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NYSDEC Region 1

SITE INVESTIGATION RESULTS REPORT

VOLUME II OF VI

FORMER THYPIN STEEL, INC. FACILITY
MANORHAVEN, NEW YORK

November 16, 2001

Prepared for:

MBA-MANORHAVEN, LLC
215 Nassau Street
Princeton, New Jersey 08540

Prepared by:

ROUX ASSOCIATES, INC.
1377 Motor Parkway
Islandia, New York 11749
and
REMEDIAL ENGINEERING P.C.
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Islandia, New York 11749

ROUX

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Soil Boring and Well Construction Logs

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

1377 Motor Parkway
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Telephone: 631-232-2600
Fax: 631-232-9898

SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-1				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**J. Orris**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / J. Orris				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/1/99-10/1/99**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Brown fine SAND and SILT, trace Gravel; Dry	N/A	5.7	
2		Brown SILT and fine SAND, trace Gravel	N/A	8.2	
3					
4		Brown SILT and fine SAND, trace Gravel and coarse Sand	N/A	13.6	
5					
6		Brown SILT, trace coarse Sand; Moist	N/A	14.8	
7					
8		Brown SILT and fine SAND, some dark brown Silt and fine Sand, trace Gravel; Moist	N/A	12.9	
9					
10		Brown SILT; Wet	N/A	5.9	
11	▽ GROUND WATER LEVEL 10/1/99				
12					Bottom of boring at 12 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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SOIL BORING LOG

WELL NO. **SB-2**	NORTHING	EASTING		
PROJECT NO./NAME **77101Y / MBA Manorhaven LLC**		LOCATION **Former Thypin Steel, Inc. Facility**		
APPROVED BY **S. Glash**	LOGGED BY **J. Orris**	**Manorhaven, New York**		
DRILLING CONTRACTOR/DRILLER **Roux Associates, Inc. / J. Orris**		GEOGRAPHIC AREA		
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **Truck Rig / Geoprobe**	SAMPLING METHOD **2" Split Spoon**	START-FINISH DATE **10/1/99-10/1/99**
LAND SURFACE ELEVATION **(FT.)**	DEPTH TO WATER **(Feet BLS)**	BACKFILL		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Brown/gray SILT and fine SAND, some Gravel, trace coarse Sand; Dry	N/A	>2000	
2		Light brown fine SAND, trace Gravel	N/A	>2000	
3					
4		Brown fine SAND	N/A	>2000	
5					
6		Brown fine SAND; Moist	N/A	>2000	
7	▽ GROUND WATER LEVEL 10/1/99				
8		Brown fine SAND; Wet	N/A	10.9	
9					
10		Brown SILT	N/A	9.5	
11					
12					Bottom of boring at 12 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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SOIL BORING LOG

WELL NO. **SB-3**	NORTHING	EASTING		
PROJECT NO./NAME **77101Y / MBA Manorhaven LLC**		LOCATION **Former Thypin Steel, Inc. Facility**		
APPROVED BY **S. Glash**	LOGGED BY **J. Orris**	**Manorhaven, New York**		
DRILLING CONTRACTOR/DRILLER **Roux Associates, Inc. / J. Orris**		GEOGRAPHIC AREA		
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **Truck Rig / Geoprobe**	SAMPLING METHOD **2" Split Spoon**	START-FINISH DATE **10/1/99-10/1/99**
LAND SURFACE ELEVATION **(FT.)**	DEPTH TO WATER **(Feet BLS)**	BACKFILL		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		Brown SILT, some Gravel, trace medium to coarse Sand; Dry	N/A	7.9	Staining noted from 0-12 ft bls.
2		Brown SILT, trace Gravel	N/A	5.7	
4		Brown fine SAND	N/A	7.4	
6		Brown fine SAND; Moist	N/A	7.9	
8		Brown SILT, trace Clay	N/A	6.4	
10		Brown SILT, trace Clay; Wet	N/A	4.5	
11	▽ GROUND WATER LEVEL 10/1/99				
12					Bottom of boring at 12 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-4				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**J. Wissing**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/20/00-10/20/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brown fine to coarse SAND and Gravel, some Concrete and Brick (Fill); Dry	NM	14	No blow counts recorded in field book.
		Brown fine to coarse SAND, trace Concrete	NM	19.3	
		Brown to light brown fine to medium SAND	NM	16.3	
5		Brown to light brown fine to medium SAND; Moist	NM	19.8	5
		Brown to light brown fine to medium SAND; Wet	NM	21.2	
10		Brown to light brown fine to medium SAND	NM	21.5	10
		Brown to light brown fine to medium SAND	NM	20.8	
		Brown to light brown fine to medium SAND	NM	21.2	
15		Brown to light brown fine to medium SAND	NM	30.2	15
		Brown to light brown fine to medium SAND	NM	85	
20		Brown to light brown fine to medium SAND	NM	0.7	20 Collected soil sample at 20-22 ft bls for TPH analysis. Bottom of boring at 22 feet bls.

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-5				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**J. Wissing**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/20/00-10/20/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brown to dark brown medium to coarse SAND, trace Concrete (Fill); Dry	NM	3.3	Blow counts were not recorded in field book.
		Brown to dark brown medium to coarse SAND	NM	2.0	
		Light brown fine to medium SAND	NM	3.9	
5					5
		Light brown fine to medium SAND; Moist	NM	3.0	
		Brown fine to medium SAND, some dark brown Sand and small fragments of Muscovite; Wet	NM	1.9	
	▽ GROUND WATER LEVEL 10/20/00				
10		Brown fine to medium SAND, some dark brown Sand and small fragments of Muscovite	NM	2.0	10
		Light brown fine to medium SAND	NM	7.1	
		Light brown fine to medium SAND	NM	2.7	
15					15
		Brown fine to coarse SAND	NM	32	
		Brown fine to coarse SAND	NM	40	
					Collected soil sample at 20-22 feet bls for TPH analysis.
20		Brown fine to coarse SAND	NM	2.3	20
					Collected Replicate sample from 0-22 ft bls.
					Bottom of boring at 22 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-6				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**J. Wissing**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/24/00-10/24/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brown to light brown fine to medium SAND, some Gravel and Concrete (Fill); Dry	NM	6.3	
		No recovery	NM	N/A	
		Brown fine to medium SAND, trace Muscovite (Fill)	NM	10.2	
5					5
		Brown fine to medium SAND, trace Muscovite (Fill); Moist	NM	9.2	
		Brown fine to medium SAND, some Concrete, Gravel, trace Muscovite (Fill)	NM	7.6	
10					10
		Brown fine to medium SAND, some Concrete, Gravel, trace Muscovite (Fill); Wet	NM	14.4	
	▽ GROUND WATER LEVEL 10/24/00				
		Brown to orange brown fine to medium SAND	NM	186	
		Fine SAND and Clay	NM	NA	Collected soil sample at 14-16 ft bls for VOC, SVOC and Metal analysis.
15					15
		Brown fine to medium SAND			
		Brown fine to medium SAND, trace Muscovite	NM	30	
		Brown fine to medium SAND, some Muscovite, trace coarse Sand	NM	18.1	
20					20
		Brown medium to coarse SAND, little Muscovite	NM	11.2	Collected soil sample at 20-22 ft bls for VOC, SVOC and Metal analysis.
					Bottom of boring at 22 feet bls.

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-7				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**J. Wissing**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/25/00-10/25/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brown medium to coarse SAND, some Gravel, Concrete and Brick (Fill); Dry	NM	13.3	
		Brown to dark brown medium to coarse SAND, some Asphalt (Fill)	NM	17.2	
		Brown to dark brown medium to coarse SAND, trace Organic Matter	NM	17.2	
5		Brown to dark brown medium to coarse SAND; Moist	NM	14.7	
		Brown to dark brown medium to coarse SAND; Wet	NM	17.7	
10	▽ GROUND WATER LEVEL 10/25/00	Brown to dark brown medium to coarse SAND	NM	13.9	Collected soil sample from 10-12 ft bls for CVOC analysis.
		Brown to dark brown medium to coarse SAND, some Muscovite	NM	7.6	
		Brown to dark brown medium to coarse SAND, some Muscovite	NM	10.1	
15		Brown to dark brown medium to coarse SAND, some Muscovite	NM	4.3	Collected soil sample from 15-17 ft bls for Metal analysis.
		Brown to light brown coarse SAND, trace Gravel	NM	9.6	
20		Brown to light brown coarse SAND, trace Gravel	NM	80.2	
		Brown to light brown coarse SAND, trace Gravel	NM	55	
		Brown fine to medium SAND	NM	NM	
25		Brown fine to medium SAND	NM	NM	
					Bottom of boring at 28 feet bls.

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-8				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**J. Wissing**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/25/00-10/25/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Brown to dark brown fine to coarse SAND, some Organic Matter (Fill); Dry	NM	15.2	Blow counts not recorded in field book.
2		Brown to dark brown fine to coarse SAND, some Organic Matter, trace Gravel and Concrete (Fill)	NM	14.3	
3					
4		Red-brown medium to coarse SAND	NM	16.5	
5					
6		Red to brown medium to coarse SAND, some Gravel; Moist	NM	17.8	Collected soil sample from 6-8 ft bls for Base Neutral anlaysis. Collected Replicate soil sample for Base Neutral analysis.
7					
8		Brown to dark brown medium to coarse SAND; Wet	NM	0.0	
9					
10	▽ GROUND WATER LEVEL 10/25/00	Brown to dark brown medium to coarse SAND	NM	0.0	
11					
12					Bottom of boring at 12 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-9				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**J. Wissing**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/25/00-10/25/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Brown to dark brown fine to coarse SAND, some Organic Matter, trace Gravel; Dry	NM	24.2	
2		Brown to dark brown fine to coarse SAND, some Organic Matter, trace Gravel	NM	18.9	
3					
4		Brown to dark brown fine to coarse SAND, trace Gravel	NM	21.4	
5					
6		Brown to dark brown fine to coarse SAND, trace Gravel; Moist	NM	24.7	Collected soil sample from 6-8 ft bls for Base Neutral analysis. Collected Matrix Spike and Matrix Spike Duplicate.
7					
8		Brown fine to coarse SAND; Wet	NM	NM	
9					
10	▽ GROUND WATER LEVEL 10/25/00	Brown fine to medium SAND, trace Clay, little Muscovite	NM	NM	
11					
12					Bottom of boring at 12 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-10				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**J. Wissing**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/24/00-10/24/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Brown to dark brown fine to coarse SAND; Dry	NM	14.3	
2		Brown to dark brown fine to coarse SAND	NM	15.2	
3					
4		Brown to dark brown fine to coarse SAND	NM	16	
5					
6		Brown to dark brown fine to coarse SAND; Moist	NM	17.9	Collected soil sample from 6-8 ft bls for Base Neutral analysis.
7					
8		Brown to dark brown fine to coarse SAND; Wet	NM	NM	
9	▽ GROUND WATER LEVEL 10/24/00				
10					Bottom of boring at 10 feet bls.

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-11				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**J. Wissing**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/20/00-10/20/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Light brown medium to coarse SAND; Dry	NM	1.3	
1					1
2		Light brown medium to coarse SAND	NM	1.6	2
3					3
4		Light brown medium to coarse SAND	NM	1.7	4
5					5
6		Light brown medium to coarse SAND	NM	1.7	6
7					7
8		Light brown to orange brown medium to coarse SAND; Moist	NM	1.9	Collected soil sample from 8-10 ft bls for VOC, SVOC and TAL Metals plus Cyanide analysis. 8
9					9
10		Light brown to orange brown medium to coarse SAND; Wet	NM	NM	10
11					11
12	▽ GROUND WATER LEVEL 10/20/00				Bottom of boring at 12 feet bls. 12

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-12	**222373.43**	**2079948.72**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**M.Lanberg**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/27/00-10/27/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
12.41 (FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Brown fine to medium SAND, trace Organic Matter; Dry	NM	3.8	
2		Brown fine to medium SAND, trace Organic Matter	NM	2.9	
3					
4		Brown to light brown fine SAND, little brown Clay, trace Muscovite; Moist	NM	1.2	
5					
6		Orange-brown fine SAND; Wet	NM	4.3	Collected soil sample from 6-8 ft bls for VOC, SVOC, and Metals plus Cyanide analysis.
7					
8		▽ GROUND WATER LEVEL 10/27/00 Brown fine SAND, little Muscovite	NM	NM	
9					
10			NM	NM	
11					
12					Bottom of boring at 12 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-13				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**J. Wissing**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/24/00-10/24/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Light brown to orange brown fine to coarse SAND, some Gravel (Fill); Dry	NM	25.3	
2		Light brown to orange brown fine to coarse SAND, some Gravel (Fill)	NM	26.9	
3					
4		Brown medium to coarse SAND	NM	26.2	Red and black staining observed.
5					
6		Brown medium to coarse SAND	NM	37.8	Red, black and grey staining observed.
7					
8		Brown to orange brown medium to coarse SAND; Moist	NM	36	Collected soil sample from 6-8 ft bls for VOC, SVOC and Metals anlaysis.
9					
10		Brown to orange brown medium to coarse SAND; Wet	NM	0.0	
11	▽ GROUND WATER LEVEL 10/24/00				
12					Bottom of boring at 12 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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Environmental Consulting & Management

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-14				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**J. Wissing**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/19/00-10/19/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		Brown to light brown medium to coarse SAND, trace Brick (Fill); Dry	NM	NM	
2		Brown to light brown medium to coarse SAND, trace Brick (Fill); Moist	NM	0.0	
4		Brown to light brown medium to coarse SAND, trace Brick (Fill)	NM	0.0	
6		Brown to light brown medium to coarse SAND, trace Brick (Fill)	NM	0.0	Collected soil sample from 6-8 ft bls for VOC, SVOC and TAL Metals plus Cyanide analysis.
8		No Recovery	NM	NM	
10	▽ GROUND WATER LEVEL 10/19/00	Medium to coarse SAND, some Clay; Wet	NM	NM	
12					Bottom of boring at 12 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-15				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**J. Wissing**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/19/00-10/19/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Brown medium to coarse SAND, little Concrete (Fill); Dry	NM	2.3	Collected soil sample from 0-2 ft bls for VOC, SVOC and TAL Metals plus Cyanide analysis.
2		Brown medium SAND	NM	0.0	Some black staining observed from 0-2 ft bls.
3					
4		Brown to orange brown medium to coarse SAND	NM	0.0	
5					
6		Brown to orange brown medium to coarse SAND: Moist	NM	0.0	
7					
8		Brown to orange brown medium to coarse SAND; Wet	NM	0.0	
9	▽ GROUND WATER LEVEL 10/19/00				
10		Orange to light brown medium to coarse SAND	NM	0.0	
11					
12					Bottom of boring at 12 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-16				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**J. Wissing**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/19/00-10/19/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Brown medium to coarse SAND, some Concrete, trace Brick (Fill); Dry	NM	0.0	
2		Brown to orange brown medium to coarse SAND	NM	0.0	
3					
4		Brown to orange brown medium to coarse SAND	NM	0.0	
5					
6		Brown to orange brown medium to coarse SAND; Moist	NM	0.0	Collected soil sample from 6-8 ft bls for VOC, SVOC and TAL Metals plus Cyanide analysis.
7					
8	▽ GROUND WATER LEVEL 10/19/00	Brown to orange brown medium to coarse SAND; Wet	NM	0.0	
9					
10		Brown to orange brown medium to coarse SAND, small band of gray clay observed at 11 feet bls	NM	0.0	
11					
12					Bottom of boring at 12 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-17				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**J. Wissing**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/19/00-10/19/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Brown medium to coarse SAND, some Gravel and Concrete, little black medium to coarse Sand (Fill); Dry	NM	16.4	Staining observed.
2		Brown to orange medium SAND, some fine Sand;	NM	6.0	Collected soil sample from 0-2 ft bls for VOC, SVOC and TAL Metals plus Cyanide analysis.
3					
4		Brown to orange medium SAND, some fine Sand	NM	1.3	
5					
6		Brown to orange medium SAND, some fine Sand	NM	6.4	
7					
8		Brown medium to coarse SAND, some Gravel, little reddish brown Clay; Moist	NM	0.0	
9					
10	▽ GROUND WATER LEVEL 10/19/00	Light brown medium to coarse SAND; Wet	NM	0.0	
11					
12					Bottom of boring at 12 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-18				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**J. Wissing**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/20/00-10/20/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Brown to dark brown fine to medium SAND, some Concrete and Brick (Fill); Dry	NM	1.5	
2		Light brown fine to medium SAND, some Brick (Fill)	NM	1.2	
3					
4		Light brown fine to medium SAND	NM	1.7	
5					
6		Light brown fine to medium SAND	NM	1.4	
7					
8		Light brown fine to medium SAND; Moist	NM	2.0	Collected soil sample from 8-10 ft bls for VOC, SVOC and TAL Metals plus Cyanide analysis.
9					
10		Light brown fine to medium SAND; Wet	NM	0.0	
11	▽ GROUND WATER LEVEL 10/20/00				
12					Bottom of boring at 12 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-19				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**J. Wissing**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/19/00-10/19/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		Brown medium to coarse SAND; Dry	NM	6.5	Staining observed.
1					
		Black SAND and GRAVEL			
2		Brown medium to coarse SAND	NM	2.6	
3					
4		Reddish-brown medium to coarse SAND, some gray Clay, trace Gravel	NM	1.6	
5					
6		Orange medium to coarse SAND, some grey medium to coarse Sand, trace Gravel; Moist	NM	1.4	
7					
8		Brown to orange brown medium to coarse SAND; Wet	NM	0.0	
9					
10		Brown to orange brown medium to coarse SAND	NM	0.0	
11	▽ GROUND WATER LEVEL 10/19/00				Bottom of boring at 12 feet bls.
12					

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-20				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**J. Wissing**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/24/00-10/24/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Brown medium to coarse SAND, some Concrete (Fill); Dry	NM	27.5	
2		Brown to orange brown fine to coarse SAND	NM	18.3	
3					
4		Brown to orange brown fine to coarse SAND	NM	90.5	Collected soil sample from 4-6 ft bls for VOC, SVOC and Metals plus Cyanide analysis.
5					
6		Brown to orange brown fine to coarse SAND, some Gravel	NM	39	
7					
8		Brown to light brown fine to medium SAND; Moist	NM	22	
9					
10		Brown to light brown fine to medium SAND; Wet	NM	NM	
11	▽ GROUND WATER LEVEL 10/24/00				
12					Bottom of boring at 12 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-21				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**J. Wissing**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/24/00-10/24/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		Brown fine to coarse SAND and CONCRETE, some Brick (Fill); Dry	NM	21.3	
1					
2		Brown fine to coarse SAND and CONCRETE, some Brick (Fill)	NM	19.2	
3					
4		Brown fine to coarse SAND and CONCRETE, some Brick (Fill)	NM	26	
5					
6		Brown fine to coarse SAND and CONCRETE, some Brick (Fill)	NM	22.1	
7					
8		Brown fine to coarse SAND; Moist	NM	27.4	Collected soil sample from 8-10 ft bls for VOC, SVOC and Metals plus Cyanide analysis.
9					
10		Brown fine to coarse SAND; Wet	NM	NM	
11	▽ GROUND WATER LEVEL 10/24/00				
12					Bottom of boring at 12 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-22				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY			
S. Glash	**J. Wissing**	**Manorhaven, New York**		
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/19/00-10/19/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Brown medium to coarse SAND, trace Brick and Concrete (Fill); Dry	NM	7.5	
2		Brown medium to coarse SAND, trace Brick and Concrete (Fill)	NM	2.5	
3					
4		Brown medium to coarse SAND, trace Brick and Concrete (Fill)	NM	13.4	
5					
6		Brown medium to coarse SAND, trace Brick and Concrete (Fill)	NM	14.6	
7					
8		Brown medium to coarse SAND, trace Brick and Concrete (Fill); Moist	NM	15.2	Collected soil sample from 8-10 ft bls for VOC, SVOC, and TAL Metals plus Cyanide analysis.
9					
10		Brown to orange brown medium to coarse SAND, trace Organic Material; Wet	NM	14.3	
11	▽ GROUND WATER LEVEL 10/19/00				Bottom of boring at 12 feet bls.
12					

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-23	**222400.39**	**2080598.07**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**J. Wissing**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/27/00-10/27/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
13.03 (FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		TOPSOIL and Brown medium to coarse SAND, some Black stained fine to coarse Sand, little Organic Matter; Dry (Fill)	NM	0.0	Collected soil sample at 0-2 ft bls for VOC, SVOC and Metals plus Cyanide analysis.
2		Brown medium to coarse SAND	NM	0.0	
3					
4		Brown medium to coarse SAND	NM	0.0	
5					
6		Brown medium to coarse SAND; Moist	NM	0.0	
7					
8		Brown fine to medium SAND; Wet	NM	NM	
9	▽ GROUND WATER LEVEL 10/27/00				
10					Bottom of boring at 10 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 9/6/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-24	**5012.09**	**4627.93**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY			
S. Glash	**J. Wissing**	**Manorhaven, New York**		
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Land, Air, Water / Rob Allegrezza				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
6.25-in. / Auger	**4-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**10/27/00-11/8/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
12.89 (FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brown to dark brown fine to medium SAND, trace Organic Matter, little Asphalt (Fill); Dry	NM	7.0	
		Brown to dark brown fine to medium SAND	NM	1.0	
5		Brown to dark brown fine to medium SAND	NM	3.6	
		Brown to dark brown fine to medium SAND	NM	0.0	
		Light brown fine to coarse SAND, some Gravel; Moist	NM	7.4	Collected soil sample from 8-10 ft bls for VOC, SVOC and Metal analysis.
10		Light brown fine to coarse SAND, some Gravel; Wet	2 4 2 4	2.4	
	▽ GROUND WATER LEVEL 10/27/00	Brown fine to medium SAND and SILT; Wet	2 5 5 6	2.6	
15		Brown fine to medium SAND, some Silt, little Gravel; Wet	2 4 5 6	2.7	
		Brown coarse to medium SAND some Gravel; Wet	4 5 4 13	1.7	
		Brown coarse to medium SAND, some Gravel; Wet	2 4 5 4	0.8	
20		Brown coarse to medium SAND, some Gravel; Wet	5 7 9 14	8.4	
		Brown coarse to medium SAND, some Gravel; Wet	4 8 13 14	8.1	
		Brown coarse to medium SAND, some Gravel; Wet Brown fine to medium SAND and Silt; Wet	12 14 20 16	31.5	
25		Brown fine to medium SAND and SILT, some iron banding; Wet	11 14 18 21	9.4	
		Brown fine to medium SAND and SILT, some iron banding; Wet	7 7 9 13	8.5	
30		Brown fine to medium SAND and SILT, some iron banding; Wet	10 10 23 19	15.5	
		Brown fine to medium SAND and SILT, some iron banding; Wet	2 2 5 4	19.2	
		Brown fine to medium SAND and SILT, some iron banding; Wet	7 10 13 14	14.2	Bottom of boring at 36 feet bls.
35					

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-25				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY			
S. Glash	**K. Somers**	**Manorhaven, New York**		
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/26/00-10/26/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Light brown to dark grey fine to coarse SAND, little Gravel, trace Silt and Asphalt (Fill); Dry	N/A		Collected composite soil sample from SB-25 A-F from 0-2 feet bls for CVOC and TAL Metals plus Cyanide analysis.
2		No Recovery	N/A		PID readings from SB-25 A-F 0-2 feet bls ranged from 0-7.2 ppm.
3					
4		Light brown to dark brown fine to medium SAND, trace Silt and yellowish orange fine Sand	N/A		Collected composite soil sample at SB-25 A-F from 4-6 feet bls for CVOC and TAL Metals plus Cyanide anlaysis. PID readings from SB-25 A-F 4-6 feet bls ranged from 0-7.2 ppm.
5					
6					Bottom of boring at 6 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-26				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**K. Somers**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/26/00-10/26/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Light brown to dark brown fine to coarse SAND, little yellowish orange fine Sand and Silt, trace Gravel; Dry	N/A		1 Collected composite soil sample from SB-26 A-F from 0-2 feet bls for CVOC and TAL Metals plus Cyanide analysis.
2		No Recovery	N/A		2 PID readings from SB-25 A-F 0-2 feet bls ranged from 0-2.1 ppm.
3					3
4		Light brown to dark grey fine to coarse SAND, some fine to coarse Gravel	N/A		4 Collected composite soil sample from SB-26 A-F from 4-6 feet bls for CVOC and TAL Metals plus Cyanide analysis.
5					5 PID readings from SB-25 A-F 4-6 feet bls ranged from 0-13.0 ppm.
6					Bottom of boring at 6 feet bls. 6

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-27				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY			
S. Glash	**J. Wissing**	**Manorhaven, New York**		
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/26/00-10/26/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Light brown to dark grey fine to medium SAND, some Silt, little fine to coarse Gravel, trace Silt, Organic Matter and Ash (Fill)	N/A		Collected composite soil sample SB-27 A-F from 0-2 feet bls for CVOC and TAL Metals plus Cyanide anlaysis.
2		No Recovery	N/A		PID readings from SB-27 A-F 0-2 feet bls ranged from 2.4-9.0 ppm.
3					
4		Light brown to dark brown fine to coarse SAND, some yellowish orange Silt, little fine Gravel and fine white Sand	N/A		Black staining observed.
5					Collected composite soil sample SB-27 A-F from 4-6 ft bls for CVOC and TAL Metals plus Cyanide analysis. PID readings from SB-27 A-F 4-6 feet bls ranged from 0-9.0 ppm.
6					Bottom of boring at 6 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-270				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**J. Wissing**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Rick Tabor				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
6.25-in. / Auger	**2-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**7/6/00-7/6/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Black to brown to orange brown fine to medium SAND, some Gravel (Fill); Dry	13 11	NM	Collected composite soil sample from 0-10 feet bls for Argo analysis.
2		Brown to orange brown SAND (Fill)	11 10 9	NM	
3			11 10		
4		Light brown to brown to orange brown fine to medium SAND, some Gravel (Fill)	8 5	NM	
5			7 9		
6		Light brown to brown fine to medium SAND, some iron banding; Moist	13 9	NM	Iron-like banding from 6-8 feet bls.
7			15 7		
8		Brown to orange brown fine to medium SAND; Wet	17 15	NM	
9			14 16		
10			15		Bottom of boring at 10 feet bls.

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-28				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**K. Somers**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/31/00-10/31/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Yellowish orange to light brown fine to medium SAND, some fine to coarse Gravel and Brick, little olive gray to white very hard Clay, trace Silt (Fill)	N/A		Collected composite soil sample SB-28 A-F from 0-2 feet bls for CVOC and Metals plus Cyanide analysis.
2		No Recovery	N/A		PID readings from SB-28 A-F from 0-2 feet bls ranged from 1.9 to 14.9 ppm.
3					
4		Light brown to dark brown fine to medium SAND, little Silt and yellowish orange fine to medium Sand, trace Brick, Gravel and Wood Fragments (Fill)	N/A		Collected composite soil sample SB-28 A-F from 4-6 feet bls for CVOC and Metals plus Cyanide analysis. PID readings from SB-28 A-F from 4-6 feet bls ranged from 1.9 to 19.4 ppm.
5					Collected composite soil sample SB-28 A-F from 4-6 feet bls for Replicate, Matrix Spike, and Matrix Spike Duplicate.
6					Bottom of boring at 6 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-280				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**J. Wissing**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Rick Tabor				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
6.25-in. / Auger	**2-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**7/6/00-7/6/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Brown fine SAND and black Ash-like substance (Fill); Dry	22 9 9	NM	
2		Brown fine SAND, some Concrete (Fill)	20 11	NM	
3			12 7		
4		Brown to light brown fine to medium SAND (Fill)	5 5	NM	
5			5 6		Collected composite soil sample from 0-10 feet bls for Argo analysis.
6		Brown fine to medium SAND, some Concrete (Fill); Moist	7 6	NM	
7			10 7		
8		Brown fine to medium SAND, some Concrete (Fill); Wet	13 15	NM	
9			15 17		
10			19		Bottom of boring at 10 feet bls.

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-29				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**K. Somers**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/31/00-10/31/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Light brown to yellowish orange fine to coarse SAND, little fine to coarse Gravel, trace Silt	N/A		Collected composite soil sample SB-29 A-F from 0-2 feet bls for CVOC and Metals plus Cyanide analysis.
2		No Recovery	N/A		Trace black staining from 0-2 feet bls. PID readings from SB-29 A-F from 0-2 feet bls ranged from 0.7 to 11.6 ppm.
3					
4		Light brown fine SAND, some light brown to olive gray Clay, trace Silt and coarse Gravel	N/A		Collected composite soil sample SB-29 A-F from 4-6 feet bls for CVOC and Metals plus Cyanide analysis. PID readings from SB-29 A-F from 4-6 feet bls ranged from 0.5 to 4.0 ppm.
5					
6					Bottom of boring at 6 feet bls.

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-30				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY			
S. Glash	**K. Somers**	**Manorhaven, New York**		
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / Pete Barczak				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**Truck Rig / Geoprobe**	**2" Split Spoon**	**10/31/00-10/31/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Light brown to dark brown fine to coarse SAND, some Gravel, little yellowish orange fine Sand, trace Silt; Dry	N/A		Collected composite soil sample SB-30 A-F from 0-2 feet bls for CVOC and Metals plus Cyanide analysis.
2		No Recovery	N/A		PID readings from SB-30 A-F from 0-2 feet bls ranged from 0 to 9.1 ppm.
3					
4		Light brown to dark brown fine to coarse SAND, little fine to coarse Gravel, trace Silt	N/A		Collected composite soil sample SB-30 A-F from 4-6 feet bls for CVOC and Metals plus Cyanide analysis.
5					PID readings from SB-30 A-F from 4-6 feet bls ranged from 0 to 9.4 ppm.
6					Bottom of boring at 6 feet bls.

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-31	**222064.8**	**2080166**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**M.Lanberg**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Chris Stratton				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Failing F-10 / HSA**	**2" Split Spoon**	**2/28/01-3/1/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
13.75 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		ASPHALT (Fill); Dry	2	0.0	12 inch recovery.
			3		
		Dark brown fine to coarse SAND and GRAVEL (Fill)	7		
			9		
		No recovery	6	0.0	No recovery.
			7		
			12		
			12		
		Dark brown fine to coarse SAND, some Gravel (Fill); Moist	14	0.0	12 inch recovery.
5			3		5
			4		
			8		
		Light brown fine to medium SAND	3	0.0	12 inch recovery.
			3		
			5		
			6		
		Light brown fine to medium SAND	15	0.1	18 inch recovery.
			5		
			8		
10			8		10
		Light brown fine to medium SAND	11	0.0	12 inch recovery.
			3		
			6		
			9		
		Brown fine SAND grading to fine SAND and SILT, some Clay	3	0.0	18 inch recovery.
			2		
			5		
			6		
	▽ GROUND WATER LEVEL 2/28/01	Brown fine SAND; Wet	3	0.0	Collected Hydropunch ™ sample every ten feet for CVOC analysis and Chromium (filtered and unfiltered). Bottom of boring at 50 feet bls.
15			3		15
			4		
			5		

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-32	**222151.3**	**2080167**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**
APPROVED BY: **S. Glash** / LOGGED BY: **M.Lanberg**	**Manorhaven, New York**
DRILLING CONTRACTOR/DRILLER: **ADT Drilling / Chris Stratton**	GEOGRAPHIC AREA

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Failing F-10 / HSA**	**2" Split Spoon**	**2/26/01-4/11/01**

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
14.35 (FT.)	**(Feet BLS)**	**Bentonite**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		ASPHALT and medium to fine SAND, some Gravel (FILL)	2 7 10	0.2	6 inch recovery.
		Red-brown fine SAND and SILT, iron staining, some Gravel	8 6 10	0.2	12 inch recovery.
5		Brown fine to medium SAND, some Silt and Gravel	12 10 5	0.2	5 inch recovery.
		Brown to white fine to coarse SAND	5 8 8	0.1	12 inch recovery.
		Brown to white fine to coarse SAND	5 10 11	0.0	12 inch recovery.
10		Brown fine to coarse SAND, some Silt; Moist	19 5 8 10	0.0	18 inch recovery.
	▽ GROUND WATER LEVEL 2/26/01	Brown fine to coarse SAND, some Silt; Wet	10 10 11 12	0.2	18 inch recovery. Collected Hydropunch™ samples every ten feet for CVOCs and Chromium (filtered and unfiltered). No samples collected from 14-70 ft bls.
15			11 6 7 8 7 N/A		
20					
25					
30					
35					
40					
45					
50					

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-32	**222151.3**	**2080167**
PROJECT NO./NAME		LOCATION
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**
APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
55					
60					
65					
70		Olive-gray fine SAND, some Clay, grading to fine Sand and Clay, some Silt	16 19 20 24	2.4	
75			N/A		Collected Hydropunch™ sample from 71-73 ft bls for CVOC analysis.
80		Olive-gray CLAY, some fine Sand and Silt, grading to olive-grey Clay, some Silt, little fine Sand	10 10 14 16	2.2	
85			N/A		Collected Hydropunch™ sample from 81-83 ft bls for CVOC analysis.
90		Olive-gray CLAY, some Silt and fine Sand	10 15 12 10	3.7	
95			N/A		Collected Hydropunch™ sample from 91-93 ft bls for CVOC analysis.
100		Olive-gray CLAY, some Silt, little fine Sand Olive-gray CLAY, little Silt	18 20 21 24	2.5	
105			N/A		Collected Hydropunch™ sample from 101-103 ft bls for CVOC analysis. Collected groundwater sample SB-32/101-103 for Chloride and Total Dissolved

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-32	**222151.3**	**2080167**
PROJECT NO./NAME		LOCATION
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**
APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
110		Olive-gray CLAY, some Silt			Solids analysis. 110 Collected groundwater sample SB-32/111-113 for Chloride and Total Dissolved Solids analysis. Bottom of boring at 113 ft bls.

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-33	**222233.5**	**2080145**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY			
S. Glash	**K. Somers**	**Manorhaven, New York**		
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Dennis Meyor				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**DK-5 / HSA**	**2" Split Spoon**	**2/27/01-2/27/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
14.49 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		TOPSOIL			
		Light brown fine to medium SAND and SILT; Dry	7	0.5	12 inch recovery.
1			18		
			24		
2			32		
		Light brown fine to medium SAND, some Silt	18	0.1	12 inch recovery.
3			24		
			30		
4			30		
		Dark brown fine to medium SAND and SILT, trace fine to coarse Gravel	48	0.1	12 inch recovery.
5		Light brown fine SAND, little Silt	30		
			24		
6			25		
		Light brown fine SAND, little Silt	18	0.0	14 inch recovery.
7			19		
			22		
8			26		
		Light brown fine to coarse SAND, little Silt; Moist	24	0.0	14 inch recovery.
9			33		
			38		
10			40		
		Light brown medium to coarse SAND, little Silt; Wet	15	0.0	12 inch recovery.
11			18		
	▽ GROUND WATER LEVEL 2/27/01		20		Collected Hydropunch™ sample every ten feet for CVOC analysis.
12			14		Bottom of boring at 50 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-34	**222305.2**	**2080137**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**K. Somers**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Dennis Meyor				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**DK-5 / HSA**	**2" Split Spoon**	**2/28/01-2/28/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
14.36 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Light brown fine to coarse SAND, little coarse Gravel, trace Silt; Dry	28 25	0.1	6 inch recovery.
2		Light brown fine to coarse SAND, little coarse Gravel and Silt	28 40 48	0.0	10 inch recovery.
3			30 12		
4			12		
5		No recovery	5 3	N/A	No recovery.
6			3 3		
7		Light brown fine to coarse SAND and SILT, some coarse Gravel	45 45	0.2	5 inch recovery.
8			20 22		
9		Light brown fine to medium SAND, trace Silt; Moist	10 10	0.0	10 inch recovery.
10			15 15		
11		Light brown fine to medium SAND; Wet	10 10	0.0	12 inch recovery.
12	▽ GROUND WATER LEVEL 2/28/01		10 8 6		Collected Hydropunch™ sample every ten feet for CVOC analysis. Bottom of boring at 50 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-35	**222428.9**	**2080133**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**K. Somers**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Dennis Meyor				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**DK-5 / HSA**	**2" Split Spoon**	**3/1/01-3/1/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
15.00 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		No recovery	12 15	N/A	No recovery.
2			21 10		
3		Dark brown medium to coarse SAND, some Silt, little fine to coarse Gravel, trace Brick (Fill); Dry	10	0.9	12 inch recovery. Collected soil sample from 2-4 feet bls for Chloride and TDS analysis.
4		Light brown medium to coarse SAND, some Silt, trace fine Gravel (Fill)	11 15		
5		Dark brown medium to coarse SAND, some Silt and coarse Gravel (Fill)	14 20	0.6	10 inch recovery.
6		Light brown fine to medium SAND, some Silt	12 14		
7		Light brown fine to medium SAND, some Silt	14 12	0.0	12 inch recovery.
8			9 15		
9		Light brown fine to medium SAND, some Silt; Moist	18 15	0.0	15 inch recovery.
10			12 20		
11		Light brown medium to coarse SAND, some Silt; Wet	19 19	0.0	15 inch recovery.
12	▽ GROUND WATER LEVEL 3/1/01		21 24 28		Collected Hydropunch™ sample every ten feet for CVOC analysis. Bottom of boring at 50 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-36	**222469.3**	**2080171**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY			
S. Glash	**K. Somers**	**Manorhaven, New York**		
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Sean Miller				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**3/7/01-3/7/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
15.49 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		CONCRETE (Fill)	12	0.0	12 inch recovery.
		Dark brown medium to coarse SAND, some Silt; Dry	9		
			6		
2			9		
		Light brown medium to coarse SAND, some Silt	16	0.0	12 inch recovery.
3			11		
			11		
4			8		
		Light brown medium to coarse SAND, little Silt, trace fine Gravel	3	0.0	10 inch recovery.
5			3		
			2		
6			3		
		Light brown medium to coarse SAND, some Silt	3	0.0	10 inch recovery.
7			7		
			7		
8			8		
		No recovery	14	N/A	No recovery.
9			15		
			16		
10			8		
		Light brown fine to medium SAND and SILT; Moist	14	0.0	12 inch recovery.
11			13		
			13		
12	▽ GROUND WATER LEVEL 3/7/01		16		
		Light brown fine SAND and SILT; Wet	8	0.0	12 inch recovery. Collected Hydropunch™ sample every ten feet for CVOC analysis. Bottom of boring at 30 feet bls.
13			13		
			17		
14			19		

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-37	**222539.6**	**2080128**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY			
S. Glash	**K. Somers**	**Manorhaven, New York**		
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Sean Miller				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**3/8/01-3/8/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
15.81 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		CONCRETE and Brown coarse SAND (Fill); Dry	23 21 7 9	0.0	6 inch recovery.
2		Light brown fine to medium SAND, some Silt	11 10 9 10	0.0	10 inch recovery.
3					
4		Light brown medium to coarse SAND, little Silt	4 3 2 1	0.0	12 inch recovery.
5					
6		Light brown medium to coarse SAND	2	0.0	10 inch recovery.
7		Brown fine to coarse SAND and SILT, trace Clay; Moist	1 1 3		
8		Light brown fine to medium SAND and SILT	3 1 3	0.0	10 inch recovery.
9					
10		Light brown fine to medium SAND and SILT; Moist	8 10 11 13	0.0	10 inch recovery. Collected soil sample SB-37/10-12 for CVOC analysis.
11					
12	▽ GROUND WATER LEVEL 3/8/01	Light brown fine SAND and SILT; Wet	13 8 16 22	0.0	2 inch recovery. Collected Hydropunch™ sample every ten feet for CVOC analysis. Bottom of boring at 30 feet bls.
13					
14			7		

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-38	**222628.5**	**2080143**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**K. Somers**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Sean Miller	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**3/8/01-3/9/01**

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
15.41 (FT.)	**(Feet BLS)**	**Bentonite**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		Dark brown medium to coarse SAND, some coarse Gravel (Fill); Dry	4	0.0	10 inch recovery.
		Light brown medium to coarse SAND, little Silt	6		
1			5		
			7		
2		Light brown medium to coarse SAND, some Silt	11	0.0	12 inch recovery.
			7		
3			7		
			9		
4		Light brown medium to coarse SAND, some Silt	7	0.0	12 inch recovery.
			6		
5			8		
			8		
6		Light brown medium to coarse SAND	12	0.0	12 inch recovery.
			5		
7			6		
			4		
8		Olive gray CLAY, some Silt	11	373	6 inch recovery. Collected soil sample SB-38/8-10 for CVOC analysis. Collected soil sample from 8-10 ft bls for DNAPL analysis.
		Light brown medium to coarse SAND, some Silt; Moist	9		
9		Coarse GRAVEL	15		
			15		
10		Yellowish orange SILT and medium to coarse SAND; Wet	6	0.0	4 inch recovery.
			21		Collected Hydropunch™ sample every ten feet for CVOCs. Collected groundwater sample from 12-14 ft for DNAPL, groundwater sample SB-38/48-50 ft for Chloride and Total Dissolved Solids, and soil sample from 48-50 ft bls for DNAPL analysis. Bottom of boring at 50 feet bls.
11			19		
12	▽ GROUND WATER LEVEL 3/8/01		18		

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-39	**222375.5**	**2080288**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**K. Somers**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Sean Miller				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**3/9/01-3/12/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
14.75 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Coarse GRAVEL and CONCRETE, trace Brick (Fill); Dry	35	3.3	10 inch recovery.
1		Dark brown medium to fine SAND, some Silt, trace fine Gravel	14		
			18		
2			11		
		Light brown fine to medium SAND, some Silt	14	25.2	10 inch recovery.
3			10		
			11		
4			11		
		Olive-gray coarse SAND and coarse GRAVEL	11	2.3	12 inch recovery.
		Light brown fine to medium SAND, some Silt	9		
5			9		
			8		
6		Light brown fine to medium SAND, some Silt	13	38.6	12 inch recovery.
7			10		
			6		
8			8		
		Light brown fine to medium SAND and SILT; Moist	12	1.6	12 inch recovery.
9			13		
			16		
10			9		
		Light brown fine to medium SAND and SILT; Wet	15	13.5	12 inch recovery.
11			19		
			26		
12		GROUND WATER LEVEL 3/9/01	14		

12 inch recovery. Collected Hydropunch™ sample every ten feet for CVOC analysis. Collected groundwater sample SB-39/48-50 ft for Chloride and Total Dissolved Solids. Bottom of boring at 50 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-40	**222291.11**	**2080216.03**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
80		Olive-gray CLAY, some Silt, little fine Sand	2 6 6 4	1.3	
			N/A	N/A	Collected Hydropunch™ sample from 81-83 ft bls for CVOC analysis. Collected groundwater duplicate sample GW-9 for CVOC analysis.
85					
90		Olive-gray CLAY, some Silt, little fine Sand	8 8 10 11	1.1	
			N/A	N/A	Collected Hydropunch™ sample from 91-93 ft bls for CVOC analysis.
95					
100		Olive-gray CLAY, some Silt, little fine Sand	6 6 8 10	1.3	
			N/A	N/A	Collected Hydropunch™ sample from 101-103 ft bls for CVOC analysis. Collected groundwater sample SB-40/101-103 for Chloride and Total Dissolved Solids analysis.
105					
110					
			N/A	N/A	Collected groundwater sample SB-40/111-113 for BTEX and MTBE analysis.
115					

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-40	**222291.11**	**2080216.03**
PROJECT NO./NAME		LOCATION
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**
APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
120					Collected groundwater sample SB-40/121-123 for BTEX and MTBE analysis. Bottom of boring at 123 ft bls. 120

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-41	**222258.59**	**2080331.99**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**K. Somers**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Dennis Meyor	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**DK-5 / HSA**	**2" Split Spoon**	**3/2/01-4/5/01**

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
14.92 (FT.)	**(Feet BLS)**	**Bentonite**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		CONCRETE (Fill)	8		
		Light brown fine SAND, some Silt, trace coarse Gravel; Dry	11	1.4	12 inch recovery.
			14		
			14		
			18	0.0	12 inch recovery.
			24		
			23		
			6		
5		Light brown fine to coarse SAND, some Silt, little fine to coarse Gravel	6	0.0	20 inch recovery.
			10		
			13		
			15		
		Light brown fine to medium SAND, some Silt	8	0.0	12 inch recovery.
			5		
			10		
			19		
		Light brown fine SAND, little Silt; Moist	9	0.0	10 inch recovery.
			8		
			14		
10			16		
		Light brown fine to medium SAND and SILT; Wet	18	0.0	20 inch recovery.
			20		
	▽		24		Collected Hydropunch™ sample every ten feet for CVOC analysis.
	GROUND WATER LEVEL 3/2/01		26		
15			N/A	N/A	
20					
25					
30					
35					
40					
45					

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-41	**222258.59**	**2080331.99**
PROJECT NO./NAME		LOCATION
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**
APPROVED BY	LOGGED BY	
S. Glash	**K. Somers**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
50					
55					
60		Light brown fine to coarse SAND, trace Silt	37 35 25 25	2.8	
			N/A	N/A	Collected Hydropunch™ from 61-63 ft bls for CVOC analysis.
65					
70		Olive-gray fine SAND and CLAY, little Silt	6 6 10 12	0.4	
			N/A	N/A	Collected Hydropunch™ from 71-73 ft bls for CVOC analysis.
75					
80		Olive-gray fine SAND and CLAY	20 25 30 40	5.1	
			N/A	N/A	Collected Hydropunch™ from 81-83 ft bls for CVOC analysis.
85					
90		Olive-gray CLAY, some Silt	18 22 15 15	1.5	
			N/A	N/A	Collected Hydropunch™ from 91-93 ft bls for CVOC analysis.
95					

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-41	**222258.59**	**2080331.99**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**K. Somers**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
100		Olive-gray CLAY, some Silt	10 14 18 22	2.1	100
					Collected Hydropunch™ from 101-103 ft bls for CVOC analysis.
			N/A	N/A	Collected groundwater sample SB-40/101-103 for Chloride and Total Dissolved Solids analysis.
105					105
110					110
					Collected Hydropunch™ from 111-113 ft bls for CVOC analysis. Bottom of boring at 113 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-42	**2222487.2**	**2080241.66**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY			
S. Glash	**M.Lanberg**	**Manorhaven, New York**		
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Chris Stratton				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Failing F-10 / HSA**	**2" Split Spoon**	**3/9/01-3/12/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
14.84 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		Light brown fine to coarse SAND, some Gravel (Fill); Dry	8 7 8	0.0	12 inch recovery.
		CONCRETE (Fill)	6 6 7 6 6	0.0	24 inch recovery.
5		Light brown fine to coarse SAND	4 5 7 7	10.0	18 inch recovery.
		Light brown fine to medium SAND, some Silt; Moist	2 3 2	0.2	24 inch recovery.
		Light brown fine to medium SAND; some Silt	4 3 3 5	0.2	24 inch recovery.
10		Light brown SILT, some brown fine Sand; Wet	7 2 2 6 9	0.2	24 inch recovery. Collected Hydropunch™ sample every ten feet for Chromium and CVOC analysis. Collected DNAPL sample from 10-12 ft and 48-50 ft bls.
	▽ GROUND WATER LEVEL 3/9/01		N/A	N/A	Collected Hydropunch™ samples from 11-13 ft bls for BTEX analysis.
15					
20					Collected Hydropunch™ samples from 11-13 ft bls for BTEX analysis.
			N/A	N/A	
25					
30					Collected Hydropunch™ samples from 31-33 ft bls for BTEX analysis. Bottom of boring at 33 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-43	**222193.19**	**2080370.37**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**M.Lanberg**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Chris Stratton				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Failing F-10 / HSA**	**2" Split Spoon**	**3/2/01-3/7/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
14.48 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Brown fine to coarse SAND (Fill); Moist	1 2	0.0	18 inch recovery.
2			2 4		
3		CONCRETE, some Brown fine to coarse Sand (Fill)	4 11	NM	6 inch recovery.
4			20 5		
5		BRICK, CONCRETE and Brown fine to coarse SAND (Fill)	25 18	3.2	12 inch recovery.
6			11 9		
7		Light brown fine to coarse SAND, trace Brick	7 7	0.1	12 inch recovery.
8			7 7		
9		Brown fine to coarse SAND	5 7	0.0	12 inch recovery.
10			9 12		
11		Brown fine to coarse SAND	4 6	0.0	12 inch recovery.
12			9 10		
13		Gray medium to coarse SAND, some Silt; Wet	9 11	0.0	12 inch recovery. Collected Hydropunch™ sample every ten feet for CVOC analysis. Bottom of boring at 50 feet bls.
14	▽ GROUND WATER LEVEL 3/2/01		12 10		

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-44	**222122.11**	**2080407.71**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY			
S. Glash	**M.Lanberg**	**Manorhaven, New York**		
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Chris Stratton				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Failing F-10 / HSA**	**2" Split Spoon**	**3/1/01-4/12/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
13.44 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		CONCRETE, some Organic Material (Fill); Dry	NM	0.0	24 inch recovery.
		Light brown fine to medium SAND and ASPHALT (Fill)			
		ASPHALT, some Organic Material (Fill)	2 4 8 10	0.0	6 inch recovery.
5		Light brown fine to medium SAND, little Asphalt (Fill)	3 2 3 2	0.0	12 inch recovery.
		ASPHALT (Fill)	3 0 0 0	0.0	3 inch recovery.
		Brown fine to coarse SAND; Moist	6 8 8 8	0.0	12 inch recovery. Collected soil sample SB-44/8-10 for soil pH analysis.
10		Brown fine to coarse SAND	8 7 9 8	0.0	12 inch recovery.
	▽ GROUND WATER LEVEL 3/1/01	Brown fine to coarse SAND; Wet	7 8 8 7	0.0	18 inch recovery. Collected Hydropunch sample every ten feet for CVOC analysis.
15			N/A	N/A	No samples collected from 14-60 ft bls.
20					
25					
30					
35					
40					
45					

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-44	**222122.11**	**2080407.71**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
50					
55					
60		Gray SILT, some Clay	5 7 11 11	0.0	
65			N/A	N/A	Collected groundwater sample SB-44/61-63 for CVOC, BTEX, and MTBE analysis.
70		Gray SILT, some Clay	8 8 14 18	0.3	Collected groundwater sample SB-44/71-73 for CVOC, BTEX, and MTBE analysis. Bottom of boring at 73 ft bls.

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1377 Motor Parkway
Islandia, New York 11749
Telephone: 631-232-2600
Fax: 631-232-9898

SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-45	**222088.01**	**2080329.09**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY			
S. Glash	**M.Lanberg**	**Manorhaven, New York**		
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Chris Stratton				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Failing F-10 / HSA**	**2" Split Spoon**	**3/8/01-4/12/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
13.37 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		ASPHALT (Fill)	10 12	0.0	12 inch recovery.
		Brown fine to coarse SAND (Fill); Dry			
		ASPHALT, some light brown fine to coarse Sand (Fill)	4 8 10	0.0	12 inch recovery.
			8		
5		Light brown fine to coarse(+) SAND, some Asphalt (Fill)	9 9 6	0.0	24 inch recovery.
			16		
		Light brown fine to coarse(+) SAND, little Asphalt (Fill); Moist	4 2 13	0.0	24 inch recovery.
			13		
		Light brown fine to coarse(+) SAND	3 4	0.0	24 inch recovery.
10			10 12		
		Light brown fine to coarse(+) SAND	6 9	0.0	24 inch recovery.
			8		Collected Hydropunch™ samples from 11-13 ft bls for BTEX analysis.
		Light brown fine to coarse(+) SAND); Wet	9 6 4 4 4	0.0	24 inch recovery. Wet at 12 feet bls. Collected Hydropunch™ sample every ten feet for CVOC and Chromium analysis. Collected DNAPL sample from 12-14 ft and 48-50 ft bls.
15			N/A	N/A	
20					
					Collected Hydropunch™ samples from 11-13 ft bls for BTEX analysis.
			N/A	N/A	
25					
30					
					Collected Hydropunch™ samples from 31-33 ft bls for BTEX and MTBE analysis.
			N/A	N/A	No samples collected from 34-60 ft bls.
35					
40					

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-45	**222088.01**	**2080329.09**
PROJECT NO./NAME		LOCATION
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**
APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
45			N/A	N/A	
50			N/A	N/A	
55					
60		Gray SILT, some Clay	NM	0.0	Collected Hydropunch™ sample from 61-63 ft bls for CVOC, BTEX, and MTBE analysis.
65			N/A	N/A	
70		Gray SILT, some Clay	NM	0.0	Collected Hydropunch™ sample from 71-73 ft bls for CVOC, BTEX, and MTBE analysis.
75			N/A	N/A	
80		Gray SILT, some Clay	NM	0.0	Collected Hydropunch™ sample from 81-83 ft bls for CVOC, BTEX, and MTBE analysis.
85			N/A	N/A	

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-45	**222088.01**	**2080329.09**
PROJECT NO./NAME		LOCATION
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**
APPROVED BY	LOGGED BY	**Manorhaven, New York**
S. Glash	**M.Lanberg**	

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
		No recovery; split spoon sleeve bent	NM	0.0	
90					90
			N/A	N/A	Collected Hydropunch™ sample from 91-93 ft bls for CVOC, BTEX, and MTBE analysis.
95					95
		Gray CLAY, little Silt	NM	0.0	
100					100
					Collected Hydropunch™ sample from 101-103 ft bls for CVOC, BTEX, and MTBE analysis. Bottom of boring at 103 ft bls.

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-46	**222031.95**	**2080204.85**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**
APPROVED BY: **S. Glash**	LOGGED BY: **K. Somers**
	Manorhaven, New York
DRILLING CONTRACTOR/DRILLER: **ADT Drilling / Sean Miller**	GEOGRAPHIC AREA

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**3/12/01-3/12/01**

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
13.39 (FT.)	**(Feet BLS)**	**Bentonite**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		No recovery	5	N/A	No recovery.
			14		
1			9		
			18		
2		Light brown fine to medium SAND and SILT; Dry	26	3.7	12 inch recovery.
		Light brown SAND, some Silt	12		
3			19		
			18		
4		Light brown fine SAND, some Silt	4	2.8	12 inch recovery.
			4		
5			9		
			11		
6		Light brown fine SAND, little Silt	11	2.4	10 inch recovery.
			10		
7			9		
			11		
8		Light brown fine SAND, little Silt	10	2.0	12 inch recovery.
			7		
9		Light brown fine SAND and SILT; Moist	9		
			10		
10		Light brown SILT and fine SAND; Wet	4	2.4	18 inch recovery. Collected Hydropunch™ sample every ten feet for CVOC analysis. Collected groundwater sample SB-46/38-40F for filtered Chromium and SB-46/38-40U for unfiltered Chromium.
			7		
11	▽ GROUND WATER LEVEL 3/12/01		8		
12			8		Bottom of boring at 50 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-47	**222450.2**	**2080438.95**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**M.Lanberg**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Chris Stratton				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Failing F-10 / HSA**	**2" Split Spoon**	**3/9/01-3/9/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
13.17 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		ASPHALT (Fill); Dry	18	0.0	12 inch recovery.
			12		
1		Light brown fine to coarse SAND, some Gravel (Fill); Moist			
2		ASPHALT (Fill)	10	0.1	12 inch recovery.
		Light brown fine to coarse SAND, some Gravel (Fill)	11		
3			6		
			18		
4		ASPHALT (Fill)			
		Light brown fine coarse SAND	6	0.0	12 inch recovery. Odor from 4-8 ft bls.
			8		
5			6		
			12		
6		Light brown fine to coarse SAND, some orange banding	13	0.7	12 inch recovery. Odor from 6-8 ft bls.
7			8		
			6		
8			8		
		Light brown fine to coarse SAND, some Slag; Moist to wet	7	0.7	12 inch recovery. Black staining and odor from 4 -8 ft bls.
9			4		
			7		
			7		
10		Light brown fine to coarse SAND; Wet	4	0.3	12 inch recovery. Collected Hydropunch™ sample every ten feet for CVOC analysis. Collected SB-47/48-50 for TDS and Chloride analysis. Odor from 10-12 ft bls. Bottom of boring at 50 ft bls.
	▽ GROUND WATER LEVEL 3/9/01		7		
11			8		
			8		
12					

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-48	**222394.69**	**2080451.8**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**M.Lanberg**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Chris Stratton				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Failing F-10 / HSA**	**2" Split Spoon**	**2/21/01-2/25/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
13.57 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		ASPHALT and Brown fine to medium SAND (Fill); Dry	12	0.2	18 inch recovery.
			12		
			12		
2			10		
		Dark brown medium to fine SAND, some Asphalt and Gravel (Fill)	9	0.2	
3			9		
			7		
4			4		
		Dark brown to black medium to fine SAND, some Gravel; Moist	6	0.4	
5			4		
			4		
6			3		
		Dark brown to black medium to fine SAND, some Gravel	12	0.0	12 inch recovery.
7		Light brown to white fine SAND and SILT	6		
			10		
8			6		
		Light brown fine SAND, some lenses of Silt; Moist	6	0.1	12 inch recovery.
9			6		
			13		
10			13		
		Light brown to orange-brown fine SAND, little Silt; Wet	6	0.0	12 inch recovery. Collected Hydropunch™ samples every ten feet for CVOC analysis. Bottom of boring at 30 ft bls.
11	▽ GROUND WATER LEVEL 2/21/01		6		
			11		
12			14		

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-49	**222341.54**	**2080479.2**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**K. Somers**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Dennis Meyor				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**DK-5 / HSA**	**2" Split Spoon**	**3/2/01-3/2/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
13.47 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		No recovery	14 19	N/A	No recovery.
2		Brown fine to coarse SAND (Fill); Dry	21 20 20	0.0	12 inch recovery.
3			21 20		
4		ASPHALT (Fill)	22		
			13	0.6	18 inch recovery.
5		Light brown fine to coarse SAND (Fill)	12 14		
6		ASPHALT (Fill)	14 15	0.0	8 inch recovery.
7		Yellowish orange fine to medium SAND, some Silt	18 20		
8		Yellowish orange fine SILT, some fine Sand; Moist	14 21	0.0	12 inch recovery.
9			24 28		
10		Yellowish orange fine SILT, some fine Sand; Wet	30 25	0.0	12 inch recovery.
11			24		
12	▽ GROUND WATER LEVEL 3/2/01		26 29		Collected Hydropunch™ sample every ten feet for CVOC analysis. Bottom of boring at 50 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-50	**222371.33**	**2080589.46**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**M.Lanberg**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Chris Stratton				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Failing F-10 / HSA**	**2" Split Spoon**	**3/2/01-3/2/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
13.01 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Fine to coarse SAND, some Asphalt (Fill); Dry	2 2 2 2	0.0	18 inch recovery.
2		Brown fine to coarse SAND	1 2 2 2	0.0	18 inch recovery.
3					
4		Brown fine to coarse SAND	2 5 7 7	0.0	18 inch recovery
5					
6		Brown fine to coarse SAND, some banding of light brown fine to coarse Sand; Moist	2 5 8 11	0.0	18 inch recovery.
7					
8		Brown fine to coarse SAND	2 4 11 15	0.0	18 inch recovery.
9					
10		Brown fine to coarse SAND; Wet	2 10 12 16	0.0	18 inch recovery. Collected Hydropunch™ sample every ten feet for CVOC analysis. Bottom of boring at 40 feet bls.
11					
12	▽ GROUND WATER LEVEL 3/2/01				

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-51	**222103.72**	**2080589.46**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**K. Somers**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Chris Stratton				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Failing F-10 / HSA**	**2" Split Spoon**	**2/20/01-2/20/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
12.92 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
			N/A	N/A	Blow counts not recorded. No samples collected from 0 - 40 ft bls.
40		Light brown SAND and SILT, little Clay; Wet	NM	0.0	
50		Light brown fine SAND and SILT, trace Clay	NM	0.0	
60		Light brown fine SAND and SILT, little Clay	NM	0.0	
		Olive-gray CLAY, some Silt			
		Olive-gray CLAY, little Silt	NM	0.0	
		Olive-gray CLAY, lenses of Sand			
75		Olive-gray CLAY, little Silt	NM	0.0	Bottom of boring at 76 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-52				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**K. Somers**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Chris Stratton				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Failing F-10 / HSA**	**2" Split Spoon**	**2/20/01-2/20/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0			N/A	N/A	Blow counts not recorded. No samples collected form 0 to 40 ft bls.
5					
10					
15					
20					
25					
30					
35					
40					
45					
50		Olive-gray CLAY, little Silt; Wet	NM	0.0	
55					
60		Olive-gray CLAY, little Silt	NM	0.0	
65					
70					
75		Olive-gray CLAY, little Silt	NM	0.0	Bottom of boring at 76 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-53	**222443.76**	**2080060.92**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**K. Somers**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Sean Miller	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**3/13/01-3/13/01**

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
14.83 (FT.)	**(Feet BLS)**	**Bentonite**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Light brown medium to coarse SAND, little coarse Gravel and Silt (Fill); Dry	9	2.7	10 inch recovery.
		Dark brown SAND and coarse GRAVEL	9		
			26		
			12		
		Dark brown medium to coarse SAND, little Concrete	23	2.4	12 inch recovery.
			19		
			25		
			17		
		Black coarse SAND and coarse GRAVEL, little light brown fine to medium Sand	17	1.9	10 inch recovery.
5			10		5
			7		
			10		
		No recovery	28	N/A	No recovery.
			50/3		Refusal at 7 feet bls. Moved boring over 4 feet south. Hit refusal again. Moved boring 7 feet east of original boring.
		Light brown fine SAND and SILT	7	2.4	12 inch recovery.
			9		
			10		
			7		
10		Light brown fine to medium SAND and SILT; Moist	9	1.2	12 inch recovery. 10
			10		
			11		
			11		
▽ GROUND WATER LEVEL 3/13/01		Light brown fine to coarse SAND, some Silt; Wet	3	2.1	10 inch recovery.
			5		
			4		
			5		Collected Hydropunch™ sample every ten feet for CVOC analysis. Bottom of boring at 30 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-54	**222401.79**	**2080091.76**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Chris Stratton	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Failing F-10 / HSA**	**2" Split Spoon**	**3/14/01-3/15/01**

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
15.55 (FT.)	**(Feet BLS)**	**Bentonite**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Brown fine to coarse SAND and GRAVEL, some Concrete, Ballast, and Asphalt (Fill); Dry	50	2.1	6 inch recovery.
2		Brown fine to coarse SAND and GRAVEL, some Concrete, Ballast, and Asphalt (Fill)	4	25.9	12 inch recovery.
3		Dark brown fine to coarse SAND, some Gravel (Fill)	8 9 10		
4		Light brown fine to coarse SAND	5 11 11	2.2	18 inch recovery.
5					
6		Light brown fine to coarse SAND, little Silt	11 5 7	1.2	10 inch recovery.
7			12		
8		Light brown fine to coarse SAND, little Silt	10 6 8	1.2	10 inch recovery.
9			10		
10		Light brown fine to medium SAND, little Silt; Moist	12 5 8	0.8	10 inch recovery.
11			14		
12	▽ GROUND WATER LEVEL 3/15/01	Light brown fine to coarse SAND, some Gravel, trace Silt; Wet	12 8 7	1.9	18 inch recovery. Collected Hydropunch™ sample every ten feet for CVOC analysis. Collected groundwater sample GW-1; duplicate of SB-54/18-20. Bottom of boring at 50 feet bls.
13			9		
14			7		

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-55	**222370.16**	**2080142.08**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**M.Lanberg**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Chris Stratton				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Failing F-10 / HSA**	**2" Split Spoon**	**3/15/01-3/15/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
16.34 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		BALLAST, CONCRETE and GRAVEL, some Gray medium to coarse Sand (Fill); Dry	10	0.9	12 inch recovery.
1			10		
			11		
2			9		
		BALLAST, CONCRETE and GRAVEL, some Gray medium to coarse Sand (Fill)	16	1.0	12 inch recovery.
3			12		
			13		
4			14		
		BALLAST, CONCRETE and GRAVEL, some Gray medium to coarse Sand, trace Wood (Fill)	25	2.2	24 inch recovery.
5			29		
			50		
6					
		GRAVEL, Gray medium to coarse SAND and CONCRETE (Fill); Moist	10	2.1	24 inch recovery.
7			10		
			6		
8			4		
		No recovery	20	N/A	No recovery.
9			12		
			12		
10			13		
		ASH, black ORGANIC MATERIAL and WOOD (Fill) Light brown fine to coarse SAND	8	8.1	18 inch recovery.
11			8		
			11		
12			9		
		Gray fine to coarse SAND, trace Silt; Wet	10	19	12 inch recovery. Collected Hydropunch™ sample every ten feet for CVOC analysis. SB-55 samples are orange in color. Collected groundwater sample GW-2; duplicate of SB-55/28-30, grey in color. Bottom of boring at 50 ft bls.
13			8		
			8		
14			10		

▽ GROUND WATER LEVEL 3/15/01

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

ROUX ASSOCIATES, INC.
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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-56	**222413.38**	**2080174.36**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**M.Lanberg**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Chris Stratton				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Failing F-10 / HSA**	**2" Split Spoon**	**3/14/01-3/14/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
14.84 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		CONCRETE (Fill); Dry	5	3.0	6 inch recovery.
1			10		
			10		
2			10		
		Dark brown fine to coarse SAND, some Gravel, Brick, Concrete and Asphalt (Fill)	26	4.2	12 inch recovery.
3			8		
			8		
4			10		
		Dark brown fine to coarse SAND, some Gravel, Concrete and Asphalt (Fill)	4	3.8	6 inch recovery.
5			4		
			4		
6			5		
		No recovery	5	N/A	No recovery.
7			50		
8		Light brown medium to coarse SAND and GRAVEL	4	3.4	12 inch recovery.
9			5		
			5		
10			6		
		Light brown medium to coarse SAND and GRAVEL, some orange banding	3	3.4	12 inch recovery.
11			3		
			6		
12	▽ GROUND WATER LEVEL 3/14/01		8		
		Brown fine to coarse SAND; Moist	6	3.1	24 inch recovery. Collected Hydropunch™ sample every ten feet for CVOC analysis. Bottom of boring at 50 feet bls.
13			8		
		Gray fine to coarse SAND, some Gravel; Wet	7		
14			7		

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-57	**222156.59**	**2080443.1**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**M.Lanberg**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Chris Stratton				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Failing F-10 / HSA**	**2" Split Spoon**	**3/16/01-3/16/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
13.41 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Brown fine to medium SAND, some Silt, trace Brick (Fill); Dry	2	2.5	12 inch recovery. Brick in tip of spoon.
			2		
			3		
2			50		
		Light brown fine to coarse SAND, some Silt and Brick (Fill)	16	2.4	18 inch recovery.
3			12		
			9		
4			11		
		Light brown fine to medium SAND and SILT	11	1.9	22 inch recovery.
5			4		
			11		
6			11		
		Brown fine to medium SAND and SILT; Moist	12	2.6	24 inch recovery.
7			11		
			11		
8			10		
		Light brown fine to coarse SAND, little Silt	10	3.3	18 inch recovery.
9			11		
			12		
10			13		
		Light brown fine to coarse SAND, little Silt	4	2.7	18 inch recovery.
11			8		
			13		
12	▽ GROUND WATER LEVEL 3/16/01		13		
		Dark brown fine to medium SAND, some Silt, trace Gravel; Wet	4	0.8	18 inch recovery. Collected Hydropunch™ sample every ten feet for CVOC analysis. Bottom of boring at 50 feet bls.
13			8		
			8		
14			9		

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-58	**222067.62**	**2080086.94**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**K. Somers**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Sean Miller	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**3/14/01-3/14/01**

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
13.31 (FT.)	**(Feet BLS)**	**Bentonite**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
5			N/A	N/A	No split-spoon samples collected. Straight drill to 18 ft bls.
10					
15					
20			N/A	N/A	Collected Hydropunch™ sample from 18-20 ft bls for CVOC analysis.
25					
30			N/A	N/A	Collected Hydropunch™ sample from 28-30 ft bls for CVOC analysis.
35					
40			N/A	N/A	Collected Hydropunch™ sample from 38-40 ft bls for CVOC analysis.
45					
50					Collected Hydropunch™ sample from 48-50 ft bls for CVOC analysis. Bottom of boring at 50 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-59	**222213.17**	**2080026.91**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**K. Somers**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Sean Miller				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**3/14/01-3/14/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
12.87 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
			N/A	N/A	No split-spoon samples collected. Straight drill to 18 ft bls.
5					
10					
15					
20			N/A	N/A	Collected Hydropunch™ sample from 18-20 ft bls for CVOC analysis.
25					
30			N/A	N/A	Collected Hydropunch™ sample from 28-30 ft bls for CVOC analysis.
35					
40			N/A	N/A	Collected Hydropunch™ sample from 38-40 ft bls for CVOC analysis.
45					
50					Collected Hydropunch™ sample from 48-50 ft bls for CVOC analysis. Bottom of boring at 50 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-60	**222298.59**	**2080395.47**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**K. Somers**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Sean Miller	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**3/15/01-3/15/01**

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
14.71 (FT.)	**(Feet BLS)**	**Bentonite**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Light brown fine to medium SAND, some Silt; Dry	3 4 5	6.3	15 inch recovery.
2		Light brown fine to medium SAND, some Silt, little fine Gravel	5 9 9	5.9	20 inch recovery.
3			9 8		
4		Brown fine SAND and SILT	3 6	3.7	16 inch recovery.
5		Brown/orange fine SILT and fine Gravel Yellowish orange fine SAND and SILT	8 10		
6		Light brown fine SAND and SILT	14 16	5.5	18 inch recovery.
7			18 22		
8		Light brown fine SAND and SILT; Moist	6 17	4.0	15 inch recovery.
9			22 18		
10		Light brown fine SAND and SILT; Wet	17 25	4.6	12 inch recovery. Collected Hydropunch™ sample every ten feet for CVOC analysis.
11			29 19		
12	▽ GROUND WATER LEVEL 3/15/01				Bottom of boring at 50 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-61	**222471.45**	**2080342.23**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**K. Somers**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Sean Miller				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**3/15/01-3/15/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
15.16 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brown fine to medium SAND and SILT; Dry	5	8.6	12 inch recovery.
1		Black fine to coarse SAND, trace coarse Gravel	20		
			15		
2			7		
		Brown medium to fine SAND, some Silt, trace Clay	12	6.2	12 inch recovery.
		Light brown fine to medium SAND, some Silt	14		
3		Black fine to coarse SAND, some Silt			
			14		
			10		
4		Dark brown to black fine to medium SAND, some Silt, trace coarse Gravel	11	4.6	10 inch recovery.
		Light brown fine to medium SAND and SILT	7		
5			5		
			3		
6		Light brown fine to medium SAND and SILT; Moist	7	1.9	12 inch recovery.
7			10		
			3		
			3		
8		Light brown fine to medium SAND and SILT	6	1.3	10 inch recovery.
9			12		
			14		
			13		
10		Light brown fine to medium SAND and SILT; Wet	7	1.4	15 inch recovery. Collected Hydropunch™ sample every ten feet for CVOC analysis.
	▽ GROUND WATER LEVEL 3/15/01		9		
11			11		
12			18		Bottom of boring at 50 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-62	**222449.4**	**2080534.59**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**M.Lanberg**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Chris Stratton				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Failing F-10 / HSA**	**2" Split Spoon**	**3/16/01-3/16/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
13.09 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Light brown fine to coarse SAND, some Silt (Fill); Dry	4 4 4	0.8	12 inch recovery.
2		ASPHALT and ORGANIC MATERIAL (Fill) Light brown fine to coarse SAND (Fill)	4 12	1.3	18 inch recovery.
3			4 12		
4		Light brown fine to coarse SAND, some Asphalt (Fill)	12 11	1.2	18 inch recovery.
5			16 13		
6		Light brown fine to coarse SAND, some Asphalt (Fill)	16 6	2.6	18 inch recovery
7			15 16		
8		ASPHALT (Fill) Light brown fine to coarse SAND; Moist	17 17	2.6	12 inch recovery. Distinct banding.
9			12 13		
10		Brown fine to coarse SAND, some Silt; Moist to wet	14 10	2.5	18 inch recovery.
11			11 20		
12	▽ GROUND WATER LEVEL 3/16/01	Light brown to orange fine to coarse SAND, some Silt; Wet	20 12	1.2	18 inch recovery. Collected Hydropunch™ sample every ten feet for CVOC analysis. Bottom of boring at 50 feet bls.
13			13 21		
14			26		

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-63	**222544.88**	**2080328.65**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**K. Somers**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Sean Miller				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**3/16/01-3/16/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
15.15 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Dark to light brown fine to coarse SAND, some Silt, trace fine Gravel; Dry (Fill)	4 7 8	8.2	6 inch recovery.
2		Light brown fine to medium SAND, some Silt	12 7	6.9	12 inch recovery.
3		Fine GRAVEL, some light brown fine to medium Sand and Silt	9 8		
4			8		
5		Light brown fine to medium SAND and fine GRAVEL, some Silt	4 5	8.1	6 inch recovery.
6			7 10		
7		Light brown fine to coarse SAND and fine GRAVEL, some Silt Light brown SILT and fine GRAVEL, some Sand	14 12	10.2	8 inch recovery. Black staining from 6-8 ft bls.
8			8 6		
9		Dark brown fine to coarse SAND and SILT, some fine Gravel Brown SILT, trace fine Gravel Light brown fine to medium SAND and SILT	14 9 7	7.3	12 inch recovery. Black staining from 8-9 ft bls.
10			11		
11	▽ GROUND WATER LEVEL 3/16/01	Brown SILT, little fine Sand; Moist	9 10 11	8.9	12 inch recovery.
12		No recovery	11 9	N/A	No recovery. Collected Hydropunch™ sample every ten feet for CVOC analysis.
13			13 18		
14			26		Bottom of boring at 50 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 9/6/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-64	**221959.56**	**2080110**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**M.Lanberg**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Lloyd Adams				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**CME-75 / HSA**	**2" Split Spoon**	**4/2/01-4/3/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
11.94 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		ORGANIC MATERIAL; Dry	NM	7.8	
		CONCRETE (Fill)			
		Light brown fine to medium SAND, little Gravel (Fill)			
		Light brown fine to medium SAND, some Silt, trace Gravel (Fill)	NM	0.9	
		Light brown fine to medium SAND, little Silt, trace Slag (Fill)	NM	0.8	
5		CONCRETE, some medium to coarse SAND (Fill); Moist	NM	0.4	5
		Light brown fine to medium SAND, little Gravel	NM	0.8	Orange and grey-brown banding apparent.
10		Light brown fine to medium SAND; Wet	NM	0.4	10 Iron-like staining from 10-12 ft bls.
					Collected Hydropunch™ sample from 12-14 ft bls for CVOC analysis
15			N/A	N/A	15
		Brown SILT and fine SAND	NM	0.0	
20			N/A	N/A	20
					Collected Hydropunch™ sample from 21-23 ft bls for CVOC analysis.
			N/A	N/A	
25					25
		Brown fine to medium SAND and SILT	NM	0.0	Iron-like banding from 28-30 ft bls.
30			N/A	N/A	30
					Collected Hydropunch™ sample from 31-33 ft bls for CVOC analysis.
			N/A	N/A	
35					35

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-64	**221959.56**	**2080110**
PROJECT NO./NAME		LOCATION
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**
APPROVED BY	LOGGED BY	**Manorhaven, New York**
S. Glash	**M.Lanberg**	

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
40		Brown fine to medium SAND and SILT	NM N/A	5.4 N/A	Collected Hydropunch™ sample from 41-43 ft bls for CVOC analysis. Bottom of boring at 43 feet bls.

40

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-65				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**K. Somers**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Dennis Meyor				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**DK-5 / HSA**	**2" Split Spoon**	**4/4/01-4/4/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
			N/A	N/A	No split-spoon samples collected from 0 to 28 ft bls.
5					5
10					10
15					15
20					20
					Collected Hydropunch™ sample from 21-23 ft bls for CVOC analysis.
			N/A	N/A	
25					25
		Light brown fine to medium SAND, little Silt; Wet	6 8 10 9	0.0	
30					30

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-65		
PROJECT NO./NAME		LOCATION
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**
APPROVED BY	LOGGED BY	**Manorhaven, New York**
S. Glash	**K. Somers**	

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
					Collected Hydropunch™ sample from 31-33 ft bls for CVOC analysis.
			N/A	N/A	
35					35
		No recovery	36 28 32	N/A	
40			33		40
					Collected Hydropunch™ sample from 41-43 ft bls for CVOC analysis.
			N/A	N/A	
45					45
		Light brown fine to medium SAND, little Silt and olive-gray Clay	8 13 16	0.0	
50			27		50
					Collected Hydropunch™ sample from 51-53 ft bls for CVOC analysis.
			N/A	N/A	
55					55
		Olive-gray fine to medium SAND, little Silt and Clay Light brown fine to medium SAND, little Silt, trace Clay	5 9 10	0.0	
60			10		60
					Bottom of boring at 60 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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Fax: 631-232-9898

SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-66	**222179.81**	**2080233.86**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**M. Lanberg**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Lloyd Adams	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**CME-75 / HSA**	**2" Split Spoon**	**4/3/01-4/5/01**

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
14.55 (FT.)	**(Feet BLS)**	**Bentonite**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
			N/A	N/A	No split-spoon samples collected from 0 to 18 ft bls.
20		Orange fine to medium SAND, some Gravel; Wet	5 11 8 11	0.0	12 inch recovery.
			N/A	N/A	Hydropunch™ sample collected from 21 to 23 ft bls for CVOCs.
25		Red fine to medium SAND			
30			8 11 15 17	9.6	12 inch recovery.
			N/A	N/A	Hydropunch™ sample collected from 31 to 33 ft bls for CVOCs.
40		Brown fine to medium SAND and SILT	6 11 12 16	2.7	12 inch recovery.
			N/A	N/A	Hydropunch™ sample collected from 41 to 43 ft bls for CVOCs.
50		Orange fine to medium SAND and SILT	7 7 17	1.8	3 inch recovery.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-66	**222179.81**	**2080233.86**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**M. Lanberg**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
			23		Hydropunch™ sample collected from 51 to 53 ft bls for CVOCs.
			N/A	N/A	
55					55
		Gray fine to medium SAND, some Silt	4 7 12 17	1.5	12 inch recovery.
60					60
					Hydropunch™ sample collected from 61 to 63 ft bls for CVOCs.
			N/A	N/A	
65					65
		Gray fine SAND and Silt	7 11 15 20	3.3	12 inch recovery.
70					70
					Hydropunch™ sample collected from 71 to 73 ft bls for CVOCs.
			N/A	N/A	
75					75
		Brown fine SAND, some Silt	5 5 9 12	0.0	2 inch recovery.
80					80
					Hydropunch™ sample collected from 81 to 83 ft bls for CVOCs.
			N/A	N/A	
85					85
		Olive-gray CLAY, trace fine Sand	7 10 14 20	0.0	12 inch recovery.
90					90
					Hydropunch™ sample collected from 91 to 93 ft bls for CVOCs.
			N/A	N/A	
95					95
		Gray SILT and Clay	20 22 20 19	0.0	
100					100
					Hydropunch™ sample collected from 101 to 103 ft bls for CVOCs.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-67	**222187.46**	**2080603.73**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**M. Lanberg**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Lloyd Adams	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**CME-75 / HSA**	**2" Split Spoon**	**4/5/01-4/6/01**

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
13.05 (FT.)	**(Feet BLS)**	**Bentonite**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Coarse Gravel and fine to medium SAND (Fill); Dry	11	0.0	
		Light brown fine to medium SAND, little Silt, trace coarse Sand	8 8 8		12 inch recovery. Black staining observed.
		Light brown fine to coarse SAND, some Silt	9 10	0.0	Soil sample collected from 0 to 1 ft bls for CVOCs
			8 8		18 inch recovery.
5		Light brown fine to coarse SAND, some banding	8 10	0.0	10 inch recovery.
		SILT, little fine Sand	11		
		Light brown fine SAND and SILT	15 18	0.0	
		Light brown fine SAND and SILT; Moist	14 14		12 inch recovery.
		Light brown fine SAND and SILT; Wet	15 15	0.0	18 inch recovery.
10			16 17 20		
			N/A	N/A	Hydropunch sample collected from 11 to 13 ft bls for CVOCs.
			N/A	N/A	
15					
		Light brown SILT and fine SAND	3 3	1.5	10 inch recovery.
20			6 8		
			N/A	N/A	Hydropunch sample collected from 21 to 23 ft bls for CVOCs.
25					
		Light brown fine SAND, some Silt	4 9	0.0	18 inch recovery.
30			15 16		
			N/A	N/A	Hydropunch sample collected from 31 to 33 ft bls for CVOCs.
35					
		Yellowish-orange fine SAND, some Silt; Wet	5 14	0.0	24 inch recovery.
40		Light brown fine SAND, little Silt	16 15		
		Light brown fine SAND, little Silt, trace Clay			
			N/A	N/A	Hydropunch sample collected from 41 to 43 ft bls for CVOCs.
45					
		Light brown fine SAND and SILT	11 15	1.3	24 inch recovery.
50			17		

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-67	**222187.46**	**2080603.73**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**M. Lanberg**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
			21		Hydropunch sample collected from 51 to 53 ft bls for CVOCs.
			N/A	N/A	
55					55
		Gray SILT, trace Clay	5 5 8 15	1.5	12 inch recovery.
60					60
					Hydropunch™ sample collected from 61 to 63 ft bls for CVOCs.
			N/A	N/A	
65					65
		Gray SILT and CLAY	7 8 11 15	1.9	2 inch recovery.
70					70
					Hydropunch™ sample collected from 71 to 73 ft bls for CVOCs.
			N/A	N/A	
75					75
		Gray SILT and CLAY	5 8 5 16	0.0	12 inch recovery.
80					80
					Hydropunch™ sample collected from 81 to 83 ft bls for CVOCs.
			N/A	N/A	
85					85
90					90
					Hydropunch™ sample collected from 91 to 93 ft bls for CVOCs.
			N/A	N/A	
95					95
100					100
					Hydropunch™ sample collected from 101 to 103 ft bls for CVOCs. Bottom of boring at 103 feet bls.

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-68	**222316.03**	**2080434.19**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**
APPROVED BY: **S. Glash**	LOGGED BY: **K. Somers**
	Manorhaven, New York
DRILLING CONTRACTOR/DRILLER: **ADT Drilling / Dennis Meyor**	GEOGRAPHIC AREA

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**DK-5 / HSA**	**2" Split Spoon**	**4/6/01-4/6/01**

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
14.81 (FT.)	**(Feet BLS)**	**Bentonite**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brown fine to medium SAND, little Silt, trace fine to coarse Gravel; Dry	10 9 15 20	0.0	
		Brown fine to medium SAND, some Silt, little fine to coarse Gravel	10 10 8 9	0.0	
5		Brown fine to medium SAND, some Silt, little fine Gravel	15 18 20 25	0.0	
		Brown fine to medium SAND, some Silt, little fine Gravel; Moist	7 9 9 8	0.0	Black staining. 10 inch recovery.
	▽ GROUND WATER LEVEL 4/6/01	Light brown fine to coarse SAND, trace Silt; Wet	7 12 26 28	0.0	10 inch recovery.
10					
			N/A	N/A	Collected Hydropunch™ sample every ten feet to 58 ft bls for CVOC analysis.
15					
20					
			N/A	N/A	
25					
30					
			N/A	N/A	
35					
40					
			N/A	N/A	
45					

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-68	**222316.03**	**2080434.19**
PROJECT NO./NAME		LOCATION
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**
APPROVED BY	LOGGED BY	**Manorhaven, New York**
S. Glash	**K. Somers**	

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
50					
			N/A	N/A	
55					
		Olive-gray fine SAND, little Clay, trace Silt	12 22 24 27	0.0	10 inch recovery.
60			N/A	N/A	
					Collected Hydropunch™ sample from 61-63 ft bls for CVOC analysis.
			N/A	N/A	
65					
		Olive-gray fine SAND, little Clay, trace Silt	16 14 28 27	0.0	18 inch recovery.
70					
					Collected Hydropunch™ sample from 71-73 ft bls for CVOC analysis.
			N/A	N/A	
75					
		Olive-gray fine SAND, some Clay, trace Silt	16 18 22 12	0.0	24 inch recovery.
80		Olive-gray CLAY, some fine Sand, trace Silt			
			N/A	N/A	Collected Hydropunch™ sample every ten feet to 111 ft bls for CVOC analysis.
85					
90					
95					

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-68	**222316.03**	**2080434.19**
PROJECT NO./NAME		LOCATION
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**
APPROVED BY	LOGGED BY	**Manorhaven, New York**
S. Glash	**K. Somers**	

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
100					
105					
110					
		Bottom of boring at 113 feet bls.			

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-69	**222434.54**	**2080603.22**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**M. Lanberg**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Lloyd Adams				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**CME-75 / HSA**	**2" Split Spoon**	**4/9/01-4/9/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
13.43 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		ASPHALT (Fill); Dry	9	5.4	24 inch recovery.
			12		
		Brown fine to medium SAND	11		
			12		
		Brown fine to medium SAND	9	1806	18 inch recovery.
			11		
			10		
			11		
		Light brown/white fine to medium SAND	8	92.6	10 inch recovery.
5			5		5
			7		
			8		
		Light brown/white fine to medium SAND; Moist	3	0.0	10 inch recovery.
			5		
			6		
			6		
		Light brown/white fine to medium SAND; Wet	4	0.0	10 inch recovery.
			5		
			6		
10	▽ GROUND WATER LEVEL 4/9/01		6		10
			N/A	N/A	
15					15
		Light brown to dark brown fine to coarse SAND	8	0.0	24 inch recovery.
			11		
			15		
20			18		20
					Collected Hydropunch™ sample from 21-23 ft bls for CVOC analysis.
			N/A	N/A	
25					25

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-69	**222434.54**	**2080603.22**
PROJECT NO./NAME		LOCATION
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**
APPROVED BY	LOGGED BY	**Manorhaven, New York**
S. Glash	**M. Lanberg**	

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brown fine to medium SAND, some Silt	12 12 14 16	0.0	18 inch recovery. Rust-colored staining.
30					Collected Hydropunch™ sample from 31-33 ft bls for CVOC analysis.
			N/A	N/A	
35					
		Dark brown fine to medium SAND, some Silt	6 8 11 15	0.0	24 inch recovery.
40					Collected Hydropunch™ sample from 41-43 ft bls for CVOC analysis.
			N/A	N/A	
45					
		Olive-gray fine SAND, some Clay	12 20 20 20	0.0	
50					Collected Hydropunch™ sample from 51-53 ft bls for CVOC analysis.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-70	**222507.59**	**2080417.41**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**K. Somers**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Dennis Meyor	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**DK-5 / HSA**	**2" Split Spoon**	**4/10/01-4/10/01**

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
13.56 (FT.)	**(Feet BLS)**	**Bentonite**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		ASPHALT (Fill)	6	0.0	22 inch recovery. Collected soil sample SB-70/0-2 ft bls for pH analysis.
		Brown fine to coarse SAND, little Silt, trace Clay; Dry	6		
		Light brown fine to coarse SAND	8		
		Brown CLAY, some fine SAND	10		
		Brown fine to coarse SAND and SILT			
		Light brown / yellowish-orange fine to medium SAND, some Silt	10	1.5	10 inch recovery.
		Brown fine to medium SAND, some Clay and Silt	11		
		Light brown / yellowish-orange fine to coarse SAND, some Silt, little fine Gravel	8		
			10		
		Brown fine to medium SAND, little Silt and coarse Gravel	10	2.3	13 inch recovey. Collected soil sample SB-70/4-6 ft bls for pH analysis.
5		Light brown fine to coarse SAND	9		5
			9		
			8		
		Light brown fine to coarse SAND, trace Silt, banding noted	13	2.1	10 inch recovery.
			16		
			12		
			16		
		Light brown fine to coarse SAND, trace Silt and fine to coarse Gravel; Moist	NM	1.5	10 inch recovery. Collected soil sample SB-70/8-10 ft bls for pH analysis.
10					10
		Light brown fine to medium SAND, little Silt, trace fine Gravel; Wet	NM	1.5	20 inch recovery.
	▽ GROUND WATER LEVEL 4/10/01				
					Collected Hydropunch™ sample from 12-14 ft bls for CVOC analysis.
			N/A	N/A	
15					15
		Light brown / brown fine to medium SAND, some Silt, trace fine Gravel	14	3.4	22 inch recovery.
			18		
			20		
20			25		20
					Collected Hydropunch™ sample from 21-23 ft bls for CVOC analysis. Bottom of boring at 23 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-71	**222650.15**	**2080198.7**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**M. Lanberg**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Lloyd Adams				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**CME-75 / HSA**	**2" Split Spoon**	**4/18/01-4/18/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
15.58 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
			N/A	N/A	Sample collected from excavation. No spit-spoon samples collected from 0-6 ft bls.
5					5
		Light brown fine to coarse SAND; Dry	11 4 6 7	3.4	12 inch recovery.
		Brown fine to coarse SAND, little Silt; Moist	2 4 7 10	6.3	12 inch recovery.
10	▽ GROUND WATER LEVEL 4/18/01	Brown fine to coarse SAND, little Silt and fine Gravel; Wet	2 6 8 10	7.2	10 12 inch recovery. Collected soil sample SB-71/10-12 for TAL Metals, Hex. Chromium and Soil pH analysis. Collected Hydropunch™ sample from 12-14 ft bls for CVOCs.
15		Dark brown fine to coarse SAND, little Silt, grading to fine to medium Sand, little Silt	10 13 17 20	7.3	12 inch recovery. 15
		Dark brown fine to coarse SAND, little Silt	10 10 12 15	1.2	12 inch recovery.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-72	**222646.03**	**2080213.4**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**K. Somers**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Lloyd Adams	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**CME-75 / HSA**	**2" Split Spoon**	**4/18/01-4/18/01**

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
15.48 (FT.)	**(Feet BLS)**	**Bentonite**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
			N/A	N/A	Sample collected from excavation. No split-spoon samples collected from 0-6 ft bls.
5					5
		Brown fine to coarse SAND, little Gravel and Brick (Fill); Dry	1 1 1 1	2.8	24 inch recovery. Black staining.
		Brown fine to coarse SAND, little Gravel, some Ashpalt and Wood (Fill); Moist	2 2 2 2	3.0	3 inch recovery. Black staining.
10	▽ GROUND WATER LEVEL 4/18/01	Black coarse SAND and GRAVEL; Wet	4 7 6 8	1.4	10 12 inch recovery. Black staining on top 6 inches of spoon. Collected soil sample SB-72/10-12 for TAL Metals and Hex. Chromium.
15		Black GRAVEL and SAND Brown medium to coarse SAND and GRAVEL	20 12 13 18	5.3	12 inch recovery. Black staining on top 2 inches of spoon. 15
		Brown fine to coarse SAND, little Gravel	22 15 22 25	5.8	6 inch recovery. Collected groundwater sample SB-72/18-20 for CVOC analysis. Bottom of boring at 18 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-73	**222305.29**	**2079997.67**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**K. Somers**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Lloyd Adams	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**CME-75 / HSA**	**2" Split Spoon**	**4/24/01-4/24/01**

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
14.48 (FT.)	**(Feet BLS)**	**Bentonite**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
1		Light brown fine to medium SAND, little Silt, trace Organic Matter (Fill); Dry	1	0.0	8 inch recovery. Black staining.
		Coarse GRAVEL (Fill)	2		
			5		
2			5		
		Light brown fine to medium SAND, little Silt, trace fine Gravel	4	0.0	12 inch recovery.
3			4		
			5		
4			4		
		Light brown to white fine SAND	5	0.0	20 inch recovery.
		Light brown fine to medium SAND, some Silt	5		
5			5		
			5		
6			5		
		Light brown fine to medium SAND, little Silt	5	0.0	14 inch recovery.
7		Light brown fine SAND, some Silt	5		
		Yellowish-orange fine to medium SAND, little Silt	5		
8			6		
		Light brown fine to medium SAND, little Silt; Moist	6	0.0	18 inch recovery.
9			7		
			7		
10			10		
		Light brown fine to medium SAND, some Silt, little olive-gray Clay; Wet	7	0.0	24 inch recovery. Collected soil sample SB-73/10-12 for VOC, SVOC and TAL Metal analysis.
11	▽ GROUND WATER LEVEL 4/24/01		5		
			9		Collected Hydropunch™ sample from 11-13 ft bls for VOC, SVOC and TAL Metal analysis.
12			9		
					Bottom of boring at 13 feet bls.
13					

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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Fax: 631-232-9898

SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-74	**222434.32**	**2080446.92**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**K. Somers**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Lloyd Adams	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**CME-75 / HSA**	**2" Split Spoon**	**4/24/01-4/24/01**

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
13.48 (FT.)	**(Feet BLS)**	**Bentonite**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
			N/A	N/A	No samples collected for geology. Collected three Hydropunch™ samples every ten feet starting at the water table.
5					
10					
		▽ GROUND WATER LEVEL 4/24/01			Collected groundwater sample SB-74/11-13 for VOCs, SVOCs, and TAL Metals filtered and unfiltered.
			N/A	N/A	
15					
20					
					Collected groundwater sample SB-74/21-23 for VOCs, SVOCs, and TAL Metals filtered and unfiltered.
			N/A	N/A	
25					
30					
					Collected groundwater sample SB-74/31-33 for VOCs, SVOCs, and TAL Metals filtered and unfiltered.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-75	**222412.63**	**2080485.61**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**K. Somers**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Lloyd Adams	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**CME-75 / HSA**	**2" Split Spoon**	**4/24/01-4/25/01**

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
13.33 (FT.)	**(Feet BLS)**	**Bentonite**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
			N/A	N/A	No samples collected for geology. Collected three Hydropunch™ samples every ten feet starting at the water table.
5					
10					
	▽ GROUND WATER LEVEL 4/24/01				Collected groundwater sample SB-75/11-13 for VOCs, SVOCs, and TAL Metals filtered and unfiltered.
			N/A	N/A	
15					
20					
					Collected groundwater sample SB-75/21-23 for VOCs, SVOCs, and TAL Metals filtered and unfiltered.
			N/A	N/A	
25					
30					
					Collected groundwater sample SB-75/31-33 for VOCs, SVOCs, and TAL Metals filtered and unfiltered.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-76	**222371.36**	**2080490.93**		
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**K. Somers**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ADT Drilling / Lloyd Adams				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**CME-75 / HSA**	**2" Split Spoon**	**4/25/01-4/25/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
13.01 (FT.)	**(Feet BLS)**	**Bentonite**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
			N/A	N/A	No samples collected for geology. Collected three Hydropunch™ samples every ten feet starting at the water table.
5					
10	▽ GROUND WATER LEVEL 4/25/01				Collected groundwater sample SB-76/11-13 for VOCs, SVOCs, and TAL Metals filtered and unfiltered.
			N/A	N/A	
15					
20					Collected groundwater sample SB-76/21-23 for VOCs, SVOCs, and TAL Metals filtered and unfiltered.
			N/A	N/A	
25					
30					Collected groundwater sample SB-76/31-33 for VOCs, SVOCs, and TAL Metals filtered and unfiltered.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
Surface #1				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY			
S. Glash	**K. Somers**	**Manorhaven, New York**		
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / K. Somers				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
N/A / N/A	**2-inches**	**N/A / Hand Auger**	**2" Hand Auger**	**12/21/00-7/3/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**	**N/A**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"		PID Values (ppm)	REMARKS
		FILL; Dry Brown fine to medium SAND, little fine to coarse Gravel, trace Silt	N/A N/A	G	0.0 0.0	Collected soil sample Surface #1/0-2" for VOC and TAL Metal analysis. Collected composite soil sample Surface #1/0-2' for Base Neutral analysis. Bottom of boring at 2 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
Surface #2				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**K. Somers**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / K. Somers				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
N/A / N/A	**2-inches**	**N/A / Hand Auger**	**2" Hand Auger**	**12/21/00-12/21/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**	**N/A**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"		PID Values (ppm)	REMARKS
		Dark brown medium to coarse SAND and coarse GRAVEL; Dry	N/A	G	59.0	Collected soil sample Surface #2/0-2" for VOC and TAL Metal analysis. Bottom of boring at 2 inches bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
Surface #3	**222373.43**	**2079948.72**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**K. Somers**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
Roux Associates, Inc. / K. Somers	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
N/A / N/A	**2-inches**	**N/A / Hand Auger**	**2" Hand Auger**	**12/21/00-7/3/01**

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
12.41 (FT.)	**(Feet BLS)**	**N/A**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"		PID Values (ppm)	REMARKS
		Light brown fine to medium SAND (FILL); Dry	N/A N/A	G	1.3 0.0	Collected soil sample Surface #3/0-2" for VOC and TAL Metal analysis. Collected composite soil sample Surface #3/0-2' for Base Neutral analysis. Bottom of boring at 2 feet bls.

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
Surface #4				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**K. Somers**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / K. Somers				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
N/A / N/A	**2-inches**	**N/A / Hand Auger**	**2" Hand Auger**	**12/21/00-7/3/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**	**N/A**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brown to light brown fine to medium SAND (FILL); Dry	N/A N/A	0.4 0.0	Collected soil sample Surface #4/0-2" for VOC and TAL Metals analysis. Collected composite soil sample Surface #4/0-2' for Base Neutral analysis. Bottom of boring at 2 feet bls.

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
Surface #5				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**K. Somers**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / K. Somers				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
N/A / N/A	**2-inches**	**N/A / Hand Auger**	**2" Hand Auger**	**12/21/00-7/3/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**	**N/A**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"		PID Values (ppm)	REMARKS
		Light brown to grey fine to coarse SAND, some fine to coarse Gravel (FILL); Dry	N/A N/A	G	33.0 0.0	Collected soil sample Surface #5/0-2" for VOC and TAL Metal analysis. Collected composite soil sample Surface #5/0-2' for Base Neutral analysis. Bottom of boring at 2 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO. **Surface #6**	NORTHING **222330.34**	EASTING **2080213.69**		
PROJECT NO./NAME **77101Y / MBA Manorhaven LLC**		LOCATION **Former Thypin Steel, Inc. Facility** **Manorhaven, New York**		
APPROVED BY **S. Glash**	LOGGED BY **K. Somers**			
DRILLING CONTRACTOR/DRILLER **Roux Associates, Inc. / K. Somers**		GEOGRAPHIC AREA		
DRILL BIT DIAMETER/TYPE **N/A / N/A**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **N/A / Hand Auger**	SAMPLING METHOD **2" Hand Auger**	START-FINISH DATE **12/21/00-12/21/00**
LAND SURFACE ELEVATION **13.48 (FT.)**	DEPTH TO WATER **(Feet BLS)**	BACKFILL **N/A**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"		PID Values (ppm)	REMARKS
		Light brown fine to medium SAND, some coarse Gravel (FILL); Dry	N/A	G	0.0	Collected soil sample Surface #6/0-2" for VOC and TAL Metal analysis. Bottom of boring at 2 inches bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
Surface #7				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**K. Somers**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / K. Somers				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
N/A / N/A	**2-inches**	**N/A / Hand Auger**	**2" Hand Auger**	**12/22/00-12/22/00**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**	**N/A**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"		PID Values (ppm)	REMARKS
		Dark brown fine to medium SAND, some fine Gravel (FILL); Dry	N/A	G	1.5	Collected soil sample Surface #7/0-2" VOC and TAL Metal analysis. Bottom of boring at 2 inches bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
Surface #8				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**K. Somers**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / K. Somers				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
N/A / N/A	**2-inches**	**N/A / Hand Auger**	**2" Hand Auger**	**12/21/00-7/3/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**	**N/A**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brown fine to coarse SAND, some fine Gravel, trace Silt (FILL); Dry	N/A N/A	0.0 0.0	Collected soil sample Surface #8/0-2" for VOC and TAL Metal analysis. Collected composite soil sample Surface #8/0-2' for Base Neutral analysis. Bottom of boring at 2 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
Surface #9	**222400.39**	**2080598.07**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**K. Somers**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
Roux Associates, Inc. / K. Somers	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
N/A / N/A	**2-inches**	**N/A / Hand Auger**	**2" Hand Auger**	**12/21/00-12/21/00**

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
13.03 (FT.)	**(Feet BLS)**	**N/A**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Light brown coarse SAND (FILL); Dry	N/A	0.0	Collected soil sample Surface #9/0-2" for VOC and TAL Metal analysis. Bottom of boring at 2 inches bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
Surface #10				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**K. Somers**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / K. Somers				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
N/A / N/A	**2-inches**	**N/A / Hand Auger**	**2" Hand Auger**	**12/21/00-7/3/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**	**N/A**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		FILL; Dry Light brown fine to medium SAND, little coarse Sand, trace fine to coarse Gravel	N/A N/A	11.1 0.0	Collected soil sample Surface #10/0-2" for VOC and TAL Metal analysis. Collected composite soil sample Surface #10/0-2' for Base Neutral analysis. Bottom of boring at 2 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
Surface #11				
PROJECT NO./NAME		LOCATION		
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**		
APPROVED BY	LOGGED BY	**Manorhaven, New York**		
S. Glash	**K. Somers**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Roux Associates, Inc. / K. Somers				
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
N/A / N/A	**2-inches**	**N/A / Hand Auger**	**2" Hand Auger**	**12/21/00-7/3/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**	**N/A**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		FILL; Dry Dark brown fine to medium SAND	N/A N/A	0.0 0.0	Collected soil sample Surface #11/0-2" for VOC and TAL Metal analysis. Collected composite soil sample Surface #11/0-2' for Base Neutral analysis. Bottom of boring at 2 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
Surface #12	**222083.63**	**2080326.16**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**K. Somers**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
Roux Associates, Inc. / K. Somers	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
N/A / N/A	**2-inches**	**N/A / Hand Auger**	**2" Hand Auger**	**12/21/00-7/3/01**

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
12.89 (FT.)	**(Feet BLS)**	**N/A**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"		PID Values (ppm)	REMARKS
		FILL; Dry Dark brown to black fine to medium SAND, some fine to coarse Gravel	N/A N/A	G	0.0 0.0	Collected soil sample Surface #12/0-2" for VOC and TAL Metal analysis. Collected composite soil sample Surface #12/0-2' for Base Neutral analysis. Bottom of boring at 2 feet bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/24/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-2I	**222128.86**	**2080365.89**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

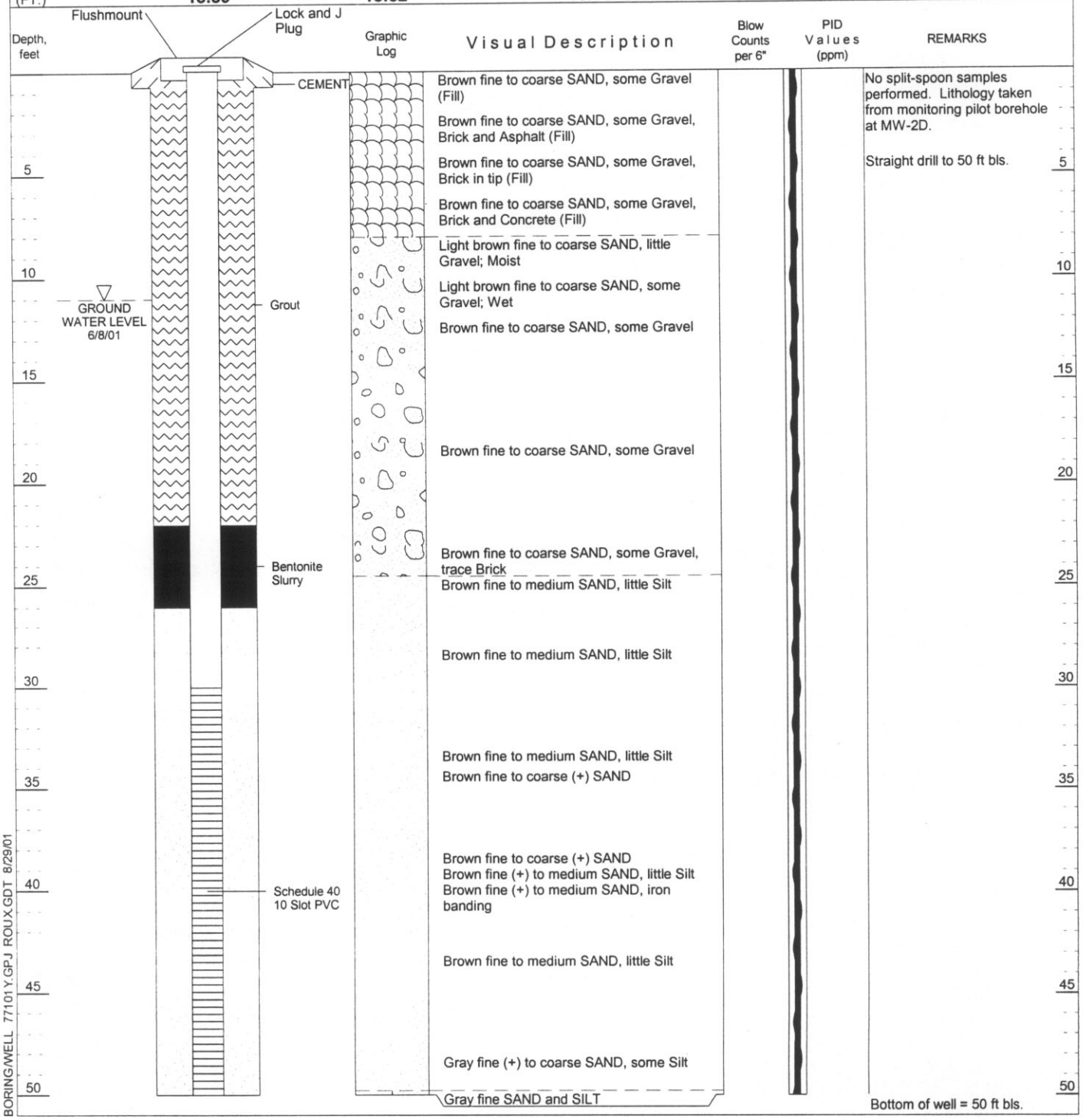
APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Chris Stratton	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Failing F-10 / HSA**	**2" Split Spoon**	**6/8/01-6/8/01**

CASING MAT./DIA.	SCREEN:				
PVC / 2-inch	TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **20.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
(FT.)	**13.89**	**13.52**	**-16.1 / -36.1**	**2.52**	**Morie #1**



BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

1377 Motor Parkway
Islandia, New York 11749
Telephone: 631-232-2600
Fax: 631-232-9898

WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-2D	**222133.36**	**2080365.08**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

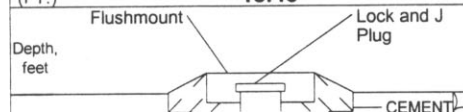
APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Lloyd Adams	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**CME-75 / HSA**	**2" Split Spoon**	**6/6/01-6/7/01**

CASING MAT./DIA.	SCREEN:				
PVC / 2-inch	TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **-20.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
(FT.)	**13.45**	**13.25**	**-111.6 / -91.6**	**2.25**	**Morie #1**



Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brown fine to coarse SAND, some Gravel (Fill); Dry	2, 4, 6, 16	10.5	12 inch recovery.
		Brown fine to coarse SAND, some Gravel, Brick and Asphalt (Fill)	2, 4, 7, 5	11.4	12 inch recovery.
5		Brown fine to coarse SAND, some Gravel, Brick in tip (Fill)	16, 6, 8, 6	4.0	6 inch recovery.
		Brown fine to coarse SAND, some Gravel, Brick and Concrete (Fill)	10, 8, 11, 12	3.6	6 inch recovery.
		Light brown fine to coarse SAND, little Gravel; Moist	13, 10, 12, 14	3.3	12 inch recovery.
10		Light brown fine to coarse SAND, some Gravel; Wet	5, 8, 10, 16	3.2	18 inch recovery.
		Brown fine to coarse SAND, some Gravel	5, 6, 8, 12	3.7	18 inch recovery.
15		Brown fine to coarse SAND, some Gravel	12, 6, 7, 12	4.5	24 inch recovery.
20		Brown fine to coarse SAND, some Gravel	4, 3, 1, 1	2.5	24 inch recovery.
25		Brown fine to medium SAND, little Silt	1, 1, 2, 2	3.6	24 inch recovery.
30		Brown fine to medium SAND, little Silt			

GROUND WATER LEVEL 6/6/01

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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Environmental Consulting & Management

1377 Motor Parkway
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Fax: 631-232-9898

WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-2D	**222133.36**	**2080365.08**
PROJECT NO./NAME		LOCATION
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**
APPROVED BY	LOGGED BY	**Manorhaven, New York**
S. Glash	**M.Lanberg**	

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brown fine to medium SAND, little Silt *(continued)*	3 6 10	16.8	12 inch recovery.
35		Brown fine to coarse (+) SAND	8		35
		Brown fine (+) to medium SAND, little Silt	10 18	10.0	24 inch recovery.
		Brown fine (+) to medium SAND, iron banding	25 26		40
40		Brown fine to medium SAND, little Silt			
				14.0	24 inch recovery.
45		Gray fine (+) to coarse SAND, some Silt			45
			5 10 14 28	13.1	24 inch recovery.
50	Grout	Gray fine SAND and SILT			50
			3 3 5 12	8.4	24 inch recovery.
55		Gray fine SAND and SILT			55
			6 9 12 15	6.5	24 inch recovery.
60		Gray SILT, little fine Sand, trace Clay Gray SILT, little fine Sand, trace Clay			60
			7 10 12 17	4.5	24 inch recovery.
65		Gray SILT, little fine Sand, trace Clay			65
			7		

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-2D	**222133.36**	**2080365.08**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
70		Gray SILT, little fine Sand, trace Clay *(continued)*	12 13 27	5.0	24 inch recovery.
		Gray SILT, little fine Sand, trace Clay			
			5 5 10 18	18.5	6 inch recovery.
75		Gray SILT, trace fine Sand			
			10 15 18 31	4.9	24 inch recovery.
80		Gray SILT, trace fine Sand			
			5 10 10 23	4.9	4 inch recovery.
85		Gray SILT, trace Clay and fine Sand			
			14 14 30 23	5.0	18 inch recovery.
90		Gray SILT, trace Clay and fine Sand			
			15 15 30 24	0.3	24 inch recovery.
95		Gray SILT, trace Clay and fine Sand			
			10 20 15 17	0.0	24 inch recovery.
100	Bentonite Slurry	Gray SILT, trace Clay and fine Sand			
			15 20 25 25	9.4	24 inch recovery.
105					

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-2D	**222133.36**	**2080365.08**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Gray SILT, trace Clay and fine Sand *(continued)*			
			15 30 15 17	4.9	8 inch recovery.
110		No recovery			110
			15 15 20 22	0.0	No recovery.
115	Schedule 40 10 Slot PVC	Gray SILT, trace Clay			115
			17 15 16 18	0.0	20 inch recovery.
120		Gray SILT, trace Clay			120
			15 20 21 22	0.0	18 inch recovery.
125					125

Bottom of well = 125 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-21	**5019.21**	**4983.78**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

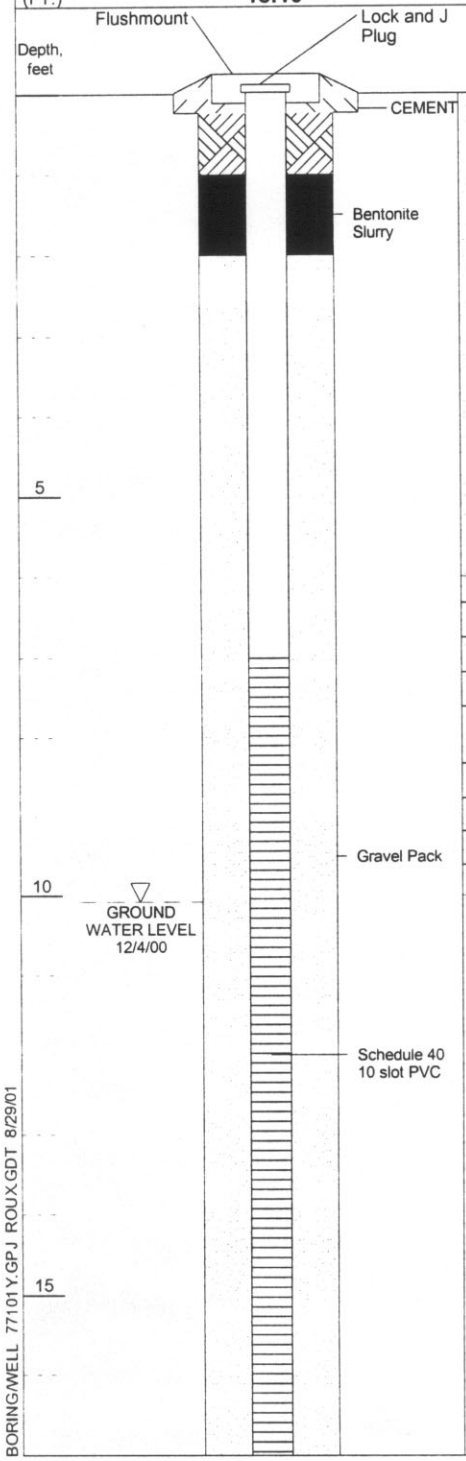
APPROVED BY	LOGGED BY	
S. Glash	**M. Lanberg**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
Land, Air, Water / Rob Allegrezza	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
6.25-in. / Auger	**4-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**11/6/00-11/6/00**

CASING MAT./DIA.	SCREEN:				
PVC / 2-inch	TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **10.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
(FT.)	**13.10**	**12.66**	**6.1 / -3.9**	**2.58**	**Morie #1**



Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Top 2" Organic Material Bottom brown fine to coarse SAND; Dry	NM	6.8	
			NM		
			NM		
			NM		
		Brown fine to coarse SAND	NM	5.1	
			NM		
			NM		
			NM		
		Brown fine to coarse SAND	7	4.6	
5			4		5
			6		
			5		
		Brown fine to medium SAND; Bottom 3" brown SILT; Moist	12	4.8	
			14		
			13		
			16		
		Top 6" Brown SILT, some Sand Bottom 1.5' brown fine to medium SAND	13	4.5	
			14		
			14		
			17		
10					10
		Top 6" Brown fine to coarse SAND, some Silt Bottom 1' brown fine to coarse SAND; Wet	8	6.2	
			10		
			12		
			14		
		Brown fine to coarse SAND	5	3.8	
			6		
			5		
			7		
		No recovery		N/A	
15					15
					Bottom of well = 17 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-22	**5583.54**	**4880.91**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

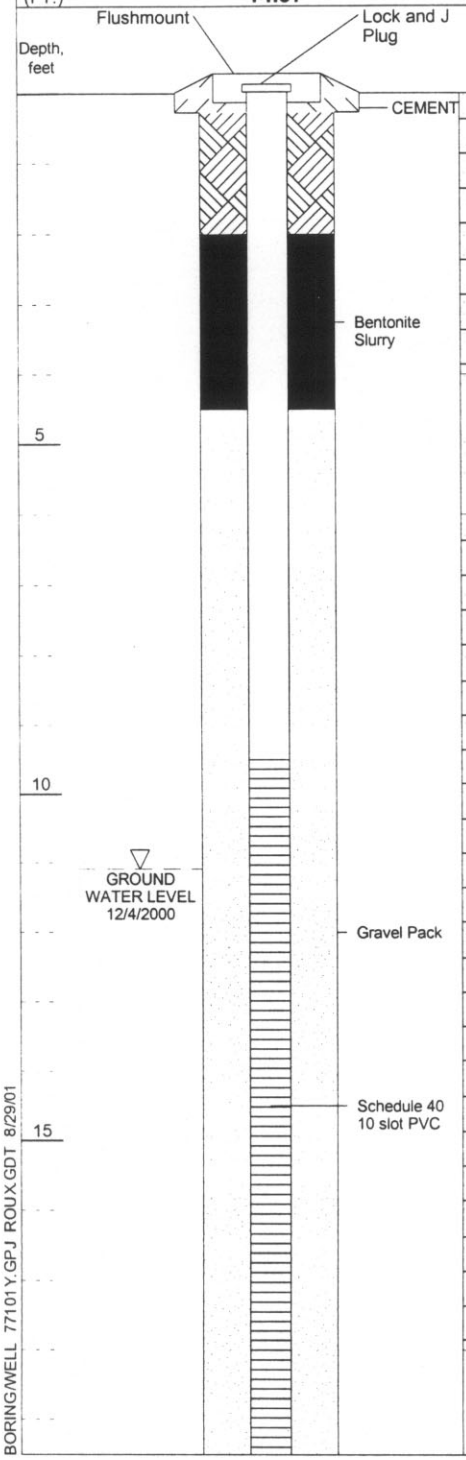
APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
Land, Air, Water / Rob Allegrezza	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
6.25-in. / Auger	**4-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**11/7/00-11/7/00**

CASING MAT./DIA.	SCREEN:					
PVC / 2-inch	TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **10.5**	DIA. **2-inch**	SLOT SIZE **10-Slot**	

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
(FT.)	**14.97**	**14.92**	**6.0 / -4.5**	**3.83**	**Morie #1**



Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Light brown fine to coarse SAND, some Silt and Gravel; Dry		14.7	
		Light brown fine to coarse SAND, some Silt and Gravel		13.6	
		Light brown fine to coarse SAND	5 6 6 4	11.6	
5					5
		Top 6" Brown CLAY, little Silt; some iron banding, Bottom 6" brown fine to medium SAND; Moist	1 1 1 2	11.0	
		No recovery		N/A	
10					10
		Dark brown fine SAND and SILT; some iron banding	1 2 2 2	14.7	
		Dark brown fine to medium SAND and SILT; some iron banding; Moist to Wet	4 7 7 5	14	
		Dark brown fine to medium SAND and SILT; Wet	3 4 8 10	12.9	
15					15
		Dark brown fine to medium SAND and SILT	2 3 2 5	14	
		No recovery		N/A	
					Bottom of well = 19.5 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-23	**5452.13**	**4676.12**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

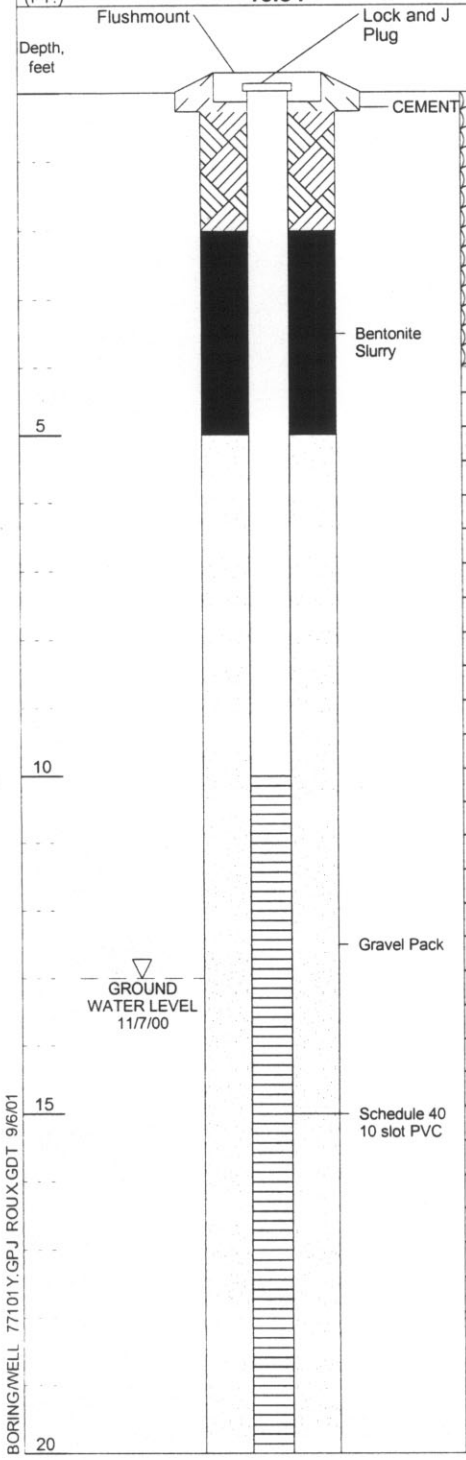
APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
Land, Air, Water / Rob Allegrezza	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
6.25-in. / Auger	**4-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**11/7/00-11/7/00**

CASING MAT./DIA.	SCREEN:				
PVC / 2-inch	TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **10.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
(FT.)	**15.84**	**15.29**	**5.8 / -4.2**	**3.33**	**Morie #1**



Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Dark brown fine SAND and SILT; some Cobble and Brick (Fill); Dry	N/A	3.6	
		Dark brown fine SAND and SILT; some Cobble and Brick (Fill)	N/A	7.4	
		Brown fine SAND and SILT compact, some iron banding; Moist	10 4 5 4	9.0	
5		Brown fine to medium SAND, some Silt	4 3 4 2	8.7	5
		Brown fine to medium SAND, some Silt	5 4 5 7	10.1	
10		Brown fine to medium SAND, some Silt; Moist	4 6 5 7	11.2	10
		Light brown fine to medium SAND and SILT; Wet	6 6 8 7	10.4	
15		Light brown fine to medium SAND and Silt, some Gravel	10 12 8 9	10.3	15
		Light brown fine to medium SAND and SILT	4 5 4 3	9.5	
		No recovery		N/A	Bottom of well = 20 ft bls.
20					20

BORING/WELL 77101Y.GPJ ROUX.GDT 9/6/01

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Islandia, New York 11749
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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-23I	**222504.65**	**2080151.94**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

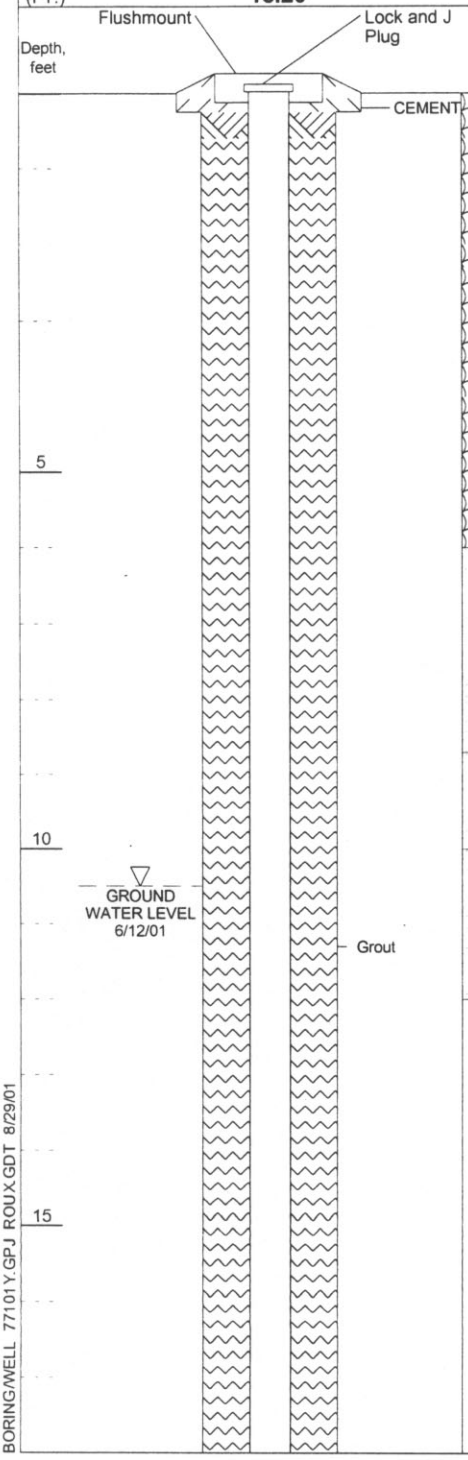
APPROVED BY	LOGGED BY	
S. Glash	**V. Glasser**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Sean Miller	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**6/8/01-6/12/01**

CASING MAT./DIA.	SCREEN:				
PVC / 2-inch	TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **20.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
(FT.)	**15.20**	**14.66**	**-14.8 / -34.8**	**4.16**	**Morie #1**



Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Black fine to medium SAND, some coarse Sand and fine Gravel, trace Silt and Clay (FILL); Dry	24	0.0	12 inch recovery.
		Orange-brown fine SAND, some medium Sand, trace coarse Sand, trace to some Silt and Clay (FILL)	18		
			16		
			19		
		Black fine SAND, some medium to coarse Sand, little Silt, trace Clay and pebbles (FILL); Moist	7	0.0	13 inch recovery.
		Orange-brown fine to medium SAND, trace Silt. One inch of Clayey Sand layer at 0.5 ft bls (FILL)	7		
			6		
			4		
		Orange-brown fine to medium SAND, trace Silt, piece of concrete near tip (FILL); Moist to wet	6	0.0	17 inch recovery.
5			4		5
			5		
			4		
		Orange-brown fine to medium SAND, trace Silt	7	0.0	14 inch recovery.
		Light brown fine to coarse SAND and fine to coarse GRAVEL	5		
		Gray-brown SAND, some Clay and Silt, grading to fine to medium Sand, some Silt, trace Gravel	4		
			4		
		Light brown to brown fine to medium SAND	4	0.0	12 inch recovery.
		Fine to coarse SAND, some fine to medium Gravel	4		
		Gray-brown SAND and SILT	5		
10			7		10
		Gray-brown fine to medium SAND, little Silt, grading to fine Sand, some Silt; Wet	5	0.0	18 inch recovery.
			6		
			7		
			6		
					Straight drill to 50 ft bls.
15					15

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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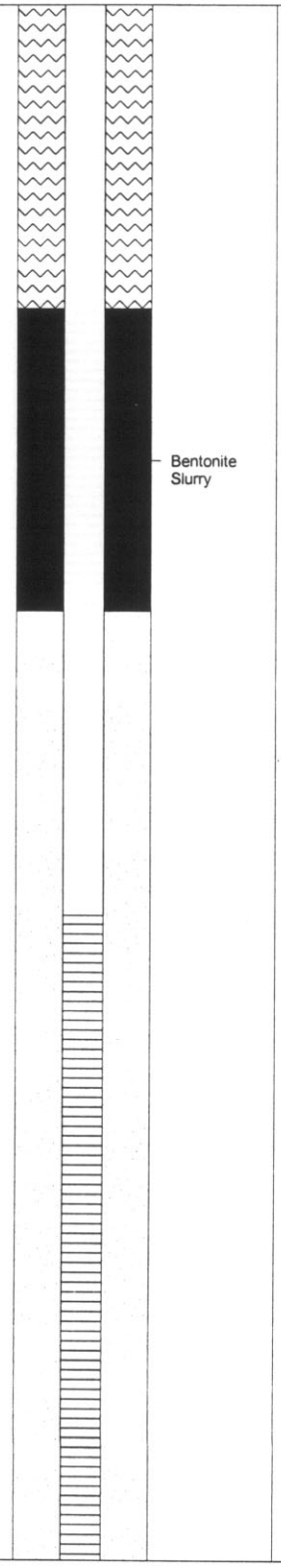
WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-23I	**222504.65**	**2080151.94**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**V. Glasser**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
20					20
		Bentonite Slurry			
25					25
30					30
35					35



BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-24	**5139.54**	**4614.29**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

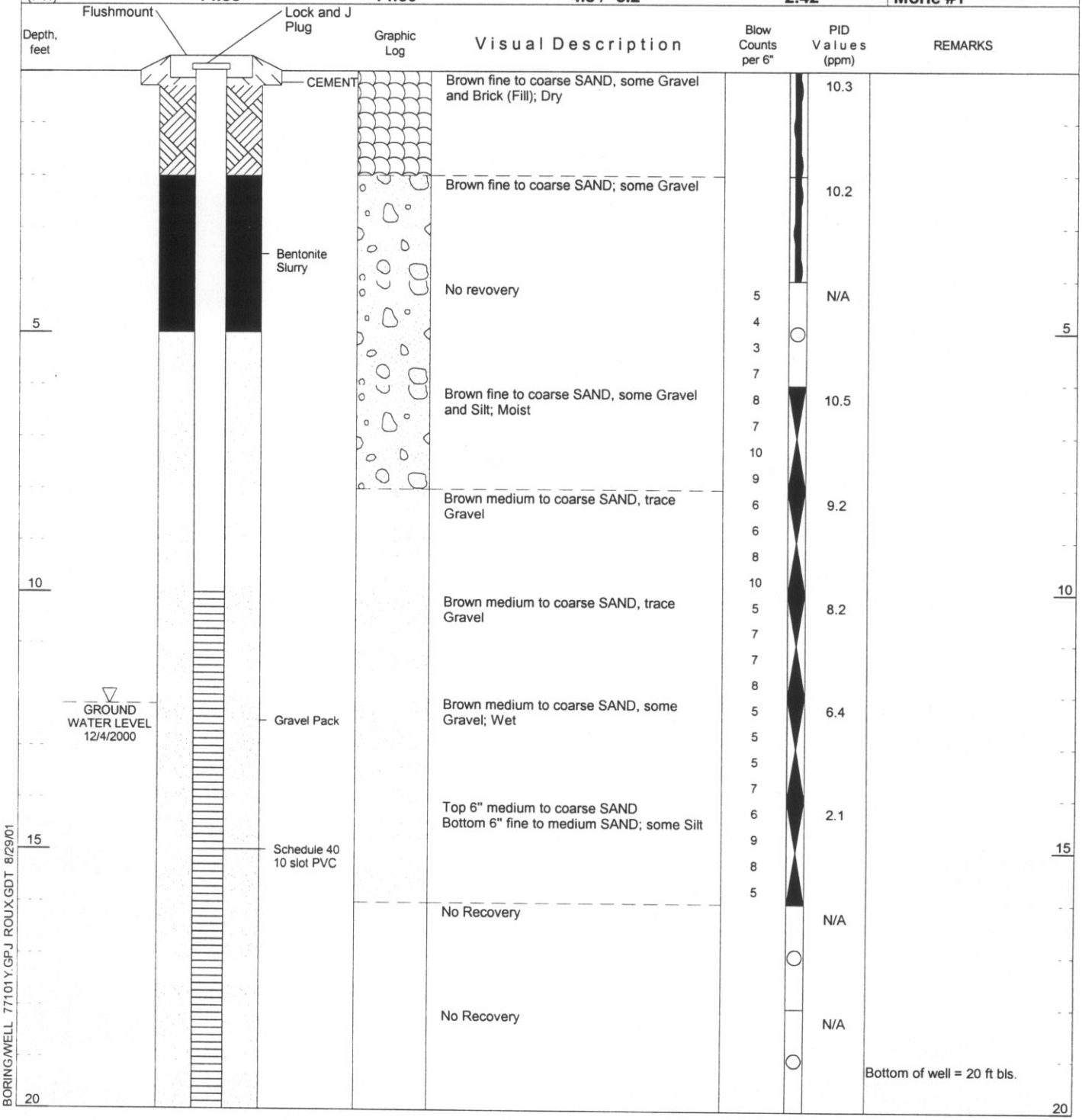
APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
Land, Air, Water / Rob Allegrezza	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
6.25-in. / Auger	**4-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**11/6/00-11/6/00**

CASING MAT./DIA.	SCREEN:				
PVC / 2-inch	TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **10.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**

ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
	14.83	**14.60**	**4.8 / -5.2**	**2.42**	**Morie #1**



BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-25	**5413.7**	**4436.37**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

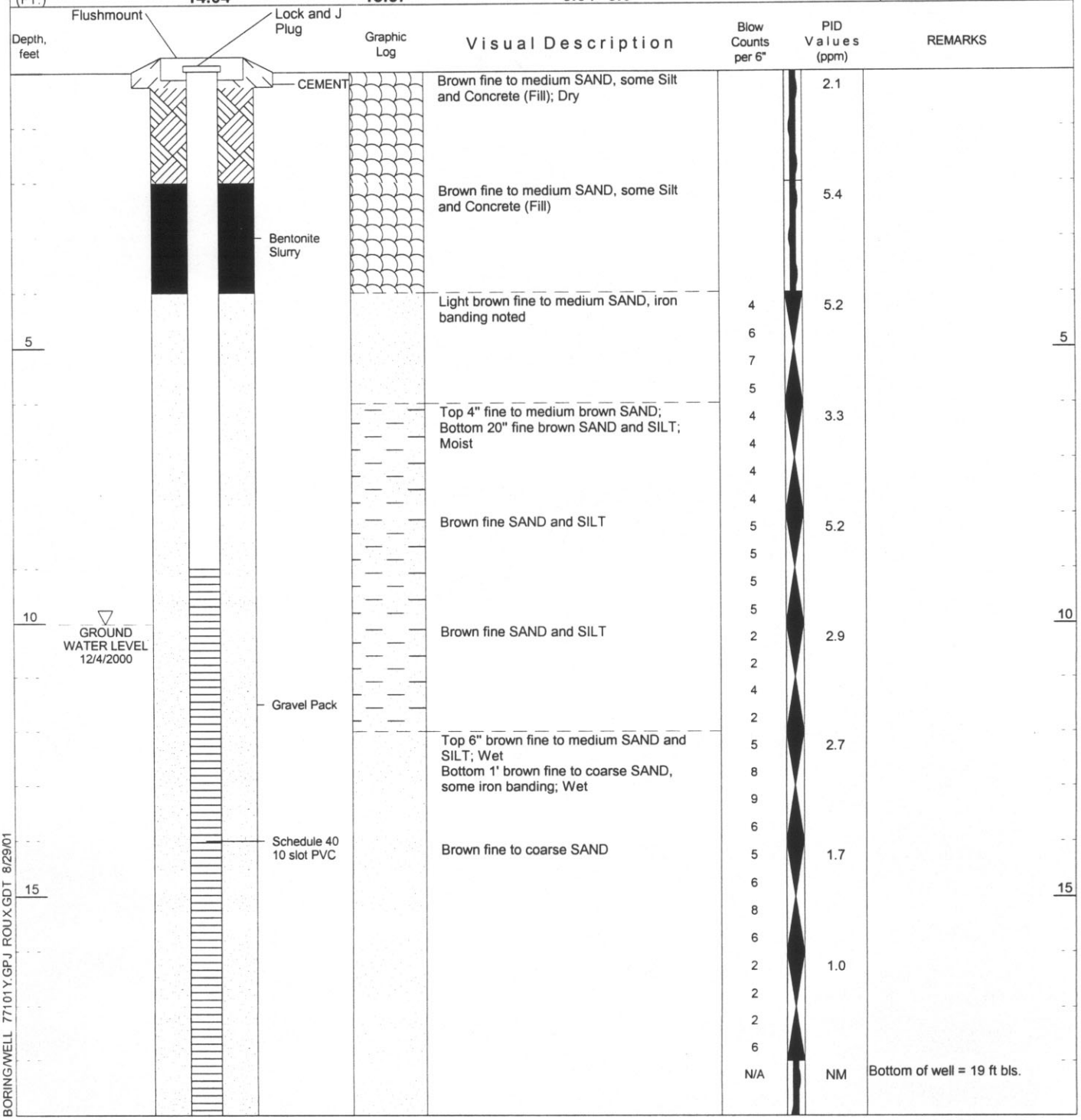
APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
Land, Air, Water / Rob Allegrezza	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
6.25-in. / Auger	**4-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**11/6/00-11/6/00**

CASING MAT./DIA.	SCREEN:				
PVC / 2-inch	TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **10.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
(FT.)	**14.04**	**13.67**	**5.0 / -5.0**	**3.65**	**Morie #1**



BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

1377 Motor Parkway
Islandia, New York 11749
Telephone: 631-232-2600
Fax: 631-232-9898

WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-26	**4994.41**	**4391.22**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

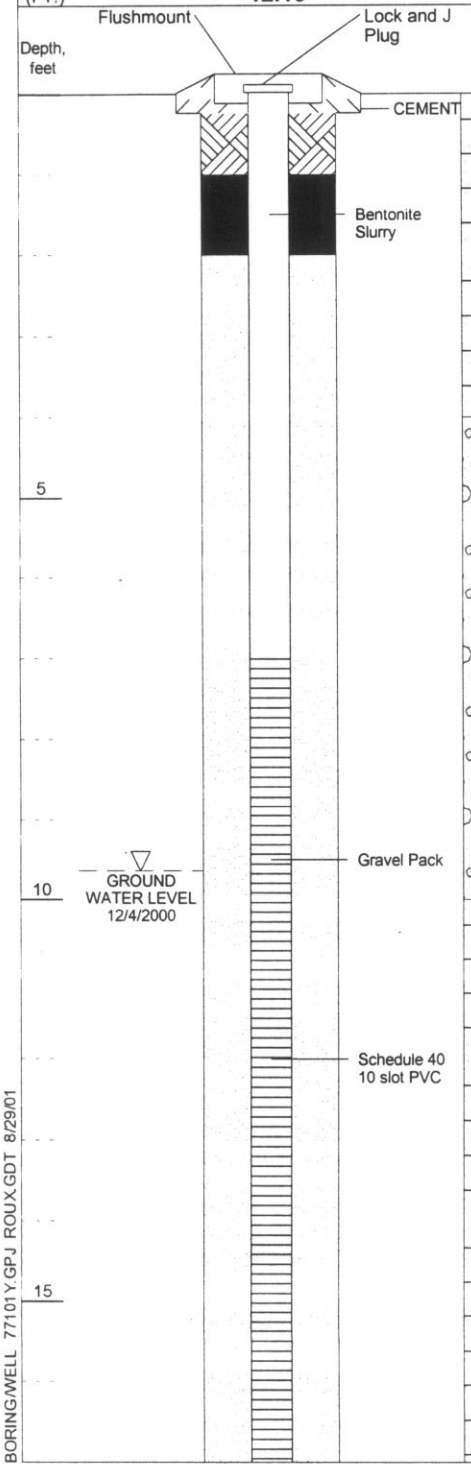
APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
Land, Air, Water / Carl Peterson	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
6.25-in. / Auger	**4-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**11/20/00-11/20/00**

CASING MAT./DIA.	SCREEN:				
PVC / 2-inch	TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **10.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**

ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
	12.16	**11.71**	**5.2 / -4.8**	**2.07**	**Morie #1**



Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Top 1" ORGANIC MATERIAL Dark brown fine to medium SAND; some Silt; Dry	N/A	4.9	
		Dark brown fine to medium SAND; some Silt	N/A	3.8	
		Light brown fine to coarse SAND. some Gravel	5 4 5	4.3	
5					5
		Light to dark brown fine to coarse SAND. some Gravel; Moist	3 4 3 2	3.5	
		Dark brown fine to coarse SAND. some Gravel	4 5 8 8	4.8	
10			7		10
		Dark brown fine to medium SAND, some Silt; Wet	2 2 2 2	5.1	
		Dark brown fine to medium SAND, some Silt	4 5 4	3.4	
		Dark brown fine to medium SAND, some Silt	3 1 1 1 2	0.9	
15					15
			N/A	NM	Bottom of well = 17 ft bls.

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-26D	**221976.83**	**2080117.35**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**V. Glasser**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
35					35
40					40
45					45
		Grout			
50					50
55					55
60					60
65					65

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-26D	**221976.83**	**2080117.35**
PROJECT NO./NAME		LOCATION
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**
APPROVED BY	LOGGED BY	**Manorhaven, New York**
S. Glash	**V. Glasser**	

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
110					110
115	Schedule 40 10 Slot PVC				115
120					120
125					125

Bottom of well = 125 ft bls.

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-27	**222403.43**	**2080469.97**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

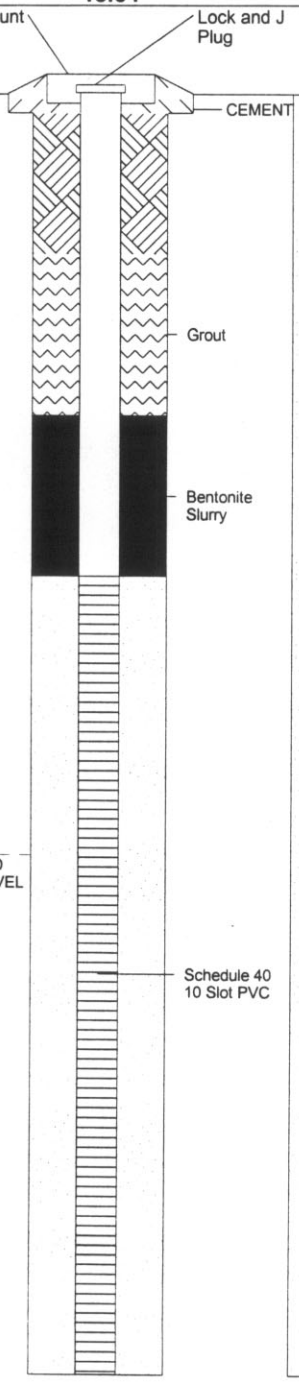
APPROVED BY	LOGGED BY	
S. Glash	**J. Wissing**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Rick Tabor	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**7/6/00-7/6/00**

CASING MAT./DIA.	SCREEN:				
PVC / 2-inch	TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **10.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
(FT.)	**13.54**	**13.45**	**7.5 / -2.5**	**3.95**	**Morie #1**



Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Black to brown to light brown fine to medium SAND, trace Gravel; Dry, loosely compacted	7 12 13 16	10.0	12 inch recovery.
		Brown to orange-brown fine to coarse SAND	12 10 9 5	10.0	12 inch recovery.
5		Light brown to orange-brown medium to coarse SAND	6 6 9 15	10.0	12 inch recovery.
		Light brown coarse SAND	13 18	11.5	14 inch recovery.
		Orange-brown fine to medium SAND; Moist	22 25		
		Brown to orange-brown fine to medium SAND; Moist to wet	19 22 23 34	12.1	12 inch recovery.
10		Brown to dark brown fine to medium SAND; Wet	15 19 22 29	0.0	13 inch recovery.
15			N/A	NM	

Bottom of well = 16 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

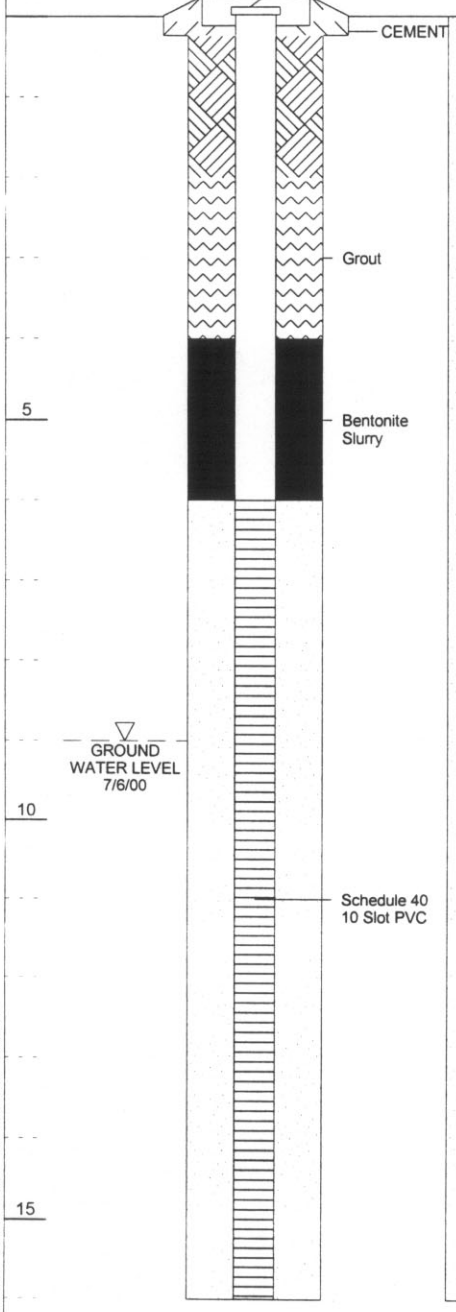
WELL NO.	NORTHING	EASTING
MW-28	**222385.38**	**2080434.58**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**
APPROVED BY: **S. Glash** / LOGGED BY: **J. Wissing**	**Manorhaven, New York**
DRILLING CONTRACTOR/DRILLER: **ADT Drilling / Rick Tabor**	GEOGRAPHIC AREA

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**7/6/00-7/6/00**

CASING MAT./DIA.	SCREEN: TYPE	MAT.	TOTAL LENGTH	DIA.	SLOT SIZE
PVC / 2-inch	**Slotted**	**SCH 40 PVC**	**10.0**	**2-inch**	**10-Slot**

ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
	14.02	**14.02**	**8.0 / -2.0**	**5.02**	**Morie #1**



Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brown fine to medium SAND; Dry, loosley compacted	11 10 9 8	0.0	20 inch recovery.
		Brown to light brown fine to medium SAND; loosely compacted	9 8 7 6	0.0	10 inch recovery.
5		Brown to light brown fine to medium SAND; loosely compacted	6 5 7 11	0.0	8 inch recovery.
		Brown to light brown fine to medium SAND, trace Gravel; Moist	10 19 21 24	10.0	21 inch recovery.
		Brown to orange-brown fine to medium SAND; Wet	8 14 17 19	11.0	14 inch recovery.
10		Brown fine to medium SAND; compact	9 11 12 14	0.0	10 inch recovery.
			N/A	NM	Straight drill to 16 ft bls.
15					Bottom of well = 16 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-29S	**222245.76**	**2080416.16**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

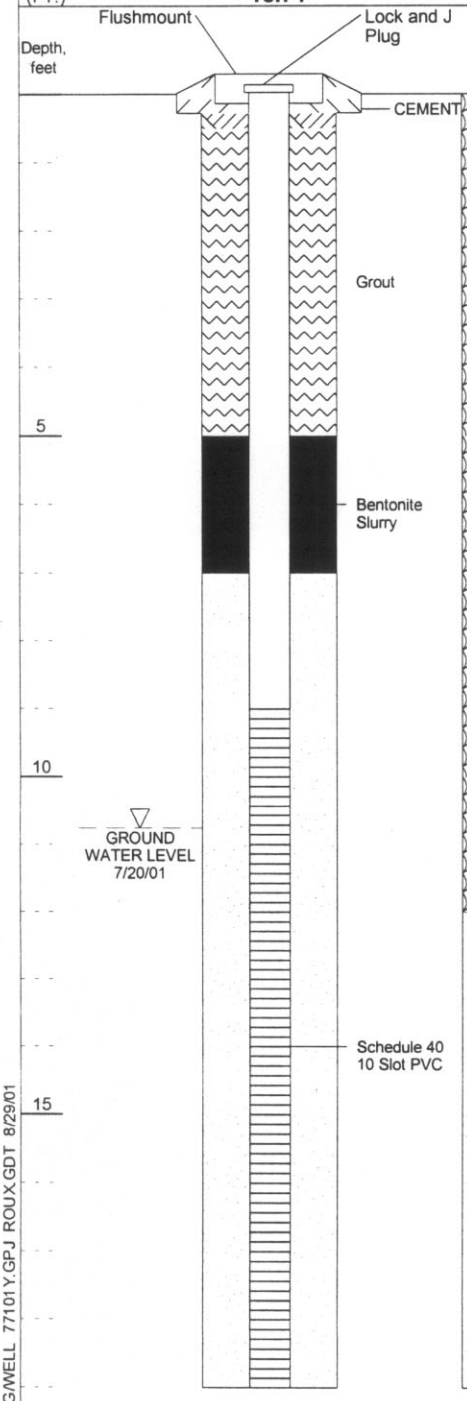
APPROVED BY	LOGGED BY	
S. Glash	**R. Fisler**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Jeremy Myers	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**6/5/01-6/5/01**

CASING MAT./DIA.	SCREEN:				
PVC / 2-inch	TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **10.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
(FT.)	**15.71**	**13.78**	**6.7 / -3.3**	**3.02**	**Morie #1**



Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brown fine to medium SAND (Fill); Dry			No split-spoon samples performed. Lithology taken from adjacent monitoring well pilot borhole at MW-29D.
					Straight drill to 19 ft bls.
5		Brown fine to medium SAND (Fill)			5
10		Gray fine SAND, Brick fragments and fine Gravel (Fill)			10
		Light brown fine SAND			
15		Brown fine SAND, trace Silt			15
					Bottom of well = 19 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-29I	**222257.31**	**2080412.37**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

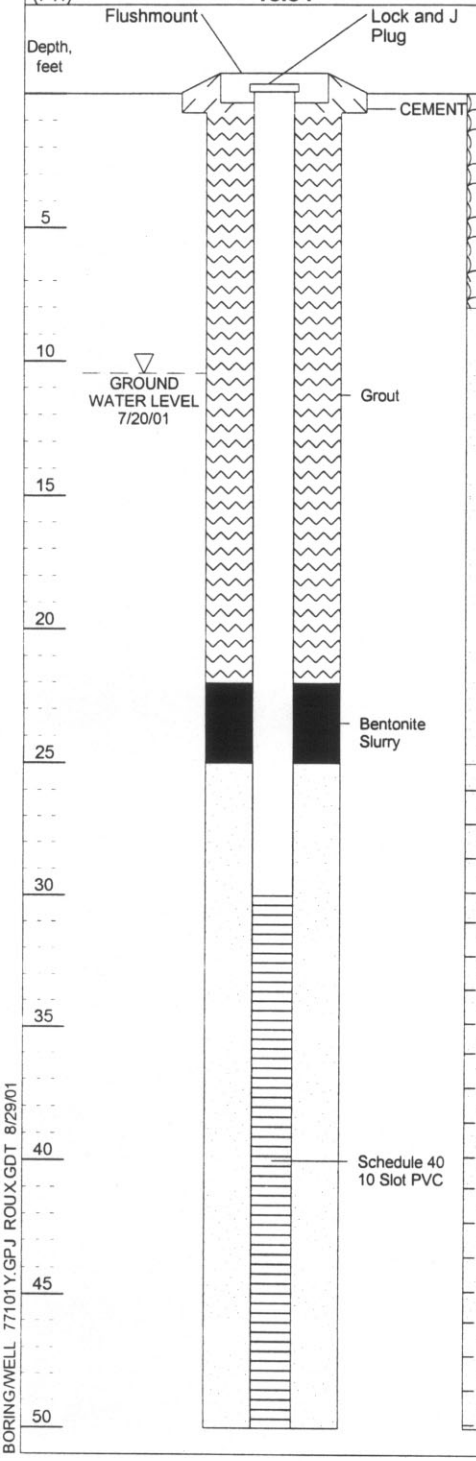
APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Victor Champagne	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**6/12/01-6/12/01**

CASING MAT./DIA.	SCREEN:				
PVC / 2-inch	TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **20.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
(FT.)	**15.84**	**13.85**	**-14.2 / -34.2**	**3.39**	**Morie #1**



Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		Brown fine to coarse SAND, some Wood (Fill); Dry			No split-spoon samples performed. Lithology taken from adajcent monitoring well pilot borhole at MW-29D.
		Brown fine to coarse SAND, some Gravel, Brick and Concrete (Fill)			
5		Brown fine to coarse SAND, some Gravel, Brick and Concrete (Fill)			Straight drill to 50 ft bls.
		Brown fine to coarse SAND (Fill)			
		CONCRETE - pulverized (Fill)			
		Brown and white fine to coarse SAND; Moist			
10		Brown fine to coarse SAND, little Gravel; Wet			
		Brown fine to coarse SAND, little Gravel			
15		Brown fine to coarse SAND, trace Silt			
20		Brown fine to coarse SAND, little Silt			
25		Brown fine to coarse SAND, some Silt			
30		Brown fine to medium SAND, some Silt			
35		Brown fine to medium SAND, some Silt			
40		Gray fine to medium SAND, some Silt, thin 1/4" band of gray Clay at 44 ft bls			
45		Gray fine to medium SAND, some Silt, 2 inch band of gray Clay at 49.5 ft bls			
50					Bottom of well = 50 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-29D	**222267.6**	**2080407.24**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

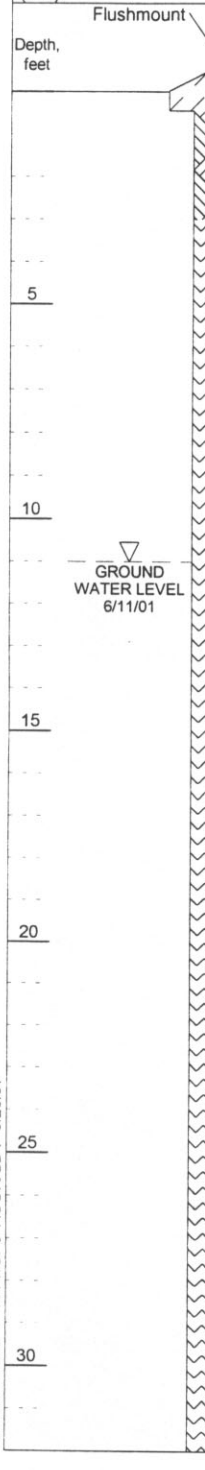
APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Chris Stratton	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Failing F-10 / HSA**	**2" Split Spoon**	**6/11/01-6/13/01**

CASING MAT./DIA.	SCREEN:				
PVC / 2-inch	TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **20.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
(FT.)	**16.10**	**14.01**	**-88.9 / -108.9**	**3.01**	**Morie #1**



Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brown fine to coarse SAND, some Wood (Fill); Dry	6 9 15 15	6.9	3 inch recovery. Rock stuck in tip of split spoon.
		Brown fine to coarse SAND, some Gravel, Brick and Concrete (Fill)	9 10 5 10	2.5	12 inch recovery.
5		Brown fine to coarse SAND, some Gravel, Brick and Concrete (Fill)	5 6 29	1.4	12 inch recovery.
		Brown fine to coarse SAND (Fill)	5 6 29	3.0	18 inch recovery.
		CONCRETE - pulverized (Fill)	50 25		
		Brown and white fine to coarse SAND; Moist	5 11 5	15	12 inch recovery.
10		Brown fine to coarse SAND, little Gravel; Wet	28 12 22 24	6.1	18 inch recovery.
		Brown fine to coarse SAND, little Gravel	23		Auger to 13 ft bls.
			14 18 9	4.6	18 inch recovery.
15		Brown fine to coarse SAND, trace Silt	20		Straight drill to 18 ft bls.
			12 13 20	2.0	24 inch recovery.
20		Brown fine to coarse SAND, little Silt	20		Straight drill to 23 ft bls.
			28 30 22	4.0	24 inch recovery.
25		Brown fine to coarse SAND, some Silt	23		Straight drill to 28 ft bls.
			15 20 22	0.8	24 inch recovery.
30		Brown fine to medium SAND, some Silt	25		Straight drill to 33 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-29D	**222267.6**	**2080407.24**
PROJECT NO./NAME		LOCATION
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**
APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brown fine to medium SAND, some Silt *(continued)*	5 5 25 31	0.7	24 inch recovery.
35		Brown fine to medium SAND, some Silt			35 Straight drill to 38 ft bls.
			20 22 23 28	0.8	24 inch recovery.
40		Gray fine to medium SAND, some Silt, thin 1/4" band of gray Clay at 44 ft bls			40 Straight drill to 43 ft bls.
			8 18 31 36	0.0	24 inch recovery.
45		Gray fine to medium SAND, some Silt, 2 inch band of gray Clay at 49.5 ft bls			45 Straight drill to 48 ft bls.
			5 13 28 22	4.3	24 inch recovery.
50	Grout	Gray fine SAND, some Silt grading to fine Sand and Silt at 55 ft bls			50 Straight drill to 53 ft bls.
			8 16 24 36	3.8	12 inch recovery.
55		Gray SILT, some fine Sand, 2 inch band of Silt with little Clay at 59.5 ft bls			55 Straight drill to 58 ft bls.
			8 24 36 37	4.1	18 inch recovery.
60		Gray SILT, some fine Sand, trace Clay			60 Straight drill to 63 ft bls.
			8 23 26 28	3.2	12 inch recovery.
65		Gray SILT, some fine Sand, 2 inch band of Silt and Clay at 69 ft bls			65 Straight drill to 68 ft bls.
			10		

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-29D	**222267.6**	**2080407.24**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
70		Gray SILT, some fine Sand, 2 inch band of Silt and Clay at 69 ft bls *(continued)*	14 14 30	2.8	18 inch recovery.
		Gray SILT, trace fine Sand and Clay			Straight drill to 73 ft bls. 70
75		Gray SILT, little Clay, trace fine Sand	5 3 5 24	0.0	24 inch recovery. Straight drill to 78 ft bls. 75
80		Gray SILT, little Clay, trace fine Sand	9 15 30 30	0.0	24 inch recovery. Straight drill to 83 ft bls. 80
85		Gray SILT, little Clay, trace fine Sand	5 6 15 18	0.0	24 inch recovery. Straight drill to 88 ft bls. 85
90		Gray SILT, little Clay, trace fine Sand	5 7 12 18	0.0	24 inch recovery. Straight drill to 93 ft bls. 90
95		Gray SILT, little Clay, trace fine Sand	5 10 27 11	1.3	24 inch recovery. Straight drill to 98 ft bls. 95
100	Bentonite Slurry	Gray SILT, little Clay, trace fine Sand	7 14 27 30	2.4	24 inch recovery. Straight drill to 103 ft bls. 100
105			5 9 18 10	4.1	24 inch recovery. 105

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-29D	**222267.6**	**2080407.24**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Gray SILT, little Clay, trace fine Sand *(continued)*			Straight drill to 108 ft bls.
			6 9 13 10	3.8	18 inch recovery.
110		Gray SILT, little Clay, trace fine Sand			Straight drill to 113 ft bls.
			6 13 18 22	0.0	24 inch recovery.
115	Schedule 40 10 Slot PVC	Gray SILT, little Clay			Straight drill to 118 ft bls.
			6 18 18 24	0.0	24 inch recovery.
120		Gray SILT, little Clay			Straight drill to 125 ft bls.
					24 inch recovery.
125					Bottom of well = 125 ft bls.

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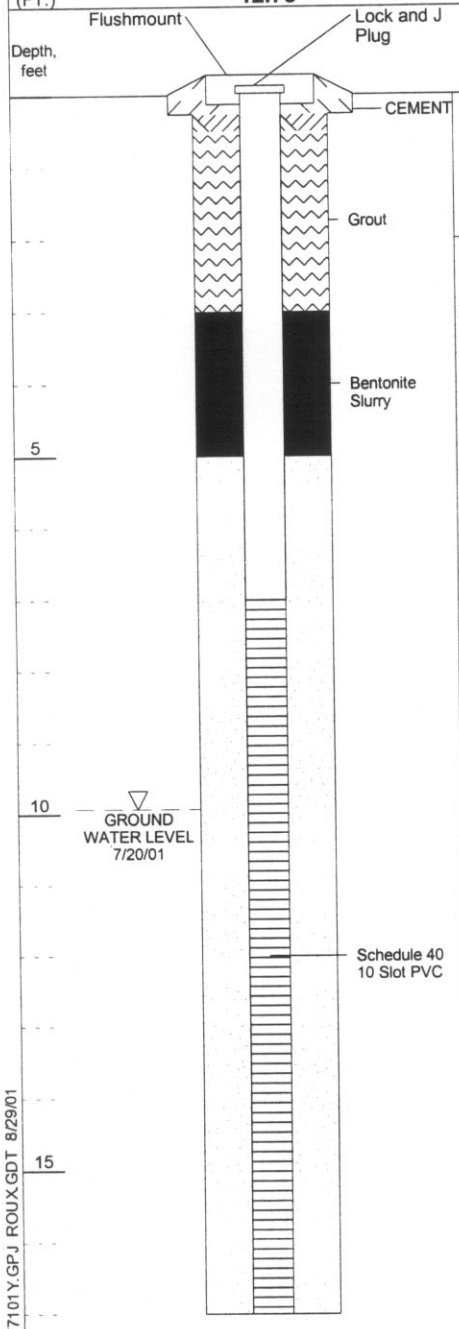
WELL CONSTRUCTION LOG

WELL NO. **MW-30S**	NORTHING **222038.5**	EASTING **2080228.31**		
PROJECT NO./NAME **77101Y / MBA Manorhaven LLC**		LOCATION **Former Thypin Steel, Inc. Facility**		
APPROVED BY **S. Glash**	LOGGED BY **R. Fisler**	**Manorhaven, New York**		
DRILLING CONTRACTOR/DRILLER **ADT Drilling / Jeremy Myers**		GEOGRAPHIC AREA		
DRILL BIT DIAMETER/TYPE **4-in. / Auger**	BOREHOLE DIAMETER **8-inches**	DRILLING EQUIPMENT/METHOD **Mobile Drill B-61 / HSA**	SAMPLING METHOD **2" Split Spoon**	START-FINISH DATE **6/4/01-6/4/01**
CASING MAT./DIA. **PVC / 2-inch**	SCREEN: TYPE **Slotted**	MAT. **SCH 40 PVC** TOTAL LENGTH **10.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**
ELEVATION OF: (FT.)	GROUND SURFACE **12.78**	TOP OF WELL CASING **12.64**	TOP & BOTTOM SCREEN **5.8 / -4.2**	GW SURFACE **2.71**	GRAVEL PACK **Morie #1**



Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		No recovery			No split-spoon samples performed. Lithology taken from adajcent monitoring well pilot borhole at MW-30I.
		Gray-brown fine SAND, some medium Sand, little Silt; Dry			
		Gray-brown fine SAND, little Silt			
5		Gray-brown fine SAND, little Silt			5
		Red-brown SILT, some fine Sand, trace Clay			
		Red-brown SILT, some fine black Sand, trace Clay			
		Light gray-brown fine to medium SAND	3	759	Peteroleum-like odor.
10		Tannish gray-brown fine SAND, trace to some medium Sand, little Silt	4 5 6		10 Straight drill to 17 ft bls.
15					15
					Bottom of well = 17 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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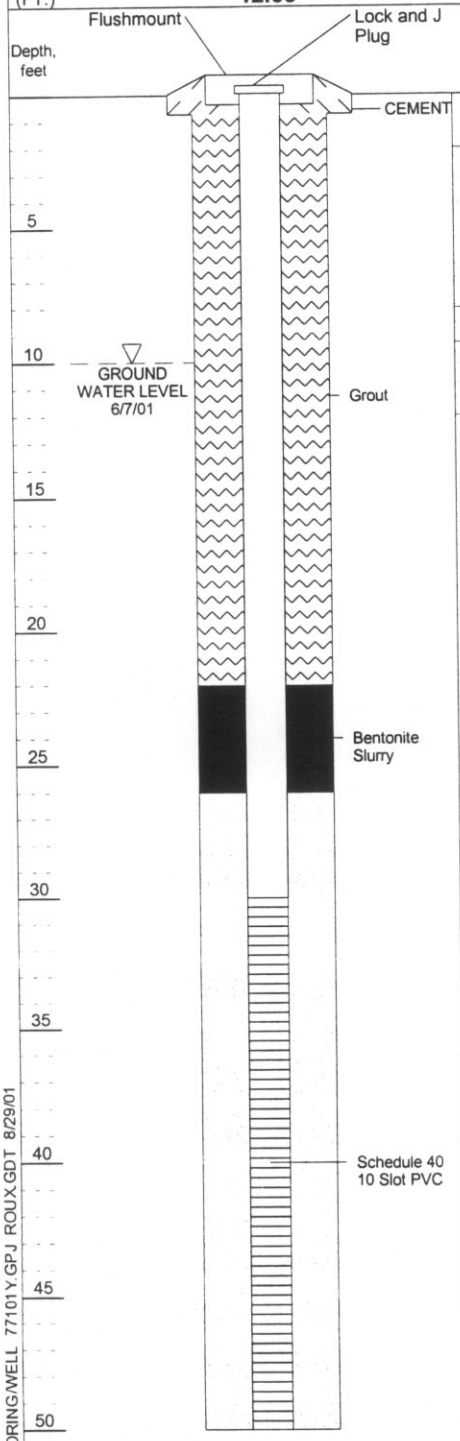
WELL CONSTRUCTION LOG

WELL NO.: **MW-30I**	NORTHING: **222048.88**	EASTING: **2080224.79**			
PROJECT NO./NAME: **77101Y / MBA Manorhaven LLC**		LOCATION: **Former Thypin Steel, Inc. Facility**			
APPROVED BY: **S. Glash**	LOGGED BY: **V. Glasser**	**Manorhaven, New York**			
DRILLING CONTRACTOR/DRILLER: **ADT Drilling / Dennis Meyor**		GEOGRAPHIC AREA			
DRILL BIT DIAMETER/TYPE: **4-in. / Auger**	BOREHOLE DIAMETER: **8-inches**	DRILLING EQUIPMENT/METHOD: **DK-5 / HSA**	SAMPLING METHOD: **2" Split Spoon**	START-FINISH DATE: **6/6/01-6/7/01**	
CASING MAT./DIA.: **PVC / 2-inch**	SCREEN: TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **20.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**
ELEVATION OF: (FT.)	GROUND SURFACE: **12.65**	TOP OF WELL CASING: **12.65**	TOP & BOTTOM SCREEN: **-17.4 / -37.4**	GW SURFACE: **2.65**	GRAVEL PACK: **Morie #1**



Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		No recovery	8 10	0.0	No recovery. Brick stuck in split spoon.
		Gray-brown fine SAND, some medium Sand, little Silt; Dry	8 10 25	0.0	9 inch recovery. Mica noted throughout sample.
5		Gray-brown fine SAND, little Silt	13 9 12	0.0	12 inch recovery.
		Gray-brown fine SAND, little Silt	4 5 8	0.0	12 inch recovery.
		Red-brown SILT, some fine Sand, trace Clay	5 13 8	0.0	14 inch recovery.
10		Red-brown SILT, some fine black Sand, trace Clay	6 5 15	0.0	13 inch recovery.
		Light gray-brown fine to medium SAND	12 8 8	0.0	Straight drill to 50 ft bls.
		Tannish gray-brown fine SAND, trace to some medium Sand, little Silt	8 9 12 50		
15					
20					
25					
30					
35					
40					
45					
50					Bottom of well = 50 ft bls.

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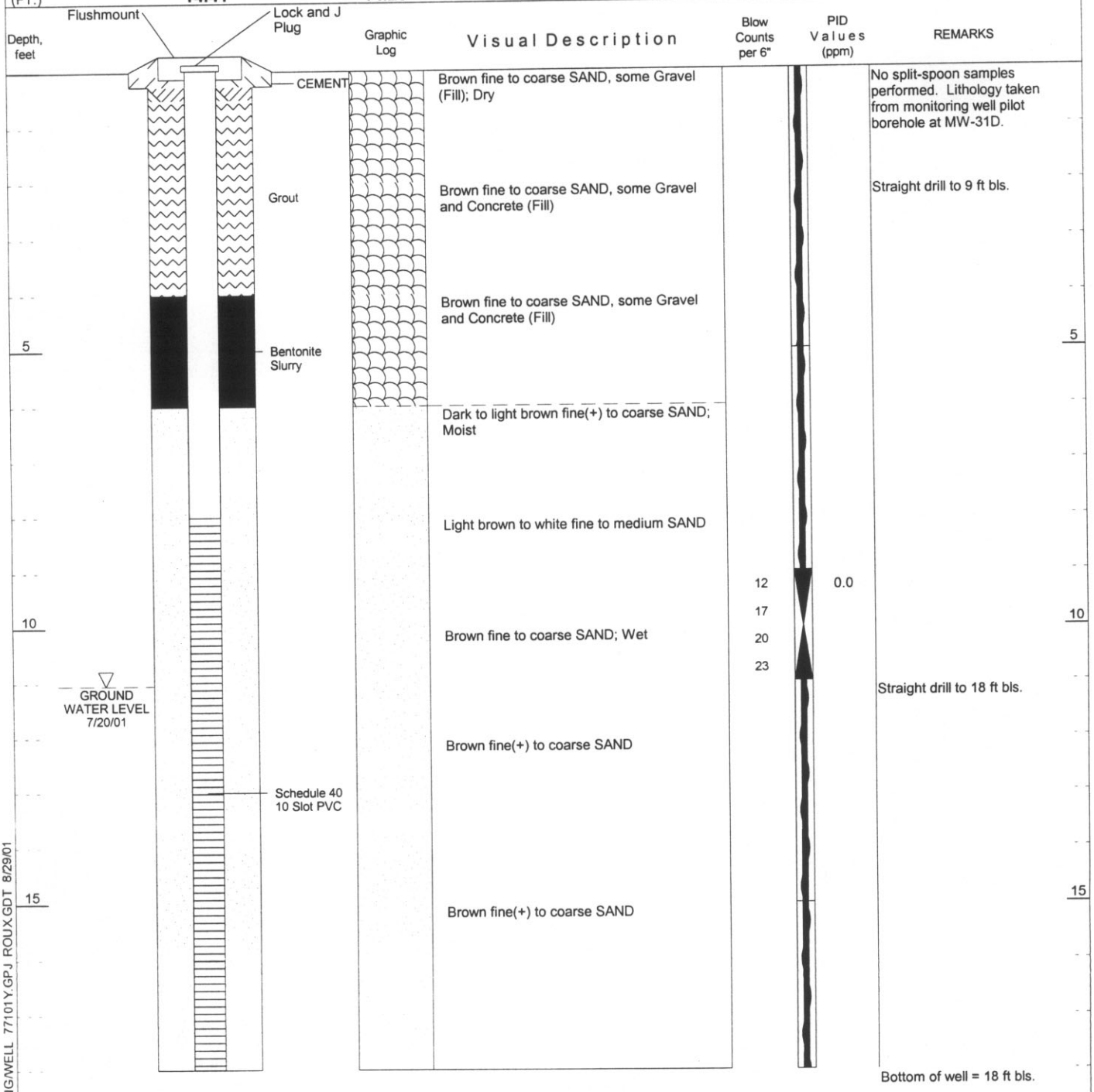
WELL CONSTRUCTION LOG

WELL NO.: **MW-31S**	NORTHING: **222248.82**	EASTING: **2080335.23**			
PROJECT NO./NAME: **77101Y / MBA Manorhaven LLC**		LOCATION: **Former Thypin Steel, Inc. Facility**			
APPROVED BY: **S. Glash**	LOGGED BY: **R. Fisler**	**Manorhaven, New York**			
DRILLING CONTRACTOR/DRILLER: **ADT Drilling / Jeremy Myers**		GEOGRAPHIC AREA			
DRILL BIT DIAMETER/TYPE: **4-in. / Auger**	BOREHOLE DIAMETER: **8-inches**	DRILLING EQUIPMENT/METHOD: **Mobile Drill B-61 / HSA**	SAMPLING METHOD: **2" Split Spoon**	START-FINISH DATE: **6/5/01-6/5/01**	
CASING MAT./DIA.: **PVC / 2-inch**	SCREEN: TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **10.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**
ELEVATION OF: (FT.)	GROUND SURFACE: **14.41**	TOP OF WELL CASING: **14.23**	TOP & BOTTOM SCREEN: **6.4 / -3.6**	GW SURFACE: **3.18**	GRAVEL PACK: **Morie #1**



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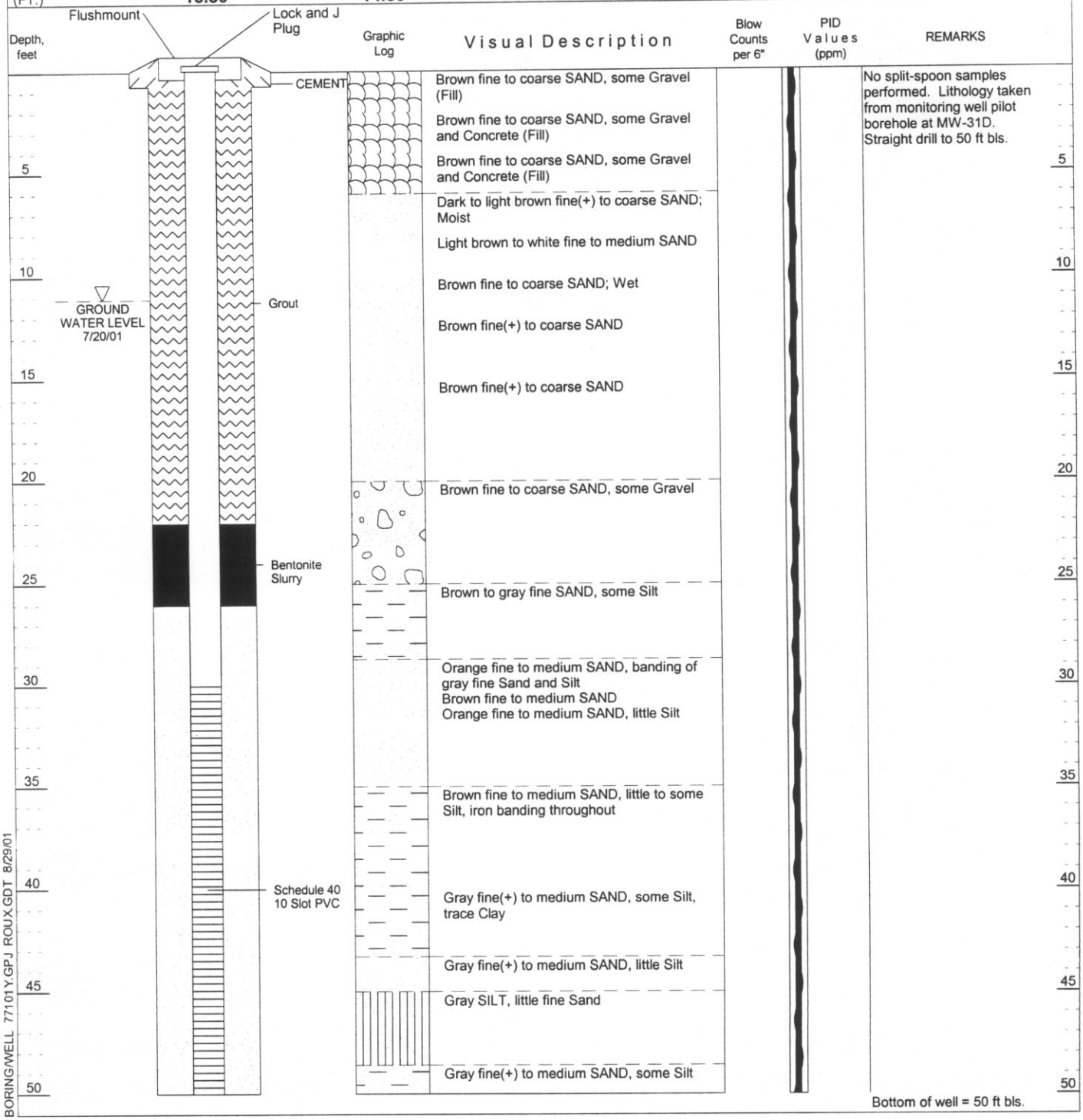
WELL CONSTRUCTION LOG

WELL NO.: **MW-31I**	NORTHING: **222264.7**	EASTING: **2080330.53**			
PROJECT NO./NAME: **77101Y / MBA Manorhaven LLC**		LOCATION: **Former Thypin Steel, Inc. Facility**			
APPROVED BY: **S. Glash**	LOGGED BY: **V. Glasser**	**Manorhaven, New York**			
DRILLING CONTRACTOR/DRILLER: **ADT Drilling / Sean Miller**		GEOGRAPHIC AREA			
DRILL BIT DIAMETER/TYPE: **4-in. / Auger**	BOREHOLE DIAMETER: **8-inches**	DRILLING EQUIPMENT/METHOD: **Mobile Drill B-61 / HSA**	SAMPLING METHOD: **2" Split Spoon**	START-FINISH DATE: **6/8/01-6/8/01**	
CASING MAT./DIA.: **PVC / 2-inch**	SCREEN: TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **20.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**
ELEVATION OF: (FT.)	GROUND SURFACE: **15.30**	TOP OF WELL CASING: **14.63**	TOP & BOTTOM SCREEN: **-14.7 / -34.7**	GW SURFACE: **3.53**	GRAVEL PACK: **Morie #1**



Bottom of well = 50 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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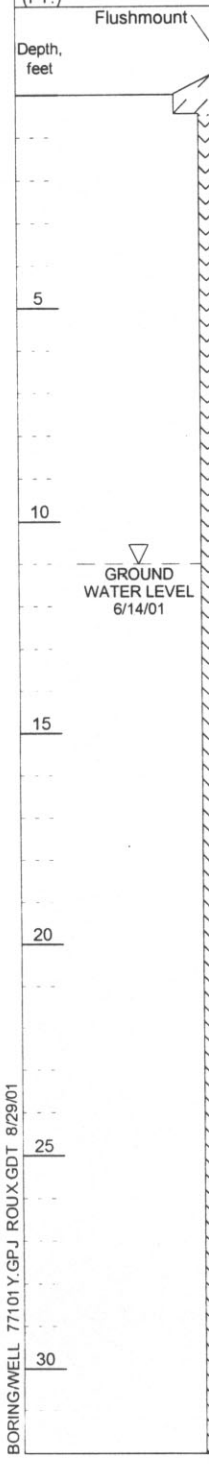
WELL CONSTRUCTION LOG

WELL NO. **MW-31D**	NORTHING **222269.59**	EASTING **2080329.96**		
PROJECT NO./NAME **77101Y / MBA Manorhaven LLC**		LOCATION **Former Thypin Steel, Inc. Facility**		
APPROVED BY **S. Glash**	LOGGED BY **M.Lanberg**	**Manorhaven, New York**		
DRILLING CONTRACTOR/DRILLER **ADT Drilling / Chris Stratton**		GEOGRAPHIC AREA		
DRILL BIT DIAMETER/TYPE **4-in. / Auger**	BOREHOLE DIAMETER **8-inches**	DRILLING EQUIPMENT/METHOD **Failing F-10 / HSA**	SAMPLING METHOD **2" Split Spoon**	START-FINISH DATE **6/14/01-6/15/01**
CASING MAT./DIA. **PVC / 2-inch**	SCREEN: TYPE **Slotted** MAT. **SCH 40 PVC** TOTAL LENGTH **20.0** DIA. **2-inch** SLOT SIZE **10-Slot**			
ELEVATION OF: (FT.)	GROUND SURFACE **14.68**	TOP OF WELL CASING **14.45**	TOP & BOTTOM SCREEN **-90.3 / -110.3**	GW SURFACE **3.45**	GRAVEL PACK **Morie #1**



Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brown fine to coarse SAND, some Gravel (Fill); Dry	3 3 5 3	0.0	12 inch recovery.
		Brown fine to coarse SAND, some Gravel and Concrete (Fill)	8 10 9 10	0.0	6 inch recovery.
5		Brown fine to coarse SAND, some Gravel and Concrete (Fill)	7 7 9 15	0.0	12 inch recovery.
		Dark to light brown fine(+) to coarse SAND; Moist	9 6 10 11	0.0	24 inch recovery.
		Light brown to white fine to medium SAND	4 8 12 13	0.0	24 inch recovery.
10		Brown fine to coarse SAND; Wet	10 12 10 12	0.0	24 inch recovery.
		Brown fine(+) to coarse SAND			Auger to 13 ft bls.
			14 10 10 15	3.2	24 inch recovery.
15		Brown fine(+) to coarse SAND			Straight drill to 18 ft bls.
			10 12 7 8	3.6	24 inch recovery.
20		Brown fine to coarse SAND, some Gravel			Straight drill to 23 ft bls.
			8 7 15 17	3.5	24 inch recovery.
25		Brown to gray fine SAND, some Silt			Straight drill to 28 ft bls.
			6 6 7 23	2.1	
30		Orange fine to medium SAND, banding of gray fine Sand and Silt Brown fine to medium SAND Orange fine to medium SAND, little Silt			Straight drill to 33 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-31D	**222269.59**	**2080329.96**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Orange fine to medium SAND, little Silt *(continued)*	6 6 7 9	2.2	
35		Brown fine to medium SAND, little to some Silt, iron banding throughout			Straight drill to 38 ft bls.
			4 4 11 12	2.8	
40		Gray fine(+) to medium SAND, some Silt, trace Clay			Straight drill to 43 ft bls.
		Gray fine(+) to medium SAND, little Silt	6 6 12 6	3.8	18 inch recovery.
45		Gray SILT, little fine Sand			Straight drill to 48 ft bls.
		Gray fine(+) to medium SAND, some Silt	3 4 9 24	7.2	18 inch recovery.
50		Gray fine SAND and SILT, some dark gray to black banding			Straight drill to 53 ft bls.
			15 16 35 23	7.9	18 inch recovery.
55		Gray fine SAND and SILT, some dark gray to black banding			Straight drill to 58 ft bls.
			7 9 7 13	6.1	18 inch recovery.
60		Gray SILT, some fine Sand and Clay			Straight drill to 63 ft bls.
			7 10 13 21	5.1	18 inch recovery.
65		Gray SILT, some fine Sand and Clay			Straight drill to 68 ft bls.
			7		

Grout

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-31D	**222269.59**	**2080329.96**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Gray SILT, some fine Sand and Clay *(continued)*	10 10 14	5.8	18 inch recovery.
70		Gray fine SAND and SILT, trace Clay			70 Straight drill to 73 ft bls.
			7 9 13 7	1.3	15 inch recovery.
75		Gray fine SAND and SILT, trace Clay			75 Straight drill to 78 ft bls.
			4 7 11 27	4.8	18 inch recovery.
80		Gray fine SAND and SILT, trace Clay			80 Straight drill to 83 ft bls.
			7 7 9 17	3.7	18 inch recovery.
85		Gray SILT, little Clay			85 Straight drill to 88 ft bls.
		Gray SILT, little Clay, trace fine Sand Gray SILT, some fine Sand	7 7 6 7	5.3	18 inch recovery.
90		Gray SILT and fine SAND, trace Clay			90 Straight drill to 93 ft bls.
			9 6 9 9	3.0	12 inch recovery.
95		Gray SILT, little Clay and fine Sand			95 Straight drill to 98 ft bls.
			4 4 7 20	0.8	12 inch recovery.
100	Bentonite Slurry	Gray SILT, little Clay, one inch band of tight compact Silt at 104 ft bls			100 Straight drill to 103 ft bls.
			10 10 11 14	0.3	12 inch recovery.
105					105

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-31D	**222269.59**	**2080329.96**
PROJECT NO./NAME		LOCATION
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**
APPROVED BY	LOGGED BY	**Manorhaven, New York**
S. Glash	**M.Lanberg**	

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Gray SILT, little Clay, one inch band of tight compact Silt at 109 ft bls *(continued)*			Straight drill to 108 ft bls.
			9 8 9 20	0.0	18 inch recovery.
110		Gray SILT, little Clay			110 Straight drill to 103 ft bls.
			8 7 8 8	0.0	12 inch recovery.
115		Gray SILT, little to some Clay banded with Silt			115 Straight drill to 118 ft bls.
			4 6 7 20	0.0	12 inch recovery.
120		Gray SILT, little to some Clay banded with Silt			120 Straight drill to 123 ft bls.
			4 5 10 24	0.0	
125					125 Bottom of well = 125 ft bls.

Schedule 40
10 Slot PVC

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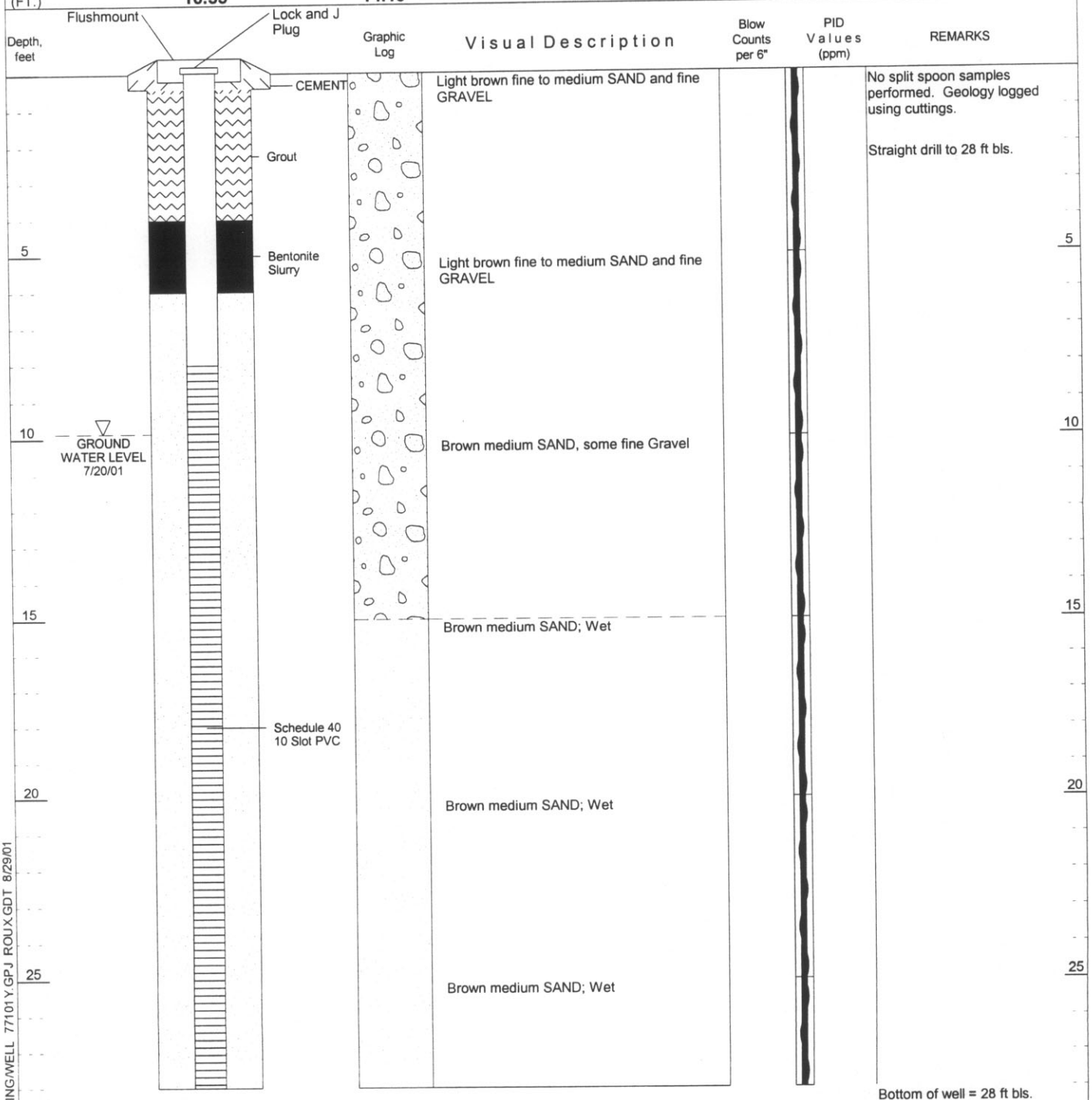
WELL CONSTRUCTION LOG

WELL NO. **MW-32S**	NORTHING **222566.24**	EASTING **2080325.19**			
PROJECT NO./NAME **77101Y / MBA Manorhaven LLC**		LOCATION **Former Thypin Steel, Inc. Facility**			
APPROVED BY **S. Glash**	LOGGED BY **R. Fisler**	**Manorhaven, New York**			
DRILLING CONTRACTOR/DRILLER **ADT Drilling / Jeremy Myers**		GEOGRAPHIC AREA			
DRILL BIT DIAMETER/TYPE **4-in. / Auger**	BOREHOLE DIAMETER **8-inches**	DRILLING EQUIPMENT/METHOD **Mobile Drill B-61 / HSA**	SAMPLING METHOD **2" Split Spoon**	START-FINISH DATE **6/5/01-6/5/01**	
CASING MAT./DIA. **PVC / 2-inch**	SCREEN: TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **10.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**
ELEVATION OF: (FT.)	GROUND SURFACE **16.55**	TOP OF WELL CASING **14.19**	TOP & BOTTOM SCREEN **-1.5 / -11.5**	GW SURFACE **4.32**	GRAVEL PACK **Morie #1**



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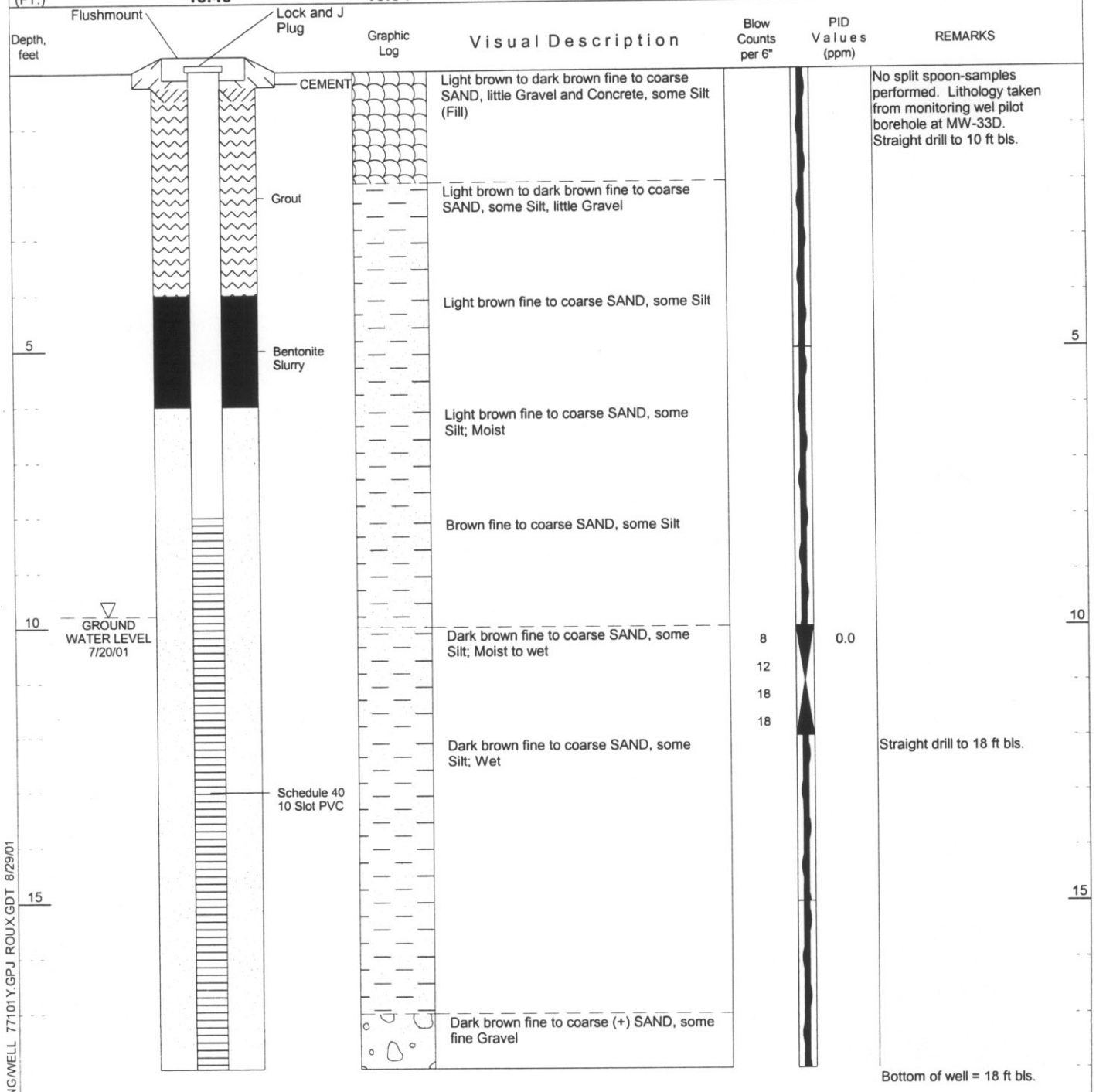
WELL CONSTRUCTION LOG

WELL NO.: **MW-33S**	NORTHING: **222280.21**	EASTING: **2080222.86**			
PROJECT NO./NAME: **77101Y / MBA Manorhaven LLC**		LOCATION: **Former Thypin Steel, Inc. Facility**			
APPROVED BY: **S. Glash**	LOGGED BY: **R. Fisler**	**Manorhaven, New York**			
DRILLING CONTRACTOR/DRILLER: **ADT Drilling / Jeremy Myers**		GEOGRAPHIC AREA			
DRILL BIT DIAMETER/TYPE: **4-in. / Auger**	BOREHOLE DIAMETER: **8-inches**	DRILLING EQUIPMENT/METHOD: **Mobile Drill B-61 / HSA**	SAMPLING METHOD: **2" Split Spoon**	START-FINISH DATE: **6/5/01-6/5/01**	
CASING MAT./DIA.: **PVC / 2-inch**	SCREEN: TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **10.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**
ELEVATION OF: (FT.)	GROUND SURFACE: **13.46**	TOP OF WELL CASING: **13.34**	TOP & BOTTOM SCREEN: **5.5 / -4.5**	GW SURFACE: **3.56**	GRAVEL PACK: **Morie #1**



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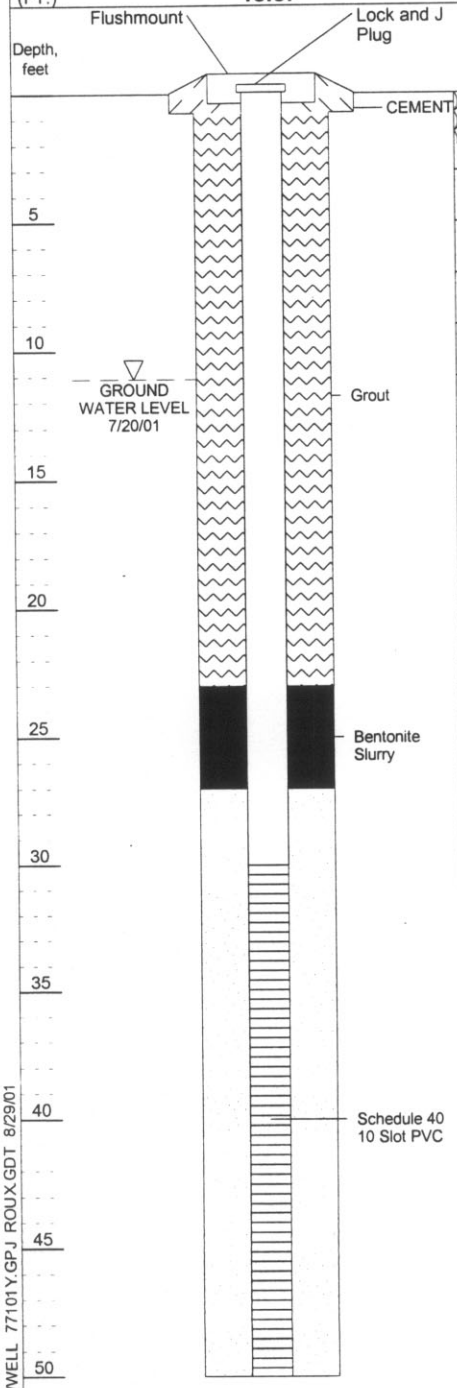
WELL CONSTRUCTION LOG

WELL NO. **MW-33I**	NORTHING **222291.21**	EASTING **2080221.59**		
PROJECT NO./NAME **77101Y / MBA Manorhaven LLC**		LOCATION **Former Thypin Steel, Inc. Facility**		
APPROVED BY **S. Glash**	LOGGED BY **V. Glasser**	**Manorhaven, New York**		
DRILLING CONTRACTOR/DRILLER **ADT Drilling / Sean Miller**		GEOGRAPHIC AREA		
DRILL BIT DIAMETER/TYPE **4-in. / Auger**	BOREHOLE DIAMETER **8-inches**	DRILLING EQUIPMENT/METHOD **Mobile Drill B-61 / HSA**	SAMPLING METHOD **2" Split Spoon**	START-FINISH DATE **6/6/01-6/8/01**
CASING MAT./DIA. **PVC / 2-inch**	SCREEN: TYPE **Slotted**	MAT. **SCH 40 PVC** TOTAL LENGTH **20.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**
ELEVATION OF: (FT.)	GROUND SURFACE **13.67**	TOP OF WELL CASING **13.48**	TOP & BOTTOM SCREEN **-16.3 / -36.3**	GW SURFACE **2.38**	GRAVEL PACK **Morie #1**



Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Light brown fine to coarse SAND, little Gravel and Concrete, some Silt (Fill)			No split spoon-samples performed. Lithology taken from monitoring wel pilot borehole at MW-33D. Straight drill to 50 ft bls.
		Light brown to dark brown fine to coarse SAND, some Silt, little Gravel			
		Light brown fine to coarse SAND, some Silt			
		Light brown fine to coarse SAND, some Silt; Moist			
		Brown fine to coarse SAND, some Silt; Moist			
		Dark brown fine to coarse SAND, some Silt; Moist to wet			
		Dark brown fine to coarse SAND, some Silt; Wet			
		Dark brown fine to coarse (+) SAND, some fine Gravel			
		Brown fine to coarse (+) SAND, some fine Gravel			
		Light brown to red fine (+) to coarse SAND, some Silt			
		Brown fine (+) to coarse SAND, some Silt, orange to red banding throughout			
		Gray fine (+) to medium SAND and SILT; Moist			
		Gray fine (+) to medium SAND and SILT, trace Clay			
		Gray fine (+) to medium SAND and SILT, trace Clay			

Bottom of well = 50 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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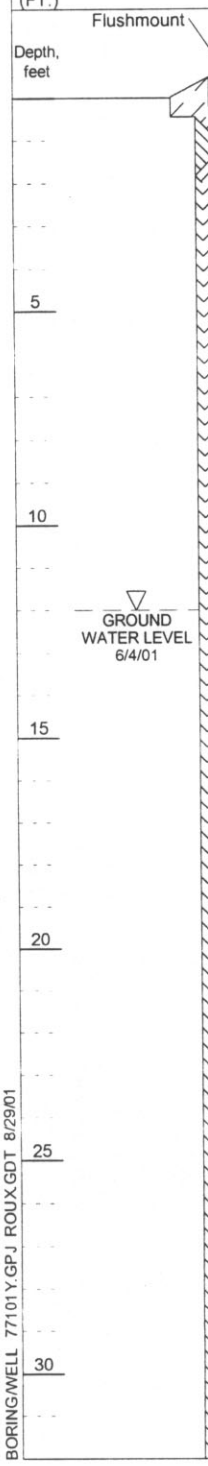
WELL CONSTRUCTION LOG

WELL NO.: **MW-33D**	NORTHING: **222302.27**	EASTING: **2080210.99**			
PROJECT NO./NAME: **77101Y / MBA Manorhaven LLC**		LOCATION: **Former Thypin Steel, Inc. Facility**			
APPROVED BY: **S. Glash**	LOGGED BY: **M.Lanberg**	**Manorhaven, New York**			
DRILLING CONTRACTOR/DRILLER: **ADT Drilling / Lloyd Adams**		GEOGRAPHIC AREA			
DRILL BIT DIAMETER/TYPE: **4-in. / Auger**	BOREHOLE DIAMETER: **8-inches**	DRILLING EQUIPMENT/METHOD: **CME-75 / HSA**	SAMPLING METHOD: **2" Split Spoon**	START-FINISH DATE: **6/4/01-6/5/01**	
CASING MAT./DIA.: **PVC / 2-inch**	SCREEN: TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **20.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**
ELEVATION OF: (FT.)	GROUND SURFACE: **13.50**	TOP OF WELL CASING: **13.30**	TOP & BOTTOM SCREEN: **-91.5 / -111.5**	GW SURFACE: **1.30**	GRAVEL PACK: **Morie #1**



Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Light brown to dark brown fine to coarse SAND, little Gravel and Concrete, some Silt (Fill)	2, 3, 3, 3	1.2	24 inch recovery.
		Light brown to dark brown fine to coarse SAND, some Silt, little Gravel	2, 4, 3, 2	0.2	24 inch recovery.
5		Light brown fine to coarse SAND, some Silt	3, 2, 2, 3	0.0	18 inch recovery.
		Light brown fine to coarse SAND, some Silt; Moist	4, 6, 7, 7	0.0	12 inch recovery.
		Brown fine to coarse SAND, some Silt	6, 8, 10, 10	0.0	24 inch recovery.
10		Dark brown fine to coarse SAND, some Silt; Moist to wet	8, 11, 16, 18	0.0	24 inch recovery.
		Dark brown fine to coarse SAND, some Silt; Wet			Straight drill to 15 ft bls.
15			5, 7, 11, 14	1.6	18 inch recovery.
		Dark brown fine to coarse (+) SAND, some fine Gravel			Straight drill to 20 ft bls.
20			6, 7, 10, 14	23.3	18 inch recovery.
		Brown fine to coarse (+) SAND, some fine Gravel			Straight drill to 25 ft bls.
25			6, 7, 11, 14	1.8	18 inch recovery.
		Light brown to red fine (+) to coarse SAND, some Silt			
		Brown fine (+) to coarse SAND, some Silt, orange to red banding throughout			Straight drill to 30 ft bls.
30			6, 6, 9, 10	27.7	12 inch recovery.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-33D	**222302.27**	**2080210.99**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**M.Lanberg**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Gray fine (+) to medium SAND and SILT; Moist			Straight drill to 35 ft bls.
35			7 11 11 15	23.7	18 inch recovery.
		Gray fine (+) to medium SAND and SILT, trace Clay			Straight drill to 40 ft bls.
40			4 4 7 12	8.1	12 inch recovery.
		Gray fine (+) to medium SAND and SILT, trace Clay			Straight drill to 45 ft bls.
45			2 3 5 7	0.0	12 inch recovery.
		Gray fine (+) to medium SAND and SILT, trace Clay			Straight drill to 50ft bls.
50	Gravel Pack		3 5 7 11	0.8	12 inch recovery.
		Gray fine (+) to medium SAND and SILT, trace Clay			Straight drill to 55 ft bls.
55			4 6 8 12	1.4	12 inch recovery.
		Gray fine SAND and SILT, trace Clay			Straight drill to 60 ft bls.
60			8 9 15 18	1.7	18 inch recovery.
		Gray fine (+) SAND and SILT, trace Clay			Straight drill to 65 ft bls.
65			4 16 12 18	0.0	24 inch recovery.
		Gray SILT, some fine Sand, trace Clay			Straight drill to 70 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-33D	**222302.27**	**2080210.99**
PROJECT NO./NAME		LOCATION
77101Y / MBA Manorhaven LLC		**Former Thypin Steel, Inc. Facility**
APPROVED BY	LOGGED BY	**Manorhaven, New York**
S. Glash	**M.Lanberg**	

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
70		Gray SILT, some fine Sand, trace Clay *(continued)*	7 9 15 18	0.0	24 inch recovery.
		Gray SILT, little fine Sand, trace Clay			Straight drill to 75 ft bls.
75			5 7 11 12	0.0	18 inch recovery.
		Gray SILT, little fine Sand, trace Clay			Straight drill to 80 ft bls.
80			3 6 10 15	0.0	18 inch recovery.
		Gray SILT, little fine Sand, trace Clay			Straight drill to 85 ft bls.
85			3 5 8 12	0.0	24 inch recovery.
		Gray very compact SILT, little fine Sand, trace Clay			Straight drill to 90 ft bls.
90			4 6 8 8	0.0	24 inch recovery.
		Gray very compact SILT, little fine Sand, trace Clay			Straight drill to 95 ft bls.
95			5 9 14 18	0.0	24 inch recovery.
		Gray very compact SILT, little Sand, trace Clay			Straight drill to 100 ft bls.
100			6 8 12 12	0.0	24 inch recovery.
		Gray very compact SILT, little Sand, trace Clay			Straight drill to 105 ft bls.
105					

Bentonite Slurry

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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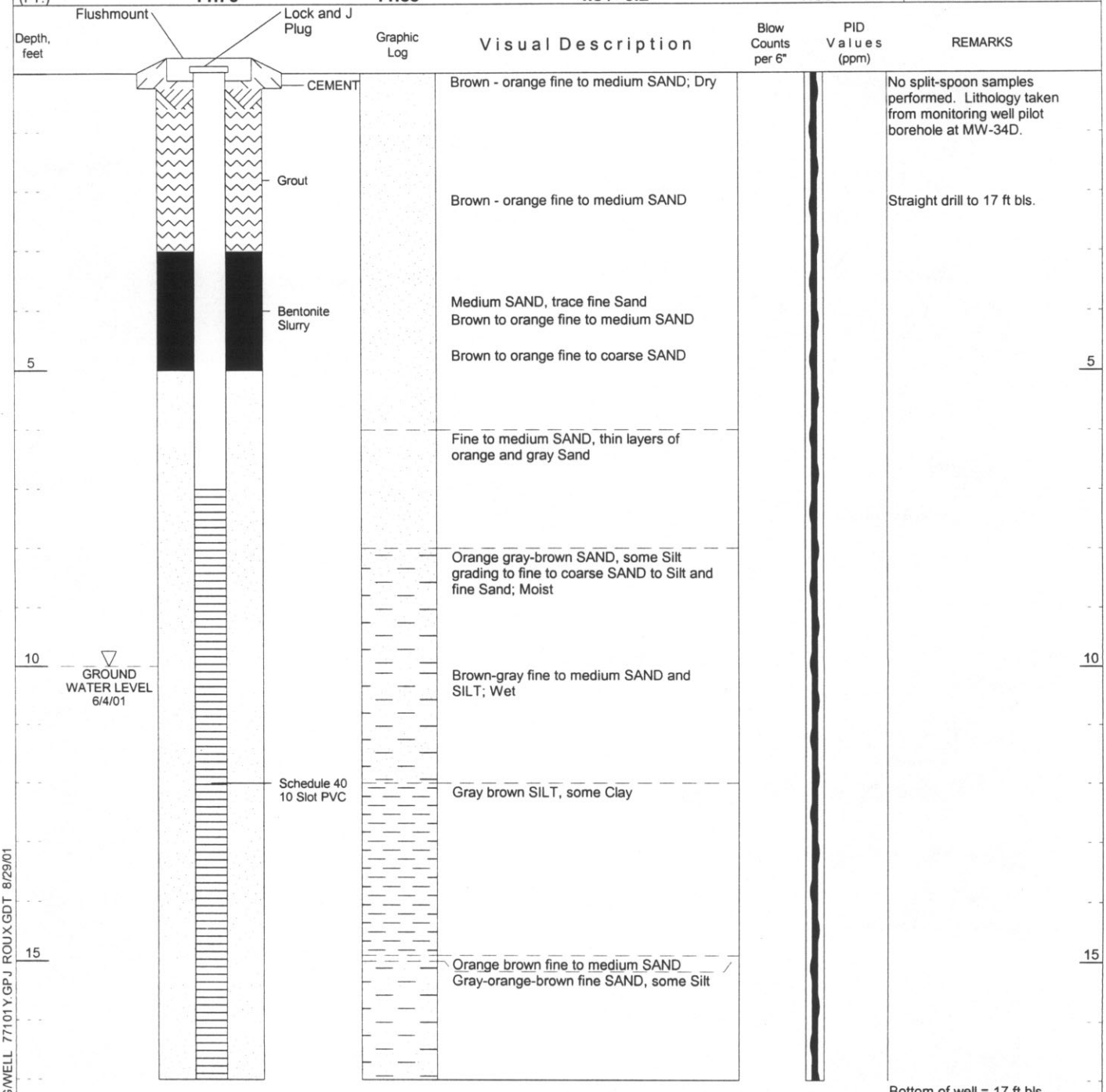
WELL CONSTRUCTION LOG

WELL NO.: **MW-34S**	NORTHING: **222112.45**	EASTING: **2080023.96**		
PROJECT NO./NAME: **77101Y / MBA Manorhaven LLC**		LOCATION: **Former Thypin Steel, Inc. Facility**		
APPROVED BY: **S. Glash**	LOGGED BY: **R. Fisler**	**Manorhaven, New York**		
DRILLING CONTRACTOR/DRILLER: **ADT Drilling / Jeremy Myers**		GEOGRAPHIC AREA		
DRILL BIT DIAMETER/TYPE: **4-in. / Auger**	BOREHOLE DIAMETER: **8-inches**	DRILLING EQUIPMENT/METHOD: **Mobile Drill B-61 / HSA**	SAMPLING METHOD: **2" Split Spoon**	START-FINISH DATE: **6/4/01-6/4/01**
CASING MAT./DIA.: **PVC / 2-inch**	SCREEN: TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **10.0**	DIA. **2-inch** SLOT SIZE **10-Slot**
ELEVATION OF: (FT.)	GROUND SURFACE: **11.76**	TOP OF WELL CASING: **11.53**	TOP & BOTTOM SCREEN: **4.8 / -5.2**	GW SURFACE: **1.53** GRAVEL PACK: **Morie #1**



BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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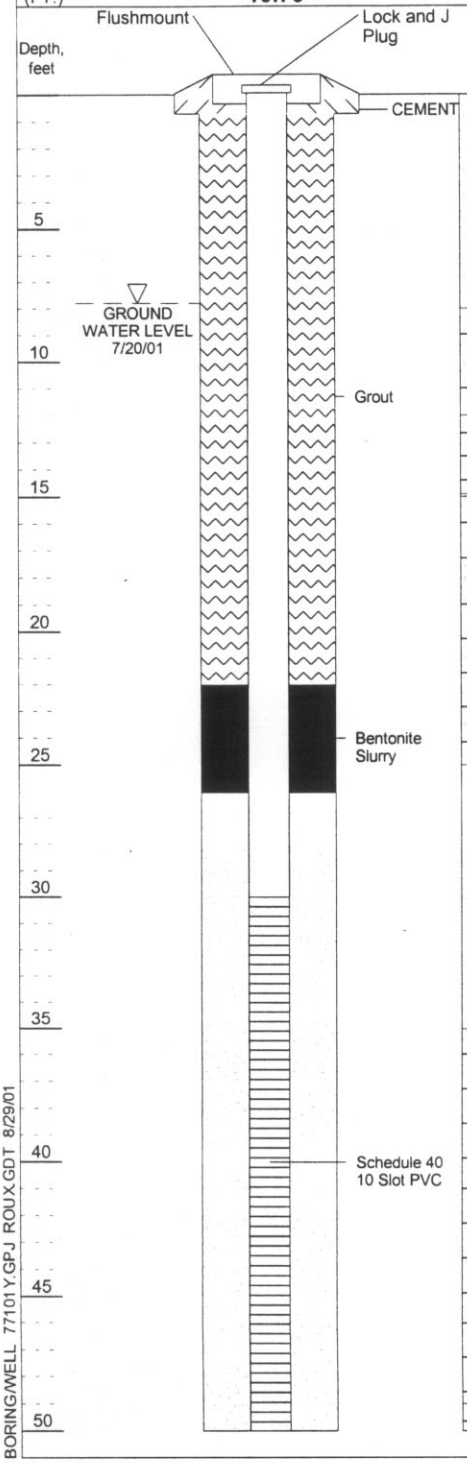
WELL CONSTRUCTION LOG

WELL NO.: **MW-34I**	NORTHING: **222126.06**	EASTING: **2080017.86**		
PROJECT NO./NAME: **77101Y / MBA Manorhaven LLC**		LOCATION: **Former Thypin Steel, Inc. Facility**		
APPROVED BY: **S. Glash**	LOGGED BY: **V. Glasser**	**Manorhaven, New York**		
DRILLING CONTRACTOR/DRILLER: **ADT Drilling / Lloyd Adams**		GEOGRAPHIC AREA		
DRILL BIT DIAMETER/TYPE: **4-in. / Auger**	BOREHOLE DIAMETER: **8-inches**	DRILLING EQUIPMENT/METHOD: **CME-75 / HSA**	SAMPLING METHOD: **2" Split Spoon**	START-FINISH DATE: **6/11/01-6/11/01**
CASING MAT./DIA.: **PVC / 2-inch**	SCREEN: TYPE **Slotted** MAT. **SCH 40 PVC** TOTAL LENGTH **20.0** DIA. **2-inch** SLOT SIZE **10-Slot**			
ELEVATION OF: (FT.)	GROUND SURFACE: **10.70**	TOP OF WELL CASING: **10.47**	TOP & BOTTOM SCREEN: **-19.3 / -39.3**	GW SURFACE: **2.68**	GRAVEL PACK: **Morie #1**



Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		Brown - orange fine to medium SAND; Dry			No split-spoon samples performed. Lithology taken from monitoring well pilot borehole at MW-34D. Straight drill to 50 ft bls.
5		Brown - orange fine to medium SAND Medium SAND, trace fine Sand Brown to orange fine to medium SAND Brown to orange fine to coarse SAND Fine to medium SAND, thin layers of orange and gray Sand			
10		Orange gray-brown SAND, some Silt grading to fine to coarse SAND to Silt and fine Sand; Moist Brown-gray fine to medium SAND and SILT; Wet			
15		Gray brown SILT, some Clay Orange brown fine to medium SAND Gray-orange-brown fine SAND, some Silt			
20		Gray-orange-brown fine SAND, some Silt grading to Silt, little Clay			
25		Brown-orange fine SAND, little Silt			
30		Brown-gray fine SAND, some Silt			
35		Orange-gray-brown fine SAND, little to some Silt			
40		Brown-orange-gray fine SAND, some Silt			
45		Brown-orange-gray fine SAND, some Silt			
50		Gray SILT			Bottom of well = 50 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-34D	**222134.72**	**2080013.92**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

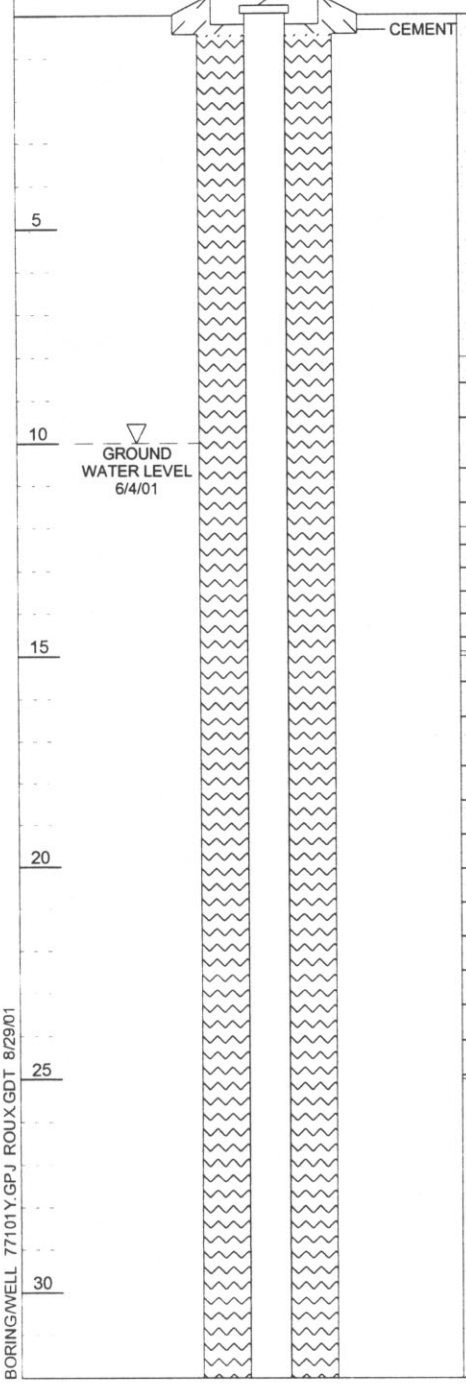
APPROVED BY	LOGGED BY	
S. Glash	**V. Glasser**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Sean Miller	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**6/4/01-6/5/01**

CASING MAT./DIA.	SCREEN:				
PVC / 2-inch	TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **20.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
(FT.)	**11.72**	**11.52**	**-93.3 / -113.3**	**1.52**	**Morie #1**



Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brown - orange fine to medium SAND; Dry	4 3 6 6	0.0	12 inch recovery.
		Brown - orange fine to medium SAND	4 3 3 3	0.0	12 inch recovery.
5		Medium SAND, trace fine Sand Brown to orange fine to medium SAND Brown to orange fine to coarse SAND	7 8 9 7	0.0	14 inch recovery.
		Fine to medium SAND, thin layers of orange and gray Sand	7 8 9 7	0.0	12 inch recovery.
		Orange grey-brown SAND, some Silt grading to Silt, fine to coarse SAND to Silt and fine Sand; Moist	4 7 5 6	0.0	15 inch recovery.
10		Brown-gray fine to medium SAND and SILT; Wet	6 7 7 9	0.0	
		Gray-brown SILT, some Clay			Straight drill to 13 ft bls.
			5 2 3 0	0.0	17 inch recovery.
15		Orange brown fine to medium SAND Gray-orange-brown fine SAND, some Silt	5 7 10 14	0.0	17 inch recovery.
		Gray-orange-brown fine SAND, grading to Silt, little Clay			Straight drill to 23 ft bls.
20					
			5 7 9 14	0.0	17 inch recovery.
25		Brown-orange fine SAND, little Silt			Straight drill to 28 ft bls.
			9 12 15 19	0.0	24 inch recovery.
30		Brown-gray fine SAND, some Silt			Straight drill to 33 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-34D	**222134.72**	**2080013.92**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**V. Glasser**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brown-gray fine SAND, some Silt *(continued)*	4 6 9 12	0.0	6 inch recovery.
35		Orange-gray-brown fine SAND, little to some Silt			Straight drill to 38 ft bls. 35
			5 9 4 7	0.0	24 inch recovery.
40		Brown-orange-gray fine SAND, some Silt			Straight drill to 43 ft bls. 40
			12 22 17 25	15.2	
45		Brown-orange-gray fine SAND, some Silt			Straight drill to 48 ft bls. 45
			10 19 20 31	15.0	24 inch recovery.
50	Grout	Gray SILT Gray SILT, trace Clay			Straight drill to 53 ft bls. 50
			7 9 15 18	0.0	17 inch recovery.
55		Gray SILT, trace Clay			Straight drill to 58 ft bls. 55
			9 16 12 23	0.0	14 inch recovery.
60		Gray SILT, trace Clay			Straight drill to 63 ft bls. 60
			10 13 18 21	0.0	12 inch recovery.
65		Gray SILT, trace Clay			Straight drill to 68 ft bls. 65
			9		

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-34D	**222134.72**	**2080013.92**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**V. Glasser**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
70		Gray SILT, trace Clay *(continued)*	15 20 20	0.0	17 inch recovery.
		Gray SILT, little Clay			Straight drill to 73 ft bls.
			9 7 12 13	0.0	20 inch recovery.
75		Gray SILT, little Clay			Straight drill to 78 ft bls.
			9 12 16 16	0.0	17 inch recovery.
80		Gray SILT, little Clay			Straight drill to 83 ft bls.
			19 22 33 38	0.0	17 inch recovery.
85		Gray SILT, little Clay			Straight drill to 88 ft bls.
			12 26 24 31	0.0	24 inch recovery.
90		Gray SILT, little Clay			Straight drill to 93 ft bls.
			14 21 27 19	0.0	24 inch recovery.
95		Gray SILT, little Clay			Straight drill to 98 ft bls.
			18 18 25 28	0.0	24 inch recovery.
100	Bentonite Slurry	SILT, trace Clay			Straight drill to 103 ft bls.
			7 4 12 13	0.0	14 inch recovery.
105					

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-34D	**222134.72**	**2080013.92**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**V. Glasser**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
		SILT, trace Clay *(continued)*			Straight drill to 108 ft bls.
			9 13 14	0.0	14 inch recovery.
110			10		110
		SILT, trace Clay			Straight drill to 113 ft bls.
			10 13 16	0.0	14 inch recovery.
115			31		115
	Schedule 40 10 Slot PVC	SILT, trace Clay			Straight drill to 118 ft bls.
			17 15 19	0.0	14 inch recovery.
120			30		120
		SILT, trace Clay			Straight drill to 123 ft bls.
			21 19 32	0.0	14 inch recovery.
125			43		125
					Bottom of well = 125 ft bls.

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-35S	**222219.29**	**2080146.76**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

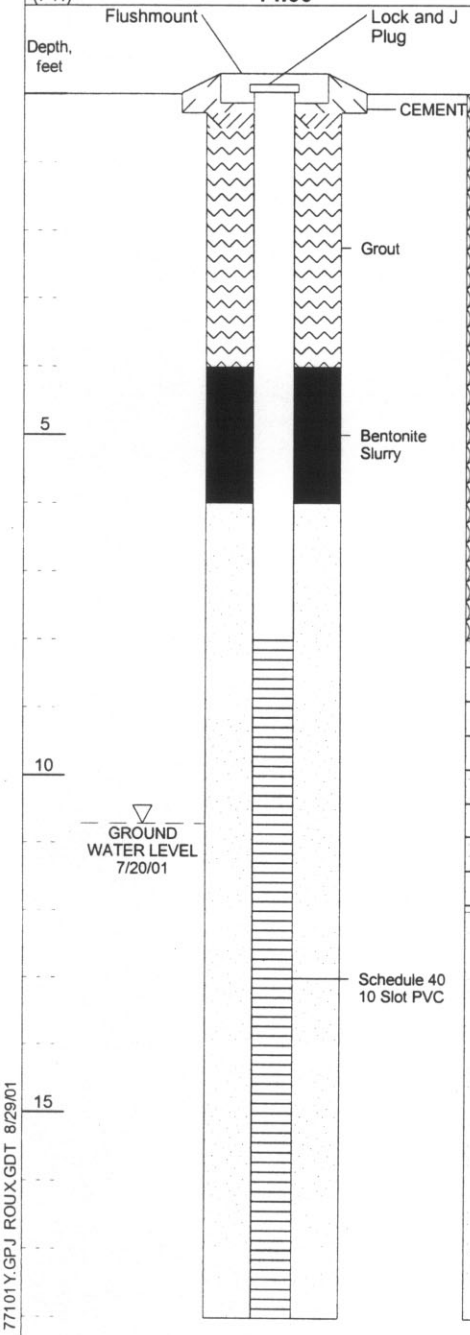
APPROVED BY	LOGGED BY	
S. Glash	**R. Fisler**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Jeremy Myers	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**6/4/01-6/4/01**

CASING MAT./DIA.	SCREEN:				
PVC / 2-inch	TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **10.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
(FT.)	**14.00**	**13.69**	**6.0 / -4.0**	**2.98**	**Morie #1**



Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Light brown SAND, some Silt, trace fine Gravel (Fill)			No split spoon samples performed. Lithology derived from monitoring well pilot borehole at MW-35D.
		Light brown SAND, some Silt, trace fine Gravel (Fill)			Straight drill to 18 ft bls.
		Light brown SAND, some Silt, trace fine Gravel and Wood (Fill)			
5		Light brown fine SAND, some Silt, trace fine Gravel and tar-like substance (Fill)			5
		Light brown fine SAND, some Silt, trace fine Gravel; Moist			
10		Light brown fine SAND, some Silt, trace fine Gravel; Wet			10
		Gray-brown fine to medium SAND, trace Silt			
15		Gray-brown fine to medium SAND, trace Silt			15
					Bottom of well = 18 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-35I	**222232.82**	**2080142.71**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

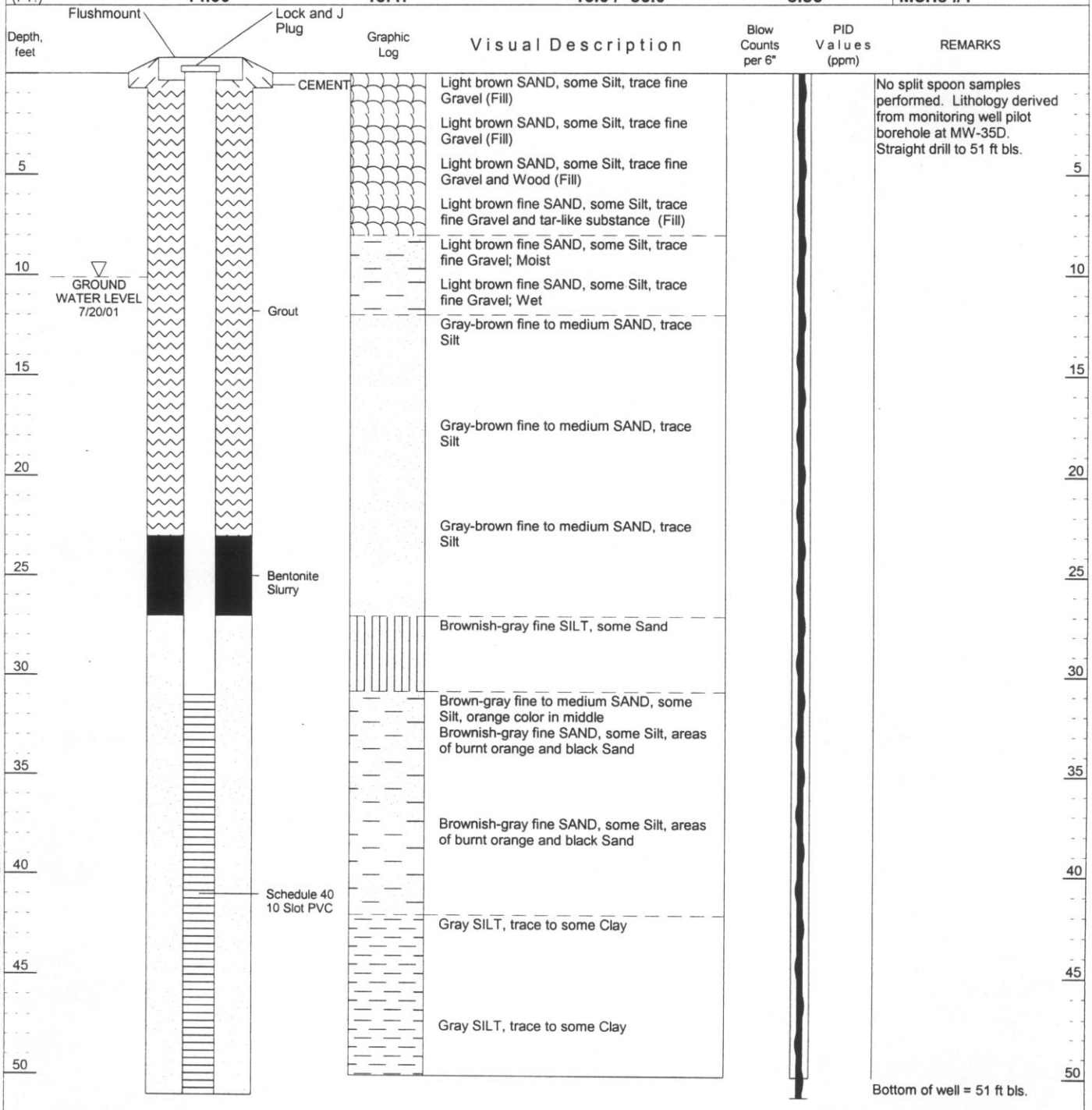
APPROVED BY	LOGGED BY	
S. Glash	**V. Glasser**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Lloyd Adams	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**CME-75 / HSA**	**2" Split Spoon**	**6/12/01-6/13/01**

CASING MAT./DIA.	SCREEN:				
PVC / 2-inch	TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **20.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**

ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
	14.00	**13.47**	**-16.0 / -36.0**	**3.35**	**Morie #1**



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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-35D	**222242.07**	**2080133.85**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

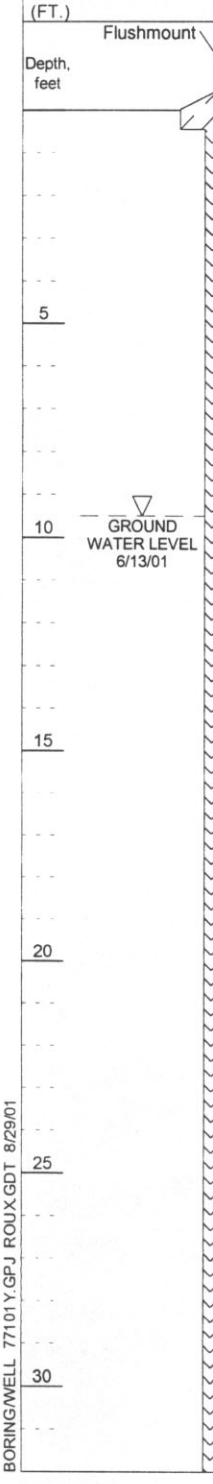
APPROVED BY	LOGGED BY	
S. Glash	**V. Glasser**	**Manorhaven, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
ADT Drilling / Lloyd Adams	

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4-in. / Auger	**8-inches**	**Mobile Drill B-61 / HSA**	**2" Split Spoon**	**6/13/01-6/14/01**

CASING MAT./DIA.	SCREEN:				
PVC / 2-inch	TYPE **Slotted**	MAT. **SCH 40 PVC**	TOTAL LENGTH **20.0**	DIA. **2-inch**	SLOT SIZE **10-Slot**

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
(FT.)	**13.73**	**13.56**	**-91.3 / -111.3**	**4.06**	**Morie #1**



Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Light brown SAND, some Silt, trace fine Gravel (Fill)	2 2 2 2	0.0	8 inch recovery.
		Light brown SAND, some Silt, trace fine Gravel (Fill)	1 2 1 2	0.0	8 inch recovery.
5		Light brown SAND, some Silt, trace fine Gravel and Wood (Fill)	1 2 1 1	0.0	6 inch recovery.
		Light brown fine SAND, some Silt, trace fine Gravel and tar-like substance (Fill)	1 1 1 1	0.0	18 inch recovery.
		Light brown fine SAND, some Silt, trace fine Gravel; Moist	1 2 2 1	0.0	7 inch recovery.
10		Light brown fine SAND, some Silt, trace fine Gravel; Wet	3 3 2 3	0.0	15 inch recovery.
		Gray-brown fine to medium SAND, trace Silt			Straight drill to 15 ft bls.
15			7 7 9 11	0.0	24 inch recovery.
		Gray-brown fine to medium SAND, trace Silt			Straight drill to 20 ft bls.
20			8 8 10 13	0.0	17 inch recovery.
		Gray-brown fine to medium SAND, trace Silt			Straight drill to 25 ft bls.
25			8 7 7 11	0.0	12 inch recovery.
		Brownish-gray fine SILT, some Sand			Straight drill to 30 ft bls.
30		Brown-gray fine to medium SAND, some Silt, orange color in middle	10 12 12 15	0.0	24 inch recovery.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

1377 Motor Parkway
Islandia, New York 11749
Telephone: 631-232-2600
Fax: 631-232-9898

WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-35D	**222242.07**	**2080133.85**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**
APPROVED BY: **S. Glash** / LOGGED BY: **V. Glasser**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brownish-gray fine SAND, some Silt, areas of burnt orange and black Sand			Straight drill to 35 ft bls.
35			6 6 7 5	0.0	16 inch recovery.
		Brownish-gray fine SAND, some Silt, areas of burnt orange and black Sand			Straight drill to 40 ft bls.
40			6 5 7 6	14.2	24 inch recovery.
		Gray SILT, trace to some Clay			Straight drill to 45 ft bls.
45			3 3 3 4	2.3	15 inch recovery.
		Gray SILT, trace to some Clay			Straight drill to 50 ft bls.
	Grout				
50			6 7 6 7	0.0	12 inch recovery.
		Gray SILT, trace Clay, banding noted			Straight drill to 55 ft bls.
55			12 14 19 20	0.4	12 inch recovery.
		SILT, trace to little Clay			Straight drill to 60 ft bls.
60			15 18 20 17	0.0	12 inch recovery.
		Gray SILT, some fine Sand, trace Clay			Straight drill to 65 ft bls.
65			5 6 8 12	0.0	18 inch recovery.
		Gray SILT, some fine Sand, trace Clay			Straight drill to 70 ft bls.

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-35D	**222242.07**	**2080133.85**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**V. Glasser**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
70		Gray SILT, some fine Sand, trace Clay *(continued)*			
			5 8 6 7	0.0	19 inch recovery.
		Gray SILT, some fine Sand, trace to little Clay			Straight drill to 75 ft bls.
75			3 5 7 8	0.0	11 inch recovery.
		Gray SILT, some fine Sand, trace Clay			Straight drill to 80 ft bls.
80			5 3 5 7	0.0	17 inch recovery.
		Gray SILT, some fine Sand, trace Clay			Straight drill to 85 ft bls.
85			5 8 7 10	0.0	18 inch recovery.
		Gray SILT, some fine Sand, trace Clay			Straight drill to 90 ft bls.
90			6 14 12 13	0.0	18 inch recovery.
		Gray SILT, some fine Sand, trace Clay			Straight drill to 95 ft bls.
95			7 9 11 13	0.0	24 inch recovery.
		SILT, little to some Clay SILT, some Clay			Straight drill to 100 ft bls.
		Bentonite Slurry			
100		Gray SILT, some Clay and fine Sand	4 7 8 11	0.0	
		Gray SILT, some Clay and fine Sand			Straight drill to 105 ft bls.
105					

BORING/WELL 77101Y.GPJ ROUX.GDT 8/29/01

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
MW-35D	**222242.07**	**2080133.85**

PROJECT NO./NAME	LOCATION
77101Y / MBA Manorhaven LLC	**Former Thypin Steel, Inc. Facility**

APPROVED BY	LOGGED BY	
S. Glash	**V. Glasser**	**Manorhaven, New York**

Depth, feet	Graphic Log	Visual Description (continued)	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Gray SILT, some Clay and fine Sand *(continued)*	5 8 8 8	0.0	
		Gray SILT, little Clay and fine Sand			Straight drill to 110 ft bls.
110			7 10 12 13	0.0	110
		Gray SILT, little Clay and fine Sand			Straight drill to 105 ft bls.
115	Schedule40 10 Slot PVC		6 10 11 11	0.0	115 12 inch recovery.
		Gray SILT, little Clay and fine Sand			Straight drill to 120 ft bls.
120			8 7 9 11	0.0	120 14 inch recovery.
					Straight drill to 125 ft bls.
125					125 Bottom of well = 125 ft bls.

APPENDIX E

Surveyor's Report

Well Locations Thypin Steel, Manorhaven, N.Y.
NAD27 State Plane Coordinates
NGVD 1929 Elevations

Prepared by:
Sidney B. Bowne Son
Prepared for:
Roux Associates

Northing	Easting	Elevation	Description	Date
222,259.19	2,080,686.79	13.11	GW 01	6/9/99
222,450.82	2,080,620.73	13.18	GW 02	6/9/99
222,723.97	2,080,504.51	14.59	GW 03	6/9/99
222,026.65	2,080,062.76	12.82	GW 04	6/9/99
222,197.79	2,079,971.15	12.29	GW 05	6/9/99
222,378.42	2,079,871.75	13.97	GW 06	6/9/99
222,232.39	2,080,145.64	14.28	GW 07	6/9/99
222,325.15	2,080,119.95	14.67	GW 08	6/9/99
222,299.20	2,080,273.29	14.40	GW 09	6/9/99
222,343.35	2,080,200.01	14.05	GW 10	6/9/99
222,396.94	2,080,215.53	15.06	GW 11	6/9/99
222,592.45	2,080,512.27	14.74	MW 01	6/9/99
222,322.20	2,079,999.18	15.66	MW 03	6/9/99
222,261.34	2,080,634.56	12.66	MW 21	11/27/00
222,260.56	2,080,634.18	13.10	MW 21 GROUND	11/27/00
222,706.26	2,080,272.48	14.92	MW 22	11/27/00
222,705.53	2,080,271.86	14.97	MW 22 GROUND	11/27/00
222,188.74	2,080,252.80	14.60	MW 24	11/27/00
222,187.84	2,080,252.76	14.83	MW 24 GROUND	11/27/00
222,343.24	2,079,964.79	13.67	MW 25	11/27/00
222,342.11	2,079,964.81	14.04	MW 25 GROUND	11/27/00
222,403.43	2,080,469.97	13.45	MW 27	11/27/00
222,402.57	2,080,469.01	13.54	MW 27 GROUND	11/27/00
222,385.38	2,080,434.58	14.02	MW 28	11/27/00
222,384.20	2,080,434.26	14.02	MW 28 GROUND	11/27/00
222,490.19	2,080,887.74	13.16	SB 01	2/22/01
222,330.34	2,080,213.69	13.48	SB 07	11/27/00
222,373.43	2,079,948.72	12.41	SB 12	11/27/00
222,400.39	2,080,598.07	13.03	SB 23	11/27/00
222,083.63	2,080,326.16	12.89	SB 24	11/27/00
222,064.76	2,080,166.29	13.75	SB 31	5/3/01
222,071.59	2,080,177.27	13.97	SB 31	2/22/01
222,149.67	2,080,159.57	14.41	SB 32	2/22/01
222,151.26	2,080,167.43	14.35	SB 32	5/3/01
222,231.00	2,080,139.91	14.48	SB 33	2/22/01
222,233.55	2,080,144.76	14.49	SB 33	5/3/01
222,305.23	2,080,136.65	14.36	SB 34	2/22/01
222,428.85	2,080,132.88	15.00	SB 35	5/4/01
222,469.29	2,080,171.38	15.50	SB 36	5/4/01
222,460.21	2,080,193.35	15.57	SB 36	2/22/01
222,543.25	2,080,121.27	15.84	SB 37	5/4/01
222,627.41	2,080,139.11	15.70	SB 38	2/22/01
222,628.54	2,080,142.85	15.41	SB 38	5/4/01
222,351.37	2,080,277.14	14.76	SB 39	2/22/01
222,375.54	2,080,288.19	14.75	SB 39	5/3/01
222,330.17	2,080,212.53	14.58	SB 40	2/22/01

Well Locations Thypin Steel, Manorhaven, N.Y.
NAD27 State Plane Coordinates
NGVD 1929 Elevations

Prepared by:
Sidney B. Bowne Son
Prepared for:
Roux Associates

Northing	Easting	Elevation	Description	Date
222,291.11	2,080,216.03	14.21	SB 40	5/3/01
222,258.59	2,080,331.99	14.92	SB 41	5/3/01
222,247.20	2,080,241.66	14.84	SB 42	5/3/01
222,193.19	2,080,370.37	14.48	SB 43	5/3/01
222,122.11	2,080,407.71	13.44	SB 44	5/3/01
222,088.01	2,080,329.09	13.37	SB 45	5/3/01
222,031.95	2,080,204.85	13.39	SB 46	5/3/01
222,450.20	2,080,438.95	13.17	SB 47	5/3/01
222,394.69	2,080,451.80	13.57	SB 48	2/22/01
222,341.54	2,080,479.20	13.47	SB 49	5/3/01
222,371.33	2,080,589.46	13.01	SB 50	5/3/01
222,103.72	2,080,061.53	12.92	SB 51	5/3/01
222,443.76	2,080,060.92	14.83	SB 53	5/3/01
222,401.79	2,080,091.76	15.55	SB 54	5/3/01
222,370.16	2,080,142.08	16.34	SB 55	5/3/01
222,413.38	2,080,174.36	14.84	SB 56	5/4/01
222,156.59	2,080,443.10	13.41	SB 57	5/3/01
222,067.62	2,080,086.94	13.31	SB 58	5/3/01
222,213.17	2,080,026.91	12.87	SB 59	5/3/01
222,298.59	2,080,395.47	14.71	SB 60	5/3/01
222,471.45	2,080,342.23	15.16	SB 61	5/3/01
222,449.40	2,080,534.59	13.09	SB 62	5/3/01
222,544.88	2,080,328.65	15.15	SB 63	5/3/01
221,959.56	2,080,110.00	11.94	SB 64	5/3/01
222,179.81	2,080,233.86	14.55	SB 66	5/3/01
222,187.46	2,080,603.73	13.05	SB 67	5/3/01
222,316.03	2,080,434.19	14.81	SB 68	5/3/01
222,434.54	2,080,603.22	13.43	SB 69	5/3/01
222,507.59	2,080,417.41	13.56	SB 70	5/3/01
222,650.15	2,080,198.70	15.58	SB 71	5/3/01
222,646.03	2,080,213.40	15.48	SB 72	5/3/01
222,305.29	2,079,997.67	14.48	SB 73	5/3/01
222,434.32	2,080,466.92	13.48	SB 74	5/3/01
222,412.63	2,080,485.61	13.33	SB 75	5/3/01
222,371.36	2,080,490.93	13.01	SB 76	5/3/01
222,706.70	2,080,482.36	15.13	SB LINE 25	11/27/00
222,605.34	2,080,510.21	13.76	SB LINE 25	11/27/00
222,514.94	2,080,551.48	13.28	SB LINE 25	11/27/00
222,418.94	2,080,590.83	13.05	SB LINE 25	11/27/00
222,328.77	2,080,626.14	12.56	SB LINE 25	11/27/00
222,237.30	2,080,665.33	12.59	SB LINE 25	11/27/00
222,665.22	2,080,395.93	14.50	SB LINE 26	11/27/00
222,571.77	2,080,429.78	13.96	SB LINE 26	11/27/00
222,477.58	2,080,463.65	13.33	SB LINE 26	11/27/00
222,385.35	2,080,497.87	12.95	SB LINE 26	11/27/00
222,295.98	2,080,536.28	13.14	SB LINE 26	11/27/00
222,201.24	2,080,572.42	13.06	SB LINE 26	11/27/00

Well Locations Thypin Steel, Manorhaven, N.Y.
NAD27 State Plane Coordinates
NGVD 1929 Elevations

Prepared by:
Sidney B. Bowne Son
Prepared for:
Roux Associates

Northing	Easting	Elevation	Description	Date
222,629.44	2,080,302.18	15.66	SB LINE 27	11/27/00
222,544.23	2,080,332.13	14.97	SB LINE 27	11/27/00
222,444.21	2,080,368.33	14.11	SB LINE 27	11/27/00
222,351.53	2,080,404.53	14.46	SB LINE 27	11/27/00
222,260.70	2,080,443.85	14.54	SB LINE 27	11/27/00
222,163.33	2,080,478.76	13.38	SB LINE 27	11/27/00
222,590.86	2,080,208.45	16.16	SB LINE 28	11/27/00
222,492.70	2,080,243.71	15.72	SB LINE 28	11/27/00
222,408.06	2,080,273.57	15.08	SB LINE 28	11/27/00
222,314.03	2,080,312.53	14.89	SB LINE 28	11/27/00
222,221.98	2,080,352.44	14.80	SB LINE 28	11/27/00
222,127.59	2,080,387.50	13.46	SB LINE 28	11/27/00
222,558.77	2,080,114.51	15.90	SB LINE 29	11/27/00
222,464.22	2,080,148.64	15.34	SB LINE 29	11/27/00
222,371.04	2,080,184.59	14.62	SB LINE 29	11/27/00
222,274.66	2,080,217.72	14.21	SB LINE 29	11/27/00
222,181.45	2,080,254.42	14.54	SB LINE 29	11/27/00
222,524.68	2,080,017.72	15.20	SB LINE 30	11/27/00
222,429.81	2,080,051.80	14.71	SB LINE 30	11/27/00
222,339.46	2,080,087.68	15.39	SB LINE 30	11/27/00
222,242.65	2,080,126.47	14.24	SB LINE 30	11/27/00
222,150.00	2,080,159.77	14.35	SB LINE 30	11/27/00
222,057.99	2,080,197.98	13.41	SB LINE 30	11/27/00
222,091.68	2,080,294.71	13.41	SB LINE29	11/27/00
222,123.84	2,080,390.87	13.92	TB 13	5/3/01
222,468.70	2,080,358.39	14.47	TB 14	5/3/01
222,627.96	2,080,361.22	14.66	TB 17	5/3/01
222,556.79	2,080,379.46	14.14	TB 18	5/3/01
222,637.41	2,080,170.68	15.95	TB 19	5/3/01
222,371.43	2,080,486.52	13.09	TB 21	5/3/01
222,590.12	2,080,318.71	15.14	TB 22	5/3/01
222,431.35	2,080,449.95	13.20	TB 23	5/3/01
222,186.26	2,080,213.57	14.77	TB 25	5/3/01
222,588.26	2,080,107.36	15.83	TB 26	5/4/01
222,457.90	2,080,171.76	15.40	TB 27	5/4/01
222,290.69	2,080,007.29	14.40	TB 29	5/3/01
222,572.17	2,080,145.66	15.85	TB 30	5/4/01
222,598.57	2,080,034.80	15.54	TB 31	5/4/01
222,133.36	2,080,365.08	13.25	WELL 02 Deep Depth Casing	6/28/01
222,133.43	2,080,365.15	13.45	WELL 02 Deep Depth Cover	6/28/01
222,128.86	2,080,365.89	13.52	WELL 02 Intermediate Depth Casing	6/28/01
222,128.96	2,080,365.97	13.89	WELL 02 Intermediate Depth Cover	6/28/01
222,112.69	2,080,371.09	14.24	WELL 02 Shallow Depth Casing	6/28/01
222,112.56	2,080,371.12	13.4	WELL 02 Shallow Depth Ground (No Cover)	6/28/01
222,048.88	2,080,224.79	12.65	WELL 03 Intermediate Depth Casing	6/28/01

Well Locations Thypin Steel, Manorhaven, N.Y.
NAD27 State Plane Coordinates
NGVD 1929 Elevations

Prepared by:
Sidney B. Bowne Son
Prepared for:
Roux Associates

Northing	Easting	Elevation	Description	Date
222,048.77	2,080,224.77	12.84	WELL 03 Intermediate Depth Cover	6/28/01
222,038.50	2,080,228.31	12.64	WELL 03 Shallow Depth Casing	6/28/01
222,038.50	2,080,228.41	12.78	WELL 03 Shallow Depth Cover	6/28/01
222,504.65	2,080,151.94	14.66	WELL 23 Intermediate Depth Casing	6/28/01
222,504.59	2,080,151.93	15.20	WELL 23 Intermediate Depth Cover	6/28/01
222,492.40	2,080,156.33	15.28	WELL 23 Shallow Depth Casing	6/28/01
222,492.42	2,080,156.40	15.84	WELL 23 Shallow Depth Cover	6/28/01
221,976.83	2,080,117.35	11.95	WELL 26 Deep Depth Casing	6/28/01
221,976.67	2,080,117.29	12.12	WELL 26 Deep Depth Cover	6/28/01
221,965.52	2,080,123.61	11.37	WELL 26 Intermediate Depth Casing	6/28/01
221,965.48	2,080,123.63	11.73	WELL 26 Intermediate Depth Cover	6/28/01
221,954.08	2,080,127.49	11.68	WELL 26 Shallow Depth Casing	6/28/01
221,953.95	2,080,127.43	12.16	WELL 26 Shallow Depth Cover	6/28/01
222,267.60	2,080,407.24	14.01	WELL 29 Deep Depth Casing	6/28/01
222,267.61	2,080,407.24	16.10	WELL 29 Deep Depth Cover	6/28/01
222,257.31	2,080,412.37	13.85	WELL 29 Intermediate Depth Casing	6/28/01
222,257.31	2,080,412.33	15.84	WELL 29 intermediate Depth Cover	6/28/01
222,245.73	2,080,416.16	13.78	WELL 29 Shallow Depth Casing	6/28/01
222,245.67	2,080,416.15	15.71	WELL 29 Shallow Depth Cover	6/28/01
222,269.59	2,080,329.96	14.45	WELL 31 Deep Depth Casing	6/28/01
222,269.43	2,080,330.01	14.68	WELL 31 Deep Depth Cover	6/28/01
222,264.70	2,080,330.53	14.63	WELL 31 Intermediate Depth Casing	6/28/01
222,264.57	2,080,330.52	15.3	WELL 31 Intermediate Depth Ground (No Cover)	6/28/01
222,248.82	2,080,335.23	14.23	WELL 31 Shallow Depth Casing	6/28/01
222,248.60	2,080,335.27	14.41	WELL 31 Shallow Depth Cover	6/28/01
222,566.20	2,080,325.32	16.55	WELL 32 Intermediate Depth Cover	6/28/01
222,566.24	2,080,325.19	14.19	WELL 32 Shallow Depth Casing	6/28/01
222,302.27	2,080,210.99	13.30	WELL 33 Deep Depth Casing	6/28/01
222,302.39	2,080,210.98	13.50	WELL 33 Deep Depth Cover	6/28/01
222,291.21	2,080,221.59	13.48	WELL 33 Intermediate Depth Casing	6/28/01
222,291.28	2,080,221.67	13.67	WELL 33 Intermediate Depth Cover	6/28/01
222,280.21	2,080,222.86	13.34	WELL 33 Shallow Depth Casing	6/28/01
222,280.15	2,080,222.98	13.46	WELL 33 Shallow Depth Cover	6/28/01
222,134.72	2,080,013.92	11.52	WELL 34 Deep Depth Casing	6/28/01
222,134.70	2,080,013.93	11.72	WELL 34 Deep Depth Cover	6/28/01
222,126.06	2,080,017.86	10.47	WELL 34 Intermediate Depth Casing	6/28/01
222,126.14	2,080,017.81	10.70	WELL 34 Intermediate Depth Cover	6/28/01
222,112.45	2,080,023.96	11.53	WELL 34 Shallow Depth Casing	6/28/01
222,112.44	2,080,024.03	11.76	WELL 34 Shallow Depth Cover	6/28/01
222,242.07	2,080,133.85	13.56	WELL 35 Deep Depth Casing	6/28/01
222,241.97	2,080,133.78	13.73	WELL 35 Deep Depth Cover	6/28/01
222,232.82	2,080,142.71	13.47	WELL 35 Intermediate Depth Casing	6/28/01
222,232.79	2,080,142.67	14.00	WELL 35 Intermediate Depth Cover	6/28/01
222,219.29	2,080,146.76	13.69	WELL 35 Shallow Depth Casing	6/28/01
222,219.19	2,080,146.82	14.00	WELL 35 Shallow Depth Cover	6/28/01

APPENDIX F

Geophysical Survey Report

ENVIROSCAN, INC.

Final Report
Geophysical Survey
Buried Pipe and Drain Detection/Delineation, and Lithology Mapping
11-Acre Former Industrial Site
Thypin Steel Facility
Manhasset Isle, NY
Enviroscan Reference Number 010112a

Prepared For: Roux Associates, Inc.
Prepared By: Enviroscan, Inc.
March 6, 2001

1051 Columbia Avenue • Lancaster, Pennsylvania 17603 • 717/396 8922 • Fax 717/396 8746 • email@enviroscan.com • www.enviroscan.com

ENVIROSCAN, INC.

March 6, 2001

Ms. Michelle Lanberg
Roux Associates, Inc.
1377 Motor Parkway
Suite 403
Islandia, NY 11788

RE: Geophysical Survey
Buried Pipe and Drain Detection/Delineation, and Lithology Mapping
11-Acre Former Industrial Site
Thypin Steel Facility
Manhasset Isle, NY
Enviroscan Reference Number 010112a

Dear Ms. Lanberg:

Pursuant to our proposal dated January 11, 2001, and proposal addendum dated January 19, 2001, Enviroscan, Inc. has completed a geophysical survey of the above-referenced site.

The purposes of the survey were to 1) determine whether there is evidence of buried metallic pipes, drains, or other metallic targets beneath the site; and 2) map the lithology beneath the site.

Background and Site Description

The site encompassed an open field approximately 11 acres in size, located at the southwest corner of the intersection of Yennicock Avenue and Sagamore Hill Road in the town of Manhasset Isle, NY (Figure 1).

According to the Geologic Map of New York (http://geology.about.com/science/geology/library/bl/maps/blnewyorkmap.htm, 1986), the site is underlain by glacial and alluvial sediments (till, gravel, sand and/or mud), Pleistocene to Recent in age. According to verbal information provided by the client, drilling activity prior to the onset of geophysical fieldwork revealed the presence of sand with scarce traces of clay to a depth of approximately 36 feet beneath the site. Additional verbal information provided by the client indicated the possibility of a depth to bedrock of up to 1000 feet, overlain by sand and possible clay layers.

Survey Methods

In order to accommodate the site conditions and survey purposes, Enviroscan completed a multi-technique geophysical survey of the Thypin Steel Facility site on February 6 and 7, 2001. Data acquisition and processing techniques are described below.

Metallic Target Mapping

In order to provide confident, cost-effective subsurface detection while minimizing interference from metallic debris, steel slag, and above ground structures, Enviroscan performed EM detection of metallic targets using an EM-61 metal detector manufactured by Geonics, Inc. The EM-61 uses a rectangular coil to transmit 150 electromagnetic pulses per second into the ground at each measurement station. A second transmitter coil is used to narrowly focus the pulses, making the instrument less sensitive to overhead and/or nearby sources of electromagnetic interference such as buildings, fences, power lines, surficial debris, and atmospheric electromagnetic activity. During the off-time between transmitted pulses, a receiver coil measures the decay of transient electrical currents induced by the transmitted pulses. Electrical currents in moderately conductive earth materials (e.g. damp clays, mineralized or oxidized soils, etc.) dissipate rapidly, leaving the more prolonged currents due to buried metallic objects. The EM-61 measures the surficial electrical potential due to the prolonged subsurface currents, providing a digital read-out of the relative metallic content of the subsurface. Note that the EM-61 focusing coil minimizes, but does not entirely eliminate, the response from near-surface metallic reinforcing or debris which would mask the presence of deeper metal from standard EM, magnetic, metal detector, or GPR instruments, and is therefore ideal for detecting underground metallic anomalies in developed areas containing sources of cultural interference (e.g. metallic debris, steel fences, buildings, vehicles, etc.).

The EM-61 is capable of detecting a single 55-gallon steel drum at a depth of 12 feet and more massive targets (e.g. USTs) to greater depths. Note that these detection depths are not affected by mineralized soils or ionic groundwater of the type which can severely limit ground penetrating radar (GPR) penetration.

The EM survey was completed by measuring the top and bottom coil responses (in millivolts or mV) along profiles spaced approximately 5 feet apart. Along each profile, measurement stations were defined by automatically triggering readings at one-second intervals, which were automatically digitally recorded using an Omnidata Polycorder. Based on the varying walking speed of the operator, this resulted in a station spacing along profiles of approximately 2 to 4 feet.

The actual location of each EM survey station was digitally recorded using a backpack-mounted Trimble Pathfinder global positioning system (GPS) receiver in contact with six to eight position-fixing satellites. The GPS positions were differentially corrected using data from a continuously operating community base station in Trenton, NJ. The resulting differential GPS (DGPS) positions have a nominal accuracy of better than 2 feet (+/-). The EM stations are depicted as black crosses in Figure 1. Please note that every fourth survey station is shown for clarity.

The EM-61 data were contoured using the statistical kriging routine in SURFER for WINDOWS by Golden Software. The filtered differential response data contours are depicted in Figure 2.

Lithology Mapping

In order map the lithology beneath the site, Enviroscan completed seismic refraction and reflection profiling of the Thypin Steel Facility site. Seismic data suitable for shallow refraction processing (as described in Appendix A) and deeper reflection processing (as described in Appendix B) were collected by recording 1000 milliseconds (msec) of ground motion at overlapping 24-channel spreads of geophones from shotpoints located at the midpoint between each successive pair of geophones. The elevations of geophone locations were surveyed using a rod and optical level, in order to correct for elevation differences during the processing sequence.

Seismic Refraction

Processing and interpretation of the seismic data were completed by first performing a shallow refraction interpretation using the SIP package of computer programs developed for the U.S. Geological Survey by Rimrock Geophysical. The first step in a complete seismic reflection processing sequence is an accurate refraction interpretation, which is presented in Figures 3-1 and 3-2.

The refraction processing sequence was as follows: First arrival times or first breaks were selected on the waveform data using the automatic picking routine SIPIK (with occasional minor manual adjustment) to ensure consistent and objective picking. From the first arrival times and geophone locations, T-X graphs (see Appendix A) were compiled for each line using the routine SIPIN. In general, the T-X data roughly defined two linear segments consistent with a two-layer shallow stratigraphy (presumed to consist of dry sandy soils underlain by saturated, similar material). Inversion of the T-X data using the iterative ray tracing routine SIPT2 yielded the statistically best-fitting refractor or layer boundary depths and layer velocities (averaged by spread for each layer) depicted in Figure 3.

The best-fitting two-layer seismic models for each profile are shown in Figures 3-1 and 3-2. In the Figures, the vertical scale represents relative elevation in feet, referenced to the Nassau County Datum (NGVD 29), and the horizontal scale is an along-profile distance (in feet). The refractor surfaces identified by the seismic survey are depicted with different line types. The ground surface or topography represents the top of Layer 1, with seismic velocity V_1, and Refractor 2 represents the top of Layer 2, with velocity V_2.

Seismic Reflection

In order to obtain information on materials at greater depths, the seismic data were also processed to provide a reflection interpretation (see Appendix B). The initial reflection processing which requires powerful and highly specialized computing resources was performed by Sterling Seismic Services, with interpretation by Enviroscan, Inc. The processing sequence and field (acquisition) and display parameters are given in Appendix C.

The processed seismic reflection profiles are depicted in Figures 4-1 and 4-2 as "wiggle trace" seismic profiles each with a vertical axis of two-way travel time, in msec, and a horizontal axis of along-profile distance, in feet. Overlain on these wiggle trace profiles is a series of lines representing Enviroscan's interpretation of possible stratigraphic surfaces indicated by the reflection data.

Location Control

The location of EM-61 and seismic survey stations were surveyed using a backpack-mounted Trimble Pathfinder global positioning system (GPS) receiver. The GPS data were differentially corrected in real time using data from a fixed-position U.S. Coast Guard beacon to provide differential GPS (DGPS) positioning with an accuracy of less than two feet. Elevations were surveyed using a rod and optical level, and were tied to points of known elevation. Topographic profiles along the seismic survey lines are depicted on the cross sections in Figure 3 as the uppermost black lines with superimposed geophone and shot point symbols. The shot point locations are depicted in Figures 1, 3, and 4 to facilitate comparison between the plan-view line traces and the cross-sections, respectively.

Survey Results

The results of the metallic target search, given as color contours in Figure 2, indicate the widespread presence of metal beneath the site. Areas of significant metallic response are indicated by purple to red contour intervals, and are highlighted by a solid black contour line.

The seismic refraction profiles for Lines 1000 through 4000 are depicted in Figures 3-1 and 3-2. The shot point locations of these profiles are displayed on Figures 1 and 3 to facilitate comparison. The vertical scale represents elevation, and the horizontal scale represents an along-profile distance (both in feet). On the cross-sections, the undulating lines represent the contacts between layers or refractors with approximately constant seismic velocities in feet per second (fps). Based on typical published seismic velocities (e.g. Redpath, 1973), the velocities of these layers appear to be consistent with the following materials:

Refractor 1, average velocity 850 fps: light, dry topsoil and dry, unconsolidated sand

Refractor 2, average velocity 5050 fps: saturated, unconsolidated sand.

The seismic reflection data and interpretation are shown in Figures 4-1 and 4-2. The vertical scale represents two-way travel time in msec, and the horizontal scale represents an along-profile distance in feet. Overlain on these Figures are the two-way travel times of Refractor 2, seen in Figures 3-1 and 3-2 (shown by a solid blue line). Along each profile, these correspond with a distinct reflection event, visible in each of the four seismic sections.

Other relatively continuous reflectors are apparent along each of the seismic lines, and are highlighted in yellow and orange (see Figures 4-1 and 4-2). Gaps in the interpretive lines indicate areas where the reflection event is faint or where there is excessive interference, inhibiting continuous interpretation. A third reflector is readily apparent along Lines 3000 and 4000 (see green line in Figure 4-2). The reflector appears deeper along the eastern ends of the profiles, rising to meet the earlier (orange) reflector near the center of both profiles, indicating the pinching-out of a stratigraphic layer. A dashed green line in the bottom panel of Figure 4-1 indicates the arrival times of the corresponding reflector along Line 1000, according to comparison of the profile with Lines 3000 and 4000 at their crossing locations.

A seismic reflection event represents a place where the density and/or elastic properties of subsurface materials change. Such a change could be indicative of variations in porosity, mineralogy, compaction, or grain size. The reflectors highlighted in Figure 4 represent the highest amplitude and most continuous events apparent in the seismic reflection data.

The combined results of the seismic refraction and reflection surveys are given in Figures 5-1 and 5-2. The vertical scale represents elevation and the horizontal scale represents an along-profile distance, both in feet. Depth estimations for the reflectors highlighted in Figure 4 were calculated according to average seismic velocities used in the processing of the seismic reflection data.

Limitations

The geophysical survey described above was completed using standard and/or routinely accepted practices of the geophysical industry and equipment representing the best available technology. Enviroscan does not accept responsibility for survey limitations due to inherent technological limitations or unforeseen site-specific conditions. However, we make every effort to identify and notify the client of such limitations or conditions.

We appreciate this opportunity to work with you. If you have any questions, please do not hesitate to contact me.

Sincerely,
Enviroscan, Inc.

Lisa J. Jacob, M.Sc.
Geophysics Project Manager

Technical Review By:
Enviroscan, Inc.

Felicia Kegel Bechtel, M.Sc., P.G.
President

enc: Figure 1: Geophysical Survey Data Coverage
Figure 2: EM-61 Filtered Differential Response Data Contours
Figure 3: Seismic Refraction Profiles
Figure 4: Seismic Reflection Data Interpretation
Figure 5: Seismic Survey Results Summary
Appendix A: Introduction to Seismic Refraction
Appendix B: Seismic Refraction vs. Seismic Reflection
Appendix C: Seismic Reflection Processing Sequence
References

Appendix A

Introduction to Seismic Refraction

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Introduction to Seismic Refraction

by

Timothy D. Bechtel, Ph.D., P.G.

Energy

Mechanical elastic (seismic) waves generated by a hammer blow, weight drop, or explosion.

Sensitivity

Primarily density contrasts; also contrasts in elastic moduli or properties.

Basic Equipment

Recording Seismograph (generally 12 or 24 channels); Geophones (one for each channel); Geophone cable; Hammer/weight and strike plate or explosives; Trigger switch.

Common Applications

Determination of the depth and dip of soil horizons and bedrock surfaces.

Principles

In a uniform isotropic earth, the shock wave from a blow or explosion at the surface travels downward in a hemispherical wave front like a three-dimensional ripple from a pebble in a still pond. At any point on the wave front, a straight line from the shock source to the wave front depicts the path of the seismic wave, and is called a ray path (see Figure S-1). In reality, there are several independent shock waves; the fast-moving primary compressional or P wave front; the slower moving shear or S wave; and several two-dimensional, circular wave fronts that travel only along the surface of the earth (called surface waves or ground roll). For the purposes of conventional seismic refraction, only the fastest moving wave front — the P wave — is considered.

In a layered earth, the hemispherical P shock wave defined by the radially distributed P ray

paths are deflected according to the laws of optics at interfaces between materials with differing seismic velocities (i.e. densities or elastic properties). Figure S-1 depicts the deflection of ray paths due to an increase in P velocity at a bedding plane. The type of deflection that a ray path will undergo is dependent upon the angle at which it strikes the interface, and falls into one of four categories:

1) The direct ray travels parallel to the ground surface at the seismic velocity of the upper layer, does not strike the underlying interface, and consequently is not deflected.

2) Reflected rays travel downward at the velocity of the upper layer and strike the interface at incident angles greater than the critical angle for total internal reflection. All of the energy of these rays is symmetrically reflected back towards the surface.

3) At a precise angle called the critical angle, the incident ray is refracted along the interface, and travels at the higher seismic velocity of the lower layer. As this refracted or head wave races along beneath the interface, it generates a secondary elastic disturbance that travels back to the surface along ray paths that define a wave front analogous to the bow wake of a ship. These returning rays again travel at the slower velocity of the upper layer.

4) Rays incident at less than the critical angle are refracted into the lower layer such that their path is bent away from an imaginary perpendicular to the interface. A portion of the energy of these rays is reflected symmetrically back towards the surface. The strength of the reflected portion is dependent upon the angle of incidence and the velocity contrast, with the strongest reflections produced for high velocity contrasts and perpendicular incidence.

To perform a refraction survey, a linear array of ground motion sensors or geophones is spaced out from the seismic source or shot point, forming a geophone spread. Each geophone is connected to a separate channel in a seismograph which records a wiggle trace representing the actual ground motion resulting from the passage of the various seismic rays. Although single channel seismographs are still occasionally employed, twelve or twenty four channel instruments are greatly preferred.

As depicted in the time-distance (T-X) curve in Figure S-2, the layered earth structure can be determined by analyzing the seismographic wiggle traces. At distances close to the seismic source, the first wiggle or ground motion (the first arrival after the shot) is due to passage of the direct wave travelling at the velocity of the upper layer. Reflected waves arrive later since they have by definition travelled a greater distance at the same velocity (additional later wiggles are caused by passage of the more slowly travelling S and surface waves). Beyond a distance dictated by the critical angle, the later arrivals also include the return ray from the head wave. These refracted rays from the head wave also by definition travel a greater distance than the direct wave. However, along part of their path, they have travelled at the higher velocity of the underlying more consolidated layer. At greater distances from the shot point, where the path length in the higher velocity layer becomes significant, the head wave arrivals actually race past the direct wave and become the first arrival. By extension, it can be shown that if a third layer with even greater velocity lies at greater depth, the head wave from this layer will become the first arrival at a sufficient distance from the shot point.

In conventional seismic refraction, only the first P wave arrivals can be reliably picked out on a wiggle trace record. The later reflected P wave arrivals are generally obscured by the slower-travelling S and surface waves, and the very slow air blast or sound wave from the shot. To interpret a seismic refraction record, the first arrival travel times are measured for each wiggle trace and plotted at the appropriate point on a time-distance (T-X) curve (see Figure S-2). In a plane-layered earth, these first arrivals define a series of line segments, each representing a discrete layer. The seismic velocity of each layer is simply the reciprocal of the slope of the associated line segment. The thickness of each layer can be calculated from the distances where the line segments intersect. The mathematics for these calculations are easily derived, and can be found in any introductory geophysics text.

True geologic strata are rarely perfectly horizontal. The effect of a dipping interface on a travel time curve cannot be recognized using a single shot point. Calculations based on a T-X curve from a single shot point should always be considered as producing apparent depths to interfaces and apparent seismic velocities for all but the uppermost layer. To determine the true depths and dips of interfaces and the true seismic velocities, it is necessary to reverse the seismic line; that is, move the shot point to a location at or beyond the farthest geophone in the spread, and repeat the shot. The calculation of true depths, dips and velocities from reversed seismic lines is also readily performed.

Capabilities

In favorable settings, seismic refraction lines can yield accurate measurements of depths and attitudes of soil horizons, distinct (as opposed to gradational) groundwater tables, and other relatively planar strata. The seismic velocities can often be related to relative or even absolute densities of layers.

Limitations

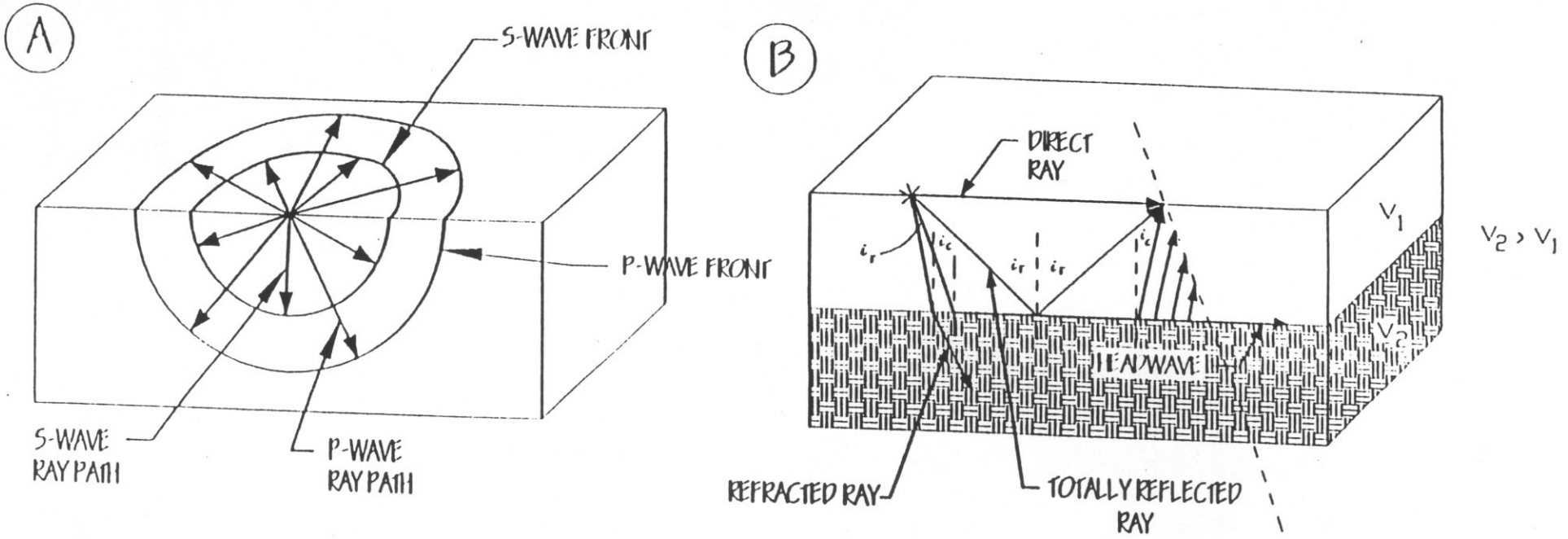
Seismic data is collected at spaced geophones, and therefore does not provide continuous profile data. If geophones are spaced too widely, thin layers can be missed entirely.

Refraction interpretations are only accurate where the velocity of strata increase with depth. Velocity inversions not only alter the data, but are particularly insidious since the presence of a low velocity zone at depth is not apparent in first arrival data.

Three dimensional structures or interface relief such as boulders, rock pinnacles or underground man-made structures produce scatter in the first arrivals about the theoretical straight line segments, making planar layer interpretations difficult. Some recent advances have been made in interpreting this scatter as additional data using mathematical inversion techniques, thereby producing refraction interpretations of undulating or irregular interfaces, but these techniques must be applied cautiously to avoid interpreting seismic noise as actual subsurface interface relief or structure.

Seismic records can contain noise due to machinery vibrations, traffic, and sometimes even wind or distant earthquakes. In general, when interpreting seismic refraction data in areas where relatively planar interfaces are expected, the correlation between a fitted straight line segment and the actual travel time data should be greater than 90 (or even 95) percent. Lower correlations should be cause for suspicion or even disposal of the data, particularly if near-surface interference is observed (i.e. railroad tracks, nearby foundations, heavy machinery, etc.)

FIGURE 5-1
RAY PATHS



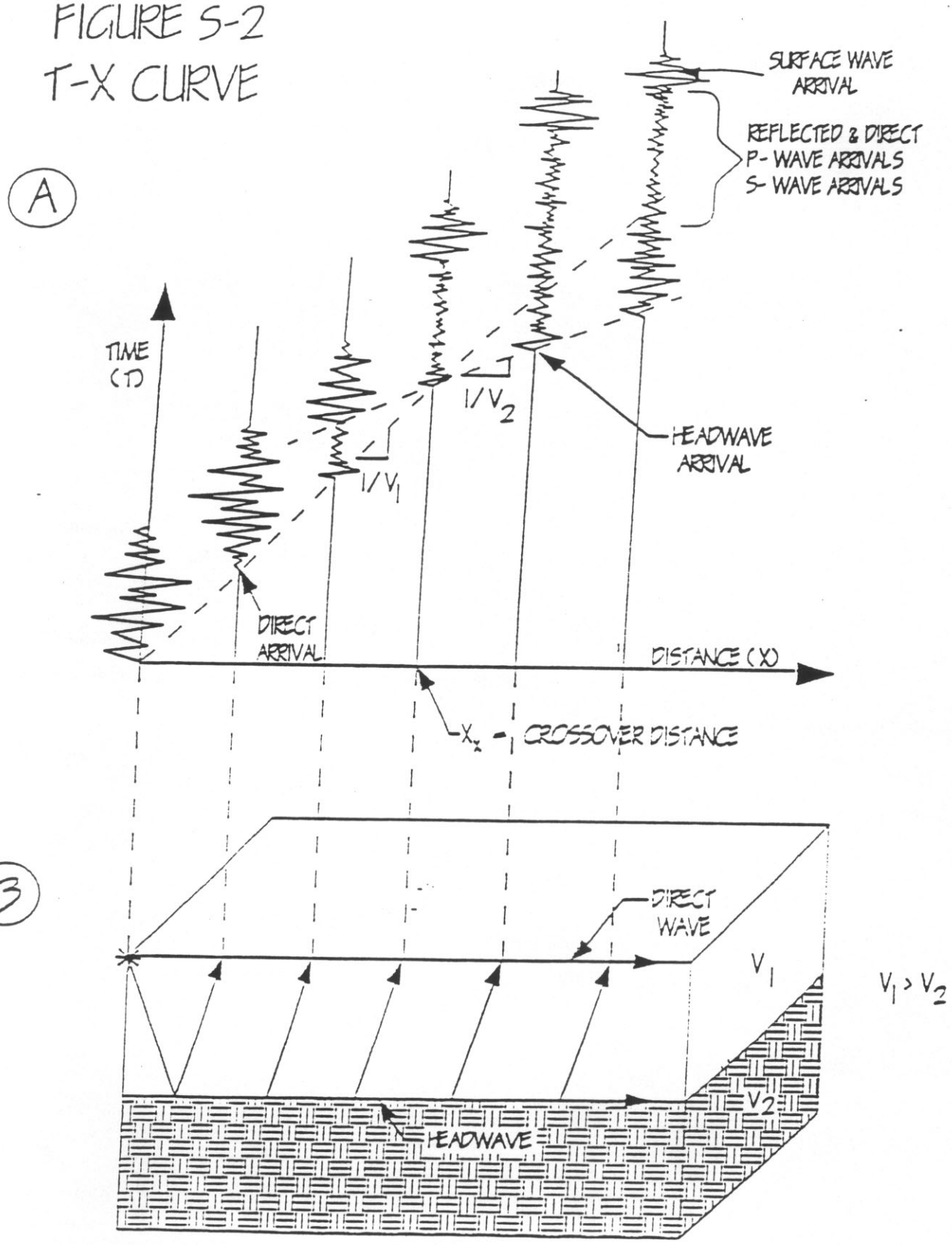
i_r - INCIDENCE ANGLE - REFLECTED ANGLE

i_c - CRITICAL ANGLE

Ray paths travel radially outward from a seismic source at the surface of a uniform isotropic earth. At any point in time, the end points of the ray paths define hemispherical P (primary or compressional) and S (shear) wave fronts. Two-dimensional wave fronts (not shown) comprised of Rayleigh and Love surface waves travel only along the earth's surface.

P wave ray paths fall into one of four categories in the presence of a subsurface velocity increase: direct rays, reflected rays, the critically refracted or the head wave, and refracted waves. See text for complete description.

FIGURE S-2
T-X CURVE



A Time-Distance or T-X curve is constructed by plotting the arrival times of seismic waves vs. the shot-point to geophone distance. The first seismic arrivals are the direct wave at small distances and refracted waves (from the head wave) at greater distances. The sets of arrival times define straight lines on the graph, with slopes equal to the reciprocal of sequentially deeper layer velocities. The direct and refracted waves arrive simultaneously at the crossover distance X_x. The distance X_x can be used to calculate the depth to the velocity contrast.

Appendix B

Seismic Refraction vs. Seismic Reflection

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Seismic Refraction vs. Seismic Reflection

The difference between seismic *refraction* and seismic *reflection* is never obvious to the non-geophysicist, and rarely directly explained in simple terms by geophysicists. Due to the similarity of the names, many non-geophysicists assume that the terms are interchangeable, or are unaware that there are critical differences between the two techniques that may make one vastly preferred and/or the other unusable under certain site- or project-specific conditions.

General Seismic Principles

Seismic techniques generally involve measuring the travel time of certain types of seismic energy from surficial shots (i.e. an explosion or weight drop) through the subsurface to arrays of ground motion sensors or geophones. In the subsurface, seismic energy travels in waves that spread out as hemispherical wavefronts (i.e. the three-dimensional version of the ring of ripples from a pebble dropped into a pond). The energy arriving at a geophone is described as having traveled a ray path perpendicular to the wavefront (i.e. a line drawn from the spot where the pebble was dropped to a point on the ripple). In the subsurface, seismic energy is refracted (i.e. bent) and/or reflected at interfaces between materials with different seismic velocities (i.e. different densities). The refraction and reflection of seismic energy at density contrasts follows exactly the same laws that govern the bending and reflection of light through the surface of water, or through prisms. Note that for each seismic ray that strikes a density contrast a portion of the energy is refracted into the underlying layer, and the remainder is reflected at the angle of incidence. The reflection and refraction of seismic energy at each subsurface density contrast, and the generation of surface waves (or ground roll), and the sound (i.e. the air-coupled wave or air blast) at the ground surface all combine to produce a long and complicated sequence of ground motion at geophones near a shot point. The ground motion produced by a shot is typically recorded as a wiggle trace for each geophone (see Example Seismic Record).

Seismic Refraction

Seismic refraction involves measuring the travel time of the component of seismic energy which travels down to the top-of-rock (or other distinct density contrast), is refracted along the top-of-rock, and returns to the surface as a head wave along a wave front similar to the bow wake of a ship (see Seismic Refraction Geometry sketch). The shock waves which travel along the top-of-rock are called refracted waves, and for geophones at a distance from the shot point, always represent the first arrival of seismic energy.

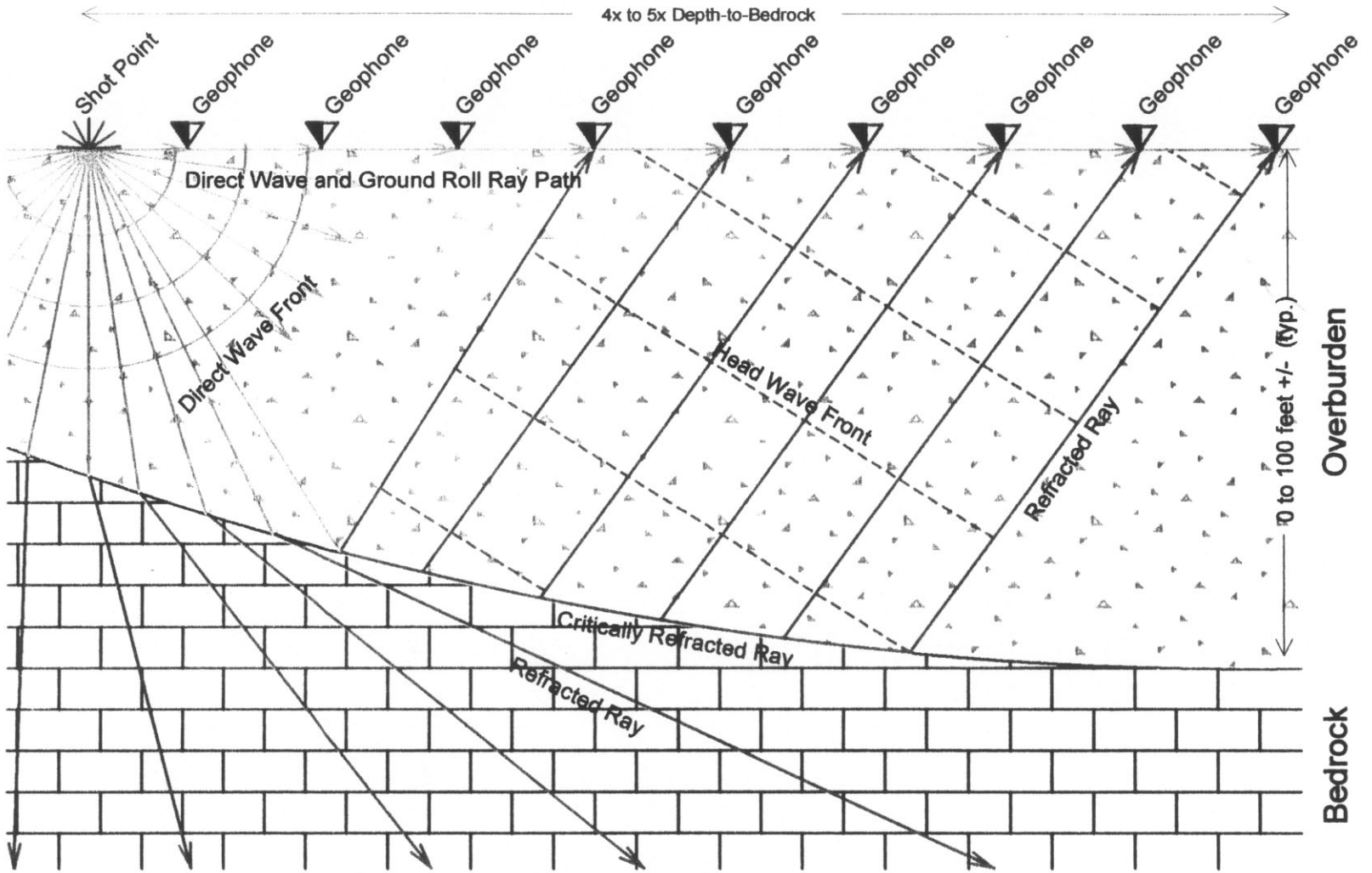
Seismic refraction is applicable only where the seismic velocities of layers increase with depth. Therefore, where higher velocity (e.g. clay) layers may overlie lower velocity (e.g. sand or gravel) layers, seismic refraction will yield incorrect results. In addition, since seismic refraction requires geophone arrays with lengths of approximately 4 to 5 times the depth to the density contrast of interest (e.g. the top-of-bedrock), seismic refraction is commonly limited (as a matter of practicality) to mapping the top-of-bedrock only where it occurs at depths less than 100 to 200 feet — i.e. at greater depths, array lengths may exceed site dimensions, and the shot energy required to transmit seismic arrivals for the required distances may necessitate the use of very large explosive charges. In addition, the lateral resolution of seismic refraction data degrades with increasing array length since the path that a seismic first arrival travels may migrate laterally (i.e. in three dimensions) off-of the trace of the desired (two-dimensional) seismic profile.

Seismic Reflection

Seismic reflection uses field equipment similar to seismic refraction, but field and data processing procedures are employed to maximize the energy reflected along near vertical ray paths by subsurface density contrasts (see Seismic Reflection Geometry sketch). Reflected seismic energy is never a first arrival, and therefore must be identified in a generally complex set of overlapping seismic arrivals (see Example Seismic Record) — generally by collecting and filtering highly redundant data. Therefore, the field and processing time for a given lineal footage of seismic reflection are much greater than for seismic refraction. However, seismic reflection can be performed in the presence of low velocity zones or velocity inversions, generally has lateral resolution vastly superior to seismic refraction, and can delineate very deep density contrasts with much less shot energy than would be required for a comparable refraction survey depth.

The main limitations to seismic reflection are its higher cost than refraction (for sites where either technique could be applied), and its physical limitation to depths generally greater than approximately 30 feet. At depths less than approximately 30 feet, reflections from subsurface density contrasts arrive at geophones at nearly the same time as the much higher amplitude ground roll (surface waves) and air blast (i.e. the sound of the shot). Reflections from greater depths arrive at geophones after the ground roll and air blast have passed, making these deeper targets easier to detect (see Example Seismic Record).

The differences between seismic refraction and reflection are summarized on the attached Seismic Method Comparison table. Note that in situations where both could be applied, seismic reflection generally has better resolution, but is considerably more expensive. In those situations, the choice between seismic reflection and refraction becomes an economic decision.



Seismic Refraction Geometry

Rev. 01/2001

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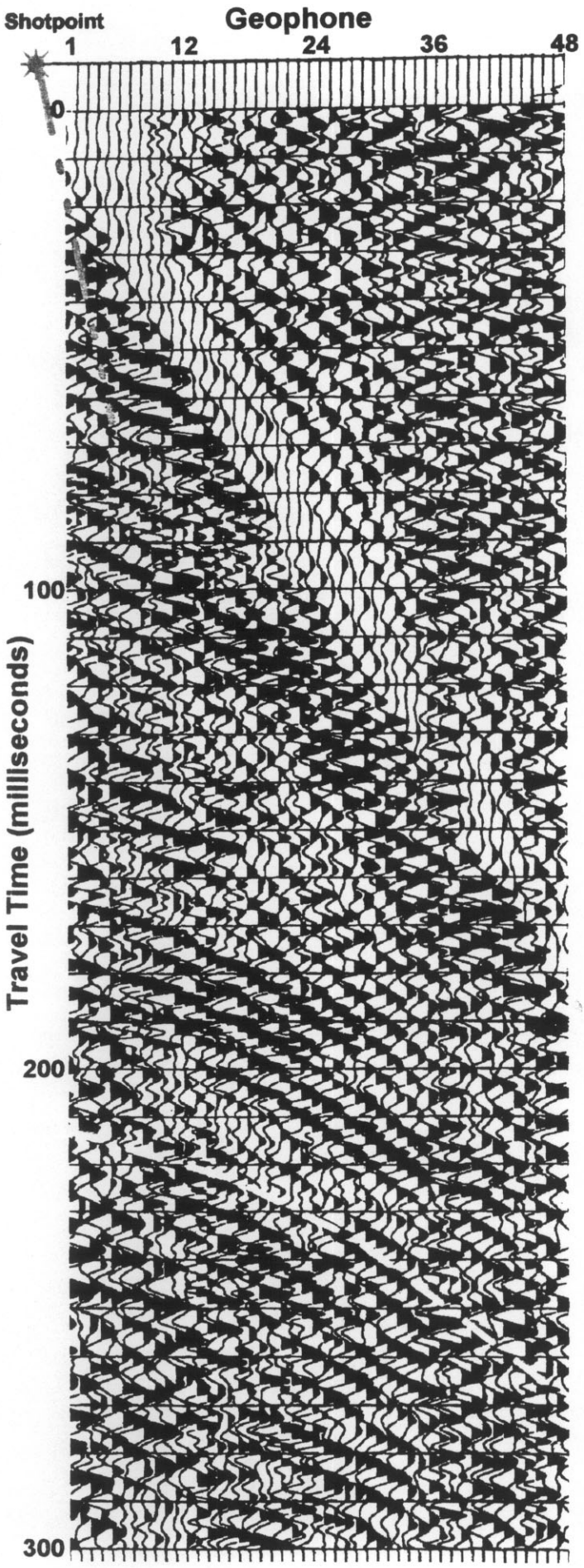
Example Seismic Reflection Record

Rev. 01/2001



Seismic Noise

Refracted Wave (First Arrivals)

Reflected Wave, Horizon 1

Reflected Wave, Horizon 2

Seismic Method Comparison		
	Refraction	Reflection
Required Conditions	Velocity increases with depth (i.e. no interbedded low velocity layers)	Layer(s) of interest at depths > 30' (+/-)
Preferred Conditions	Layer(s) of interest at depths < 100' (+/-)	Smooth topography
Vertical Resolution	Good	Excellent
Lateral Resolution	Fair	Excellent
Relative Cost	Low	High

Appendix C

Seismic Reflection Field Parameters and Processing Sequence

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Field Parameters

Data Recorded	January 6 and 7, 2001
Source Type	Weight Drop
Record Length	1000 msec
Source Array	Single Source
Source Interval	10 feet
Instrument	Geometrics SmartSeis
Channels	24
Sample Rate	0.5 msec
Filter	Out
Geophone Type	4.5 Hz
Spread	115 – 5 – x – 5 - 115

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Processing Sequence

- REFORMAT TO SEGY
- SEGY TO INTERNAL FORMAT CONVERSION
- GEOMETRY, RENUMBER AND TRACE EDIT
- GAIN RECOVERY
- AIR BLAST ATTENUATION
- SURFACE CONSISTENT AMPLITUDE ANALYSIS AND RECOVERY
- SURFACE CONSISTENT DECONVOLUTION
    - SPIKING OPERATOR: 80 MS; NOISE: 0.01X
- SPECTRAL ENHANCEMENT (20-700 HZ)
- ELEVATION TO DATUM STATICS: FLOATING DATUM (NMO)
    - DATUM: 13 FEET
    - VELOCITY: 5000 FT/SEC
- COMMON DEPTH POINT GATHER
- BANDPASS FILTER
    - 50/24-300/72 HZ/DB
- TRACE MUTE: SURGICAL NOISE CONE
- AUTOMATIC GAIN CONTROL
    - 100 MS WINDOW
- PASS 1 VELOCITY/MUTE ANALYSIS
- FINAL MORMAL MOVEOUT CORRECTIONS
- TRACE MUTE: FRONT END/FIRST BREAK
- COMMON DEPTH POINT STACK
- CORRECTION TO FINAL FLAT DATUM
- BANDPASS FILTER
    - 50/24-220/72 HZ/DB
- POST STACK SCALE: TIME/SPACE VARIANT WINDOWS

Display Information

- TRACES PER INCH: 10
- INCHES PER SECOND: 20
- PLOT POLARITY: FIELD POLARITY

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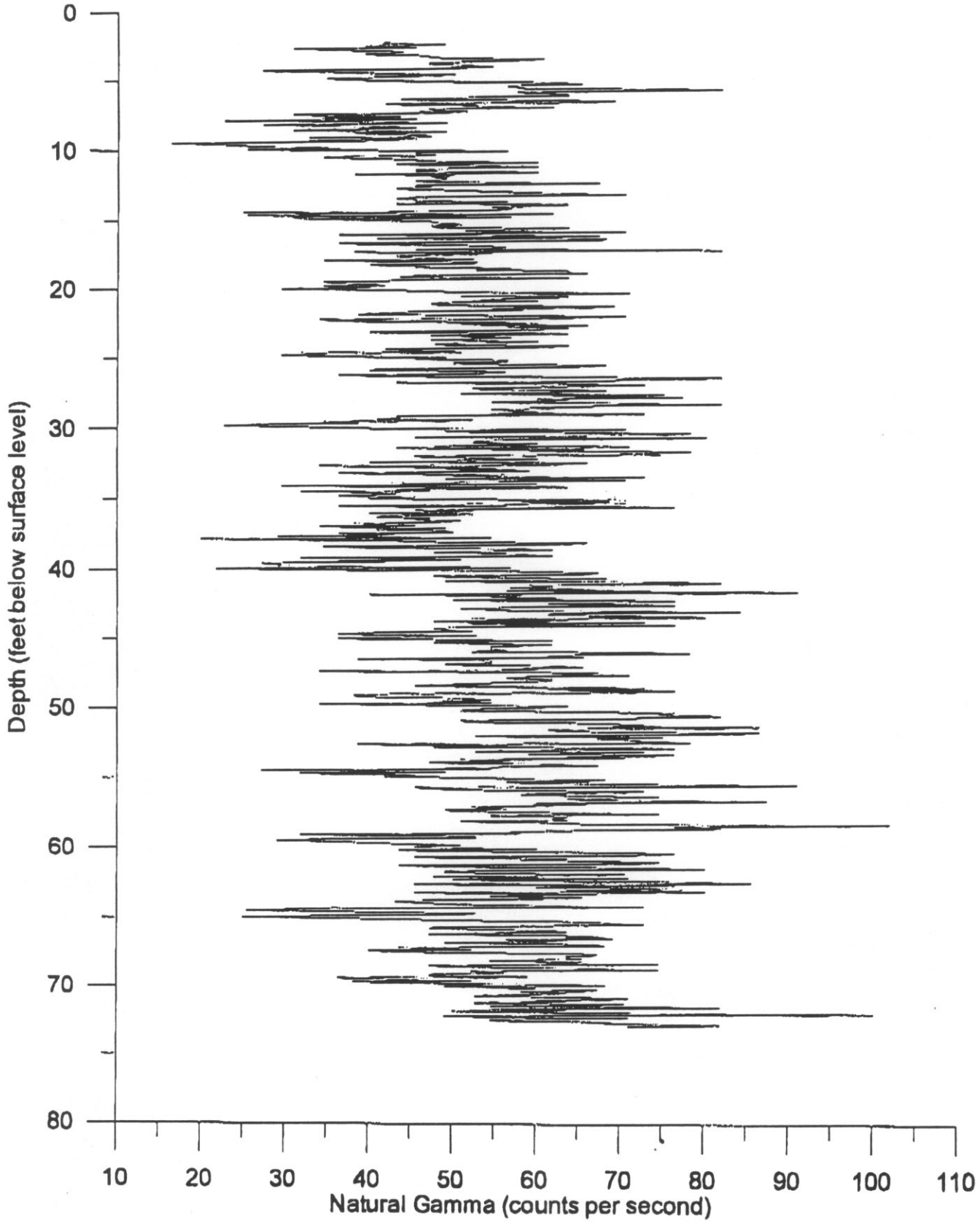
U.S. Department of the Interior, U.S. Geological Survey, Reston, VA, USA
URL http://ngmdb.usgs.gov/Geolex/geolex_home.html.
Last Modified: September 25, 2000



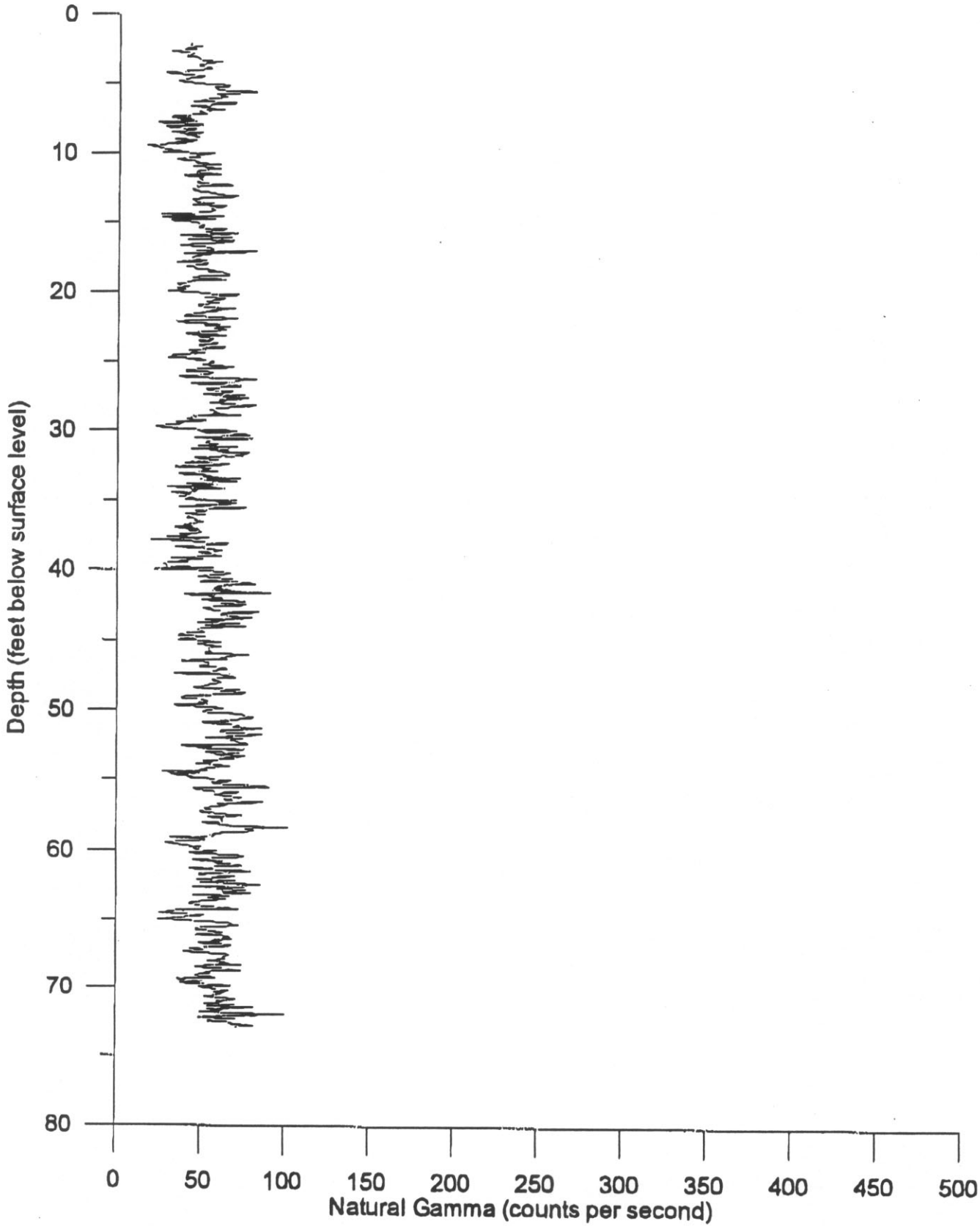
Draft Figure

Borehole Geophysics
Natural Gamma Logging
Soil Boring 51

Thypin Steel Facility
Sagamore Hill Road
Manorhaven,
Nassau County, NY

Enviroscan, Inc.
Project No. 010112log
Rev. 02/21/01

ENVIROSCAN, INC



Draft Figure

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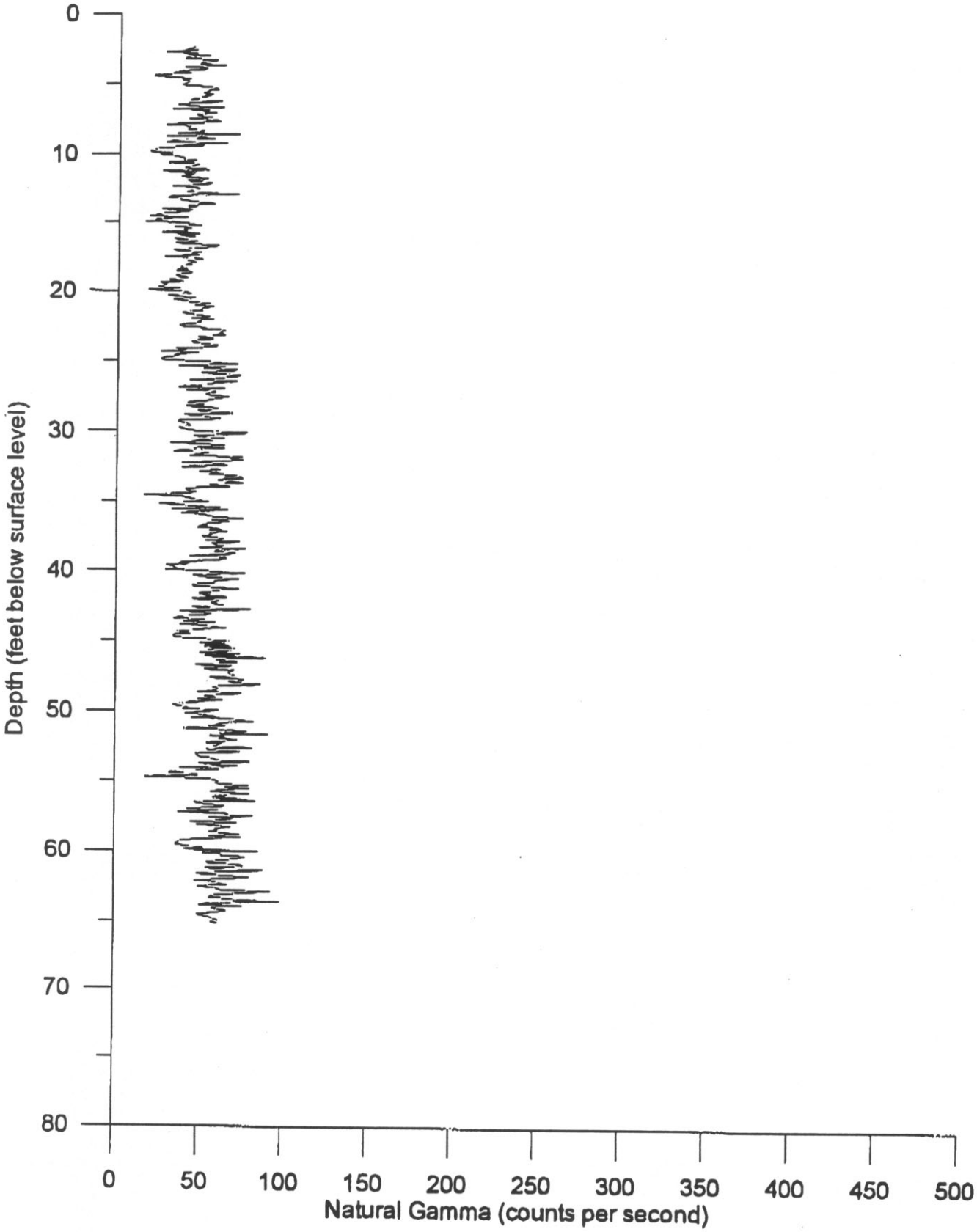

Draft Figure

Borehole Geophysics
Natural Gamma Logging
Soil Boring 52

Thypin Steel Facility
Sagamore Hill Road
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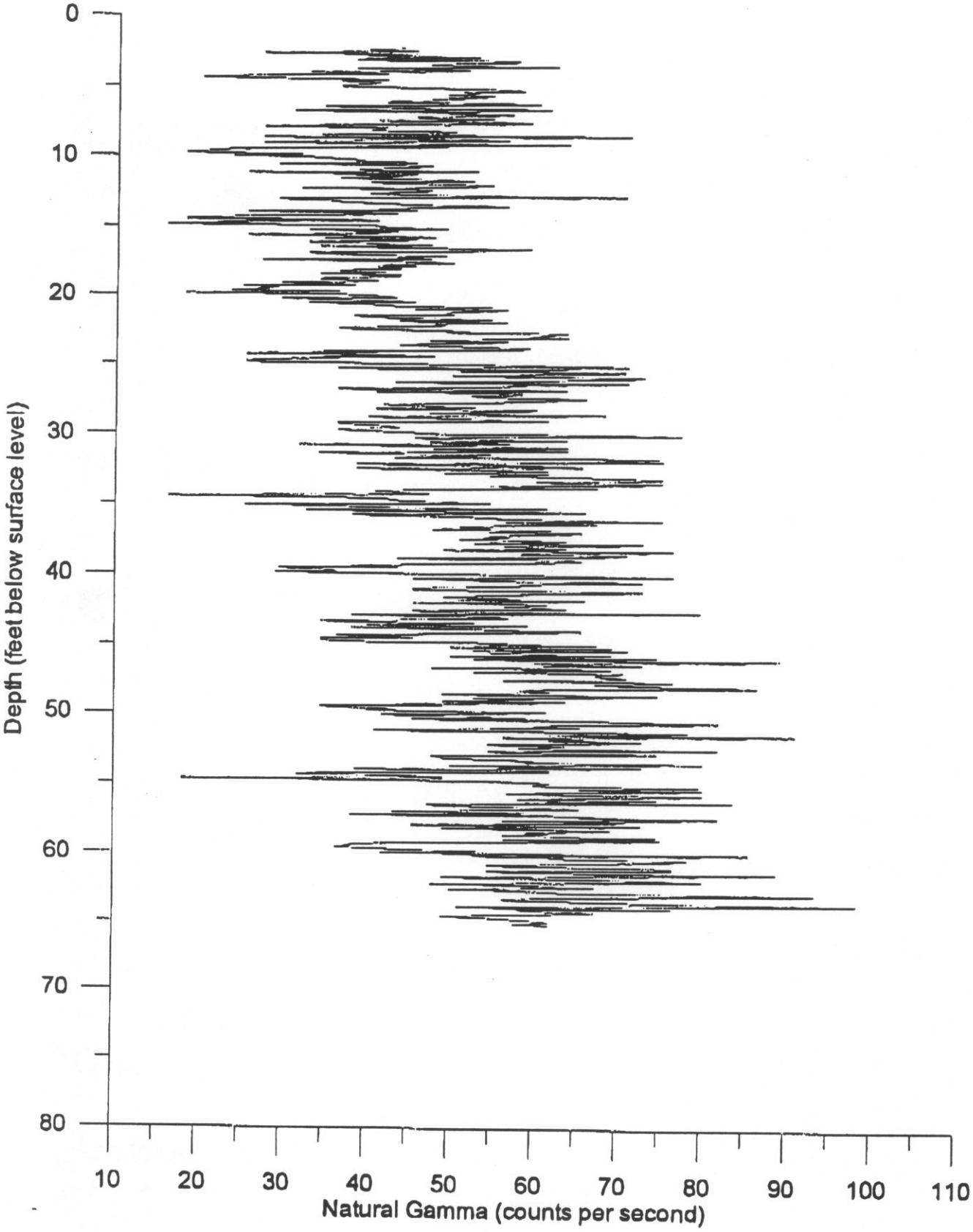
Project No. 010112log
Rev. 02/21/01

ENVIROSCAN, INC.



Draft Figure

Borehole Geophysics
Natural Gamma Logging
Soil Boring 52

Thypin Steel Facility
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Fax Transmission Cover Sheet

To:	Mr. Scott Glash	**Fax:**	**(631) 232-9898**
Company:	**Roux Associates, Inc.**	**Date:**	February 21, 2001
From:	Philip M. Donmoyer	**Re:**	Draft Figures-Gamma Logging
Pages:	5		

Notes:

Scott,

Following are the draft figures for the borehole logging conducted on 2/20/01. The results for each well are displayed at two scales each – 110 counts per second (cps) and 500 cps, as you requested. If you have any questions, or would like a full report as described in our proposal (Proposal reference No. 010112log, dated 2/5/01) to Roux Associates, Inc., please do not hesitate to contact us.

Sincerely,

Philip M. Donmoyer, P.G.

APPENDIX G

Groundwater Sample Logs and
Field Parameter Measurements

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility

Well No: MW-2 Weather: Sunny - 50's

Date: 11/29/00 Purge Water Disposal: On-Site Drums

Sampled By: ML, AL Well Diameter / Type: 2" / PVC

Depth of Well (ft): 20.87 Water Column (ft): 9.71

Depth to Water(ft): 11.16 Volume of Water in Well (gal) 1.55

Depth to Product (ft): — Volume of Water to Remove (gal): 4.65

well diameter:	1 in	2 in	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 0415 Purge Rate: 2 gpm

End Purging: 0420 Volume of Water Removed (gal): 10 gal.

Method of Purge: Whale pump Method of Sampling: Teflon bailer

Physical Appearance/ Comments:

Samples Collected: (analyses / no. bottles) 0430 - MW-2 Sampled for Nat. Attenuation, CVOCs, Chloride, TDS.

Laboratory : STL-CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity mS/cm - S/m	Turbidity NTU	pH SU	Temperature C° - F°	Salinity %
0415	0		233	1.00		6.53	14.6	
0416	2		229	1.04		6.54	14.7	
0417	4		228	1.05		6.55	14.7	
0418	6		226	1.05		6.54	14.6	
0419	8		220	1.05		6.55	14.6	
0420	10		218	1.05		6.54	14.7	
0430	Sample		250	1.03		6.57	14.4	

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility

Well No: MW-25 Weather: Sunny - 50's

Date: 11/29/00 Purge Water Disposal: On-Site drums

Sampled By: ML, AL Well Diameter / Type: 2" / PVC

Depth of Well (ft): 18.42 Water Column (ft): 7.74

Depth to Water(ft): 10.68 Volume of Water in Well (gal) 1.23

Depth to Product (ft): — Volume of Water to Remove (gal): 3.64

well diameter:	1 in	2 in	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 0820 Purge Rate: 2 gpm

End Purging: 0825 Volume of Water Removed (gal): 10 gal.

Method of Purge: Whale Pump Method of Sampling: teflon bailer

Physical Appearance/ Comments:

Samples Collected: (analyses / no. bottles) MW-25 Sampled at 0900 for CVOCs, Chloride, TDS, and Natural Attenuation.

Laboratory : STL-CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity mS/cm - S/m	Turbidity NTU	pH SU	Temperature C° - F°	Salinity %
0820	0		221	.442	24.1	6.34	14.1	
0821	2		200	1.04	16.9	6.20	14.3	
0822	4		201	1.01	2.2	6.34	14.4	
0823	6		201	1.08	2.2	6.34	14.1	
0824	8		201	1.10	3.1	6.34	14.1	
0825	10		201	1.10	2.2	6.34	14.1	
0900	Sample		222	1.04	23	6.67	14.3	

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility

Well No: MW-22 Weather: Sunny - 50's

Date: 11/29/00 Purge Water Disposal: On-site drums

Sampled By: ML, AL Well Diameter / Type: 2" / PVC

Depth of Well (ft): 19.46 Water Column (ft): 8.42

Depth to Water(ft): 11.04 Volume of Water in Well (gal) 1.37

Depth to Product (ft): — Volume of Water to Remove (gal): 4.02

well diameter:	1 in	2 in	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 0710 Purge Rate: 2 gpm

End Purging: 0716 Volume of Water Removed (gal): 12 gal.

Method of Purge: whale pump Method of Sampling: teflon bailer

Physical Appearance/ Comments:

Samples Collected: (analyses / no. bottles) 0745 - MW-22 Sampled for Natural Attenuation, CVOCs, Chloride, TDS

Laboratory : STL-CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity mS/cm - S/m	Turbidity NTU	pH SU	Temperature C° - F°	Salinity %
0710	0		322	957	77.2	5.38	14.0	0.0
0711	2		316	1.04	34	5.52	14.4	0.0
0712	4		306	.90	30.7	5.65	14.5	0.0
0713	6		244	1.02	0.0	5.95	14.6	0.0
0714	8		250	1.02	0.0	5.92	14.6	0.0
0715	10		202	1.02	0.0	5.92	14.6	0.0
0716	12		202	1.05	0.0	5.92	14.6	0.0
0745	Sample		202	1.03	9.99	6.10	14.1	0.0

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility

Well No: MW-21 Weather: Sunny, 50's

Date: 11/27/00 Purge Water Disposal: On-Site drums

Sampled By: ML, AL Well Diameter / Type: 2" / PVC

Depth of Well (ft): 16.9 Water Column (ft): 6.55

Depth to Water(ft): 10.35 Volume of Water in Well (gal) 1.048

Depth to Product (ft): — Volume of Water to Remove (gal): 3.14

well diameter:	1 in	2 in	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 0930 Purge Rate: 2 gpm

End Purging: 0933 Volume of Water Removed (gal): 4

Method of Purge: Whale Pump Method of Sampling: teflon bailer

Physical Appearance/ Comments: Samples Collected at 1000.

Samples Collected: (analyses / no. bottles) Samples Collected for Nat. Attenuation, CVOCs, Chloride and Total Dissolved Solids.

Laboratory : STL-CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity mS/cm - S/m	Turbidity NTU	pH SU	Temperature C° - F°	Salinity %
Initial	0	9.98	217	0.308	39.3	6.04	14.8	
0931	2	10.00	210	0.257	35.6	6.64	14.7	
0933	4	10.12	220	0.253	29.8	6.71	14.8	
1000	Sample	10.10	221	0.254	25.0	6.70	14.8	

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility

Well No: MW-27 Weather: Sunny, 50's

Date: 11/27/06 Purge Water Disposal: On-Site Drums

Sampled By: ML, AL Well Diameter / Type: 2" / PVC

Depth of Well (ft): 15.67 Water Column (ft): 5.47

Depth to Water(ft): 10.20 Volume of Water in Well (gal) .875

Depth to Product (ft): ~~~ Volume of Water to Remove (gal): 2.62

well diameter:	1 in	2 in	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 1057 Purge Rate: 2 gpm

End Purging: 1100 Volume of Water Removed (gal): 6 Gal.

Method of Purge: Whale pump Method of Sampling: teflon bailer

Physical Appearance/ Comments:

Samples Collected: (analyses / no. bottles) Samples collected at 1115 for CVOCs.

Laboratory : STL-CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity mS/cm - S/m	Turbidity NTU	pH SU	Temperature C° - F°	Salinity %
Initial	0	10.4	205	0.0	74.3	5.55	16.1	
1100	6	9.42	146	0.404	38.9	6.32	16.0	
1115	Sample	9.08	218	0.405	21.3	6.63	16.0	

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility

Well No: MW-26 Weather: Sunny, 50's

Date: 11/27/00 Purge Water Disposal: On-Site drums

Sampled By: ML, AL Well Diameter / Type: 2" / PVC

Depth of Well (ft): 14.5 Water Column (ft): 5.24

Depth to Water(ft): 9.26 Volume of Water in Well (gal) 0.83

Depth to Product (ft): — Volume of Water to Remove (gal): 2.51

well diameter:	1 in	2 in	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 1250 Purge Rate: 2 gpm

End Purging: 1253 Volume of Water Removed (gal): 6 gals

Method of Purge: whale pump Method of Sampling: teflon bailer

Physical Appearance/ Comments: Samples collected at 1300

Samples Collected: (analyses / no. bottles) Samples collected for Nat. Attenuation, BNs, Cvocs, Chloride and TDS. Replicate / MS / MSD collected at this location.

Laboratory : STL-CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity mS/cm - S/m	Turbidity NTU	pH SU	Temperature C° - F°	Salinity %
Initial	0	10.65	232	0.449	19.9	6.65	15.1	
1252	4	5.64	210	0.886	21.6	6.65	15.1	
1253	6	5.64	210	0.886	21.0	6.65	15.1	
1300	Sample	7.12	218	0.90	22.9	7.18	14.7	

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility

Well No: MW-24 Weather: Sunny - 50's

Date: 11/28/10 Purge Water Disposal: On-Site drums

Sampled By: ML, AL Well Diameter / Type: 2" / PVC

Depth of Well (ft): 20.00 Water Column (ft): 7.85

Depth to Water(ft): 12' 1.25" Volume of Water in Well (gal) 1.25

Depth to Product (ft): — Volume of Water to Remove (gal): 3.75

well diameter:	1 in	2 in	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 1225 Purge Rate: 2 gpm

End Purging: 1230 Volume of Water Removed (gal): 10 gal.

Method of Purge: Whale pump Method of Sampling: teflon bailer

Physical Appearance/ Comments:

Samples Collected: (analyses / no. bottles) Samples Collected at 1245 for CVOCs, Metals, Chloride, TDS, Natural Attenuation.

Laboratory : STL-CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity mS/cm - S/m	Turbidity NTU	pH SU	Temperature C° - F°	Salinity %
1225	0	8.28	296	.691	44.2	7.11	15.2	
1226	2	3.81	283	.673	9.1	6.37	15.3	
1227	4	6.74	278	.642	14.9	6.40	15.4	
1228	6	3.80	276	.620	6.0	6.40	15.4	
1224	9	3.82	264	.620	4.1	6.40	15.4	
1230	10	3.83	258	.621	4.5	6.40	15.3	
1245	Sample	3.83	253	.659	6.77	6.45	15.1	

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility

Well No: MW-23 Weather: Sunny, 50's

Date: 11/28/00 Purge Water Disposal: On-site drums

Sampled By: ML, AL Well Diameter / Type: 2" / PVC

Depth of Well (ft): 19'7" Water Column (ft): 7.7

Depth to Water(ft): 11'10.5" Volume of Water in Well (gal) 1.23

Depth to Product (ft): — Volume of Water to Remove (gal): 3.70

well diameter:	1 in	2 in	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 1030 Purge Rate: 2 gpm

End Purging: 1035 Volume of Water Removed (gal): 10 gal

Method of Purge: Whale Pump Method of Sampling: teflon bailer

Physical Appearance/ Comments:

Samples Collected: (analyses / no. bottles) Samples collected at 1115 for CVOCs, Metals, Cyanide, Nit. Attenuation, Chloride and TDS.

Laboratory : STL-CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity mS/cm - S/m	Turbidity NTU	pH SU	Temperature C° - F°	Salinity %
Initial	0	9.61	287	.830	43.7	6.16	13.1	
1030	2	9.17	292	.783	40.0	6.29	15.5	
1031	4	8.78	284	.771	30.4	6.33	15.7	
1032	6	9.11	285	.771	11.3	6.33	16.1	
1033	8	9.12	278	.771	11.0	6.33	16.2	
1034	10	9.10	284	.771	11.4	6.33	16.1	

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility

Well No: MW-28 Weather: Sunny, 50's

Date: 11/27/00 Purge Water Disposal: On-site drums

Sampled By: ML, AL Well Diameter / Type: 2" / PVC

Depth of Well (ft): 15.51 Water Column (ft): 4.73

Depth to Water(ft): 10.78 Volume of Water in Well (gal) 0.75

Depth to Product (ft): — Volume of Water to Remove (gal): 2.27

well diameter:	1 in	2 in	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 1424 Purge Rate: 2 gpm

End Purging: 1429 Volume of Water Removed (gal): 10 gal.

Method of Purge: whale pump Method of Sampling: teflon bailer

Physical Appearance/ Comments: Purge water is very turbid

Samples Collected: (analyses / no. bottles) Samples collected at 1445 for Nat. Attenuation, CVOCs, Chloride and TDS.

Laboratory : STL-CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity mS/cm - S/m	Turbidity NTU	pH SU	Temperature C° - F°	Salinity %
Initial	0	9.67	276	0.604	185	7.64	14.9	
1425	2	9.22	277	0.608	95	6.54	15.1	
1426	4	8.54	292	0.616	95	6.54	15.0	
1427	6	8.57	294	0.616	62.8	6.44	14.8	
1428	8	9.00	293	0.616	45.2	6.44	14.8	
1429	10	8.84	293	0.616	40.0	6.44	14.8	
1445	Sample	9.01	261	0.616	225	6.50	14.8	

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-1 Weather: hazy, humid, 70's

Date: 6-14-01 Purge Water Disposal: Drum

Sampled By: KS/RF Well Diameter / Type: 2inch PVC 1ft stickup

Depth of Well (ft): 21.6 Water Column (ft): 11.35

Depth to Water(ft): 10.25 Volume of Water in Well (gal) 1.85

Depth to Product (ft): — Volume of Water to Remove (gal): 5.55

well diameter:	1 in	2 in	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: ~~1002~~ 1046 Purge Rate: ~~1~~ 1/2 gal/min

End Purging: 1201 Volume of Water Removed (gal): 9.25

Method of Purge: Grunfos pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: clear, no sheen, no odor

1135 - After lowering new pump - purge water is turbid brown

Samples Collected: (analyses / no. bottles) VOCs, SVOCs, PCBs (2 bottles each); Cyanide, Hex Cr, TAL metals filtered & unfiltered (one bottle each)

Laboratory : STL CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity ~~mS/cm~~ - ~~S/m~~	Turbidity NTU	pH SU	Temperature ~~C°~~ - ~~F°~~	Salinity %
1046 initial	@	3.92	251	0.158	~~2~~ 14.6	5.94	16.06	0
1103	1	0.0	262	0.176	6.9	5.80	13.74	0
1147	2	0.60	238	0.196	155.0	5.80	14.48	0
1152	3	0.65	225	0.199	163.0	5.75	13.65	0
1156	4	0.00	225	0.199	256.0	5.75	13.54	0
1200	5	0.00	225	0.200	256.0	5.75	13.65	0

1008 - tubing fell down well

1113 - pump stopped working - try grunfopers pump

1135 start purging with grunfopes pump

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-2 Weather: cloudy, humid/low 70's

Date: 6-15-01 Purge Water Disposal: Drum

Sampled By: KS/RF Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 20.50 Water Column (ft): 9.1

Depth to Water(ft): 11.40 Volume of Water in Well (gal) 1.48

Depth to Product (ft): — Volume of Water to Remove (gal): 4.44

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 1018 Purge Rate: 1/2 gal/min

End Purging: 1035 Volume of Water Removed (gal): 9.0

Method of Purge: Grundfos Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: clear, no sheen or odors

Samples Collected: (analyses / no. bottles) 2 bottles each: VOCs, SVOCs, PCBs
1 bottle each: Cyanide, Hexavalent Chromium, TAL Metals
filtered & unfiltered Laboratory : STL CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity ~~µS/cm~~ mS/cm	Turbidity NTU	pH SU	Temperature ~~C°~~ - ~~F°~~	Salinity %
1018 initial	~~10 L~~ 0	9.77	206	1.18	41.4	6.46	16.00	0
1020	1	1.64	191	1.18	14.2	6.40	13.54	0
1022	2	~~0.00~~ 1.14	190	1.17	10.4	6.40	13.54	0
1025	3	0.98	188	1.17	4.2	6.41	13.46	0
1028	4	0.77	186	1.16	2.1	6.42	13.37	0
1031	5	0.56	184	1.16	0.8	6.42	13.37	0
1034	6	0.45	183	1.16	0.9	6.42	13.36	0

1045 - Collected samples
1500 - Replicate sample.

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-2I Weather: Sunny 80's

Date: 7-6-01 Purge Water Disposal: Drum

Sampled By: KS/ML Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 46.5 Water Column (ft): 35.89

Depth to Water(ft): 10.61 Volume of Water in Well (gal) 5.85

Depth to Product (ft): — Volume of Water to Remove (gal): 17.5

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 0717 Purge Rate: 1/2 gal/min

End Purging: 0802 Volume of Water Removed (gal): 23.5

Method of Purge: Grundfos Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Clear after initial volume, no sheen, no odors

Samples Collected: (analyses / no. bottles) (2 bottles each:) VOCs, SVOCs, PCBs.
(1 bottle each:) Cyanide, Hex Cr, TAL Metals (U&F)

Laboratory: STL CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity mS/cm - ~~S/m~~	Turbidity NTU	pH SU	Temperature C° - ~~F°~~	Salinity %
initial	0	19.99	-37	1.50	403.0	5.44	14.6	0.1
0728	1	0.0	-98	2.56	-10	6.57	14.6	0.1
0739	2	0.0	-93	2.60	-10	6.60	14.5	0.1
0750	3	0.0	-89	2.48	-10	6.60	14.6	0.1
0801	4	0.0	-86	2.49	-10	6.60	14.6	0.1

0815- Collected sample

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-2D Weather: Sunny 80's

Date: 7-5-01 Purge Water Disposal: Drum

Sampled By: KS/ML Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 123.5 Water Column (ft): 113.7

Depth to Water(ft): 10.21 Volume of Water in Well (gal) 18.5

Depth to Product (ft): — Volume of Water to Remove (gal): 55.5

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 0837 Purge Rate: ~1/4 gal/min

took readings based on volume not time due to fluctuations in flow rate

End Purging: 1600 Volume of Water Removed (gal): 74.0

Method of Purge: Grundfos Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: turbid brown, no sheen, no odor

Samples Collected: (analyses / no. bottles) 2 bottles for SVOCs & PCBs (due to breakage during prior shipment)

Laboratory: STL-CT

Field Measurements:

Time	Volume ~~gal~~	Dissolved O_2 mg/L	ORP mV	Conductivity ~~mS~~/cm ~~S/m~~	Turbidity NTU	pH SU	Temperature ~~C°~~ ~~F°~~	Salinity %
initial	0	7.48	78	0.508	155.0	10.84	17.9	0.0
1100	1	1.85	-16	0.388	999.0	9.30	22.8	0.0
1330	2	2.00	-2	0.403	560.0	9.17	20.2	0.0
1500	3	0.10	-87	0.400	999.0	9.43	19.9	0.0
1600	4	~~0.99~~ 0.99	-155	0.412	999.0	8.97	20.3	0.0

1600 - Collected sample

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-21 Weather: cloudy, low 70's

Date: 6-14-01 Purge Water Disposal: Drum

Sampled By: KS/RF Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 16.85 Water Column (ft): 7.25

Depth to Water(ft): 9.60 Volume of Water in Well (gal) 1.18

Depth to Product (ft): — Volume of Water to Remove (gal): 3.54

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 0932 Purge Rate: 0.1 gal/min

End Purging: 0925 Volume of Water Removed (gal): 6 gallons

Method of Purge: Peristaltic Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: clear, no sheen, no odors

Samples Collected: (analyses / no. bottles) VOCs, SVOCs, PCBs (2 bottles for each), Cyanide, Hexavalent chromium, TAL metals filtered & unfiltered (one bottle each) Laboratory : STL CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity µS/cm ~~mS/cm~~	Turbidity NTU	pH SU	Temperature C° ~~F°~~	Salinity %
0832 initial	0	12.08	233	0.094	27.5	6.22	15.84	0
0843	1	10.12	234	0.087	4.4	6.29	14.22	0
0851	2	9.99	236	0.089	6.3	6.37	14.14	0
0900	3	9.88	241	0.090	7.0	6.37	14.10	0
0911	4	10.08	246	0.091	7.7	6.41	15.0	0
0923	5	9.88	246	0.092	7.2	6.41	14.12	0

0910: Pump stopped working - fixed with pulse button & continue purging

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-22 Weather: Hazy, Humid, 80's

Date: 6-21-01 Purge Water Disposal: Drum

Sampled By: KS/RF Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 19.35 Water Column (ft): 9.25

Depth to Water(ft): 10.1 Volume of Water in Well (gal) 1.50

Depth to Product (ft): — Volume of Water to Remove (gal): 4.52

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 0947 Purge Rate: ~1/4 gal/min

End Purging: 1047 Volume of Water Removed (gal): 9.0

Method of Purge: Peristaltic Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Turbid brown, turning clear after 3rd volume, no sheen, no odor.

Samples Collected: (analyses / no. bottles) (2 bottles each:) VOCs, SVOCs, PCBs (1 bottle each:) Cyanide, Hex Cr, TAL metals filtered & unfiltered Laboratory : STL CT

Field Measurements:

Time	Volume ~~gal~~	Dissolved O_2 mg/L	ORP mV	Conductivity ~~mS/cm~~ ~~S/m~~	Turbidity NTU	pH SU	Temperature C° - ~~F°~~	Salinity %
initial	0	7.04	282	0.356	999.0	5.67	14.98	0.0
1002	1	0.00	289	0.431	664.0	5.75	14.14	0.0
~~1021~~ ~~1017~~	2	1.32	287	0.439	999.0	5.75	13.40	0.0
1026	3	4.50	276	0.455	98.0	5.78	13.90	0.0
1035	4	0.55	246	0.445	102.0	5.76	13.41	0.0
1040	5	0.63	240	0.444	79.2	5.77	13.49	0.0
1046	6	0.67	239	0.445	83.6	5.77	13.49	0.0

1010 - Pump stopped work - switch to new pump

1015 - Resume pumping

1100 - Collected samples

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: ~~MW-23~~ MW-23 Weather: Hazy, high 70's

Date: 6-14-01 Purge Water Disposal: Drum

Sampled By: KS / RF Well Diameter / Type: 2 inch PVC

Depth of Well (ft): 20' Water Column (ft): 8.9

Depth to Water(ft): 11.1 Volume of Water in Well (gal) 1.45

Depth to Product (ft): — Volume of Water to Remove (gal): 4.35

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 1400 Purge Rate: ½ gal/min

End Purging: 1413 Volume of Water Removed (gal): 7.5

Method of Purge: Grunfos Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Turbid lt. brown; clearing up after first volume, no sheen, no odors

Samples Collected: (analyses / no. bottles) 2 bottles each: VOCs, SVOCs, PCBs

1 bottle each: Cyanide, Hex Cr, TAL Metals filtered & unfiltered

Laboratory : STL CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity ~~µS/cm~~ mS/cm	Turbidity NTU	pH SU	Temperature C° - F°	Salinity %
Initial	0	11.55	257	0.404	248	6.50	17.40	0
1402	1	10.02	210	0.412	50.2	6.56	14.11	0
1404	2	9.18	187	0.414	8.6	6.59	14.00	0
1406	3	8.67	181	0.412	0.4	6.60	13.74	0
1409	4	8.39	181	0.410	0.3	6.60	13.74	0
1412	5	8.25	180	0.408	3.8	6.60	13.79	0

1430 Collected sample

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-23I Weather: Sunny, 70's

Date: 7-2-01 Purge Water Disposal: Drum

Sampled By: KS/ML Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 49.15 Water Column (ft): 38.81

Depth to Water(ft): 10.34 Volume of Water in Well (gal) 6.32

Depth to Product (ft): — Volume of Water to Remove (gal): 18.97

well diameter:	1 in	2 in	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 1151 Purge Rate: 1/2 gal/min

End Purging: 1257 Volume of Water Removed (gal): 32

Method of Purge: Grundfos Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Turbid light brown, no sheen, no odors

Samples Collected: (analyses / no. bottles) (2 bottles each:) VOCs, SVOCs, PCBs

(1 bottle each:) Cyanide, Nitrate, TAL Metals (U & F)

Laboratory: STL-CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity mS/cm	Turbidity NTU	pH SU	Temperature C°	Salinity %
initial	0	7.37	41	1.02	42.3	9.96	21.2	0.0
1204	1	4.26	-112	1.11	78.7	7.36	15.2	0.0
1217	2	7.30	-105	0.786	30.4	7.34	15.2	0.0
1230	3	1.72	-106	0.787	21.4	7.34	15.3	0.0
1243	4	0.0	-107	0.791	16.5	7.37	15.3	0.0
1256	5	0.0	-109	0.793	16.4	7.39	15.5	0.0

1300 - Collected sample

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-24 Weather: Hazy, Humid, 80's

Date: 6-15-01 Purge Water Disposal: Drum

Sampled By: KS / RF Well Diameter / Type: 2 inch PVC

Depth of Well (ft): 19.85 Water Column (ft): ~~8.3~~ 8.3

Depth to Water(ft): 11.55 Volume of Water in Well (gal) 1.35

Depth to Product (ft): ~~8.3~~ (NA) Volume of Water to Remove (gal): 4.05

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 1310 Purge Rate: 1/2 gal / min

End Purging: 1324 Volume of Water Removed (gal): 6.75

Method of Purge: Grunfos Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: clear, no sheen, no odors.

Samples Collected: (analyses / no. bottles)
2 bottles each: VOCs, SVOCs, PCBs
1 bottle each: Cyanide, Hex. Cr, TAL Metals
filtered & unfiltered Laboratory : STL CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity ~~mS/cm~~ - ~~S/m~~	Turbidity NTU	pH SU	Temperature C° - F°	Salinity %
initial	0	11.86	204	0.660	355.0	6.36	15.63	0
1315	1	3.55	217	0.625	149.0	6.31	13.63	0
1317	2	3.25	210	0.614	41.0	6.31	13.63	0
1319	3	3.06	209	0.613	25.5	6.31	13.61	0
1321	4	2.80	207	0.612	18.8	6.31	13.72	0
1323	5	2.70	206	0.611	12.2	6.31	13.70	0

1345 - Collected sample

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-25 Weather: Cloudy, humid, low 70's

Date: 6-15-01 Purge Water Disposal: Drum

Sampled By: KS/RF Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 18.35 Water Column (ft): 7.90

Depth to Water(ft): 10.45 Volume of Water in Well (gal) 1.29

Depth to Product (ft): — Volume of Water to Remove (gal): 3.87

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 0817 Purge Rate: ½ gal/min

End Purging: 0831 Volume of Water Removed (gal): 7

Method of Purge: Grunfos Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Turbid light brown, no sheen, no odors

Samples Collected: (analyses / no. bottles)
2 bottles each: SVOCs, VOCs, PCBs
1 bottle each: Cyanide, Hexavalent Chromium, ~~TAL~~ Metals filtered & unfiltered

Laboratory : STL CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity ~~mS/cm~~ S/cm	Turbidity NTU	pH SU	Temperature ~~C°~~ F°	Salinity %
initial	0	3.87	208	0.551	206.0	6.19	13.95	0
0819	1	1.36	195	0.493	62.7	6.31	13.24	0
0821	2	1.40	173	0.492	43.1	6.35	13.32	0
0824	3	1.52	151	0.488	39.9	6.38	13.33	0
0826	4	1.62	151	0.486	36.0	6.39	13.31	0
0828	5	1.69	155	0.483	35.8	6.40	13.30	0

0840: Collected Sample
0900 MW-25/MS sample & MW-25/MSD

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-26 Weather: Hazy, Humid, 80's

Date: 6-19-01 Purge Water Disposal: Drum

Sampled By: KS/RF Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 14.40 Water Column (ft): 5.0

Depth to Water(ft): 9.40 Volume of Water in Well (gal) 0.815

Depth to Product (ft): — Volume of Water to Remove (gal): 2.4

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 0814 Purge Rate: ½gal/min

End Purging: 0828 Volume of Water Removed (gal): 5.0

Method of Purge: Grundfos Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Turbid lt brown, no odors, no sheen, becoming more clear after purging second volume

Samples Collected: (analyses / no. bottles) (2 bottles each:) VOCs, SVOCs, & PCBs. (1 bottle each:) Cyanide, Hex. Cr, & TAL Metals Filtered & Unfiltered

Laboratory : STL CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity ~~mS~~/cm - ~~S/m~~	Turbidity NTU	pH SU	Temperature C° - ~~F°~~	Salinity %
Initial	0	9.44	225	0.773	34.3	7.0	13.27	6
0818	1	9.00	221	0.773	25.5	6.97	13.25	0
~~0819~~ 0819	2	7.81	214	0.780	10.2	6.94	13.15	0
0820	3	7.55	210	0.798	2.6	6.94	13.42	0
0821	4	7.33	203	0.806	0.2	6.94	13.32	0
0822	5	7.16	195	0.828	-3.7	6.94	13.29	0
0823	6	7.11	190	0.853	-3.4	6.93	13.20	0

0830 - Collected sample.

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-26 I Weather: Hazy, Humid, 80's

Date: 6-19-01 Purge Water Disposal: Drum

Sampled By: KS / RF Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 47.65 Water Column (ft): 39.53

Depth to Water(ft): 8.12 Volume of Water in Well (gal) 6.44

Depth to Product (ft): — Volume of Water to Remove (gal): 19.32

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 1041 Purge Rate: ½ gal/min

End Purging: 1145 Volume of Water Removed (gal): 320.

Method of Purge: Grundfos Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Clear, no sheen, no odor

Samples Collected: (analyses / no. bottles) (2 bottles:) VOCs, SVOCs, PCBs
(1 bottle each:) Cyanide, Hex Cr, TAL Metals
filtered & unfiltered Laboratory : STL CT

Field Measurements:

Time	Volume ~~gal~~	Dissolved O_2 mg/L	ORP mV	Conductivity ~~mS/cm~~ - ~~S/m~~	Turbidity NTU	pH SU	Temperature ~~C°~~ - ~~F°~~	Salinity %
initial	0	9.99	64	1.73	16.70	7.78	18.74	0.1
1053	1	0.00	-16	1.64	38.2	6.82	14.96	0.1
1106	2	0.00	-20	1.58	14.9	6.78	15.06	0.1
1119	3	0.00	-25	1.56	~~14~~ 15.5	6.75	15.24	0.1
1131	4	0.00	-29	1.56	7.2	6.74	15.42	0.1
1143	5	0.00	-32	1.57	7.0	6.75	15.45	0.1

1200 - Collected sample

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-26D Weather: Sunny 80's

Date: 7-9-01 Purge Water Disposal: Drum

Sampled By: KS/ML Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 118.35 Water Column (ft): 108.85

Depth to Water(ft): 9.5 Volume of Water in Well (gal) 17.74

Depth to Product (ft): — Volume of Water to Remove (gal): 53.22

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 0830 Purge Rate: ½ gal/min

End Purging: 1600 Volume of Water Removed (gal): 54

Method of Purge: Grundfos Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Turbid brown, no sheen, no odors

Samples Collected: (analyses / no. bottles) (2 bottles each:) VOCs, SVOCs, PCBs.
(1 bottle each:) Cyanide, Hexavalent Chromium, & TAL Metals (U&F)

Laboratory: STL-CT

Field Measurements:

Time	Volume ~~gal~~	Dissolved O_2 mg/L	ORP mV	Conductivity mS/cm - ~~S/m~~	Turbidity NTU	pH SU	Temperature C° - ~~F~~	Salinity %
0830	0	16.24	137	0.371	999	10.20	14.6	0.0
1020	1	16.39	-58	0.319	999	9.0	17.6	0.0
1330	2	8.12	-18	0.333	999	8.69	18.1	0.0
1600	3	8.00	-36	0.332	999	8.71	17.9	0.0

initial

1600 - Collected groundwater sample.

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-27 Weather: Cloudy, high 60's

Date: 6-13-01 Purge Water Disposal: ~~Peristaltic Pump~~ Drum

Sampled By: KS Well Diameter / Type: 2 inch PVC

Depth of Well (ft): 15.6 Water Column (ft): 6.3

Depth to Water(ft): 9.3 Volume of Water in Well (gal) 1.02

Depth to Product (ft): — Volume of Water to Remove (gal): 3.08

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 1110 Purge Rate: ½ gal/min

End Purging: ~~1128~~ 1132 Volume of Water Removed (gal): 5.5

Method of Purge: Peristaltic Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Light brown to clear after second volume, no odor, no sheen

Samples Collected: (analyses / no. bottles) 2 amber bottles for SVOCs, 2 ambers for PCBs, 2 VOAs for VOCs, 1 plastic 500 ml for Cyanide, 1 plastic for TAL Metals filtered, 1 plastic for TAL Metals unfiltered, 1 plastic for hex. chromium Laboratory : STL CT

Field Measurements: 4 min increments

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity mS/cm - S/m	Turbidity NTU	pH SU	Temperature °C - F°	Salinity %
~~1108~~ 1110	1	12.36	279	0.255 S/cm	131.0	6.43	14.62	0.0
1114	2	9.17	266	0.238 S/cm	100	6.39	14.18	0.0
1118	3	8.79	260	0.231 S/cm	10.8	6.40	14.09	0.0
1122	4	8.62	258	0.230	17.8	6.42	14.08	0.0
1126	5	8.61	258	0.229	13.5	6.43	14.05	0.0

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-28 Weather: cloudy, low 70's

Date: 6-13-01 Purge Water Disposal: Drum

Sampled By: KS Well Diameter / Type: 2inch PVC

Depth of Well (ft): 15.35 Water Column (ft): 5.4

Depth to Water(ft): 9.95 Volume of Water in Well (gal) 0.88

Depth to Product (ft): — Volume of Water to Remove (gal): 2.64

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 1340 Purge Rate: 1/4 gal/min

End Purging: 1408 Volume of Water Removed (gal): 4.5

Method of Purge: Peristaltic Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Clear, no odor, no sheen

Samples Collected: (analyses / no. bottles) VOCs, SVOCs, PCBs, TAL metals filtered, TAL metals unfiltered, Cyanide, Hexavalent chromium,

Laboratory : STL CT

Field Measurements:

Time	Volume ~~gal~~	Dissolved O_2 mg/L	ORP mV	Conductivity ~~mS~~/cm - S/m	Turbidity NTU	pH SU	Temperature C° - F°	Salinity %
1340	1	15.44	231	0.341 S/m	77.2	6.21	14.73	0.0
1346	2	7.27	248	0.325 S/m	0.4	6.27	14.50	0.0
1355	3	7.07	273	0.339 S/m	0.0	6.29	14.35	0.0
1401	4	6.98	286	0.339 S/m	0.8	6.30	14.43	0.0
1408	5	6.99	292	0.339	1.5	6.31	14.49	0.0

Collected sample at 1415

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-29S Weather: Sunny 80's

Date: 6-29-01 Purge Water Disposal: Drum

Sampled By: KS / RF Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 17.0 Water Column (ft): 6.4

Depth to Water(ft): 10.6 Volume of Water in Well (gal) 1.04

Depth to Product (ft): — Volume of Water to Remove (gal): 3.12

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 0742 Purge Rate: 1/2 gal/min

End Purging: 0803 Volume of Water Removed (gal): 6.5

Method of Purge: Peristaltic Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Turbid brown, becoming light brown after second volume, no sheen nor odor

Samples Collected: (analyses / no. bottles) (2 bottles each:) VOCs, SVOCs, PCBs (1 bottle each:) Cyanide, Hex. Cr., TAL Metals (U&F)

Laboratory: STL-CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity ~~mS/cm~~ - ~~S/m~~	Turbidity NTU	pH SU	Temperature C° - F°	Salinity %
initial	0	8.78	196	2.89	913.0	6.02	15.1	0.1
0747	1	6.33	182	2.87	322.0	6.50	14.1	0.1
0750	2	5.56	170	2.85	106.0	6.52	14.0	0.1
0753	3	5.24	166	2.81	58.4	6.52	14.2	0.1
0756	4	5.02	164	2.78	51.5	6.51	14.2	0.1
0759	5	4.77	160	2.76	36.4	6.51	14.2	0.1
0802	6	4.60	150	2.73	37.9	6.51	14.1	0.1

0815 - Collected sample

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-29 I Weather: Sunny 70's

Date: 7-2-01 Purge Water Disposal: Drum

Sampled By: KS/ML Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 45.6 Water Column (ft): 35.34

Depth to Water(ft): 10.26 Volume of Water in Well (gal) 5.76

Depth to Product (ft): — Volume of Water to Remove (gal): 17.28

well diameter:	1 in	2 in	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 0802 Purge Rate: 1/2 gal/min

End Purging: 0917 Volume of Water Removed (gal): 34.5

Method of Purge: Grundfos Pump Method of Sampling: Disposable bailer

Physical Appearance/ Comments: Turbid brown, to light brown, no sheen, no odour

Samples Collected: (analyses / no. bottles) (2 bottles each:) VOCs, SVOCs, PCBs, (1 bottle each:) Cyanide, Hex Cr, TAL metals (U+F)

Laboratory: STL-CT

Field Measurements:

Time	Volume ~~gal~~	Dissolved O_2 mg/L	ORP mV	Conductivity ~~mS/cm~~ - ~~S/m~~	Turbidity NTU	pH SU	Temperature C° - ~~F°~~	Salinity %
Initial	0	9.26	178	.610	999.0	5.54	13.5	0.0
0814	1	0.0	75	.579	115.0	7.03	14.2	0.0
0826	2	0.0	41	.549	44.9	7.10	14.3	0.0
0839	3	7.02	29	.535	29.9	7.11	14.3	0.0
0851	4	8.65	23	.536	26.5	7.12	14.3	0.0
0903	5	8.03	19	.530	26.3	7.12	14.3	0.0
0916	6	7.05	19	.530	21.0	7.12	14.3	0.0

0930 - Collected sample

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-29D Weather: Sunny 80's

Date: 7-16-01 Purge Water Disposal: Drum

Sampled By: KS/mL Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 118.9 Water Column (ft): 108.7

Depth to Water(ft): 10.7 Volume of Water in Well (gal) 17.63

Depth to Product (ft): - Volume of Water to Remove (gal): 52.9

well diameter:	1 in	2 in	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 0828 Purge Rate: ½ gal/min

End Purging: 1430 Volume of Water Removed (gal): 53

Method of Purge: Whale Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Turbid light brown, turning clear, no sheen, no odor

Samples Collected: (analyses / no. bottles) (2 bottles each:) VOCs, SVOCs, PCBs. (1 bottle each:) Cyanide, Hex Cr, TAL metals (U+F)

Laboratory : STL CT

Field Measurements:

Time	Volume ~~gal~~	Dissolved O_2 mg/L	ORP mV	Conductivity mS/cm ~~S/m~~	Turbidity NTU	pH SU	Temperature C° ~~F°~~	Salinity %
initial	0	5.73	83	1.38	140.0	11.83	13.8	0.1
1330	1	0.6	-97	1.54	60	12.09	15.2	0.1
7/18 1030	2	0.68	-8	0.666	56.9	11.51	14.9	0.0
1430	3	0.66	3	0.356	112.0	10.36	14.9	0.0

7/20 0910- Collected sample
(7/17- Battery pack failure)

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-30S Weather: Sunny, 80's

Date: 6-18-01 Purge Water Disposal: Drum

Sampled By: KS/ML Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 17.9 Water Column (ft): 8.5

Depth to Water(ft): 9.4 Volume of Water in Well (gal) 1.38

Depth to Product (ft): — Volume of Water to Remove (gal): 4.15

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 1043 Purge Rate: ½ gal/min

End Purging: 1057 Volume of Water Removed (gal): 8.5

Method of Purge: Grundfos Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: turbid lt yellow, no odor, no sheen

Samples Collected: (analyses / no. bottles) (2 bottles each:) VOCs, SVOCs, PCBs
(1 bottle each:) Cyanide, Hex Cr, TAL Metals filtered & unfiltered

Laboratory : STL CT

Field Measurements:

Time	Volume ~~gal~~	Dissolved O_2 mg/L	ORP mV	Conductivity ~~µS/cm~~ mS/cm	Turbidity NTU	pH SU	Temperature C° ~~F~~	Salinity %
initial	0	10.06	246	1.19	231.0	6.14	16.10	0
1046	1	4.50	199	0.94	99.6	6.45	13.24	0
1048	2	4.57	175	0.875	34.7	6.54	12.82	0
1050	3	4.35	164	0.869	23.0	6.57	12.81	0
1052	4	4.24	148	0.853	13.6	6.59	12.80	0
1054	5	4.13	137	0.851	13.5	6.60	12.86	0
1056	6	4.13	131	0.852	13.2	6.61	12.89	0

1100 - Collected sample

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-30I Weather: Sunny, 80's

Date: 6-28-01 Purge Water Disposal: Drum

Sampled By: KS / RF Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 47.5 Water Column (ft): 37.95

Depth to Water(ft): 9.55 Volume of Water in Well (gal) 6.18

Depth to Product (ft): - Volume of Water to Remove (gal): 18.55

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 0750 Purge Rate: ½ gal/min

End Purging: 0903 Volume of Water Removed (gal): 38

Method of Purge: ~~Grundfos~~ Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Very light brown to clear, no sheen, no odor

Samples Collected: (analyses / no. bottles)
(2 bottles each:) VOCs, SVOCs, PCBs
(1 bottle each:) Cyanide, Hex Cr, TAL Metals (U & F)

Laboratory: STL-CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity ~~mS/cm~~ S/m	Turbidity NTU	pH SU	Temperature C° - F°	Salinity %
Initial	0	9.05	246	0.741	19.1	5.57	13.72	0.0
0802	1	0.00	153	0.867	12.5	5.99	14.86	0.0
0814	2	8.61	151	0.814	13.7	6.40	14.5	0.0
0826	3	6.84	132	0.757	5.8	6.44	14.6	0.0
0838	4	5.59	127	0.718	6.1	6.44	14.6	0.0
0850	5	1.57	126	0.685	5.4	6.44	14.1	0.0
0902	6	0.67	124	0.662	(illegible) 5.1	6.44	14.3	0.0

0915 - collected sample

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-31S Weather: Sunny 80's

Date: 6-29-01 Purge Water Disposal: Drum

Sampled By: KS/RF Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 17.0 Water Column (ft): 6.2

Depth to Water(ft): 10.8 Volume of Water in Well (gal) 1.01

Depth to Product (ft): — Volume of Water to Remove (gal): 3.03

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 0853 Purge Rate: ½ gal/min

End Purging: 0910 Volume of Water Removed (gal): 6

Method of Purge: Peristaltic Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Turbid light brown, becoming clearer after second volume, no sheen, no odors

Samples Collected: (analyses / no. bottles)
(2 bottles each:) VOCs, SVOCs, PCBs
(1 bottle each:) Cyanide, Hex. Cr., TAL Metals (U&F)

Laboratory: STL-CT

Field Measurements:

Time	Volume ~~gal~~	Dissolved O_2 mg/L	ORP mV	Conductivity ~~mS~~/cm - ~~S/m~~	Turbidity NTU	pH SU	Temperature ~~C°~~ - ~~F°~~	Salinity %
Initial	0	8.32	135	1.81	248	7.18	16.4	0.1
0856	1	1.18	135	1.83	118	6.69	14.5	0.1
0859	2	0.71	134	1.82	42.5	6.69	14.6	0.1
0902	3	0.77	131	1.83	31.1	6.69	14.8	0.1
0905	4	0.84	129	1.83	29.1	6.69	15.1	0.1
0908	5	0.89	126	1.82	25.2	6.69	15.4	0.1

0915 - Collected sample

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-31I Weather: Sunny 80's

Date: 7-11-01 Purge Water Disposal: Drum

Sampled By: KS/ML Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 50.0 Water Column (ft): 38.9

Depth to Water(ft): 11.1 Volume of Water in Well (gal) 6.34

Depth to Product (ft): — Volume of Water to Remove (gal): 19.0

well diameter:	1 in	2 in	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 1130 Purge Rate: 1/2 gal/min

End Purging: 1232 Volume of Water Removed (gal): 32

Method of Purge: Grundfos Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Turbid brown, turning clear after first volume, no sheen, no odor

Samples Collected: (analyses / no. bottles) VOCs, SVOCs, PCBs, Cyanide, Hex Cr, TAL Metals (U&F) Matrix Spike, & Matrix Spike Duplicate

Laboratory : STL-CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity mS/cm ~~S/m~~	Turbidity NTU	pH SU	Temperature C° ~~F°~~	Salinity %
initial	0	6.52	-57	0.846	999	5.69	15.2	0.1
1142	1	0.0	-123	1.28	26.4	7.10	14.9	0.1
1154	2	0.0	-80	1.16	8.0	6.83	15.0	0.1
1206	3	0.0	-64	1.10	0	6.71	15.2	0.0
1218	4	0.0	-57	1.07	0	6.65	14.9	0.0
1230	5	0.0	-53	1.05	0	6.62	15.1	0.0

1400 - Collected sample and MATRIX SPIKE & MSD.

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-31D Weather: Sunny, 80's

Date: 7-16-01 Purge Water Disposal: Drum

Sampled By: KS/ML Well Diameter / Type: 2 inch PVC

Depth of Well (ft): 117.0 Water Column (ft): 106

Depth to Water(ft): 11.0 Volume of Water in Well (gal) 17.2

Depth to Product (ft): — Volume of Water to Remove (gal): 51.8

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 0853 Purge Rate: 1/2 gal/min

End Purging: 1500 Volume of Water Removed (gal): 52

Method of Purge: Grunfos Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Turbid brown, no sheen, no odor

Samples Collected: (analyses / no. bottles)
(2 bottles each:) VOCs, SVOCs, PCBs
(1 bottle each:) Cyanide, Hex Cr, TAL Metals (U&F)

Laboratory: STL-CT

Field Measurements:

Time	Volume ~~gal~~	Dissolved O_2 mg/L	ORP mV	Conductivity mS/cm ~~-Sm~~	Turbidity NTU	pH SU	Temperature C° - ~~F°~~	Salinity %
initial	0	10.73	-30	1.24	139.0	11.85	18.3	0.1
0927	1	1.25	-78	1.21	96.5	11.55	21.6	0.1
1230	2	0.31	-124	0.380	666.0	8.92	22.7	0.0
1500	3	0.28	-20	0.372	>999	8.93	22.6	0.0

1500 - Collected sample

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-32S Weather: Hazy, Humid, 80's

Date: 6-21-01 Purge Water Disposal: Drum

Sampled By: KS / KR Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 26.8 Water Column (ft): 17.2

Depth to Water(ft): 9.6 Volume of Water in Well (gal) 2.80

Depth to Product (ft): — Volume of Water to Remove (gal): 8.41

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 1205 Purge Rate: 1/4 gal/min

End Purging: 1328 Volume of Water Removed (gal): 15

Method of Purge: Peristaltic Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Turbid light brown, no sheen, no odor

Samples Collected: (analyses / no. bottles)
(2 bottles each:) VOCs, SVOCs, PCBs
(1 bottle each:) ~~PCBs~~, Cyanide, Hexavalent Chromium, TAL Metals filtered & unfiltered Laboratory : STL CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity ~~mS/cm~~ S/m	Turbidity NTU	pH SU	Temperature C° ~~F°~~	Salinity %
initial	0	7.02	275	0.337	602.0	6.28	16.09	0.0
1220	1	3.64	283	0.351	161.0	6.29	14.89	0.0
1236	2	2.74	285	0.356	11.9	6.28	14.99	0.0
1250	3	2.66	289	0.354	-7.4	6.28	14.98	0.0
1308	4	2.65	291	0.354	-10.0	6.27	15.00	0.0
1327	5	2.69	289	0.354	-10.0	6.27	15.30	0.0

1350 - Collected sample

* Re-sample due to warm samples from Fed X not delivering on time

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-33S Weather: Sunny 80's

Date: 6-26-01 Purge Water Disposal: Drum

Sampled By: KS/RF Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 16.7 Water Column (ft): 7.2

Depth to Water(ft): 9.5 Volume of Water in Well (gal) 1.17

Depth to Product (ft): — Volume of Water to Remove (gal): 3.52

well diameter:	1 in	2 in	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 1056 Purge Rate: 1/4 gal/min

End Purging: 1130 Volume of Water Removed (gal): 7.0

Method of Purge: Peristaltic Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Turbid light brown, turning clear after initial volume, no sheen, no odor

Samples Collected: (analyses / no. bottles) (2 bottles each:) VOCs, SVOCs, PCBs
(1 bottle each:) Cyanide, Hex Cr, TAL Metals
filtered & unfiltered Laboratory: STL-CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity ~~mS~~/cm - ~~Stm~~	Turbidity NTU	pH SU	Temperature C° - ~~F~~	Salinity %
1105 initial	0	2.88	119	1.56	153.0	7.05	15.08	0.1
1109	1	0.00	93	1.54	16.7	6.98	14.76	0.1
1113	2	0.00	82	1.54	13.2	6.98	14.79	0.1
1117	3	0.00	81	1.54	-10.0	6.98	14.79	0.1
1121	4	0.00	75	1.53	-3.5	6.99	14.88	0.1
1125	5	0.00	70	1.53	38.8	7.00	14.89	0.1
1129	6	0.00	70	1.53	-10.0	7.00	14.80	0.1

1145 - Collected sample.

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-33 I Weather: Sunny 80's

Date: 6-26-01 Purge Water Disposal: Drum

Sampled By: KS/RF Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 48.5 Water Column (ft): 38.95

Depth to Water(ft): 9.55 Volume of Water in Well (gal) 6.34

Depth to Product (ft): — Volume of Water to Remove (gal): 19.0

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 0817 Purge Rate: 1/2 gal/min

End Purging: 0935 Volume of Water Removed (gal): 38

Method of Purge: Grundfos Pump. Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: turbid light brown, no sheen, no odor

Samples Collected: (analyses / no. bottles) (2 bottles each:) VOCs, SVOCs, PCBs

(1 bottle each:) Cyanide, Hex Cr, TAL Metals

filtered & unfiltered Laboratory: STL-CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity ~~mS/cm~~ - ~~S/m~~	Turbidity NTU	pH SU	Temperature C° - F°	Salinity %
initial	0	9.82	28	3.05	103.0	5.99	18.82	0.2
0830	1	0.00	-128	3.03	36.0	6.73	15.54	0.1
0843	2	0.00	-131	3.02	40.8	6.74	15.64	0.1
0856	3	0.00	-133	3.02	93.2	6.75	15.64	0.1
0909	4	0.0	-134	3.00	60.9	6.75	15.69	0.1
0922	5	0.0	-135	2.97	42.4	6.76	15.77	0.1
0935	6	0.0	-136	2.94	38.6	6.79	15.79	0.1

0945 Collected sample
1000 Collected MS & MSD
"1500" Collected Replicate Rep. 2

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-33D Weather: Sunny 80's

Date: 7-12-01 & 7-13-01 Purge Water Disposal: Drum

Sampled By: KS/ML Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 122.1 Water Column (ft): 111.94

Depth to Water(ft): 10.16 Volume of Water in Well (gal) 18.24

Depth to Product (ft): — Volume of Water to Remove (gal): 54.7

well diameter:	1 in	2 in	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 0740 (7/12) Purge Rate: ½ gal/min - 1 gal/min

End Purging: 1330 (7/13) Volume of Water Removed (gal): 72.9

Method of Purge: Grundfos & Whale Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Turbid brown, no sheen, no odor

Samples Collected: (analyses / no. bottles)
2-(2 bottles each) VOCs, SVOCs, PCBs
2-(1 bottle each) Cyanide, Hex Cr, TAL metals (U&F)

Laboratory: STL-CT

Field Measurements:

Time	Volume ~~gal~~	Dissolved O_2 mg/L	ORP mV	Conductivity mS/cm - ~~S/m~~	Turbidity NTU	pH SU	Temperature C° - ~~F°~~	Salinity %
initial	0	7.82	142	0.30	324.0	9.18	14.3	0.0
1019	1	0.0	-62	0.298	999	9.31	17.6	0.0
1230	Pump not	working	(Grundfos)					
7/13 whale Pump initial 0720		3.15	56	0.329	999	9.98	14.0	0.0
0820	2	2.34	94	0.309	999	9.50	14.3	0.0
0928	3	2.40	107	0.300	999	9.26	14.4	0.0
1330	4	2.51	126	0.308	999	9.19	14.6	0.0

1330 - Collected sample

1345 - Collected replicate sample "Rep-3"

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-34S Weather: Sunny 80's

Date: 6-29-01 Purge Water Disposal: Drum

Sampled By: KS / RF Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 16.3 Water Column (ft): 8.0

Depth to Water(ft): 8.3 Volume of Water in Well (gal) 1.3

Depth to Product (ft): — Volume of Water to Remove (gal): 3.9

well diameter:	1 in	2 in	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 1119 Purge Rate: ½ ¼ gal/min

End Purging: 1145 Volume of Water Removed (gal): 7.0

Method of Purge: Peristaltic Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Turbid light brown, becoming clear after first volume, no sheen, no odor

Samples Collected: (analyses / no. bottles) (2 bottles each:) VOCs, SVOCs, PCBs
(1 bottle each:) Cyanide, Hex Cr, TAL Metals (U&F)

Laboratory: STL-CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity mS/cm - S/m	Turbidity NTU	pH SU	Temperature C° - F°	Salinity %
initial	0	19.99	134	0.896	284	7.35	15.2	0.0
1123	1	7.74	124	0.905	59.8	6.94	15.1	0.0
1127	2	6.92	113	1.12	30.6	6.89	15.2	~~0.0~~ 0.1 KS
1131	3	6.34	107	1.08	23.2	6.88	15.7	0.0
1135	4	5.98	101	1.04	20.5	6.87	16.1	0.0
1139	5	5.66	97	0.97	22.5	6.87	15.2	0.0
1143	6	5.13	93	0.92	17.0	6.87	15.5	0.0

1200 - Collected sample

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-34I Weather: Sunny, 80's

Date: 7-6-01 Purge Water Disposal: Drum

Sampled By: KS/ML Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 47.9 Water Column (ft): 40.95

Depth to Water(ft): 6.95 Volume of Water in Well (gal) 6.67

Depth to Product (ft): — Volume of Water to Remove (gal): 20.00

well diameter:	1 in	2 in	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 1118 Purge Rate: ½ gal/min

End Purging: 1224 Volume of Water Removed (gal): 33.5

Method of Purge: Grundfos Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Turbid light brown, turning clear after initial volume, no sheen, no odor

Samples Collected: (analyses / no. bottles) (2 bottles each:) VOCs, SVOCs, PCBs (1 bottle each:) Cyanide, Hex. Cr, TAL Metals (UF)

Laboratory: STL-CT

Field Measurements:

Time	Volume ~~gal~~	Dissolved O_2 mg/L	ORP mV	Conductivity mS/cm ~~S/m~~	Turbidity NTU	pH SU	Temperature C° ~~F~~	Salinity %
1118	0	4.56	-118	1.50	526.0	9.48	14.9	0.1
1131	1	0.0	-60	1.84	10.0	6.33	15.8	0.1
1145	2	0.0	-54	1.82	-10.0	6.33	15.0	0.1
1157	3	0.0	-52	1.77	-10.0	6.32	15.7	0.1
1210	4	0.23	-42	1.77	-10.0	6.33	15.9	0.1
1223	5	0.09	-44	1.77	-10.0	6.32	15.7	0.1

1230 - Collected sample

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-34D Weather: Cloudy, 70's

Date: 7-17-01 Purge Water Disposal: Drum

Sampled By: KS/ML Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 122.35 Water Column (ft): 113.35

Depth to Water(ft): 9.0 Volume of Water in Well (gal) 18.47

Depth to Product (ft): — Volume of Water to Remove (gal): 55.42

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 0849 (7/17) Purge Rate:

End Purging: 1131 (7/19) Volume of Water Removed (gal): 56

Method of Purge: Grundfos Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Very light brown - to clear, no sheen, no odor

Samples Collected: (analyses / no. bottles)
(2 bottles each:) VOCs, SVOCs, PCBs
(1 bottle each:) Cyanide, Hex Cr, TAL Metals (U+F)

Laboratory : STL CT

Field Measurements:

Time	Volume ~~gal~~	Dissolved O_2 mg/L	ORP mV	Conductivity mS/cm - ~~S/cm~~	Turbidity NTU	pH SU	Temperature C° - ~~F~~	Salinity %
initial	0	10.69	-14	0.367	65.9	10.02	15.1	0.0
7/18 0728	Begin purging							
1120	1	0.32	-59	0.372	691.0	9.00	19.3	0.0
1320	2	0.34	-23	0.402	999	8.66	20.7	0.0
7/19 1130	3	0.34	-23	0.382	999	8.65	15.3	0.0

1200 - collected sample.

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-35S Weather: Sunny 80's

Date: 6-28-01 Purge Water Disposal: Drum

Sampled By: KS/RF Well Diameter / Type: 2 inch PVC

Depth of Well (ft): 16.8 Water Column (ft): 6.3

Depth to Water(ft): 10.5 Volume of Water in Well (gal) 1.02

Depth to Product (ft): — Volume of Water to Remove (gal): 3.0

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 1203 Purge Rate: 1/2 gal/ 7 min

End Purging: 1318 Volume of Water Removed (gal): 15

Method of Purge: Peristaltic Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Turbid light brown, becoming clear after first volume, no sheen, no odor

Samples Collected: (analyses / no. bottles) (2 bottles each:) VOCs, SVOCs, PCBs. (1 bottle each:) Cyanide, Hex. Chromium, TAL Metals (U+F)

Laboratory: STL-CT

Field Measurements:

Time	Volume gal	Dissolved O_2 mg/L	ORP mV	Conductivity ~~mS/cm~~ - ~~S/m~~	Turbidity NTU	pH SU	Temperature C° - ~~F~~	Salinity %
Initial	0	9.71	106	0.299	246	7.08	19.8	0.0
1217	1	7.55	134	0.283	46.2	6.54	17.2	0.0
1230	2	7.58	136	0.286	11.1	6.57	17.1	0.0
1245	3	6.86	133	0.286	10.9	6.59	17.1	0.0
1302	4	7.45	128	0.286	10.8	6.64	17.2	0.0
1317	5	7.33	125	0.286	9.4	6.63	17.3	0.0
1330 —	sample							

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-35I Weather: Sunny 80's

Date: 6-28-01 Purge Water Disposal: Drum

Sampled By: KS/RF Well Diameter / Type: 2inch PVC

Depth of Well (ft): 47.90 Water Column (ft): 38.05

Depth to Water(ft): 9.85 Volume of Water in Well (gal) 6.20

Depth to Product (ft): - Volume of Water to Remove (gal): 18.60

well diameter:	1 in	(2 in)	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 1010 Purge Rate: ½ gal/min

End Purging: 1125 Volume of Water Removed (gal): 37.2

Method of Purge: Grundfos Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Turbid brown, turning clear after first volume, no sheen, no odor

Samples Collected: (analyses / no. bottles)
(2 bottles each:) VOCs, SVOCs, PCBs
(1 bottle each:) Cyanide, Hex Cr, TAL Metals (U&F)

Laboratory: STL-CT

Field Measurements:

Time	Volume ~~gal~~	Dissolved O_2 mg/L	ORP mV	Conductivity ~~mS/cm~~ - ~~S/m~~	Turbidity NTU	pH SU	Temperature ~~C°~~ - ~~F°~~	Salinity %
Initial	0	14.37	12	1.65	422.0	6.89	17.3	0.1
1022	1	5.82	-19	1.76	126	6.80	~~15.0~~ 15.0	0.1
1034	2	4.31	-26	1.78	85.9	6.79	15.0	0.1
1046	3	3.17	-30	1.74	89.0	6.80	15.0	0.1
1058	4	2.23	-31	1.70	88.0	6.80	15.1	0.1
1112	5	1.46	-33	1.70	91.2	6.80	15.3	0.1
1124	6	0.90	-34	1.74	92.0	6.80	15.3	0.1

1145: Collected sample.

Well Sampling Data Form

Client: MBA Manorhaven LLC **Project Number:** 77101Y

Site Location: Former Thypin Steel Facility, Manorhaven, NY

Well No: MW-35D Weather: cloudy, 70's

Date: 7/19/01 Purge Water Disposal: Drum

Sampled By: KS/ML Well Diameter / Type: 2-inch PVC

Depth of Well (ft): 115.7 Water Column (ft): 105.11

Depth to Water(ft): 10.59 Volume of Water in Well (gal) 17.13

Depth to Product (ft): — Volume of Water to Remove (gal): 51.39

well diameter:	1 in	2 in	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 0835 Purge Rate: 5 3oz / min steady

End Purging: 1421 Volume of Water Removed (gal): 68.5

Method of Purge: Whale Pump Method of Sampling: Disposable Bailer

Physical Appearance/ Comments: Turbid light brown/grey - cloudy, no sheen, no odor.

Samples Collected: (analyses / no. bottles) (2 bottles each:) VOCs, SVOCs, PCBs. (1 bottle each:) Cyanide, Hex Cr, TAL Metals (U+F)

Laboratory: STL-CT

Field Measurements:

Time	Volume ~~gal~~	Dissolved O_2 mg/L	ORP mV	Conductivity mS/cm - ~~S/m~~	Turbidity NTU	pH SU	Temperature C° - ~~F°~~	Salinity %
initial	0	4.4	46	0.667	270	11.6	14.3	0.0
0915	1	0.33	-9	1.10	353	11.83	14.5	0.0
1105	2	1.2	114	0.351	999	9.09	14.6	0.0
1310	3	1.2	126	0.372	999	8.7	15.0	0.0
1420	4	1.5	63	0.373	999	8.69	15.1	0.0

1430 - Collected samples.

Table G1. Summary of Natural Attenuation Parameters, Chloride, TDS, and CN Detected in Groundwater, Former Thypin Steel, Inc. Facility, Manorhaven, New York.

Parameter (Concentrations in mg/L)	Designation: / Sample Date:	GW-12 09/28/1999	GW-13 09/28/1999	GW-14 09/28/1999	GW-15 09/28/1999	MW-1 11/28/2000	MW-2 11/29/2000	MW-21 11/27/2000
Alkalinity		NA	NA	NA	NA	49.0	182	37
Carbon Dioxide		10U	10U	10U	10U	82	86	13
Chloride		2.7	2.7	6.2	2.7	17.4	4.98	2.79
Cyanide (CN), Total		NA	NA	NA	NA	NA	NA	NA
Dissolved Oxygen		2.5	2.7	2.5	2.7	7.0	6.4	8.4
Ethane		0.0004U	0.0004U	0.0004U	0.0004U	0.002U	0.002U	0.002U
Ethene		0.0004U	0.0004U	0.0004U	0.0004U	0.001U	0.001U	0.001U
Ferrous Iron		NA	NA	NA	NA	0.05U	0.05U	0.05U
Nitrite		0.949	0.381	1.55	1.02	0.1U	0.1U	0.1U
Sulfate		27.9	16.0	27.3	209.0	22.8U	357	10.4
Total Dissolved Solids (TDS)		150	100	160	360	116	712	73.0
Nitrate		0.949	0.381	1.55	1.02	NA	NA	NA
TOC		10.6	0.6U	1.0	4.8	NA	NA	NA
Sulfate		27.9	16.0	27.3	209.0	NA	NA	NA
Carbon Dioxide[1]		10U	10U	10U	10U	NA	NA	NA
Chloride		2.7	2.7	6.2	2.7	NA	NA	NA
Dissolved Oxygen		2.5	2.7	2.5	2.7	NA	NA	NA
Dissolved Iron		0.49	0.3	0.34	0.39	NA	NA	NA
Dissolved Manganese		0.22	0.23	0.64	0.19	NA	NA	NA
Turbidity (NTU)		71	11	510	294	NA	NA	NA
Salinity[2]		0.01	0	0	0.01	NA	NA	NA
pH[3]		6.58	7.05	7.45	6.93	NA	NA	NA
TDS		150	100	160	360	NA	NA	NA
Ethene		0.0004U	0.0004U	0.0004U	0.0004U	NA	NA	NA
Ethane		0.0004U	0.0004U	0.0004U	0.0004U	NA	NA	NA
Field Parameters								
Dissolved Oxygen		10.06	9.64	9.78	9.54	(4)	(4)	(4)
ORP (mV)		56.5	-105	54.5	-36.7	(4)	(4)	(4)
pH		6.58	7.05	7.45	6.93	(4)	(4)	(4)
Temperature (°C)		20.5	21.7	20.5	21.2	(4)	(4)	(4)
Conductivity (µs/cm)		0.287	0.11	0.147	0.293	(4)	(4)	(4)

mg/L - Milligrams per liter
TOC - Total Organic Carbon
TDS - Total Dissolved Solids
NTU - Nephelometer Turbidity Units
U - Indicates compound analyzed for but not detected
°C - Degrees Celsius
µs/cm - Micro seimens per centimeter
mV - Milli Volts
[1] Determined by Acidity Method 2310
[2] Reported in percent
[3] Reported in Standard Units
[4] Data is presented in well logs in Appendix G.
Note: Turbidity, salinity and pH were measured in the field at the time of groundwater sampling.

Table G1. Summary of Natural Attenuation Parameters, Chloride, TDS, and CN Detected in Groundwater, Former Thypin Steel, Inc. Facility, Manorhaven, New York.

Parameter (Concentrations in mg/L)	Designation: / Sample Date:	MW-22 11/29/2000	MW-23 11/28/2000	MW-24 11/28/2000	MW-25 11/29/2000	MW-26 11/27/2000	MW-28 11/27/2000
Alkalinity		46.0	108	124	236	179	102
Carbon Dioxide		49	34	66	97	30	56
Chloride		108	3.14	4.63	5.81	152	3.10
Cyanide (CN), Total		NA	10U	10U	NA	NA	NA
Dissolved Oxygen		6.8	9.2	7.2	5.8	7.6	7.6
Ethane		0.002U	0.002U	0.002U	0.002U	0.002U	0.002U
Ethene		0.001U	0.001U	0.001U	0.001U	0.001U	0.001U
Ferrous Iron		0.05U	0.05U	0.05U	0.05U	0.05U	0.05U
Nitrite		0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
Sulfate		38.3	87.6	224	61.4	36.8	54.6
Total Dissolved Solids (TDS)		297	239	461	336	491	213
Nitrate		NA	NA	NA	NA	NA	NA
TOC		NA	NA	NA	NA	NA	NA
Sulfate		NA	NA	NA	NA	NA	NA
Carbon Dioxide[1]		NA	NA	NA	NA	NA	NA
Chloride		NA	NA	NA	NA	NA	NA
Dissolved Oxygen		NA	NA	NA	NA	NA	NA
Dissolved Iron		NA	NA	NA	NA	NA	NA
Dissolved Manganese		NA	NA	NA	NA	NA	NA
Turbidity (NTU)		NA	NA	NA	NA	NA	NA
Salinity[2]		NA	NA	NA	NA	NA	NA
pH[3]		NA	NA	NA	NA	NA	NA
TDS		NA	NA	NA	NA	NA	NA
Ethene		NA	NA	NA	NA	NA	NA
Ethane		NA	NA	NA	NA	NA	NA
Field Parameters							
Dissolved Oxygen		(4)	(4)	(4)	(4)	(4)	(4)
ORP (mV)		(4)	(4)	(4)	(4)	(4)	(4)
pH		(4)	(4)	(4)	(4)	(4)	(4)
Temperature (°C)		(4)	(4)	(4)	(4)	(4)	(4)
Conductivity (µs/cm)		(4)	(4)	(4)	(4)	(4)	(4)

mg/L - Milligrams per liter
TOC - Total Organic Carbon
TDS - Total Dissolved Solids
NTU - Nephelometer Turbidity Units
U - Indicates compound analyzed for but not detected
°C - Degrees Celsius
µs/cm - Micro seimens per centimeter
mV - Milli Volts
[1] Determined by Acidity Method 2310
[2] Reported in percent
[3] Reported in Standard Units
(4) Data is presented in well logs in Appendix G.
Note: Turbidity, salinity and pH were measured in the field at the time of groundwater sampling.

APPENDIX H

Risk Assessment

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1.0 INTRODUCTION

Roux Associates, Inc. (Roux Associates), on behalf of MBA Manorhaven, LLC, has prepared this human health risk assessment (RA) for the former Thypin Steel, Inc. (Thypin Steel) property in Manorhaven, New York (Site). The purpose of the RA is to evaluate whether residual concentrations of volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), target analyte list (TAL) metals, and cyanide in soil, groundwater, soil gas, and materials contained within subsurface building structures could pose a potential risk to future receptors at the Site.

This RA was prepared based on guidelines provided by the United States Environmental Protection Agency (USEPA) in, "Risk Assessment Guidance for Superfund. Volume I: Human Health Evaluation Manual (Part A) Interim Final" (RAGS) (USEPA, 1989) and supplemental guidance documents pertaining to RAGS. The proposed future land use of this Site is for residential purposes; therefore, the USEPA recommends that a conservative health protective approach be adopted that includes consideration of increased potential risk from chemical exposures due to behavior patterns that are consistent with the intended land use. Higher sensitivities to be considered include children in contact with soil and persons who derive some of their diet from home grown produce. Data used in the development of exposure estimates were obtained from monitoring events implemented in accordance with the following:

- Investigation Work Plan (IWP), Roux Associates, Inc., September 26,2000;
- Letter Report, "RE: Supplemental Investigation Scope of Work, Former Thypin Steel, Inc. Facility, Manorhaven, New York." January 23, 2001.

In accordance with the USEPA guidelines, the RA used a stepped approach for evaluating the potential future risks for each exposure scenario. First, chemicals with a frequency of detection of less than 5 percent in each medium were eliminated from further evaluation. Secondly, the concentrations of detected chemicals retained from the first step were compared to appropriate published regulatory screening criteria. The site-related constituents that were retained by the screening (i.e., constituents with one or more concentrations that exceed the screening criteria) were subjected to a rigorous evaluation using USEPA algorithms to calculate the potential risk to assumed receptors. The calculated risks were then compared to USEPA recommended risk

values (i.e., hazard quotients [HQs] for noncarcinogenic chemicals, and Incremental Lifetime Cancer Risks [ILCRs] for carcinogenic chemicals).

This RA is organized into eight additional sections.

- Section 2: Discusses the Site Background, scope of the RA, and chemicals of potential concern;
- Section 3: Includes the Data Evaluation methodology;
- Section 4: Details the Exposure Assessment that considers potential receptors, relevant exposure pathways, and describes the models used in the RA;
- Section 5: Provides the Toxicity Assessment, performed to gather and evaluate both qualitative and quantitative toxicological information available for each COPC.
- Section 6: Presents the Risk Characterization, a comparison of exposure estimates to relative criteria;
- Section 7: Provides an Uncertainty Analysis that evaluates possible or probable conservatism in the calculations of the exposure estimates and risk;
- Section 8: Discusses the Conclusions; and
- Section 9: Contains a Reference section documenting the literature cited.

2.0 SITE BACKGROUND

The former Thypin Steel property is located at 5 Sagamore Hill Drive in the Village of Manorhaven, New York (Figure 1 of the SI Report). The Site is bordered to the north by Yennicock Avenue, to the south by Toms Point Lane, to the east by Sagamore Hill Drive, and to the west by Manhasset Bay. The property is approximately 11 acres in size and is currently vacant with no buildings present.

Previous environmental investigations/remedial activities were completed at the Site as part of the building demolition and potential property transfer. A summary of these activities is provided in the Section 2.3 of the Background Information. Soil above the water table primarily consists of sand with depth to groundwater ranging from 8 feet (ft) to 12 ft below land surface (bls).

3.0 DATA EVALUATION

The purpose of the data evaluation as part of the RA is to consolidate the data into a format suitable for conducting the RA, and to identify which chemicals, if any, are Site-specific chemicals of potential concern (COPCs) in the environmental media. Chemicals of potential concern are chemicals that are potentially site-related and whose data are of sufficient quality for use in the RA.

The RA for the Thypin Steel Site utilizes analytical data for environmental media (soil, groundwater, materials from within subsurface building structures, and soil gas) sampled at the Site. Thus, the RA analytical database is consolidated from data generated in accordance with the IWP and SI.

The data evaluation for the RA was a three-step process that involved:

- Summarizing the analytical data;
- Determining the COPCs in environmental media; and
- Determining appropriate chemical media concentrations for each COPC.

The following sections describe the technical approach for summarizing and evaluating the data.

3.1 Summary of Analytical Data

The sampling efforts conducted at the Site generated analytical data that was used to chemically characterize the environmental media at the Site. Media sampled at the Site included soil, subsurface building structure materials, groundwater, and soil gas (see Tables H1 through H8).

The data set employed in the RA had undergone a data usability evaluation, which is summarized in Section 4.2 of the SI Report and presented as a Data Usability Summary Report (DUSR) in Appendix I of the SI Report. For the most part, the results presented herein were not affected by the outcome of the DUSR. Where samples were reanalyzed (for example due to internal standard area suppression) and both analyses were reported, the highest concentration of each detected analyte was used. In addition, data for several analytes were also used "as is,"

although they are likely the result of laboratory artifacts (e.g., acetone, dichloromethane, di-n-butylphthalate, bis(2-ethylhexyl)phthalate).

3.1.1 Soil Quality

A series of soil samples were collected specifically for the development of theoretical residential risk estimates and included six composite samples collected each at two sampling intervals, one interval was at the surface to a depth of 2 ft bls, the second sampling interval was from 4 ft to 6 ft bls. Each composite soil sample consisted of six individual soil samples collected along a north to south transect, separated by approximately 100 ft along the transect from the eastern fence line that borders the property (Plate 5 of the SI Report). The strategy behind the compositing of samples was to collect soil samples that were representative of Site-wide concentrations. Each of these composite samples was analyzed for VOCs and TAL metals.

A comparison of the soil VOC and TAL metals concentrations collected for the RA (Tables 4 and 5 of the SI Report) with other soil boring data collected as part of the Site investigation (Tables 6, 12, and 13 of the SI Report) verify that these RA samples are representative of the type of chemicals and are at concentration levels consistent with those previously measured. In addition to the composite samples, the New York State Department of Health (NYSDOH) requested that twelve micro-surface soil samples (0 to 2 inches (in) bls) (Plate 5 of the SI Report) also be collected and analyzed for VOCs and TAL Metals (Tables 4 and 5 of the SI Report).

Data for evaluating exposure to SVOCs was obtained from twenty-one soil borings sampled across the Site (Table 6 and Plate 5 of the SI Report), ranging in depths from surface to 12 ft bls, four test pit samples collected in the vicinity of a former UST, and an additional 8 samples collected at the 0 to 2 ft interval bls at eight of the twelve locations where the microsurface soil samples were collected (Table 6 and Plate 5 of the SI Report).

3.1.2 Groundwater Quality

The groundwater evaluation included the collection of groundwater samples from seventeen water table monitoring wells between June 13, 2001 and June 29, 2001. The recent monitoring well data are considered the most representative of chemical concentrations at the water table.

All seventeen groundwater samples were analyzed for VOCs, SVOCs, TAL metals (both filtered and unfiltered), cyanide, and PCBs.

A comparison of the most recent groundwater sample data collected from monitoring wells with those collected previously show that these data are consistent in both the type of groundwater chemicals and concentration levels commonly observed at the Site (Tables 3, 7, 8, 27, 28, and 29 of the SI Report). Therefore, all groundwater data generated between the above time periods and collected from monitoring wells were considered in this risk assessment. Furthermore, the few liquid samples that were obtained from within subsurface structures were not considered as part of Site-wide groundwater. This was primarily due to the different sample collection method (i.e., grab) and the limited number of samples collected. In addition, because there were no apparent differences between the concentration levels or analytes detected in these grab samples and those collected from the monitoring wells, the results of the liquid sample analyses were incorporated into the RA by default. Therefore, only the analytical data associated with the July 20, 2001 groundwater samples collected from monitoring wells were used in the RA.

3.1.3 Material Contained Within Subsurface Building Structures

The primary subsurface building structures at the Site included six former leaching structures and a former septic chamber. Three of these structures were observed by Roux Associates to be approximately 10 ft in diameter and constructed of concrete hollow blocks from approximately 3 ft bls to the water table. Two structures were observed to be approximately 3 ft in diameter and constructed of brick at the top underlain with concrete hollow blocks from approximately 3 ft bls to the water table. The sixth structure was approximately 10 ft in diameter and constructed of concrete hollow blocks from approximately 3 ft bls to the water table. All structures appeared to contain fill and/or wood debris. In addition a former septic chamber was identified at the Site. The former septic chamber was constructed of concrete, and its dimensions are approximately 30 ft in length by 20 ft in width by 10 ft in depth. The top of the former septic chamber was observed to be approximately 3 ft bls. The septic chamber was also observed to be partially filled (approximately half full) with liquid and sediment. A more detailed description of the subsurface structures can be found in Section 4.5.1 of the SIRR.

Subsurface building structure material samples were analyzed for VOCs, SVOCs, TAL metals, and cyanide. Analytical data associated with each of these structures are unique and as such are treated in a manner consistent with limited and localized exposure rather than considering the COPCs as representative of the Site as a whole. Analytical data were grouped based on the general location of structures and are as follows.

- Northern Area: Includes TP-19 and TP-31;
- Western Area: Includes TP-12, TP-33, TP-35 and TP-36;
- Central Area: Includes TP-16 and TP-32 (contains the leaching pool (LP) and septic tank (ST) samples); and
- Eastern Area: Includes TP-15 and TP-21.

All data for the VOC, SVOC, TAL metals, and cyanide analyses performed on the solid material contained within subsurface structures are presented in Tables 15 through 20 of the SI Report.

3.1.4 Soil Vapor

The soil vapor survey was performed at and surrounding four water quality borings onsite where the four highest total VOC concentrations at the water table were previously detected. These borings include SB-7, SB-34, and SB-59 in the west-central portion of the Site, and borings SB-24 and SB-45 in the south-central portion of the Site along Tom's Point Lane (Plate 4 of the SI Report). Two discrete samples were collected for analysis at each sampling location; one sample at 3 ft bls; and the second sample at 6 ft bls. Soil gas VOC analyses for each of these sampling intervals is summarized in Table 30 of the SI Report.

3.2 Resolution of Data Qualifiers

As part of any data quality review process, the laboratory conducting the analyses of the environmental samples attaches various qualifiers to the data. Because the qualifiers may indicate potential uncertainties regarding the chemical identity and chemical concentrations, the effect of data qualifiers on the data must be considered prior to evaluating chemical data. The qualifiers encountered in the Site analytical data and the impact of these qualifiers on the review of the data is described below.

The typical qualifiers encountered in the analytical database for the Site were the following:

- B
- J
- U

When present with organic data, the "B" qualifier indicates that the organic analyte is found in the associated laboratory blank as well as the sample. Consistent with USEPA (1989) guidance, any "B" qualified data are used in the screening process at the reported concentration. The "B" qualifier in inorganic data indicates the chemical has been detected above the instrument detection limit, but is below the method detection limit. The "J" qualifier indicates that the associated numerical value is an estimated quantity (USEPA, 1989). For purposes of the screening, all concentrations associated with the "J" and "B" qualifiers are used at the reported concentrations.

The "U" qualifier indicates that the chemical was analyzed for and not detected in that sample. If a specific chemical is not detected in any samples in a given medium (i.e., all the samples analyzed for a given chemical in a given medium have "U" qualifiers), then that chemical is eliminated from further consideration in that medium.

The numerical value associated with the "U" qualifier is considered to represent the sample quantitation limit (SQL). A chemical that is analyzed for but reported as not detected may actually be present at a concentration less than the SQL but greater than zero. Because the chemical could be present at any concentration up to the SQL, it is considered by the USEPA to be present at least at a concentration equal to one half its SQL (USEPA, 1989). Thus, for chemicals registering at least one detection in a sample, the SQL of the remaining samples reported as not detected (i.e., those associated with a "U" qualifier) in the data set were divided by two, and the resulting proxy concentrations were used in the screening process (USEPA, 1989).

3.3 Elimination of Essential Nutrients

RAGS (USEPA, 1989) states (i.e., the USEPA), "chemicals that are (1) essential human nutrients, (2) present at low concentrations, and (3) toxic only at very high doses (e.g., higher than those that could be associated with contact at the Site) need not be considered further in the quantitative risk assessment. Examples of such chemicals are iron, magnesium, calcium, potassium and sodium." Based on the USEPA guidance, these metals were eliminated from further evaluation in the RA. Following the removal of all blanks, matrix spikes and matrix spike duplicates and the data associated with essential nutrients, the samples from each environmental medium (soils, groundwater, and subsurface building structure materials) were grouped together by analytical suite (VOCs, SVOCs, PCBs, and metals).

3.4 Presentation of Data

The values used in the RA (such as the reported chemical concentrations in an environmental medium) are presented in scientific notation format. For example, one in one million can be expressed as 0.000001 or 1 in 1,000,000 or $1x10^{-6}$ or 1E-6. Similarly, a concentration of ten thousand micrograms per liter (µg/L) can be expressed as 10,000 or $1x10^{4}$ or 1E+4. In order to be consistent with the computer-generated format shown in the spreadsheet tables, all numbers in the text of the RA are presented in the scientific notation form of 1E-6 or 1E+4.

The soil concentrations for the organic compounds (VOCs, SVOCs, TPHs, and PCBs) were originally reported from the laboratory in units of micrograms per kilogram (µg/kg). In order to be consistent with published chemical data that typically report soil concentrations in milligrams per kilogram (mg/kg), all chemical concentrations originally reported in µg/kg were converted to mg/kg prior to the development of exposure estimates. All soil and solid material summary tables contained within this document are also in units of mg/kg. Groundwater data were all reported in units of µg/L and are retained in these units.

The following sections briefly describe the statistical parameters that were generated for each chemical that was detected at least one time in a given sampling medium. These parameters are shown on Tables H-1 through Table H-8, which are the screening tables for soil, groundwater, solid material from within subsurface building structures, and soil gas.

3.4.1 Frequency of Detection

The frequency of detection for a given chemical in a given medium is the number of samples with measurable concentrations of the given chemical exceeding the SQL compared to the total number of samples analyzed. For all chemicals, the frequency of detection is reported both as a number (e.g., 8 detections out of 21 total samples analyzed) and as a percent (e.g., detected in 38 percent of the samples).

3.4.2 Range of Concentrations

The range of concentrations presents the minimum and maximum concentrations of a given chemical in a given medium. Following the count of the frequency of detection, all chemicals that were undetected in samples, following the USEPA guidelines, were subsequently assumed to be present at concentrations equal to one-half of the SQL (Section 3.2). Thus, the minimum and maximum concentrations reported do not necessarily correspond to the minimum and maximum detected concentrations. For example, in samples with elevated SQLs due to sample dilution, the concentration corresponding to one-half of the SQL may be greater than the maximum concentration associated with a confirmed detection. In such instances, the concentration corresponding to one-half of the SQL is the concentration reported on the table for the maximum range of concentrations.

3.5 Screening Methodology for Determining Chemicals of Potential Concern

Selection of COPCs in environmental media present at the Site (soil, groundwater, solid materials contained within subsurface building structures, and soil gas) was based on both the frequency of detection of each chemical in each medium and a screening methodology comparing Site concentrations to relevant criteria.

In accordance with USEPA guidelines, chemicals with a frequency of detection of 5 percent or less in all samples within a given medium were eliminated from further consideration in the RA (USEPA, 1989). This approach is consistent with USEPA guidance provided in RAGS (USEPA, 1989) that recommends that chemicals that are infrequently detected (e.g., detected only once in twenty samples analyzed, or 5 percent) be eliminated from further consideration in a risk assessment.

Following the elimination of chemicals that were detected 5 percent or less in soil, groundwater, solid materials within subsurface building structures, and soil gas, the maximum concentrations of the remaining chemicals were compared to media-specific screening criteria. These media-specific screening criteria were the risk-based concentrations (RBCs) developed by Region III of the USEPA (1993, 2001a) for soil and solid subsurface building structure materials, and the NYSDEC Ambient Water Quality Standards and Guidance Values (AWQSGVs) (NYSDEC, 2000) for groundwater. There is no relevant screening for soil gas, however, the Annual Guideline Concentrations (AGCs) (NYSDEC, 1997) and the Ambient Air Criteria (AACs) (USEPA, 2001b) were used as a very conservative mechanism for selecting site-related constituents in soil gas that should be retained for further evaluation. The guidance from USEPA Region III is used because Region II of the USEPA has not issued specific RA guidance, but instead recognizes the Region III guidance documents.

Although the NYSDEC has developed RSCOs for soil, these are not necessarily risk-based concentrations. Of the 34 organic constituents identified in soil and retained as COPCs for risk-based screening using the RBCs only four of them have RSCOs that were actually based on direct risk criteria. Of these four constituents, three are PAHs (benzo[a]anthracene, benzo[a]pyrene and dibenzo[a,h]anthracene) that were retained for detailed analysis in the risk assessment using the Region III RBCs (USEPA, 2001a) and would similarly have been retained if RSCOs had been used. The fourth constituent was bis(2-ethylhexyl)phthalate, which was not retained as a COPC using the Region III RBC and also would not have been retained using the appropriate RSCO. This demonstrates a good correlation between the RBCs and true risk-based RSCOs.

Of the remaining 30 constituents, 18 of them have RSCOs that were based on values developed for transfer of the constituent to groundwater and for the other 12 chemicals there was either no RSCO available or the derivation of the value was not evident. Thus, the majority of the available RSCOs were developed to be protective of groundwater quality, and consequently have no application to screening for potential risks from soil exposure at a residential site.

In contrast, the residential RBCs have been developed by USEPA Region III to provide a risk-based screening tool specifically for potential exposure to soil. Thus, the use of the RBCs provides a better and more consistent mechanism for screening for COPCs than the RSCOs.

3.5.1 USEPA Region III RBCs

Current guidance from USEPA Region III recommends using an absolute risk-based screening methodology for determining COPCs because this approach evaluates the total theoretical risk associated with the presence of a chemical in a given medium (USEPA, 1993; 2001a). This theoretical risk-based approach uses a table containing concentrations of over 600 chemicals in several media (soil, water, etc.) that correspond to a systemic HQ of 1 or an ILCR of 1E-6 (also expressed as 1 x 10^{-6} or 1 in a million) (USEPA, 2001a). These RBCs were developed using theoretical health protective default exposure scenarios for both residential and industrial (i.e., non-residential) land uses suggested by the USEPA and the best available toxicity factors (reference doses [RfD] and cancer potency factors [CPFs]) (USEPA, 1993, 2001a). The media concentrations presented in the risk-based table are sufficiently conservative and health protective such that the USEPA would typically not address these concentrations further in terms of risk to human health (USEPA, 1993).

3.5.1.1 Surrogate RBCs

There are seven chemicals, acenaphthylene, benzo[g,h,i]perylene, chrysene, phenanthrene, 4-chlorophenyl phenyl ether, and lead, detected in soil and/or solid materials contained within subsurface structures at the Site for which no toxicity factors are available, thus, there are no published RBCs (USEPA, 2001a). The RBC for acenaphthene of 4.69E+6 mg/kg was used for acenaphthylene and the RBC for anthracene of 2.35E+7 mg/kg was used for phenanthrene, because the two respective compounds are structurally similar. Both benzo[g,h,i]perylene and pyrene are considered noncarcinogens (USEPA, 2001b), therefore the RBC for pyrene of 2.35E+6 mg/kg was used for benzo[g,h,i]perylene. The most closely related compounds to 4-chlorophenyl phenyl ether (4-chlorophenoxy benzene) were a group of chlorophenoxy compounds. As a conservative measure, the lowest RBC of 3.91E+4 mg/kg for 2-methyl-4-chlorophenoxyacetic acid (MCPA) was used as a surrogate for 4-chlorophenyl phenyl ether. For lead, the USEPA Office of Solid Waste and Emergency Response (OSWER) produced a directive recommending a screening level of 400 milligrams per kilogram (mg/kg) in soil for

residential use (USEPA, 1994a). This screening level of 400 mg/kg, which was developed using the USEPA's Integrated Exposure Uptake Biokinetic (IEUBK) model, is the equivalent of the RBC for lead in soil for residential land use (USEPA, 1994a; 2001a).

3.5.2 Ambient Water Quality Standards and Guidance Values

The New York State Department of Environmental Conservation (NYSDEC) has developed Ambient Water Quality Standards and Guidance Values (AWQSGVs) for evaluating potential toxic effects to human health and the environment associated with the presence of chemicals in groundwater (NYSDEC, 2000). The future land use for the Site is as a residential area and although the groundwater at the Site is not currently used, or anticipated to be used as a source of drinking water or for any other purpose in the future, GA classification concentrations for analytes were selected for use in the screening process because it is a sole source aquifer for the area. If a groundwater standard concentration for the GA classification was not available, then the compound was retained for further evaluation.

3.5.3 Annual Guideline Concentrations and Ambient Air Criteria

The soil gas survey results, in addition to VOCs in groundwater, will be used in assessing potential indoor air exposure to future residents based on the intended residential future use of the Site. There are no regulations for soil gas vapor concentrations issued by the USEPA, NYSDEC, and NYSDOH. There are no current regulations regarding residential indoor air quality administered by the USEPA or the NYSDEC, although the NYSDOH (1997) has issued guidance specifically pertaining to tetrachloroethene in both indoor and outdoor air.

In the absence of soil gas standards or other screening criteria, the measured soil gas concentrations at each sampling interval were screened using existing NYSDEC and NYSDOH ambient air guidelines. The NYSDEC Division of Air Resources document, "Guidelines for the Control of Toxic Ambient Air Contaminants" (NYSDEC, 1997) contains Annual Guideline Concentrations (AGCs) derived from toxicological data. The NYSDOH (1997) provides specific guidance for tetrachloroethene in indoor and outdoor air. USEPA Ambient Air Criteria (USEPA, 2001a) are also provided for comparative purposes along with the AGCs. If an ambient air AGC was exceeded or did not exist for a particular chemical, then that chemical was retained in the risk assessment for further evaluation. This screening method is considered

extremely conservative because actual soil gas concentrations are anticipated to undergo significant dilution/attenuation during vertical migration through the soil column and subsequent mixing with ambient air once at the ground surface.

3.6 Selection of Chemicals of Potential Concern

As stated previously, the selection of COPCs was based on both the frequency of detection of that compound and a comparison of the chemical's maximum concentration with the appropriate screening criteria. All compounds detected at a frequency of 5 percent or less in each environmental medium at the Site are eliminated from further consideration. Among the remaining chemicals (e.g., those with a detection frequency exceeding 5 percent), the maximum concentration of each chemical in soil, groundwater, solid material contained within subsurface structures, and soil gas is compared to its respective screening criteria discussed above (e.g., the residential USEPA Region III RBC for soil and solid materials; the NYSDEC AWQSGVs for groundwater; the NYSDEC AGCs for soil gas). If the maximum concentration of a chemical exceeded its respective screening criteria (USEPA Region III residential RBC, NYSDEC AWQSGV, or NYSDEC AGC) or if no screening criteria exist, then that chemical was retained as a COPC for further evaluation in the RA. The following sections present the COPCs that are determined for soil, groundwater, solid material contained within subsurface structures, and soil gas at the Site based on this process.

3.6.1 Soil

Surface soil, defined as the soil horizon from ground surface to 2 ft below land surface (bls) can theoretically be encountered as fugitive dusts, through direct contact during typical playground activities, or while gardening or performing other types of yard work. The surface soil samples collected were analyzed for VOCs, SVOCs, and TAL metals. Additional samples were collected in the 0 to 2 in bls depth interval and analyzed for VOCs and TAL metals. The data for both sampling intervals were evaluated together because it is likely that construction activities prior to actual residential building development will result in both a vertical and horizontal homogenization of surface soil across the Site. In addition, data were comparable for both sampling intervals and analyses performed.

Subsurface soil could potentially be encountered as a result of deep soil moving activities, such as digging associated with limited construction or installation of utility lines. The subsurface soil samples were collected at discrete horizons within the 0 to 12 foot depth interval and were analyzed for VOCs, SVOCs and TAL metals.

Table H-1 presents the frequency of detection, range of concentrations, maximum detected concentration, and the range of SQLs for all chemicals detected at least one time in the soil at the Site. Also shown in Table H-1 are the associated USEPA Region III RBCs for residential land use (USEPA, 2001a). As previously stated, COPCs were selected on the basis of a comparison of the maximum concentration with the associated USEPA Region III residential RBC. As shown on Table H-1, six chemicals were selected as COPCs in soil samples because maximum concentrations of these chemicals detected in the surface and subsurface soil samples are above their respective USEPA Region III residential RBC. These compounds, which are marked with an "*" on Table H-1 are:

- Benzo[a]anthracene
- Benzo[a]pyrene
- Benzo[b]fluoranthene
- Dibenzo[a,h]anthracene
- Indeno[1,2,3-cd]pyrene
- Arsenic

3.6.2 Groundwater

Three potential exposure scenarios were initial considered for groundwater. Based on the intended use of the property for residential purposes these pathways included:

- Exposure to groundwater drawn from an irrigation well;
- Exposure to vapors migrating from groundwater into the enclosed spaces of residential buildings; and
- Direct contact with groundwater by construction workers.

During the course of the Site investigation, it was observed that deeper (intermediate zone) monitoring wells provided a maximum flow rate of approximately 1 gallon per minute, while the shallow wells had a flow rate of 3 to 5 gallons per minute. While it is theoretically possible that irrigation wells could be installed, from a practical standpoint the likelihood of even one irrigation well being installed is minimal because the rate of water production is relatively low. Reasonably priced city water will be provided to each proposed residence such that installation

of an irrigation well is highly unlikely. Additionally, the proposed plot size of the future residences is small (the size of the front yard is proposed to be approximately 20 ft by 20 ft, while the size of the back yard is proposed to be approximately 40 ft by 35 ft), therefore, the installation and operation of an irrigation well would not be cost effective . As such, Roux Associates does not believe an irrigation exposure pathway is needed.

The groundwater exposure scenario considered that a theoretical exposure could occur through migration of vapors originating from chemicals dissolved in groundwater through the soil and into enclosed spaces of residential buildings. In addition, while there are no known users of the Site groundwater, the scenario also considered theoretical direct human contact with the groundwater at the Site during construction activities. Therefore, the samples included in the RA were all those analyzed for VOCs, SVOCs, PCBs, and unfiltered metals samples. Metals data associated with unfiltered groundwater samples were considered to be most representative of the type of groundwater to be encountered by potential receptors (i.e., construction workers) through direct contact.

Table H-2 presents the frequency of detection, range of concentrations, maximum detected concentrations for all chemicals detected at least one time in the groundwater samples collected at the Site. Also shown on Table H-2 are the NYSDEC Ambient Water Quality Standards and Guideline Values (AWQSGV) concentrations (NYSDEC, 2000). A chemical was selected as a COPC if the maximum concentration of the chemical exceeds its respective NYSDEC AWQSGV concentration or if no AWQSGV was available. As shown on Table H-2, there are twenty-three chemicals that were selected as COPCs in the groundwater because either their maximum concentrations exceed their respective NYSDEC AWQSGV concentration or no AWQSGV concentration was available. These chemicals, which are marked with an asterisk on Table H-2 are:

- 1,1,1-Trichloroethane
- 1,1-Dichloroethane
- cis-1,2-Dichloroethene
- Tetrachloroethene
- Trichloroethene
- Chrysene
- Indeno[1,2,3-cd]pyrene
- Aluminum
- Beryllium
- Chromium

- 1,2-Dichlorobenzene
- Benzo[a]anthracene
- Benzo[a]pyrene
- Benzo[b]fluoranthene
- Benzo[g,h,i]perylene
- Benzo[k]fluoranthene
- bis(2-Ethylhexyl)phthalate
- Cobalt
- Cyanide
- Hexavalent Chromium
- Lead
- Manganese
- Vanadium

3.6.3 Subsurface Structures

Because subsurface structures are immobile and assuming the solid material within them would also remain in place, the structures were divided into specific areas (Section 3.1.3). The solid materials are unlikely to be encountered, except in the limited context of ground invasive activities and any such theoretical encounter, could occur with limited frequency. Therefore, as a conservative health protective measure, each area was screened using the residential soil RBCs as was done with the soil in Section 3.6.1.

Tables H-3 through H-6 presents the frequency of detection, range of concentrations, maximum detected concentration, and the range of SQLs for all chemicals detected at least one time in the solid subsurface structure materials at the Site. Also shown in the tables are the associated USEPA Region III RBCs for residential land use (USEPA, 2001a). As previously stated, COPCs were selected on the basis of a comparison of the maximum concentration with the associated USEPA Region III residential RBC. As shown on Tables H-3 through H-6, several chemicals were selected as COPCs in solid subsurface structure materials because maximum concentrations of these chemicals detected are above their respective USEPA Region III residential RBC. These compounds, which are marked with an "*" on each of the tables are:

Northern Area (Table H-3)

- Benzo[a]anthracene
- Benzo[a]pyrene
- Benzo[b]fluoranthene
- Dibenzo[a,h]anthracene
- Indeno[1,2,3-cd]pyrene
- Antimony
- Arsenic
- Cadmium
- Lead

Western Area (Table H-4)

- Benzo[a]pyrene
- Dibenzo[a,h]anthracene
- Cadmium
- Lead
- Thallium
- Zinc

Central Area (Table H-5)

- Benzo[a]anthracene
- Benzo[a]pyrene
- Benzo[b]fluoranthene
- Dibenzo[a,h]anthracene
- Indeno[1,2,3-cd]pyrene
- n-Nitrosodi-n-propylamine
- Arsenic
- Cadmium
- Lead
- Thallium

Eastern Area (Table H-6)

- Benzo[a]anthracene
- Benzo[a]pyrene
- Benzo[b]fluoranthene
- Dibenzo[a,h]anthracene
- Indeno[1,2,3-cd]pyrene
- n-Nitrosodi-n-propylamine
- Arsenic

3.6.4 Soil Vapor

A soil vapor exposure scenario was constructed around the theoretical risk of exposure through migration of vapors originating from chemicals present in both soil and/or groundwater through the soil and into enclosed spaces of residential buildings. Because groundwater was determined to contain VOCs in certain areas of the Site, soil vapor samples were collected and analyzed for VOCs.

Tables H-7 and H-8 present the frequency of detection, range of concentrations, maximum detected concentrations for all volatile chemicals detected at least one time in the soil vapor samples collected at the Site at each respective sampling interval. Also shown on Tables H-7 and H-8 are the NYSDEC Air Guide Concentrations (AGCs) (NYSDEC, 1997). A chemical was selected as a COPC if the maximum concentration of the chemical exceeds its respective NYSDEC AGC or if no AGC was available. USEPA ambient air criteria are shown for

comparison to the NYSDEC AGCs. As shown on Tables H-7 and H-8, there are ten chemicals (nine chemicals at each soil gas sampling interval) that were selected as COPCs in the soil vapor because either their maximum concentrations exceed their respective NYSDEC AGC or no AGC was available. These chemicals, which are marked with an asterisk on Tables H-7 and H-8 are:

- 1,1-Dichloroethene
- Benzene
- Bromomethane
- Bromodichloromethane
- Carbon disulfide
- Carbon tetrachloride
- Chloroform
- Methylene Chloride
- Tetrachloroethene
- Trichloroethene

3.7 Determining Appropriate Exposure Concentrations for the Chemicals of Potential Concern

Following the determination of the COPCs, the final step in the data evaluation process is to determine the appropriate chemical media concentration (i.e., the concentration term) for use in the intake equations associated with the risk assessment. Current guidance from the USEPA (USEPA, 1992a; Personal communication, 1996) directs the use of the average and 95 percent upper confidence limit (UCL) on the mean. While the arithmetic mean is an appropriate measure of the long-term average theoretical exposure regardless of the statistical distribution of the data, the specific procedure for calculating the 95 percent UCL on the arithmetic mean depends on first determining the underlying distribution type (either normal or lognormal) of the data set (USEPA, 1992a).

3.7.1 Arithmetic Mean Concentration

The arithmetic mean is used as a concentration term in risk assessments because the average concentration is a reasonable estimate of the concentration likely to be contacted by a receptor over time (USEPA, 1989; 1992a). The calculation of the arithmetic mean concentration for each chemical includes the use of one-half of the SQLs as proxy concentrations for that chemical when the chemical is not detected in one or more samples (USEPA, 1989).

Soil samples collected at the Site for the purpose of the RA were collected from the surface to a maximum depth of 6 ft bls (Tables 4 through 6 of the SI Report). As described above, soil sampling intervals included 0 to 2 in., 0 to 2 ft bls, and 4 ft to 6 ft bls. Because there were

multiple scenarios incorporating theoretical soil exposures, some of the analytical data associated with each soil interval were considered separately (i.e., the samples collected in the 0 to 2-in interval, samples collected in the 0 to 2-ft interval), while a soil horizon consisting of all sampling intervals (0 to 6 ft bls for the VOCs and metals; 0 to 12 ft bls for the SVOCs) were combined for the construction soil exposure scenarios. Specific soil sample intervals containing the COPC are provided in Tables H-9 through H-11.

All seventeen groundwater samples collected from the shallow monitoring wells were used to develop the average Site-wide theoretical exposure point concentrations (Table H-2).

Solid materials contained within subsurface structures were grouped into distinct areas described in Section 3.1.3. Tables H-3 through H-6 contain the average theoretical exposure concentrations for each of the defined substructure areas.

Soil gas samples were grouped according to the collection interval (i.e., either 3 or 6 ft bls). Average soil gas theoretical exposure concentrations are provided in Tables H-7 and H-8 for the 3-foot and 6-foot sampling intervals, respectively.

3.7.2 Upper Level Exposure Concentration

The 95 percent UCL is used in a risk assessment to evaluate an upper bound risk associated with a Site. In a statistical evaluation, the 95 percent UCL uses all the available data to provide an upper bound for the mean. In most circumstances, it is anticipated that the UCL of the mean is higher than the arithmetic mean, but falls within the general distribution of the data set. However, at the Thypin Site analysis of the comprehensive data set showed that in most instances the calculated UCLs for the COPCs actually exceeds the maximum concentration at the Site. Clearly, use of the 95 percent UCL under these circumstances would create an unrealistic situation that implies that any contamination at the Site is much worse than the actual situation.

When the 95 percent UCL exceeds the maximum concentration, the appropriate default concentration term becomes the maximum concentration (USEPA, 1992a; Personal communication, 1996). Therefore, in order to illustrate an extreme upper bound of risk in a consistent manner, the maximum concentration was used as a surrogate for the 95 percent UCL.

In reality, the use of a single maximum concentration is **not** representative of Site conditions either. The use of the maximum Site concentration of a constituent is not an appropriate exposure point concentration to assess the risk at the Thypin Site. Rather, the maximum concentration was used along with extremely conservative exposure assumptions to illustrate an upper bound condition that was not likely to be exceeded under almost any circumstances.

As an example of the conservatism incorporated into the use of a maximum concentration, a careful review of the comprehensive data set (i.e., from 33 data points) demonstrates that in all cases the maximum concentration exceeds the second highest concentration by a factor of at least 2.5 to 5. Thus, the maximum concentrations are outliers and should not be relied on to attribute an overall Site risk. Selection of a single value (the maximum concentration) out of the comprehensive data set that were distributed across the Site is truly not representative of Site conditions but rather was used to evaluate very conservatively conditions that are not likely to occur on any consistent basis.

Upper level (maximum) concentrations for each of the exposure matrices (i.e., soil, groundwater, solid materials within subsurface structures, and soil gas) using the same samples incorporated in the development of mean concentrations are provided in Tables H-2 through H-11.

3.7.3 Maximum Detected Concentration

The maximum detected concentration is the concentration associated with a confirmed detection (i.e., no "U" qualifier is associated with the datum). This concentration is presented as a point of comparison with the maximum concentration in each summary table, because, as discussed above, the maximum concentration may exceed the maximum detected concentration if elevated SQLs are associated with the data.

4.0 EXPOSURE ASSESSMENT

The purpose of the exposure assessment is to identify potential receptors, evaluate relevant exposure pathways, and estimate the theoretical intakes by receptors resulting from these pathways. Exposure pathways are defined and identified in terms of sources and receiving media, fate and transport in the release (source) media, and exposure points and exposure routes. The approach used to define the theoretical exposure of receptors to Site-related chemicals is divided into the following three specific phases:

- potential receptors were reviewed to provide a basis for conducting the human health risk assessment;
- the technical basis for selecting exposure pathways and for estimating the theoretical intake of constituents of potential concern for each exposure pathway was identified; and
- theoretical Site-specific exposure assumptions for each exposure pathway were identified.

4.1 Potential Receptors

Based upon the proposed future site use for the construction of condominiums, the potential for exposure by residential receptors was recognized and needs to be considered. There is a possibility of direct and/or indirect contact with both soil and indirect contact with groundwater through vapor intrusion into residences; consequently, USEPA protocols recommend that residential occupants (both children and adults) be evaluated as potential receptors at the Site. The analyses might also cover theoretical exposure through outdoor construction activities to chemicals at the Site during Site development activities such as digging into the subsurface soils to install or perform maintenance to utility lines. Thus, USEPA protocols recommend scenarios where construction personnel are evaluated as potential receptors at the Site.

Thus, two primary receptors were considered for the relevant exposure scenarios described in this RA were:

- Building occupants (Residential scenario); and
- Construction workers (Construction scenario).

The residential receptors are defined as three separate populations for modeling purposes. The child is designated as between the ages of birth to 6 years in the indoor air exposure scenario.

For the purpose of outdoor exposures (recreational), it was assumed that children between the ages of birth to 1 have no contact with soil. The youth is designated as between the ages of 6 and 18 years, while an adult is considered in excess of 18 years of age.

In this risk assessment, two approaches were used to develop a range of potential exposures at the Site. These involved the concepts of a Plausible Average Exposed Individual (PAEI) and a Reasonable Maximum Exposed Individual (RMEI). The PAEI and the RMEI were then used to develop a range of estimated theoretical risks rather than presenting a single theoretical risk estimate. Presenting a range of exposures using multiple risk descriptors such as central tendency (mean) and high end of individual risk is consistent with USEPA guidance (USEPA, 1992a; 1995b).

4.1.1 Plausible Average Exposed Individual

The PAEI exposure scenario considered exposures consistent with the most likely residential and construction activities at the Site. As part of the RA the PAEI assumptions included the use of the arithmetic mean concentrations for the COPCs in environmental media at the Site, and modeling assumptions associated with an average exposure.

4.1.2 Reasonable Maximum Exposed Individual

The RMEI exposure scenario was used to describe a highly conservative, health protective upper bound estimate of any potential exposures at the Site. As such, the RMEI represented a highly conservative, health-protective approach. The RMEI assumptions included the use of the maximum concentration for each COPC identified in the environmental media at the Site in concert with extremely conservative, health protective, modeling assumptions. Presenting a range of exposures using multiple risk descriptors such as central tendency (mean) and high end of individual risk is consistent with USEPA guidance (USEPA, 1992b; 1995a). However, at the Thypin Site, the high end of individual risk represent conditions that have no chance of occurring on any basis that could lead to an impact to human health.

4.2 Pathway Analysis

An exposure pathway is defined by the following four elements (USEPA, 1989):

- A source and mechanism of chemical release to the environment;

- A retention or transport medium (or media in cases involving media transfer of chemicals);
- A point of potential human contact with the chemical-containing medium (referred to as the exposure point); and
- An exposure route (e.g., inhalation) at the contact point.

A discussion of the chemicals that were retained for consideration in the RA in environmental media is presented in Section 3.0. The purpose of the pathway analysis was to describe mechanisms by which a receptor may come into contact with the chemicals present in any given environmental medium. The following sections describe the exposure scenario and the potential exposure pathways associated with the COPCs present in soil, groundwater, solid material contained within subsurface structures, and soil gas, and describe the rationale for their inclusion or exclusion in the RA.

4.2.1 Soil

Soils at the Site must be considered as a transport medium for chemicals. There is a theoretical risk of residents (receptors) coming into contact with chemicals present in the soil through inhalation of fugitive dusts while conducting yard work or ingesting soil particulates during various outdoor activities. Because the future proposed use of the Site is for residential purposes, the USEPA recommends that consideration be given to the theoretical risk of residents being exposed to chemicals through ingestion of homegrown fruits and vegetables that have accumulated Site-related chemicals from the soil. Thus, residential occupants theoretically could come into contact with chemicals present in soil through dermal absorption, direct and indirect ingestion, and through inhalation of fugitive dusts.

Consideration must also be given to the theoretical risk of construction workers (receptors) coming into contact with chemicals present in the soil during digging activities or by conducting other outdoor construction tasks, such as moving activities that have the potential to generate fugitive dusts. Chemicals present in the soil would also theoretically be present in fugitive dusts derived from the soil. Exposure of offsite residents from this fugitive dust was identified as a theoretical exposure scenario; however, any consideration of this pathway was reserved for consideration only if the risk to onsite construction workers was found to be unacceptable. Thus,

the potential human receptors (i.e., construction workers) at the Site theoretically could come into contact with chemicals present in the soil through dermal absorption, incidental ingestion, and through inhalation of fugitive dusts derived from the Site soil during construction activities.

4.2.2 Groundwater

Groundwater at the Site may be a transport medium for chemicals, and exposure could theoretically result from indirect and/or direct contact. Evaluation was made of the theoretical migration of vapors originating from chemicals dissolved in groundwater through the soil and into enclosed spaces of the residential buildings. Thus, the potential human receptors (i.e., residential occupants) at the Site theoretically could indirectly come into contact with chemicals present in groundwater through inhalation of vapors originating from Site groundwater and infiltrating into proposed future onsite dwellings.

In addition, because there are no present or potential future users of the groundwater at the Site (see Section 3.6.2), direct human contact with the groundwater at the Site was only evaluated in the context of construction activities. Depth to groundwater at the Site ranges from 8 ft to 12 ft bls, depths at which exposure to groundwater at its shallowest depths could occur to receptors during ground intrusive activities. Thus, the potential human receptors (i.e., construction workers) at the Site theoretically could come into direct contact with chemicals present in groundwater through dermal absorption and indirectly through inhalation of vapors originating from Site groundwater during ground intrusive activities.

4.2.3 Solid Material in Subsurface Structures

The scenario considered theoretical construction workers (receptors) coming into contact with chemicals present in the solid materials contained within the subsurface structures during digging for and construction of building foundations. The scenario evaluated theoretical exposure to fugitive dusts generated by ground invasive activities, and the prospect that chemicals present in the solid material would be present in fugitive dusts derived from the soil material. Thus, the potential human receptors (i.e., construction workers) at the Site theoretically could come into contact with chemicals present in the soil through dermal absorption, incidental ingestion, and through inhalation of fugitive dusts derived from the Site soil during construction activities.

4.2.4 Soil Gas

Soil gas concentrations serve as a verification of the potential vertical migration of VOCs originating in Site groundwater. The scenario evaluated a theoretical direct exposure route to residents through inhalation of indoor air following migration through subsurface soil and into future onsite dwellings.

4.3 Pathway Selection

As stated previously in section 3.1, residents of the future buildings and construction workers are identified as potential receptors at the Site. The theoretical exposure routes associated with these exposure scenarios considered in the RA are:

- Inhalation of indoor air vapors originating from groundwater chemicals and through measured soil gas;
- Ingestion, inhalation, and dermal absorption of chemicals in soil particulates and/or solid materials contained within subsurface structures;
- Ingestion of chemicals through homegrown fruits and vegetables;
- Dermal absorption of chemicals in groundwater; and
- Inhalation of chemical vapors originating from exposed groundwater.

Following a determination of relevant exposure pathways and exposure routes, chemical-specific exposures for human receptors, also called intakes, are estimated. Intakes are expressed in terms of the mass of substance in contact with the body per unit body weight (mg/kg) or the mass of substance in contact with the body per unit body weight per unit time (mg/kg/day). The chemical intakes are estimated using equations that include variables for exposure concentration, contact rate, exposure frequency, and body weight. Receptor specific parameters unique to each scenario are given in Tables H-12 to H-18.

The following sections present the equations and generic assumptions associated with these routes of exposure.

4.3.1 Exposure to Volatile Organic Compounds by Inhalation of Indoor Air Vapors Originating from Chemicals in Groundwater

The transport of chemical vapors emanating from groundwater into indoor spaces located directly above or in close proximity to the source of chemicals may be theoretically estimated using the revised Johnson and Ettinger model (1991) (USEPA, 2000a). The model considers both convective and diffusive vapor transport and provides estimated attenuation coefficients that relate the vapor concentrations in indoor air to vapor concentrations at the chemical source. Inputs to the model include chemical-specific properties, Site-specific soil parameters and structural properties of the buildings. The model utilized the soil gas concentrations measured at the Site during the soil gas survey as input values for the resultant indoor vapor concentrations calculated by the model. Key assumptions for the Johnson and Ettinger model (1991) (USEPA, 2000a) include the following:

- Chemicals are homogeneously distributed within the soil and/or groundwater;
- There are no measurable losses in chemical concentrations due to biodegradation;
- Vapor transport is primarily by diffusion between the chemical source and the building zone of influence;
- Vapor transport is primarily by convection within the building zone of influence, and vapor velocities decrease with increasing distance from the structure;
- Vapors enter the building through cracks and openings in the building walls and foundations;
- The areal extent of the source of chemicals is greater than the area of the building floor in contact with the soil; and
- The building ventilation rate and the difference in dynamic pressure between the interior of the building and the soil surface are constant values.

The full model outputs, including the modeling parameters, are given in Attachment 1 for each residential exposure scenario. Certain Site-specific factors were used to the extent possible so that the model is reflective of actual Site conditions. The factors of special relevance to the Johnson and Ettinger (1991) (USEPA, 2000a) model are the following:

- Chemical concentrations in groundwater.
- Depth to groundwater

- Soil type present at the Site
- Building characteristics

The modeling results presented herein are through the use of this revised model without modification by Roux Associates. Based on our initial observation of the model, the risks calculated by the model are extremely conservative because of the lack of receptor specific exposure inputs to allow for the estimation of a theoretical dose (typically in mg/kg/day). To evaluate carcinogens, the model uses a unit risk factor (URF), which is a concentration level (mg/m^3) based on a lifetime exposure as an adult. The revised model does not take into account the variability of several exposure parameters for children or youths such as inhalation rate and body weight. However, because the model has not undergone a detailed evaluation and was used without modification, the results of the model are extremely conservative and err on the side of health protection.

4.3.1.1 Chemical Concentrations in Groundwater

As previously stated, all groundwater data collected during the groundwater monitoring well event of June/July 2001 were evaluated for use in the model. The analytical data associated with the sampling locations were reviewed and for each VOC that was detected in the groundwater sample, both the average and the maximum concentrations were used in each modeling scenario in order to provide a bracket of theoretical exposure levels and to err on the side of health protection.

4.3.1.2 Chemical Concentrations in Soil

Soil can theoretically also serve as a medium to supply chemical vapors to indoor air; however, all detected VOCs were orders of magnitude below their respective residential RBC. Therefore, VOC detections were not used in the model. Based on Roux Associates' experience in modeling indoor air, the contribution of these low level concentrations to the actual calculated risk would be orders of magnitude less than that of the contribution through groundwater VOCs, hence they were not included in the indoor air modeling.

4.3.1.3 Depth to Groundwater

Groundwater elevations were measured in 17 water table monitoring wells during conducted on July 20, 2001 during low and high tide. The minimum depth to groundwater measured in each of these wells during this time period was used as the most conservative measure to approximate the depth to groundwater at the Site. The minimum depth to groundwater for these wells was determined to be approximately 8 ft or 246 centimeters (cm) measured at monitoring well MW-34S. The value of 246 cm was used in the model.

Groundwater temperatures were measured as part of the November 2000 groundwater sampling. Temperatures ranged between 14°C and 15°C; therefore, to err on the side of health protection, 15°C was used in the model.

4.3.1.4 Soil Type

Based on the geologic log data, the predominant type of soil at the Site is sand. This soil type, which is designated by "S" in the model, is used to estimate soil characteristics such as total soil porosity and the water-filled and air-filled porosities.

4.3.1.5 Building Characteristics

The preliminary site plan for the residential buildings provided by Nelson & Pope, LLP was reviewed to determine the dimensions of the most appropriate first floor room to use in the model. The building space is assumed to contain an open layout with approximate dimensions of 30 ft by 25 ft (915 cm x 762 cm) and ceilings of 9 ft (274 cm). Residential airflow patterns were not available; however, the USEPA (2000a) recommends a default value of 2.2 air exchanges per hour for use in the model to demonstrate a conservative approach.

4.3.1.6 Potential Residential Exposure from Groundwater

As discussed above, the potential exists for children and adults to be theoretically exposed to indoor air vapors originating in groundwater during residential exposure. As discussed in Section 4.3.1, receptor specific intakes are not estimated using this model, which results in a more conservative assessment of health risks. Receptor parameters allowed for input into the model and their assumptions are provided in Table H-12. Following an estimation of the indoor air concentration, the model directly estimates both the hazard quotient (HQ) for noncarcinogens

and the incremental lifetime cancer risk (ILCR) for carcinogens using one of the below equations.

For noncarcinogens:

$$HQ = \frac{IA * DE * EY * \frac{1}{RfC}}{ATN * 365\ days / year} \qquad \text{(Equation 4-1)}$$

Where:

HQ = Estimated hazard quotient associated with inhalation of chemical vapors derived from soil and/or groundwater (unitless).

IA = Indoor air concentration ($\mu g/m^3$) estimated using Johnson and Ettinger (1991) (USEPA, 2000a).

DE = Frequency of days exposed (days/year)

ATN = Averaging time for noncarcinogens (years; equal to EY)

EY = Exposure duration at residence (years)

RfC = Reference concentration (mg/m^3)

For carcinogens:

$$ILCR = \frac{IA * DE * EY * URF}{ATC * 365\ days / year} \qquad \text{(Equation 4-2)}$$

Where:

ILCR = Estimated incremental lifetime cancer risk associated with inhalation of chemical vapors derived from groundwater (unitless).

IA = Indoor air concentration ($\mu g/m^3$) estimated using Johnson and Ettinger (1991) (USEPA, 2000a).

DE = Frequency of days exposed (days/year)

ATC = Averaging time for carcinogens (70 years)

EY = Exposure duration at residence (years)

URF = Unit risk factor (mg/m^3)

Details regarding the equations for approximating the theoretical indoor air concentration originating from chemicals in groundwater are given in the model's guidance document (USEPA, 2000a). All modeling input parameters and estimated indoor air concentrations are provided in Attachment 1.

Tables H-19 and H-20 summarize the modeling results of each VOC COPCs measured in groundwater for noncarcinogenic and carcinogenic effects, respectively.

4.3.2 Exposure to Volatile Organic Compounds by Inhalation of Indoor Air Vapors Originating from Soil Gas

The theoretical indoor air concentrations were determined for all detected compounds in soil gas using a Johnson and Ettinger (1991) model (USEPA, 2000a) for subsurface vapor intrusion. The revised model contains a module for evaluating exposure to soil gas. As stated in Section 3.1.4, soil gas was measured at four areas where the four highest groundwater VOC concentrations in the shallow monitoring wells were detected. All of the above modeling parameters utilized for the soil and groundwater remained the same in addition to using the same equations (i.e., Equations 4-1 and 4-2) to estimate HQs and ILCRs, except for the depth of the sample collected. Receptor parameters allowed for input into the model and their assumptions are provided in Table H-12.

Details regarding the equations for approximating the theoretical indoor air concentration originating from migration of soil gas are given in the model's guidance document (USEPA, 2000a). All modeling input parameters and estimated indoor air concentrations derived from each soil gas sampling interval are provided in Attachment 2. Tables H-21 and H-22 summarize the modeling results of each VOC COPCs measured in the 3-foot soil gas sampling interval for noncarcinogenic and carcinogenic effects, respectively. Tables H-23 and H-24 summarize the modeling results of each VOC COPCs measured in the 6-foot soil gas sampling interval for noncarcinogenic and carcinogenic effects, respectively.

4.3.3 Exposure by Dermal Absorption of Chemicals in Water

If groundwater comes in contact with and adheres to the skin for a marginal period of time, there is a potential for chemicals to be theoretically absorbed through the dermal layer and be

distributed throughout the body. The dermal permeability coefficient (K_p) reflects the movement of a chemical in an aqueous solution across the skin and into the blood stream. The dermal permeability coefficient is an equilibrium-partitioning coefficient and is likely to over-estimate the absorbed dose over short exposure periods. Values for K_p have been generated from both *in vivo* and *in vitro* studies and published in the literature (USEPA, 1992b).

Chemical-specific K_p values, if available, were used to estimate theoretical intakes via dermal absorption from groundwater. The USEPA (1992b) presents K_p values for approximately 200 analytes in aqueous solutions. The selection of K_p values utilized in the risk assessment is based on the following order of precedence, beginning with the highest priority:

- Experimentally measured K_p values;
- Experimentally predicted K_p values;
- Structurally analogous chemicals with available K_p values; or
- Default K_p values.

A compound-specific K_p was experimentally determined for TCE (2.3E-1 cm/hour), but not for the cis isomer of DCE (USEPA, 1992b). An estimated K_p value of 1.0E-2 cm/hour reported for the trans isomer of DCE and was used for the cis isomer because these compounds are structurally similar (USEPA, 1992b). Cyanide was assigned a K_p value of 1.0E-3 commonly used as a default for inorganic chemicals (USEPA, 1992b).

Potential receptors at the Site theoretically that could be exposed to chemicals through dermal absorption are construction workers through direct contact with groundwater. Thus, an assumed adult body weight of 70 kilograms (kg) and height of 175 centimeters (cm) is used (AIHC, 1994; USEPA, 1989 and 1997a). Total body surface area is dependent on both the height and weight of the individual and is approximated by the following equation (Gehan and George, 1970).

$$\text{Body Surface Area } (cm^2) = 0.0235 \times \text{height}^{0.42246} \times \text{body weight}^{0.51456} \times 1.0E+4 \qquad \text{(Equation 4-3)}$$

The groundwater levels at the Site are at depths that, during ground intrusive activities, workers coming into direct contact could be theoretically exposed to chemicals associated with the

groundwater. Thus, receptors (i.e., construction workers) theoretically could have the potential to contact the groundwater on their hands and lower extremities, equivalent to approximately 10 percent of total body surface area. It is assumed that a maximum period of time for exposure is 2 hours/day over a total duration of 10 days (RMEI scenario). Dermal uptake for the construction exposure scenarios for direct contact with groundwater are estimated using the theoretical exposure factors summarized in Table H-13 and the equation presented in RAGS (USEPA, 1989):

$$DA_{GW} = \frac{GW * Kp * V * SA * X * CG * HG * DG}{AT * BW} \qquad \text{(Equation 4-4)}$$

Where:

DA_{GW} = Estimated average daily intake of chemicals via dermal absorption from groundwater (mg/kg/day)

GW = Concentration of chemical in groundwater (mg/L)

K_p = Dermal permeability constant for chemical of concern (cm/hour)

V = Volumetric conversion factor for water ($1E^{-3}$ L/cm^3)

SA = Total body surface area (Gehan and George, 1970)

X = Conversion factor or micrograms to milligrams ($1.0E^{-3}$ mg/mg)

CG = Contact area of groundwater on body (percent)

HG = Exposure duration to groundwater (hours/day)

DG = Days exposed in a year (days)

AT = Averaging time (7/5 x total days of construction period [i.e., 7/5 x days exposed to soil] for noncarcinogens, 365 days for carcinogens)

BW = Body weight (kg)

Tables H-25 through H-28 present the estimated general construction worker intakes and Tables H-29 to H-32 present the estimated intakes for construction performed at subsurface structures using the above equation and associated with direct dermal contact with groundwater.

4.3.4 Exposure by Inhalation of Chemical Vapors from Exposed Groundwater

Theoretical exposures to vapors from groundwater could occur at the Site as excavations "uncover" groundwater and expose it to the surface. Under these scenarios, the volatilization from groundwater is essentially the same as volatilization from surface water. One module within the TScreen model (USEPA, 1995a) was used for predicting air vapor concentrations associated with exposed groundwater during excavation activities. Thus, the module within the TScreen model was determined to be appropriate for predicting theoretical vapor concentrations associated with groundwater.

For each of the VOCs detected in groundwater and retained in the RA, the maximum observed concentration was selected for each chemical to use in the risk assessment for added health protection. The model assumed emissions from an area of 10 m^2 representing a typical sized work trench (e.g., 2-m x 5-m). The complete results of the TScreen model output, including the modeling parameters and estimated vapor concentration, are provided in Attachment 3.

The TScreen model does not contain a component for estimating intakes and theoretical risks associated with given air vapor concentrations. Potential intakes associated with air vapor concentrations from the TScreen model were estimated using exposure factors given in Table H-13 and the following equation developed by the USEPA (1989):

$$IH_{GW} = \frac{VA * X * IR * HG * DG}{AT * BW} \qquad \text{(Equation 4-5)}$$

Where:

IH_{GW} = Estimated daily intake through inhalation of vapors from exposed groundwater (mg/kg/day)

VA = Vapor concentration ($\mu g/m^3$) of compound originating in groundwater and estimated from TScreen model (1995a)

X = Factor for converting micrograms to milligrams ($1.0E^{-3}$ mg/µg)

IR = Hourly inhalation rate (m^3/hour)

HG = Hours of exposure to groundwater (hours/day)

DG = Days of exposure to groundwater (days)

AT = Averaging time (7/5 x total days of construction period [i.e., 7/5 x days exposed to soil] for noncarcinogens, 365 days for carcinogens)

BW = Body weight (kg)

Tables H-25 through H-28 present the estimated general construction worker intakes and Tables H-29 to H-32 present the estimated intakes for construction performed at subsurface structures using the above equation and associated with indirect contact with groundwater through inhalation of chemical vapors.

4.3.5 Dermal Absorption of Chemicals in Soil

During the course of dermal contact, soil particulates could theoretically adhere to exposed skin. Uptake of chemicals via dermal absorption from soil is limited by the tendency for chemicals present in soil to remain adsorbed to soil particulates (dependent upon matrix composition), the adherence of the soil to the skin, and the permeability of the skin (dermal absorption factor). In addition to the consideration that construction workers could be exposed to soils through dermal contact, all residential receptors described as a part of this RA theoretically have the potential for dermal absorption of soil chemicals during outdoor recreational activities.

Organic compounds tend to bind to particular substances present in soil, thus limiting, to some degree, their availability for dermal absorption (Howard, 1990). A matrix effect can be anticipated, but is not included as a factor in estimating dermal absorption because of the uncertainties in assigning a value to this factor. Therefore, the theoretical exposure of a receptor to chemicals present in the soils is most likely overstated (conservative), with regard to the matrix effect, because all of the chemicals present in the soils are assumed to be available for absorption by the receptor.

The model adopted for estimating the theoretical intake by dermal absorption from contact with soil was derived by the USEPA (1989). This model assumes that the quantity of soil adhering to the skin is independent of the duration of the theoretical exposure for each visit to the Site. Soil adherence for construction activities were estimated based on the percent surface area exposed

and the body-part specific soil adherence values for adult utility workers. Duties for the workers included cleaning, fixing mains and performing excavations. The hands and forearms constitute approximately 5.2 and 5.9 percent of the total body surface area, respectively, and on average are associated soil adherences of 0.32 and 0.30 mg/cm^2, respectively (USEPA, 1997a). Assuming two-thirds of the head is exposed (constituting 5.2 percent of the total body surface area) and a soil adherence of 0.10 mg/cm^2 (USEPA, 1997a), an average soil adherence of 0.23 mg/cm^2 is estimated to represent the soil adherence for the total exposed area.

Similar reasoning was used to estimate soil adherence to the hands, arms and face of a residential adult. It was assumed that the complete dermal area of the hands, half of the arms and legs and two-thirds of the face were exposed. This amounted to a maximum fraction of the exposed dermal surface of 0.28 and a soil adherence of 0.042 and 0.088 mg/cm2 for the recreational (i.e., adults playing rugby) and gardening scenarios (weeding, pruning, digging a trench), respectively (USEPA, 1997a). Using similar assumptions, the child and youth contain a maximum contact area of 0.30 and 0.29, respectively and a total soil adherence of 0.051 and 0.061 mg/cm2, respectively. The soil adherence factor for the child is for outdoor activities conducted on bare earth and grass areas, and the youth soil adherence factors are for youths playing soccer on a field of half grass half bare earth (USEPA, 1997a).

Very little data are available in the literature regarding the theoretical dermal absorption of chemicals present in soil (USEPA, 1992b). The USEPA reported that the absorption of topically applied pure benzo[a]pyrene ranged from 1 to 13 percent (USEPA, 1992b). Ryan *et al.* (1987) proposed a dermal absorption range of 1 to 10 percent for semivolatile organic compounds (SVOCs) from soil. Wester et al. (1990) observed that approximately 10 to 18 percent of a dose of benzo[a]pyrene in soil applied to the skin of the rhesus monkey was absorbed. Based on this study, the Massachusetts Department of Environmental Protection (MADEP) recommended a dermal absorption factor of 18 percent (0.18) as a protective estimate for human exposure to benzo[a]pyrene in soil (MADEP, 1992). However, based on recommendations by the USEPA (1995b) and because the dermal absorption of benzo[a]pyrene appears to be representative of the dermal absorption of other PAHs (MADEP, 1992), the theoretical dermal absorption factor of 10 percent is applied to all the PAHs and SVOCs evaluated in the RA.

Very few quantitative studies were located regarding the dermal absorption of metals in humans (MADEP, 1992). However, MADEP (1992) recommends a 3 percent dermal absorption factor for arsenic in soil as a conservative estimate of theoretical exposures to arsenic. Dermal absorption factors for other metals are estimated in the range of 1 percent or less (MADEP, 1992; USEPA, 1992c). Thus, to ensure a health-protective approach, a 3 percent dermal absorption factor is used to estimate theoretical exposures to metals present in soils at the Site.

The list of all of the theoretical exposure assumptions for receptors and their justifications are provided in Tables H-13 through H-17. To estimate average daily intake of the COPCs in soils, the following equation is used:

$$DA_{soil} = \frac{SL * SA * CS * S * F * \{AS \ or \ AM\} * DS}{AT * BW} \qquad \text{(Equation 4-6)}$$

Where:

DA_{soil} = Estimated daily intake of chemicals via dermal absorption from soil (mg/kg/day)

SL = Concentration of chemical in soil (mg/kg)

SA = Total body surface area (cm^2 [Equation 4-3, Gehan and George, 1970])

CS = Contact area for soil (unitless)

S = Average soil adherence to skin (mg/cm^2)

F = Factor for converting kilograms to milligrams (1.0E-6 kg/mg)

AS = Absorption factor for semivolatile organic compounds (0.10, unitless)

AM = Absorption factor for metals (0.03, unitless)

DS = Days exposed in a year (days)

AT = Averaging time (days)

BW = Body weight (kg)

Tables H-33 through H-36 present the estimated general construction worker intakes using the model described above for dermal absorption of chemicals associated with soil. Tables H-37

through H-52 present the estimated construction worker intakes while performing ground intrusive activities using the model described above for dermal absorption of chemicals within solid material from subsurface structures. Estimated intakes through dermal absorption of chemicals in soil for children during recreational activities are provided in Tables H-53 through H-56. Tables H-57 through H-60 contain the estimated intakes associated with dermal exposure of chemicals in soil for the youth. Adult intakes were estimated for two different activities for dermal exposure; during recreation (Tables H-61 through H-64) and gardening (Tables H-65 through H-68).

4.3.6 Exposure by Incidental Ingestion of Soils

Soil that adheres to the skin can, under certain circumstances, theoretically can be ingested (e.g., eating with dirty hands). Incidental ingestion of Site-related chemicals by construction workers may occur following contact with soils at the Site during ground intrusive activities. Residential receptors (i.e., adults, youths, and children) could also unintentionally ingest soil chemicals during outdoor recreational activities.

The USEPA (1999) recommends a plausible range of 50 milligrams per day (mg/day) to 200 mg/day for estimating theoretical adult ingestion of soil in construction settings. It was assumed that a rate of 100 mg/day was adequate to represent soil ingestion during the PAEI exposure scenario for the construction worker. For purposes of describing reasonable upper bound potential exposures, the construction worker ingestion rate of 200 mg/day for soil is used in the RMEI exposure scenario. Values of 100 and 200 mg/day were selected as the PAEI and RMEI ingestion rates for children based on USEPA (1997a) recommendations. For adults, 50 mg/day is the default soil ingestion rate and is used for both the PAEI and RMEI during recreational activities, while 100 mg/day was used for adult gardening scenarios. Youths were assumed to ingest soil midway between the rates of the child and adult during recreational activities; therefore, soil ingestion rates of 50 and 100 mg/day were used for the PAEI and RMEI youth exposure scenarios, respectively.

Uptake of chemicals present in soil that has been incidentally ingested is limited by the tendency for chemicals present in soil to remain adsorbed to soil particulates (matrix effect) and the permeability of the gastrointestinal (GI) tract (gastrointestinal absorption factor). As a health

protective approach, it was assumed that complete transfer across the GI membrane occurs, thus a gastrointestinal absorption factor of 100 percent (1.0) is used.

The model adopted for estimating theoretical intake was derived by the USEPA (1989). A list of all of the theoretical exposure assumptions and their justifications are provided in Tables H-13 thorough H-17. To estimate the average daily intake of the COPCs identified in the soils, the following equation was used:

$$IG_{soil} = \frac{SL * IS * F * GIS * DS}{AT * BW} \qquad \text{(Equation 4-7)}$$

Where:

IG_{soil}	=	Estimated daily intake of chemicals by incidental ingestion of soil (mg/kg/day)
SL	=	Concentration of chemical in soil (mg/kg)
IS	=	Ingestion rate of soils (mg/day)
F	=	Factor for converting kilograms to milligrams (1.0E-6 kg/mg)
GIS	=	Gastrointestinal absorption factor (1.0 for complete absorption, unitless)
DS	=	Days exposed to soil in a year (days)
AT	=	Averaging time (days)
BW	=	Body weight (kg)

Tables H-33 through H-36 present the estimated general construction worker intakes using the model described above for ingestion of chemicals associated with soil. Tables H-37 through H-52 present the estimated construction worker intakes while performing ground intrusive activities using the model described above for ingestion of chemicals within solid materials from subsurface structures. Estimated intakes through ingestion of chemicals in soil for children during recreational activities are provided in Tables H-53 through H-56. Tables H-57 through H-60 contain the estimated intakes associated with ingestion of chemicals in soil for the youth. Adult intakes were estimated for two different activities for ingestion exposure; during recreation (Tables H-61 through H-64) and while gardening (Tables H-65 through H-68).

4.3.7 Exposure by Inhalation of Dusts

Inhalation of chemicals present in dust derived from soil at the Site is a theoretical pathway identified for adults participating in construction activities at Site. Because SVOCs and arsenic are identified in soils at the Site (Section 3.4.1), inhalation of fugitive dusts that contain these chemicals was considered a theoretical exposure pathway for both the residential receptors (i.e., adults, youths, and children) and construction workers.

Deposition of fugitive dust in the lungs is dependent on both particulate size and breathing pattern (Raabe, 1982; USEPA, 1986a; Gordon and Amdur, 1991). In general, particulates between 5 and 30 microns (μm) are likely to be deposited in the nasopharyngeal region by inertial impaction (Menzel and Amdur, 1986), while particulates less than 10 μm can penetrate and be retained in the bronchiolar region (USEPA, 1998). Both the NYSDEC and the New York State Department of Health (NYSDOH) have issued guidance regarding dust levels for either inactive hazardous waste sites (NYSDEC, 1989) or for intrusive ground activities at work areas (NYSDOH, 1994). Dust suppression techniques must be employed when the downwind particulate level is 150 micrograms per cubic meter ($\mu g/m^3$) greater than the upwind particulate level (NYSDOH, 1994; NYSDEC, 1989). A level of 150 $\mu g/m^3$ was chosen to represent a maximum air particulate concentration during construction activities because this assumes that the conditions at the Site are conducive to fugitive dust generation. However, there are factors, most notably soil moisture content, that are directly related to the lack of fugitive dust generation. It should also be noted that the guidance level of 150 $\mu g/m^3$ is for all particulate matter (PM) regardless of size, while the critical PM size considered most relevant to inhalation exposure is the PM of 10 μm or less (PM_{10}). Although PM_{10} encompasses only a fraction of the total PM and assuming Site conditions are conducive to dust generation, it was assumed that the maximum allowable concentration of dust particulates (e.g., the action level of 150 $\mu g/m^3$) is present in the atmosphere at the Site during all construction activities and consists entirely of (PM_{10}) to demonstrate a health-protective approach in the RA.

For the residential receptors, it was assumed that much of the soil surface would be covered and would contain limited ability to be suspended as air particulate during recreational activities. Values of 18 and 30 $\mu g/m^3$ were selected to represent the PM_{10} for the PAEI and RMEI

residential scenarios. These values represent the annual mean and 90th percentile for PM_{10} in Nassau and Suffolk Counties, New York (USEPA, 2000b).

In this risk assessment, the portion of particulate matter retained by the lung following inhalation is synonymous with theoretical short-term deposition. Over time, the respiratory system has mechanisms (such as the mucociliary system) for clearing particles from the lung. These cleared particles may be either expectorated or absorbed into the body by other pathways, such as through the gastrointestinal tract or the lymphatic system (Raabe, 1982). Multiple inhalation studies were reviewed and summarized by the USEPA (1986a) and out of 100 data points generated, only nine points exceeded a deposition of 50 percent. Therefore, a value of 50 percent for the pulmonary retention factor was determined to be a conservative value.

Theoretical respiratory rates (cubic meters per hour [m^3/hour]) have been estimated for residential receptors and construction workers based on activity level (USEPA, 1997a). Inhalation rates for short-term exposures were averaged for male and females performing light (PAEI) to moderate (RMEI) activities. Inhalation rates representative of the residential PAEI scenario for adults, children, and youths were 0.47, 0.72, and 0.75 m^3/hour, respectively. Inhalation rates representative of the residential RMEI scenario for adults, children, and youths were 0.93, 1.38, and 1.53 m^3/hour, respectively. A respiratory rate of 2.08 m^3/hour is used is representative of workers involved in trade specific activities (USEPA, 1997a) and was used for the PAEI scenario. A respiratory rate of 2.28 m^3/hour is used for the construction RMEI value and is representative of workers carrying materials (USEPA, 1997a).

Best professional judgment was used to determine the theoretical total inhalation exposure hours for each of the residential receptors. It was assumed that during recreational activities for both adults and young children, a range of 1 to 2 hours per day exposed would reflect the PAEI and RMEI scenario, respectively, while additional independence for the youths accounted for a range of 2 to 4 hours per day for the PAEI and RMEI scenarios, respectively. Adults performing any gardening or yard maintenance would be expected to have a range between 1 and 2 hours for inhalation exposure under the PAEI and RMEI scenarios, respectively.

The following equation used to estimate average daily potential intakes of chemicals present in fugitive dusts derived from the Site soil was developed by the USEPA (1989):

$$IH_{soil} = \frac{SL * F * PM * X * IR * HH * PF * DS}{AT * BW} \qquad \text{(Equation 4-8)}$$

Where:

IH_{soil}	=	Estimated daily intake of chemical from inhalation of fugitive dusts (mg/kg/day)
SL	=	Soil concentration of chemicals in soil (mg/kg)
F	=	Factor for converting kilograms to milligrams (1.0E-6 kg/mg)
PM	=	Concentration of dust particulates in air ($\mu g/m^3$)
X	=	Factor for converting micrograms to milligrams (1.0E-3 mg/mg)
IR	=	Inhalation rate (m^3/hour)
HH	=	Hours of exposure (hours/day)
PF	=	Pulmonary retention factor (0.5, unitless)
DS	=	Days exposed to soil in a year (days)
AT	=	Averaging time (days)
BW	=	Body weight (kg)

Tables H-33 through H-36 present the estimated general construction worker intakes using the model described above for inhalation of chemicals associated with soil. Tables H-37 through H-52 present the estimated construction worker intakes while performing ground intrusive activities using the model described above for inhalation of chemicals within solid materials from subsurface structures. Estimated intakes through inhalation of chemicals in soil for children during recreational activities are provided in Tables H-53 through H-56. Tables H-57 through H-60 contain the estimated intakes associated with inhalation of chemicals in soil for the youth. Adult intakes were estimated for two different activities for inhalation exposure; during recreation (Tables H-61 through H-64) and while gardening (Tables H-65 through H-68).

4.3.8 Exposure by Ingestion of Homegrown Produce

Ingestion of chemicals present in soil at the Site is a theoretical pathway identified for those residents that construct a garden for the purpose of growing fruits and vegetables. Because SVOCs and arsenic are identified as COPCs in soils at the Site (Section 3.6.1), an exposure pathway theoretically exists for the uptake of these soil chemicals by the plant that potentially could be ingested by the resident.

4.3.8.1 Estimation of Chemical Concentrations in Homegrown Produce

Organic chemical uptake by plants is dictated by chemical properties, driven mostly by a substance's solubility or partitioning characteristic and is dependent on availability (USEPA, 1999). The ability of chemical transfer to any organic matrix can be measured by a partitioning coefficient (K), most commonly offered as an octanol-water partitioning coefficient (K_{ow}) or organic carbon partitioning coefficient (K_{oc}) and represents the ratio of the equilibrium concentrations of an analyte in two distinct matrices (octanol and water for the K_{ow}, organic carbon and water for the K_{oc}). Both the K_{ow} and K_{oc} are available for many environmental chemicals from a wide variety of literature sources (Verschueren, 2001;Gustafson et al., 1997; etc.).

When describing transfer of chemicals to biological matrices, a bioconcentration factor (BCF) is used to represent the ratio of the equilibrium concentration of a chemical in a biologic material (e.g., produce) relative to that of a chemical in an exposure medium (e.g., soil). Specifically as part of this risk assessment, three types of produce are modeled; root vegetables (e.g., carrots, beets, turnips, potatoes, etc.), above-ground vegetables (e.g., cabbage, cauliflower, string beans, squash, peppers, etc.) and above-ground fruits (e.g., tomatoes, pears, melons, etc.). Therefore, based on the type of produce anticipated to be grown in the future, two types of bioconcentration factors are necessary to describe the theoretical transfer of chemicals from soil to plants. One is defined as the root vegetable concentration factor (RCF) to describe the theoretical transfer of chemicals from soil to root vegetables and potatoes, and an above-ground produce concentration factor (ACF) to describe the theoretical transfer of chemicals from soil to above-ground fruits and vegetables. USEPA (1996a) provides chemical specific RCFs for dioxin compounds with

Chemical specific bioconcentration factors for transfer of metals to root vegetables are provided by USEPA (1996a). An equation to estimate the concentration of metals in (USEPA, 1996a; USEPA, 1999) is as follows:

$$RVCm = SL * RCFm \qquad \text{(Equation 4-11)}$$

Where:

RVCm = Root vegetable concentration of metals (mg chemical/kg plant dry weight).

SL = Soil concentration (mg/kg).

RCFm = Soil to root plant bioconcentration factor for metals compounds (kg soil/ kg plant dry weight).

ACFs for organic compounds were not available, however, an equation provided by Travis and Arms (1988) was used to estimate ACFs for the SVOCs as follows:

$$\log (ACF) = 1.588 - 0.578 \log (K_{ow}) \qquad \text{(Equation 4-12)}$$

Where:

$\log (ACF)$ = Logarithm of the soil to above-ground plant bioconcentration factor for organic compounds (kg soil/ kg plant dry weight).

$\log (K_{ow})$ = Logarithm of the octanol-water partitioning coefficient for a specific chemical.

ACFs for several metals are given in USEPA (1996a), originally provided by Baes et al., (1984) and USEPA (1992d). The units for the organic compound ACF and the metal ACF are expressed in the same terms (grams of plant tissue dry weight per gram of soil), thus, the same equation can be used to describe the theoretical concentration of soil chemicals in above-ground produce (USEPA, 1996a; and USEPA, 1999):

$$APC = SL * ACF \qquad \text{(Equation 4-13)}$$

Where:

APC = Concentration of chemicals (metals or organics) in above-ground produce (mg chemical/kg plant dry weight).

SL = Soil concentration (mg/kg).

ACF = Soil to above-ground plant bioconcentration factor for chemicals (metals or organics) (kg soil/ kg plant dry weight).

Tables H-69 through H-70 presents the estimated concentrations in root vegetables and above-ground produce through soil uptake using the equations described above and the average (PAEI) and maximum (RMEI) chemical concentrations in soil within the 0 to 2 ft bls sampling interval.

4.3.8.2 Estimation of Exposure

A general equation to estimate potential uptake by plants adapted for estimating potential intake was derived by the USEPA (1989). A list of all of the unique exposure assumptions and their justifications are provided in Table H-18. To estimate the average daily intake of the COPCs identified in the soils that have concentrated in root vegetables, the following equation was used:

$$IG_{root} = \frac{\{RVC \text{ or } APC\} * \{RVI \text{ or } AVI \text{ or } FI\} * GIS * DE * FH}{AT * BW} \quad \text{(Equation 4-14)}$$

Where:

IG soil = Estimated daily intake of chemicals by incidental ingestion of soil (mg/kg/day)

RVC = Concentration of chemical in root vegetable (mg/kg produce dry weight)

APC = Concentration of chemicals (metals or organics) in above-ground produce (mg chemical/kg plant dry weight)

RVI = Ingestion rate of root vegetables (kg/day)

AVI = Ingestion rate of above ground vegetables (kg/day)

FI = Ingestion rate of fruit (kg/day)

GIS = Gastrointestinal absorption factor (unitless)

DE = Days consuming vegetables in a year (days)

FH = Fraction of homegrown produce that is homegrown (unitless)

AT = Averaging time (days)

BW = Body weight (kg)

Tables H-71 through H-82 presents the estimated concentrations in root vegetables and above-ground produce through soil uptake using the equations described or the child, youth, and adult receptors.

4.4 Average Daily Intake for Multiple Pathways

In some of the exposure scenarios, the average daily intakes from each of several routes of exposure (e.g., dermal absorption, ingestion, and inhalation of chemicals in soil for the construction scenario) are summed to present an average daily intake for all pathways. The equation for summing the individual intakes is as follows:

$$EDI_{total} = DA_{soil} + IG_{Isoil} + IH_{soil} \qquad \text{(Equation 4-15)}$$

Where:

EDItotal = Estimated total average daily intake from all pathways (mg/kg/day)

DAsoil = Estimated average daily intake via dermal absorption (mg/kg/day)

IGsoil = Estimated average daily intake via ingestion (mg/kg/day)

IHsoil = Estimated average daily intake via inhalation (mg/kg/day)

4.5 Lifetime Average Daily Intake for all Pathways

The estimated average daily intake is based on theoretical exposures that are averaged over the entire period of exposure. The equations presented above (Sections 4.3.1 through 4.3.8) estimate the average daily intakes based on theoretical exposure events for either the pathways of exposure addressed in the RA for the residential exposures (inhalation of indoor air vapors, dermal absorption, ingestion, inhalation of chemicals in soil), or for each of the pathways addressed in the RA for the construction worker exposure (e.g., dermal absorption, ingestion, and inhalation). For assessing a long-term or chronic carcinogenic risk, it is a common practice to

estimate the total intake over a lifetime to derive the lifetime average daily intake. The following equation describes the procedure to derive the lifetime average daily intake for a given pathway (e.g., dermal absorption or inhalation) following exposure to a given matrix (soil, groundwater, or solid materials) (USEPA, 1989):

$$LADI = \frac{EDI_{total} * EY}{LT} \qquad \text{(Equation 4-16)}$$

Where:

LADI	=	Estimated lifetime average daily intake for individual or multiple pathways (mg/kg/day)
EDI_{total}	=	Estimated total daily intake (mg/kg/day)
EY	=	Number of years exposed (years)
LT	=	Average lifetime (70 years)

The LADI for each of the scenarios and specific receptors (construction [Tables H-25 through H-52], and residential [Tables H-53 through H-82]) is provided in their respective tables.

4.6 Exposure to Lead

There is currently neither a reference dose nor a carcinogenic slope factor available for lead. The USEPA (1996b) has recently developed a methodology for assessing theoretical risks associated with non-residential adult exposures to lead in soil. This methodology, conceptually similar to the methodology proposed by Bowers et al. (1994), estimates blood lead concentrations in adult females of child-bearing age based on theoretical exposure to lead in soil via incidental ingestion. Algorithms used in this approach rely on estimated parameters such as the biokinetic slope factor, soil ingestion rates, and media-specific absorption factors. The biokinetic slope factor is the relationship between daily-absorbed amounts of lead and adult blood lead concentrations. The USEPA (1996b) provides a set of default parameter values (such as baseline adult blood lead concentration and the geometric standard deviation [GSD]) that can be used in the absence of verifiable Site-specific information.

While the USEPA (1996b) model addresses only theoretical intakes of lead resulting from ingestion of soil, the Bowers et al. (1994) model addresses theoretical intakes from the ingestion (soil and groundwater) and inhalation routes of exposure. In order to demonstrate a health protective approach at the Site, theoretical intakes of lead from both ingestion and inhalation of dusts are considered in a biokinetic slope factor model. This biokinetic slope factor model, based on both the USEPA (1996b) and Bowers *et al.* (1994) models, assumed a baseline adult blood lead concentration of 2.0 micrograms per deciliter (µg/dL) (USEPA, 1996b) and a biokinetic slope factor of 0.375 µg/dL per µg/day (Bowers et al., 1994). The GSDs used in the model are obtained from USEPA (1996b) and are for a homogenous population (GSD of 1.8) or a heterogeneous urban population (GSD of 2.1). The absorption factors for lead for the ingestion and inhalation pathways are obtained from Bowers et al. (1994).

Based on the screening described in Section 3.6.3, certain subsurface structure areas had lead retained as a COPC (specifically the Northern, Western, and Central Areas). Tables H-83 through H-88 present the potential blood lead concentration of an adult construction worker using a biokinetic slope factor approach and the assumptions discussed above for the PAEI and RMEI scenario. The predicted blood lead concentrations for an adult worker are based on theoretical exposures to the arithmetic mean concentration of lead in subsurface soil (PAEI) and the maximum concentration of lead in subsurface soil (RMEI).

Theoretical intakes associated with dermal absorption of lead in groundwater were not estimated. Lead is insoluble in water (ATSDR, 2000); thus, intakes associated with dermal absorption of lead from an aqueous medium are assumed to be negligible. Furthermore, neither the IEUBK model (USEPA, 1994b) nor the 1996 Adult Interim Guidance (USEPA, 1996b) address potential intakes associated with dermal absorption of lead from an aqueous medium.

5.0 TOXICITY ASSESSMENT

The purpose of the toxicity assessment is to summarize health effects that could theoretically occur as a result of exposure to a particular chemical. Where possible, the toxicity assessment includes a brief overview of the relationship between theoretical exposure to the chemical and increased likelihood and/or severity of adverse effects. Both noncarcinogenic and carcinogenic effects are discussed, and reference doses (RfDs) and cancer potency factors (CPFs) are presented, if available.

The RfD is defined as an estimate of the daily exposure to the human population that is likely to be without an appreciable risk of deleterious noncarcinogenic health effects. The RfD was theoretically derived to protect sensitive subpopulations and has an uncertainty spanning at least one order of magnitude (USEPA, 1989).

In assessing the human carcinogenic potential of a chemical, the USEPA classifies the chemical into one of the following groups, known as the "weight-of-evidence classification" system (USEPA, 1989):

Group	Classification	Evidence
Group A:	Human Carcinogen.	Indicates sufficient evidence of carcinogenicity in humans.
Group B:	Probable Human Carcinogen	
B1:		Indicates limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in animals.
B2:		Indicates inadequate or no evidence in humans and sufficient evidence of carcinogenicity in animals.
Group C:	Possible Human Carcinogen.	Indicates limited evidence of carcinogenicity in animals and inadequate or lack of human data.
Group D:	Not classifiable as to Human Carcinogenicity.	Indicates inadequate or no evidence.
Group E:	Evidence of Noncarcinogenicity for Humans.	Indicates evidence in adequate studies that the agent is not carcinogenic to humans.

Quantitative carcinogenic risk assessments (RAs) are performed for chemicals in Groups A and B, and on a case-by-case basis, for chemicals in Group C. These carcinogenic RAs are used to determine theoretical cancer potency factors (CPFs), also known as slope factors (SFs). The CPF quantitatively defines the relationship between dose and response for potential carcinogens (USEPA, 1989). CPFs are upper bound estimates of the carcinogenic risk to humans associated with theoretical exposure to a chemical. CPFs are estimated through the use of extrapolation models, and are estimated such that the true risk to humans is not expected to exceed the CPF. As defined, the true risk may be as low as zero (USEPA, 1989).

Default values for RfDs and CPFs are available through the Integrated Risk Information System (IRIS), an electronic database maintained by USEPA (2001b) and the Health Effects Assessment Summary Tables (HEAST) (USEPA, 1997b). IRIS (USEPA, 2001b), which is updated monthly, is the official repository of health risk and regulatory information for chemicals. HEAST (USEPA, 1997b) is a comprehensive listing of provisional RA information. While information in HEAST has the concurrence of individual USEPA program offices, it has not yet had USEPA Agency-wide verification. Hence, toxicity criteria published in HEAST are associated with more uncertainty than those criteria published in IRIS (USEPA, 1989; 1997b). The USEPA Region III RBC table (USEPA, 2001a) also has some provisional values for RfDs and CPFs that have been developed by the USEPA National Center for Environmental Assessment (NCEA).

RfDs and CPFs, if available, are obtained for all chemicals that were detected during the RA. However, there are some chemicals that did not have either RfDs or CPFs or both. In order to address as many compounds as possible in the RA, when toxicity criteria are not available on IRIS (USEPA, 2001b), HEAST (USEPA, 1997b) or the USEPA Region III RBC Table, either former toxicity data are used or toxicity data are obtained from structurally related compounds, if available. For example, because toxicity data are not available for benzo[g,h,i]perylene and phenanthrene, toxicity data from structurally related PAHs are applied to these compounds.

Attachment 4 presents the toxicological profiles for each of the COPCs. Each profile presents the current RfD and/or CPF, if available, from IRIS (USEPA, 2001b), HEAST (USEPA, 1997b) or the USEPA Region III RBC Table (USEPA, 2001a).

6.0 RISK CHARACTERIZATION

Health risk estimation quantitatively defines the general magnitude and range of human health posed by a defined set of circumstances. The precision of such estimates is limited by the size of the database and the assumptions that support the mathematical estimations of intake and effect. The uncertainties associated with estimating human health risks that may result from any chemical exposure include the following:

- The extrapolation of toxic effects observed at the high intakes necessary to conduct animal studies to effects that might occur at lower, environmentally relevant intakes.
- The extrapolation from toxic effects in animals to toxic effects in humans (i.e., responses of animals may be different from responses of humans.)

Risk characterization integrates information on the presence of chemicals in Site-related media, the known toxicity of those chemicals, and the Site-specific exposure scenarios described in Section 4. The exposure scenarios described in the exposure assessment are based upon the most likely pathways by which exposure could occur to defined receptors.

Extremely health-protective assumptions that are designed to overestimate potential risks were used in this part of the RA. This approach for managing uncertainties has a magnifying effect on the outcome of the RA process. Because each conservative step builds on the previous one, the overall result of making biased assumptions likely overestimates risk. This approach compensates for RA uncertainties that may result in underestimation of risk and, therefore assures that the overall assessment provides an ample margin of safety.

6.1 Hazard Quotients

Acceptable daily intakes for these compounds are derived from relevant human and/or animal dose-response data. These acceptable intakes may be expressed in a variety of ways, such as acceptable intake-chronic (AIC) or oral reference doses (RfDs).

Oral reference doses (RfDs) are commonly derived by applying a safety factor to the estimated "no observed adverse effect level" (NOAEL) observed in animal experiments. The NOAEL is defined as the exposure level in dose-response experiments at which there are no statistically or biologically significant increases in the frequency or severity of adverse effects between the

exposed population and its control population. While some effects may be produced at this exposure level, these effects are considered to be neither adverse effects nor precursors to adverse effects. The RfD data are derived from quantitative information available from studies in animals (or observations made in human epidemiological studies) on the relationship between intake and noncarcinogenic toxic effects, and are designed to be protective of all individuals, including sensitive populations.

There are a few chemicals detected in soils at the Site for which no noncarcinogenic toxicity factors are available, thus, there are no published RfDs (USEPA, 2001a). Structurally related compounds were used to represent RfDs for several SVOC compounds where available. Specifically, noncarcinogenic effects of some of the carcinogenic PAHs were assessed using RfDs from noncarcinogenic PAHs assuming the manifestation of potential effect would occur through a similar mechanism of action. As a conservative measure, pyrene served as the surrogate to evaluate potential noncarcinogenic exposure to benzo[g,h,i]perylene, indeno[123,-cd]pyrene, and benzo[a]pyrene, fluoranthene was used to evaluate the potential noncarcinogenic exposure to benzo[b]fluoranthene, and anthracene was used to evaluate the potential noncarcinogenic exposure to benzo[a]anthracene, chrysene, and dibenzo[ah]anthracene.

A hazard quotient is defined as the ratio between the daily intake of a chemical and the oral RfD for that chemical (USEPA, 1989). The hazard quotient does not define dose-response relationships and is not a direct estimate of risk. The hazard quotient is a numerical indication of the nearness to acceptable limits of exposure or the degree to which acceptable exposure intakes are exceeded. As this quotient approaches unity, concern for the potential hazard increases. Exceeding unity does not in itself imply a potential hazard; however, it does suggest that a given exposure scenario should be evaluated using more realistic and Site-specific assumptions.

6.1.1 Estimating Hazard Quotients

A hazard quotient (HQ) is determined for noncarcinogens based on the ratio of the estimated daily intake to the RfD, such that:

$$HQ = \frac{EDI}{RfD} \qquad \text{(Equation 6-1)}$$

Where:

HQ = Hazard quotient (unitless)

EDI = Estimated daily intake (mg/kg/day)

RfD = Reference dose (mg/kg/day)

6.2 Incremental Lifetime Cancer Risk

Incremental lifetime cancer risk (ILCR), also referred to as excess cancer risk, is defined as the estimated increased risk that occurs over an assumed average lifespan of 70 years as the result of exposure to a specific known or suspected carcinogen (USEPA, 1989). It is expressed in terms of additional cancers, above the normal background, that might be anticipated as a result of specific exposure to an external influence such as exposure to a carcinogen via ingestion, inhalation or absorption. Thus, an ILCR of one in one million (1E-6) may be interpreted as an increase in the baseline (background) cancer incidence from 333,000 persons per million population to 333,001 persons per million population (American Cancer Society, 1994). The Food and Drug Administration (FDA) considers an ILCR of one in one million to be a *de minimis* or insignificant risk (FDA 1985a, 1985b). Similarly, the USEPA uses an incremental lifetime risk range of 1E-4 (one in ten thousand) to 1E-6 when considering and selecting remedial alternatives in site cleanups (40 CFR Section 300.430 55 Federal Regulation 8848).

6.2.1 Estimating the Incremental Lifetime Cancer Risk

The ILCR is theoretically derived from the estimated average daily lifetime intake and a CPF. Because some of the information on the theoretical carcinogenic potency of chemicals in humans is generally not available, data derived from laboratory animal studies are frequently used to derive a CPF. The CPFs that are used in the RA are the most recent values developed by the

Carcinogen Assessment Group (CAG) of the USEPA as cited in the IRIS (USEPA, 2001b), or in HEAST (USEPA, 1997b).

The estimation of the ILCR is given by:

$$ILCR = CPF * LADI \qquad \text{(Equation 6-2)}$$

Where:

ILCR = Incremental lifetime cancer risk for exposure to chemical concentration in a given environmental medium.

CPF = Cancer potency factor $(mg/kg/day)^{-1}$.

LADI = Estimated average lifetime daily intake (mg/kg/day) from exposure to chemical concentration in a given environmental medium.

In order to evaluate the ILCR for simultaneous exposure to more than one carcinogenic compound, the individual chemical-specific ILCRs may be summed (USEPA, 1989). However, there are several limitations to this approach. Because each CPF associated with a given carcinogen is an upper 95th percentile estimate of potency, and because upper 95th percentiles are not strictly additive, the total theoretical cancer risk estimate may be overstated as risks from a number of different carcinogens are summed (USEPA, 1989). Furthermore, summing individual ILCRs assumes that the mechanisms of action of the carcinogens are independent even though data indicate that the action of two different carcinogens might not be independent (USEPA, 1989). Therefore, as part of this RA, the ILCRs were not summed.

6.3 Residential Receptor Risk Characterization

Two theoretical exposure scenarios were considered in the residential risk assessment to estimate potential risk to children, youths, and adults. The PAEI scenario represents an average potential exposure for each receptor, while the RMEI represents a maximum potential exposure. Relevant pathways included exposure to chemicals in indoor air (from groundwater and soil gas), during recreational activities, gardening, and consumption of homegrown produce. The results for each activity related pathway are presented below.

6.3.1 Residential Indoor Air Exposure to Chemicals in Groundwater

Attachment 1 contains the estimated indoor air chemical concentrations predicted by the Johnson and Ettinger (1991) (USEPA, 2000a) model for groundwater and the estimated risks associated with residential exposure to these chemical concentrations are summarized in Table H-19 and H-20.

6.3.1.1 Hazard Quotients

Table H-19 presents the range of estimated HQs (i.e., PAEI and RMEI) for children and youths between the ages of birth to 18 years (and children and youths combined) and adults using the model described above and associated with average and maximum theoretical exposure to air vapor concentrations derived from groundwater.

As shown in Table H-19, the estimated HQs for residential exposure to VOCs through inhalation of indoor air are all nearly two orders of magnitude below unity (1.0) for both the PAEI and RMEI scenarios. Thus, the presence of VOCs in groundwater at the Site does not negatively impact indoor air with regard to noncarcinogenic health effects and potential exposure to these VOCs via inhalation of vapors from groundwater should not present any risk of noncarcinogenic health effects to future residents.

6.3.1.2 Incremental Lifetime Cancer Risk

Table H-20 presents the range of estimated ILCRs (i.e., PAEI and RMEI) for children and youths between the ages of birth to 18 years (and children and youths combined) and adults using the model described above and associated with average and maximum theoretical exposure to air vapor concentrations derived from groundwater.

As shown on Table H-20, the estimated ILCRs for residential exposure to VOCs through inhalation of indoor air are all below *de minimis* (1.0E-6) for both the PAEI and RMEI scenarios, with the exception of trichloroethene (1.01E-6) in the adult RMEI exposure scenario. Because this ILCR is at a risk level considered insignificant, the presence of VOCs in groundwater at the Site does not negatively impact indoor air with regard to carcinogenic health effects and potential exposure to these VOCs via inhalation of vapors from groundwater should not present any risk of carcinogenic health effects to future residents.

6.3.2 Residential Indoor Air Exposure to Chemicals in Soil Gas

Attachment 2 contains the estimated indoor air chemical concentrations predicted by the Johnson and Ettinger (1991) (USEPA 2000a) soil gas model and the estimated risk associated with residential exposure to these chemical concentrations are summarized in Tables H-21 through H-24.

Measured soil gas concentrations and the corresponding estimated indoor air VOC concentrations for each of the two soil gas sampling intervals are summarized in Table H-89. The estimated indoor air VOC concentrations for two chemicals (1,1-dichloroethene and trichloroethene) are slightly in excess of the NYSDEC AGC for the RMEI exposure scenario. Comparison of the estimated indoor air concentrations to the NYSDEC AGC is a first step to determine whether a potential risk could be present. This first step is an extremely conservative approach because the AGC values are derived assuming that an individual is exposed at a theoretical specific concentration continuously over an entire lifespan of 70 years. Clearly there are multiple unrealistic assumptions that are incorporated into the derivation of the AGC.

If the estimated indoor air concentration, as compared to the NYSDEC AGCs, indicates that a potential theoretical risk could be present, the USEPA recommends that further evaluation be performed using Site-specific exposure scenarios. This further evaluation (i.e., second step in the process) was conducted using exposure algorithms described in RAGS by the USEPA (1989).

6.3.2.1 Hazard Quotients

Tables H-21 and H-23 presents the range of estimated HQs (i.e., PAEI and RMEI) for children and youths between the ages of birth to 18 years (and children and youths combined) and adults using the model described above and associated with average and maximum theoretical exposure to air vapor concentrations derived from the 3-foot and 6-foot soil gas sampling intervals.

As shown in Tables H-21 and H-23, the estimated HQs for residential exposure to VOCs through inhalation of indoor air are all nearly two orders of magnitude below unity (1.0) for both the PAEI and RMEI scenarios. Thus, the presence of VOCs migrating from groundwater as measured by the soil gas at the Site does not negatively impact indoor air with regard to noncarcinogenic health effects. Thus, the potential exposure to these VOCs via inhalation of

chemical vapors as indicated by the actual soil gas concentrations should not present any risk of noncarcinogenic health effects to future residents.

6.3.2.2 Incremental Lifetime Cancer Risk

Tables H-22 and H-24 presents the range of estimated ILCRs (i.e., PAEI and RMEI) for children and youths between the ages of birth to 18 years (and children and youths combined) and adults using the model described above and associated with average and maximum exposure to air vapor concentrations derived from the 3-foot and 6-foot soil gas sampling intervals.

As shown in Tables H-22 and H-24, the estimated ILCRs for residential exposure to VOCs through inhalation of indoor air are all below *de minimis* (1.0E-6) for both the PAEI and RMEI scenarios. Thus, the presence of VOCs migrating from groundwater as measured by the soil gas at the Site does not negatively impact indoor air with regard to carcinogenic health effects and potential exposure to these VOCs via inhalation of vapors from groundwater should not present any risk of carcinogenic health effects to future residents.

6.3.3 Residential Recreational Exposure to Chemicals in Soil

Under all recreational scenarios, residents were assumed potentially exposed to Site soil. Relevant pathways include dermal absorption, ingestion, and inhalation of chemicals in soil.

6.3.3.1 Hazard Quotients

Tables H-53 and H-54, H-57 and H-58, H-61 and H-62, present the range of estimated HQs (i.e., PAEI and RMEI) for children, youths, and adults, respectively using the model described above and associated with theoretical average and maximum exposure to chemicals in soil during recreational activities. Table H-90 presents a summary of the estimated HQs for the combined exposure to soil during recreational activities for the child and youth combined (PAEI and RMEI scenarios).

As shown in Tables H-53, H-54, H-57, H-58, H-61, and H-62, the estimated HQs for residential exposure to chemicals in soil through dermal absorption, ingestion, and inhalation are all below unity (1.0) for both the PAEI and RMEI scenarios. The combined HQs for children and youths as indicated by Table H-90 are also below unity (1.0). Thus, the potential exposure to chemicals

in soil via all pathways described should not present any risk of noncarcinogenic health effects to future residents.

6.3.3.2 Incremental Lifetime Cancer Risk

Tables H-55 and H-56, H-59 and H-60, H-63 and H-64, present the range of estimated ILCRs (i.e., PAEI and RMEI) for children, youths, and adults, respectively using the model described above and associated with theoretical average and maximum exposure to chemicals in soil during recreational activities. Table H-91 presents a summary of the estimated ILCRs for the combined exposure to soil during recreational activities for the child and youth combined (PAEI and RMEI scenarios).

As shown in Tables H-55, H-56, H-59, H-60, H-63, and H-64, the estimated ILCRs for residential exposure to chemicals in soil through dermal absorption, ingestion, and inhalation are all below *de minimis* (1.0E-6) for the PAEI scenario. The combined ILCRs for children and youths indicated by Table H-91 for the PAEI scenario are also below *de minimis.*

For the RMEI scenario, there were several slight exceedances of the *de* minimis risk level (same order of magnitude for both children and youth summarized in Table H-91, and adults (Table H-64). However, the RMEI scenario uses the maximum detected soil concentration for each COPC along with extremely conservative health protective exposure assumptions to estimate the upper bound risk. Examination of the raw data indicates that the maximum concentrations used for purposes of these calculations were, in all cases, approximately five fold or more higher than the mean concentrations. In addition, in all cases, the maximum concentration exceeds the second highest concentration by a factor of at least 2.5. Clearly, the maximum concentrations are outliers and thus, associated theoretical risks are not representative of actual Site-wide conditions.

The following presents the estimated RMEI carcinogenic risks that exceed 1.0E-6 for the recreational scenarios.

Estimated Incremental Lifetime Cancer Risks above *de minimis* ($1.0E^{-6}$) Associated with the Recreational Reasonable Maximum Exposure Scenario.

Chemical	Child	Youth	Child + Youth	Adult
Benzo[a]anthracene	1.09E-6		1.92E-6	
Benzo[a]pyrene	9.00E-6	6.88E-6	1.59E-5	2.64E-6
Benzo[b]fluoranthene			1.29E-6	
Dibenzo[a,h]anthracene	3.26E-6	2.49E-6	5.75E-6	
Indeno[1,2,3]pyrene			1.12E-6	
Arsenic	7.00E-6	4.91E-6	1.19E-5	1.68E-6

6.3.4 Residential Gardening Exposure to Chemicals in Soil

Under the gardening scenarios, adults were theoretically exposed to Site soil through gardening maintenance activities. Relevant pathways include dermal absorption, ingestion, and inhalation of chemicals in soil.

6.3.4.1 Hazard Quotients

Tables H-65 and H-66, present the range of estimated HQs (i.e., PAEI and RMEI) for adults, using the model described above and associated with theoretical average and maximum exposure to chemicals in soil during gardening activities.

As shown in Tables H-65 and H-66, the estimated HQs for adult exposure to chemicals in soil through dermal absorption, ingestion, and inhalation are all below unity (1.0) for both the PAEI and RMEI scenarios. The theoretical exposure to chemicals in soil via all pathways while gardening as described above should not present any risk of noncarcinogenic health effects to future residents.

6.3.4.2 Incremental Lifetime Cancer Risk

Tables H-67 and H-68, present the range of estimated ILCRs (i.e., PAEI and RMEI) for adults using the model described above and associated with theoretical average and maximum exposure to chemicals in soil during gardening activities.

As shown in Tables H-67 and H-68, the estimated ILCRs for adult exposure to chemicals in soil through dermal absorption, ingestion, and inhalation are all below *de minimis* (1.0E-6) for the PAEI scenario. However, three chemicals were at exposure levels that were above 1.0E-6 for the RMEI scenario. The estimated ILCRs for benzo[a]pyrene (5.36E-6), dibenzo[a,h]anthracene (1.94E-6), and arsenic (3.37E-6) were each above *de minimis* risk levels.

The RMEI scenario uses the maximum detected soil concentration for each COPC along with extremely conservative health protective exposure assumptions to estimate the upper bound risk. Examination of the raw data indicates that the maximum concentrations used for purposes of these calculations were, in all cases, approximately five fold or more higher than the mean concentrations. In addition, in all cases, the maximum concentration exceeds the second highest concentration by a factor of at least 2.5. Clearly, the maximum concentrations are outliers and thus, associated theoretical risks are not representative of any actual Site-wide conditions. Therefore, the exceedances of the *de minimis* risk level for the RMEI scenario are not indicative of an unacceptable risk for the residential gardening scenario receptors.

6.3.5 Residential Exposure to Chemicals in Homegrown Produce

Under all produce ingestion scenarios, residents were theoretically exposed to Site soil through bioconcentration of chemicals in homegrown produce. Tables H-69 and H-70 summarize the estimated concentrations in produce grown in Site soil.

6.3.5.1 Hazard Quotients

Tables H-71 and H-72, H-75 and H-76, H-79 and H-80, present the range of estimated HQs (i.e., PAEI and RMEI) for children, youths, and adults, respectively using the model described above and associated with theoretical average and maximum exposure to chemicals in soil following consumption of homegrown produce. Table H-92 presents a summary of the estimated HQs for the combined exposure to soil following consumption of homegrown produce for the child and youth combined (PAEI and RMEI scenarios).

As shown in Tables H-71 and H-72, H-75 and H-76, H-79 and H-80, the estimated HQs for residential exposure to chemicals in soil through consumption of homegrown produce are all below unity (1.0) for both the PAEI and RMEI scenarios. The combined HQs for children and

youths as indicated by Table H-92 are also below unity (1.0). The potential exposure to chemicals in soil via a produce consumption pathway described above should not present any risk of noncarcinogenic health effects to future residents.

6.3.5.2 Incremental Lifetime Cancer Risk

Tables H-73 and H-74, H-77 and H-78, H-81 and H-82, present the range of estimated ILCRs (i.e., PAEI and RMEI) for children, youths, and adults, respectively using the model described above and associated with theoretical average and maximum exposure to chemicals in soil following consumption of homegrown vegetables. Table H-93 presents a summary of the estimated ILCRs for the combined exposure to soil following consumption of homegrown vegetables for the child and youth combined (PAEI and RMEI scenarios).

As shown in Tables H-73 and H-74, H-77 and H-78, H-81 and H-82, the estimated ILCRs for residential exposure to chemicals in soil through consumption of homegrown vegetables are all below *de minimis* (1.0E-6) for the PAEI scenario, except for benzo[a]pyrene for the youth (2.08E-6) and adult (1.59E-6) receptors. The combined ILCRs for children and youths indicated by Table H-93 for the PAEI scenario are also below *de minimis*, except for benzo[a]pyrene (2.79E-6). A few chemicals were calculated at levels slightly above the *de minimis* level for the RMEI scenario for children, youths and adults. In addition to the uncertainties with respect to the plant uptake models, there is significant uncertainty whether any homegrown produce will actually be cultivated in pre-existing soils after construction is complete. Therefore, the RMEI scenario, which uses the maximum detected soil concentration along with extremely conservative health protective exposure assumptions to estimate the upper bound risk, is a highly speculative scenario with multiple levels of conservatism that overestimates any theoretical risk. Furthermore, assuming that the pre-existing soil conditions remain accessible, examination of the raw data indicates that the maximum concentrations, in all cases, are five fold or more higher than the mean concentrations. . In addition, in all cases, the maximum concentration exceeds the second highest concentration by a factor of at least 2.5. Clearly, the maximum concentrations are outliers and thus, associated theoretical risks are not representative of any actual Site-wide conditions. Therefore, the exceedances of the *de minimis* risk level for the RMEI scenario are not indicative of an unacceptable risk to residential receptors consuming homegrown produce.

The following presents the estimated ILCRs above *de minimis* for the produce consumption scenarios.

Estimated Incremental Lifetime Cancer Risks Above *de minimis* (1.0E-6) Associated with the Consumption of Vegetables in the Reasonable Maximum Exposure Scenario.

Chemical	Child	Youth	Child + Youth	Adult
Benzo[a]anthracene	1.25E-6	3.63E-6	4.88E-6	3.10E-6
Benzo[a]pyrene	1.01E-5	2.94E-5	3.95E-5	2.50E-5
Benzo[b]fluoranthene		2.47E-6	3.32E-6	2.11E-6
Dibenzo[a,h]anthracene	3.34E-6	9.76E-6	1.31E-5	8.24E-6
Indeno[1,2,3]pyrene		1.85E-6	2.48E-6	1.56E-6
Arsenic		1.47E-6	2.06E-6	1.91E-6

6.4 Construction Worker Risk Characterization

Two theoretical exposure scenarios were considered in the construction risk assessment to evaluate risk to workers performing ground invasive activities. The PAEI scenario represents an average potential exposure, while the RMEI represents a maximum potential exposure. Construction worker scenarios incorporated exposure to groundwater, soil, and solid materials contained within subsurface structures.

6.4.1 Construction Worker Exposure to Groundwater

Under both the general construction scenario and when performing activities within subsurface structures, Site-wide groundwater was evaluated for dermal and inhalation (VOCs only) exposure pathways. The construction scenario assumed that the workers are wearing normal construction-type work clothes (i.e., long pants and short sleeve shirts).

6.4.1.1 Hazard Quotients

Tables H-25 and H-26, present the range of estimated HQs (i.e., PAEI and RMEI) for general construction workers using the model described above and associated with the theoretical average and maximum exposure to chemicals in groundwater. Tables H-29 and H-30, present the range of estimated HQs (i.e., PAEI and RMEI) for construction workers performing ground invasive activities within subsurface structures.

As shown in Tables H-25, H-26, H-29, and H-30, the estimated HQs for construction worker exposure to chemicals in groundwater through dermal absorption and inhalation (VOCs only) are all below unity (1.0) for both the PAEI and RMEI scenarios. The theoretical exposure to chemicals in groundwater via all pathways described should not present any risk of noncarcinogenic health effects to construction workers.

6.4.1.2 Incremental Lifetime Cancer Risk

Tables H-27 and H-28, present the range of estimated ILCRs (i.e., PAEI and RMEI) for general construction workers using the model described above and associated with the theoretical average and maximum exposure to chemicals in groundwater. Tables H-31 and H-32, present the range of estimated ILCRs (i.e., PAEI and RMEI) for construction workers performing ground invasive activities within subsurface structures.

As shown in Tables H-27, H-28, H-31, and H-32, the estimated ILCRs for construction worker exposure to chemicals in groundwater through dermal absorption and inhalation (VOCs only) are all below *de minimis* (1.0E-6) for the PAEI and RMEI scenarios, except for benzo[a]pyrene (2.00E-6) for the general construction RMEI scenario. Under this scenario, the risk calculation uses a hypothetical concentration for benzo[a]pyrene that is based on one-half of the maximum analytical method non-detection limit, i.e., 5.5 µg/L, rather than a confirmed detection of benzo[a]pyrene. Consistent with the protocol previously described for non-detects, one-half of the reported detection limit is used as a surrogate concentration in any statistical evaluation or risk estimate. Thus, this estimated risk for benzo[a]pyrene is based on a theoretical concentration and not an actual concentration for this chemical. In fact, the maximum detected in all groundwater samples was nearly an order of magnitude lower (i.e., 0.7 µg/L). This maximum detected concentration corresponds to an estimated risk level of nearly an order of magnitude lower than reported above when using one-half the detection limit as the maximum concentration level. Thus, potential exposure via dermal absorption and inhalation of chemicals from groundwater should not present any risk of carcinogenic health effects to construction workers performing ground invasive activities at the Site.

6.4.2 Construction Worker Exposure to Soil

Under both the general construction scenario and when workers are performing activities within subsurface structures, soil and solid materials contained within subsurface structures were evaluated for dermal absorption, ingestion, and inhalation exposure pathways.

6.4.2.1 Hazard Quotients

Tables H-33, H-34, H-37, H-38, H-41, H-42, H-45, H-46, H-49, and H-50 present the range of estimated HQs (i.e., PAEI and RMEI) for all construction workers using the model described above and associated with the theoretical average and maximum exposure to chemicals in soil.

As shown in Tables H-33, H-34, H-37, H-38, H-41, H-42, H-45, H-46, H-49, and H-50 present the range of the estimated HQs (i.e., PAEI and RMEI) for construction worker exposure to chemicals in groundwater through dermal absorption, ingestion, and inhalation are all below unity (1.0) for both the PAEI and RMEI scenarios, with the exception of antimony (2.86E+0) in the Northern Area RMEI scenario and thallium (1.77E+0) in the Western Area RMEI scenario. These two exceedances of unity for the HQs are associated with the assumed ingestion of soil containing the maximum concentration of each metal. Because, in each case, the average soil concentration detected at the Site is approximately five fold lower, the maximum concentrations are outlier concentrations that are not representative of any likely ingestion scenario. In general, the theoretical exposure to chemicals in soil via all pathways described should not present any risk of noncarcinogenic health effects to construction workers.

6.4.2.2 Incremental Lifetime Cancer Risk

Tables H-35, H-36, H-39, H-40, H-43, H-44, H-47, H-48, H-51, and H-52 present the range of estimated ILCRs (i.e., PAEI and RMEI) for all construction workers using the model described above and associated with the theoretical average and maximum exposure to chemicals in soil.

As shown in Tables H-35, H-36, H-39, H-40, H-43, H-44, H-47, H-48, H-51, and H-52, the estimated ILCRs for construction worker exposure to chemicals in soil through dermal absorption, ingestion, and inhalation are all below *de minimis* (1.0E-6) for the PAEI and RMEI scenarios. Thus, theoretical exposure via dermal absorption, ingestion, and inhalation of

chemicals in soil should not present any risk of carcinogenic health effects to construction workers performing ground invasive activities at the Site.

6.4.3 Lead

The Occupational Safety and Health Administration (OSHA) states that blood lead level of workers (male and female) intending to have children should remain below 30 micrograms per deciliter (µg/dL) to minimize adverse health effects to the parents and the developing fetus. Prevention of adverse health effects for most workers from lead exposure throughout a working lifetime requires that worker blood lead level be maintained at or below 40 µg/dL of whole blood (29 CFR Part 1910.1025). Tables H-83 through H-88 summarize the results of the lead biokinetic model for the PAEI, and RMEI exposure scenarios for construction workers performing ground invasive activities within the subsurface structures.

The highest blood lead level predicted in the RA using the biokinetic slope factor model was 24 µg/dL estimated for the Central Area. This blood lead level corresponded to the 99th percentile with a geometric standard deviation (GSD) of 2.1 for exposure to lead in the solid material within subsurface structures for the RMEI construction scenario. This blood lead concentration is below any blood lead concentrations of concern (i.e., between 30 and 40 µg/dL blood lead concentration).

7.0 UNCERTAINTY ANALYSIS

Human health risks posed by a defined set of circumstances may be evaluated quantitatively. The precision of these theoretical estimates is dependent on the size and quality of the database, and the assumptions one must make to utilize the data in the exposure and risk calculations. The varying degrees of uncertainty associated with the estimation of risk that may result from human exposures have been compensated for throughout the RA by making health-protective assumptions, where necessary. Specific areas of uncertainty include the following:

- Analytical database
- Receptor population
- Exposure estimates
- Toxicological data and risk characterization
- Complex interactions of uncertainty elements

The uncertainty elements and the steps taken to address them are reviewed in the following sections.

7.1 Analytical Database

The analytical database used in the RA was generated during the site investigation (SI). Several areas of uncertainty are associated with the individual chemicals and the associated concentrations that were ultimately selected for inclusion in the RA.

7.1.1 Factors Contributing to Overestimation of Risk

Among the chemicals that are quantitatively carried through the RA, there are uncertainties associated with the chemical concentrations that are used to estimate potential risks. Specifically, the use of one-half the SQL to estimate concentrations of compounds that were not detected in a sample introduces a degree of uncertainty in the RA. This is especially true for cases of unusually high SQLs (i.e., samples analyzed at significant dilution). Because this practice likely overestimates chemical concentrations, any theoretical risks (either carcinogenic or noncarcinogenic) associated with exposure to these compounds are also likely to be overstated.

7.1.2 Factors with Unknown Contribution to Risk Estimate

Toxicological data are not available for all chemicals, thus introducing uncertainty into the assessment of potential risks associated with exposures to these chemicals. As discussed in Section 3.5.1.1 and Section 6.1, toxicity data for several chemicals were not available. In order to evaluate as many of the chemicals as possible in the analytical database, the toxicity data from structurally similar compounds were used. The effect on the theoretical risk associated with these chemicals could either be underestimated, overestimated, or appropriate, but is essentially unknown.

7.2 Receptor Population

Based on a review of Site-specific conditions and future development of the property, the following exposure pathways were quantitatively evaluated in the RA:

- dermal absorption of chemicals present in soil by construction workers and future residents;
- dermal absorption of chemicals present in groundwater by construction workers;
- incidental ingestion of chemicals present in the soil by construction workers and future residents;
- inhalation of chemicals present in dusts derived from soil by construction workers and future residents;
- inhalation of chemicals present in vapors derived from groundwater by construction workers;
- inhalation of chemicals in indoor air originating from groundwater or soil gas by future residents; and
- ingestion of chemicals associated with soil through the ingestion of homegrown vegetables.

7.2.1 Factors Contributing to Overestimation of Risk

The selection of receptors for the construction exposure scenario assumes that the same worker will be present at the Site during the entire period of construction. However, it is more likely that construction activities will be conducted by a variety of workers from different crafts (i.e., carpenters, masons, electricians, plumbers, etc.). Thus, the scenario overestimates the

potential risk because it is unlikely that any one worker will be present at the Site during the entire construction period.

The duration of theoretical exposure for the recreational activities may also be inflated, particularly for the youth receptor. Although with increased age comes increased independence, it is likely that the actual time spent at the Site by youths, being exposed to Site soils, is lowered in comparison with the total days exposed used in this RA.

7.2.2 Factors with Unknown Contribution to Risk Estimate

In each case, the theoretical exposure scenarios for these receptors used health-protective exposure assumptions for the various exposure pathways to provide high-end estimates of potential risk. However, there are uncertainties associated with the potential exposures of the receptor populations. Although best professional judgment was used to estimate possible length of exposure for construction workers and residents, it is not known precisely how long potential receptors will actually remain at the Site.

7.3 Exposure Estimates

The risk assessment utilizes mathematical models that assume a priori that the COPCs are in a form in which they are readily available for the potential receptors to be exposed. These models are helpful in providing a numerical approximation of a biological system's response given a particular set of input conditions and constraints. Any attempt to model a biological system incorporates some degree of uncertainty. A number of these uncertainties were mentioned during the description of each potential exposure scenario and assumptions were used to estimate possible intakes of chemicals by different routes of exposure. Some of the key assumptions are restated to illustrate the consistently health-protective bias built into the model assumptions to compensate for uncertainty. Where reasonable approximations of the Site-specific scenario could not be estimated, conservative "default" factors that erred on the side of exposure overestimation were utilized.

7.3.1 Factors Contributing to Overestimation of Risk

Finite quantities of chemicals are present in the soil, groundwater, and solid materials contained within subsurface structures at the Site. Chemical concentrations will tend to undergo

attenuation over a period of years as a result of processes such as degradation by naturally occurring organisms (Riser-Roberts, 1992). Thus, over a period of years under natural conditions, the maximum observable concentrations of chemicals in the soil, groundwater, and solid materials contained within subsurface structures will decrease. The risk assessment does not take this potential attenuation into account.

The vegetable consumption and recreational risk assessments assumed that the chemical concentrations measured in soil are completely bioavailable. For most of the COPC involved in this scenario (i.e., PAHs) prediction of bioconcentration based on equilibrium partitioning may be inappropriate (Schaefer, 2001; McGroddy and Farrington, 1995) and actual concentration available for partitioning to produce or the rate of dermal absorptions may be significantly lower. The vegetable scenario models also do not take into account the removal of chemicals that would be expected to occur due to uptake by the plants over the exposure period, again resulting in lowered exposure concentrations over time. In addition, when creating a garden, clean fill (typically topsoil) is added to supplement existing soil. This could have the effect of immediately and significantly diluting the Site soil COPCs and ultimately reducing bioconcentration in homegrown produce. The limited size of the proposed individual properties will also severely limit the quantity of homegrown produce that can be cultivated and consumed.

The vapor models used to estimate air vapor concentrations associated with the presence of VOCs in groundwater and as soil gas assume a continuous release of vapor. Ideally there will be a loss of chemical mass over time that the models do not take into account.

The one detected chemical that contained an ILCR in excess of the target value was driven by maximum groundwater concentrations that represent the extreme conditions for chemical exposure (adult RMEI indoor air exposure). Trichloroethene is one order of magnitude higher in concentration for the RMEI exposure scenario than the PAEI exposure scenario (Table H-2). It is highly unlikely that the receptor would be exposed to the maximum concentration throughout the duration of this RMEI exposure scenario given removal mechanisms such as attenuation, volatilization, advection, etc. Furthermore, the building infiltration model applied used generic assumptions that will tend to overestimate indoor air concentrations. For example factors such as

the method of slab construction and building ventilation can influence indoor air concentration. The model, as used, included default conservative assumptions that likely overestimate indoor air concentrations.

The averaging time used to estimate average daily intake for noncarcinogenic compounds was established at either 3 or 6 weeks for construction exposures during ground invasive activities at subsurface structures. This was a health-protective procedure because it averaged the intakes of noncarcinogenic compounds over a short period of time. In reality, the construction worker may spend the 15 or 30 workdays at the Site spread over the course of an entire year rather than in a 3 or 6-week period. Use of the shorter averaging time for exposure ensures that the average daily intake is greater, and thus, HQs associated with these compounds are also greater.

7.3.2 Factors with Unknown Contribution to Risk Estimate

Biological factors that will ultimately affect the theoretical presence of chemicals within the body include differential absorption and metabolism as chemicals move through the skin and digestive tract. While best professional judgment was used to estimate these factors, the true value for these factors is unknown. As discussed in Sections 4.3.5 and 4.3.6, there are uncertainties associated with estimating the dermal permeability and gastrointestinal absorption factor for the metals.

For purposes of the risk assessment, the actual hours and number of days spent in construction activities are unknown. However, the assumptions used are directed towards ensuring that potential intake is not understated.

The biokinetic slope factor model used to predict blood lead concentrations relies on data from a large number of studies (e.g., baseline blood lead levels, variability of blood lead levels, lead bioavailability) to support a predictive probabilistic (log normal) model for adult blood lead concentrations. There are varying degrees of uncertainty associated with theoretical estimation of each of the parameters used in the model.

7.4 Toxicological Data and Risk Characterization

Although the uncertainties described above may affect the quantitative risk determination, the overriding uncertainties associated with the risk characterization are:

- The extrapolation of toxic or carcinogenic effects observed at the high doses necessary to conduct animal studies to the effects that might occur at much lower, actual human intake; and
- The extrapolation from toxic effects in animals to toxic effects in humans (i.e., responses of animals may be different from responses of humans).

7.4.1 Factors Contributing to Overestimation of Risk

These extrapolations form the basis for the derivation of the toxicity factors used to evaluate risks. The carcinogenic potency factors (CPFs) are derived using a weight-of-evidence approach to studies in the scientific literature. Due to the lack of epidemiological data for most chemicals, the evidence for a chemical's toxicity to humans is derived from animal studies where experimental groups are exposed for their lifetime to doses higher those typically found in the environment. In some cases, only a single animal study is used to derive human toxicity factors.

The USEPA uses a prescribed protocol to evaluate animal data to estimate human CPFs (USEPA, 1989; 1997b). The protocol utilizes a linear multistage extrapolation model that provides a mathematical approximation of the dose-response slopes. There are several equally feasible dose-response extrapolation models available; however, the one typically selected by both Federal and State agencies, and applied here, is designed to define the highest upper bound risk condition. The results of this model most likely overestimate the actual toxicity associated with the particular chemical.

As previously discussed in Section 7.3.1, a short averaging time of either 3 or 6 weeks was used for estimating health effects associated with exposure to noncarcinogenic compound contained in solid materials within subsurface structures. Use of the shorter averaging time as compared to a more typical averaging time period of one year ensured that the average daily intakes, and thus estimated HQs were greater.

It is not known whether arsenic is present at the Site in primarily the carcinogenic or noncarcinogenic form. However, to ensure a health protective approach in the RA both the RfD and the CPF were used to evaluate the arsenic present in soil and groundwater. Application of both the RfD and CPF to the Site-specific concentrations of arsenic yields ILCRs and HQs based on the arsenic present as being totally in the carcinogenic form (for ILCRs) or the noncarcinogenic form (for HQs). To the extent that the arsenic is present in the noncarcinogenic form instead of the carcinogenic form, the ILCRs associated with arsenic exposure are overestimated.

7.4.2 Factors with Unknown Contribution to Risk Estimate

Current scientific evidence indicates that biological alteration must occur in order for many chemicals to initiate cancer. Metabolic and pharmacokinetic differences between the test animals and humans are, in general, not considered in estimating human CPFs. In addition, the high doses administered during animal studies may result in saturation effects in certain biochemical systems within the organism. These same effects may not be relevant at lower doses when the biochemical systems are not saturated. Thus, an additional degree of uncertainty is added to the toxicity factors derived by these methods.

Even in cases where epidemiological data are available, a measure of uncertainty exists because exposures are not controlled in the sense of a laboratory experiment. Thus, it is usually impossible to isolate exposure to a specific chemical, determine the actual exposure concentration, or quantify the exposure duration, resulting in potential errors in the toxicity factors derived from epidemiological studies.

For noncarcinogens, the RfDs and other agency-established criteria and standards have been established in a similar manner. The degree of uncertainty that exists for these noncarcinogenic values is thus similar to the uncertainties associated with potential carcinogens.

The USEPA has taken some uncertainties into account when deriving RfDs, CPFs and other similar human response factors. The RA utilizes the guidance of the USEPA in minimizing the uncertainties by using published standards and criteria to evaluate the potential risks posed by the Site.

7.5 Complex Interactions of Uncertainty Elements

A risk assessment for a specific site is ultimately an integrated evaluation of historical, chemical, analytical, environmental, and toxicological data that is as site-specific as possible. To minimize the chances of underestimating risk due to uncertainties in the evaluation, each step is biased toward health-protective estimations. In addition, the RA is not intended to represent currently existing exposures or actual health risks. Rather, the RA generates theoretical risk estimations that may occur only if all the conservative assumptions are realized.

8.0 CONCLUSIONS

A conservative Site-specific risk assessment was conducted, based on procedures recommended by the USEPA, to evaluate current and future theoretical risks, if any, to human health posed by chemicals identified in environmental media associated with the former Thypin Steel Inc. Facility (Site). With the proposed redevelopment of the Site for future residential use, this risk assessment focused on residential scenarios that included both average (PAEI) and upper bound (RMEI) exposure assumptions. The use of the PAEI and RMEI exposure scenarios allows the potential exposure and risk to be bracketed between exposures that could reasonably be expected at the Site, and exposures that are highly unlikely to be reached or exceeded. In addition, construction worker scenarios were included to address the potential for exposure to chemicals in soils, groundwater and solid material contained within subsurface structures.

The PAEI scenario was used to evaluate a theoretical Site-wide exposure through the use of average concentrations for each of the COPCs and exposure parameters that reflect a credible exposure paradigm. The RMEI represents an upper bound exposure scenario that uses the maximum chemical concentrations and more stringent exposure assumptions. The RMEI scenario results in estimations of exposure and risk that are considered exceedingly conservative and in general unlikely to occur. The use of the PAEI and RMEI exposure scenarios allows the potential exposure and risk to be bracketed between exposures that could reasonably be expected at the Site and exposures that are highly unlikely to be exceeded.

Intakes for all possible routes of theoretical exposure for a construction scenario were evaluated for each COPC in each medium (soil, groundwater, and solid materials within subsurface structures). The estimated average daily intake for each chemical in each medium was used to derive chemical-specific carcinogenic and/or noncarcinogenic risks under a defined set of exposure conditions. Theoretical residential intakes via inhalation of indoor vapors derived from VOCs present in groundwater or soil gas beneath any buildings constructed on the Site in the future were also estimated. In addition, residential recreational, gardening, and vegetable consumption scenarios were developed to estimate chemical intakes via these theoretical future exposure pathways.

The estimated indoor air VOC concentrations for two chemicals (1,1-dichloroethene and trichloroethene) are slightly in excess of the NYSDEC AGC for the RMEI exposure scenario. The estimated HQs for residential exposure to VOCs through inhalation of indoor air are all nearly two orders of magnitude below unity (1.0) for both the PAEI and RMEI scenarios. Thus, the presence of VOCs migrating from groundwater as measured by the soil gas at the Site does not negatively impact indoor air with regard to noncarcinogenic health effects. The potential exposure to these VOCs via inhalation of chemical vapors as indicated by the actual soil gas concentrations should not present any risk of noncarcinogenic health effects to future residents. The estimated ILCRs for residential exposure to VOCs through inhalation of indoor air are all at or below *de minimis* (1.0E-6) for both the PAEI and RMEI scenarios. Thus, the presence of VOCs migrating from groundwater as measured by the soil gas at the Site does not negatively impact indoor air with regard to carcinogenic health effects. Potential exposure to these VOCs via inhalation of vapors from groundwater should not present any risk of carcinogenic health effects to future residents.

The presence of lead in groundwater was not evaluated because lead is considered essentially insoluble in water. Furthermore, there is no appropriate model to address any dissolved lead and absorption through the skin is expected to be of very limited concern compared to oral or inhalation intake. Potential exposures to lead present in subsurface soil are evaluated using a biokinetic slope factor model (Tables H-83, H-88). The 95th percentile maximum blood lead concentration predicted according to a biokinetic slope factor model is 1.7E+1 µg/dL (Table H-88). This blood lead concentration is well below any blood lead concentration of concern for construction workers. Thus, the presence of lead in solid materials within subsurface structures at the Site does not pose a threat to human health.

The approach of this RA used extremely health-protective assumptions that are designed to overestimate the potential theoretical risks. This approach for managing uncertainties has a magnifying effect on the outcome of the RA process. Because each conservative step builds on the previous one, the overall result of making biased assumptions likely significantly overestimates risk, therefore compensating for any RA uncertainties that may result in underestimation of risk and assures that the overall assessment provides an ample margin of safety.

Under the exposure scenarios described there are three situations where the ILCR exceeds the *de minimis* risk level of 1E-6 in a PAEI exposure scenario. These exceedances occur when the risk from estimated consumption of benzo[a]pyrene in home grown produce for children and youth(s) are combined. There are inherent uncertainties in this evaluation because:

- no literature has been identified that supports any specific uptake rate for SVOCs into plant material;
- information on possible distribution and metabolism of SVOCs within any plant has not been identified;
- based on the space that would potentially be available for cultivation it is uncertain whether the quantity of crops suggested under the RMEI exposure scenario could actually be grown simultaneously; and
- the fraction of benzo[a]pyrene included within a food matrix subject to gastrointestinal absorption is unknown.

To maintain a health-protective approach it was assumed that 80 percent of the theoretical amount of benzo[a]pyrene ingested was absorbed, however, studies with PAHs dissolved in oil suggest that absorption is more likely in the range of 40 to 60 percent (ATSDR, 1995) This hypothetical pathway is not sufficiently supported by experimental data for risk levels that marginally exceed (less than an order of magnitude) a *de minimis* level to be considered a risk, nor should it be used to justify any form of remedial activity.

All other exceedances of the target risk level occurred in the RMEI exposure scenarios. With the use of the maximum detected chemical concentration and the associated health protective assumptions, there is a considerable level of overestimation of potential risks. Use of average concentrations of Site-related constituents to estimate potential risk is more representative, but still likely overestimates any anticipated exposure that could occur after redevelopment is complete. Thus, it is concluded that the residual VOCs, SVOCs, and metals in the soil, groundwater, and subsurface building structures will not negatively impact indoor air quality and will not pose any excessive human health risk to residents occupying future buildings and for construction workers performing activities consistent with these exposure conditions and with regard to both carcinogenic and noncarcinogenic health effects.

It is understood that additional fill will likely be placed on the Site prior to property development; thus, the likelihood of contact with soils impacted by Site related chemicals or to groundwater will be reduced by the presence of the additional soil cover. Added soil could also be mixed with Site soil, which ultimately will dilute concentrations of COPCs. After construction is completed, buildings and impervious surfaces (e.g., a roadway, a driveway, and/or a patio) will cover much of the Site and there will be likely be little opportunity for contact with any Site related constituents in soil and groundwater.

Respectfully submitted,

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Table H-1: Summary of Compounds Identified in Soil, Former Thypin Steel Inc. Facility, Manorhaven, New York.

Analyte		Number of Detections	Total Analyzed	Detection Frequency (%)	Minimum (mg/kg)	Maximum (mg/kg)	Maximum Detected (mg/kg)	USEPA RBC Residential (mg/kg)	Screening Results
Volatile Organic Compounds									
Benzene	71432	1	12	8.3	6.00E-4	3.00E-3	6.00E-4	1.16E+01	No further evaluation
Carbon Disulfide	75150	2	24	8.3	2.00E-3	4.00E-3	4.00E-3	7.82E+03	No further evaluation
Methylene Chloride	75092	24	24	100.0	3.00E-3	2.40E-2	2.40E-2	8.52E+01	No further evaluation
Tetrachloroethene	127184	5	24	20.8	2.00E-3	1.50E-2	1.50E-2	1.23E+01	No further evaluation
Trichloroethene	79016	4	24	16.7	2.50E-3	1.60E-2	1.60E-2	5.81E+01	No further evaluation
Semivolatile Organic Compounds									
2,4-Dinitrophenol	105679	1	22	4.5	1.40E-1	3.35E+0	1.40E-1	1.56E+03	No further evaluation
2-Chlorophenol	95578	1	22	4.5	3.00E-3	7.00E-1	3.00E-3	3.91E+02	No further evaluation
2-Methylnaphthalene	91576	15	30	50.0	1.00E-2	8.40E-1	8.40E-1	1.56E+03	No further evaluation
Acenaphthene	83329	16	30	53.3	2.00E-3	1.20E+0	1.20E+0	4.69E+03	No further evaluation
Acenaphthylene	208968	16	33	48.5	2.00E-3	2.40E-1	2.40E-1	4.69E+03	No further evaluation
Anthracene	120127	19	33	57.6	1.00E-2	3.00E+0	3.00E+0	2.35E+04	No further evaluation
Benzo[a]anthracene	56553	29	33	87.9	1.00E-3	7.00E+0	7.00E+0	8.75E-01	* Exceeds criteria
Benzo[a]pyrene	50328	27	33	81.8	5.00E-3	5.80E+0	5.80E+0	8.75E-02	* Exceeds criteria
Benzo[b]fluoranthene	205992	26	33	78.8	6.00E-3	4.70E+0	4.70E+0	8.75E-01	* Exceeds criteria
Benzo[g,h,i]perylene	191242	22	33	66.7	1.00E-2	5.80E+0	5.80E+0	1.56E+03	No further evaluation
Benzo[k]fluoranthene	207089	26	33	78.8	5.00E-3	4.90E+0	4.90E+0	8.75E+00	No further evaluation
Benzoic acid	65850	2	22	9.1	5.00E-3	3.35E+0	1.60E-2	3.13E+05	No further evaluation
bis(2-Ethylhexyl) phthalate	117817	25	30	83.3	2.00E-2	7.00E-1	2.40E-1	4.56E+01	No further evaluation
Butylbenzyl phthalate	85687	5	30	16.7	2.00E-3	9.00E-1	4.70E-2	1.56E+04	No further evaluation
Carbazole	86748	10	22	45.5	6.20E-2	1.20E+0	1.20E+0	3.19E+01	No further evaluation
Chrysene	218019	25	33	75.8	8.00E-3	7.60E+0	7.60E+0	8.75E+01	No further evaluation
Dibenzo[a,h]anthracene	53703	18	33	54.5	1.50E-2	2.10E+0	2.10E+0	8.75E-02	* Exceeds criteria
Dibenzofuran	132649	16	30	53.3	8.00E-3	7.10E-1	7.10E-1	3.13E+02	No further evaluation
Diethyl phthalate	84662	2	30	6.7	5.00E-3	9.00E-1	1.80E-2	6.26E+04	No further evaluation
Dimethyl phthalate	131113	4	30	13.3	1.80E-2	9.50E-1	9.50E-1	7.82E+05	No further evaluation
Di-n-butyl phthalate	84742	11	30	36.7	2.00E-3	7.00E-1	1.10E-1	7.82E+03	No further evaluation
Fluoranthene	206440	28	33	84.8	9.00E-3	1.20E+1	1.20E+1	3.13E+03	No further evaluation
Fluorene	86737	17	33	51.5	3.00E-3	1.50E+0	1.50E+0	3.13E+03	No further evaluation
Indeno[1,2,3-cd]pyrene	193395	22	33	66.7	1.00E-2	5.00E+0	5.00E+0	8.75E-01	* Exceeds criteria
Naphthalene	91203	15	33	45.5	1.00E-2	5.10E-1	5.10E-1	1.56E+03	No further evaluation
Nitrobenzene	98953	2	30	6.7	9.00E-2	1.40E+0	1.40E+0	3.91E+01	No further evaluation
N-Nitrosodi-n-propylamine	621647	1	22	4.5	5.00E-3	7.00E-1	5.00E-3	9.12E-02	No further evaluation
Phenanthrene	85018	26	33	78.8	1.00E-3	1.00E+1	1.00E+1	2.35E+03	No further evaluation
Pyrene	129000	31	33	93.9	1.00E-3	1.40E+1	1.40E+1	2.35E+03	No further evaluation

Table H-1: Summary of Compounds Identified in Soil, Former Thypin Steel Inc. Facility, Manorhaven, New York.

Analyte		Number of Detections	Total Analyzed	Detection Frequency (%)	Minimum (mg/kg)	Maximum (mg/kg)	Maximum Detected (mg/kg)	USEPA RBC Residential (mg/kg)	Screening Results
Metals									
Aluminum	7429905	24	24	100.0	2.11E+2	5.94E+3	5.94E+3	7.82E+04	No further evaluation
Antimony	7440360	2	24	8.3	3.45E-1	2.20E+0	2.20E+0	3.13E+01	No further evaluation
Arsenic	7440382	22	24	91.7	4.40E-1	2.26E+1	2.26E+1	4.26E-01	* Exceeds criteria
Barium	7440393	24	24	100.0	1.70E+0	6.18E+1	6.18E+1	5.48E+03	No further evaluation
Beryllium	7440417	19	24	79.2	9.00E-2	4.40E-1	4.40E-1	1.56E+02	No further evaluation
Cadmium	7440439	10	24	41.7	3.45E-2	3.00E+0	3.00E+0	7.82E+01	No further evaluation
Chromium	7440473	24	24	100.0	1.10E+0	1.09E+2	1.09E+2	1.17E+05	No further evaluation
Cobalt	7440484	23	24	95.8	1.75E-1	5.40E+0	5.40E+0	4.69E+03	No further evaluation
Copper	7440508	24	24	100.0	5.20E-1	3.43E+2	3.43E+2	3.13E+03	No further evaluation
Lead	7439921	22	24	91.7	2.60E-1	7.56E+1	7.56E+1	1.00E+03	No further evaluation
Manganese	7439965	24	24	100.0	4.40E+0	2.57E+2	2.57E+2	1.10E+04	No further evaluation
Mercury	7439976	19	24	79.2	1.05E-3	1.40E-1	1.40E-1	2.35E+01	No further evaluation
Nickel	7440020	24	24	100.0	8.20E-1	7.28E+1	7.28E+1	1.56E+03	No further evaluation
Selenium	7782492	6	24	25.0	4.15E-1	1.50E+0	1.50E+0	3.91E+02	No further evaluation
Silver	7440224	3	24	12.5	7.00E-2	5.30E-1	5.30E-1	3.91E+02	No further evaluation
Thallium	7440280	3	24	12.5	4.85E-1	3.40E+0	3.40E+0	5.48E+00	No further evaluation
Vanadium	7440622	24	24	100.0	1.20E+0	3.88E+1	3.88E+1	5.48E+02	No further evaluation
Zinc	7440666	24	24	100.0	1.80E+0	4.88E+2	4.88E+2	2.35E+04	No further evaluation

Notes:

mg/kg	Milligrams per kilogram
%	Percent
USEPA	United States Environmental Protection Agency
RBC	USEPA Region III Residential Soil Risk Based Concentration (USEPA, 2001a)

Table H-2: Summary of Chemicals Detected and Exposure Point Concentrations in Groundwater at the Water Table, Former Thypin Steel Inc. Facility, Manorhaven, New York.

Analyte	CAS RN	Number of Detections	Total Analyzed	Detection Frequency (%)	Minimum (µg/L)	Maximum (µg/L)	Maximum Detected (µg/L)	NYSDEC AWQSGV (µg/L)	Screening Results	Exposure Point Concentrations Used	
										Mean	Upper Level
Volatile Organic Compounds											
1,1,1-Trichloroethane	71556	4	17	24	5.00E-1	5.20E+1	5.20E+1	5.00E+0	* Exceeds criteria	5.71E+0	5.20E+1
1,1-Dichloroethane	75343	1	17	6	2.50E+0	1.00E+1	1.00E+1	5.00E+0	* Exceeds criteria	2.94E+0	1.00E+1
1,1-Dichloroethene	75354	1	17	6	2.50E+0	3.00E+0	3.00E+0	5.00E+0	No further evaluation	NP	NP
Acetone	67641	7	17	41	2.00E+0	5.00E+0	4.00E+0	5.00E+1	No further evaluation	NP	NP
Carbon Tetrachloride	56235	2	17	12	8.00E-1	2.50E+0	9.00E-1	5.00E+0	No further evaluation	NP	NP
Chloroform	67663	2	17	12	1.00E+0	6.00E+0	6.00E+0	7.00E+0	No further evaluation	NP	NP
cis-1,2-Dichloroethene	156592	2	17	12	2.00E+0	7.60E+1	7.60E+1	5.00E+0	* Exceeds criteria	6.79E+0	7.60E+1
Methylene Chloride	75092	9	17	53	5.00E-1	4.00E+0	4.00E+0	5.00E+0	No further evaluation	NP	NP
Tetrachloroethene	127184	10	17	59	8.00E-1	1.00E+2	1.00E+2	5.00E+0	* Exceeds criteria	1.01E+1	1.00E+2
trans-1,2-Dichloroethene	156605	1	17	6	2.00E+0	2.50E+0	2.00E+0	5.00E+0	No further evaluation	NP	NP
Trichloroethene	79016	10	17	59	2.00E+0	1.00E+2	1.00E+2	5.00E+0	* Exceeds criteria	1.14E+1	1.00E+2
Semivolatile Organic Compounds											
1,2-Dichlorobenzene	95501	1	17	6	1.00E+0	5.50E+0	1.00E+0	3.00E+0	* Exceeds criteria	4.94E+0	5.50E+0
Anthracene	120127	2	17	12	1.00E-1	5.50E+0	4.00E-1	5.00E+1	No further evaluation	NP	NP
Benzo[a]anthracene	56553	2	17	12	3.00E-1	5.50E+0	8.00E-1	2.00E-3	* Exceeds criteria	4.62E+0	5.50E+0
Benzo[a]pyrene	50328	2	17	12	2.00E-1	5.50E+0	7.00E-1	ND	* Exceeds criteria	4.61E+0	5.50E+0
Benzo[b]fluoranthene	205992	2	17	12	2.00E-1	5.50E+0	5.00E-1	2.00E-3	* Exceeds criteria	4.60E+0	5.50E+0
Benzo[g,h,i]perylene	191242	1	17	6	2.00E-1	5.50E+0	2.00E-1	--	* Exceeds criteria	4.89E+0	5.50E+0
Benzo[k]fluoranthene	207089	2	17	12	3.00E-1	5.50E+0	8.00E-1	2.00E-3	* Exceeds criteria	4.62E+0	5.50E+0
bis(2-Ethylhexyl) phthalate	117817	15	17	88	2.00E-1	3.40E+1	3.40E+1	5.00E+0	* Exceeds criteria	7.21E+0	3.40E+1
Butylbenzyl phthalate	85687	1	17	6	2.00E-1	5.50E+0	2.00E-1	5.00E+1	No further evaluation	NP	NP
Chrysene	218019	2	17	12	2.00E-1	5.50E+0	8.00E-1	2.00E-3	* Exceeds criteria	4.62E+0	5.50E+0
Diethyl phthalate	84662	5	17	29	1.00E-1	5.50E+0	2.00E-1	5.00E+1	No further evaluation	NP	NP
Di-n-butyl phthalate	84742	9	17	53	9.00E-2	5.50E+0	5.00E-1	5.00E+1	No further evaluation	NP	NP
Fluoranthene	206440	2	17	12	3.00E-1	5.50E+0	1.00E+0	5.00E+1	No further evaluation	NP	NP
Indeno[1,2,3-cd]pyrene	193395	2	17	12	2.00E-1	5.50E+0	3.00E-1	2.00E-3	* Exceeds criteria	4.59E+0	5.50E+0
Naphthalene	91203	2	17	12	1.00E-1	5.50E+0	2.00E-1	1.00E+1	No further evaluation	NP	NP
Phenanthrene	85018	2	17	12	1.00E-1	5.50E+0	9.00E-1	5.00E+1	No further evaluation	NP	NP
Pyrene	129000	2	17	12	4.00E-1	5.50E+0	1.00E+0	5.00E+1	No further evaluation	NP	NP
Metals											
Aluminum	7429905	17	17	100	1.52E+3	2.98E+4	2.98E+4	--	* Exceeds criteria	9.63E+3	2.98E+4
Arsenic	7440382	4	17	24	2.05E+0	1.04E+1	1.04E+1	2.50E+1	No further evaluation	NP	NP

Table H-2: Summary of Chemicals Detected and Exposure Point Concentrations in Groundwater at the Water Table, Former Thypin Steel Inc. Facility, Manorhaven, New York.

Analyte	CAS RN	Number of Detections	Total Analyzed	Detection Frequency (%)	Minimum (µg/L)	Maximum (µg/L)	Maximum Detected (µg/L)	NYSDEC AWQSGV (µg/L)	Screening Results	Exposure Point Concentrations Used	
										Mean	Upper Level
Barium	7440393	17	17	100	2.52E+1	8.48E+2	8.48E+2	1.00E+3	No further evaluation	NP	NP
Beryllium	7440417	10	17	59	2.50E-1	3.60E+0	3.60E+0	3.00E+0	* Exceeds criteria	7.36E-1	3.60E+0
Cadmium	7440439	1	17	6	4.00E-1	1.20E+0	1.20E+0	5.00E+0	No further evaluation	NP	NP
Chromium	7440473	17	17	100	5.70E+0	1.89E+2	1.89E+2	5.00E+1	* Exceeds criteria	4.55E+1	1.89E+2
Cobalt	7440484	17	17	100	1.70E+0	8.21E+1	8.21E+1	--	* Exceeds criteria	1.76E+1	8.21E+1
Copper	7440508	17	17	100	6.60E+0	8.70E+1	8.70E+1	2.00E+2	No further evaluation	NP	NP
Cyanide	57125	1	17	6	5.00E+0	2.09E+2	2.09E+2	2.00E+2	* Exceeds criteria	1.70E+1	2.09E+2
Hexavalent Chromium	18540299	4	17	24	5.00E+0	1.80E+2	1.80E+2	5.00E+1	* Exceeds criteria	2.15E+1	1.80E+2
Lead	7439921	17	17	100	2.90E+0	1.49E+2	1.49E+2	2.50E+1	* Exceeds criteria	2.18E+1	1.49E+2
Manganese	7439965	17	17	100	1.14E+2	9.30E+3	9.30E+3	3.00E+2	* Exceeds criteria	1.84E+3	9.30E+3
Nickel	7440020	17	17	100	4.70E+0	7.36E+1	7.36E+1	1.00E+2	No further evaluation	NP	NP
Selenium	7782492	1	17	6	2.30E+0	6.20E+0	6.20E+0	1.00E+1	No further evaluation	NP	NP
Vanadium	7440622	17	17	100	4.00E+0	6.28E+1	6.28E+1	--	* Exceeds criteria	2.47E+1	6.28E+1
Zinc	7440666	17	17	100	1.63E+1	3.92E+2	3.92E+2	2.00E+3	No further evaluation	NP	NP

Notes:

µg/L	Micrograms per liter
%	Percent
--	No standard or guideline value at this time
NP	Not Applicable
NYSDEC	New York State Department of Environmental Conservation
AWQSGV	Ambient Water Quality Standards and Guideline Values

Table H-3: Summary of Chemicals Detected and Exposure Point Concentrations in Solid Materials Collected from Subsurface Structures in the Northern Area. Former Thypin Steel Inc. Facility, Manorhaven, New York.

Analyte	CAS RN	Number of Detections	Total Analyzed	Detection Frequency (%)	Minimum (mg/kg)	Maximum (mg/kg)	Maximum Detected (mg/kg)	USEPA RBC Residential (mg/kg)	Screening Results	Exposure Point Concentrations Used	
										Mean	Upper Level
Volatile Organic Compounds											
2-Butanone	78933	1	3	33	5.00E-3	1.80E-1	1.80E-1	4.69E+04	No further evaluation	NP	NP
Acetone	67641	3	3	100	7.00E-3	6.00E-1	6.00E-1	7.82E+03	No further evaluation	NP	NP
Carbon Disulfide	75150	1	3	33	2.50E-3	3.20E-2	3.20E-2	7.82E+03	No further evaluation	NP	NP
Methylene Chloride	75092	3	3	100	1.00E-2	3.20E-2	3.20E-2	8.52E+01	No further evaluation	NP	NP
Tetrachloroethene	127184	2	3	67	8.00E-4	8.00E-3	8.00E-3	1.23E+01	No further evaluation	NP	NP
Toluene	108883	2	3	67	1.00E-3	6.00E-3	6.00E-3	1.56E+04	No further evaluation	NP	NP
Trichloroethene	79016	1	3	33	2.50E-3	1.00E-2	1.00E-2	5.81E+01	No further evaluation	NP	NP
Xylenes (total)	1330207	1	3	33	2.50E-3	4.00E-3	4.00E-3	1.56E+05	No further evaluation	NP	NP
Semivolatile Organic Compounds											
1,2-Dichlorobenzene	95501	2	4	50	1.20E-2	1.65E-1	1.50E-2	7.04E+03	No further evaluation	NP	NP
1,4-Dichlorobenzene	106467	3	4	75	1.40E-1	4.00E-1	4.00E-1	2.66E+01	No further evaluation	NP	NP
2,4-Dimethylphenol	105679	2	4	50	1.70E-2	1.65E-1	1.60E-1	1.56E+03	No further evaluation	NP	NP
2,6-Dinitrotoluene	606202	1	4	25	2.40E-2	1.65E-1	2.40E-2	7.82E+01	No further evaluation	NP	NP
2-Methylnaphthalene	91576	3	4	75	1.40E-1	2.60E-1	2.60E-1	1.56E+03	No further evaluation	NP	NP
4-Methylphenol	106445	3	4	75	1.40E-2	2.30E-1	2.30E-1	3.91E+02	No further evaluation	NP	NP
Acenaphthene	83329	2	4	50	1.60E-2	1.65E-1	1.90E-2	4.69E+03	No further evaluation	NP	NP
Acenaphthylene	208968	3	4	75	3.90E-2	1.65E-1	1.30E-1	4.69E+03	No further evaluation	NP	NP
Anthracene	120127	3	4	75	7.50E-2	3.80E-1	3.80E-1	2.35E+04	No further evaluation	NP	NP
Benzo[a]anthracene	56553	4	4	100	3.20E-2	1.20E+0	1.20E+0	8.75E-01	* Exceeds criteria	4.03E-1	1.20E+0
Benzo[a]pyrene	50328	4	4	100	2.60E-2	1.00E+0	1.00E+0	8.75E-02	* Exceeds criteria	4.32E-1	1.00E+0
Benzo[b]fluoranthene	205992	4	4	100	2.60E-2	9.10E-1	9.10E-1	8.75E-01	* Exceeds criteria	4.14E-1	9.10E-1
Benzo[g,h,i]perylene	191242	4	4	100	1.60E-2	1.20E+0	1.20E+0	2.35E+03	No further evaluation	NP	NP
Benzo[k]fluoranthene	207089	4	4	100	2.80E-2	8.80E-1	8.80E-1	8.75E+00	No further evaluation	NP	NP
Benzoic acid	65850	3	4	75	1.30E-1	8.00E-1	6.60E-1	3.13E+05	No further evaluation	NP	NP
bis(2-Ethylhexyl) phthalate	117817	4	4	100	1.90E-2	9.00E-1	9.00E-1	4.56E+01	No further evaluation	NP	NP
Butylbenzyl phthalate	85687	1	4	25	6.10E-2	1.65E-1	6.10E-2	1.56E+04	No further evaluation	NP	NP
Carbazole	86748	2	4	50	1.10E-2	1.65E-1	1.70E-2	3.19E+01	No further evaluation	NP	NP
Chrysene	218019	4	4	100	3.20E-2	1.20E+0	1.20E+0	8.75E+01	No further evaluation	NP	NP
Dibenzo[a,h]anthracene	53703	4	4	100	7.00E-3	4.00E-1	4.00E-1	8.75E-02	* Exceeds criteria	1.16E-1	4.00E-1
Dibenzofuran	132649	3	4	75	2.70E-2	1.65E-1	1.20E-1	3.13E+02	No further evaluation	NP	NP
Diethyl phthalate	84662	1	4	25	3.00E-3	1.65E-1	3.00E-3	6.26E+04	No further evaluation	NP	NP
Di-n-butyl phthalate	84742	4	4	100	3.00E-3	5.40E-1	5.40E-1	7.82E+03	No further evaluation	NP	NP
Di-n-octyl phthalate	117840	2	4	50	2.70E-2	1.65E-1	3.40E-2	1.56E+03	No further evaluation	NP	NP
Fluoranthene	206440	4	4	100	5.50E-2	1.50E+0	1.50E+0	3.13E+03	No further evaluation	NP	NP
Fluorene	86737	2	4	50	1.00E-2	1.65E-1	1.80E-2	3.13E+03	No further evaluation	NP	NP
Hexachloroethane	67721	1	4	25	3.00E-2	1.65E-1	3.00E-2	4.56E+01	No further evaluation	NP	NP

Table H-3: Summary of Chemicals Detected and Exposure Point Concentrations in Solid Materials Collected from Subsurface Structures in the Northern Area. Former Thypin Steel Inc. Facility, Manorhaven, New York.

Analyte	CAS RN	Number of Detections	Total Analyzed	Detection Frequency (%)	Minimum (mg/kg)	Maximum (mg/kg)	Maximum Detected (mg/kg)	USEPA RBC Residential (mg/kg)	Screening Results	Exposure Point Concentrations Used	
										Mean	Upper Level
Indeno[1,2,3-cd]pyrene	193395	4	4	100	1.60E-2	1.00E+0	1.00E+0	8.75E-01	* Exceeds criteria	2.91E-1	1.00E+0
Naphthalene	91203	3	4	75	1.65E-1	2.40E-1	2.40E-1	1.56E+03	No further evaluation	NP	NP
Nitrobenzene	98953	1	4	25	1.20E-2	1.65E-1	1.20E-2	3.91E+01	No further evaluation	NP	NP
Phenanthrene	85018	4	4	100	2.60E-2	9.80E-1	9.80E-1	2.35E+04	No further evaluation	NP	NP
Phenol	108952	2	4	50	4.70E-2	1.65E-1	5.90E-2	4.69E+04	No further evaluation	NP	NP
Pyrene	129000	4	4	100	5.40E-2	1.80E+0	1.80E+0	2.35E+03	No further evaluation	NP	NP
Metals											
Aluminum	7429905	3	3	100	1.90E+3	2.49E+4	2.49E+4	7.82E+04	No further evaluation	NP	NP
Antimony	7440360	2	3	67	1.00E+0	5.04E+2	5.04E+2	3.13E+01	* Exceeds criteria	1.71E+2	5.04E+2
Arsenic	7440382	2	3	67	1.00E+0	1.32E+1	1.32E+1	4.26E-01	* Exceeds criteria	8.53E+0	1.32E+1
Barium	7440393	3	3	100	1.21E+1	1.34E+3	1.34E+3	5.48E+03	No further evaluation	NP	NP
Cadmium	7440439	3	3	100	1.70E+0	1.00E+2	1.00E+2	7.82E+01	* Exceeds criteria	4.58E+1	1.00E+2
Chromium	7440473	3	3	100	6.70E+0	4.58E+2	4.58E+2	1.17E+05	No further evaluation	NP	NP
Cobalt	7440484	3	3	100	2.90E+0	2.13E+1	2.13E+1	1.56E+03	No further evaluation	NP	NP
Copper	7440508	3	3	100	4.60E+0	1.62E+3	1.62E+3	3.13E+03	No further evaluation	NP	NP
Lead	7439921	3	3	100	3.24E+1	9.86E+2	9.86E+2	4.00E+02	* Exceeds criteria	4.84E+2	9.86E+2
Manganese	7439965	3	3	100	1.45E+2	1.46E+3	1.46E+3	1.10E+04	No further evaluation	NP	NP
Mercury	7439976	3	3	100	9.30E-3	4.00E+0	4.00E+0	2.35E+01	No further evaluation	NP	NP
Nickel	7440020	3	3	100	6.20E+0	2.23E+2	2.23E+2	1.56E+03	No further evaluation	NP	NP
Selenium	7782492	1	3	33	4.95E-1	3.90E+0	3.90E+0	3.91E+02	No further evaluation	NP	NP
Silver	7440224	1	3	33	4.95E-1	2.30E+1	2.30E+1	3.91E+02	No further evaluation	NP	NP
Thallium	7440280	1	3	33	1.00E+0	2.80E+0	2.80E+0	5.48E+00	No further evaluation	NP	NP
Vanadium	7440622	3	3	100	5.90E+0	3.97E+1	3.97E+1	5.48E+02	No further evaluation	NP	NP
Zinc	7440666	3	3	100	7.14E+2	2.56E+3	2.56E+3	2.35E+04	No further evaluation	NP	NP

Notes:

mg/kg	Milligrams per kilogram
%	Percent
USEPA	United States Environmental Protection Agency
RBC	USEPA Region III Residential Soil Risk Based Concentration (USEPA, 2001a)
NP	Not applicable

Table H-4: Summary of Chemicals Detected and Exposure Point Concentrations in Solid Materials Collected from Subsurface Structures in the Western Area. Former Thypin Steel Inc. Facility, Manorhaven, New York.

Analyte	CAS RN	Number of Detections	Total Analyzed	Detection Frequency (%)	Minimum (mg/kg)	Maximum (mg/kg)	Maximum Detected (mg/kg)	USEPA RBC Residential (mg/kg)	Screening Results	Exposure Point Concentrations Used	
										Mean	Upper Level
Volatile Organic Compounds											
2-Butanone	78933	1	7	14	2.50E-3	3.30E-1	3.30E-1	4.69E+04	No further evaluation	NP	NP
Acetone	67641	3	3	100	1.90E-2	8.20E-1	8.20E-1	7.82E+03	No further evaluation	NP	NP
Chloroform	67663	3	8	38	8.00E-4	2.50E-3	8.00E-4	1.05E+02	No further evaluation	NP	NP
Methylene Chloride	75092	8	8	100	7.00E-3	1.40E-1	1.40E-1	8.52E+01	No further evaluation	NP	NP
Tetrachloroethene	127184	2	8	25	9.00E-4	2.50E-3	2.00E-3	1.23E+01	No further evaluation	NP	NP
Trichloroethene	79016	2	8	25	2.00E-3	9.00E-3	9.00E-3	5.81E+01	No further evaluation	NP	NP
Semivolatile Organic Compounds											
4-Chlorophenyl phenyl ether	7005723	1	2	50	2.10E-2	1.65E-1	2.10E-2	3.91E+01	No further evaluation	NP	NP
Acenaphthene	83329	1	2	50	2.10E-2	1.65E-1	2.10E-2	4.69E+03	No further evaluation	NP	NP
Anthracene	120127	1	2	50	5.90E-2	1.65E-1	5.90E-2	2.35E+04	No further evaluation	NP	NP
Benzo[a]anthracene	56553	2	2	100	7.00E-3	2.00E-1	2.00E-1	8.75E-01	No further evaluation	NP	NP
Benzo[a]pyrene	50328	1	2	50	1.65E-1	1.80E-1	1.80E-1	8.75E-02	* Exceeds criteria	1.73E-1	1.80E-1
Benzo[b]fluoranthene	205992	1	2	50	1.50E-1	1.65E-1	1.50E-1	8.75E-01	No further evaluation	NP	NP
Benzo[g,h,i]perylene	191242	1	2	50	1.40E-1	1.65E-1	1.40E-1	2.35E+03	No further evaluation	NP	NP
Benzo[k]fluoranthene	207089	1	2	50	1.65E-1	1.80E-1	1.80E-1	8.75E+00	No further evaluation	NP	NP
Benzyl alcohol	65850	1	2	50	1.65E-1	1.70E-1	1.70E-1	3.13E+05	No further evaluation	NP	NP
bis(2-Ethylhexyl) phthalate	117817	1	2	50	7.10E-2	1.65E-1	7.10E-2	4.56E+01	No further evaluation	NP	NP
Carbazole	86748	1	2	50	2.20E-2	1.65E-1	2.20E-2	3.19E+01	No further evaluation	NP	NP
Chrysene	218019	2	2	100	5.00E-3	2.00E-1	2.00E-1	8.75E+01	No further evaluation	NP	NP
Dibenzo[a,h]anthracene	53703	1	2	50	4.90E-2	1.65E-1	4.90E-2	8.75E-02	* Exceeds criteria	1.07E-1	1.65E-1
Dibenzofuran	132649	1	2	50	8.00E-3	1.65E-1	8.00E-3	3.13E+02	No further evaluation	NP	NP
Fluoranthene	206440	2	2	100	1.00E-2	3.70E-1	3.70E-1	3.13E+03	No further evaluation	NP	NP
Indeno[1,2,3-cd]pyrene	193395	1	2	50	1.30E-1	1.65E-1	1.30E-1	8.75E-01	No further evaluation	NP	NP
Phenanthrene	85018	1	2	50	1.65E-1	2.20E-1	2.20E-1	2.35E+04	No further evaluation	NP	NP
Pyrene	129000	2	2	100	8.00E-3	3.90E-1	3.90E-1	2.35E+03	No further evaluation	NP	NP
Metals											
Aluminum	7429905	3	3	100	1.92E+3	4.54E+3	4.54E+3	7.82E+04	No further evaluation	NP	NP
Barium	7440393	3	3	100	2.94E+1	6.64E+1	6.64E+1	5.48E+03	No further evaluation	NP	NP
Beryllium	7440417	1	3	33	5.00E-1	1.82E+1	1.82E+1	1.56E+02	No further evaluation	NP	NP
Cadmium	7440439	1	3	33	5.00E-1	1.92E+2	1.92E+2	7.82E+01	* Exceeds criteria	6.43E+1	1.92E+2
Chromium	7440473	2	3	67	1.03E+1	7.50E+1	7.50E+1	1.17E+05	No further evaluation	NP	NP
Cobalt	7440484	2	3	67	2.60E+0	1.82E+1	3.20E+0	1.56E+03	No further evaluation	NP	NP
Copper	7440508	3	3	100	8.90E+0	5.75E+1	5.75E+1	3.13E+03	No further evaluation	NP	NP
Lead	7439921	3	3	100	7.70E+0	1.18E+3	1.18E+3	4.00E+02	* Exceeds criteria	4.01E+2	1.18E+3
Manganese	7439965	3	3	100	6.42E+1	9.89E+2	9.89E+2	1.10E+04	No further evaluation	NP	NP
Mercury	7439976	2	3	67	2.00E-3	1.10E+0	1.10E+0	2.35E+01	No further evaluation	NP	NP

Table H-4: Summary of Chemicals Detected and Exposure Point Concentrations in Solid Materials Collected from Subsurface Structures in the Western Area. Former Thypin Steel Inc. Facility, Manorhaven, New York.

Analyte	CAS RN	Number of Detections	Total Analyzed	Detection Frequency (%)	Minimum (mg/kg)	Maximum (mg/kg)	Maximum Detected (mg/kg)	USEPA RBC Residential (mg/kg)	Screening Results	Exposure Point Concentrations Used	
										Mean	Upper Level
Nickel	7440020	3	3	100	8.30E+0	3.92E+1	3.92E+1	1.56E+03	No further evaluation	NP	NP
Thallium	7440280	1	3	33	1.00E+0	5.45E+1	5.45E+1	5.48E+00	* Exceeds criteria	1.88E+1	5.45E+1
Vanadium	7440622	3	3	100	1.39E+1	3.71E+1	3.71E+1	5.48E+02	No further evaluation	NP	NP
Zinc	7440666	3	3	100	1.91E+1	8.07E+4	8.07E+4	2.35E+04	* Exceeds criteria	2.69E+4	8.07E+4

Notes:

mg/kg	Milligrams per kilogram
%	Percent
USEPA	United States Environmental Protection Agency
RBC	USEPA Region III Residential Soil Risk Based Concentration (USEPA, 2001a)
NP	Not applicable

Table H-5: Summary of Chemicals Detected and Exposure Point Concentrations in Solid Materials Collected from Subsurface Structures in the Central Area. Former Thypin Steel Inc. Facility, Manorhaven, New York.

Analyte	CAS RN	Number of Detections	Total Analyzed	Detection Frequency (%)	Minimum (mg/kg)	Maximum (mg/kg)	Maximum Detected (mg/kg)	USEPA RBC Residential (mg/kg)	Screening Results	Exposure Point Concentrations Used	
										Mean	Upper Level
Volatile Organic Compounds											
1,1-Dichloroethane	75343	1	18	6	1.00E-3	2.50E-3	1.00E-3	7.82E+3	No further evaluation	NP	NP
2-Butanone	78933	7	14	50	2.50E-3	5.50E-1	5.50E-1	4.69E+4	No further evaluation	NP	NP
Acetone	67641	14	14	100	1.00E-2	2.40E+0	2.40E+0	7.82E+3	No further evaluation	NP	NP
Benzene	71432	1	14	7	2.50E-3	7.70E-1	7.70E-1	1.16E+1	No further evaluation	NP	NP
Carbon Disulfide	75150	5	18	28	8.00E-4	1.30E-1	1.30E-1	7.82E+3	No further evaluation	NP	NP
Chlorobenzene	108907	3	18	17	3.00E-4	1.20E+1	1.20E+1	1.56E+3	No further evaluation	NP	NP
Chloroform	67663	4	18	22	2.00E-3	1.70E-1	1.70E-1	1.05E+2	No further evaluation	NP	NP
cis-1,2-Dichloroethene	156592	1	18	6	7.00E-4	2.50E-3	7.00E-4	7.82E+2	No further evaluation	NP	NP
Ethylbenzene	100414	3	14	21	9.00E-4	2.00E-1	2.00E-1	7.82E+3	No further evaluation	NP	NP
Methylene Chloride	75092	18	18	100	2.00E-3	4.80E-1	4.80E-1	8.52E+1	No further evaluation	NP	NP
Tetrachloroethene	127184	8	18	44	6.00E-4	7.20E-2	7.20E-2	1.23E+1	No further evaluation	NP	NP
Toluene	108883	6	14	43	5.00E-4	3.00E-3	3.00E-3	1.56E+4	No further evaluation	NP	NP
Trichloroethene	79016	11	18	61	8.00E-4	1.80E-1	1.80E-1	5.81E+1	No further evaluation	NP	NP
Xylenes (total)	1330207	4	14	29	2.00E-3	1.60E-1	1.60E-1	1.56E+5	No further evaluation	NP	NP
Semivolatile Organic Compounds											
1,2,4-Trichlorobenzene	120821	1	12	8	1.65E-1	2.00E+0	2.00E+0	7.82E+2	No further evaluation	NP	NP
1,2-Dichlorobenzene	95501	2	12	17	5.00E-2	1.65E-1	1.10E-1	7.04E+3	No further evaluation	NP	NP
1,4-Dichlorobenzene	106467	6	12	50	4.60E-2	7.70E-1	7.70E-1	2.66E+1	No further evaluation	NP	NP
2,4-Dimethylphenol	105679	1	12	8	1.65E-1	6.20E-1	6.20E-1	1.56E+3	No further evaluation	NP	NP
2-Methylnaphthalene	91576	7	12	58	2.60E-2	8.00E-1	8.00E-1	1.56E+3	No further evaluation	NP	NP
4-Methylphenol	106445	6	12	50	2.00E-2	1.20E+0	1.20E+0	3.91E+2	No further evaluation	NP	NP
Acenaphthene	83329	8	12	67	6.00E-3	2.60E+0	2.60E+0	4.69E+3	No further evaluation	NP	NP
Acenaphthylene	208968	6	12	50	1.40E-2	1.90E-1	1.90E-1	4.69E+3	No further evaluation	NP	NP
Anthracene	120127	12	12	100	3.00E-3	5.90E+0	5.90E+0	2.35E+4	No further evaluation	NP	NP
Benzo[a]anthracene	56553	12	12	100	6.00E-3	1.00E+1	1.00E+1	8.75E-1	* Exceeds criteria	1.15E+0	1.00E+1
Benzo[a]pyrene	50328	8	12	67	5.90E-2	8.50E+0	8.50E+0	8.75E-2	* Exceeds criteria	1.02E+0	8.50E+0
Benzo[b]fluoranthene	205992	8	12	67	7.00E-3	6.80E+0	6.80E+0	8.75E-1	* Exceeds criteria	8.08E-1	6.80E+0
Benzo[g,h,i]perylene	191242	7	12	58	2.10E-2	7.70E+0	7.70E+0	2.35E+3	No further evaluation	NP	NP
Benzo[k]fluoranthene	207089	8	12	67	7.00E-3	6.50E+0	6.50E+0	8.75E+0	No further evaluation	NP	NP
Benzoic acid	65850	1	12	8	7.00E-2	8.00E-1	7.00E-2	3.13E+5	No further evaluation	NP	NP
bis(2-Ethylhexyl) phthalate	117817	10	12	83	1.20E-2	2.30E+0	2.30E+0	4.56E+1	No further evaluation	NP	NP
Butylbenzyl phthalate	85687	1	12	8	3.40E-2	1.65E-1	3.40E-2	1.56E+4	No further evaluation	NP	NP
Carbazole	86748	8	12	67	8.00E-3	3.00E+0	3.00E+0	3.19E+1	No further evaluation	NP	NP
Chrysene	218019	12	12	100	5.00E-3	9.30E+0	9.30E+0	8.75E+1	No further evaluation	NP	NP
Dibenzo[a,h]anthracene	53703	7	12	58	1.10E-2	2.70E+0	2.70E+0	8.75E-2	* Exceeds criteria	3.49E-1	2.70E+0
Dibenzofuran	132649	7	12	58	7.00E-3	1.70E+0	1.70E+0	3.13E+2	No further evaluation	NP	NP
Diethyl phthalate	84662	4	12	33	8.00E-3	3.30E-1	3.30E-1	6.26E+4	No further evaluation	NP	NP
Dimethyl phthalate	131113	1	12	8	2.10E-2	1.65E-1	2.10E-2	7.82E+5	No further evaluation	NP	NP
Di-n-butyl phthalate	84742	8	12	67	3.00E-3	5.80E-1	5.80E-1	7.82E+3	No further evaluation	NP	NP

Table H-5: Summary of Chemicals Detected and Exposure Point Concentrations in Solid Materials Collected from Subsurface Structures in the Central Area. Former Thypin Steel Inc. Facility, Manorhaven, New York.

Analyte	CAS RN	Number of Detections	Total Analyzed	Detection Frequency (%)	Minimum (mg/kg)	Maximum (mg/kg)	Maximum Detected (mg/kg)	USEPA RBC Residential (mg/kg)	Screening Results	Exposure Point Concentrations Used	
										Mean	Upper Level
Di-n-octyl phthalate	117840	5	12	42	4.90E-2	2.70E+0	2.70E+0	1.56E+3	No further evaluation	NP	NP
Fluoranthene	206440	12	12	100	8.00E-3	1.60E+1	1.60E+1	3.13E+3	No further evaluation	NP	NP
Fluorene	86737	8	12	67	9.00E-3	3.00E+0	3.00E+0	3.13E+3	No further evaluation	NP	NP
Indeno[1,2,3-cd]pyrene	193395	8	12	67	2.40E-2	7.40E+0	7.40E+0	8.75E-1	* Exceeds criteria	8.20E-1	7.40E+0
Naphthalene	91203	5	12	42	2.40E-2	1.65E-1	1.20E-1	1.56E+3	No further evaluation	NP	NP
N-Nitrosodi-n-propylamine	621647	1	12	8	1.40E-1	1.65E-1	1.40E-1	9.12E-2	* Exceeds criteria	1.63E-1	1.65E-1
N-Nitrosodiphenylamine	86306	1	12	8	4.00E-3	1.65E-1	4.00E-3	1.30E+2	No further evaluation	NP	NP
Pentachlorophenol	87865	1	12	8	8.00E-1	8.60E-1	8.60E-1	5.32E+0	No further evaluation	NP	NP
Phenanthrene	85018	12	12	100	6.00E-3	1.80E+1	1.80E+1	2.35E+4	No further evaluation	NP	NP
Phenol	108952	1	12	8	6.00E-2	1.65E-1	6.00E-2	4.69E+4	No further evaluation	NP	NP
Pyrene	129000	12	12	100	8.00E-3	1.80E+1	1.80E+1	2.35E+3	No further evaluation	NP	NP
Metals											
Aluminum	7429905	15	15	100	8.48E+2	1.01E+4	1.01E+4	7.82E+4	No further evaluation	NP	NP
Antimony	7440360	4	15	27	8.60E-1	6.25E+0	5.20E+0	3.13E+1	No further evaluation	NP	NP
Arsenic	7440382	9	15	60	1.00E+0	1.52E+1	1.52E+1	4.26E-1	* Exceeds criteria	3.31E+0	1.52E+1
Barium	7440393	15	15	100	1.99E+1	9.32E+2	9.32E+2	5.48E+3	No further evaluation	NP	NP
Beryllium	7440417	4	15	27	1.90E-1	3.15E+0	2.30E-1	1.56E+2	No further evaluation	NP	NP
Cadmium	7440439	9	15	60	3.00E-2	1.26E+2	1.26E+2	7.82E+1	* Exceeds criteria	1.66E+1	1.26E+2
Chromium	7440473	15	15	100	7.10E+0	6.32E+2	6.32E+2	1.17E+5	No further evaluation	NP	NP
Cobalt	7440484	13	15	87	1.50E+0	5.01E+1	5.01E+1	1.56E+3	No further evaluation	NP	NP
Copper	7440508	15	15	100	4.70E+0	9.90E+2	9.90E+2	3.13E+3	No further evaluation	NP	NP
Hexavalent Chromium	18540299	3	11	27	1.11E-1	1.53E+0	1.53E+0	2.35E+2	No further evaluation	NP	NP
Lead	7439921	15	15	100	1.60E+0	2.89E+3	2.89E+3	4.00E+2	* Exceeds criteria	2.60E+2	2.89E+3
Manganese	7439965	15	15	100	5.37E+1	3.35E+2	3.35E+2	1.10E+4	No further evaluation	NP	NP
Mercury	7439976	9	13	69	2.35E-3	4.70E+0	4.70E+0	2.35E+1	No further evaluation	NP	NP
Nickel	7440020	15	15	100	6.00E+0	9.98E+1	9.98E+1	1.56E+3	No further evaluation	NP	NP
Selenium	7782492	2	15	13	2.40E-1	4.60E+0	4.60E+0	3.91E+2	No further evaluation	NP	NP
Silver	7440224	4	15	27	3.70E-2	1.91E+1	1.91E+1	3.91E+2	No further evaluation	NP	NP
Thallium	7440280	1	15	7	7.50E-1	9.40E+0	4.80E+0	5.48E+0	* Exceeds criteria	1.97E+0	9.40E+0
Vanadium	7440622	15	15	100	4.80E+0	2.50E+1	2.50E+1	5.48E+2	No further evaluation	NP	NP
Zinc	7440666	15	15	100	1.61E+1	4.20E+3	4.20E+3	2.35E+4	No further evaluation	NP	NP

Notes:

mg/kg	Milligrams per kilogram
%	Percent
USEPA	United States Environmental Protection Agency
RBC	USEPA Region III Residential Soil Risk Based Concentration (USEPA, 2001a)
NA	Not applicable

Table H-6: Summary of Chemicals Detected and Exposure Point Concentrations in Solid Materials Collected from Subsurface Structures in the Eastern Area. Former Thypin Steel Inc. Facility, Manorhaven, New York.

Analyte	CAS RN	Number of Detections	Total Analyzed	Detection Frequency (%)	Minimum (mg/kg)	Maximum (mg/kg)	Maximum Detected (mg/kg)	USEPA RBC Residential (mg/kg)	Screening Results	Exposure Point Concentrations Used	
										Mean	Upper Level
Volatile Organic Compounds											
1,1,2,2-Tetrachloroethane	79345	1	10	10	1.00E-3	2.50E-3	1.00E-3	3.19E+00	No further evaluation	NP	NP
Carbon Disulfide	75150	2	10	20	7.00E-4	1.20E-2	1.20E-2	7.82E+03	No further evaluation	NP	NP
Methylene Chloride	75092	10	10	100	4.00E-3	3.30E-2	3.30E-2	8.52E+01	No further evaluation	NP	NP
Tetrachloroethene	127184	9	10	90	4.00E-4	1.90E-1	1.90E-1	1.23E+01	No further evaluation	NP	NP
Trichloroethene	79016	6	10	60	4.00E-4	4.80E-2	4.80E-2	5.81E+01	No further evaluation	NP	NP
Semivolatile Organic Compounds											
2,4-Dimethylphenol	105679	1	7	14	5.80E-2	1.65E-1	5.80E-2	1.56E+03	No further evaluation	NP	NP
2-Methylnaphthalene	91576	3	7	43	1.10E-2	2.20E-1	2.20E-1	1.56E+03	No further evaluation	NP	NP
4-Methylphenol	106445	1	7	14	1.20E-1	1.65E-1	1.20E-1	3.91E+02	No further evaluation	NP	NP
Acenaphthene	83329	2	7	29	4.50E-2	7.30E-1	7.30E-1	4.69E+03	No further evaluation	NP	NP
Acenaphthylene	208968	4	7	57	3.00E-3	1.65E-1	2.80E-2	4.69E+03	No further evaluation	NP	NP
Anthracene	120127	7	7	100	2.00E-3	1.90E+0	1.90E+0	2.35E+04	No further evaluation	NP	NP
Benzo[a]anthracene	56553	7	7	100	5.00E-3	3.30E+0	3.30E+0	8.75E-01	* Exceeds criteria	5.35E-1	3.30E+0
Benzo[a]pyrene	50328	6	7	86	6.00E-3	2.90E+0	2.90E+0	8.75E-02	* Exceeds criteria	5.01E-1	2.90E+0
Benzo[b]fluoranthene	205992	6	7	86	4.00E-3	2.70E+0	2.70E+0	8.75E-01	* Exceeds criteria	4.80E-1	2.70E+0
Benzo[g,h,i]perylene	191242	5	7	71	3.00E-3	1.80E+0	1.80E+0	2.35E+03	No further evaluation	NP	NP
Benzo[k]fluoranthene	207089	6	7	86	4.00E-3	2.20E+0	2.20E+0	8.75E+00	No further evaluation	NP	NP
Benzoic acid	65850	1	7	14	6.40E-1	8.00E-1	6.40E-1	3.13E+05	No further evaluation	NP	NP
bis(2-Ethylhexyl) phthalate	117817	7	7	100	1.60E-2	4.30E-1	4.30E-1	4.56E+01	No further evaluation	NP	NP
Carbazole	86748	4	7	57	3.00E-3	7.60E-1	7.60E-1	3.19E+01	No further evaluation	NP	NP
Chrysene	218019	7	7	100	5.00E-3	3.00E+0	3.00E+0	8.75E+01	No further evaluation	NP	NP
Dibenzo[a,h]anthracene	53703	4	7	57	1.00E-3	6.50E-1	6.50E-1	8.75E-02	* Exceeds criteria	1.71E-1	6.50E-1
Dibenzofuran	132649	3	7	43	7.00E-3	5.00E-1	5.00E-1	3.13E+02	No further evaluation	NP	NP
Diethyl phthalate	84662	4	7	57	3.00E-3	1.65E-1	3.00E-2	6.26E+04	No further evaluation	NP	NP
Dimethyl phthalate	131113	2	7	29	1.80E-2	3.50E-1	3.50E-1	7.82E+05	No further evaluation	NP	NP
Di-n-butyl phthalate	84742	5	7	71	3.00E-3	2.40E-1	2.40E-1	7.82E+03	No further evaluation	NP	NP
Di-n-octyl phthalate	117840	3	7	43	1.00E-3	5.00E-1	5.00E-1	1.56E+03	No further evaluation	NP	NP
Fluoranthene	206440	7	7	100	6.00E-3	6.00E+0	6.00E+0	3.13E+03	No further evaluation	NP	NP
Fluorene	86737	4	7	57	2.00E-3	9.10E-1	9.10E-1	3.13E+03	No further evaluation	NP	NP
Indeno[1,2,3-cd]pyrene	193395	5	7	71	3.00E-3	1.70E+0	1.70E+0	8.75E-01	* Exceeds criteria	3.10E-1	1.70E+0
Naphthalene	91203	4	7	57	2.00E-3	3.60E-1	3.60E-1	1.56E+03	No further evaluation	NP	NP
N-Nitrosodi-n-propylamine	621647	2	7	29	1.60E-2	1.65E-1	1.20E-1	9.12E-02	* Exceeds criteria	1.37E-1	1.65E-1
Phenanthrene	85018	7	7	100	3.00E-3	5.50E+0	5.50E+0	2.35E+04	No further evaluation	NP	NP
Phenol	108952	3	7	43	3.00E-3	1.50E+0	1.50E+0	4.69E+04	No further evaluation	NP	NP
Pyrene	129000	7	7	100	7.00E-3	5.00E+0	5.00E+0	2.35E+03	No further evaluation	NP	NP

Table H-6: Summary of Chemicals Detected and Exposure Point Concentrations in Solid Materials Collected from Subsurface Structures in the Eastern Area. Former Thypin Steel Inc. Facility, Manorhaven, New York.

Analyte	CAS RN	Number of Detections	Total Analyzed	Detection Frequency (%)	Minimum (mg/kg)	Maximum (mg/kg)	Maximum Detected (mg/kg)	USEPA RBC Residential (mg/kg)	Screening Results	Exposure Point Concentrations Used	
										Mean	Upper Level
Metals											
Aluminum	7429905	7	7	100	1.22E+3	4.82E+3	4.82E+3	7.82E+04	No further evaluation	NP	NP
Antimony	7440360	1	7	14	9.50E-1	5.30E+0	5.30E+0	3.13E+01	No further evaluation	NP	NP
Arsenic	7440382	1	7	14	9.50E-1	4.30E+0	4.30E+0	4.26E-01	* Exceeds criteria	1.49E+0	4.30E+0
Barium	7440393	7	7	100	1.40E+1	6.05E+1	6.05E+1	5.48E+03	No further evaluation	NP	NP
Cadmium	7440439	1	7	14	4.70E-1	3.19E+1	3.19E+1	7.82E+01	No further evaluation	NP	NP
Chromium	7440473	7	7	100	5.00E+0	3.24E+3	3.24E+3	1.17E+05	No further evaluation	NP	NP
Cobalt	7440484	4	7	57	1.00E+0	1.67E+1	1.67E+1	1.56E+03	No further evaluation	NP	NP
Copper	7440508	7	7	100	3.40E+0	2.88E+1	2.88E+1	3.13E+03	No further evaluation	NP	NP
Cyanide, Total	57125	1	3	33	1.05E-1	1.28E+1	1.28E+1	1.56E+03	No further evaluation	NP	NP
Hexavalent Chromium	18540299	3	7	43	1.05E-1	1.28E+1	1.28E+1	2.35E+02	No further evaluation	NP	NP
Lead	7439921	7	7	100	1.00E+0	3.79E+2	3.79E+2	4.00E+02	No further evaluation	NP	NP
Manganese	7439965	7	7	100	7.09E+1	2.96E+2	2.96E+2	1.10E+04	No further evaluation	NP	NP
Mercury	7439976	2	7	29	2.35E-3	2.00E-2	2.00E-2	2.35E+01	No further evaluation	NP	NP
Nickel	7440020	7	7	100	3.10E+0	1.97E+2	1.97E+2	1.56E+03	No further evaluation	NP	NP
Vanadium	7440622	7	7	100	5.30E+0	2.72E+1	2.72E+1	5.48E+02	No further evaluation	NP	NP
Zinc	7440666	7	7	100	1.04E+1	7.91E+3	7.91E+3	2.35E+04	No further evaluation	NP	NP

Notes:

mg/kg	Milligrams per kilogram
%	Percent
USEPA	United States Environmental Protection Agency
RBC	USEPA Region III Residential Soil Risk Based Concentration (USEPA, 2001a)
NP	Not applicable

Table H-7: Summary of Chemicals Detected and Exposure Point Concentrations in Soil Vapor Collected from Three Feet Below Land Surface.
Former Thypin Steel Inc. Facility, Manorhaven, New York.

Analyte	CAS RN	Number of Detections	Total Analyzed	Detection Frequency (%)	Minimum (mg/m^3)	Maximum (mg/m^3)	Maximum Detected (mg/m^3)	NYSDEC AGCs (mg/m^3)	USEPA AAC (mg/m^3)	Screening Results	Exposure Point Concentrations Used	
											Mean	Upper Level
Volatile Organic Compounds												
1,1-Dichloroethene	75354	4	20	20	4.50E-3	2.95E-1	2.95E-1	2.00E-5	3.58E-5	* Exceeds criteria	3.69E-2	2.95E-1
Benzene	71432	15	20	75	7.00E-3	1.00E-1	7.60E-2	1.20E-4	2.16E-4	* Exceeds criteria	2.16E-2	1.00E-1
Bromomethane	74839	2	20	10	9.50E-3	2.00E-1	1.70E-2	--	5.11E-3	* Exceeds criteria	3.97E-2	2.00E-1
Carbon disulfide	75150	2	20	10	4.50E-3	1.00E-1	5.30E-2	7.00E-3	7.30E-1	* Exceeds criteria	2.23E-2	1.00E-1
Carbon tetrachloride	56235	4	20	20	4.50E-3	1.00E-1	5.10E-2	7.00E-5	1.18E-4	* Exceeds criteria	2.30E-2	1.00E-1
Chloroform	67663	7	20	35	2.00E-3	1.00E-1	9.60E-2	2.30E-2	7.73E-5	* Exceeds criteria	2.72E-2	1.00E-1
Chloromethane	74873	1	20	5	9.50E-3	2.00E-1	6.10E-2	7.70E-1	1.79E-3	No further evaluation	NP	NP
Ethylbenzene	100414	10	20	50	4.50E-3	1.00E-1	1.20E-2	1.00E+0	1.06E+0	No further evaluation	NP	NP
m+p-Xylene[1]	1330207	13	20	65	1.40E-2	1.00E-1	3.60E-2	3.00E-1	7.30E+0	No further evaluation	NP	NP
Methylene chloride	75092	14	20	70	2.00E-3	1.00E-1	4.90E-2	2.70E-2	3.79E-3	* Exceeds criteria	2.33E-2	1.00E-1
o-xylene	95476	12	20	60	4.50E-3	1.00E-1	1.60E-2	7.00E-1	7.30E+0	No further evaluation	NP	NP
Styrene	100425	13	20	65	7.00E-3	1.00E-1	2.40E-2	5.10E-1	1.04E+0	No further evaluation	NP	NP
Tetrachloroethene[2]	127184	17	20	85	1.70E-2	1.11E-1	1.11E-1	1.00E-1	3.13E-3	* Exceeds criteria	5.03E-2	1.11E-1
Toluene	108883	19	20	95	7.00E-2	1.87E-1	1.87E-1	2.00E+0	4.16E-1	No further evaluation	NP	NP
Trichloroethene	79016	19	20	95	4.50E-3	4.20E+0	4.20E+0	4.50E-4	1.04E-3	* Exceeds criteria	7.58E-1	4.20E+0

Notes:

[1] NYSDEC AGC screening parameter is for mixed isomers of xylenes; USEPA AAC is for xylenes.

[2] NYSDEC screening parameter is from NYSDOH (1997).

mg/m^3 Milligrams per cubic meter
% Percent
NYSDEC New York State Department of Environmental Conservation
AGCs Annual Guideline Concentrations for ambient air (NYSDEC, 1997).
NYSDOH New York State Department of Health
USEPA United States Environmental Protection Agency
AAC Ambient Air Criteria (USEPA, 2001a)
NP Not applicable

Table H-8: Summary of Chemicals Detected and Exposure Point Concentrations in Soil Vapor Collected from Six Feet Below Land Surface.
Former Thypin Steel Inc. Facility, Manorhaven, New York.

Analyte	CAS RN	Number of Detections	Total Analyzed	Detection Frequency (%)	Minimum (mg/m^3)	Maximum (mg/m^3)	Maximum Detected (mg/m^3)	NYSDEC AGCs (mg/m^3)	USEPA AAC (mg/m^3)	Screening Results	Exposure Point Concentrations Used	
											Mean	Upper Level
Volatile Organic Compounds (mg/m^3)												
1,1-Dichloroethene	75354	4	20	20	4.50E-3	8.30E-2	8.10E-2	2.00E-5	3.58E-5	* Exceeds criteria	2.26E-2	8.30E-2
Benzene	71432	15	20	75	4.00E-3	7.10E-2	7.60E-2	1.20E-4	2.16E-4	* Exceeds criteria	1.64E-2	7.10E-2
Bromodichloromethane	75274	2	20	10	4.50E-3	8.30E-2	1.70E-2	2.00E-5	1.01E-4	* Exceeds criteria	1.70E-2	8.30E-2
Carbon disulfide	75150	2	20	10	4.50E-3	8.30E-2	5.30E-2	7.00E-3	7.30E-1	* Exceeds criteria	1.77E-2	8.30E-2
Carbon tetrachloride	56235	4	20	20	3.00E-3	8.30E-2	5.10E-2	7.00E-5	1.18E-4	* Exceeds criteria	1.72E-2	8.30E-2
Chloroform	67663	7	20	35	3.00E-3	1.59E-1	9.60E-2	2.30E-2	7.73E-5	* Exceeds criteria	2.61E-2	1.59E-1
Chloromethane	74873	1	20	5	9.00E-3	1.67E-1	6.10E-2	7.70E-1	1.79E-3	No further evaluation	NP	NP
Ethylbenzene	100414	10	20	50	4.50E-3	8.30E-2	1.20E-2	1.00E+0	1.06E+0	No further evaluation	NP	NP
m+p-Xylene[1]	1330207	13	20	65	9.00E-3	8.30E-2	3.60E-2	3.00E-1	7.30E+0	No further evaluation	NP	NP
Methylene chloride	75092	14	20	70	4.50E-3	1.69E-1	4.90E-2	2.70E-2	3.79E-3	* Exceeds criteria	3.02E-2	1.69E-1
o-xylene	95476	12	20	60	3.00E-3	8.30E-2	1.60E-2	7.00E-1	7.30E+0	No further evaluation	NP	NP
Styrene	100425	13	20	65	8.00E-3	8.30E-2	2.40E-2	5.10E-1	1.04E+0	No further evaluation	NP	NP
Tetrachloroethene[2]	127184	17	20	85	2.00E-2	1.60E-1	1.11E-1	1.00E-1	3.13E-3	* Exceeds criteria	5.60E-2	1.60E-1
Toluene	108883	19	20	95	2.50E-2	3.19E-1	1.87E-1	2.00E+0	4.16E-1	No further evaluation	NP	NP
Trichloroethene	79016	19	20	95	1.00E-2	3.30E+0	4.20E+0	4.50E-4	1.04E-3	* Exceeds criteria	6.16E-1	3.30E+0

Notes:

[1] NYSDEC AGC screening parameter is for mixed isomers of xylenes; USEPA AAC is for xylenes.

[2] NYSDEC screening parameter is from NYSDOH (1997).

mg/m^3 Milligrams per cubic meter
% Percent
NYSDEC New York State Department of Environmental Conservation
AGCs Annual Guideline Concentrations for ambient air (NYSDEC, 1997)
NYSDOH New York State Department of Health
USEPA United States Environmental Protection Agency
AAC Ambient Air Criteria (USEPA, 2001a)
NP Not applicable

Table H-9: Statistical Summary of Concentrations of Chemicals of Potential Concern in Subsurface Soil Former Thypin Steel Inc. Facility, Manorhaven, New York -- General Construction Scenario.

Analyte	CAS RN	Site Range (mg/kg)			Exposure Point Concentrations Used	
					Mean	Upper Level
Semivolatile Organic Compounds[1]						
Benzo[a]anthracene	56553	1.00E-3	-	7.00E+0	9.35E-1	7.00E+0
Benzo[a]pyrene	50328	5.00E-3	-	5.80E+0	8.16E-1	5.80E+0
Benzo[b]fluoranthene	205992	6.00E-3	-	4.70E+0	7.47E-1	4.70E+0
Dibenzo[a,h]anthracene	53703	1.50E-2	-	2.10E+0	3.00E-1	2.10E+0
Indeno[1,2,3-cd]pyrene	193395	1.00E-2	-	5.00E+0	6.12E-1	5.00E+0
Metals[2]						
Arsenic	7440382	4.40E-1	-	2.26E+1	3.43E+0	2.26E+1

Notes:

[1] Semivolatile soil samples were compiled from depth intervals ranging from surface to 12 feet in depth.

[2] Metals soil samples were compiled from depth intervals ranging from surface to 6 feet in depth.

Table H-10: Statistical Summary of Concentrations of Chemicals of Potential Concern in Surface Soil. Former Thypin Steel Inc. Facility, Manorhaven, New York -- Residential Recreational Scenario.

Analyte	CAS RN	Site Range (mg/kg)			Exposure Point Concentrations Used	
					Mean	Upper Level
Semivolatile Organic Compounds[1]						
Benzo[a]anthracene	56553	5.00E-3	-	7.00E+0	1.39E+0	7.00E+0
Benzo[a]pyrene	50328	5.00E-3	-	5.80E+0	1.23E+0	5.80E+0
Benzo[b]fluoranthene	205992	6.00E-3	-	4.70E+0	1.03E+0	4.70E+0
Dibenzo[a,h]anthracene	53703	3.60E-2	-	2.10E+0	3.83E-1	2.10E+0
Indeno[1,2,3-cd]pyrene	193395	1.30E-2	-	4.10E+0	8.67E-1	4.10E+0
Metals[2]						
Arsenic	7440382	4.40E-1	-	2.26E+1	4.24E+0	2.26E+1

Notes:

[1] Semivolatile soil samples were compiled from depth intervals ranging from surface to 2 feet in depth.

[2] Metals soil samples consist of the surface to 2 inch depth interval.

Table H-11: Statistical Summary of Concentrations of Chemicals of Potential Concern in Subsurface Soil Former Thypin Steel Inc. Facility, Manorhaven, New York -- Residential Gardening and Vegetable Scenarios.

Analyte	CAS RN	Site Range (mg/kg)			Exposure Point Concentrations Used	
					Mean	Upper Level
Semivolatile Organic Compounds[1]						
Benzo[a]anthracene	56553	5.00E-3	-	7.00E+0	1.39E+0	7.00E+0
Benzo[a]pyrene	50328	5.00E-3	-	5.80E+0	1.23E+0	5.80E+0
Benzo[b]fluoranthene	205992	6.00E-3	-	4.70E+0	1.03E+0	4.70E+0
Dibenzo[a,h]anthracene	53703	3.60E-2	-	2.10E+0	3.83E-1	2.10E+0
Indeno[1,2,3-cd]pyrene	193395	1.30E-2	-	4.10E+0	8.67E-1	4.10E+0
Metals[2]						
Arsenic	7440382	4.40E-1	-	2.26E+1	4.00E+0	2.26E+1

Notes:

[1] Semivolatile soil samples were compiled from depth intervals ranging from surface to 2 feet in depth.

[2] Metals soil samples were compiled from the depth intervals of surface to 2 inches and surface to 2 feet in depth.

Table H-12: Exposure Factors and Justification for the Plausible Average Exposed Individual (PAEI) and the Reasonable Maximum Exposed Individual (RMEI) for All Residential Indoor Air Exposure Assessment Scenarios. Former Thypin Steel Inc. Facility, Manorhaven, New York.

Factor	Units	Child		Youth		Adult		Justification
		PAEI	RMEI	PAEI	RMEI	PAEI	RMEI	
DE	days/year	350	350	300	300	260	320	**Child:** Both values are assuming 24 hours per day for 50 weeks annually less two weeks vacation spent outside home. **Youth:** A factor for school age children was needed to adjust their duration of exposure. A factor 0.85 was used assuming 6 hours per day for a 40 week school year for both the PAEI and RMEI (less 2 weeks vacation). **Adult:** For the PAEI, it was assumed that residential exposure was for 15 hours with 9 hours per day spent out of the home for work (less 2 weeks vacation). For the RMEI, It was assumed that residential exposure was for 22 hours to account for a non-working parent taking care of a child, with 2 hours daily spent outside home (less 2 weeks vacation).
EY	years	3	6	6	12	9	30	**PAEI:** The value of 9 years for residential adult represents the average for residence time (USEPA, 1997a). Professional judgment was used to bracket both child and youth exposure in concert with adult residence (3 years as a child plus 6 years as a youth equals a total of 9 years). **RMEI:** For child and youth duration of exposure, the value is equal to the total age of the individual. The value of 30 years for residential adult represents a default upper percentile for residence time (USEPA, 2000a).
ATN	years	3	6	6	12	9	30	Averaging time for indoor air exposure is the total time in years over which duration of exposure is averaged. For noncarcinogenic effects, USEPA (2000a) recommends an averaging time equivalent to the duration of exposure (EY).
ATC	years	70	70	70	70	70	70	Averaging time for indoor air exposure is the total time in years over which duration of exposure is averaged. For carcinogenic effects, USEPA (2000a) recommends an averaging time of 70 years.

Table H-13: Plausible Average Exposed Individual (PAEI) and Reasonable Maximum Exposed Individual (RMEI) Exposure Parameters and their Justification for All Construction Exposure Assessment Scenarios. Former Thypin Steel Inc. Facility, Manorhaven, New York.

Factor	Units	PAEI	RMEI	Justification
BW	kg	70	70	Standard adult body weight recommended by USEPA (1989).
CG	unitless	0.10	0.10	Groundwater contact is assumed to be limited to hands and lower extremities that account for approximately 10 percent of total body surface area in an adult (USEPA, 1997a).
CS	unitless	0.16	0.16	Soil contact is assumed to be limited to hands, forearms, and a portion of the head that account for approximately 16 percent of total body surface area in an adult (USEPA, 1997a).
DG	days	2 or 10	5 or 20	Direct contact with groundwater is assumed very limited. For construction involving subsurface structures, between 2 and 5 days was selected using best professional judgment. For general construction involving soil exposure, 10 to 20 days was selected.
DS	days	15 or 60	30 or 120	Construction activities involving contact with solid material contained within subsurface structures by the same personnel are assumed to be limited (i.e., 3 to 6 weeks). For soils, construction involving ground intrusive activities are typically performed between 3 and 6 months time. Values selected were based on best professional judgement.
AT	days	365 or 7/5 * (DG or DS)	365 or 7/5 * (DG or DS)	Averaging time is the total time in days over which duration of exposure is averaged. For noncarcinogenic effects where exposure is over longer periods and when evaluating carcinogenic effects, USEPA (1989) recommends the exposure averaged over a full year (365 days). Since the days exposed is limited for the construction scenario, the averaging time is equivalent to the total days in a week (7) per number of workweeks (number of days exposed to soil or solid materials divided by 5) for noncarcinogens.
EYA	years	1	1	Construction activities are typically completed within one year.
GIS	unitless	1	1	Assumes complete (100 percent) absorption of ingested chemicals present in soils across the gastrointestinal tract.
HG	hours/day	1	2	Construction activities involving groundwater contact is assumed to be limited. Values based on professional judgement.
HH	hours/day	8	8	Assumes worker spends full 8-hour workday at the site.
HT	cm	175	175	Equivalent to a 5'9" adult. Uses data provided in AIHC (1994).
IR	m^3/hour	2.04	2.28	PAEI inhalation rate is for workers conducting trade specific activities (USEPA, 1997a). RMEI inhalation rates are based on those for carpenters carrying materials (USEPA, 1997a).
IS	mg/day	100	200	The range recommended by the USEPA is from 50 to 200 mg/day for ground intrusive activities (USEPA, 1999). Professional judgement was used to select a reasonable value.
LT	years	70	70	Standard assumption for lifetime (USEPA, 1989).
PM	$\mu g/m^3$	150	150	Action level for dust suppression (NYSDEC, 1989; NYSDOH, 2000).
S	mg/cm^2	0.23	0.23	Values are based on mean values of soil adherence specific for exposed dermal areas (hands, forearms, and 2/3 of head area) of utility workers (USEPA, 1997a).
SA	cm^2	1.85E+4	1.85E+4	Equation obtained from Gehan and George (1970).

Table H-14: Plausible Average Exposed Individual (PAEI) and Reasonable Maximum Exposed Individual (RMEI) Exposure Parameters and their Justification for the Child Recreational Exposure Assessment Scenarios. Former Thypin Steel Inc. Facility, Manorhaven, New York.

Factor	Units	PAEI	RMEI	Justification
BW	kg	15	15	Body weight for a child is the mean of body weights from children birth to 6 years of age (USEPA, 1997a).
CS	unitless	0.2	0.30	Soil contact is assumed to be limited to complete dermal area of the hands, one-half of the arms and legs and two-thirds of the face equivalent to 30 of total body surface area in a child (USEPA, 1997a). PAEI value is based on professional judgment.
DS	days	52	78	Recreational activities involving soil contact for young children are assumed to be limited to 2 or 3 days per week over averaging period.
AT	days	365 or 182	365 or 182	Averaging time is the total time in days over which duration of exposure is averaged. For noncarcinogenic effects where exposure is over longer periods and when evaluating carcinogenic effects, USEPA (1989) recommends the exposure averaged over a full year (365 days). 182 days is used for recreational exposure scenarios (one-half year).
EY	years	3	6	Professional judgment was used to bracket both child and youth exposure in concert with adult residence (3 years as a child plus 6 years as a youth equals a total of 9 years for PAEI exposure). See Tables H-15 and H-16.
GIS	unitless	1	1	Assumes complete (100 percent) absorption of ingested chemicals present in soils across the gastrointestinal tract.
HH	hours/day	1	2	Professional judgment was used to select values to estimate actual time child would spend outdoors at the Site.
HT	cm	76	76	Height for young children is the mean of heights from children at birth to 6 years of age (USEPA, 1997a).
IR	m^3/hour	0.47	0.93	Inhalation rates are the mean rates of males and females age 3 to 10 performing light (PAEI) and moderate (RMEI) activities during short term exposure (USEPA, 1997a).
IS	mg/day	100	200	The mean value for young children recommended by the USEPA is 100 mg/day (USEPA, 1997a). Professional judgment was used to select a reasonable value for RMEI scenario.
LT	years	70	70	Standard assumption for lifetime (USEPA, 1989).
PM	$\mu g/m^3$	18	30	Annual mean and 90^{th} percentile PM_{10} concentrations, respectively, for Nassau and Suffolk counties (USEPA, 2000b).
S	mg/cm^2	0.051	0.051	Body part specific soil adherence factors are for outdoor activities conducted on bare earth and grass areas (USEPA, 1997a).
SA	cm^2	5.90E+3	5.90E+3	Equation obtained from Gehan and George (1970) and uses height and weight of receptor.

Table H-15: Plausible Average Exposed Individual (PAEI) and Reasonable Maximum Exposed Individual (RMEI) Exposure Parameters and their Justification for the Youth Recreational Exposure Assessment Scenarios. Former Thypin Steel Inc. Facility, Manorhaven, New York.

Factor	Units	PAEI	RMEI	Justification
BW	kg	36	36	Body weight for youths is the mean of body weights from children 7 to 18 years of age (USEPA, 1997a).
CS	unitless	0.2	0.29	Soil contact is assumed to be limited to complete dermal area of the hands, one-half of the arms and legs and two-thirds of the face equivalent to 29 of total body surface area in a youth (USEPA, 1997a). PAEI value is based on professional judgment.
DS	days	78	104	Recreational activities involving soil contact are assumed to be limited to 3 or 4 days per week over averaging period.
AT	days	365 or 182	365 or 182	Averaging time is the total time in days over which duration of exposure is averaged. For noncarcinogenic effects where exposure is over longer periods and when evaluating carcinogenic effects, USEPA (1989) recommends the exposure averaged over a full year (365 days). 182 days is used for recreational exposure scenarios (one-half year).
EY	years	6	12	Professional judgment was used to bracket both child and youth exposure in concert with adult residence (3 years as a child plus 6 years as a youth equals a total of 9 years for PAEI exposure). See Tables H-14 and H-16.
GIS	unitless	1	1	Assumes complete (100 percent) absorption of ingested chemicals present in soils across the gastrointestinal tract.
HH	hours/day	2	4	Professional judgment was used to select values to estimate actual time spent at the Site and to account for the increased independence of youths.
HT	cm	120	120	Height for youths is the mean of heights from children 7 to 18 years of age (USEPA, 1997a).
IR	m^3/hour	0.72	1.38	Inhalation rates are the mean rates of males and females age 10 to 18 performing light (PAEI) and moderate (RMEI) activities during short term exposure (USEPA, 1997a).
IS	mg/day	50	100	50 mg/day is an estimate provided by the USEPA (1997a) for an older child. Professional judgment was used to select a reasonable value for RMEI scenario.
LT	years	70	70	Standard assumption for lifetime (USEPA, 1989).
PM	$\mu g/m^3$	18	30	Annual mean and 90^{th} percentile PM_{10} concentrations, respectively, for Nassau and Suffolk counties (USEPA, 2000b).
S	mg/cm^2	0.061	0.061	Body part specific youth soil adherence factors are for children playing soccer on a field of half grass half bare earth (USEPA, 1997a).
SA	cm^2	1.12E+4	1.12E+4	Equation obtained from Gehan and George (1970) and uses height and weight of receptor.

Table H-16: Plausible Average Exposed Individual (PAEI) and Reasonable Maximum Exposed Individual (RMEI) Exposure Parameters and their Justification for the Adult Recreational Exposure Assessment Scenarios. Former Thypin Steel Facility, Manorhaven, New York.

Factor	Units	PAEI	RMEI	Justification
BW	kg	70	70	Standard adult body weight recommended by USEPA (1989).
CS	unitless	0.20	0.28	Soil contact is assumed to be limited to complete dermal area of the hands, one-half of the arms and legs and two-thirds of the face equivalent to 28 of total body surface area in an adult (USEPA, 1997a).
DS	days	26	52	Recreational activities involving soil contact are assumed to be limited to 1 or 2 days per week over averaging period.
AT	days	365 or 182	365 or 182	Averaging time is the total time in days over which duration of exposure is averaged. For noncarcinogenic effects where exposure is over longer periods and when evaluating carcinogenic effects, USEPA (1989) recommends the exposure averaged over a full year (365 days). 182 days is used for recreational exposure scenarios (one-half year).
EY	years	9	30	Residency of 9 years represents a central tendency value (USEPA, 1997a); 30 years is the default for residential exposure (USEPA, 2000a).
GIS	unitless	1	1	Assumes complete (100 percent) absorption of ingested chemicals present in soils across the gastrointestinal tract.
HH	hours/day	1	2	Professional judgment was used to select values to estimate actual time an adult would spend outdoors at the Site.
HT	cm	175	175	Equivalent to a 5'9" adult. Uses data provided in AIHC (1994).
IR	m^3/hour	0.75	1.53	Inhalation rates are the mean of the maximum rates for male and female adults performing light (PAEI) and moderate (RMEI) activities during short term exposure (USEPA, 1997a).
IS	mg/day	50	50	50 mg/day is the standard default ingestion for adults (1997a).
LT	years	70	70	Standard assumption for lifetime (USEPA, 1989).
PM	$\mu g/m^3$	18	30	Annual mean and 90^{th} percentile PM_{10} concentrations, respectively, for Nassau and Suffolk counties (USEPA, 2000b).
S	mg/cm^2	0.042	0.042	Values are based on mean values of soil adherence specific for exposed dermal areas (hands, one-half arms and legs, and 2/3 of head area) of adults playing rugby (USEPA, 1997a).
SA	cm^2	1.85E+4	1.85E+4	Equation obtained from Gehan and George (1970) and uses height and weight of receptor.

Table H-17: Plausible Average Exposed Individual (PAEI) and Reasonable Maximum Exposed Individual (RMEI) Exposure Parameters and their Justification for Adult Gardening Exposure Assessment Scenarios. Former Thypin Steel Inc. Facility, Manorhaven, New York.

Factor	Units	PAEI	RMEI	Justification
BW	kg	70	70	Standard adult body weight recommended by USEPA (1989).
CS	unitless	0.20	0.28	Maximum soil contact is assumed to be limited to complete dermal area of the hands, half of the arms and legs and two-thirds of the face equivalent to 28 of total body surface area in an adult (USEPA, 1997a). PAEI based on best professional judgment
DS	days	26	52	Recreational activities involving soil contact are assumed to be limited to 1 or 2 days per week over averaging period.
AT	days	365 or 182	365 or 182	Averaging time is the total time in days over which duration of exposure is averaged. For noncarcinogenic effects where exposure is over longer periods and when evaluating carcinogenic effects, USEPA (1989) recommends the exposure averaged over a full year (365 days). 182 days is used for recreational exposure scenarios (one-half year).
EY	years	9	30	Residency of 9 years represents a central tendency value (USEPA, 1997a); 30 years is the default for residential exposure (USEPA, 2000a)
GIS	unitless	1	1	Assumes complete (100 percent) absorption of ingested chemicals present in soils across the gastrointestinal tract.
HH	hours/day	1	2	Professional judgment was used to select values to estimate actual time adult would spend outdoors gardening and/or doing yard work.
HT	cm	175	175	Equivalent to a 5'9" adult. Uses data provided in AIHC (1994).
IR	m^3/hour	0.75	1.53	Inhalation rates are the mean of the maximum rates for male and female adults performing light (PAEI) and moderate (RMEI) activities during short term exposure (USEPA, 1997a).
IS	mg/day	50	100	The range recommended by the USEPA is from 50 to 200 mg/day during ground invasive activities (USEPA, 1999). Professional judgement was used to select a reasonable value.
LT	years	70	70	Standard assumption for lifetime (USEPA, 1989).
PM	$\mu g/m^3$	18	30	Annual mean and 90^{th} percentile PM_{10} concentrations, respectively, for Nassau and Suffolk counties (USEPA, 2000b).
S	mg/cm^2	0.088	0.088	Values are based on mean values of soil adherence specific for exposed dermal areas (hands, one-half arms and legs, and 2/3 of head area) of gardeners (USEPA, 1997a).
SA	cm^2	1.85E+4	1.85E+4	Equation obtained from Gehan and George (1970) and uses height and weight of receptor.

Table H-18: Exposure Factors and Justification for the Plausible Average Exposed Individual (PAEI) and the Reasonable Maximum Exposed Individual (RMEI) for Ingestion of Homegrown Produce Exposure Assessment Scenarios. Former Thypin Steel Inc. Facility, Manorhaven, New York.

Factor	Units	Child		Youth		Adult		Justification
		PAEI	RMEI	PAEI	RMEI	PAEI	RMEI	
DE	days/year	20	30	20	30	20	30	Professional judgment was used to estimate actual yield over growing period would equal approximately 20 days for PAEI and 30 days for the RMEI scenario.
RVI	kg dry/day	5.15E-3	5.15E-3	1.81E-2	1.81E-2	1.77E-2	1.77E-2	Age specific intakes for potatoes and root vegetables were averaged across bracketed age interval (USEPA, 1997a)
FI	kg dry/day	1.50E-3	1.50E-3	3.02E-3	3.02E-3	7.18E-3	7.18E-3	Age specific intakes for fruits were averaged across bracketed age interval (USEPA, 1997a)
AVI	kg dry/day	2.49E-3	2.49E-3	8.36E-3	8.36E-3	1.22E-2	1.22E-2	Age specific intakes for leafy vegetables, legumes, and mushrooms were averaged across bracketed age interval (USEPA, 1997a)
FH	unitless	0.25	0.25	0.25	0.25	0.25	0.25	Professional judgment was used to select a value of 25 percent of total vegetables consumed on a given day exposed was homegrown.
ATN	days	120	120	120	120	120	120	Averaging time is the total time in days over which duration of exposure is averaged. For noncarcinogenic effects, growth and harvest period was assumed to span four months.
ATC	days	365	365	365	365	365	365	Averaging time is the total time in days over which duration of exposure is averaged. For carcinogenic effects, USEPA (2000a) recommends an averaging time over entire year.
LT	years	70	70	70	70	70	70	Standard assumption for lifetime (USEPA, 1989).
GIS	unitless	0.8	0.8	0.8	0.8	0.8	0.8	Efficiency of transfer from biota to human receptor was assumed less than complete since a fraction of chemicals would remain unavailable due to inedible portions of fruit or vegetable and from certain indigestible cellular components such as chemicals contained within the cell wall.

Table H-19: Estimated Baseline Hazard Quotients for Exposure to Noncarcinogenic Volatile Chemicals in Groundfloor Rooms Based on the Johnson and Ettinger (1991) Model Assuming Migration of Chemical Vapors from Groundwater into Future Buildings. Former Thypin Steel Inc. Facility, Manorhaven, New York.

		Child		Youth		Child + Youth		Adult	
		PAEI	RMEI	PAEI	RMEI	PAEI	RMEI	PAEI	RMEI
1,1,1-Trichloroethane	71556	1.48E-4	1.35E-3	1.27E-4	1.16E-3	2.75E-4	2.51E-3	1.10E-4	1.23E-3
1,1-Dichloroethane	75343	4.91E-5	1.67E-4	4.21E-5	1.43E-4	9.12E-5	3.10E-4	3.65E-5	1.53E-4
cis-1,2-Dichloroethene	156592	1.15E-3	1.29E-2	9.88E-4	1.11E-2	2.14E-3	2.39E-2	8.56E-4	1.18E-2
Tetrachloroethene	127184	NP	NP	NP	NP	NP	NP	NP	NP
Trichloroethene	79016	NP	NP	NP	NP	NP	NP	NP	NP

Notes:

All modeling input parameters, estimated indoor air concentrations, and results are provided in Appendix H, Attachment 1.

PAEI Plausible average exposed individual uses mean concentrations and average exposure parameters

RMEI Reasonable maximum exposed individual uses maximum concentrations and upper level exposure parameters

NP Not applicable

Table H-20: Estimated Baseline Incremental Lifetime Cancer Risk for Exposure to Carcinogenic Volatile Chemicals in Groundfloor Rooms Based on the Johnson and Ettinger (1991) Model Assuming Migration of Chemical Vapors from Groundwater Land Surface into Future Buildings. Former Thypin Steel Inc. Facility, Manorhaven, New York.

		Child		Youth		Child + Youth		Adult	
		PAEI	RMEI	PAEI	RMEI	PAEI	RMEI	PAEI	RMEI
1,1,1-Trichloroethane	71556	NP	NP	NP	NP	NP	NP	NP	NP
1,1-Dichloroethane	75343	NP	NP	NP	NP	NP	NP	NP	NP
cis-1,2-Dichloroethene	156592	NP	NP	NP	NP	NP	NP	NP	NP
Tetrachloroethene	127184	5.85E-9	1.16E-7	1.00E-8	1.99E-7	1.59E-8	3.15E-7	1.30E-8	5.31E-7
Trichloroethene	79016	1.26E-8	2.21E-7	2.15E-8	3.78E-7	3.41E-8	5.99E-7	2.80E-8	1.01E-6

Notes:

All modeling input parameters, estimated indoor air concentrations, and results are provided in Appendix H, Attachment 1.

PAEI Plausible average exposed individual uses mean concentrations and average exposure parameters

RMEI Reasonable maximum exposed individual uses maximum concentrations and upper level exposure parameters

NP Not applicable

Table H-21: Estimated Baseline Hazard Quotients for Exposure to Noncarcinogenic Volatile Chemicals in Groundfloor Rooms Based on the Johnson and Ettinger (1991) Model Assuming Migration of Soil Gas Measured Three Feet Below Land Surface into Future Buildings. Former Thypin Steel Inc. Facility, Manorhaven, New York.

		Child		Youth		Child + Youth		Adult	
		PAEI	RMEI	PAEI	RMEI	PAEI	RMEI	PAEI	RMEI
1,1-Dichloroethene	75354	NP	NP	NP	NP	NP	NP	NP	NP
Benzene	71432	NP	NP	NP	NP	NP	NP	NP	NP
Bromomethane	74839	1.13E-3	5.70E-3	9.70E-4	4.89E-3	2.10E-3	1.06E-2	8.41E-4	5.21E-3
Carbon disulfide	75150	5.98E-6	2.68E-5	5.12E-6	2.30E-5	1.11E-5	4.98E-5	4.44E-6	2.45E-5
Carbon tetrachloride	56235	NP	NP	NP	NP	NP	NP	NP	NP
Chloroform	67663	NP	NP	NP	NP	NP	NP	NP	NP
Methylene chloride	75092	1.45E-6	6.22E-6	1.24E-6	5.33E-6	2.69E-6	1.15E-5	1.08E-6	5.69E-6
Tetrachloroethene	127184	NP	NP	NP	NP	NP	NP	NP	NP
Trichloroethene	79016	NP	NP	NP	NP	NP	NP	NP	NP

Notes:

All modeling input parameters, estimated indoor air concentrations, and results are provided in Appendix H, Attachment 2.

PAEI Plausible average exposed individual uses mean concentrations and average exposure parameters

RMEI Reasonable maximum exposed individual uses maximum concentrations and upper level exposure parameters

NP Not applicable

Table H-22: Estimated Baseline Incremental Lifetime Cancer Risk for Exposure to Carcinogenic Volatile Chemicals in Groundfloor Rooms Based on the Johnson and Ettinger (1991) Model Assuming Migration of Soil Gas Measured Three Feet Below Land Surface into Future Buildings. Former Thypin Steel Inc. Facility, Manorhaven, New York.

		Child		Youth		Child + Youth		Adult	
		PAEI	RMEI	PAEI	RMEI	PAEI	RMEI	PAEI	RMEI
1,1-Dichloroethene	75354	1.33E-8	2.12E-7	2.27E-8	3.64E-7	3.60E-8	5.76E-7	2.96E-8	9.71E-7
Benzene	71432	1.20E-9	1.11E-8	2.05E-9	1.90E-8	3.25E-9	3.01E-8	2.67E-9	5.07E-8
Bromomethane	74839	NP	NP	NP	NP	NP	NP	NP	NP
Carbon disulfide	75150	NP	NP	NP	NP	NP	NP	NP	NP
Carbon tetrachloride	56235	2.21E-9	1.93E-8	3.80E-9	3.30E-8	6.01E-9	5.23E-8	4.93E-9	8.80E-8
Chloroform	67663	5.07E-9	3.73E-8	8.68E-9	6.40E-8	1.37E-8	1.01E-7	1.13E-8	1.71E-7
Methylene chloride	75092	8.76E-11	7.52E-10	1.50E-10	1.29E-9	2.38E-10	2.04E-9	1.95E-10	3.44E-9
Tetrachloroethene	127184	1.75E-10	7.75E-10	3.01E-10	1.33E-9	4.76E-10	2.10E-9	3.91E-10	3.54E-9
Trichloroethene	79016	8.38E-9	9.28E-8	1.44E-8	1.59E-7	2.28E-8	2.52E-7	1.87E-8	4.24E-7

Notes:

All modeling input parameters, estimated indoor air concentrations, and results are provided in Appendix H, Attachment 2.

PAEI Plausible average exposed individual uses mean concentrations and average exposure parameters

RMEI Reasonable maximum exposed individual uses maximum concentrations and upper level exposure parameters

NP Not applicable

Table H-23: Estimated Baseline Hazard Quotients for Exposure to Noncarcinogenic Volatile Chemicals in Groundfloor Rooms Based on the Johnson and Ettinger (1991) Model Assuming Migration of Soil Gas Measured Six Feet Below Land Surface into Future Buildings. Former Thypin Steel Inc. Facility, Manorhaven, New York.

		Child		Youth		Child + Youth		Adult	
		PAEI	RMEI	PAEI	RMEI	PAEI	RMEI	PAEI	RMEI
1,1-Dichloroethene	75354	NP	NP	NP	NP	NP	NP	NP	NP
Benzene	71432	NP	NP	NP	NP	NP	NP	NP	NP
Bromodichloromethane	75274	NP	NP	NP	NP	NP	NP	NP	NP
Carbon disulfide	75150	2.46E-6	1.16E-5	2.11E-6	9.91E-6	4.57E-6	2.15E-5	1.83E-6	1.06E-5
Carbon tetrachloride	56235	NP	NP	NP	NP	NP	NP	NP	NP
Chloroform	67663	NP	NP	NP	NP	NP	NP	NP	NP
Methylene chloride	75092	9.74E-7	5.45E-6	8.35E-7	4.67E-6	1.81E-6	1.01E-5	7.24E-7	4.98E-6
Tetrachloroethene	127184	NP	NP	NP	NP	NP	NP	NP	NP
Trichloroethene	79016	NP	NP	NP	NP	NP	NP	NP	NP

Notes:

All modeling input parameters, estimated indoor air concentrations, and results are provided in Appendix H, Attachment 2.

PAEI Plausible average exposed individual uses mean concentrations and average exposure parameters

RMEI Reasonable maximum exposed individual uses maximum concentrations and upper level exposure parameters

NP Not applicable

Table H-24: Estimated Baseline Incremental Lifetime Cancer Risk for Exposure to Carcinogenic Volatile Chemicals in Groundfloor Rooms Based on the Johnson and Ettinger (1991) Model Assuming Migration of Soil Gas Measured Six Feet Below Land Surface into Future Buildings. Former Thypin Steel Inc. Facility, Manorhaven, New York.

		Child		Youth		Child + Youth		Adult	
		PAEI	RMEI	PAEI	RMEI	PAEI	RMEI	PAEI	RMEI
1,1-Dichloroethene	75354	4.16E-9	3.05E-8	7.13E-9	5.24E-8	1.13E-8	8.29E-8	9.27E-9	1.40E-7
Benzene	71432	4.65E-10	4.02E-9	7.97E-10	6.89E-9	1.26E-9	1.09E-8	1.04E-9	1.84E-8
Bromodichloromethane	75274	4.39E-10	4.29E-9	7.53E-10	7.36E-9	1.19E-9	1.16E-8	9.79E-10	1.96E-8
Carbon disulfide	75150	NP	NP	NP	NP	NP	NP	NP	NP
Carbon tetrachloride	56235	8.32E-10	8.06E-9	1.43E-9	1.38E-8	2.26E-9	2.19E-8	1.85E-9	3.68E-8
Chloroform	67663	2.53E-9	3.08E-8	4.34E-9	5.29E-8	6.88E-9	8.37E-8	5.65E-9	1.41E-7
Methylene chloride	75092	5.89E-11	6.59E-10	1.01E-10	1.13E-9	1.60E-10	1.79E-9	1.31E-10	3.01E-9
Tetrachloroethene	127184	9.78E-11	5.59E-10	1.68E-10	9.58E-10	2.65E-10	1.52E-9	2.18E-10	2.56E-9
Trichloroethene	79016	3.44E-9	3.68E-8	5.89E-9	6.31E-8	9.33E-9	1.00E-7	7.66E-9	1.68E-7

Notes:

All modeling input parameters, estimated indoor air concentrations, and results are provided in Appendix H, Attachment 2.

PAEI Plausible average exposed individual uses mean concentrations and average exposure parameters

RMEI Reasonable maximum exposed individual uses maximum concentrations and upper level exposure parameters

NP Not applicable

Table H-25: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Groundwater at the Former Thypin Steel Inc. Facility, Manorhaven, New York.
-- General Construction Scenario -- PAEI

Chemical	CAS RN	Groundwater Concentration (µg/L) (GW) (a)	Estimated Vapor Concentration (µg/m^3) (VA) (b)	Dermal Permeability Constant (cm/hour) (Kp) (c)	Average Daily Intakes by Exposure Route (mg/kg/day)		Reference Dose		Hazard Quotient (HQ) by Exposure Route		Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
					Dermal Absorption (DA) (d)	Inhalation (IH) (e)	Oral (mg/kg/day) (RfDo) (f)	Inhalation (mg/kg/day) (RfDi) (f)	Dermal Absorption (QDA) (g)	Inhalation (QIH) (h)	
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	71556	5.71E+0	6.27E-1	1.70E-2	3.06E-7	2.18E-6	2.80E-1	6.30E-1	1.09E-6	3.45E-6	4.55E-6
1,1-Dichloroethane	75343	2.94E+0	1.10E-1	8.90E-3	8.25E-8	3.82E-7	1.00E-1	1.40E-1	8.25E-7	2.73E-6	3.55E-6
cis-1,2-Dichloroethene	156592	6.79E+0	8.36E-1	1.00E-2	2.14E-7	2.90E-6	1.00E-2	NA	2.14E-5	2.90E-4	3.12E-4
Tetrachloroethene	127184	1.01E+1	1.10E+0	3.70E-1	1.18E-5	3.82E-6	1.00E-2	1.40E-1	1.18E-3	2.73E-5	1.20E-3
Trichloroethene	79016	1.14E+1	1.10E+0	2.30E-1	8.25E-6	3.82E-6	6.00E-3	NA	1.38E-3	6.36E-4	2.01E-3
SEMIVOLATILE ORGANIC COMPOUNDS											
1,2-Dichlorobenzene	95501	4.94E+0	NP	6.10E-2	9.50E-7	NP	9.00E-2	NA	1.06E-5	NP	1.06E-5
Benzo[a]anthracene	56553	4.62E+0	NP	8.10E-1	1.18E-5	NP	3.00E-1	NA	3.94E-5	NP	3.94E-5
Benzo[a]pyrene	50328	4.61E+0	NP	1.20E+0	1.74E-5	NP	3.00E-2	NA	5.82E-4	NP	5.82E-4
Benzo[b]fluoranthene	205992	4.60E+0	NP	3.60E-1	5.22E-6	NP	4.00E-2	NA	1.31E-4	NP	1.31E-4
Benzo[g,h,i]perylene	191242	4.89E+0	NP	1.20E+0	1.85E-5	NP	3.00E-2	NA	6.17E-4	NP	6.17E-4
Benzo[k]fluoranthene	207089	4.62E+0	NP	3.60E-1	5.25E-6	NP	4.00E-2	NA	1.31E-4	NP	1.31E-4
Bis(2-ethylhexyl)phthalate	117817	7.21E+0	NP	3.30E-2	7.50E-7	NP	2.00E-2	NA	3.75E-5	NP	3.75E-5
Chrysene	218019	4.62E+0	NP	8.10E-1	1.18E-5	NP	3.00E-1	NA	3.93E-5	NP	3.93E-5
Indeno[1,2,3-cd]pyrene	193395	4.59E+0	NP	1.90E+0	2.75E-5	NP	3.00E-2	NA	9.16E-4	NP	9.16E-4
METALS											
Aluminum	7429905	9.63E+3	NP	1.00E-3	3.03E-5	NP	1.00E+0	1.00E-3	3.03E-5	NP	3.03E-5
Beryllium	7440417	7.36E-1	NP	1.00E-3	2.32E-9	NP	2.00E-3	5.70E-6	1.16E-6	NP	1.16E-6
Chromium	7440473	4.55E+1	NP	1.00E-3	1.44E-7	NP	1.50E+0	NA	9.57E-8	NP	9.57E-8
Cobalt	7440484	1.76E+1	NP	4.00E-4	2.22E-8	NP	6.00E-2	NA	3.71E-7	NP	3.71E-7
Cyanide	57125	1.70E+1	NP	1.00E-3	5.36E-8	NP	2.00E-2	NA	2.68E-6	NP	2.68E-6
Chromium VI	18540299	2.15E+1	NP	1.00E-3	6.77E-8	NP	3.00E-3	3.00E-5	2.26E-5	NP	2.26E-5
Lead	7439921	2.18E+1	NP	No reference dose is available for lead, see Appendix H Section 4.6							
Manganese	7439965	1.84E+3	NP	1.00E-3	5.79E-6	NP	1.40E-1	1.43E-5	4.14E-5	NP	4.14E-5
Vanadium	7440622	2.47E+1	NP	1.00E-3	7.80E-8	NP	7.00E-3	NA	1.11E-5	NP	1.11E-5

Table H-25: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Groundwater at the Former Thypin Steel Inc. Facility, Manorhaven, New York.
-- General Construction Scenario -- PAEI

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.04
Contact area-ground water (percent) (CG)	= 0.1
Exposed hours-ground water (hrs/day) (HG)	= 1
Exposed days-ground water (days) (DG)	= 10
Averaging time noncarcinogens (days) (ATN)	= 84
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3
Volumetric conversion factor (L/cm^3) (V)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NP Not applicable.
NA Not available at this time.
(a) Concentration is the average concentration of chemical in groundwater (µg/L) (GW).
(b) Concentration is the TScreen (USEPA, 1995a) calculated maximum concentration of chemical in air (µg/m3) using the maximum concentration measured in groundwater (Attachment 3).
(c) Dermal permeability constant (chemical-specific) for absorption of chemical across skin (Kp). Obtained from USEPA, 1992b.
(d) Estimated average daily intake via dermal absorption (DA). DA = (GW * Kp * SA * CG * X * HG * V * DG) / (ATN * BW).
(e) Estimated average daily intake via inhalation (IH). IH = (VA * X * IR * HG * DG) / (ATN * BW).
(f) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) or HEAST (USEPA, 1997b) or USEPA Region III RBC Table (USEPA, 2001a).
(g) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfDo.
(h) Hazard quotient for average daily intake from inhalation (QDA). QDA = DA / RfDi.
(i) Hazard quotient for average daily intake from all pathways (QT). QT = QDA + QIH.

Table H-26: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Groundwater at the Former Thypin Steel Inc. Facility, Manorhaven, New York.
-- General Construction Scenario -- RMEI

Chemical	CAS RN	Groundwater Concentration (µg/L) (GW) (a)	Estimated Vapor Concentration ($\mu g/m^3$) (VA) (b)	Dermal Permeability Constant (cm/hour) (Kp) (c)	Average Daily Intakes by Exposure Route (mg/kg/day)		Reference Dose		Hazard Quotient (HQ) by Exposure Route		Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
					Dermal Absorption (DA) (d)	Inhalation (IH) (e)	Oral (mg/kg/day) (RfDo) (f)	Inhalation (mg/kg/day) (RfDi) (f)	Dermal Absorption (QDA) (g)	Inhalation (QIH) (h)	
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	71556	5.20E+1	6.27E-1	1.70E-2	5.57E-6	4.86E-6	2.80E-1	6.30E-1	1.99E-5	7.72E-6	2.76E-5
1,1-Dichloroethane	75343	1.00E+1	1.10E-1	8.90E-3	5.61E-7	8.53E-7	1.00E-1	1.40E-1	5.61E-6	6.09E-6	1.17E-5
cis-1,2-Dichloroethene	156592	7.60E+1	8.36E-1	1.00E-2	4.79E-6	6.48E-6	1.00E-2	NA	4.79E-4	6.48E-4	1.13E-3
Tetrachloroethene	127184	1.00E+2	1.10E+0	3.70E-1	2.33E-4	8.53E-6	1.00E-2	1.40E-1	2.33E-2	6.09E-5	2.34E-2
Trichloroethene	79016	1.00E+2	1.10E+0	2.30E-1	1.45E-4	8.53E-6	6.00E-3	NA	2.42E-2	1.42E-3	2.56E-2
SEMIVOLATILE ORGANIC COMPOUNDS											
1,2-Dichlorobenzene	95501	5.50E+0	NP	6.10E-2	2.12E-6	NP	9.00E-2	NA	2.35E-5	NP	2.35E-5
Benzo[a]anthracene	56553	5.50E+0	NP	8.10E-1	2.81E-5	NP	3.00E-1	NA	9.36E-5	NP	9.36E-5
Benzo[a]pyrene	50328	5.50E+0	NP	1.20E+0	4.16E-5	NP	3.00E-2	NA	1.39E-3	NP	1.39E-3
Benzo[b]fluoranthene	205992	5.50E+0	NP	3.60E-1	1.25E-5	NP	4.00E-2	NA	3.12E-4	NP	3.12E-4
Benzo[g,h,i]perylene	191242	5.50E+0	NP	1.20E+0	4.16E-5	NP	3.00E-2	NA	1.39E-3	NP	1.39E-3
Benzo[k]fluoranthene	207089	5.50E+0	NP	3.60E-1	1.25E-5	NP	4.00E-2	NA	3.12E-4	NP	3.12E-4
Bis(2-ethylhexyl)phthalate	117817	3.40E+1	NP	3.30E-2	7.07E-6	NP	2.00E-2	NA	3.54E-4	NP	3.54E-4
Chrysene	218019	5.50E+0	NP	8.10E-1	2.81E-5	NP	3.00E-1	NA	9.36E-5	NP	9.36E-5
Indeno[1,2,3-cd]pyrene	193395	5.50E+0	NP	1.90E+0	6.59E-5	NP	3.00E-2	NA	2.20E-3	NP	2.20E-3
METALS											
Aluminum	7429905	2.98E+4	NP	1.00E-3	1.88E-4	NP	1.00E+0	1.00E-3	1.88E-4	NP	1.88E-4
Beryllium	7440417	3.60E+0	NP	1.00E-3	2.27E-8	NP	2.00E-3	5.70E-6	1.14E-5	NP	1.14E-5
Chromium	7440473	1.89E+2	NP	1.00E-3	1.19E-6	NP	1.50E+0	NA	7.95E-7	NP	7.95E-7
Cobalt	7440484	8.21E+1	NP	4.00E-4	2.07E-7	NP	6.00E-2	NA	3.45E-6	NP	3.45E-6
Cyanide	57125	2.09E+2	NP	1.00E-3	1.32E-6	NP	2.00E-2	NA	6.59E-5	NP	6.59E-5
Chromium VI	18540299	1.80E+2	NP	1.00E-3	1.14E-6	NP	3.00E-3	3.00E-5	3.78E-4	NP	3.78E-4
Lead	7439921	1.49E+2	NP	No reference dose is available for lead, see Appendix H Section 4.6							
Manganese	7439965	9.30E+3	NP	1.00E-3	5.86E-5	NP	1.40E-1	1.43E-5	4.19E-4	NP	4.19E-4
Vanadium	7440622	6.28E+1	NP	1.00E-3	3.96E-7	NP	7.00E-3	NA	5.66E-5	NP	5.66E-5

Table H-26: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Groundwater at the Former Thypin Steel Inc. Facility, Manorhaven, New York.
-- General Construction Scenario -- RMEI

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.28
Contact area-ground water (percent) (CG)	= 0.1
Exposed hours-ground water (hrs/day) (HG)	= 2
Exposed days-ground water (days) (DG)	= 20
Averaging time noncarcinogens (days) (ATN)	= 168
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3
Volumetric conversion factor (L/cm^3) (V)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NP Not applicable.
NA Not available at this time.
(a) Concentration is the maximum concentration of chemical in groundwater (µg/L) (GW).
(b) Concentration is the TScreen (USEPA, 1995a) calculated maximum concentration of chemical in air (µg/m3) using the maximum concentration measured in groundwater (Attachment 3).
(c) Dermal permeability constant (chemical-specific) for absorption of chemical across skin (Kp). Obtained from USEPA, 1992b.
(d) Estimated average daily intake via dermal absorption (DA). DA = (GW * Kp * SA * CG * X * HG * V * DG) / (ATN * BW).
(e) Estimated average daily intake via inhalation (IH). IH = (VA * X * IR * HG * DG) / (ATN * BW).
(f) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) or HEAST (USEPA, 1997b) or USEPA Region III RBC Table (USEPA, 2001a).
(g) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfDo.
(h) Hazard quotient for average daily intake from inhalation (QDA). QDA = DA / RfDi.
(i) Hazard quotient for average daily intake from all pathways (QT). QT = QDA + QIH.

Table H-26: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Groundwater at the Former Thypin Steel Inc. Facility, Manorhaven, New York.
-- General Construction Scenario -- RMEI

Chemical	CAS RN	Groundwater Concentration (µg/L) (GW) (a)	Estimated Vapor Concentration (µg/m^3) (VA) (b)	Dermal Permeability Constant (cm/hour) (Kp) (c)	Average Daily Intakes by Exposure Route (mg/kg/day)		Reference Dose		Hazard Quotient (HQ) by Exposure Route		Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
					Dermal Absorption (DA) (d)	Inhalation (IH) (e)	Oral (mg/kg/day) (RfDo) (f)	Inhalation (mg/kg/day) (RfDi) (f)	Dermal Absorption (QDA) (g)	Inhalation (QIH) (h)	
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	71556	5.20E+1	6.27E-1	1.70E-2	5.57E-6	4.86E-6	2.80E-1	6.30E-1	1.99E-5	7.72E-6	2.76E-5
1,1-Dichloroethane	75343	1.00E+1	1.10E-1	8.90E-3	5.61E-7	8.53E-7	1.00E-1	1.40E-1	5.61E-6	6.09E-6	1.17E-5
cis-1,2-Dichloroethene	156592	7.60E+1	8.36E-1	1.00E-2	4.79E-6	6.48E-6	1.00E-2	NA	4.79E-4	6.48E-4	1.13E-3
Tetrachloroethene	127184	1.00E+2	1.10E+0	3.70E-1	2.33E-4	8.53E-6	1.00E-2	1.40E-1	2.33E-2	6.09E-5	2.34E-2
Trichloroethene	79016	1.00E+2	1.10E+0	2.30E-1	1.45E-4	8.53E-6	6.00E-3	NA	2.42E-2	1.42E-3	2.56E-2
SEMIVOLATILE ORGANIC COMPOUNDS											
1,2-Dichlorobenzene	95501	5.50E+0	NP	6.10E-2	2.12E-6	NP	9.00E-2	NA	2.35E-5	NP	2.35E-5
Benzo[a]anthracene	56553	5.50E+0	NP	8.10E-1	2.81E-5	NP	3.00E-1	NA	9.36E-5	NP	9.36E-5
Benzo[a]pyrene	50328	5.50E+0	NP	1.20E+0	4.16E-5	NP	3.00E-2	NA	1.39E-3	NP	1.39E-3
Benzo[b]fluoranthene	205992	5.50E+0	NP	3.60E-1	1.25E-5	NP	4.00E-2	NA	3.12E-4	NP	3.12E-4
Benzo[g,h,i]perylene	191242	5.50E+0	NP	1.20E+0	4.16E-5	NP	3.00E-2	NA	1.39E-3	NP	1.39E-3
Benzo[k]fluoranthene	207089	5.50E+0	NP	3.60E-1	1.25E-5	NP	4.00E-2	NA	3.12E-4	NP	3.12E-4
Bis(2-ethylhexyl)phthalate	117817	3.40E+1	NP	3.30E-2	7.07E-6	NP	2.00E-2	NA	3.54E-4	NP	3.54E-4
Chrysene	218019	5.50E+0	NP	8.10E-1	2.81E-5	NP	3.00E-1	NA	9.36E-5	NP	9.36E-5
Indeno[1,2,3-cd]pyrene	193395	5.50E+0	NP	1.90E+0	6.59E-5	NP	3.00E-2	NA	2.20E-3	NP	2.20E-3
METALS											
Aluminum	7429905	2.98E+4	NP	1.00E-3	1.88E-4	NP	1.00E+0	1.00E-3	1.88E-4	NP	1.88E-4
Beryllium	7440417	3.60E+0	NP	1.00E-3	2.27E-8	NP	2.00E-3	5.70E-6	1.14E-5	NP	1.14E-5
Chromium	7440473	1.89E+2	NP	1.00E-3	1.19E-6	NP	1.50E+0	NA	7.95E-7	NP	7.95E-7
Cobalt	7440484	8.21E+1	NP	4.00E-4	2.07E-7	NP	6.00E-2	NA	3.45E-6	NP	3.45E-6
Cyanide	57125	2.09E+2	NP	1.00E-3	1.32E-6	NP	2.00E-2	NA	6.59E-5	NP	6.59E-5
Chromium VI	18540299	1.80E+2	NP	1.00E-3	1.14E-6	NP	3.00E-3	3.00E-5	3.78E-4	NP	3.78E-4
Lead	7439921	1.49E+2	NP	No reference dose is available for lead, see Appendix H Section 4.6							
Manganese	7439965	9.30E+3	NP	1.00E-3	5.86E-5	NP	1.40E-1	1.43E-5	4.19E-4	NP	4.19E-4
Vanadium	7440622	6.28E+1	NP	1.00E-3	3.96E-7	NP	7.00E-3	NA	5.66E-5	NP	5.66E-5

Table H-26: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Groundwater at the Former Thypin Steel Inc. Facility, Manorhaven, New York.
-- General Construction Scenario -- RMEI

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.28
Contact area-ground water (percent) (CG)	= 0.1
Exposed hours-ground water (hrs/day) (HG)	= 2
Exposed days-ground water (days) (DG)	= 20
Averaging time noncarcinogens (days) (ATN)	= 168
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3
Volumetric conversion factor (L/cm^3) (V)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NP Not applicable.
NA Not available at this time.
(a) Concentration is the maximum concentration of chemical in groundwater (µg/L) (GW).
(b) Concentration is the TScreen (USEPA, 1995a) calculated maximum concentration of chemical in air (µg/m3) using the maximum concentration measured in groundwater (Attachment 3).
(c) Dermal permeability constant (chemical-specific) for absorption of chemical across skin (Kp). Obtained from USEPA, 1992b.
(d) Estimated average daily intake via dermal absorption (DA). DA = (GW * Kp * SA * CG * X * HG * V * DG) / (ATN * BW).
(e) Estimated average daily intake via inhalation (IH). IH = (VA * X * IR * HG * DG) / (ATN * BW).
(f) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) or HEAST (USEPA, 1997b) or USEPA Region III RBC Table (USEPA, 2001a).
(g) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfDo.
(h) Hazard quotient for average daily intake from inhalation (QDA). QDA = DA / RfDi.
(i) Hazard quotient for average daily intake from all pathways (QT). QT = QDA + QIH.

Table H-27: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Groundwater at the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- General Construction Scenario -- PAEI

Chemical	CAS RN	Groundwater Concentration (µg/L) (GW) (a)	Estimated Vapor Concentration (µg/m^3) (VA) (b)	Dermal Permeability Constant (cm/hour) (Kp) (c)	Lifetime Average Daily Intakes by Exposure Route (mg/kg/day)		Slope Factors (mg/kg/day)$^{-1}$		ILCR by Exposure Route		Sum of Estimated Potential ILCRs (All Relevant Exposure Routes) (ILCRT) (i)
					Dermal Absorption (DA) (d)	Inhalation (IH) (e)	Oral (IG_CPF) (f)	Inhalation (IH_CPF) (f)	Dermal Absorption (ILCRDA) (g)	Inhalation (ILCRIH) (h)	
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	71556	5.71E+0	6.27E-1	1.70E-2	1.01E-9	7.15E-9	NC	NC	NC	NC	NC
1,1-Dichloroethane	75343	2.94E+0	1.10E-1	8.90E-3	2.71E-10	1.25E-9	NC	NC	NC	NC	NC
cis-1,2-Dichloroethene	156592	6.79E+0	8.36E-1	1.00E-2	7.04E-10	9.54E-9	NC	NC	NC	NC	NC
Tetrachloroethene	127184	1.01E+1	1.10E+0	3.70E-1	3.86E-8	1.25E-8	5.20E-2	2.00E-3	2.01E-9	2.51E-11	2.03E-9
Trichloroethene	79016	1.14E+1	1.10E+0	2.30E-1	2.71E-8	1.25E-8	1.10E-2	6.00E-3	2.98E-10	7.53E-11	3.74E-10
SEMIVOLATILE ORGANIC COMPOUDS											
1,2-Dichlorobenzene	95501	4.94E+0	NP	6.10E-2	3.12E-9	NP	NC	NC	NC	NP	NC
Benzo[a]anthracene	56553	4.62E+0	NP	8.10E-1	3.88E-8	NP	7.30E-1	6.10E-1	2.83E-8	NP	2.83E-8
Benzo[a]pyrene	50328	4.61E+0	NP	1.20E+0	5.74E-8	NP	7.30E+0	3.10E+0	4.19E-7	NP	4.19E-7
Benzo[b]fluoranthene	205992	4.60E+0	NP	3.60E-1	1.72E-8	NP	7.30E-1	6.10E-1	1.25E-8	NP	1.25E-8
Benzo[g,h,i]perylene	191242	4.89E+0	NP	1.20E+0	6.09E-8	NP	NC	NC	NC	NP	NC
Benzo[k]fluoranthene	207089	4.62E+0	NP	3.60E-1	1.73E-8	NP	7.30E-2	6.10E-2	1.26E-9	NP	1.26E-9
Bis(2-ethylhexyl)phthalate	117817	7.21E+0	NP	3.30E-2	2.46E-9	NP	1.40E-2	1.40E-2	3.45E-11	NP	3.45E-11
Chrysene	218019	4.62E+0	NP	8.10E-1	3.88E-8	NP	7.30E-3	6.10E-3	2.83E-10	NP	2.83E-10
Indeno[1,2,3-cd]pyrene	193395	4.59E+0	NP	1.90E+0	9.04E-8	NP	7.30E-1	6.10E-1	6.60E-8	NP	6.60E-8
METALS											
Aluminum	7429905	9.63E+3	NP	1.00E-3	9.98E-8	NP	NC	NC	NC	NP	NC
Beryllium	7440417	7.36E-1	NP	1.00E-3	7.63E-12	NP	NA	8.40E+0	NA	NP	NP
Chromium	7440473	4.55E+1	NP	1.00E-3	4.72E-10	NP	NC	NC	NC	NP	NC
Cobalt	7440484	1.76E+1	NP	4.00E-4	7.31E-11	NP	NC	NC	NC	NP	NC
Cyanide	57125	1.70E+1	NP	1.00E-3	1.76E-10	NP	NC	NC	NC	NP	NC
Chromium VI	18540299	2.15E+1	NP	1.00E-3	2.23E-10	NP	NC	4.20E+1	NC	NP	NP
Lead	7439921	2.18E+1	NP	4.00E-6	9.04E-13	NP	NA	NA	NA	NP	NA
Manganese	7439965	1.84E+3	NP	1.00E-3	1.90E-8	NP	NC	NC	NC	NP	NC
Vanadium	7440622	2.47E+1	NP	1.00E-3	2.57E-10	NP	NC	NC	NC	NP	NC

Table H-27: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Groundwater at the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- General Construction Scenario -- PAEI

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.04
Contact area-ground water (percent) (CG)	= 0.1
Exposed hours-ground water (hrs/day) (HG)	= 1
Exposed days-ground water (days) (DG)	= 10
Averaging time carcinogens (days) (ATC)	= 365
Exposure years as adult (yrs) (EY)	= 1
Lifetime (yrs) (LT)	= 70
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3
Volumetric conversion factor (L/cm^3) (V)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NC indicates compound is considered to be a noncarcinogen according to IRIS (USEPA, 2001b) or HEAST (USEPA, 1997b).
NP Not applicable.
NA Not available at this time.
(a) Concentration is the average concentration of chemical in groundwater (µg/L) (GW).
(b) Concentration is the TScreen (USEPA, 1995a) calculated maximum concentration of chemical in air ($\mu g/m^3$) using the maximum concentration measured in groundwater (Attachment 3).
(c) Dermal permeability constant (chemical-specific) for absorption of chemical across skin (Kp). Obtained from USEPA, 1992b.
(d) Estimated lifetime average daily intake via dermal absorption (DA). DA = (GW * Kp * SA * CG * X * HG * V * DG * EY) / (LT * ATC * BW).
(e) Estimated lifetime average daily intake via inhalation (IH). IH = (VA * X * IR * HG * DG * EY)/(LT * ATC * BW).
(f) Carcinogenic potency factors (CPFs) were obtained from IRIS (USEPA, 2001b) or HEAST (USEPA, 1997b) or USEPA Region III RBC Table (USEPA, 2001a).
(g) Incremetal lifetime cancer risk (ILCR) for lifetime average daily intake from dermal exposure (ILCRDA). ILCRDA = DA * IG_CPF.
(h) Incremetal lifetime cancer risk (ILCR) for lifetime average daily intake from inhalation (ILCRIH). ILCRIH = IH * IH_CPF
(i) Incremetal lifetime cancer risk (ILCR) for lifetime average daily intake from all pathways (ILCRT). ILCRT = ILCRDA + ILCRIH

Table H-28: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Groundwater at the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- General Construction Scenario -- RMEI

Chemical	CAS RN	Groundwater Concentration (µg/L) (GW) (a)	Estimated Vapor Concentration ($\mu g/m^3$) (VA) (b)	Dermal Permeability Constant (cm/hour) (Kp) (c)	Lifetime Average Daily Intakes by Exposure Route (mg/kg/day)		Slope Factors $(mg/kg/day)^{-1}$		ILCR by Exposure Route		Sum of Estimated Potential ILCRs (All Relevant Exposure Routes) (ILCRT) (i)
					Dermal Absorption (DA) (d)	Inhalation (IH) (e)	Oral (IG_CPF) (f)	Inhalation (IH_CPF) (f)	Dermal Absorption (ILCRDA) (g)	Inhalation (ILCRIH) (h)	
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	71556	5.20E+1	6.27E-1	1.70E-2	3.67E-8	3.20E-8	NC	NC	NC	NC	NC
1,1-Dichloroethane	75343	1.00E+1	1.10E-1	8.90E-3	3.69E-9	5.61E-9	NC	NC	NC	NC	NC
cis-1,2-Dichloroethene	156592	7.60E+1	8.36E-1	1.00E-2	3.15E-8	4.26E-8	NC	NC	NC	NC	NC
Tetrachloroethene	127184	1.00E+2	1.10E+0	3.70E-1	1.53E-6	5.61E-8	5.20E-2	2.00E-3	7.98E-8	1.12E-10	7.99E-8
Trichloroethene	79016	1.00E+2	1.10E+0	2.30E-1	9.54E-7	5.61E-8	1.10E-2	6.00E-3	1.05E-8	3.37E-10	1.08E-8
SEMIVOLATILE ORGANIC COMPOUDS											
1,2-Dichlorobenzene	95501	5.50E+0	NP	6.10E-2	1.39E-8	NP	NC	NC	NC	NP	NC
Benzo[a]anthracene	56553	5.50E+0	NP	8.10E-1	1.85E-7	NP	7.30E-1	6.10E-1	1.35E-7	NP	1.35E-7
Benzo[a]pyrene	50328	5.50E+0	NP	1.20E+0	2.74E-7	NP	7.30E+0	3.10E+0	2.00E-6	NP	2.00E-6
Benzo[b]fluoranthene	205992	5.50E+0	NP	3.60E-1	8.21E-8	NP	7.30E-1	6.10E-1	5.99E-8	NP	5.99E-8
Benzo[g,h,i]perylene	191242	5.50E+0	NP	1.20E+0	2.74E-7	NP	NC	NC	NC	NP	NC
Benzo[k]fluoranthene	207089	5.50E+0	NP	3.60E-1	8.21E-8	NP	7.30E-2	6.10E-2	5.99E-9	NP	5.99E-9
Bis(2-ethylhexyl)phthalate	117817	3.40E+1	NP	3.30E-2	4.65E-8	NP	1.40E-2	1.40E-2	6.51E-10	NP	6.51E-10
Chrysene	218019	5.50E+0	NP	8.10E-1	1.85E-7	NP	7.30E-3	6.10E-3	1.35E-9	NP	1.35E-9
Indeno[1,2,3-cd]pyrene	193395	5.50E+0	NP	1.90E+0	4.33E-7	NP	7.30E-1	6.10E-1	3.16E-7	NP	3.16E-7
METALS											
Aluminum	7429905	2.98E+4	NP	1.00E-3	1.24E-6	NP	NC	NC	NC	NP	NC
Beryllium	7440417	3.60E+0	NP	1.00E-3	1.49E-10	NP	NA	8.40E+0	NA	NP	NP
Chromium	7440473	1.89E+2	NP	1.00E-3	7.84E-9	NP	NC	NC	NC	NP	NC
Cobalt	7440484	8.21E+1	NP	4.00E-4	1.36E-9	NP	NC	NC	NC	NP	NC
Cyanide	57125	2.09E+2	NP	1.00E-3	8.67E-9	NP	NC	NC	NC	NP	NC
Chromium VI	18540299	1.80E+2	NP	1.00E-3	7.46E-9	NP	NC	4.20E+1	NC	NP	NP
Lead	7439921	1.49E+2	NP	4.00E-6	2.47E-11	NP	NA	NA	NA	NP	NA
Manganese	7439965	9.30E+3	NP	1.00E-3	3.86E-7	NP	NC	NC	NC	NP	NC
Vanadium	7440622	6.28E+1	NP	1.00E-3	2.60E-9	NP	NC	NC	NC	NP	NC

Table H-28: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Groundwater at the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- General Construction Scenario -- RMEI

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.28
Contact area-ground water (percent) (CG)	= 0.1
Exposed hours-ground water (hrs/day) (HG)	= 2
Exposed days-ground water (days) (DG)	= 20
Averaging time carcinogens (days) (ATC)	= 365
Exposure years as adult (yrs) (EY)	= 1
Lifetime (yrs) (LT)	= 70
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3
Volumetric conversion factor (L/cm^3) (V)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NC indicates compound is considered to be a noncarcinogen according to IRIS (USEPA, 2001b) or HEAST (USEPA, 1997b).
NP Not applicable.
NA Not available at this time.
(a) Concentration is the maximum concentration of chemical in groundwater (µg/L) (GW).
(b) Concentration is the TScreen (USEPA, 1995a) calculated maximum concentration of chemical in air ($\mu g/m^3$) using the maximum concentration measured in groundwater (Attachment 3).
(c) Dermal permeability constant (chemical-specific) for absorption of chemical across skin (Kp). Obtained from USEPA, 1992b.
(d) Estimated lifetime average daily intake via dermal absorption (DA). DA = (GW * Kp * SA * CG * X * HG * V * DG * EY) / (LT * ATC * BW).
(e) Estimated lifetime average daily intake via inhalation (IH). IH = (VA * X * IR * HG * DG * EY)/(LT * ATC * BW).
(f) Carcinogenic potency factors (CPFs) were obtained from IRIS (USEPA, 2001b) or HEAST (USEPA, 1997b) or USEPA Region III RBC Table (USEPA, 2001a).
(g) Incremetal lifetime cancer risk (ILCR) for lifetime average daily intake from dermal exposure (ILCRDA). ILCRDA = DA * IG_CPF.
(h) Incremetal lifetime cancer risk (ILCR) for lifetime average daily intake from inhalation (ILCRIH). ILCRIH = IH * IH_CPF
(i) Incremetal lifetime cancer risk (ILCR) for lifetime average daily intake from all pathways (ILCRT). ILCRT = ILCRDA + ILCRIH

Table H-29: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Groundwater at the Former Thypin Steel Inc. Facility, Manorhaven, New York.
-- Subsurface Structure Construction Scenario -- PAEI

Chemical	CAS RN	Groundwater Concentration (µg/L) (GW) (a)	Estimated Vapor Concentration (µg/m³) (VA) (b)	Dermal Permeability Constant (cm/hour) (Kp) (c)	Average Daily Intakes by Exposure Route (mg/kg/day)		Reference Dose		Hazard Quotient (HQ) by Exposure Route		Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
					Dermal Absorption (DA) (d)	Inhalation (IH) (e)	Oral (mg/kg/day) (RfDo) (f)	Inhalation (mg/kg/day) (RfDi) (f)	Dermal Absorption (QDA) (g)	Inhalation (QIH) (h)	
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	71556	5.71E+0	6.27E-1	1.70E-2	2.45E-7	1.74E-6	2.80E-1	6.30E-1	8.74E-7	2.76E-6	3.64E-6
1,1-Dichloroethane	75343	2.94E+0	1.10E-1	8.90E-3	6.60E-8	3.05E-7	1.00E-1	1.40E-1	6.60E-7	2.18E-6	2.84E-6
cis-1,2-Dichloroethene	156592	6.79E+0	8.36E-1	1.00E-2	1.71E-7	2.32E-6	1.00E-2	NA	1.71E-5	2.32E-4	2.49E-4
Tetrachloroethene	127184	1.01E+1	1.10E+0	3.70E-1	9.40E-6	3.05E-6	1.00E-2	1.40E-1	9.40E-4	2.18E-5	9.62E-4
Trichloroethene	79016	1.14E+1	1.10E+0	2.30E-1	6.60E-6	3.05E-6	6.00E-3	NA	1.10E-3	5.09E-4	1.61E-3
SEMIVOLATILE ORGANIC COMPOUNDS											
1,2-Dichlorobenzene	95501	4.94E+0	NP	6.10E-2	7.60E-7	NP	9.00E-2	NA	8.45E-6	NP	8.45E-6
Benzo[a]anthracene	56553	4.62E+0	NP	8.10E-1	9.45E-6	NP	3.00E-1	NA	3.15E-5	NP	3.15E-5
Benzo[a]pyrene	50328	4.61E+0	NP	1.20E+0	1.40E-5	NP	3.00E-2	NA	4.65E-4	NP	4.65E-4
Benzo[b]fluoranthene	205992	4.60E+0	NP	3.60E-1	4.18E-6	NP	4.00E-2	NA	1.04E-4	NP	1.04E-4
Benzo[g,h,i]perylene	191242	4.89E+0	NP	1.20E+0	1.48E-5	NP	3.00E-2	NA	4.94E-4	NP	4.94E-4
Benzo[k]fluoranthene	207089	4.62E+0	NP	3.60E-1	4.20E-6	NP	4.00E-2	NA	1.05E-4	NP	1.05E-4
Bis(2-ethylhexyl)phthalate	117817	7.21E+0	NP	3.30E-2	6.00E-7	NP	2.00E-2	NA	3.00E-5	NP	3.00E-5
Chrysene	218019	4.62E+0	NP	8.10E-1	9.43E-6	NP	3.00E-1	NA	3.14E-5	NP	3.14E-5
Indeno[1,2,3-cd]pyrene	193395	4.59E+0	NP	1.90E+0	2.20E-5	NP	3.00E-2	NA	7.33E-4	NP	7.33E-4
METALS											
Aluminum	7429905	9.63E+3	NP	1.00E-3	2.43E-5	NP	1.00E+0	1.00E-3	2.43E-5	NP	2.43E-5
Beryllium	7440417	7.36E-1	NP	1.00E-3	1.86E-9	NP	2.00E-3	5.70E-6	9.28E-7	NP	9.28E-7
Chromium	7440473	4.55E+1	NP	1.00E-3	1.15E-7	NP	1.50E+0	NA	7.66E-8	NP	7.66E-8
Cobalt	7440484	1.76E+1	NP	4.00E-4	1.78E-8	NP	6.00E-2	NA	2.96E-7	NP	2.96E-7
Cyanide	57125	1.70E+1	NP	1.00E-3	4.29E-8	NP	2.00E-2	NA	2.14E-6	NP	2.14E-6
Chromium VI	18540299	2.15E+1	NP	1.00E-3	5.42E-8	NP	1.50E+0	NA	3.61E-8	NP	3.61E-8
Lead	7439921	2.18E+1	NP	No reference dose is available for lead, see Appendix H Section 4.6							
Manganese	7439965	1.84E+3	NP	1.00E-3	4.63E-6	NP	1.40E-1	1.43E-5	3.31E-5	NP	3.31E-5
Vanadium	7440622	2.47E+1	NP	1.00E-3	6.24E-8	NP	7.00E-3	NA	8.92E-6	NP	8.92E-6

Table H-29: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Groundwater at the Former Thypin Steel Inc. Facility, Manorhaven, New York.
-- Subsurface Structure Construction Scenario -- PAEI

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.04
Contact area-ground water (percent) (CG)	= 0.1
Exposed hours-ground water (hrs/day) (HG)	= 1
Exposed days-ground water (days) (DG)	= 2
Averaging time noncarcinogens (days) (ATN)	= 21
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3
Volumetric conversion factor (L/cm^3) (V)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NP Not applicable.
NA Not avaialble at this time.
(a) Concentration is the average concentration of chemical in groundwater (µg/L) (GW).
(b) Concentration is the TScreen (USEPA, 1995a) calculated maximum concentration of chemical in air (µg/m3) using the maximum concentration measured in groundwater (Attachment 3).
(c) Dermal permeability constant (chemical-specific) for absorption of chemical across skin (Kp). Obtained from USEPA, 1992b.
(d) Estimated average daily intake via dermal absorption (DA). DA = (GW * Kp * SA * CG * X * HG * V * DG) / (ATN * BW).
(e) Estimated average daily intake via inhalation (IH). IH = (VA * X * IR * HG * DG) / (ATN * BW).
(f) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) or HEAST (USEPA, 1997b) or USEPA Region III RBC Table (USEPA, 2001a).
(g) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfDo.
(h) Hazard quotient for average daily intake from inhalation (QDA). QDA = DA / RfDi.
(i) Hazard quotient for average daily intake from all pathways (QT). QT = QDA + QIH.

Table H-30: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Groundwater at the Former Thypin Steel Inc. Facility, Manorhaven, New York.
-- Subsurface Structure Construction Scenario -- RMEI

Chemical	CAS RN	Groundwater Concentration (µg/L) (GW) (a)	Estimated Vapor Concentration ($\mu g/m^3$) (VA) (b)	Dermal Permeability Constant (cm/hour) (Kp) (c)	Average Daily Intakes by Exposure Route (mg/kg/day)		Reference Dose		Hazard Quotient (HQ) by Exposure Route		Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
					Dermal Absorption (DA) (d)	Inhalation (IH) (e)	Oral (mg/kg/day) (RfDo) (f)	Inhalation (mg/kg/day) (RfDi) (f)	Dermal Absorption (QDA) (g)	Inhalation (QIH) (h)	
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	71556	5.20E+1	6.27E-1	1.70E-2	5.57E-6	4.86E-6	2.80E-1	6.30E-1	1.99E-5	7.72E-6	2.76E-5
1,1-Dichloroethane	75343	1.00E+1	1.10E-1	8.90E-3	5.61E-7	8.53E-7	1.00E-1	1.40E-1	5.61E-6	6.09E-6	1.17E-5
cis-1,2-Dichloroethene	156592	7.60E+1	8.36E-1	1.00E-2	4.79E-6	6.48E-6	1.00E-2	NA	4.79E-4	6.48E-4	1.13E-3
Tetrachloroethene	127184	1.00E+2	1.10E+0	3.70E-1	2.33E-4	8.53E-6	1.00E-2	1.40E-1	2.33E-2	6.09E-5	2.34E-2
Trichloroethene	79016	1.00E+2	1.10E+0	2.30E-1	1.45E-4	8.53E-6	6.00E-3	NA	2.42E-2	1.42E-3	2.56E-2
SEMIVOLATILE ORGANIC COMPOUNDS											
1,2-Dichlorobenzene	95501	5.50E+0	NP	6.10E-2	2.12E-6	NP	9.00E-2	NA	2.35E-5	NP	2.35E-5
Benzo[a]anthracene	56553	5.50E+0	NP	8.10E-1	2.81E-5	NP	3.00E-1	NA	9.36E-5	NP	9.36E-5
Benzo[a]pyrene	50328	5.50E+0	NP	1.20E+0	4.16E-5	NP	3.00E-2	NA	1.39E-3	NP	1.39E-3
Benzo[b]fluoranthene	205992	5.50E+0	NP	3.60E-1	1.25E-5	NP	4.00E-2	NA	3.12E-4	NP	3.12E-4
Benzo[g,h,i]perylene	191242	5.50E+0	NP	1.20E+0	4.16E-5	NP	3.00E-2	NA	1.39E-3	NP	1.39E-3
Benzo[k]fluoranthene	207089	5.50E+0	NP	3.60E-1	1.25E-5	NP	4.00E-2	NA	3.12E-4	NP	3.12E-4
Bis(2-ethylhexyl)phthalate	117817	3.40E+1	NP	3.30E-2	7.07E-6	NP	2.00E-2	NA	3.54E-4	NP	3.54E-4
Chrysene	218019	5.50E+0	NP	8.10E-1	2.81E-5	NP	3.00E-1	NA	9.36E-5	NP	9.36E-5
Indeno[1,2,3-cd]pyrene	193395	5.50E+0	NP	1.90E+0	6.59E-5	NP	3.00E-2	NA	2.20E-3	NP	2.20E-3
METALS											
Aluminum	7429905	2.98E+4	NP	1.00E-3	1.88E-4	NP	1.00E+0	1.00E-3	1.88E-4	NP	1.88E-4
Beryllium	7440417	3.60E+0	NP	1.00E-3	2.27E-8	NP	2.00E-3	5.70E-6	1.14E-5	NP	1.14E-5
Chromium	7440473	1.89E+2	NP	1.00E-3	1.19E-6	NP	1.50E+0	NA	7.95E-7	NP	7.95E-7
Cobalt	7440484	8.21E+1	NP	4.00E-4	2.07E-7	NP	6.00E-2	NA	3.45E-6	NP	3.45E-6
Cyanide	57125	2.09E+2	NP	1.00E-3	1.32E-6	NP	2.00E-2	NA	6.59E-5	NP	6.59E-5
Chromium VI	18540299	1.80E+2	NP	1.00E-3	1.14E-6	NP	1.50E+0	NA	7.57E-7	NP	7.57E-7
Lead	7439921	1.49E+2	NP	No reference dose is available for lead, see Appendix H Section 4.6							
Manganese	7439965	9.30E+3	NP	1.00E-3	5.86E-5	NP	1.40E-1	1.43E-5	4.19E-4	NP	4.19E-4
Vanadium	7440622	6.28E+1	NP	1.00E-3	3.96E-7	NP	7.00E-3	NA	5.66E-5	NP	5.66E-5

Table H-30: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Groundwater at the Former Thypin Steel Inc. Facility, Manorhaven, New York.
-- Subsurface Structure Construction Scenario -- RMEI

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.28
Contact area-ground water (percent) (CG)	= 0.1
Exposed hours-ground water (hrs/day) (HG)	= 2
Exposed days-ground water (days) (DG)	= 5
Averaging time noncarcinogens (days) (ATN)	= 42
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3
Volumetric conversion factor (L/cm^3) (V)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NP Not applicable.
NA Not avaialble at this time.
(a) Concentration is the maximum concentration of chemical in groundwater (µg/L) (GW).
(b) Concentration is the TScreen (USEPA, 1995a) calculated maximum concentration of chemical in air (µg/m3) using the maximum concentration measured in groundwater (Attachment 3).
(c) Dermal permeability constant (chemical-specific) for absorption of chemical across skin (Kp). Obtained from USEPA, 1992b.
(d) Estimated average daily intake via dermal absorption (DA). DA = (GW * Kp * SA * CG * X * HG * V * DG) / (ATN * BW).
(e) Estimated average daily intake via inhalation (IH). IH = (VA * X * IR * HG * DG) / (ATN * BW).
(f) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) or HEAST (USEPA, 1997b) or USEPA Region III RBC Table (USEPA, 2001a).
(g) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfDo.
(h) Hazard quotient for average daily intake from inhalation (QDA). QDA = DA / RfDi.
(i) Hazard quotient for average daily intake from all pathways (QT). QT = QDA + QIH.

Table H-31: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Groundwater at the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Subsurface Construction Scenario -- PAEI

Chemical	CAS RN	Groundwater Concentration (µg/L) (GW) (a)	Estimated Vapor Concentration (µg/m^3) (VA) (b)	Dermal Permeability Constant (cm/hour) (Kp) (c)	Lifetime Average Daily Intakes by Exposure Route (mg/kg/day)		Slope Factors (mg/kg/day)$^{-1}$		ILCR by Exposure Route		Sum of Estimated Potential ILCRs (All Relevant Exposure Routes) (ILCRT) (i)
					Dermal Absorption (DA) (d)	Inhalation (IH) (e)	Oral (IG_CPF) (f)	Inhalation (IH_CPF) (f)	Dermal Absorption (ILCRDA) (g)	Inhalation (ILCRIH) (h)	
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	71556	5.71E+0	6.27E-1	1.70E-2	2.01E-10	1.43E-9	NC	NC	NC	NC	NC
1,1-Dichloroethane	75343	2.94E+0	1.10E-1	8.90E-3	5.43E-11	2.51E-10	NC	NC	NC	NC	NC
cis-1,2-Dichloroethene	156592	6.79E+0	8.36E-1	1.00E-2	1.41E-10	1.91E-9	NC	NC	NC	NC	NC
Tetrachloroethene	127184	1.01E+1	1.10E+0	3.70E-1	7.73E-9	2.51E-9	5.20E-2	2.00E-3	4.02E-10	5.02E-12	4.07E-10
Trichloroethene	79016	1.14E+1	1.10E+0	2.30E-1	5.43E-9	2.51E-9	1.10E-2	6.00E-3	5.97E-11	1.51E-11	7.48E-11
SEMIVOLATILE ORGANIC COMPOUDS											
1,2-Dichlorobenzene	95501	4.94E+0	NP	6.10E-2	6.25E-10	NP	NC	NC	NC	NP	NC
Benzo[a]anthracene	56553	4.62E+0	NP	8.10E-1	7.76E-9	NP	7.30E-1	6.10E-1	5.67E-9	NP	5.67E-9
Benzo[a]pyrene	50328	4.61E+0	NP	1.20E+0	1.15E-8	NP	7.30E+0	3.10E+0	8.38E-8	NP	8.38E-8
Benzo[b]fluoranthene	205992	4.60E+0	NP	3.60E-1	3.43E-9	NP	7.30E-1	6.10E-1	2.51E-9	NP	2.51E-9
Benzo[g,h,i]perylene	191242	4.89E+0	NP	1.20E+0	1.22E-8	NP	NC	NC	NC	NP	NC
Benzo[k]fluoranthene	207089	4.62E+0	NP	3.60E-1	3.45E-9	NP	7.30E-2	6.10E-2	2.52E-10	NP	2.52E-10
Bis(2-ethylhexyl)phthalate	117817	7.21E+0	NP	3.30E-2	4.93E-10	NP	1.40E-2	1.40E-2	6.90E-12	NP	6.90E-12
Chrysene	218019	4.62E+0	NP	8.10E-1	7.75E-9	NP	7.30E-3	6.10E-3	5.66E-11	NP	5.66E-11
Indeno[1,2,3-cd]pyrene	193395	4.59E+0	NP	1.90E+0	1.81E-8	NP	7.30E-1	6.10E-1	1.32E-8	NP	1.32E-8
METALS											
Aluminum	7429905	9.63E+3	NP	1.00E-3	2.00E-8	NP	NC	NC	NC	NP	NC
Beryllium	7440417	7.36E-1	NP	1.00E-3	1.53E-12	NP	NA	8.40E+0	NA	NP	NP
Chromium	7440473	4.55E+1	NP	1.00E-3	9.44E-11	NP	NC	NC	NC	NP	NC
Cobalt	7440484	1.76E+1	NP	4.00E-4	1.46E-11	NP	NC	NC	NC	NP	NC
Cyanide	57125	1.70E+1	NP	1.00E-3	3.52E-11	NP	NC	NC	NC	NP	NC
Chromium VI	18540299	2.15E+1	NP	1.00E-3	4.45E-11	NP	NC	4.20E+1	NC	NP	NP
Lead	7439921	2.18E+1	NP	4.00E-6	1.81E-13	NP	NA	NA	NA	NP	NA
Manganese	7439965	1.84E+3	NP	1.00E-3	3.81E-9	NP	NC	NC	NC	NP	NC
Vanadium	7440622	2.47E+1	NP	1.00E-3	5.13E-11	NP	NC	NC	NC	NP	NC

Table H-31: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Groundwater at the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Subsurface Construction Scenario -- PAEI

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.04
Contact area-ground water (percent) (CG)	= 0.1
Exposed hours-ground water (hrs/day) (HG)	= 1
Exposed days-ground water (days) (DG)	= 2
Averaging time carcinogens (days) (ATC)	= 365
Exposure years as adult (yrs) (EY)	= 1
Lifetime (yrs) (LT)	= 70
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3
Volumetric conversion factor (L/cm^3) (V)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NC indicates compound is considered to be a noncarcinogen according to IRIS (USEPA, 2001b) or HEAST (USEPA, 1997b).
NP Not applicable.
NA Not avaialble at this time.
(a) Concentration is the average concentration of chemical in groundwater (µg/L) (GW).
(b) Concentration is the TScreen (USEPA, 1995a) calculated maximum concentration of chemical in air ($\mu g/m^3$) using the maximum concentration measured in groundwater (Attachment 3).
(c) Dermal permeability constant (chemical-specific) for absorption of chemical across skin (Kp). Obtained from USEPA, 1992b.
(d) Estimated lifetime average daily intake via dermal absorption (DA). DA = (GW * Kp * SA * CG * X * HG * V * DG * EY) / (LT * ATC * BW).
(e) Estimated lifetime average daily intake via inhalation (IH). IH = (VA * X * IR * HG * DG * EY)/(LT * ATC * BW).
(f) Carcinogenic potency factors (CPFs) were obtained from IRIS (USEPA, 2001b) or HEAST (USEPA, 1997b) or USEPA Region III RBC Table (USEPA, 2001a).
(g) Incremetal lifetime cancer risk (ILCR) for lifetime average daily intake from dermal exposure (ILCRDA). ILCRDA = DA * IG_CPF.
(h) Incremetal lifetime cancer risk (ILCR) for lifetime average daily intake from inhalation (ILCRIH). ILCRIH = IH * IH_CPF
(i) Incremetal lifetime cancer risk (ILCR) for lifetime average daily intake from all pathways (ILCRT). ILCRT = ILCRDA + ILCRIH

Table H-32: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Groundwater at the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Subsurface Construction Scenario -- RMEI

Chemical	CAS RN	Groundwater Concentration (µg/L) (GW) (a)	Estimated Vapor Concentration (µg/m^3) (VA) (b)	Dermal Permeability Constant (cm/hour) (Kp) (c)	Lifetime Average Daily Intakes by Exposure Route (mg/kg/day)		Slope Factors (mg/kg/day)$^{-1}$		ILCR by Exposure Route		Sum of Estimated Potential ILCRs (All Relevant Exposure Routes) (ILCRT) (i)
					Dermal Absorption (DA) (d)	Inhalation (IH) (e)	Oral (IG_CPF) (f)	Inhalation (IH_CPF) (f)	Dermal Absorption (ILCRDA) (g)	Inhalation (ILCRIH) (h)	
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	71556	5.20E+1	6.27E-1	1.70E-2	9.16E-9	8.00E-9	NC	NC	NC	NC	NC
1,1-Dichloroethane	75343	1.00E+1	1.10E-1	8.90E-3	9.23E-10	1.40E-9	NC	NC	NC	NC	NC
cis-1,2-Dichloroethene	156592	7.60E+1	8.36E-1	1.00E-2	7.88E-9	1.07E-8	NC	NC	NC	NC	NC
Tetrachloroethene	127184	1.00E+2	1.10E+0	3.70E-1	3.84E-7	1.40E-8	5.20E-2	2.00E-3	1.99E-8	2.80E-11	2.00E-8
Trichloroethene	79016	1.00E+2	1.10E+0	2.30E-1	2.38E-7	1.40E-8	1.10E-2	6.00E-3	2.62E-9	8.41E-11	2.71E-9
SEMIVOLATILE ORGANIC COMPOUDS											
1,2-Dichlorobenzene	95501	5.50E+0	NP	6.10E-2	3.48E-9	NP	NC	NC	NC	NP	NC
Benzo[a]anthracene	56553	5.50E+0	NP	8.10E-1	4.62E-8	NP	7.30E-1	6.10E-1	3.37E-8	NP	3.37E-8
Benzo[a]pyrene	50328	5.50E+0	NP	1.20E+0	6.84E-8	NP	7.30E+0	3.10E+0	4.99E-7	NP	4.99E-7
Benzo[b]fluoranthene	205992	5.50E+0	NP	3.60E-1	2.05E-8	NP	7.30E-1	6.10E-1	1.50E-8	NP	1.50E-8
Benzo[g,h,i]perylene	191242	5.50E+0	NP	1.20E+0	6.84E-8	NP	NC	NC	NC	NP	NC
Benzo[k]fluoranthene	207089	5.50E+0	NP	3.60E-1	2.05E-8	NP	7.30E-2	6.10E-2	1.50E-9	NP	1.50E-9
Bis(2-ethylhexyl)phthalate	117817	3.40E+1	NP	3.30E-2	1.16E-8	NP	1.40E-2	1.40E-2	1.63E-10	NP	1.63E-10
Chrysene	218019	5.50E+0	NP	8.10E-1	4.62E-8	NP	7.30E-3	6.10E-3	3.37E-10	NP	3.37E-10
Indeno[1,2,3-cd]pyrene	193395	5.50E+0	NP	1.90E+0	1.08E-7	NP	7.30E-1	6.10E-1	7.91E-8	NP	7.91E-8
METALS											
Aluminum	7429905	2.98E+4	NP	1.00E-3	3.09E-7	NP	NC	NC	NC	NP	NC
Beryllium	7440417	3.60E+0	NP	1.00E-3	3.73E-11	NP	NA	8.40E+0	NA	NP	NP
Chromium	7440473	1.89E+2	NP	1.00E-3	1.96E-9	NP	NC	NC	NC	NP	NC
Cobalt	7440484	8.21E+1	NP	4.00E-4	3.40E-10	NP	NC	NC	NC	NP	NC
Cyanide	57125	2.09E+2	NP	1.00E-3	2.17E-9	NP	NC	NC	NC	NP	NC
Chromium VI	18540299	1.80E+2	NP	1.00E-3	1.87E-9	NP	NC	4.20E+1	NC	NP	NP
Lead	7439921	1.49E+2	NP	4.00E-6	6.18E-12	NP	NA	NA	NA	NP	NA
Manganese	7439965	9.30E+3	NP	1.00E-3	9.64E-8	NP	NC	NC	NC	NP	NC
Vanadium	7440622	6.28E+1	NP	1.00E-3	6.51E-10	NP	NC	NC	NC	NP	NC

Table H-32: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Groundwater at the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Subsurface Construction Scenario -- RMEI

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.28
Contact area-ground water (percent) (CG)	= 0.1
Exposed hours-ground water (hrs/day) (HG)	= 2
Exposed days-ground water (days) (DG)	= 5
Averaging time carcinogens (days) (ATC)	= 365
Exposure years as adult (yrs) (EY)	= 1
Lifetime (yrs) (LT)	= 70
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3
Volumetric conversion factor (L/cm^3) (V)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NC indicates compound is considered to be a noncarcinogen according to IRIS (USEPA, 2001b) or HEAST (USEPA, 1997b).
NP Not applicable.
NA Not avaialble at this time.
(a) Concentration is the maximum concentration of chemical in groundwater (µg/L) (GW).
(b) Concentration is the TScreen (USEPA, 1995a) calculated maximum concentration of chemical in air ($\mu g/m^3$) using the maximum concentration measured in groundwater (Attachment 3).
(c) Dermal permeability constant (chemical-specific) for absorption of chemical across skin (Kp). Obtained from USEPA, 1992b.
(d) Estimated lifetime average daily intake via dermal absorption (DA). DA = (GW * Kp * SA * CG * X * HG * V * DG * EY) / (LT * ATC * BW).
(e) Estimated lifetime average daily intake via inhalation (IH). IH = (VA * X * IR * HG * DG * EY)/(LT * ATC * BW).
(f) Carcinogenic potency factors (CPFs) were obtained from IRIS (USEPA, 2001b) or HEAST (USEPA, 1997b) or USEPA Region III RBC Table (USEPA, 2001a).
(g) Incremetal lifetime cancer risk (ILCR) for lifetime average daily intake from dermal exposure (ILCRDA). ILCRDA = DA * IG_CPF.
(h) Incremetal lifetime cancer risk (ILCR) for lifetime average daily intake from inhalation (ILCRIH). ILCRIH = IH * IH_CPF
(i) Incremetal lifetime cancer risk (ILCR) for lifetime average daily intake from all pathways (ILCRT). ILCRT = ILCRDA + ILCRIH

Table H-33: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Soil at the Former Thypin Steel Inc. Facility, Manorhaven, New York.
-- General Construction Scenario -- PAEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Average Daily Intakes (mg/kg/day) by Exposure Route: Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Reference Dose: Oral (mg/kg/day) (RfDo) (e)	Inhalation (mg/kg/day) (RfDi) (e)	Hazard Quotient (HQ) by Exposure Route: Dermal Absorption (QDA) (f)	Ingestion (QIG) (g)	Inhalation (QIH) (h)	Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	9.35E-1	6.75E-7	9.54E-7	1.17E-8	3.00E-1	NA	2.25E-6	3.18E-6	3.89E-8	5.47E-6
Benzo[a]pyrene	50328	8.16E-1	5.88E-7	8.32E-7	1.02E-8	3.00E-2	NA	1.96E-5	2.77E-5	3.40E-7	4.77E-5
Benzo[b]fluoranthene	205992	7.47E-1	5.39E-7	7.62E-7	9.33E-9	4.00E-2	NA	1.35E-5	1.91E-5	2.33E-7	3.28E-5
Dibenzo[a,h]anthracene	53703	3.00E-1	2.16E-7	3.06E-7	3.75E-9	3.00E-1	NA	7.21E-7	1.02E-6	1.25E-8	1.75E-6
Indeno[1,2,3-cd]pyrene	193395	6.12E-1	4.42E-7	6.24E-7	7.64E-9	3.00E-2	NA	1.47E-5	2.08E-5	2.55E-7	3.58E-5
METALS											
Arsenic	7440382	3.43E+0	7.43E-7	3.50E-6	4.29E-8	3.00E-4	NA	2.48E-3	1.17E-2	1.43E-4	1.43E-2

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.04
Contact area-soil (percent) (CS)	= 0.16
Soil adherence (mg/cm^2) (S)	= 0.23
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 100
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 150
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 8
Exposed days-soil (days) (DS)	= 60
Averaging time noncarcinogens (days) (ATN)	= 84
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/μg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NA Not available at this time.
(a) Concentration is the arithmetic mean of the chemical concentration in soil (mg/kg) (SL).
(b) Estimated average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS) / (ATN * BW).
(c) Estimated average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS) / (ATN * BW).
(d) Estimated average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS) / (ATN * BW).
(e) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfD.
(g) Hazard quotient for average daily intake from ingestion (QIG). QIG = IG / RfD.
(h) Hazard quotient for average daily intake from inhalation (QIH). QIH = IH / RfD.
(i) Hazard quotient for all exposure routes summed (QT). QT = QDA + QIG + QIH.

Table H-34: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Soil at the Former Thypin Steel Inc. Facility, Manorhaven, New York.
-- General Construction Scenario -- RMEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Average Daily Intakes (mg/kg/day) by Exposure Route: Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Reference Dose: Oral (mg/kg/day) (RfDo) (e)	Inhalation (mg/kg/day) (RfDi) (e)	Hazard Quotient (HQ) by Exposure Route: Dermal Absorption (QDA) (f)	Ingestion (QIG) (g)	Inhalation (QIH) (h)	Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	7.00E+0	5.05E-6	1.43E-5	9.77E-8	3.00E-1	NA	1.68E-5	4.76E-5	3.26E-7	6.48E-5
Benzo[a]pyrene	50328	5.80E+0	4.18E-6	1.18E-5	8.10E-8	3.00E-2	NA	1.39E-4	3.95E-4	2.70E-6	5.37E-4
Benzo[b]fluoranthene	205992	4.70E+0	3.39E-6	9.59E-6	6.56E-8	4.00E-2	NA	8.48E-5	2.40E-4	1.64E-6	3.26E-4
Dibenzo[a,h]anthracene	53703	2.10E+0	1.52E-6	4.29E-6	2.93E-8	3.00E-1	NA	5.05E-6	1.43E-5	9.77E-8	1.94E-5
Indeno[1,2,3-cd]pyrene	193395	5.00E+0	3.61E-6	1.02E-5	6.98E-8	3.00E-2	NA	1.20E-4	3.40E-4	2.33E-6	4.63E-4
METALS											
Arsenic	7440382	2.26E+1	4.89E-6	4.61E-5	3.15E-7	3.00E-4	NA	1.63E-2	1.54E-1	1.05E-3	1.71E-1

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.28
Contact area-soil (percent) (CS)	= 0.16
Soil adherence (mg/cm^2) (S)	= 0.23
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 200
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 150
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 8
Exposed days-soil (days) (DS)	= 120
Averaging time noncarcinogens (days) (ATN)	= 168
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NA Not available at this time.
(a) Concentration is the maximum concentration of chemical in soil (mg/kg) (SL).
(b) Estimated average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS) / (ATN * BW).
(c) Estimated average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS) / (ATN * BW).
(d) Estimated average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS) / (ATN * BW).
(e) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfD.
(g) Hazard quotient for average daily intake from ingestion (QIG). QIG = IG / RfD.
(h) Hazard quotient for average daily intake from inhalation (QIH). QIH = IH / RfD.
(i) Hazard quotient for all exposure routes summed (QT). QT = QDA + QIG + QIH.

Table H-35: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Soil at the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- General Construction Scenario -- PAEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Lifetime Average Daily Intake (mg/kg/day)			Slope Factors $(mg/kg/day)^{-1}$		Incremental Lifetime Cancer Risk by Exposure Route			Sum of Estimated Potential ILCRs (All Relevant Exposure Routes) (ILCRT) (i)
			Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Oral (IG_CPF) (e)	Inhalation (IH_CPF) (e)	Dermal Absorption (ILCRDA) (f)	Ingestion (ILCRIG) (g)	Inhalation (ILCRIH) (h)	
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	9.35E-1	2.22E-9	3.14E-9	3.84E-11	7.30E-1	6.10E-1	1.62E-9	2.29E-9	2.34E-11	3.93E-9
Benzo[a]pyrene	50328	8.16E-1	1.93E-9	2.74E-9	3.35E-11	7.30E+0	3.10E+0	1.41E-8	2.00E-8	1.04E-10	3.42E-8
Benzo[b]fluoranthene	205992	7.47E-1	1.77E-9	2.51E-9	3.07E-11	7.30E-1	6.10E-1	1.29E-9	1.83E-9	1.87E-11	3.14E-9
Dibenzo[a,h]anthracene	53703	3.00E-1	7.11E-10	1.01E-9	1.23E-11	7.30E+0	6.10E+0	5.19E-9	7.34E-9	7.51E-11	1.26E-8
Indeno[1,2,3-cd]pyrene	193395	6.12E-1	1.45E-9	2.05E-9	2.51E-11	7.30E-1	6.10E-1	1.06E-9	1.50E-9	1.53E-11	2.57E-9
METALS											
Arsenic	7440382	3.43E+0	2.44E-9	1.15E-8	1.41E-10	1.50E+0	1.50E+1	3.67E-9	1.73E-8	2.12E-9	2.31E-8

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.04
Contact area-soil (percent) (CS)	= 0.16
Soil adherence (mg/cm^2) (S)	= 0.23
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 100
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 150
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 8
Exposed days-soil (days) (DS)	= 60
Averaging time carcinogens (days) (ATC)	= 365
Exposure years (yrs) (EY)	= 1
Lifetime (yrs) (LT)	= 70
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NA Not available at this time.
NC Noncarcinogenic.
(a) Concentration is the arithmetic mean of the chemical concentration in soil (mg/kg) (SL).
(b) Estimated lifetime average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS * EY) / (LT * ATC * BW).
(c) Estimated lifetime average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS * EY) / (LT * ATC * BW).
(d) Estimated lifetime average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS * EY) / (LT * ATC * BW).
(e) Carcinogenic potency factors (CPFs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from dermal exposure (ILCRDA). ILCRDA = DA * IG_CPF.
(g) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from ingestion (ILCRIG). ILCRIG = IG * IG_CPF.
(h) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from inhalation (ILCRIH). ILCRIH = IH * IH_CPF.
(i) Incremental lifetimecancer risk (ILCR) for all exposure routes summed (ILCRT). ILCRT = ILCRDA + ILCRIG + ILCRIH.

Table H-36: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Soil at the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- General Construction Scenario -- RMEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Lifetime Average Daily Intake (mg/kg/day)			Slope Factors $(mg/kg/day)^{-1}$		Incremental Lifetime Cancer Risk by Exposure Route			Sum of Estimated Potential ILCRs (All Relevant Exposure Routes) (ILCRT) (i)
			Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Oral (IG_CPF) (e)	Inhalation (IH_CPF) (e)	Dermal Absorption (ILCRDA) (f)	Ingestion (ILCRIG) (g)	Inhalation (ILCRIH) (h)	
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	7.00E+0	3.32E-8	9.39E-8	6.43E-10	7.30E-1	6.10E-1	2.42E-8	6.86E-8	3.92E-10	9.32E-8
Benzo[a]pyrene	50328	5.80E+0	2.75E-8	7.78E-8	5.32E-10	7.30E+0	3.10E+0	2.01E-7	5.68E-7	1.65E-9	7.71E-7
Benzo[b]fluoranthene	205992	4.70E+0	2.23E-8	6.31E-8	4.31E-10	7.30E-1	6.10E-1	1.63E-8	4.60E-8	2.63E-10	6.26E-8
Dibenzo[a,h]anthracene	53703	2.10E+0	9.96E-9	2.82E-8	1.93E-10	7.30E+0	6.10E+0	7.27E-8	2.06E-7	1.18E-9	2.80E-7
Indeno[1,2,3-cd]pyrene	193395	5.00E+0	2.37E-8	6.71E-8	4.59E-10	7.30E-1	6.10E-1	1.73E-8	4.90E-8	2.80E-10	6.66E-8
METALS											
Arsenic	7440382	2.26E+1	3.22E-8	3.03E-7	2.07E-9	1.50E+0	1.50E+1	4.82E-8	4.55E-7	3.11E-8	5.34E-7

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.28
Contact area-soil (percent) (CS)	= 0.16
Soil adherence (mg/cm^2) (S)	= 0.23
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 200
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 150
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 8
Exposed days-soil (days) (DS)	= 120
Averaging time carcinogens (days) (ATC)	= 365
Exposure years (yrs) (EY)	= 1
Lifetime (yrs) (LT)	= 70
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NA Not available at this time.
NC Noncarcinogenic.
(a) Concentration is the maximum concentration of chemical in soil (mg/kg) (SL).
(b) Estimated lifetime average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS * EY) / (LT * ATC * BW).
(c) Estimated lifetime average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS * EY) / (LT * ATC * BW).
(d) Estimated lifetime average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS * EY) / (LT * ATC * BW).
(e) Carcinogenic potency factors (CPFs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from dermal exposure (ILCRDA). ILCRDA = DA * IG_CPF.
(g) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from ingestion (ILCRIG). ILCRIG = IG * IG_CPF.
(h) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from inhalation (ILCRIH). ILCRIH = IH * IH_CPF.
(i) Incremental lifetimecancer risk (ILCR) for all exposure routes summed (ILCRT). ILCRT = ILCRDA + ILCRIG + ILCRIH.

Table H-37: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Solid Material Collected from Subsurface Structures Northern Area of the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Subsurface Structure Construction Scenario -- PAEI

Chemical	CAS RN	Solid Material Concentration (mg/kg) (SL) (a)	Average Daily Intakes (mg/kg/day) by Exposure Route			Reference Dose		Hazard Quotient (HQ) by Exposure Route			Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
			Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Oral (mg/kg/day) (RfDo) (e)	Inhalation (mg/kg/day) (RfDi) (e)	Dermal Absorption (QDA) (f)	Ingestion (QIG) (g)	Inhalation (QIH) (h)	
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	4.03E-1	2.91E-7	4.11E-7	5.03E-9	3.00E-1	NA	9.69E-7	1.37E-6	1.68E-8	2.36E-6
Benzo[a]pyrene	50328	4.32E-1	3.11E-7	4.40E-7	5.39E-9	3.00E-2	NA	1.04E-5	1.47E-5	1.80E-7	2.52E-5
Benzo[b]fluoranthene	205992	4.14E-1	2.99E-7	4.22E-7	5.17E-9	4.00E-2	NA	7.47E-6	1.06E-5	1.29E-7	1.82E-5
Dibenzo[a,h]anthracene	53703	1.16E-1	8.37E-8	1.18E-7	1.45E-9	3.00E-1	NA	2.79E-7	3.95E-7	4.83E-9	6.78E-7
Indeno[1,2,3-cd]pyrene	193395	2.91E-1	2.10E-7	2.97E-7	3.63E-9	3.00E-2	NA	7.00E-6	9.90E-6	1.21E-7	1.70E-5
METALS											
Antimony	7440360	1.71E+2	3.71E-5	1.75E-4	2.14E-6	4.00E-4	NA	9.27E-2	4.37E-1	5.35E-3	5.35E-1
Arsenic	7440382	8.53E+0	1.85E-6	8.71E-6	1.07E-7	3.00E-4	NA	6.16E-3	2.90E-2	3.55E-4	3.55E-2
Cadmium	7440439	4.58E+1	9.91E-6	4.67E-5	5.72E-7	1.00E-3	5.70E-5	9.91E-3	4.67E-2	1.00E-2	6.66E-2
Lead	7439921	4.84E+2	No RfD is available for lead; potential exposures are evaluated using a biokinetic model. See Table H-83.								

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.04
Contact area-soil (percent) (CS)	= 0.16
Soil adherence (mg/cm^2) (S)	= 0.23
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 100
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 150
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 8
Exposed days-soil (days) (DS)	= 15
Averaging time noncarcinogens (days) (ATN)	= 21
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NA Not available at this time.
(a) Concentration is the arithmetic mean of the chemical concentration in solid material (SL).
(b) Estimated average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS) / (ATN * BW).
(c) Estimated average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS) / (ATN * BW).
(d) Estimated average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS) / (ATN * BW).
(e) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfD.
(g) Hazard quotient for average daily intake from ingestion (QIG). QIG = IG / RfD.
(h) Hazard quotient for average daily intake from inhalation (QIH). QIH = IH / RfD.
(i) Hazard quotient for all exposure routes summed (QT). QT = QDA + QIG + QIH.

Table H-38: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Solid Material Collected from Subsurface Structures
Northern Area of the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Subsurface Structure Construction Scenario -- RMEI

Chemical	CAS RN	Solid Material Concentration (mg/kg) (SL) (a)	Average Daily Intakes (mg/kg/day) by Exposure Route: Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Reference Dose: Oral (mg/kg/day) (RfDo) (e)	Inhalation (mg/kg/day) (RfDi) (e)	Hazard Quotient (HQ) by Exposure Route: Dermal Absorption (QDA) (f)	Ingestion (QIG) (g)	Inhalation (QIH) (h)	Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	1.20E+0	8.66E-7	2.45E-6	1.68E-8	3.00E-1	NA	2.89E-6	8.16E-6	5.58E-8	1.11E-5
Benzo[a]pyrene	50328	1.00E+0	7.21E-7	2.04E-6	1.40E-8	3.00E-2	NA	2.40E-5	6.80E-5	4.65E-7	9.25E-5
Benzo[b]fluoranthene	205992	9.10E-1	6.57E-7	1.86E-6	1.27E-8	4.00E-2	NA	1.64E-5	4.64E-5	3.18E-7	6.32E-5
Dibenzo[a,h]anthracene	53703	4.00E-1	2.89E-7	8.16E-7	5.58E-9	3.00E-1	NA	9.62E-7	2.72E-6	1.86E-8	3.70E-6
Indeno[1,2,3-cd]pyrene	193395	1.00E+0	7.21E-7	2.04E-6	1.40E-8	3.00E-2	NA	2.40E-5	6.80E-5	4.65E-7	9.25E-5
METALS											
Antimony	7440360	5.04E+2	1.09E-4	1.03E-3	7.04E-6	4.00E-4	NA	2.73E-1	2.57E+0	1.76E-2	2.86E+0
Arsenic	7440382	1.32E+1	2.86E-6	2.69E-5	1.84E-7	3.00E-4	NA	9.52E-3	8.98E-2	6.14E-4	9.99E-2
Cadmium	7440439	1.00E+2	2.16E-5	2.04E-4	1.40E-6	1.00E-3	5.70E-5	2.16E-2	2.04E-1	1.00E-2	2.36E-1
Lead	7439921	9.86E+2	No RfD is available for lead; potential exposures are evaluated using a biokinetic model. See Table H-84.								

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.28
Contact area-soil (percent) (CS)	= 0.16
Soil adherence (mg/cm^2) (S)	= 0.23
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 200
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 150
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 8
Exposed days-soil (days) (DS)	= 30
Averaging time noncarcinogens (days) (ATN)	= 42
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/μg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NA Not available at this time.
(a) Concentration is the maximum concentration of chemical in solid material (mg/kg) (SL).
(b) Estimated average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS) / (ATN * BW).
(c) Estimated average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS) / (ATN * BW).
(d) Estimated average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS) / (ATN * BW).
(e) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfD.
(g) Hazard quotient for average daily intake from ingestion (QIG). QIG = IG / RfD.
(h) Hazard quotient for average daily intake from inhalation (QIH). QIH = IH / RfD.
(i) Hazard quotient for all exposure routes summed (QT). QT = QDA + QIG + QIH.

Table H-39: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Solid Materials Collected from Subsurface Structures Northern Area of the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Subsurface Structure Construction Scenario -- PAEI

Chemical	CAS RN	Solid Material Concentration (mg/kg) (SL) (a)	Lifetime Average Daily Intake (mg/kg/day)			Slope Factors $(mg/kg/day)^{-1}$		Incremental Lifetime Cancer Risk by Exposure Route			Sum of Estimated Potential ILCRs (All Relevant Exposure Routes) (ILCRT) (i)
			Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Oral (IG_CPF) (e)	Inhalation (IH_CPF) (e)	Dermal Absorption (ILCRDA) (f)	Ingestion (ILCRIG) (g)	Inhalation (ILCRIH) (h)	
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	4.03E-1	2.39E-10	3.38E-10	4.14E-12	7.30E-1	6.10E-1	1.74E-10	2.47E-10	2.52E-12	4.24E-10
Benzo[a]pyrene	50328	4.32E-1	2.56E-10	3.62E-10	4.43E-12	7.30E+0	3.10E+0	1.87E-9	2.64E-9	1.37E-11	4.52E-9
Benzo[b]fluoranthene	205992	4.14E-1	2.46E-10	3.47E-10	4.25E-12	7.30E-1	6.10E-1	1.79E-10	2.53E-10	2.59E-12	4.35E-10
Dibenzo[a,h]anthracene	53703	1.16E-1	6.88E-11	9.73E-11	1.19E-12	7.30E+0	6.10E+0	5.02E-10	7.10E-10	7.26E-12	1.22E-9
Indeno[1,2,3-cd]pyrene	193395	2.91E-1	1.73E-10	2.44E-10	2.99E-12	7.30E-1	6.10E-1	1.26E-10	1.78E-10	1.82E-12	3.06E-10
METALS											
Antimony	7440360	1.71E+2	3.05E-8	1.44E-7	1.76E-9	NC	NC	NC	NC	NC	NC
Arsenic	7440382	8.53E+0	1.52E-9	7.16E-9	8.76E-11	1.50E+0	1.50E+1	2.28E-9	1.07E-8	1.31E-9	1.43E-8
Cadmium	7440439	4.58E+1	8.14E-9	3.84E-8	4.70E-10	NA	6.30E+0	NA	NA	2.96E-9	2.96E-9
Lead	7439921	4.84E+2	8.62E-8	4.06E-7	4.97E-9	NA	NA	NA	NA	NA	NA

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.04
Contact area-soil (percent) (CS)	= 0.16
Soil adherence (mg/cm^2) (S)	= 0.23
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 100
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 150
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 8
Exposed days-soil (days) (DS)	= 15
Averaging time carcinogens (days) (ATC)	= 365
Exposure years (yrs) (EY)	= 1
Lifetime (yrs) (LT)	= 70
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NA Not available at this time.
NC Noncarcinogenic.
(a) Concentration is the arithmetic mean of the chemical concentration in solid material (mg/kg) (SL).
(b) Estimated lifetime average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS * EY) / (LT * ATC * BW).
(c) Estimated lifetime average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS * EY) / (LT * ATC * BW).
(d) Estimated lifetime average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS * EY) / (LT * ATC * BW).
(e) Carcinogenic potency factors (CPFs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from dermal exposure (ILCRDA). ILCRDA = DA * IG_CPF.
(g) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from ingestion (ILCRIG). ILCRIG = IG * IG_CPF.
(h) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from inhalation (ILCRIH). ILCRIH = IH * IH_CPF.
(i) Incremental lifetimecancer risk (ILCR) for all exposure routes summed (ILCRT). ILCRT = ILCRDA + ILCRIG + ILCRIH.

Table H-40: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Solid Material Collected from Subsurface Structures Northern Area of the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Subsurface Structure Construction Scenario -- RMEI

Chemical	CAS RN	Solid Material Concentration (mg/kg) (SL) (a)	Lifetime Average Daily Intake (mg/kg/day)			Slope Factors $(mg/kg/day)^{-1}$		Incremental Lifetime Cancer Risk by Exposure Route			Sum of Estimated Potential ILCRs (All Relevant Exposure Routes) (ILCRT) (i)
			Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Oral (IG_CPF) (e)	Inhalation (IH_CPF) (e)	Dermal Absorption (ILCRDA) (f)	Ingestion (ILCRIG) (g)	Inhalation (ILCRIH) (h)	
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	1.20E+0	1.42E-9	4.03E-9	2.75E-11	7.30E-1	6.10E-1	1.04E-9	2.94E-9	1.68E-11	3.99E-9
Benzo[a]pyrene	50328	1.00E+0	1.19E-9	3.35E-9	2.29E-11	7.30E+0	3.10E+0	8.66E-9	2.45E-8	7.11E-11	3.32E-8
Benzo[b]fluoranthene	205992	9.10E-1	1.08E-9	3.05E-9	2.09E-11	7.30E-1	6.10E-1	7.88E-10	2.23E-9	1.27E-11	3.03E-9
Dibenzo[a,h]anthracene	53703	4.00E-1	4.74E-10	1.34E-9	9.18E-12	7.30E+0	6.10E+0	3.46E-9	9.80E-9	5.60E-11	1.33E-8
Indeno[1,2,3-cd]pyrene	193395	1.00E+0	1.19E-9	3.35E-9	2.29E-11	7.30E-1	6.10E-1	8.66E-10	2.45E-9	1.40E-11	3.33E-9
METALS											
Antimony	7440360	5.04E+2	1.79E-7	1.69E-6	1.16E-8	NC	NC	NC	NC	NC	NC
Arsenic	7440382	1.32E+1	4.70E-9	4.43E-8	3.03E-10	1.50E+0	1.50E+1	7.04E-9	6.64E-8	4.54E-9	7.80E-8
Cadmium	7440439	1.00E+2	3.56E-8	3.35E-7	2.29E-9	NA	6.30E+0	NA	NA	1.45E-8	1.45E-8
Lead	7439921	9.86E+2	3.51E-7	3.31E-6	2.26E-8	NA	NA	NA	NA	NA	NA

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.28
Contact area-soil (percent) (CS)	= 0.16
Soil adherence (mg/cm^2) (S)	= 0.23
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 200
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 150
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 8
Exposed days-soil (days) (DS)	= 30
Averaging time carcinogens (days) (ATC)	= 365
Exposure years (yrs) (EY)	= 1
Lifetime (yrs) (LT)	= 70
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NA Not available at this time.
NC Noncarcinogenic.
(a) Concentration is the maximum concentration of chemical in solid material (mg/kg) (SL).
(b) Estimated lifetime average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS * EY) / (LT * ATC * BW).
(c) Estimated lifetime average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS * EY) / (LT * ATC * BW).
(d) Estimated lifetime average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS * EY) / (LT * ATC * BW).
(e) Carcinogenic potency factors (CPFs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from dermal exposure (ILCRDA). ILCRDA = DA * IG_CPF.
(g) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from ingestion (ILCRIG). ILCRIG = IG * IG_CPF.
(h) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from inhalation (ILCRIH). ILCRIH = IH * IH_CPF.
(i) Incremental lifetimecancer risk (ILCR) for all exposure routes summed (ILCRT). ILCRT = ILCRDA + ILCRIG + ILCRIH.

Table H-41: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Solid Material Collected from Subsurface Structures Western Area of the Former Thypin Steel Inc. Facility, Manorhaven, NewYork. -- Subsurface Structure Construction Scenario -- PAEI

Chemical	CAS RN	Solid Material Concentration (mg/kg) (SL) (a)	Average Daily Intakes (mg/kg/day) by Exposure Route: Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Reference Dose Oral (mg/kg/day) (RfDo) (e)	Inhalation (mg/kg/day) (RfDi) (e)	Hazard Quotient (HQ) by Exposure Route: Dermal Absorption (QDA) (f)	Ingestion (QIG) (g)	Inhalation (QIH) (h)	Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]pyrene	50328	1.73E-1	1.24E-7	1.76E-7	2.15E-9	3.00E-2	NA	4.15E-6	5.87E-6	7.18E-8	1.01E-5
Dibenzo[a,h]anthracene	53703	1.07E-1	7.72E-8	1.09E-7	1.34E-9	3.00E-1	NA	2.57E-7	3.64E-7	4.45E-9	6.26E-7
METALS											
Cadmium	7440439	6.43E+1	1.39E-5	6.56E-5	8.04E-7	1.00E-3	5.70E-5	1.39E-2	6.56E-2	1.41E-2	9.37E-2
Lead	7439921	4.01E+2	No RfD is available for lead; potential exposures are evaluated using a biokinetic model. See Table H-85.								
Thallium	7440280	1.88E+1	4.08E-6	1.92E-5	2.35E-7	7.00E-5	NA	5.82E-2	2.75E-1	3.36E-3	3.36E-1
Zinc	7440666	2.69E+4	5.83E-3	2.75E-2	3.36E-4	3.00E-1	NA	1.94E-2	9.16E-2	1.12E-3	1.12E-1

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.04
Contact area-soil (percent) (CS)	= 0.16
Soil adherence (mg/cm^2) (S)	= 0.23
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 100
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 150
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 8
Exposed days-soil (days) (DS)	= 15
Averaging time noncarcinogens (days) (ATN)	= 21
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NA Not available at this time.
(a) Concentration is the arithmetic mean of the chemical concentration in solid material (mg/kg) (SL).
(b) Estimated average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS) / (ATN * BW).
(c) Estimated average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS) / (ATN * BW).
(d) Estimated average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS) / (ATN * BW).
(e) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfD.
(g) Hazard quotient for average daily intake from ingestion (QIG). QIG = IG / RfD.
(h) Hazard quotient for average daily intake from inhalation (QIH). QIH = IH / RfD.
(i) Hazard quotient for all exposure routes summed (QT). QT = QDA + QIG + QIH.

Table H-42: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Solid Material Collected from Subsurface Structures
Western Area of the Former Thypin Steel Inc. Facility, Manorhaven, New York -- Subsurface Structure Construction Scenario -- RMEI

Chemical	CAS RN	Solid Material Concentration (mg/kg) (SL) (a)	Average Daily Intakes (mg/kg/day) by Exposure Route: Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Reference Dose: Oral (mg/kg/day) (RfDo) (e)	Reference Dose: Inhalation (mg/kg/day) (RfDi) (e)	Hazard Quotient (HQ) by Exposure Route: Dermal Absorption (QDA) (f)	Ingestion (QIG) (g)	Inhalation (QIH) (h)	Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]pyrene	50328	1.80E-1	1.30E-7	3.67E-7	2.51E-9	3.00E-2	NA	4.33E-6	1.22E-5	8.38E-8	1.67E-5
Dibenzo[a,h]anthracene	53703	1.65E-1	1.19E-7	3.37E-7	2.30E-9	3.00E-1	NA	3.97E-7	1.12E-6	7.68E-9	1.53E-6
METALS											
Cadmium	7440439	1.92E+2	4.16E-5	3.92E-4	2.68E-6	1.00E-3	5.70E-5	4.16E-2	3.92E-1	1.41E-2	4.47E-1
Lead	7439921	1.18E+3	No RfD is available for lead; potential exposures are evaluated using a biokinetic model. See Table H-86.								
Thallium	7440280	5.45E+1	1.18E-5	1.11E-4	7.61E-7	7.00E-5	NA	1.69E-1	1.59E+0	1.09E-2	1.77E+0
Zinc	7440666	8.07E+4	1.75E-2	1.65E-1	1.13E-3	3.00E-1	NA	5.82E-2	5.49E-1	3.76E-3	6.11E-1

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.28
Contact area-soil (percent) (CS)	= 0.16
Soil adherence (mg/cm^2) (S)	= 0.23
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 200
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 150
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 8
Exposed days-soil (days) (DS)	= 30
Averaging time noncarcinogens (days) (ATN)	= 42
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/μg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NA Not available at this time.
(a) Concentration is the maximum concentration of chemical in solid material (mg/kg) (SL).
(b) Estimated average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS) / (ATN * BW).
(c) Estimated average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS) / (ATN * BW).
(d) Estimated average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS) / (ATN * BW).
(e) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfD.
(g) Hazard quotient for average daily intake from ingestion (QIG). QIG = IG / RfD.
(h) Hazard quotient for average daily intake from inhalation (QIH). QIH = IH / RfD.
(i) Hazard quotient for all exposure routes summed (QT). QT = QDA + QIG + QIH.

Table H-43: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Solid Materials Collected from Subsurface Structures Western Area of the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Subsurface Structure Construction Scenario -- PAEI

Chemical	CAS RN	Solid Material Concentration (mg/kg) (SL) (a)	Lifetime Average Daily Intake (mg/kg/day)			Slope Factors $(mg/kg/day)^{-1}$		Incremental Lifetime Cancer Risk (ILCR) by Exposure Route:			Sum of Estimated Potential ILCRs (All Relevant Exposure Routes) (ILCRT) (i)
			Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Oral (IG_CPF) (e)	Inhalation (IH_CPF) (e)	Dermal Absorption (ILCRDA) (f)	Ingestion (ILCRIG) (g)	Inhalation (ILCRIH) (h)	
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]pyrene	50328	1.73E-1	1.02E-10	1.45E-10	1.77E-12	7.30E+0	3.10E+0	7.47E-10	1.06E-9	5.49E-12	1.81E-9
Dibenzo[a,h]anthracene	53703	1.07E-1	6.35E-11	8.97E-11	1.10E-12	7.30E+0	6.10E+0	4.63E-10	6.55E-10	6.70E-12	1.12E-9
METALS											
Cadmium	7440439	6.43E+1	1.14E-8	5.40E-8	6.60E-10	NA	6.30E+0	NA	NA	4.16E-9	4.16E-9
Lead	7439921	4.01E+2	7.14E-8	3.36E-7	4.12E-9	NA	NA	NA	NA	NA	NA
Thallium	7440280	1.88E+1	3.35E-9	1.58E-8	1.93E-10	NC	NC	NC	NC	NC	NC
Zinc	7440666	2.69E+4	4.79E-6	2.26E-5	2.76E-7	NC	NC	NC	NC	NC	NC

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.04
Contact area-soil (percent) (CS)	= 0.16
Soil adherence (mg/cm^2) (S)	= 0.23
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 100
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 150
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 8
Exposed days-soil (days) (DS)	= 15
Averaging time carcinogens (days) (ATC)	= 365
Exposure years (yrs) (EY)	= 1
Lifetime (yrs) (LT)	= 70
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NA Not available at this time.
NC Noncarcinogenic.
(a) Concentration is the arithmetic mean of the chemical concentration in solid material (mg/kg) (SL).
(b) Estimated lifetime average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS * EY) / (LT * ATC * BW).
(c) Estimated lifetime average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS * EY) / (LT * ATC * BW).
(d) Estimated lifetime average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS * EY) / (LT * ATC * BW).
(e) Carcinogenic potency factors (CPFs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from dermal exposure (ILCRDA). ILCRDA = DA * IG_CPF.
(g) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from ingestion (ILCRIG). ILCRIG = IG * IG_CPF.
(h) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from inhalation (ILCRIH). ILCRIH = IH * IH_CPF.
(i) Incremental lifetimecancer risk (ILCR) for all exposure routes summed (ILCRT). ILCRT = ILCRDA + ILCRIG + ILCRIH.

Table H-44: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Solid Material Collected from Subsurface Structures Western Area of the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Subsurface Structure Construction Scenario -- RMEI

Chemical	CAS RN	Solid Material Concentration (mg/kg) (SL) (a)	Lifetime Average Daily Intake (mg/kg/day)			Slope Factors $(mg/kg/day)^{-1}$		Incremental Lifetime Cancer Risk (ILCR) by Exposure Route:			Sum of Estimated Potential ILCRs (All Relevant Exposure Routes) (ILCRT) (i)
			Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Oral (IG_CPF) (e)	Inhalation (IH_CPF) (e)	Dermal Absorption (ILCRDA) (f)	Ingestion (ILCRIG) (g)	Inhalation (ILCRIH) (h)	
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]pyrene	50328	1.80E-1	2.13E-10	6.04E-10	4.13E-12	7.30E+0	3.10E+0	1.56E-9	4.41E-9	1.28E-11	5.98E-9
Dibenzo[a,h]anthracene	53703	1.65E-1	1.96E-10	5.54E-10	3.79E-12	7.30E+0	6.10E+0	1.43E-9	4.04E-9	2.31E-11	5.49E-9
METALS											
Cadmium	7440439	1.92E+2	6.83E-8	6.44E-7	4.41E-9	NA	6.30E+0	NA	NA	2.78E-8	2.78E-8
Lead	7439921	1.18E+3	4.20E-7	3.96E-6	2.71E-8	NA	NA	NA	NA	NA	NA
Thallium	7440280	5.45E+1	1.94E-8	1.83E-7	1.25E-9	NC	NC	NC	NC	NC	NC
Zinc	7440666	8.07E+4	2.87E-5	2.71E-4	1.85E-6	NC	NC	NC	NC	NC	NC

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.28
Contact area-soil (percent) (CS)	= 0.16
Soil adherence (mg/cm^2) (S)	= 0.23
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 200
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 150
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 8
Exposed days-soil (days) (DS)	= 30
Averaging time carcinogens (days) (ATC)	= 365
Exposure years (yrs) (EY)	= 1
Lifetime (yrs) (LT)	= 70
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NA Not available at this time.
NC Noncarcinogenic.
(a) Concentration is the maximum concentration of chemical in soild material (mg/kg) (SL).
(b) Estimated lifetime average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS * EY) / (LT * ATC * BW).
(c) Estimated lifetime average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS * EY) / (LT * ATC * BW).
(d) Estimated lifetime average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS * EY) / (LT * ATC * BW).
(e) Carcinogenic potency factors (CPFs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from dermal exposure (ILCRDA). ILCRDA = DA * IG_CPF.
(g) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from ingestion (ILCRIG). ILCRIG = IG * IG_CPF.
(h) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from inhalation (ILCRIH). ILCRIH = IH * IH_CPF.
(i) Incremental lifetimecancer risk (ILCR) for all exposure routes summed (ILCRT). ILCRT = ILCRDA + ILCRIG + ILCRIH.

Table H-45: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Solid Material Collected from Subsurface Structures
Central Area of the Former Thypin Steel Inc. Facility, Manorhaven, New York -- Subsurface Structure Construction Scenario -- PAEI

Chemical	CAS RN	Solid Material Concentration (mg/kg) (SL) (a)	Average Daily Intakes (mg/kg/day) by Exposure Route: Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Reference Dose: Oral (mg/kg/day) (RfDo) (e)	Inhalation (mg/kg/day) (RfDi) (e)	Hazard Quotient (HQ) by Exposure Route: Dermal Absorption (QDA) (f)	Ingestion (QIG) (g)	Inhalation (QIH) (h)	Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	1.15E+0	8.32E-7	1.18E-6	1.44E-8	3.00E-1	NA	2.77E-6	3.92E-6	4.80E-8	6.74E-6
Benzo[a]pyrene	50328	1.02E+0	7.35E-7	1.04E-6	1.27E-8	3.00E-2	NA	2.45E-5	3.46E-5	4.24E-7	5.95E-5
Benzo[b]fluoranthene	205992	8.08E-1	5.83E-7	8.24E-7	1.01E-8	4.00E-2	NA	1.46E-5	2.06E-5	2.52E-7	3.54E-5
Dibenzo[a,h]anthracene	53703	3.49E-1	2.52E-7	3.57E-7	4.36E-9	3.00E-1	NA	8.40E-7	1.19E-6	1.45E-8	2.04E-6
Indeno[1,2,3-cd]pyrene	193395	8.20E-1	5.92E-7	8.37E-7	1.02E-8	3.00E-2	NA	1.97E-5	2.79E-5	3.41E-7	4.79E-5
n-Nitrosodipropylamine	621647	1.63E-1	1.18E-7	1.66E-7	2.03E-9	C	NA	C	C	C	C
METALS											
Arsenic	7440382	3.31E+0	7.17E-7	3.38E-6	4.14E-8	3.00E-4	NA	2.39E-3	1.13E-2	1.38E-4	1.38E-2
Cadmium	7440439	1.66E+1	3.59E-6	1.69E-5	2.07E-7	1.00E-3	5.70E-5	3.59E-3	1.69E-2	3.63E-3	2.41E-2
Lead	7439921	2.60E+2	No RfD is available for lead; potential exposures are evaluated using a biokinetic model. See Table H-87.								
Thallium	7440280	1.97E+0	4.27E-7	2.01E-6	2.46E-8	7.00E-5	NA	6.10E-3	2.88E-2	3.52E-4	3.52E-2

Assumptions Used for Estimating Daily Intake and Associated Risks

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.04
Contact area-soil (percent) (CS)	= 0.16
Soil adherence (mg/cm^2) (S)	= 0.23
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 100
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 150
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 8
Exposed days-soil (days) (DS)	= 15
Averaging time noncarcinogens (days) (ATN)	= 21
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NA Not available at this time.
C Carcinogenic.
(a) Concentration is the arithmetic mean of the chemical concentration in solid material (mg/kg) (SL).
(b) Estimated average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS) / (ATN * BW).
(c) Estimated average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS) / (ATN * BW).
(d) Estimated average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS) / (ATN * BW).
(e) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfD.
(g) Hazard quotient for average daily intake from ingestion (QIG). QIG = IG / RfD.
(h) Hazard quotient for average daily intake from inhalation (QIH). QIH = IH / RfD.
(i) Hazard quotient for all exposure routes summed (QT). QT = QDA + QIG + QIH.

Table H-46: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Solid Material Collected from Subsurface Structures Central Area of the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Subsurface Structure Construction Scenario -- RMEI

Chemical	CAS RN	Solid Material Concentration (mg/kg) (SL) (a)	Average Daily Intakes (mg/kg/day) by Exposure Route: Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Reference Dose: Oral (mg/kg/day) (RfDo) (e)	Inhalation (mg/kg/day) (RfDi) (e)	Hazard Quotient (HQ) by Exposure Route: Dermal Absorption (QDA) (f)	Ingestion (QIG) (g)	Inhalation (QIH) (h)	Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	1.00E+1	7.21E-6	2.04E-5	1.40E-7	3.00E-1	NA	2.40E-5	6.80E-5	4.65E-7	9.25E-5
Benzo[a]pyrene	50328	8.50E+0	6.13E-6	1.73E-5	1.19E-7	3.00E-2	NA	2.04E-4	5.78E-4	3.96E-6	7.87E-4
Benzo[b]fluoranthene	205992	6.80E+0	4.91E-6	1.39E-5	9.49E-8	4.00E-2	NA	1.23E-4	3.47E-4	2.37E-6	4.72E-4
Dibenzo[a,h]anthracene	53703	2.70E+0	1.95E-6	5.51E-6	3.77E-8	3.00E-1	NA	6.49E-6	1.84E-5	1.26E-7	2.50E-5
Indeno[1,2,3-cd]pyrene	193395	7.40E+0	5.34E-6	1.51E-5	1.03E-7	3.00E-2	NA	1.78E-4	5.03E-4	3.44E-6	6.85E-4
n-Nitrosodipropylamine	621647	1.65E-1	1.19E-7	3.37E-7	2.30E-9	C	NA	C	C	C	C
METALS											
Arsenic	7440382	1.52E+1	3.29E-6	3.10E-5	2.12E-7	3.00E-4	NA	1.10E-2	1.03E-1	7.07E-4	1.15E-1
Cadmium	7440439	1.26E+2	2.73E-5	2.57E-4	1.76E-6	1.00E-3	5.70E-5	2.73E-2	2.57E-1	3.63E-3	2.88E-1
Lead	7439921	2.89E+3	No RfD is available for lead; potential exposures are evaluated using a biokinetic model. See Table H-88.								
Thallium	7440280	9.40E+0	2.03E-6	1.92E-5	1.31E-7	7.00E-5	NA	2.91E-2	2.74E-1	1.87E-3	3.05E-1

Assumptions Used for Estimating Daily Intake and Associated Risks

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.28
Contact area-soil (percent) (CS)	= 0.16
Soil adherence (mg/cm^2) (S)	= 0.23
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 200
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 150
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 8
Exposed days-soil (days) (DS)	= 30
Averaging time noncarcinogens (days) (ATN)	= 42
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NA Not available at this time.
C Carcinogenic.
(a) Concentration is the maximum concentration of chemical in solid material (mg/kg) (SL).
(b) Estimated average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS) / (ATN * BW).
(c) Estimated average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS) / (ATN * BW).
(d) Estimated average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS) / (ATN * BW).
(e) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfD.
(g) Hazard quotient for average daily intake from ingestion (QIG). QIG = IG / RfD.
(h) Hazard quotient for average daily intake from inhalation (QIH). QIH = IH / RfD.
(i) Hazard quotient for all exposure routes summed (QT). QT = QDA + QIG + QIH.

Table H-47: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Solid Materials Collected from Subsurface Structures
Central Area of the Former Thypin Steel Inc. Facility, Manorhaven, New York -- Subsurface Structure Construction Scenario -- PAEI

Chemical	CAS RN	Solid Material Concentration (mg/kg) (SL) (a)	Lifetime Average Daily Intake (mg/kg/day)			Slope Factors $(mg/kg/day)^{-1}$		Incremental Lifetime Cancer Risk by Exposure Route			Sum of Estimated Potential ILCRs (All Relevant Exposure Routes) (ILCRT) (i)
			Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Oral (IG_CPF) (e)	Inhalation (IH_CPF) (e)	Dermal Absorption (ILCRDA) (f)	Ingestion (ILCRIG) (g)	Inhalation (ILCRIH) (h)	
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	1.15E+0	6.83E-10	9.67E-10	1.18E-11	7.30E-1	6.10E-1	4.99E-10	7.06E-10	7.22E-12	1.21E-9
Benzo[a]pyrene	50328	1.02E+0	6.04E-10	8.54E-10	1.05E-11	7.30E+0	3.10E+0	4.41E-9	6.23E-9	3.24E-11	1.07E-8
Benzo[b]fluoranthene	205992	8.08E-1	4.79E-10	6.77E-10	8.29E-12	7.30E-1	6.10E-1	3.50E-10	4.94E-10	5.06E-12	8.49E-10
Dibenzo[a,h]anthracene	53703	3.49E-1	2.07E-10	2.93E-10	3.59E-12	7.30E+0	6.10E+0	1.51E-9	2.14E-9	2.19E-11	3.67E-9
Indeno[1,2,3-cd]pyrene	193395	8.20E-1	4.86E-10	6.88E-10	8.42E-12	7.30E-1	6.10E-1	3.55E-10	5.02E-10	5.13E-12	8.62E-10
n-Nitrosodipropylamine	621647	1.63E-1	9.66E-11	1.37E-10	1.67E-12	7.00E+0	NA	6.76E-10	9.56E-10	1.17E-11	1.64E-9
METALS											
Arsenic	7440382	3.31E+0	5.89E-10	2.78E-9	3.40E-11	1.50E+0	1.50E+1	8.84E-10	4.17E-9	5.10E-10	5.56E-9
Cadmium	7440439	1.66E+1	2.95E-9	1.39E-8	1.70E-10	NA	6.30E+0	NA	NA	1.07E-9	1.07E-9
Lead	7439921	2.60E+2	4.63E-8	2.18E-7	2.67E-9	NA	NA	NA	NA	NA	NA
Thallium	7440280	1.97E+0	3.51E-10	1.66E-9	2.03E-11	NC	NC	NC	NC	NC	NC

Assumptions Used for Estimating Daily Intake and Associated Risks

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.04
Contact area-soil (percent) (CS)	= 0.16
Soil adherence (mg/cm^2) (S)	= 0.23
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 100
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 150
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 8
Exposed days-soil (days) (DS)	= 15
Averaging time carcinogens (days) (ATC)	= 365
Exposure years (yrs) (EY)	= 1
Lifetime (yrs) (LT)	= 70
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NA Not available at this time.
NC Noncarcinogenic.
(a) Concentration is the arithmetic mean of the chemical concentration in solid material (mg/kg) (SL).
(b) Estimated lifetime average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS * EY) / (LT * ATC * BW).
(c) Estimated lifetime average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS * EY) / (LT * ATC * BW).
(d) Estimated lifetime average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS * EY) / (LT * ATC * BW).
(e) Carcinogenic potency factors (CPFs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from dermal exposure (ILCRDA). ILCRDA = DA * IG_CPF.
(g) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from ingestion (ILCRIG). ILCRIG = IG * IG_CPF.
(h) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from inhalation (ILCRIH). ILCRIH = IH * IH_CPF.
(i) Incremental lifetimecancer risk (ILCR) for all exposure routes summed (ILCRT). ILCRT = ILCRDA + ILCRIG + ILCRIH.

Table H-48: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Solid Material Collected from Subsurface Structures Central Area of the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Subsurface Structure Construction Scenario -- RMEI

Chemical	CAS RN	Solid Material Concentration (mg/kg) (SL) (a)	Lifetime Average Daily Intake (mg/kg/day)			Slope Factors $(mg/kg/day)^{-1}$		Incremental Lifetime Cancer Risk by Exposure Route			Sum of Estimated Potential ILCRs (All Relevant Exposure Routes) (ILCRT) (i)
			Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Oral (IG_CPF) (e)	Inhalation (IH_CPF) (e)	Dermal Absorption (ILCRDA) (f)	Ingestion (ILCRIG) (g)	Inhalation (ILCRIH) (h)	
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	1.00E+1	1.19E-8	3.35E-8	2.29E-10	7.30E-1	6.10E-1	8.66E-9	2.45E-8	1.40E-10	3.33E-8
Benzo[a]pyrene	50328	8.50E+0	1.01E-8	2.85E-8	1.95E-10	7.30E+0	3.10E+0	7.36E-8	2.08E-7	6.05E-10	2.82E-7
Benzo[b]fluoranthene	205992	6.80E+0	8.06E-9	2.28E-8	1.56E-10	7.30E-1	6.10E-1	5.89E-9	1.67E-8	9.52E-11	2.26E-8
Dibenzo[a,h]anthracene	53703	2.70E+0	3.20E-9	9.06E-9	6.20E-11	7.30E+0	6.10E+0	2.34E-8	6.61E-8	3.78E-10	8.99E-8
Indeno[1,2,3-cd]pyrene	193395	7.40E+0	8.78E-9	2.48E-8	1.70E-10	7.30E-1	6.10E-1	6.41E-9	1.81E-8	1.04E-10	2.46E-8
n-Nitrosodipropylamine	621647	1.65E-1	1.96E-10	5.54E-10	3.79E-12	7.00E+0	NA	1.37E-9	3.87E-9	2.65E-11	5.27E-9
METALS											
Arsenic	7440382	1.52E+1	5.41E-9	5.10E-8	3.49E-10	1.50E+0	1.50E+1	8.11E-9	7.65E-8	5.23E-9	8.98E-8
Cadmium	7440439	1.26E+2	4.48E-8	4.23E-7	2.89E-9	NA	6.30E+0	NA	NA	1.82E-8	1.82E-8
Lead	7439921	2.89E+3	1.03E-6	9.70E-6	6.63E-8	NA	NA	NA	NA	NA	NA
Thallium	7440280	9.40E+0	3.34E-9	3.15E-8	2.16E-10	NC	NC	NC	NC	NC	NC

Assumptions Used for Estimating Daily Intake and Associated Risks

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.28
Contact area-soil (percent) (CS)	= 0.16
Soil adherence (mg/cm^2) (S)	= 0.23
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 200
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 150
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 8
Exposed days-soil (days) (DS)	= 30
Averaging time carcinogens (days) (ATC)	= 365
Exposure years (yrs) (EY)	= 1
Lifetime (yrs) (LT)	= 70
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NA Not available at this time.
NC Noncarcinogenic.
(a) Concentration is the maximum concentration of chemical in solid material (mg/kg) (SL).
(b) Estimated lifetime average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS * EY) / (LT * ATC * BW).
(c) Estimated lifetime average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS * EY) / (LT * ATC * BW).
(d) Estimated lifetime average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS * EY) / (LT * ATC * BW).
(e) Carcinogenic potency factors (CPFs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from dermal exposure (ILCRDA). ILCRDA = DA * IG_CPF.
(g) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from ingestion (ILCRIG). ILCRIG = IG * IG_CPF.
(h) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from inhalation (ILCRIH). ILCRIH = IH * IH_CPF.
(i) Incremental lifetimecancer risk (ILCR) for all exposure routes summed (ILCRT). ILCRT = ILCRDA + ILCRIG + ILCRIH.

Table H-49: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Solid Material Collected from Subsurface Structures
Eastern Area of the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Construction Scenario -- PAEI

Chemical	CAS RN	Solid Material Concentration (mg/kg) (SL) (a)	Average Daily Intakes (mg/kg/day) by Exposure Route			Reference Dose		Hazard Quotient (HQ) by Exposure Route			Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
			Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Oral (mg/kg/day) (RfDo) (e)	Inhalation (mg/kg/day) (RfDi) (e)	Dermal Absorption (QDA) (f)	Ingestion (QIG) (g)	Inhalation (QIH) (h)	
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	5.35E-1	3.86E-7	5.46E-7	6.68E-9	3.00E-1	NA	1.29E-6	1.82E-6	2.23E-8	3.13E-6
Benzo[a]pyrene	50328	5.01E-1	3.62E-7	5.11E-7	6.26E-9	3.00E-2	NA	1.21E-5	1.70E-5	2.09E-7	2.93E-5
Benzo[b]fluoranthene	205992	4.80E-1	3.47E-7	4.90E-7	6.00E-9	4.00E-2	NA	8.67E-6	1.23E-5	1.50E-7	2.11E-5
Dibenzo[a,h]anthracene	53703	1.71E-1	1.23E-7	1.74E-7	2.14E-9	3.00E-1	NA	4.11E-7	5.82E-7	7.12E-9	1.00E-6
Indeno[1,2,3-cd]pyrene	193395	3.10E-1	2.24E-7	3.17E-7	3.88E-9	3.00E-2	NA	7.46E-6	1.06E-5	1.29E-7	1.81E-5
n-Nitrosodipropylamine	621647	1.37E-1	9.91E-8	1.40E-7	1.71E-9	C	NA	C	C	C	C
METALS											
Arsenic	7440382	1.49E+0	3.22E-7	1.52E-6	1.86E-8	3.00E-4	NA	1.07E-3	5.05E-3	6.19E-5	6.19E-3

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.04
Contact area-soil (percent) (CS)	= 0.16
Soil adherence (mg/cm^2) (S)	= 0.23
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 100
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter (µg/m^3) (PM)	= 150
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 8
Exposed days-soil (days) (DS)	= 15
Averaging time noncarcinogens (days) (ATN)	= 21
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NA Not available at this time.
C Carcinogenic.
(a) Concentration is the arithmetic mean of the chemical concentration in solid material (mg/kg) (SL).
(b) Estimated average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS) / (ATN * BW).
(c) Estimated average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS) / (ATN * BW).
(d) Estimated average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS) / (ATN * BW).
(e) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfD.
(g) Hazard quotient for average daily intake from ingestion (QIG). QIG = IG / RfD.
(h) Hazard quotient for average daily intake from inhalation (QIH). QIH = IH / RfD.
(i) Hazard quotient for all exposure routes summed (QT). QT = QDA + QIG + QIH.

Table H-50: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Solid Material Collected from Subsurface Structures
Eastern Area of the Former Thypin Steel Inc. Facility, Manorhaven, NY -- Subsurface Structure Construction Scenario -- RMEI

Chemical	CAS RN	Solid Material Concentration (mg/kg) (SL) (a)	Average Daily Intakes (mg/kg/day) by Exposure Route: Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Reference Dose: Oral (mg/kg/day) (RfDo) (e)	Inhalation (mg/kg/day) (RfDi) (e)	Hazard Quotient (HQ) by Exposure Route: Dermal Absorption (QDA) (f)	Ingestion (QIG) (g)	Inhalation (QIH) (h)	Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	3.30E+0	2.38E-6	6.73E-6	4.61E-8	3.00E-1	NA	7.94E-6	2.24E-5	1.54E-7	3.05E-5
Benzo[a]pyrene	50328	2.90E+0	2.09E-6	5.92E-6	4.05E-8	3.00E-2	NA	6.97E-5	1.97E-4	1.35E-6	2.68E-4
Benzo[b]fluoranthene	205992	2.70E+0	1.95E-6	5.51E-6	3.77E-8	4.00E-2	NA	4.87E-5	1.38E-4	9.42E-7	1.87E-4
Dibenzo[a,h]anthracene	53703	6.50E-1	4.69E-7	1.33E-6	9.07E-9	3.00E-1	NA	1.56E-6	4.42E-6	3.02E-8	6.02E-6
Indeno[1,2,3-cd]pyrene	193395	1.70E+0	1.23E-6	3.47E-6	2.37E-8	3.00E-2	NA	4.09E-5	1.16E-4	7.91E-7	1.57E-4
n-Nitrosodipropylamine	621647	1.65E-1	1.19E-7	3.37E-7	2.30E-9	C	NA	C	C	C	C
METALS											
Arsenic	7440382	4.30E+0	9.31E-7	8.78E-6	6.00E-8	3.00E-4	NA	3.10E-3	2.93E-2	2.00E-4	3.26E-2

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.28
Contact area-soil (percent) (CS)	= 0.16
Soil adherence (mg/cm^2) (S)	= 0.23
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 200
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 150
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 8
Exposed days-soil (days) (DS)	= 30
Averaging time noncarcinogens (days) (ATN)	= 42
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NA Not available at this time.
C Carcinogenic.
(a) Concentration is the maximum concentration of chemical in solid material (mg/kg) (SL).
(b) Estimated average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS) / (ATN * BW).
(c) Estimated average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS) / (ATN * BW).
(d) Estimated average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS) / (ATN * BW).
(e) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfD.
(g) Hazard quotient for average daily intake from ingestion (QIG). QIG = IG / RfD.
(h) Hazard quotient for average daily intake from inhalation (QIH). QIH = IH / RfD.
(i) Hazard quotient for all exposure routes summed (QT). QT = QDA + QIG + QIH.

Table H-51: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Solid Materials Collected from Subsurface Structures Eastern Area of the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Subsurface Structure Construction Scenario -- PAEI

Chemical	CAS RN	Solid Material Concentration (mg/kg) (SL) (a)	Lifetime Average Daily Intake (mg/kg/day)			Slope Factors (mg/kg/day)$^{-1}$		Incremental Lifetime Cancer Risk by Exposure Route			Sum of Estimated Potential ILCRs (All Relevant Exposure Routes) (ILCRT) (i)
			Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Oral (IG_CPF) (e)	Inhalation (IH_CPF) (e)	Dermal Absorption (ILCRDA) (f)	Ingestion (ILCRIG) (g)	Inhalation (ILCRIH) (h)	
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	5.35E-1	3.17E-10	4.48E-10	5.49E-12	7.30E-1	6.10E-1	2.31E-10	3.27E-10	3.35E-12	5.62E-10
Benzo[a]pyrene	50328	5.01E-1	2.97E-10	4.20E-10	5.14E-12	7.30E+0	3.10E+0	2.17E-9	3.07E-9	1.59E-11	5.25E-9
Benzo[b]fluoranthene	205992	4.80E-1	2.85E-10	4.03E-10	4.93E-12	7.30E-1	6.10E-1	2.08E-10	2.94E-10	3.01E-12	5.05E-10
Dibenzo[a,h]anthracene	53703	1.71E-1	1.01E-10	1.43E-10	1.76E-12	7.30E+0	6.10E+0	7.40E-10	1.05E-9	1.07E-11	1.80E-9
Indeno[1,2,3-cd]pyrene	193395	3.10E-1	1.84E-10	2.60E-10	3.19E-12	7.30E-1	6.10E-1	1.34E-10	1.90E-10	1.94E-12	3.26E-10
n-Nitrosodipropylamine	621647	1.37E-1	8.14E-11	1.15E-10	1.41E-12	7.00E+0	NA	5.70E-10	8.06E-10	9.87E-12	1.39E-9
METALS											
Arsenic	7440382	1.49E+0	2.64E-10	1.25E-9	1.53E-11	1.50E+0	1.50E+1	3.96E-10	1.87E-9	2.29E-10	2.49E-9

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.04
Contact area-soil (percent) (CS)	= 0.16
Soil adherence (mg/cm^2) (S)	= 0.23
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 100
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 150
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 8
Exposed days-soil (days) (DS)	= 15
Averaging time carcinogens (days) (ATC)	= 365
Exposure years (yrs) (EY)	= 1
Lifetime (yrs) (LT)	= 70
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NA Not available at this time.
NC Noncarcinogenic.
(a) Concentration is the arithmetic mean of the chemical concentration in solid material (mg/kg) (SL).
(b) Estimated lifetime average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS * EY) / (LT * ATC * BW).
(c) Estimated lifetime average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS * EY) / (LT * ATC * BW).
(d) Estimated lifetime average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS * EY) / (LT * ATC * BW).
(e) Carcinogenic potency factors (CPFs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from dermal exposure (ILCRDA). ILCRDA = DA * IG_CPF.
(g) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from ingestion (ILCRIG). ILCRIG = IG * IG_CPF.
(h) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from inhalation (ILCRIH). ILCRIH = IH * IH_CPF.
(i) Incremental lifetimecancer risk (ILCR) for all exposure routes summed (ILCRT). ILCRT = ILCRDA + ILCRIG + ILCRIH.

Table H-52: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Solid Material Collected from Subsurface Structures Eastern Area of the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Subsurface Structure Construction Scenario -- RMEI

Chemical	CAS RN	Solid Material Concentration (mg/kg) (SL) (a)	Lifetime Average Daily Intake (mg/kg/day)			Slope Factors $(mg/kg/day)^{-1}$		Incremental Lifetime Cancer Risk by Exposure Route			Sum of Estimated Potential ILCRs (All Relevant Exposure Routes) (ILCRT) (i)
			Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Oral (IG_CPF) (e)	Inhalation (IH_CPF) (e)	Dermal Absorption (ILCRDA) (f)	Ingestion (ILCRIG) (g)	Inhalation (ILCRIH) (h)	
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	3.30E+0	3.91E-9	1.11E-8	7.57E-11	7.30E-1	6.10E-1	2.86E-9	8.08E-9	4.62E-11	1.10E-8
Benzo[a]pyrene	50328	2.90E+0	3.44E-9	9.73E-9	6.65E-11	7.30E+0	3.10E+0	2.51E-8	7.10E-8	2.06E-10	9.63E-8
Benzo[b]fluoranthene	205992	2.70E+0	3.20E-9	9.06E-9	6.20E-11	7.30E-1	6.10E-1	2.34E-9	6.61E-9	3.78E-11	8.99E-9
Dibenzo[a,h]anthracene	53703	6.50E-1	7.71E-10	2.18E-9	1.49E-11	7.30E+0	6.10E+0	5.63E-9	1.59E-8	9.10E-11	2.16E-8
Indeno[1,2,3-cd]pyrene	193395	1.70E+0	2.02E-9	5.70E-9	3.90E-11	7.30E-1	6.10E-1	1.47E-9	4.16E-9	2.38E-11	5.66E-9
n-Nitrosodipropylamine	621647	1.65E-1	1.96E-10	5.54E-10	3.79E-12	7.00E+0	NA	1.37E-9	3.87E-9	2.65E-11	5.27E-9
METALS											
Arsenic	7440382	4.30E+0	1.53E-9	1.44E-8	9.87E-11	1.50E+0	1.50E+1	2.29E-9	2.16E-8	1.48E-9	2.54E-8

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 2.28
Contact area-soil (percent) (CS)	= 0.16
Soil adherence (mg/cm^2) (S)	= 0.23
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 200
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 150
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 8
Exposed days-soil (days) (DS)	= 30
Averaging time carcinogens (days) (ATC)	= 365
Exposure years (yrs) (EY)	= 1
Lifetime (yrs) (LT)	= 70
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

NA Not available at this time.
NC Non carcinogenic.
(a) Concentration is the maximum concentration of chemical in solid material (mg/kg) (SL).
(b) Estimated lifetime average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS * EY) / (LT * ATC * BW).
(c) Estimated lifetime average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS * EY) / (LT * ATC * BW).
(d) Estimated lifetime average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS * EY) / (LT * ATC * BW).
(e) Carcinogenic potency factors (CPFs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from dermal exposure (ILCRDA). ILCRDA = DA * IG_CPF.
(g) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from ingestion (ILCRIG). ILCRIG = IG * IG_CPF.
(h) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from inhalation (ILCRIH). ILCRIH = IH * IH_CPF.
(i) Incremental lifetimecancer risk (ILCR) for all exposure routes summed (ILCRT). ILCRT = ILCRDA + ILCRIG + ILCRIH.

Table H-53: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Surface Soil, Former Thypin Steel Inc. Facility, Manorhaven, New York.
-- Young Child Residential Scenario -- PAEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Average Daily Intakes (mg/kg/day) by Exposure Route: Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Reference Dose: Oral (mg/kg/day) (RfDo) (e)	Inhalation (mg/kg/day) (RfDi) (e)	Hazard Quotient (HQ) by Exposure Route: Dermal Absorption (QDA) (f)	Ingestion (QIG) (g)	Inhalation (QIH) (h)	Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	1.39E+0	1.58E-7	2.65E-6	1.12E-10	3.00E-1	NA	5.27E-7	8.84E-6	3.74E-10	9.37E-6
Benzo[a]pyrene	50328	1.23E+0	1.39E-7	2.34E-6	9.89E-11	3.00E-2	NA	4.64E-6	7.79E-5	3.30E-9	8.26E-5
Benzo[b]fluoranthene	205992	1.03E+0	1.17E-7	1.96E-6	8.28E-11	4.00E-2	NA	2.92E-6	4.89E-5	2.07E-9	5.18E-5
Dibenzo[a,h]anthracene	53703	3.83E-1	4.35E-8	7.30E-7	3.09E-11	3.00E-1	NA	1.45E-7	2.43E-6	1.03E-10	2.58E-6
Indeno[1,2,3-cd]pyrene	193395	8.67E-1	9.84E-8	1.65E-6	6.98E-11	3.00E-2	NA	3.28E-6	5.50E-5	2.33E-9	5.83E-5
METALS											
Arsenic	7440382	4.24E+0	1.44E-7	8.07E-6	3.41E-10	3.00E-4	NA	4.81E-4	2.69E-2	1.14E-6	2.74E-2

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 15
Height (cm) (HT)	= 76
Body surface area (cm^2) (SA)	= 5.90E+3
Inhalation rate (m^3/hr) (IR)	= 0.47
Contact area-soil (percent) (CS)	= 0.20
Soil adherence (mg/cm^2) (S)	= 0.051
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 100
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 18
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 1
Exposed days-soil (days) (DS)	= 52
Averaging time noncarcinogens (days) (ATN)	= 182
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

(a) Concentration is the arithmetic mean of the chemical concentration in surface soil (0 to 2 feet for SVOCs; 0 to 2 inch for metals) (mg/kg) (SL).
(b) Estimated average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS) / (ATN * BW).
(c) Estimated average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS) / (ATN * BW).
(d) Estimated average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS) / (ATN * BW).
(e) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfD.
(g) Hazard quotient for average daily intake from ingestion (QIG). QIG = IG / RfD.
(h) Hazard quotient for average daily intake from inhalation (QIH). QIH = IH / RfD.
(i) Hazard quotient for all exposure routes summed (QT). QT = QDA + QIG + QIH.

Table H-54: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Surface Soil, Former Thypin Steel Inc. Facility, Manorhaven, New York.
-- Young Child Residential Scenario -- RMEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Average Daily Intakes (mg/kg/day) by Exposure Route: Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Reference Dose: Oral (mg/kg/day) (RfDo) (e)	Inhalation (mg/kg/day) (RfDi) (e)	Hazard Quotient (HQ) by Exposure Route: Dermal Absorption (QDA) (f)	Ingestion (QIG) (g)	Inhalation (QIH) (h)	Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	7.00E+0	1.79E-6	4.00E-5	5.58E-9	3.00E-1	NA	5.96E-6	1.33E-4	1.86E-8	1.39E-4
Benzo[a]pyrene	50328	5.80E+0	1.48E-6	3.31E-5	4.62E-9	3.00E-2	NA	4.94E-5	1.10E-3	1.54E-7	1.15E-3
Benzo[b]fluoranthene	205992	4.70E+0	1.20E-6	2.69E-5	3.75E-9	4.00E-2	NA	3.00E-5	6.71E-4	9.37E-8	7.02E-4
Dibenzo[a,h]anthracene	53703	2.10E+0	5.36E-7	1.20E-5	1.67E-9	3.00E-1	NA	1.79E-6	4.00E-5	5.58E-9	4.18E-5
Indeno[1,2,3-cd]pyrene	193395	4.10E+0	1.05E-6	2.34E-5	3.27E-9	3.00E-2	NA	3.49E-5	7.81E-4	1.09E-7	8.16E-4
METALS											
Arsenic	7440382	2.26E+1	1.73E-6	1.29E-4	1.80E-8	3.00E-4	NA	5.77E-3	4.30E-1	6.01E-5	4.36E-1

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 15
Height (cm) (HT)	= 76
Body surface area (cm^2) (SA)	= 5.90E+3
Inhalation rate (m^3/hr) (IR)	= 0.93
Contact area-soil (percent) (CS)	= 0.30
Soil adherence (mg/cm^2) (S)	= 0.051
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 200
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 30
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 2
Exposed days-soil (days) (DS)	= 78
Averaging time noncarcinogens (days) (ATN)	= 182
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

(a) Concentration is the 95 percent UCL or maximum concentration of chemical in surface soil (0 to 2 feet for SVOCs; 0 to 2 inch for metals) (mg/kg) (SL).
(b) Estimated average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS) / (ATN * BW).
(c) Estimated average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS) / (ATN * BW).
(d) Estimated average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS) / (ATN * BW).
(e) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfD.
(g) Hazard quotient for average daily intake from ingestion (QIG). QIG = IG / RfD.
(h) Hazard quotient for average daily intake from inhalation (QIH). QIH = IH / RfD.
(i) Hazard quotient for all exposure routes summed (QT). QT = QDA + QIG + QIH.

Table H-55: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Surface Soil, Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Young Child Residential Scenario -- PAEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Lifetime Average Daily Intake (mg/kg/day)			Slope Factors $(mg/kg/day)^{-1}$		Incremental Lifetime Cancer Risk by Exposure Route			Sum of Estimated Potential ILCRs (All Relevant Exposure Routes) (ILCRT) (i)
			Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Oral (IG_CPF) (e)	Inhalation (IH_CPF) (e)	Dermal Absorption (ILCRDA) (f)	Ingestion (ILCRIG) (g)	Inhalation (ILCRIH) (h)	
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	1.39E+0	3.38E-9	5.67E-8	2.40E-12	7.30E-1	6.10E-1	2.47E-9	4.14E-8	1.46E-12	4.38E-8
Benzo[a]pyrene	50328	1.23E+0	2.98E-9	5.00E-8	2.11E-12	7.30E+0	3.10E+0	2.17E-8	3.65E-7	6.55E-12	3.86E-7
Benzo[b]fluoranthene	205992	1.03E+0	2.49E-9	4.18E-8	1.77E-12	7.30E-1	6.10E-1	1.82E-9	3.05E-8	1.08E-12	3.23E-8
Dibenzo[a,h]anthracene	53703	3.83E-1	9.29E-10	1.56E-8	6.59E-13	7.30E+0	6.10E+0	6.78E-9	1.14E-7	4.02E-12	1.21E-7
Indeno[1,2,3-cd]pyrene	193395	8.67E-1	2.10E-9	3.53E-8	1.49E-12	7.30E-1	6.10E-1	1.54E-9	2.58E-8	9.11E-13	2.73E-8
METALS											
Arsenic	7440382	4.24E+0	3.08E-9	1.72E-7	7.29E-12	1.50E+0	1.50E+1	4.62E-9	2.59E-7	1.09E-10	2.63E-7

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 15
Height (cm) (HT)	= 76
Body surface area (cm^2) (SA)	= 5.90E+3
Inhalation rate (m^3/hr) (IR)	= 0.47
Contact area-soil (percent) (CS)	= 0.20
Soil adherence (mg/cm^2) (S)	= 0.051
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 100
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 18
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 1
Exposed days-soil (days) (DS)	= 52
Averaging time carcinogens (days) (ATC)	= 365
Exposure years (yrs) (EY)	= 3
Lifetime (yrs) (LT)	= 70
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

(a) Concentration is the arithmetic mean of the chemical concentration in surface soil (0 to 2 feet for SVOCs; 0 to 2 inch for metals) (mg/kg) (SL).
(b) Estimated lifetime average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS * EY) / (LT * ATC * BW).
(c) Estimated lifetime average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS * EY) / (LT * ATC * BW).
(d) Estimated lifetime average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS * EY) / (LT * ATC * BW).
(e) Carcinogenic potency factors (CPFs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from dermal exposure (ILCRDA). ILCRDA = DA * IG_CPF.
(g) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from ingestion (ILCRIG). ILCRIG = IG * IG_CPF.
(h) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from inhalation (ILCRIH). ILCRIH = IH * IH_CPF.
(i) Incremental lifetimecancer risk (ILCR) for all exposure routes summed (ILCRT). ILCRT = ILCRDA + ILCRIG + ILCRIH.

Table H-56: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Surface Soil, Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Young Child Residential Scenario -- RMEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Lifetime Average Daily Intake (mg/kg/day)			Slope Factors $(mg/kg/day)^{-1}$		Incremental Lifetime Cancer Risk by Exposure Route			Sum of Estimated Potential ILCRs (All Relevant Exposure Routes) (ILCRT) (i)
			Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Oral (IG_CPF) (e)	Inhalation (IH_CPF) (e)	Dermal Absorption (ILCRDA) (f)	Ingestion (ILCRIG) (g)	Inhalation (ILCRIH) (h)	
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	7.00E+0	6.37E-8	1.42E-6	1.99E-10	7.30E-1	6.10E-1	4.65E-8	1.04E-6	1.21E-10	1.09E-6
Benzo[a]pyrene	50328	5.80E+0	5.28E-8	1.18E-6	1.65E-10	7.30E+0	3.10E+0	3.85E-7	8.62E-6	5.10E-10	9.00E-6
Benzo[b]fluoranthene	205992	4.70E+0	4.28E-8	9.57E-7	1.33E-10	7.30E-1	6.10E-1	3.12E-8	6.98E-7	8.14E-11	7.30E-7
Dibenzo[a,h]anthracene	53703	2.10E+0	1.91E-8	4.27E-7	5.96E-11	7.30E+0	6.10E+0	1.39E-7	3.12E-6	3.64E-10	3.26E-6
Indeno[1,2,3-cd]pyrene	193395	4.10E+0	3.73E-8	8.34E-7	1.16E-10	7.30E-1	6.10E-1	2.72E-8	6.09E-7	7.10E-11	6.36E-7
METALS											
Arsenic	7440382	2.26E+1	6.17E-8	4.60E-6	6.42E-10	1.50E+0	1.50E+1	9.25E-8	6.90E-6	9.62E-9	7.00E-6

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 15
Height (cm) (HT)	= 76
Body surface area (cm^2) (SA)	= 5.90E+3
Inhalation rate (m^3/hr) (IR)	= 0.93
Contact area-soil (percent) (CS)	= 0.30
Soil adherence (mg/cm^2) (S)	= 0.051
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 200
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 30
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 2
Exposed days-soil (days) (DS)	= 78
Averaging time carcinogens (days) (ATC)	= 365
Exposure years (yrs) (EY)	= 5
Lifetime (yrs) (LT)	= 70
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/μg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

(a) Concentration is the maximum concentration of chemical in surface soil (0 to 2 feet for SVOCs; 0 to 2 inch for metals) (mg/kg) (SL).
(b) Estimated lifetime average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS * EY) / (LT * ATC * BW).
(c) Estimated lifetime average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS * EY) / (LT * ATC * BW).
(d) Estimated lifetime average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS * EY) / (LT * ATC * BW).
(e) Carcinogenic potency factors (CPFs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from dermal exposure (ILCRDA). ILCRDA = DA * IG_CPF.
(g) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from ingestion (ILCRIG). ILCRIG = IG * IG_CPF.
(h) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from inhalation (ILCRIH). ILCRIH = IH * IH_CPF.
(i) Incremental lifetimecancer risk (ILCR) for all exposure routes summed (ILCRT). ILCRT = ILCRDA + ILCRIG + ILCRIH.

Table H-57: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Surface Soil at the Former Thypin Steel Inc. Facility, Manorhaven, New York.
-- Youth Residential Scenario -- PAEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Average Daily Intakes (mg/kg/day) by Exposure Route: Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Reference Dose: Oral (mg/kg/day) (RfDo) (e)	Inhalation (mg/kg/day) (RfDi) (e)	Hazard Quotient (HQ) by Exposure Route: Dermal Absorption (QDA) (f)	Ingestion (QIG) (g)	Inhalation (QIH) (h)	Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	1.39E+0	2.28E-7	8.29E-7	2.15E-10	3.00E-1	NA	7.61E-7	2.76E-6	7.16E-10	3.52E-6
Benzo[a]pyrene	50328	1.23E+0	2.01E-7	7.31E-7	1.89E-10	3.00E-2	NA	6.71E-6	2.44E-5	6.31E-9	3.11E-5
Benzo[b]fluoranthene	205992	1.03E+0	1.68E-7	6.11E-7	1.58E-10	4.00E-2	NA	4.21E-6	1.53E-5	3.96E-9	1.95E-5
Dibenzo[a,h]anthracene	53703	3.83E-1	6.28E-8	2.28E-7	5.91E-11	3.00E-1	NA	2.09E-7	7.60E-7	1.97E-10	9.70E-7
Indeno[1,2,3-cd]pyrene	193395	8.67E-1	1.42E-7	5.16E-7	1.34E-10	3.00E-2	NA	4.74E-6	1.72E-5	4.46E-9	2.19E-5
METALS											
Arsenic	7440382	4.24E+0	2.08E-7	2.52E-6	6.54E-10	3.00E-4	NA	6.95E-4	8.41E-3	2.18E-6	9.10E-3

Assumptions Used for Estimating Daily Intake and Associated Risks

Body weight (kg) (BW)	= 36
Height (cm) (HT)	= 120
Body surface area (cm^2) (SA)	= 1.12E+4
Inhalation rate (m^3/hr) (IR)	= 0.72
Contact area-soil (percent) (CS)	= 0.20
Soil adherence (mg/cm^2) (S)	= 0.061
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 50
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter (µg/m^3) (PM)	= 18
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 2
Exposed days-soil (days) (DS)	= 78
Averaging time noncarcinogens (days) (ATN)	= 182
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

(a) Concentration is the arithmetic mean of the chemical concentration in subsurface soil (0 to 2 feet for SVOCs; 0 to 2 inch for metals) (mg/kg) (SL).
(b) Estimated average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS) / (ATN * BW).
(c) Estimated average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS) / (ATN * BW).
(d) Estimated average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS) / (ATN * BW).
(e) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfD.
(g) Hazard quotient for average daily intake from ingestion (QIG). QIG = IG / RfD.
(h) Hazard quotient for average daily intake from inhalation (QIH). QIH = IH / RfD.
(i) Hazard quotient for all exposure routes summed (QT). QT = QDA + QIG + QIH.

Table H-58: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Surface Soil at the Former Thypin Steel Inc. Facility, Manorhaven, New York.
-- Youth Residential Scenario -- RMEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Average Daily Intakes (mg/kg/day) by Exposure Route: Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Reference Dose: Oral (mg/kg/day) (RfDo) (e)	Inhalation (mg/kg/day) (RfDi) (e)	Hazard Quotient (HQ) by Exposure Route: Dermal Absorption (QDA) (f)	Ingestion (QIG) (g)	Inhalation (QIH) (h)	Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	7.00E+0	2.19E-6	1.11E-5	9.20E-9	3.00E-1	NA	7.31E-6	3.70E-5	3.07E-8	4.44E-5
Benzo[a]pyrene	50328	5.80E+0	1.82E-6	9.21E-6	7.62E-9	3.00E-2	NA	6.06E-5	3.07E-4	2.54E-7	3.68E-4
Benzo[b]fluoranthene	205992	4.70E+0	1.47E-6	7.46E-6	6.18E-9	4.00E-2	NA	3.68E-5	1.87E-4	1.54E-7	2.23E-4
Dibenzo[a,h]anthracene	53703	2.10E+0	6.58E-7	3.33E-6	2.76E-9	3.00E-1	NA	2.19E-6	1.11E-5	9.20E-9	1.33E-5
Indeno[1,2,3-cd]pyrene	193395	4.10E+0	1.29E-6	6.51E-6	5.39E-9	3.00E-2	NA	4.28E-5	2.17E-4	1.80E-7	2.60E-4
METALS											
Arsenic	7440382	2.26E+1	2.12E-6	3.59E-5	2.97E-8	3.00E-4	NA	7.08E-3	1.20E-1	9.90E-5	1.27E-1

Assumptions Used for Estimating Daily Intake and Associated Risks

Body weight (kg) (BW)	= 36
Height (cm) (HT)	= 120
Body surface area (cm^2) (SA)	= 1.12E+4
Inhalation rate (m^3/hr) (IR)	= 1.38
Contact area-soil (percent) (CS)	= 0.29
Soil adherence (mg/cm^2) (S)	= 0.061
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 100
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 30
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 4
Exposed days-soil (days) (DS)	= 104
Averaging time noncarcinogens (days) (ATN)	= 182
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

(a) Concentration is the maximum concentration of chemical in surface soil (0 to 2 feet for SVOCs; 0 to 2 inch for metals) (mg/kg) (SL).
(b) Estimated average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS) / (ATN * BW).
(c) Estimated average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS) / (ATN * BW).
(d) Estimated average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS) / (ATN * BW).
(e) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfD.
(g) Hazard quotient for average daily intake from ingestion (QIG). QIG = IG / RfD.
(h) Hazard quotient for average daily intake from inhalation (QIH). QIH = IH / RfD.
(i) Hazard quotient for all exposure routes summed (QT). QT = QDA + QIG + QIH.

Table H-59: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Surface Soil at the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Youth Residential Scenario -- PAEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Lifetime Average Daily Intake (mg/kg/day)			Slope Factors $(mg/kg/day)^{-1}$		Incremental Lifetime Cancer Risk by Exposure Route			Sum of Estimated Potential ILCRs (All Relevant Exposure Routes) (ILCRT) (i)
			Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Oral (IG_CPF) (e)	Inhalation (IH_CPF) (e)	Dermal Absorption (ILCRDA) (f)	Ingestion (ILCRIG) (g)	Inhalation (ILCRIH) (h)	
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	1.39E+0	9.76E-9	3.54E-8	9.18E-12	7.30E-1	6.10E-1	7.12E-9	2.59E-8	5.60E-12	3.30E-8
Benzo[a]pyrene	50328	1.23E+0	8.60E-9	3.12E-8	8.09E-12	7.30E+0	3.10E+0	6.28E-8	2.28E-7	2.51E-11	2.91E-7
Benzo[b]fluoranthene	205992	1.03E+0	7.20E-9	2.61E-8	6.77E-12	7.30E-1	6.10E-1	5.26E-9	1.91E-8	4.13E-12	2.43E-8
Dibenzo[a,h]anthracene	53703	3.83E-1	2.68E-9	9.74E-9	2.53E-12	7.30E+0	6.10E+0	1.96E-8	7.11E-8	1.54E-11	9.07E-8
Indeno[1,2,3-cd]pyrene	193395	8.67E-1	6.08E-9	2.21E-8	5.72E-12	7.30E-1	6.10E-1	4.44E-9	1.61E-8	3.49E-12	2.05E-8
METALS											
Arsenic	7440382	4.24E+0	8.91E-9	1.08E-7	2.79E-11	1.50E+0	1.50E+1	1.34E-8	1.62E-7	4.19E-10	1.75E-7

Assumptions Used for Estimating Daily Intake and Associated Risks

Body weight (kg) (BW)	= 36
Height (cm) (HT)	= 120
Body surface area (cm^2) (SA)	= 1.12E+4
Inhalation rate (m^3/hr) (IR)	= 0.72
Contact area-soil (percent) (CS)	= 0.20
Soil adherence (mg/cm^2) (S)	= 0.061
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 50
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 18
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 2
Exposed days-soil (days) (DS)	= 78
Averaging time carcinogens (days) (ATC)	= 365
Exposure years (yrs) (EY)	= 6
Lifetime (yrs) (LT)	= 70
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

(a) Concentration is the arithmetic mean of the chemical concentration in surface soil (0 to 2 feet for SVOCs; 0 to 2 inch for metals) (mg/kg) (SL).
(b) Estimated lifetime average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS * EY) / (LT * ATC * BW).
(c) Estimated lifetime average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS * EY) / (LT * ATC * BW).
(d) Estimated lifetime average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS * EY) / (LT * ATC * BW).
(e) Carcinogenic potency factors (CPFs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from dermal exposure (ILCRDA). ILCRDA = DA * IG_CPF.
(g) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from ingestion (ILCRIG). ILCRIG = IG * IG_CPF.
(h) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from inhalation (ILCRIH). ILCRIH = IH * IH_CPF.
(i) Incremental lifetimecancer risk (ILCR) for all exposure routes summed (ILCRT). ILCRT = ILCRDA + ILCRIG + ILCRIH.

Table H-60: **Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Surface Soil at the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Youth Residential Scenario -- RMEI**

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Lifetime Average Daily Intake (mg/kg/day)			Slope Factors $(mg/kg/day)^{-1}$		Incremental Lifetime Cancer Risk by Exposure Route			Sum of Estimated Potential ILCRs (All Relevant Exposure Routes) (ILCRT) (i)
			Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Oral (IG_CPF) (e)	Inhalation (IH_CPF) (e)	Dermal Absorption (ILCRDA) (f)	Ingestion (ILCRIG) (g)	Inhalation (ILCRIH) (h)	
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	7.00E+0	1.88E-7	9.50E-7	7.86E-10	7.30E-1	6.10E-1	1.37E-7	6.93E-7	4.80E-10	8.31E-7
Benzo[a]pyrene	50328	5.80E+0	1.55E-7	7.87E-7	6.52E-10	7.30E+0	3.10E+0	1.13E-6	5.74E-6	2.02E-9	6.88E-6
Benzo[b]fluoranthene	205992	4.70E+0	1.26E-7	6.38E-7	5.28E-10	7.30E-1	6.10E-1	9.19E-8	4.66E-7	3.22E-10	5.58E-7
Dibenzo[a,h]anthracene	53703	2.10E+0	5.63E-8	2.85E-7	2.36E-10	7.30E+0	6.10E+0	4.11E-7	2.08E-6	1.44E-9	2.49E-6
Indeno[1,2,3-cd]pyrene	193395	4.10E+0	1.10E-7	5.56E-7	4.61E-10	7.30E-1	6.10E-1	8.02E-8	4.06E-7	2.81E-10	4.87E-7
METALS											
Arsenic	7440382	2.26E+1	1.82E-7	3.07E-6	2.54E-9	1.50E+0	1.50E+1	2.72E-7	4.60E-6	3.81E-8	4.91E-6

Assumptions Used for Estimating Daily Intake and Associated Risks

Body weight (kg) (BW)	= 36
Height (cm) (HT)	= 120
Body surface area (cm^2) (SA)	= 1.12E+4
Inhalation rate (m^3/hr) (IR)	= 1.38
Contact area-soil (percent) (CS)	= 0.29
Soil adherence (mg/cm^2) (S)	= 0.061
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 100
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 30
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 4
Exposed days-soil (days/year) (DS)	= 104
Averaging time carcinogens (days) (ATC)	= 365
Exposure years (yrs) (EY)	= 12
Lifetime (yrs) (LT)	= 70
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/μg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

(a) Concentration is the 95 percent UCL or maximum concentration of chemical in surface soil (0 to 2 feet for SVOCs; 0 to 2 inch for metals) (mg/kg) (SL).
(b) Estimated lifetime average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS * EY) / (LT * ATC * BW).
(c) Estimated lifetime average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS * EY) / (LT * ATC * BW).
(d) Estimated lifetime average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS * EY) / (LT * ATC * BW).
(e) Carcinogenic potency factors (CPFs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from dermal exposure (ILCRDA). ILCRDA = DA * IG_CPF.
(g) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from ingestion (ILCRIG). ILCRIG = IG * IG_CPF.
(h) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from inhalation (ILCRIH). ILCRIH = IH * IH_CPF.
(i) Incremental lifetimecancer risk (ILCR) for all exposure routes summed (ILCRT). ILCRT = ILCRDA + ILCRIG + ILCRIH.

Table H-61: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Surface Soil, Former Thypin Steel Inc. Facility, Manorhaven, New York.
-- Adult Residential Scenario -- PAEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Average Daily Intakes (mg/kg/day) by Exposure Route: Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Reference Dose: Oral (mg/kg/day) (RfDo) (e)	Inhalation (mg/kg/day) (RfDi) (e)	Hazard Quotient (HQ) by Exposure Route: Dermal Absorption (QDA) (f)	Ingestion (QIG) (g)	Inhalation (QIH) (h)	Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	1.39E+0	4.42E-8	1.42E-7	1.92E-11	3.00E-1	NA	1.47E-7	4.74E-7	6.39E-11	6.21E-7
Benzo[a]pyrene	50328	1.23E+0	3.90E-8	1.25E-7	1.69E-11	3.00E-2	NA	1.30E-6	4.17E-6	5.64E-10	5.47E-6
Benzo[b]fluoranthene	205992	1.03E+0	3.26E-8	1.05E-7	1.42E-11	4.00E-2	NA	8.15E-7	2.62E-6	3.54E-10	3.44E-6
Dibenzo[a,h]anthracene	53703	3.83E-1	1.22E-8	3.91E-8	5.28E-12	3.00E-1	NA	4.05E-8	1.30E-7	1.76E-11	1.71E-7
Indeno[1,2,3-cd]pyrene	193395	8.67E-1	2.75E-8	8.85E-8	1.19E-11	3.00E-2	NA	9.17E-7	2.95E-6	3.98E-10	3.87E-6
METALS											
Arsenic	7440382	4.24E+0	4.04E-8	4.32E-7	5.84E-11	3.00E-4	NA	1.35E-4	1.44E-3	1.95E-7	1.58E-3

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 0.75
Contact area-soil (percent) (CS)	= 0.20
Soil adherence (mg/cm^2) (S)	= 0.042
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 50
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 18
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 1
Exposed days-soil (days) (DS)	= 26
Averaging time noncarcinogens (days) (ATN)	= 182
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/μg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

(a) Concentration is the arithmetic mean of the chemical concentration in surface soil (0 to 2 feet for SVOCs; 0 to 2 inch for metals) (mg/kg) (SL).
(b) Estimated average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS) / (ATN * BW).
(c) Estimated average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS) / (ATN * BW).
(d) Estimated average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS) / (ATN * BW).
(e) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfD.
(g) Hazard quotient for average daily intake from ingestion (QIG). QIG = IG / RfD.
(h) Hazard quotient for average daily intake from inhalation (QIH). QIH = IH / RfD.
(i) Hazard quotient for all exposure routes summed (QT). QT = QDA + QIG + QIH.

Table H-62: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Surface Soil, Former Thypin Steel Inc. Facility, Manorhaven, New York -- Adult Residential Scenario -- RMEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Average Daily Intakes (mg/kg/day) by Exposure Route: Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Reference Dose: Oral (mg/kg/day) (RfDo) (e)	Inhalation (mg/kg/day) (RfDi) (e)	Hazard Quotient (HQ) by Exposure Route: Dermal Absorption (QDA) (f)	Ingestion (QIG) (g)	Inhalation (QIH) (h)	Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	7.00E+0	6.17E-7	1.43E-6	1.31E-9	3.00E-1	NA	2.06E-6	4.76E-6	4.37E-9	6.82E-6
Benzo[a]pyrene	50328	5.80E+0	5.11E-7	1.18E-6	1.09E-9	3.00E-2	NA	1.70E-5	3.95E-5	3.62E-8	5.65E-5
Benzo[b]fluoranthene	205992	4.70E+0	4.14E-7	9.59E-7	8.81E-10	4.00E-2	NA	1.04E-5	2.40E-5	2.20E-8	3.44E-5
Dibenzo[a,h]anthracene	53703	2.10E+0	1.85E-7	4.29E-7	3.93E-10	3.00E-1	NA	6.17E-7	1.43E-6	1.31E-9	2.05E-6
Indeno[1,2,3-cd]pyrene	193395	4.10E+0	3.61E-7	8.37E-7	7.68E-10	3.00E-2	NA	1.20E-5	2.79E-5	2.56E-8	4.00E-5
METALS											
Arsenic	7440382	2.26E+1	5.97E-7	4.61E-6	4.23E-9	3.00E-4	NA	1.99E-3	1.54E-2	1.41E-5	1.74E-2

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 1.53
Contact area-soil (percent) (CS)	= 0.28
Soil adherence (mg/cm^2) (S)	= 0.042
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 50
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 30
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 2
Exposed days-soil (days) (DS)	= 52
Averaging time noncarcinogens (days) (ATN)	= 182
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

(a) Concentration is the maximum concentration of chemical in surface soil (0 to 2 feet for SVOCs; 0 to 2 inch for metals) (mg/kg) (SL).
(b) Estimated average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS) / (ATN * BW).
(c) Estimated average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS) / (ATN * BW).
(d) Estimated average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS) / (ATN * BW).
(e) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfD.
(g) Hazard quotient for average daily intake from ingestion (QIG). QIG = IG / RfD.
(h) Hazard quotient for average daily intake from inhalation (QIH). QIH = IH / RfD.
(i) Hazard quotient for all exposure routes summed (QT). QT = QDA + QIG + QIH.

Table H-63: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Surface Soil, Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Adult Residential Scenario -- PAEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Lifetime Average Daily Intake (mg/kg/day)			Slope Factors $(mg/kg/day)^{-1}$		Incremental Lifetime Cancer Risk by Exposure Route			Sum of Estimated Potential ILCRs (All Relevant Exposure Routes) (ILCRT) (i)
			Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Oral (IG_CPF) (e)	Inhalation (IH_CPF) (e)	Dermal Absorption (ILCRDA) (f)	Ingestion (ILCRIG) (g)	Inhalation (ILCRIH) (h)	
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	1.39E+0	2.83E-9	9.11E-9	1.23E-12	7.30E-1	6.10E-1	2.07E-9	6.65E-9	7.50E-13	8.72E-9
Benzo[a]pyrene	50328	1.23E+0	2.50E-9	8.03E-9	1.08E-12	7.30E+0	3.10E+0	1.82E-8	5.86E-8	3.36E-12	7.69E-8
Benzo[b]fluoranthene	205992	1.03E+0	2.09E-9	6.72E-9	9.07E-13	7.30E-1	6.10E-1	1.53E-9	4.91E-9	5.53E-13	6.43E-9
Dibenzo[a,h]anthracene	53703	3.83E-1	7.80E-10	2.51E-9	3.38E-13	7.30E+0	6.10E+0	5.69E-9	1.83E-8	2.06E-12	2.40E-8
Indeno[1,2,3-cd]pyrene	193395	8.67E-1	1.76E-9	5.67E-9	7.66E-13	7.30E-1	6.10E-1	1.29E-9	4.14E-9	4.67E-13	5.43E-9
METALS											
Arsenic	7440382	4.24E+0	2.59E-9	2.77E-8	3.74E-12	1.50E+0	1.50E+1	3.88E-9	4.16E-8	5.61E-11	4.55E-8

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 0.75
Contact area-soil (percent) (CS)	= 0.20
Soil adherence (mg/cm^2) (S)	= 0.042
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 50
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 18
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 1
Exposed days-soil (days) (DS)	= 26
Averaging time carcinogens (days) (ATC)	= 365
Exposure years (yrs) (EY)	= 9
Lifetime (yrs) (LT)	= 70
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

(a) Concentration is the arithmetic mean of the chemical concentration in surface soil (0 to 2 feet for SVOCs; 0 to 2 inch for metals) (mg/kg) (SL).
(b) Estimated lifetime average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS * EY) / (LT * ATC * BW).
(c) Estimated lifetime average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS * EY) / (LT * ATC * BW).
(d) Estimated lifetime average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS * EY) / (LT * ATC * BW).
(e) Carcinogenic potency factors (CPFs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from dermal exposure (ILCRDA). ILCRDA = DA * IG_CPF.
(g) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from ingestion (ILCRIG). ILCRIG = IG * IG_CPF.
(h) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from inhalation (ILCRIH). ILCRIH = IH * IH_CPF.
(i) Incremental lifetimecancer risk (ILCR) for all exposure routes summed (ILCRT). ILCRT = ILCRDA + ILCRIG + ILCRIH.

Table H-64: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Surface Soil, Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Adult Residential Scenario -- RMEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Lifetime Average Daily Intake (mg/kg/day)			Slope Factors $(mg/kg/day)^{-1}$		Incremental Lifetime Cancer Risk by Exposure Route			Sum of Estimated Potential ILCRs (All Relevant Exposure Routes) (ILCRT) (i)
			Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Oral (IG_CPF) (e)	Inhalation (IH_CPF) (e)	Dermal Absorption (ILCRDA) (f)	Ingestion (ILCRIG) (g)	Inhalation (ILCRIH) (h)	
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	7.00E+0	1.32E-7	3.05E-7	2.80E-10	7.30E-1	6.10E-1	9.62E-8	2.23E-7	1.71E-10	3.19E-7
Benzo[a]pyrene	50328	5.80E+0	1.09E-7	2.53E-7	2.32E-10	7.30E+0	3.10E+0	7.97E-7	1.85E-6	7.20E-10	2.64E-6
Benzo[b]fluoranthene	205992	4.70E+0	8.85E-8	2.05E-7	1.88E-10	7.30E-1	6.10E-1	6.46E-8	1.50E-7	1.15E-10	2.14E-7
Dibenzo[a,h]anthracene	53703	2.10E+0	3.95E-8	9.16E-8	8.41E-11	7.30E+0	6.10E+0	2.89E-7	6.69E-7	5.13E-10	9.58E-7
Indeno[1,2,3-cd]pyrene	193395	4.10E+0	7.72E-8	1.79E-7	1.64E-10	7.30E-1	6.10E-1	5.63E-8	1.31E-7	1.00E-10	1.87E-7
METALS											
Arsenic	7440382	2.26E+1	1.28E-7	9.86E-7	9.05E-10	1.50E+0	1.50E+1	1.91E-7	1.48E-6	1.36E-8	1.68E-6

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate (m^3/hr) (IR)	= 1.53
Contact area-soil (percent) (CS)	= 0.28
Soil adherence (mg/cm^2) (S)	= 0.042
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 50
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 30
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 2
Exposed days-soil (days/year) (DS)	= 52
Averaging time carcinogens (days) (ATC)	= 365
Exposure years (yrs) (EY)	= 30
Lifetime (yrs) (LT)	= 70
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

(a) Concentration is the maximum concentration of chemical in surface soil (0 to 2 feet for SVOCs; 0 to 2 inch for metals) (mg/kg) (SL).
(b) Estimated lifetime average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS * EY) / (LT * ATC * BW).
(c) Estimated lifetime average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS * EY) / (LT * ATC * BW).
(d) Estimated lifetime average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS * EY) / (LT * ATC * BW).
(e) Carcinogenic potency factors (CPFs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from dermal exposure (ILCRDA). ILCRDA = DA * IG_CPF.
(g) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from ingestion (ILCRIG). ILCRIG = IG * IG_CPF.
(h) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from inhalation (ILCRIH). ILCRIH = IH * IH_CPF.
(i) Incremental lifetimecancer risk (ILCR) for all exposure routes summed (ILCRT). ILCRT = ILCRDA + ILCRIG + ILCRIH.

Table H-65: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Surface Soil, Former Thypin Steel Inc. Facility, Manorhaven, New York.
-- Adult Gardening Scenario -- PAEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Average Daily Intakes (mg/kg/day) by Exposure Route: Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Reference Dose: Oral (mg/kg/day) (RfDo) (e)	Inhalation (mg/kg/day) (RfDi) (e)	Hazard Quotient (HQ) by Exposure Route: Dermal Absorption (QDA) (f)	Ingestion (QIG) (g)	Inhalation (QIH) (h)	Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	1.39E+0	9.25E-8	1.42E-7	1.92E-11	3.00E-1	NA	3.08E-7	4.74E-7	6.39E-11	7.82E-7
Benzo[a]pyrene	50328	1.23E+0	8.15E-8	1.25E-7	1.69E-11	3.00E-2	NA	2.72E-6	4.17E-6	5.64E-10	6.89E-6
Benzo[b]fluoranthene	205992	1.03E+0	6.82E-8	1.05E-7	1.42E-11	4.00E-2	NA	1.71E-6	2.62E-6	3.54E-10	4.33E-6
Dibenzo[a,h]anthracene	53703	3.83E-1	2.54E-8	3.91E-8	5.28E-12	3.00E-1	NA	8.48E-8	1.30E-7	1.76E-11	2.15E-7
Indeno[1,2,3-cd]pyrene	193395	8.67E-1	5.76E-8	8.85E-8	1.19E-11	3.00E-2	NA	1.92E-6	2.95E-6	3.98E-10	4.87E-6
METALS											
Arsenic	7440382	4.00E+0	7.97E-8	4.08E-7	5.51E-11	3.00E-4	NA	2.66E-4	1.36E-3	1.84E-7	1.63E-3

Assumptions Used for Estimating Daily Intake and Associated Risks

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate for adult (m3/hr) (IR)	= 0.75
Contact area-soil (percent) (CS)	= 0.2
Soil adherence (mg/cm^2) (S)	= 0.088
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 50
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 18
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 1
Exposed days-soil (days) (DS)	= 26
Averaging time noncarcinogens (days) (ATN)	= 182
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

(a) Concentration is the arithmetic mean of the chemical concentration in subsurface soil (0 to 2 feet for SVOCs; 0 to 2 inch and 0 to 2 feet for metals) (mg/kg) (SL).
(b) Estimated average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS) / (ATN * BW).
(c) Estimated average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS) / (ATN * BW).
(d) Estimated average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS) / (ATN * BW).
(e) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfD.
(g) Hazard quotient for average daily intake from ingestion (QIG). QIG = IG / RfD.
(h) Hazard quotient for average daily intake from inhalation (QIH). QIH = IH / RfD.
(i) Hazard quotient for all exposure routes summed (QT). QT = QDA + QIG + QIH.

Table H-66: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Surface Soil, Former Thypin Steel Inc. Facility, Manorhaven, New York.
-- Adult Gardening Scenario -- RMEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Average Daily Intakes (mg/kg/day) by Exposure Route: Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Reference Dose: Oral (mg/kg/day) (RfDo) (e)	Inhalation (mg/kg/day) (RfDi) (e)	Hazard Quotient (HQ) by Exposure Route: Dermal Absorption (QDA) (f)	Ingestion (QIG) (g)	Inhalation (QIH) (h)	Sum of Estimated Potential HQs (All Relevant Exposure Routes) (QT) (i)
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	7.00E+0	1.29E-6	2.86E-6	1.31E-9	3.00E-1	NA	4.30E-6	9.52E-6	4.37E-9	1.38E-5
Benzo[a]pyrene	50328	5.80E+0	1.07E-6	2.37E-6	1.09E-9	3.00E-2	NA	3.56E-5	7.89E-5	3.62E-8	1.15E-4
Benzo[b]fluoranthene	205992	4.70E+0	8.66E-7	1.92E-6	8.81E-10	4.00E-2	NA	2.17E-5	4.80E-5	2.20E-8	6.96E-5
Dibenzo[a,h]anthracene	53703	2.10E+0	3.87E-7	8.57E-7	3.93E-10	3.00E-1	NA	1.29E-6	2.86E-6	1.31E-9	4.15E-6
Indeno[1,2,3-cd]pyrene	193395	4.10E+0	7.56E-7	1.67E-6	7.68E-10	3.00E-2	NA	2.52E-5	5.58E-5	2.56E-8	8.10E-5
METALS											
Arsenic	7440382	2.26E+1	1.25E-6	9.22E-6	4.23E-9	3.00E-4	NA	4.16E-3	3.07E-2	1.41E-5	3.49E-2

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate for adult (m3/hr) (IR)	= 1.53
Contact area-soil (percent) (CS)	= 0.28
Soil adherence (mg/cm^2) (S)	= 0.088
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 100
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 30
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 2
Exposed days-soil (days) (DS)	= 52
Averaging time noncarcinogens (days) (ATN)	= 182
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

(a) Concentration is the maximum concentration of chemical in subsurface soil (0 to 2 feet for SVOCs; 0 to 2 inch and 0 to 2 feet for metals) (mg/kg) (SL).
(b) Estimated average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS) / (ATN * BW).
(c) Estimated average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS) / (ATN * BW).
(d) Estimated average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS) / (ATN * BW).
(e) Reference doses for chronic exposure (RfDs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Hazard quotient for average daily intake from dermal exposure (QDA). QDA = DA / RfD.
(g) Hazard quotient for average daily intake from ingestion (QIG). QIG = IG/ RfD.
(h) Hazard quotient for average daily intake from inhalation (QIH). QIH = IH / RfD.
(i) Hazard quotient for all exposure routes summed (QT). QT = QDA + QIG + QIH.

Table H-67: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Surface Soil, Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Adult Gardening Scenario -- PAEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Lifetime Average Daily Intake (mg/kg/day)			Slope Factors $(mg/kg/day)^{-1}$		Incremental Lifetime Cancer Risk by Exposure Route			Sum of Estimated Potential ILCRs (All Relevant Exposure Routes) (ILCRT) (i)
			Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Oral (IG_CPF) (e)	Inhalation (IH_CPF) (e)	Dermal Absorption (ILCRDA) (f)	Ingestion (ILCRIG) (g)	Inhalation (ILCRIH) (h)	
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	1.39E+0	5.93E-9	9.11E-9	1.23E-12	7.30E-1	6.10E-1	4.33E-9	6.65E-9	7.50E-13	1.10E-8
Benzo[a]pyrene	50328	1.23E+0	5.23E-9	8.03E-9	1.08E-12	7.30E+0	3.10E+0	3.82E-8	5.86E-8	3.36E-12	9.68E-8
Benzo[b]fluoranthene	205992	1.03E+0	4.37E-9	6.72E-9	9.07E-13	7.30E-1	6.10E-1	3.19E-9	4.91E-9	5.53E-13	8.10E-9
Dibenzo[a,h]anthracene	53703	3.83E-1	1.63E-9	2.51E-9	3.38E-13	7.30E+0	6.10E+0	1.19E-8	1.83E-8	2.06E-12	3.02E-8
Indeno[1,2,3-cd]pyrene	193395	8.67E-1	3.69E-9	5.67E-9	7.66E-13	7.30E-1	6.10E-1	2.69E-9	4.14E-9	4.67E-13	6.84E-9
METALS											
Arsenic	7440382	4.00E+0	5.11E-9	2.62E-8	3.53E-12	1.50E+0	1.50E+1	7.67E-9	3.93E-8	5.30E-11	4.70E-8

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate for adult (m3/hr) (IR)	= 0.75
Contact area-soil (percent) (CS)	= 0.20
Soil adherence (mg/cm^2) (S)	= 0.088
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 50
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 18
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 1
Exposed days-soil (days) (DS)	= 26
Averaging time carcinogens (days) (ATC)	= 365
Exposure years (yrs) (EY)	= 9
Lifetime (yrs) (LT)	= 70
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

(a) Concentration is the arithmetic mean of the chemical concentration in subsurface soil (0 to 2 feet for SVOCs; 0 to 2 inch and 0 to 2 feet for metals)(mg/kg) (SL).
(b) Estimated lifetime average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS * EY) / (LT *ATC * BW).
(c) Estimated lifetime average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS * EY) / (LT * ATC * BW).
(d) Estimated lifetime average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS * EY) / (LT * ATC * BW).
(e) Carcinogenic potency factors (CPFs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from dermal exposure (ILCRDA). ILCRDA = DA * IG_CPF.
(g) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from ingestion (ILCRIG). ILCRIG = IG * IG_CPF.
(h) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from inhalation (ILCRIH). ILCRIH = IH * IH_CPF.
(i) Incremental lifetimecancer risk (ILCR) for all exposure routes summed (ILCRT). ILCRT = ILCRDA + ILCRIG + ILCRIH.

Table H-68: Estimated Baseline Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Surface Soil, Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Adult Gardening Scenario -- RMEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Lifetime Average Daily Intake (mg/kg/day)			Slope Factors $(mg/kg/day)^{-1}$		Incremental Lifetime Cancer Risk by Exposure Route			Sum of Estimated Potential ILCRs (All Relevant Exposure Routes) (ILCRT) (i)
			Dermal Absorption (DA) (b)	Ingestion (IG) (c)	Inhalation (IH) (d)	Oral (IG_CPF) (e)	Inhalation (IH_CPF) (e)	Dermal Absorption (ILCRDA) (f)	Ingestion (ILCRIG) (g)	Inhalation (ILCRIH) (h)	
SEMIVOLATILE ORGANIC COMPOUNDS											
Benzo[a]anthracene	56553	7.00E+0	2.76E-7	6.11E-7	2.80E-10	7.30E-1	6.10E-1	2.01E-7	4.46E-7	1.71E-10	6.47E-7
Benzo[a]pyrene	50328	5.80E+0	2.28E-7	5.06E-7	2.32E-10	7.30E+0	3.10E+0	1.67E-6	3.69E-6	7.20E-10	5.36E-6
Benzo[b]fluoranthene	205992	4.70E+0	1.85E-7	4.10E-7	1.88E-10	7.30E-1	6.10E-1	1.35E-7	2.99E-7	1.15E-10	4.34E-7
Dibenzo[a,h]anthracene	53703	2.10E+0	8.27E-8	1.83E-7	8.41E-11	7.30E+0	6.10E+0	6.04E-7	1.34E-6	5.13E-10	1.94E-6
Indeno[1,2,3-cd]pyrene	193395	4.10E+0	1.61E-7	3.58E-7	1.64E-10	7.30E-1	6.10E-1	1.18E-7	2.61E-7	1.00E-10	3.79E-7
METALS											
Arsenic	7440382	2.26E+1	2.67E-7	1.97E-6	9.05E-10	1.50E+0	1.50E+1	4.01E-7	2.96E-6	1.36E-8	3.37E-6

Assumptions Used for Estimating Daily Intake and Associated Risks:

Body weight (kg) (BW)	= 70
Height (cm) (HT)	= 175
Body surface area (cm^2) (SA)	= 1.85E+4
Inhalation rate for adult (m3/hr) (IR)	= 1.53
Contact area-soil (percent) (CS)	= 0.28
Soil adherence (mg/cm^2) (S)	= 0.088
Skin absorption factor-metals (AFM)	= 0.03
Skin absorption factor-SVOCs (AS)	= 0.1
Soil ingestion rate (mg/day) (IS)	= 100
GI absorption factor-soil/sediment (GIS)	= 1
Particulate matter ($\mu g/m^3$) (PM)	= 30
Pulmonary retention factor (PF)	= 0.5
Exposed hours-inhalation (hrs/day) (HH)	= 2
Exposed days-soil (days/year) (DS)	= 52
Averaging time carcinogens (days) (ATC)	= 365
Exposure years (yrs) (EY)	= 30
Lifetime (yrs) (LT)	= 70
Conversion factor (kg/mg) (F)	= 1.00E-6
Conversion factor (mg/µg) (X)	= 1.00E-3

Notes and Equations Used for Estimating Intakes:

(a) Concentration is the maximum concentration of chemical in subsurface soil (0 to 2 feet for SVOCs; 0 to 2 inch and 0 to 2 feet for metals) (mg/kg) (SL).
(b) Estimated lifetime average daily intake via dermal absorption (DA). DA = (SL * SA * CS * S * F * {AS or AFM} * DS * EY) / (LT *ATC * BW).
(c) Estimated lifetime average daily intake via ingestion (IG). IG = (SL * IS * F * GIS * DS * EY) / (LT * ATC * BW).
(d) Estimated lifetime average daily intake via inhalation (IH). IH = (SL * F * PM * X * IR * HH * PF * DS * EY) / (LT * ATC * BW).
(e) Carcinogenic potency factors (CPFs) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(f) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from dermal exposure (ILCRDA). ILCRDA = DA * IG_CPF.
(g) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from ingestion (ILCRIG). ILCRIG = IG * IG_CPF.
(h) Incremental lifetimecancer risk (ILCR) for lifetime average daily intake from inhalation (ILCRIH). ILCRIH = IH * IH_CPF.
(i) Incremental lifetimecancer risk (ILCR) for all exposure routes summed (ILCRT). ILCRT = ILCRDA + ILCRIG + ILCRIH.

Table H-69: Predicted Average Concentration in Above-Ground Produce and Root Vegetables from Subsurface Soil at the Former Thypin Steel Inc. Facility, Manorhaven, New York.

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Octanol Water Partition Coefficient (LogKow) (b)	Organic Carbon Partition Coefficient (Koc) (c)	Root Concentration Factor Organics (RCF) (d)	Above Ground Plant-Soil Bioconcentration Factor (ACF) (e)	Root Vegetable Concentration (mg/kg DW) (RVC) (f)	Above Ground Produce Concentration (mg/kg DW) (APC) (g)
SEMIVOLATILE ORGANIC COMPOUNDS								
Benzo[a]anthracene	56553	1.39E+0	5.91E+0	1.02E+5	1.07E+3	1.49E-2	6.86E-1	2.07E-2
Benzo[a]pyrene	50328	1.23E+0	6.04E+0	1.31E+5	1.35E+3	1.25E-2	5.93E-1	1.53E-2
Benzo[b]fluoranthene	205992	1.03E+0	5.80E+0	8.30E+4	8.83E+2	1.72E-2	5.12E-1	1.77E-2
Dibenzo[a,h]anthracene	53703	3.83E-1	6.75E+0	4.99E+5	4.76E+3	4.86E-3	1.71E-1	1.86E-3
Indeno[1,2,3-cd]pyrene	193395	8.67E-1	7.00E+0	8.00E+5	7.41E+3	3.48E-3	3.76E-1	3.02E-3
METALS								
Arsenic	7440382	4.00E+0	NA	NA	8.00E-3	3.60E-2	3.20E-2	1.44E-1

Assumptions Used for Estimating Fruit and Vegetable Concentrations:

Empirical correction factor for root vegetables (VG) = 0.01
Fraction of organic carbon (foc) = 0.002
Fresh to dry conversion factor for vegetables (kg plant DW/kg plant FW) (CV) = 0.11

Notes and Equations Used for Estimating Intakes:

mg/kg is miligrams per kilogram.
DW is dry weight.
FW is fresh weight.
(a) Concentration is the average concentration of chemical in subsurface soil (mg/kg, 0 to 2 feet below land surface) (SL).
(b) The logarithm of the octano-water partition coefficient (Kow) (unitless) (Gustafson *et al*., 1997)
(c) The organic carbon partition coefficients (Koc) were provided by (Gustafson *et al.*, 1997), values not listed were estimated using the relationship Log Koc = 0.937 * Log Kow - 0.006 (L/kg) (Gustafson *et al.*, 1997).
(d) Root concentration factors for organics (RCF) were estimated using an equation provided by USEPA (1996a) for dioxins. Log RCF = 0.77 * Log Kow - 1.52. Units are in [mg chemical/kg plant tissue FW]/[mg chemical/L soil pore water]. Root concentration factors for metals (RCFm) were provided by USEPA (1996a). Units are in [mg chemical/kg plant tissue DW]/[mg chemical/kg soil].
(e) Above ground produce bioconcentration factors (ACF) for organics were calculated using an equation provided by Travis and Arms (1988). Log (ACF) = 1.588 - 0.578 Log Kow. ACFs for metals were provided by USEPA (1996). Units are [mg chemical/kg plant tissue DW]/[mg chemical/kg soil]
(f) Estimated root vegetable concentration (RVC) for organic compounds is RVC = (SL * RCF * VG)/(Koc * FOC * CV) (mg/kg DW). Estimated RVCs for metals is RVC = SL * RCF. (mg/kg DW).
(g) Estimated concentrations in above ground produce (APC) for all chemicals. APC = SL * ACF. (mg/kg DW).

Table H-70: Predicted Maximum Concentration in Above-Ground Produce and Root Vegetables from Subsurface Soil at the Former Thypin Steel Inc. Facility, Manorhaven, New York.

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Octanol Water Partition Coefficient (LogKow) (b)	Organic Carbon Partition Coefficient (Koc) (c)	Root Concentration Factor Organics (RCF) (d)	Above Ground Plant-Soil Bioconcentration Factor (ACF) (e)	Root Vegetable Concentration (mg/kg DW) (RVC) (f)	Above Ground Produce Concentration (mg/kg DW) (APC) (g)
SEMIVOLATILE ORGANIC COMPOUNDS								
Benzo[a]anthracene	56553	7.00E+0	5.91E+0	1.02E+5	1.07E+3	1.49E-2	3.45E+0	1.04E-1
Benzo[a]pyrene	50328	5.80E+0	6.04E+0	1.31E+5	1.35E+3	1.25E-2	2.80E+0	7.25E-2
Benzo[b]fluoranthene	205992	4.70E+0	5.80E+0	8.30E+4	8.83E+2	1.72E-2	2.34E+0	8.09E-2
Dibenzo[a,h]anthracene	53703	2.10E+0	6.75E+0	4.99E+5	4.76E+3	4.86E-3	9.38E-1	1.02E-2
Indeno[1,2,3-cd]pyrene	193395	4.10E+0	7.00E+0	8.00E+5	7.41E+3	3.48E-3	1.78E+0	1.43E-2
METALS								
Arsenic	7440382	2.26E+1	NA	NA	8.00E-3	3.60E-2	1.81E-1	8.14E-1

Assumptions Used for Estimating Fruit and Vegetable Concentrations:

Empirical correction factor for root vegetables (VG) = 0.01
Fraction of organic carbon (foc) = 0.002
Fresh to dry conversion factor for vegetables (kg plant DW/kg plant FW) (CV) = 0.11

Notes and Equations Used for Estimating Intakes:

mg/kg is miligrams per kilogram.
DW is dry weight.
FW is fresh weight.
(a) Concentration is the maximum concentration of chemical in subsurface soil (mg/kg, 0 to 2 feet below land surface) (SL).
(b) The logarithm of the octano-water partition coefficient (Kow) (unitless) (Gustafson *et al*., 1997)
(c) The organic carbon partition coefficients (Koc) were provided by (Gustafson *et al.*, 1997), values not listed were estimated using the relationship Log Koc = 0.937 * Log Kow - 0.006 (L/kg) (Gustafson *et al.*, 1997).
(d) Root concentration factors for organics (RCF) were estimated using an equation provided by USEPA (1996a) for dioxins. Log RCF = 0.77 * Log Kow - 1.52. Units are in [mg chemical/kg plant tissue FW]/[mg chemical/L soil pore water]. Root concentration factors for metals (RCFm) were provided by USEPA (1996a). Units are in [mg chemical/kg plant tissue DW]/[mg chemical/kg soil].
(e) Above ground produce bioconcentration factors (ACF) for organics were calculated using an equation provided by Travis and Arms (1988). Log (ACF) = 1.588 - 0.578 Log Kow. ACFs for metals were provided by USEPA (1996). Units are [mg chemical/kg plant tissue DW]/[mg chemical/kg soil]
(f) Estimated root vegetable concentration (RVC) for organic compounds is RVC = (SL * RCF * VG)/(Koc * FOC * CV) (mg/kg DW). Estimated RVCs for metals is RVC = SL * RCF. (mg/kg DW).
(g) Estimated concentrations in above ground produce (APC) for all chemicals. APC = SL * ACF. (mg/kg DW).

Table H-71: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Subsurface Soil at the Former Thypin Steel Inc. Facility, Manorhaven, New York -- Young Child Vegetable Scenario -- PAEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Root Vegetable Concentration (mg/kg DW) (RVC) (b)	Above Ground Produce Concentration (mg/kg DW) (APC) (c)	Average Daily Intakes (mg/kg/day) of Chemical by Food Type			Reference Dose	Hazard Quotient (HQ) (h)
					Root Vegetable (ADIrv) (d)	Above-Ground Fruit (ADIf) (e)	Above-Ground Vegetable (ADIav) (f)	Oral (mg/kg/day) (RfD) (g)	
SEMIVOLATILE ORGANIC COMPOUNDS									
Benzo[a]anthracene	56553	1.39E+0	6.86E-1	2.07E-2	7.85E-6	6.87E-8	1.14E-7	3.00E-1	2.68E-5
Benzo[a]pyrene	50328	1.23E+0	5.93E-1	1.53E-2	6.79E-6	5.10E-8	8.49E-8	3.00E-2	2.31E-4
Benzo[b]fluoranthene	205992	1.03E+0	5.12E-1	1.77E-2	5.86E-6	5.87E-8	9.77E-8	4.00E-2	1.50E-4
Dibenzo[a,h]anthracene	53703	3.83E-1	1.71E-1	1.86E-3	1.96E-6	6.18E-9	1.03E-8	3.00E-1	6.58E-6
Indeno[1,2,3-cd]pyrene	193395	8.67E-1	3.76E-1	3.02E-3	4.31E-6	1.00E-8	1.67E-8	3.00E-2	1.44E-4
METALS									
Arsenic	7440382	4.00E+0	3.20E-2	1.44E-1	3.66E-7	4.79E-7	7.97E-7	3.00E-4	5.47E-3

Assumptions Used for Estimating Daily Intake and Associated Risks, as described on Table 2:

			Comments
Body weight (kg) (BW)	=	15	
Root vegetable ingestion rate (kg dry/day) (RVI)	=	5.15E-03	Root vegetables plus potatoes
Fruit ingestion rate (kg dry/day) (FI)	=	1.50E-03	
Above ground vegetable ingestion rate (kg dry/day) (AVI)	=	2.49E-03	Leafy, legumes and mushrooms vegetables
GI absorption factor-food (GIS)	=	0.8	
Fraction of consumption that is homegrown (FH)	=	0.25	
Days consuming homegrown vegetables (days) (DE)	=	20	
Averaging time noncarcinogens (days) (ATN)	=	120	

Notes and Equations Used for Estimating Intakes:

mg/kg is miligrams per kilogram.
DW is dry weight.
(a) Concentration is the average concentration of chemical in subsurface soil (mg/kg, 0 to 2 feet below land surface) (SL).
(b) Estimated root vegetable concentration (RVC) (Table H-69).
(c) Estimated concentrations in above ground produce (APC) (Table H-69).
(d) Average daily intake of chemicals via ingestion of homegrown root vegetables (ADIrv). ADIrv = (RVC * RVI * GIS * DE * FH) / (BW *ATN).
(e) Average daily intake of chemicals via ingestion of homegrown fruits (ADIf). ADIf = (APC * FI * GIS * DE * FH) / (BW *ATN).
(f) Average daily intake of chemicals via ingestion of homegrown above-ground vegetables (ADIav). ADIav = (APC *AVI * GIS * DE * FH) / (BW *ATN).
(g) Reference doses for chronic exposure (RfD) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(h) Hazard quotient for exposure to chemicals via combined vegetable types (HQ). HQ = (ADIrv + ADIf + ADIav) / RfD.

Table H-72: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Subsurface Soil at the Former Thypin Steel Inc. Facility, Manorhaven, New York -- Young Child Vegetable Scenario -- RMEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Root Vegetable Concentration (mg/kg DW) (RVC) (b)	Above Ground Produce Concentration (mg/kg DW) (APC) (c)	Average Daily Intakes (mg/kg/day) of Chemical by Food Type: Root Vegetable (ADIrv) (d)	Above-Ground Fruit (ADIf) (e)	Above-Ground Vegetable (ADIav) (f)	Reference Dose Oral (mg/kg/day) (RfD) (g)	Hazard Quotient (HQ) (h)
SEMIVOLATILE ORGANIC COMPOUNDS									
Benzo[a]anthracene	56553	7.00E+0	3.45E+0	1.04E-1	5.92E-5	5.18E-7	8.63E-7	3.00E-1	2.02E-4
Benzo[a]pyrene	50328	5.80E+0	2.80E+0	7.25E-2	4.81E-5	3.61E-7	6.01E-7	3.00E-2	1.64E-3
Benzo[b]fluoranthene	205992	4.70E+0	2.34E+0	8.09E-2	4.02E-5	4.03E-7	6.71E-7	4.00E-2	1.03E-3
Dibenzo[a,h]anthracene	53703	2.10E+0	9.38E-1	1.02E-2	1.61E-5	5.08E-8	8.46E-8	3.00E-1	5.41E-5
Indeno[1,2,3-cd]pyrene	193395	4.10E+0	1.78E+0	1.43E-2	3.05E-5	7.12E-8	1.18E-7	3.00E-2	1.02E-3
METALS									
Arsenic	7440382	2.26E+1	1.81E-1	8.14E-1	3.10E-6	4.05E-6	6.75E-6	3.00E-4	4.64E-2

Assumptions Used for Estimating Daily Intake and Associated Risks

			Comments
Body weight (kg) (BW)	=	15	
Root vegetable ingestion rate (kg dry/day) (RVI)	=	5.15E-03	Root vegetables plus potatoes
Fruit ingestion rate (kg dry/day) (FI)	=	1.50E-03	
Above ground vegetable ingestion rate (kg dry/day) (AVI)	=	2.49E-03	Leafy, legumes and mushrooms vegetables
GI absorption factor-food (GIS)	=	0.8	
Fraction of consumption that is homegrown (FH)	=	0.25	
Days consuming homegrown vegetables (days) (DE)	=	30	
Averaging time noncarcinogens (days) (ATN)	=	120	

Notes and Equations Used for Estimating Intakes:

mg/kg is miligrams per kilogram.
DW is dry weight.
(a) Concentration is the maximum concentration of chemical in subsurface soil (mg/kg, 0 to 2 feet below land surface) (SL).
(b) Estimated root vegetable concentration (RVC) (Table H-70).
(c) Estimated concentrations in above ground produce (APC) (Table H-70).
(d) Average daily intake of chemicals via ingestion of homegrown root vegetables (ADIrv). ADIrv = (RVC * RVI * GIS * DE * FH) / (BW *ATN).
(e) Average daily intake of chemicals via ingestion of homegrown fruits (ADIf). ADIf = (APC * FI * GIS * DE * FH) / (BW *ATN).
(f) Average daily intake of chemicals via ingestion of homegrown above-ground vegetables (ADIav). ADIav = (APC *AVI * GIS * DE * FH) / (BW *ATN).
(g) Reference doses for chronic exposure (RfD) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(h) Hazard quotient for exposure to chemicals via combined vegetable types (HQ). HQ = (ADIrv + ADIf + ADIav) / RfD.

Table H-73: Estimated Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Subsurface Soil at the Former Thypin Steel Inc. Facility, Manorhaven, New York -- Young Child Vegetable Scenario -- PAEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Root Vegetable Concentration (mg/kg DW) (RVC) (b)	Above Ground Fruit or Vegetable Concentration (mg/kg DW) (APC) (c)	Lifetime Average Daily Intakes (mg/kg/day) of Chemical by Food Type			Slope Factor	Incremental Lifetime Cancer Risk
					Root Vegetable (LADIrv) (d)	Above-Ground Fruit (LADIf) (e)	Above-Ground Vegetable (LADIav) (f)	Oral (mg/kg/day) $^{-1}$ (CPF) (g)	(ILCR) (h)
SEMIVOLATILE ORGANIC COMPOUNDS									
Benzo[a]anthracene	56553	1.39E+0	6.86E-1	2.07E-2	1.11E-7	9.68E-10	1.61E-9	7.30E-1	8.26E-8
Benzo[a]pyrene	50328	1.23E+0	5.93E-1	1.53E-2	9.56E-8	7.18E-10	1.20E-9	7.30E+0	7.12E-7
Benzo[b]fluoranthene	205992	1.03E+0	5.12E-1	1.77E-2	8.25E-8	8.27E-10	1.38E-9	7.30E-1	6.19E-8
Dibenzo[a,h]anthracene	53703	3.83E-1	1.71E-1	1.86E-3	2.76E-8	8.71E-11	1.45E-10	7.30E+0	2.03E-7
Indeno[1,2,3-cd]pyrene	193395	8.67E-1	3.76E-1	3.02E-3	6.07E-8	1.41E-10	2.35E-10	7.30E-1	4.46E-8
METALS									
Arsenic	7440382	4.00E+0	3.20E-2	1.44E-1	5.16E-9	6.74E-9	1.12E-8	1.50E+0	3.47E-8

Assumptions Used for Estimating Daily Intake and Associated Risks, as described on Table 2:

			Comments
Body weight (kg) (BW)	=	15	
Root vegetable ingestion rate (kg dry/day) (RVI)	=	5.15E-03	Root vegetables plus potatoes
Fruit ingestion rate (kg dry/day) (FI)	=	1.50E-03	
Above ground vegetable ingestion rate (kg dry/day) (AVI)	=	2.49E-03	Leafy, legumes and mushrooms vegetables
GI absorption factor-food (GIS)	=	0.8	
Fraction of consumption that is homegrown (FH)	=	0.25	
Exposure days (DE) (days)	=	20	
Averaging time carcinogens (days) (ATC)	=	365	
Exposure Years (years) (EY)	=	3	
Lifetime (LT) (years)	=	70	

Notes and Equations Used for Estimating Intakes:

mg/kg is miligrams per kilogram.
DW is dry weight.
(a) Concentration is the average concentration of chemical in subsurface soil (mg/kg, 0 to 2 feet below land surface) (SL).
(b) Estimated root vegetable concentration (RVC) (Table H-69).
(c) Estimated concentrations in above ground produce (APC) (Table H-69).
(d) Lifetime average daily intake of chemicals via homegrown root vegetables (LADIr). For metals, LADIr = (RVC * RVI * GIS * DE * FH * EY) / (BW *ATN * LT).
For organics, LADIr = (RVC * RVI * GIS *DE * FH * EY) / (CVV * BW * ATN * LT).
(e) Lifetime average daily intake of chemicals via homegrown fruits (LADIf). LADf = (APC * FI * GIS * DE * FH * EY) / (BW *ATN * LT).
(f) Lifetime average daily intake of chemicals via homegrown above ground vegetables (LADIv). LADIv = (APC *AVI * GIS * DE * FH * EY) / (BW * ATN * LT).
(g) Carcinogenic potency factors (CPF) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(h) Incremental lifetime cancer risk (ILCR) via combinedl vegetable types (ILCR). ILCR = (LADAr + LADIf + LADIv) * CPF.

Table H-74: Estimated Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Subsurface Soil at the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Young Child Vegetable Scenario -- RMEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Root Vegetable Concentration (mg/kg DW) (RVC) (b)	Above Ground Fruit or Vegetable Concentration (mg/kg DW) (APC) (c)	Lifetime Average Daily Intakes (mg/kg/day) of Chemical by Food Type: Root Vegetable (LADIrv) (d)	Above-Ground Fruit (LADIf) (e)	Above-Ground Vegetable (LADIav) (f)	Slope Factor Oral (mg/kg/day) $^{-1}$ (CPF) (g)	Incremental Lifetime Cancer Risk (ILCR) (h)
SEMIVOLATILE ORGANIC COMPOUNDS									
Benzo[a]anthracene	56553	7.00E+0	3.45E+0	1.04E-1	1.67E-6	1.46E-8	2.43E-8	7.30E-1	1.25E-6
Benzo[a]pyrene	50328	5.80E+0	2.80E+0	7.25E-2	1.36E-6	1.02E-8	1.69E-8	7.30E+0	1.01E-5
Benzo[b]fluoranthene	205992	4.70E+0	2.34E+0	8.09E-2	1.13E-6	1.14E-8	1.89E-8	7.30E-1	8.49E-7
Dibenzo[a,h]anthracene	53703	2.10E+0	9.38E-1	1.02E-2	4.54E-7	1.43E-9	2.39E-9	7.30E+0	3.34E-6
Indeno[1,2,3-cd]pyrene	193395	4.10E+0	1.78E+0	1.43E-2	8.61E-7	2.01E-9	3.34E-9	7.30E-1	6.32E-7
METALS									
Arsenic	7440382	2.26E+1	1.81E-1	8.14E-1	8.75E-8	1.14E-7	1.90E-7	1.50E+0	5.88E-7

Assumptions Used for Estimating Daily Intake and Associated Risks

			Comments
Body weight (kg) (BW)	=	15	
Root vegetable ingestion rate (kg dry/day) (RVI)	=	5.15E-03	Root vegetables plus potatoes
Fruit ingestion rate (kg dry/day) (FI)	=	1.50E-03	
Above ground vegetable ingestion rate (kg dry/day) (AVI)	=	2.49E-03	Leafy, legumes and mushrooms vegetables
GI absorption factor-food (GIS)	=	0.8	
Fraction of consumption that is homegrown (FH)	=	0.25	
Exposure days (DE) (days)	=	30	
Averaging time carcinogens (days) (ATC)	=	365	
Exposure Years (years) (EY)	=	6	
Lifetime (LT) (years)	=	70	

Notes and Equations Used for Estimating Intakes:

mg/kg is miligrams per kilogram.
DW is dry weight.
(a) Concentration is the maximum concentration of chemical in subsurface soil (mg/kg, 0 to 2 feet below land surface) (SL).
(b) Estimated root vegetable concentration (RVC) (Table H-70).
(c) Estimated concentrations in above ground produce (APC) (Table H-70).
(d) Lifetime average daily intake of chemicals via homegrown root vegetables (LADIr). For metals, LADIr = (RVC * RVI * GIS * DE * FH * EY) / (BW *ATN * LT).
For organics, LADIr = (RVC * RVI * GIS *DE * FH * EY) / (CVV * BW * ATN * LT).
(e) Lifetime average daily intake of chemicals via homegrown fruits (LADIf). LADf = (APC * FI * GIS * DE * FH * EY) / (BW *ATN * LT).
(f) Lifetime average daily intake of chemicals via homegrown above ground vegetables (LADIv). LADIv = (APC *AVI * GIS * DE * FH * EY) / (BW * ATN * LT).
(g) Carcinogenic potency factors (CPF) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(h) Incremental lifetime cancer risk (ILCR) via combinedl vegetable types (ILCR). ILCR = (LADAr + LADIf + LADIv) * CPF.

Table H-75: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Subsurface Soil at the Former Thypin Steel Inc. Facility, Manorhaven, New York.-- Youth Vegetable Scenario -- PAEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Root Vegetable Concentration (mg/kg DW) (RVC) (b)	Above Ground Produce Concentration (mg/kg DW) (APC) (c)	Average Daily Intakes (mg/kg/day) of Chemical by Food Type			Reference Dose	Hazard Quotient (HQ) (h)
					Root Vegetable (ADIrv) (d)	Above-Ground Fruit (ADIf) (e)	Above-Ground Vegetable (ADIav) (f)	Oral (mg/kg/day) (RfD) (g)	
SEMIVOLATILE ORGANIC COMPOUNDS									
Benzo[a]anthracene	56553	1.39E+0	6.86E-1	2.07E-2	1.15E-5	5.79E-8	1.60E-7	3.00E-1	3.90E-5
Benzo[a]pyrene	50328	1.23E+0	5.93E-1	1.53E-2	9.93E-6	4.29E-8	1.19E-7	3.00E-2	3.36E-4
Benzo[b]fluoranthene	205992	1.03E+0	5.12E-1	1.77E-2	8.57E-6	4.94E-8	1.37E-7	4.00E-2	2.19E-4
Dibenzo[a,h]anthracene	53703	3.83E-1	1.71E-1	1.86E-3	2.86E-6	5.20E-9	1.44E-8	3.00E-1	9.61E-6
Indeno[1,2,3-cd]pyrene	193395	8.67E-1	3.76E-1	3.02E-3	6.30E-6	8.44E-9	2.34E-8	3.00E-2	2.11E-4
METALS									
Arsenic	7440382	4.00E+0	3.20E-2	1.44E-1	5.36E-7	4.03E-7	1.11E-6	3.00E-4	6.85E-3

Assumptions Used for Estimating Daily Intake and Associated Risks, as described on Table 2:

			Comments
Body weight (kg) (BW)	=	36	
Root vegetable ingestion rate (kg dry/day) (RVI)	=	1.81E-02	Root vegetables plus potatoes
Fruit ingestion rate (kg dry/day) (FI)	=	3.02E-03	
Above ground vegetable ingestion rate (kg dry/day) (AVI)	=	8.36E-03	Leafy, legumes and mushrooms vegetables
GI absorption factor-food (GIS)	=	0.8	
Fraction of consumption that is homegrown (FH)	=	0.25	
Days consuming homegrown vegetables (days) (DE)	=	20	
Averaging time noncarcinogens (days) (ATN)	=	120	

Notes and Equations Used for Estimating Intakes:

mg/kg is miligrams per kilogram.
DW is dry weight.
(a) Concentration is the average concentration of chemical in subsurface soil (mg/kg, 0 to 2 feet below land surface) (SL).
(b) Estimated root vegetable concentration (RVC) (Table H-69).
(c) Estimated concentrations in above ground produce (APC) (Table H-69).
(d) Average daily intake of chemicals via ingestion of homegrown root vegetables (ADIrv). ADIrv = (RVC * RVI * GIS * DE * FH) / (BW *ATN).
(e) Average daily intake of chemicals via ingestion of homegrown fruits (ADIf). ADIf = (APC * FI * GIS * DE * FH) / (BW *ATN).
(f) Average daily intake of chemicals via ingestion of homegrown above-ground vegetables (ADIav). ADIav = (APC *AVI * GIS * DE * FH) / (BW *ATN).
(g) Reference doses for chronic exposure (RfD) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(h) Hazard quotient for exposure to chemicals via combined vegetable types (HQ). HQ = (ADIrv + ADIf + ADIav) / RfD.

Table H-76: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Subsurface Soil at the Former Thypin Steel Inc. Facility, Manorhaven, New York -- Youth Vegetable Scenario -- RMEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Root Vegetable Concentration (mg/kg DW) (RVC) (b)	Above Ground Produce Concentration (mg/kg DW) (APC) (c)	Average Daily Intakes (mg/kg/day) of Chemical by Food Type: Root Vegetable (ADIrv) (d)	Above-Ground Fruit (ADIf) (e)	Above-Ground Vegetable (ADIav) (f)	Reference Dose Oral (mg/kg/day) (RfD) (g)	Hazard Quotient (HQ) (h)
SEMIVOLATILE ORGANIC COMPOUNDS									
Benzo[a]anthracene	56553	7.00E+0	3.45E+0	1.04E-1	8.67E-5	4.36E-7	1.21E-6	3.00E-1	2.94E-4
Benzo[a]pyrene	50328	5.80E+0	2.80E+0	7.25E-2	7.04E-5	3.04E-7	8.41E-7	3.00E-2	2.38E-3
Benzo[b]fluoranthene	205992	4.70E+0	2.34E+0	8.09E-2	5.88E-5	3.39E-7	9.38E-7	4.00E-2	1.50E-3
Dibenzo[a,h]anthracene	53703	2.10E+0	9.38E-1	1.02E-2	2.36E-5	4.28E-8	1.18E-7	3.00E-1	7.91E-5
Indeno[1,2,3-cd]pyrene	193395	4.10E+0	1.78E+0	1.43E-2	4.47E-5	5.99E-8	1.66E-7	3.00E-2	1.50E-3
METALS									
Arsenic	7440382	2.26E+1	1.81E-1	8.14E-1	4.54E-6	3.41E-6	9.44E-6	3.00E-4	5.80E-2

Assumptions Used for Estimating Daily Intake and Associated Risks

			Comments
Body weight (kg) (BW)	=	36	
Root vegetable ingestion rate (kg dry/day) (RVI)	=	1.81E-02	Root vegetables plus potatoes
Fruit ingestion rate (kg dry/day) (FI)	=	3.02E-03	
Above ground vegetable ingestion rate (kg dry/day) (AVI)	=	8.36E-03	Leafy, legumes and mushrooms vegetables
GI absorption factor-food (GIS)	=	0.8	
Fraction of consumption that is homegrown (FH)	=	0.25	
Days consuming homegrown vegetables (days) (DE)	=	30	
Averaging time noncarcinogens (days) (ATN)	=	120	

Notes and Equations Used for Estimating Intakes:

mg/kg is miligrams per kilogram.
DW is dry weight.
(a) Concentration is the maximum concentration of chemical in subsurface soil (mg/kg, 0 to 2 feet below land surface) (SL).
(b) Estimated root vegetable concentration (RVC) (Table H-70).
(c) Estimated concentrations in above ground produce (APC) (Table H-70).
(d) Average daily intake of chemicals via ingestion of homegrown root vegetables (ADIrv). ADIrv = (RVC * RVI * GIS * DE * FH) / (BW *ATN).
(e) Average daily intake of chemicals via ingestion of homegrown fruits (ADIf). ADIf = (APC * FI * GIS * DE * FH) / (BW *ATN).
(f) Average daily intake of chemicals via ingestion of homegrown above-ground vegetables (ADIav). ADIav = (APC *AVI * GIS * DE * FH) / (BW *ATN).
(g) Reference doses for chronic exposure (RfD) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(h) Hazard quotient for exposure to chemicals via combined vegetable types (HQ). HQ = (ADIrv + ADIf + ADIav) / RfD.

Table H-77: Estimated Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Subsurface Soil at the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Youth Vegetable Scenario -- PAEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Root Vegetable Concentration (mg/kg DW) (RVC) (b)	Above Ground Fruit or Vegetable Concentration (mg/kg DW) (APC) (c)	Lifetime Average Daily Intakes (mg/kg/day) of Chemical by Food Type			Slope Factor	Incremental Lifetime Cancer Risk
					Root Vegetable (LADIrv) (d)	Above-Ground Fruit (LADIf) (e)	Above-Ground Vegetable (LADIav) (f)	Oral (mg/kg/day) $^{-1}$ (CPF) (g)	(ILCR) (h)
SEMIVOLATILE ORGANIC COMPOUNDS									
Benzo[a]anthracene	56553	1.39E+0	6.86E-1	2.07E-2	3.24E-7	1.63E-9	4.51E-9	7.30E-1	2.41E-7
Benzo[a]pyrene	50328	1.23E+0	5.93E-1	1.53E-2	2.80E-7	1.21E-9	3.34E-9	7.30E+0	2.08E-6
Benzo[b]fluoranthene	205992	1.03E+0	5.12E-1	1.77E-2	2.42E-7	1.39E-9	3.85E-9	7.30E-1	1.80E-7
Dibenzo[a,h]anthracene	53703	3.83E-1	1.71E-1	1.86E-3	8.07E-8	1.47E-10	4.06E-10	7.30E+0	5.93E-7
Indeno[1,2,3-cd]pyrene	193395	8.67E-1	3.76E-1	3.02E-3	1.78E-7	2.38E-10	6.58E-10	7.30E-1	1.30E-7
METALS									
Arsenic	7440382	4.00E+0	3.20E-2	1.44E-1	1.51E-8	1.14E-8	3.14E-8	1.50E+0	8.68E-8

Assumptions Used for Estimating Daily Intake and Associated Risks, as described on Table 2:

			Comments
Body weight (kg) (BW)	=	36	
Root vegetable ingestion rate (kg dry/day) (RVI)	=	1.81E-02	Root vegetables plus potatoes
Fruit ingestion rate (kg dry/day) (FI)	=	3.02E-03	
Above ground vegetable ingestion rate (kg dry/day) (AVI)	=	8.36E-03	Leafy, legumes and mushrooms vegetables
GI absorption factor-food (GIS)	=	0.8	
Fraction of consumption that is homegrown (FH)	=	0.25	
Exposure days (DE) (days)	=	20	
Averaging time carcinogens (days) (ATC)	=	365	
Exposure Years (years) (EY)	=	6	
Lifetime (LT) (years)	=	70	

Notes and Equations Used for Estimating Intakes:

mg/kg is miligrams per kilogram.
DW is dry weight.
(a) Concentration is the average concentration of chemical in subsurface soil (mg/kg, 0 to 2 feet below land surface) (SL).
(b) Estimated root vegetable concentration (RVC) (Table H-69).
(c) Estimated concentrations in above ground produce (APC) (Table H-69).
(d) Lifetime average daily intake of chemicals via homegrown root vegetables (LADIr). For metals, LADIr = (RVC * RVI * GIS * DE * FH * EY) / (BW *ATN * LT).
For organics, LADIr = (RVC * RVI * GIS *DE * FH * EY) / (CVV * BW * ATN * LT).
(e) Lifetime average daily intake of chemicals via homegrown fruits (LADIf). LADf = (APC * FI * GIS * DE * FH * EY) / (BW *ATN * LT).
(f) Lifetime average daily intake of chemicals via homegrown above ground vegetables (LADIv). LADIv = (APC *AVI * GIS * DE * FH * EY) / (BW * ATN * LT).
(g) Carcinogenic potency factors (CPF) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(h) Incremental lifetime cancer risk (ILCR) via combinedl vegetable types (ILCR). ILCR = (LADAr + LADIf + LADIv) * CPF.

Table H-78: Estimated Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Subsurface Soil at the Former Thypin Steel Inc. Facility, Manorhaven, New York -- Youth Vegetable Scenario -- RMEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Root Vegetable Concentration (mg/kg DW) (RVC) (b)	Above Ground Fruit or Vegetable Concentration (mg/kg DW) (APC) (c)	Lifetime Average Daily Intakes (mg/kg/day) of Chemical by Food Type: Root Vegetable (LADIrv) (d)	Above-Ground Fruit (LADIf) (e)	Above-Ground Vegetable (LADIav) (f)	Slope Factor Oral (mg/kg/day) $^{-1}$ (CPF) (g)	Incremental Lifetime Cancer Risk (ILCR) (h)
SEMIVOLATILE ORGANIC COMPOUNDS									
Benzo[a]anthracene	56553	7.00E+0	3.45E+0	1.04E-1	4.88E-6	2.46E-8	6.80E-8	7.30E-1	3.63E-6
Benzo[a]pyrene	50328	5.80E+0	2.80E+0	7.25E-2	3.97E-6	1.71E-8	4.74E-8	7.30E+0	2.94E-5
Benzo[b]fluoranthene	205992	4.70E+0	2.34E+0	8.09E-2	3.32E-6	1.91E-8	5.29E-8	7.30E-1	2.47E-6
Dibenzo[a,h]anthracene	53703	2.10E+0	9.38E-1	1.02E-2	1.33E-6	2.41E-9	6.67E-9	7.30E+0	9.76E-6
Indeno[1,2,3-cd]pyrene	193395	4.10E+0	1.78E+0	1.43E-2	2.52E-6	3.38E-9	9.34E-9	7.30E-1	1.85E-6
METALS									
Arsenic	7440382	2.26E+1	1.81E-1	8.14E-1	2.56E-7	1.92E-7	5.32E-7	1.50E+0	1.47E-6

Assumptions Used for Estimating Daily Intake and Associated Risks

			Comments
Body weight (kg) (BW)	=	36	
Root vegetable ingestion rate (kg dry/day) (RVI)	=	1.81E-02	Root vegetables plus potatoes
Fruit ingestion rate (kg dry/day) (FI)	=	3.02E-03	
Above ground vegetable ingestion rate (kg dry/day) (AVI)	=	8.36E-03	Leafy, legumes and mushrooms vegetables
GI absorption factor-food (GIS)	=	0.8	
Fraction of consumption that is homegrown (FH)	=	0.25	
Exposure days (DE) (days)	=	30	
Averaging time carcinogens (days) (ATC)	=	365	
Exposure Years (years) (EY)	=	12	
Lifetime (LT) (years)	=	70	

Notes and Equations Used for Estimating Intakes:

mg/kg is miligrams per kilogram.
DW is dry weight.
(a) Concentration is the maximum concentration of chemical in subsurface soil (mg/kg, 0 to 2 feet below land surface) (SL).
(b) Estimated root vegetable concentration (RVC) (Table H-70).
(c) Estimated concentrations in above ground produce (APC) (Table H-70).
(d) Lifetime average daily intake of chemicals via homegrown root vegetables (LADIr). For metals, LADIr = (RVC * RVI * GIS * DE * FH * EY) / (BW *ATN * LT).
For organics, LADIr = (RVC * RVI * GIS *DE * FH * EY) / (CVV * BW * ATN * LT).
(e) Lifetime average daily intake of chemicals via homegrown fruits (LADIf). LADf = (APC * FI * GIS * DE * FH * EY) / (BW *ATN * LT).
(f) Lifetime average daily intake of chemicals via homegrown above ground vegetables (LADIv). LADIv = (APC *AVI * GIS * DE * FH * EY) / (BW * ATN * LT).
(g) Carcinogenic potency factors (CPF) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(h) Incremental lifetime cancer risk (ILCR) via combinedl vegetable types (ILCR). ILCR = (LADAr + LADIf + LADIv) * CPF.

Table H-79: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Subsurface Soil at the Former Thypin Steel Inc. Facility, Manorhaven, New York.-- Adult Vegetable Scenario -- PAEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Root Vegetable Concentration (mg/kg DW) (RVC) (b)	Above Ground Produce Concentration (mg/kg DW) (APC) (c)	Average Daily Intakes (mg/kg/day) of Chemical by Food Type			Reference Dose	Hazard Quotient (HQ) (h)
					Root Vegetable (ADIrv) (d)	Above-Ground Fruit (ADIf) (e)	Above-Ground Vegetable (ADIav) (f)	Oral (mg/kg/day) (RfD) (g)	
SEMIVOLATILE ORGANIC COMPOUNDS									
Benzo[a]anthracene	56553	1.39E+0	6.86E-1	2.07E-2	5.79E-6	7.07E-8	1.20E-7	3.00E-1	2.00E-5
Benzo[a]pyrene	50328	1.23E+0	5.93E-1	1.53E-2	5.01E-6	5.25E-8	8.88E-8	3.00E-2	1.72E-4
Benzo[b]fluoranthene	205992	1.03E+0	5.12E-1	1.77E-2	4.32E-6	6.04E-8	1.02E-7	4.00E-2	1.12E-4
Dibenzo[a,h]anthracene	53703	3.83E-1	1.71E-1	1.86E-3	1.44E-6	6.36E-9	1.08E-8	3.00E-1	4.87E-6
Indeno[1,2,3-cd]pyrene	193395	8.67E-1	3.76E-1	3.02E-3	3.18E-6	1.03E-8	1.75E-8	3.00E-2	1.07E-4
METALS									
Arsenic	7440382	4.00E+0	3.20E-2	1.44E-1	2.70E-7	4.93E-7	8.34E-7	3.00E-4	5.32E-3

Assumptions Used for Estimating Daily Intake and Associated Risks, as described on Table 2:

			Comments
Body weight (kg) (BW)	=	70	
Root vegetable ingestion rate (kg dry/day) (RVI)	=	1.77E-02	Root vegetables plus potatoes
Fruit ingestion rate (kg dry/day) (FI)	=	7.18E-03	
Above ground vegetable ingestion rate (kg dry/day) (AVI)	=	1.22E-02	Leafy, legumes and muchrooms vegetables
GI absorption factor-food (GIS)	=	0.8	
Fraction of consumption that is homegrown (FH)	=	0.25	
Days consuming homegrown vegetables (days) (DE)	=	20	
Averaging time noncarcinogens (days) (ATN)	=	120	

Notes and Equations Used for Estimating Intakes:

mg/kg is miligrams per kilogram.
DW is dry weight.
(a) Concentration is the average concentration of chemical in subsurface soil (mg/kg, 0 to 2 feet below land surface) (SL).
(b) Estimated root vegetable concentration (RVC) (Table H-69).
(c) Estimated concentrations in above ground produce (APC) (Table H-69).
(d) Average daily intake of chemicals via ingestion of homegrown root vegetables (ADIrv). ADIrv = (RVC * RVI * GIS * DE * FH) / (BW *ATN).
(e) Average daily intake of chemicals via ingestion of homegrown fruits (ADIf). ADIf = (APC * FI * GIS * DE * FH) / (BW *ATN).
(f) Average daily intake of chemicals via ingestion of homegrown above-ground vegetables (ADIav). ADIav = (APC *AVI * GIS * DE * FH) / (BW *ATN).
(g) Reference doses for chronic exposure (RfD) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(h) Hazard quotient for exposure to chemicals via combined vegetable types (HQ). HQ = (ADIrv + ADIf + ADIav) / RfD.

Table H-80: Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Subsurface Soil at the Former Thypin Steel Inc. Facility, Manorhaven, New York -- Adult Vegetable Scenario -- RMEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Root Vegetable Concentration (mg/kg DW) (RVC) (b)	Above Ground Produce Concentration (mg/kg DW) (APC) (c)	Average Daily Intakes (mg/kg/day) of Chemical by Food Type: Root Vegetable (ADIrv) (d)	Above-Ground Fruit (ADIf) (e)	Above-Ground Vegetable (ADIav) (f)	Reference Dose Oral (mg/kg/day) (RfD) (g)	Hazard Quotient (HQ) (h)
SEMIVOLATILE ORGANIC COMPOUNDS									
Benzo[a]anthracene	56553	7.00E+0	3.45E+0	1.04E-1	4.37E-5	5.33E-7	9.03E-7	3.00E-1	1.50E-4
Benzo[a]pyrene	50328	5.80E+0	2.80E+0	7.25E-2	3.55E-5	3.72E-7	6.30E-7	3.00E-2	1.22E-3
Benzo[b]fluoranthene	205992	4.70E+0	2.34E+0	8.09E-2	2.97E-5	4.15E-7	7.02E-7	4.00E-2	7.70E-4
Dibenzo[a,h]anthracene	53703	2.10E+0	9.38E-1	1.02E-2	1.19E-5	5.23E-8	8.86E-8	3.00E-1	4.01E-5
Indeno[1,2,3-cd]pyrene	193395	4.10E+0	1.78E+0	1.43E-2	2.25E-5	7.32E-8	1.24E-7	3.00E-2	7.58E-4
METALS									
Arsenic	7440382	2.26E+1	1.81E-1	8.14E-1	2.29E-6	4.17E-6	7.07E-6	3.00E-4	4.51E-2

Assumptions Used for Estimating Daily Intake and Associated Risks

			Comments
Body weight (kg) (BW)	=	70	
Root vegetable ingestion rate (kg dry/day) (RVI)	=	1.77E-02	Root vegetables plus potatoes
Fruit ingestion rate (kg dry/day) (FI)	=	7.18E-03	
Above ground vegetable ingestion rate (kg dry/day) (AVI)	=	1.22E-02	Leafy, legumes and muchrooms vegetables
GI absorption factor-food (GIS)	=	0.8	
Fraction of consumption that is homegrown (FH)	=	0.25	
Days consuming homegrown vegetables (days) (DE)	=	30	
Averaging time noncarcinogens (days) (ATN)	=	120	

Notes and Equations Used for Estimating Intakes:

mg/kg is miligrams per kilogram.
DW is dry weight.
(a) Concentration is the maximum concentration of chemical in subsurface soil (mg/kg, 0 to 2 feet below land surface) (SL).
(b) Estimated root vegetable concentration (RVC) (Table H-70).
(c) Estimated concentrations in above ground produce (APC) (Table H-70).
(d) Average daily intake of chemicals via ingestion of homegrown root vegetables (ADIrv). ADIrv = (RVC * RVI * GIS * DE * FH) / (BW *ATN).
(e) Average daily intake of chemicals via ingestion of homegrown fruits (ADIf). ADIf = (APC * FI * GIS * DE * FH) / (BW *ATN).
(f) Average daily intake of chemicals via ingestion of homegrown above-ground vegetables (ADIav). ADIav = (APC *AVI * GIS * DE * FH) / (BW *ATN).
(g) Reference doses for chronic exposure (RfD) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(h) Hazard quotient for exposure to chemicals via combined vegetable types (HQ). HQ = (ADIrv + ADIf + ADIav) / RfD.

Table H-81: Estimated Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Subsurface Soil at the Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Adult Vegetable Scenario -- PAEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Root Vegetable Concentration (mg/kg DW) (RVC) (b)	Above Ground Fruit or Vegetable Concentration (mg/kg DW) (APC) (c)	Lifetime Average Daily Intakes (mg/kg/day) of Chemical by Food Type			Slope Factor	Incremental Lifetime Cancer Risk
					Root Vegetable (LADIrv) (d)	Above-Ground Fruit (LADIf) (e)	Above-Ground Vegetable (LADIav) (f)	Oral (mg/kg/day) $^{-1}$ (CPF) (g)	(ILCR) (h)
SEMIVOLATILE ORGANIC COMPOUNDS									
Benzo[a]anthracene	56553	1.39E+0	6.86E-1	2.07E-2	2.45E-7	2.99E-9	5.06E-9	7.30E-1	1.85E-7
Benzo[a]pyrene	50328	1.23E+0	5.93E-1	1.53E-2	2.12E-7	2.22E-9	3.76E-9	7.30E+0	1.59E-6
Benzo[b]fluoranthene	205992	1.03E+0	5.12E-1	1.77E-2	1.83E-7	2.55E-9	4.33E-9	7.30E-1	1.38E-7
Dibenzo[a,h]anthracene	53703	3.83E-1	1.71E-1	1.86E-3	6.11E-8	2.69E-10	4.55E-10	7.30E+0	4.51E-7
Indeno[1,2,3-cd]pyrene	193395	8.67E-1	3.76E-1	3.02E-3	1.34E-7	4.36E-10	7.39E-10	7.30E-1	9.89E-8
METALS									
Arsenic	7440382	4.00E+0	3.20E-2	1.44E-1	1.14E-8	2.08E-8	3.53E-8	1.50E+0	1.01E-7

Assumptions Used for Estimating Daily Intake and Associated Risks, as described on Table 2:

			Comments
Body weight (kg) (BW)	=	70	
Root vegetable ingestion rate (kg dry/day) (RVI)	=	1.77E-02	Root vegetables plus potatoes
Fruit ingestion rate (kg dry/day) (FI)	=	7.18E-03	
Above ground vegetable ingestion rate (kg dry/day) (AVI)	=	1.22E-02	Leafy, legumes and mushrooms vegetables
GI absorption factor-food (GIS)	=	0.8	
Fraction of consumption that is homegrown (FH)	=	0.25	
Exposure days (DE) (days)	=	20	
Averaging time carcinogens (days) (ATC)	=	365	
Exposure Years (years) (EY)	=	9	
Lifetime (LT) (years)	=	70	

Notes and Equations Used for Estimating Intakes:

mg/kg is miligrams per kilogram.
DW is dry weight.
(a) Concentration is the average concentration of chemical in subsurface soil (mg/kg, 0 to 2 feet below land surface) (SL).
(b) Estimated root vegetable concentration (RVC) (Table H-69).
(c) Estimated concentrations in above ground produce (APC) (Table H-69).
(d) Lifetime average daily intake of chemicals via homegrown root vegetables (LADIr). For metals, LADIr = (RVC * RVI * GIS * DE * FH * EY) / (BW *ATN * LT).
For organics, LADIr = (RVC * RVI * GIS *DE * FH * EY) / (CVV * BW * ATN * LT).
(e) Lifetime average daily intake of chemicals via homegrown fruits (LADIf). LADf = (APC * FI * GIS * DE * FH * EY) / (BW *ATN * LT).
(f) Lifetime average daily intake of chemicals via homegrown above ground vegetables (LADIv). LADIv = (APC *AVI * GIS * DE * FH * EY) / (BW * ATN * LT).
(g) Carcinogenic potency factors (CPF) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(h) Incremental lifetime cancer risk (ILCR) via combinedl vegetable types (ILCR). ILCR = (LADAr + LADIf + LADIv) * CPF.

Table H-82: Estimated Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Subsurface Soil at the Former Thypin Steel Inc. Facility, Manorhaven, New York -- Adult Vegetable Scenario -- RMEI

Chemical	CAS RN	Soil Concentration (mg/kg) (SL) (a)	Root Vegetable Concentration (mg/kg DW) (RVC) (b)	Above Ground Fruit or Vegetable Concentration (mg/kg DW) (APC) (c)	Lifetime Average Daily Intakes (mg/kg/day) of Chemical by Food Type: Root Vegetable (LADIrv) (d)	Above-Ground Fruit (LADIf) (e)	Above-Ground Vegetable (LADIav) (f)	Slope Factor Oral (mg/kg/day) $^{-1}$ (CPF) (g)	Incremental Lifetime Cancer Risk (ILCR) (h)
SEMIVOLATILE ORGANIC COMPOUNDS									
Benzo[a]anthracene	56553	7.00E+0	3.45E+0	1.04E-1	4.10E-6	5.01E-8	8.49E-8	7.30E-1	3.10E-6
Benzo[a]pyrene	50328	5.80E+0	2.80E+0	7.25E-2	3.33E-6	3.49E-8	5.91E-8	7.30E+0	2.50E-5
Benzo[b]fluoranthene	205992	4.70E+0	2.34E+0	8.09E-2	2.79E-6	3.90E-8	6.60E-8	7.30E-1	2.11E-6
Dibenzo[a,h]anthracene	53703	2.10E+0	9.38E-1	1.02E-2	1.12E-6	4.92E-9	8.32E-9	7.30E+0	8.24E-6
Indeno[1,2,3-cd]pyrene	193395	4.10E+0	1.78E+0	1.43E-2	2.12E-6	6.88E-9	1.17E-8	7.30E-1	1.56E-6
METALS									
Arsenic	7440382	2.26E+1	1.81E-1	8.14E-1	2.15E-7	3.92E-7	6.64E-7	1.50E+0	1.91E-6

Assumptions Used for Estimating Daily Intake and Associated Risks

			Comments
Body weight (kg) (BW)	=	70	
Root vegetable ingestion rate (kg dry/day) (RVI)	=	1.77E-02	Root vegetables plus potatoes
Fruit ingestion rate (kg dry/day) (FI)	=	7.18E-03	
Above ground vegetable ingestion rate (kg dry/day) (AVI)	=	1.22E-02	Leafy, legumes and mushrooms vegetables
GI absorption factor-food (GIS)	=	0.8	
Fraction of consumption that is homegrown (FH)	=	0.25	
Exposure days (DE) (days)	=	20	
Averaging time carcinogens (days) (ATC)	=	365	
Exposure Years (years) (EY)	=	30	
Lifetime (LT) (years)	=	70	

Notes and Equations Used for Estimating Intakes:

mg/kg is miligrams per kilogram.
DW is dry weight.
(a) Concentration is the maximum concentration of chemical in subsurface soil (mg/kg, 0 to 2 feet below land surface) (SL).
(b) Estimated root vegetable concentration (RVC) (Table H-70).
(c) Estimated concentrations in above ground produce (APC) (Table H-70).
(d) Lifetime average daily intake of chemicals via homegrown root vegetables (LADIr). For metals, LADIr = (RVC * RVI * GIS * DE * FH * EY) / (BW *ATN * LT).
For organics, LADIr = (RVC * RVI * GIS *DE * FH * EY) / (CVV * BW * ATN * LT).
(e) Lifetime average daily intake of chemicals via homegrown fruits (LADIf). LADf = (APC * FI * GIS * DE * FH * EY) / (BW *ATN * LT).
(f) Lifetime average daily intake of chemicals via homegrown above ground vegetables (LADIv). LADIv = (APC *AVI * GIS * DE * FH * EY) / (BW * ATN * LT).
(g) Carcinogenic potency factors (CPF) were obtained from IRIS (USEPA, 2001b) and HEAST (USEPA, 1997b).
(h) Incremental lifetime cancer risk (ILCR) via combinedl vegetable types (ILCR). ILCR = (LADAr + LADIf + LADIv) * CPF.

Table H-83: Estimated Potential Blood Lead Concentrations, Based on a Biokinetic Slope Factor Model, Associated with Exposure During Construction Activities to Lead Identified in Solid Material Within Subsurface Structures in the Northern Area of the Former Thypin Steel Inc. Facility in Manorhaven, New York -- PAEI

INPUT Site-Specific Lead Concentrations in Soil (a)	
Concentration in Soil (CS) (mg/kg)	4.84E+2
Background Concentration in Soil (BS) (mg/kg)	0
Airborne Dust Concentration (CD) (µg/m^3)	18

OUTPUT Estimated Blood Lead Concentration (µg/dL) Percentile Ranges Using Geometric Standard Deviation (GSD) of 1.8 or 2.1 (b)							
	50th	90th		95th		99th	
GSD used:	none	1.8	2.1	1.8	2.1	1.8	2.1
ADULT WORKER (µg/dL)	2.1E+0	4.5E+0	5.4E+0	5.5E+0	7.1E+0	8.2E+0	1.2E+1

CONSTRUCTION EXPOSURE

Exposure Pathway		Lead Concentrations (CF)	Fractional Absorption of Lead (FA)	Contact Rate (CR)	Blood Pb (µg/dL)	
Incidental Soil Ingestion	(SPb) (c)	4.84E+2 mg/kg	0.12	100 mg/day	9.5E-2	
Inhalation-Airborne Dust	(APb) (d)	8.71E-3 µg/m^3	0.32	2.04 m^3/hr	7.5E-4	
				Sum of Blood Lead Concentration from Ingestion and Inhalation Pathways (µg/dL) (TPb) =	9.6E-2	(e)
				ESTIMATED GEOMETRIC MEAN BLOOD LEAD CONCENTRATION (µg/dL) =	2.1E+0	(f)

CONSTANTS

	Value	Reference
Baseline adult blood lead concentration (µg/dL) (B) =	2.0	Based on mixed racial population (USEPA, 1996b)
Biokinetic slope factor (µg/dL per µg/day) (BSF) =	0.4	From USEPA, 1996b
Days spent at site in one year (days) (WD) =	15	Professional judgement
Hours spent at site (hours/day) (HD) =	8	Professional judgement
Days in a year (days/year) (DY) =	365	Days per year
Conversion factor (kg/mg) (Y) =	1.0E-6	Conversion factor
Conversion factor (µg/mg) (Z) =	1.0E+3	Conversion factor

NOTES AND EQUATIONS

mg/kg indicates units of milligrams per kilograms

µg/dL indicates units of micrograms per deciliter

µg/m^3 indicates units of micrograms per cubic meter

(a) Soil lead concentration is arithmetic mean concentration in soil at the Northern area of the site. Background concentration of lead is assumed to be zero. The airborne dust concentrations of 18 µg/m^3 is the weighted annual mean for particulate matter less than 10 microns for Nassau-Suffolk Co. NY in 1998 (USEPA, 2000b).

(b) Geometric mean blood lead concentration for adults is assumed to be 50th percentile. 90th percentile= exp(ln(50th percentile)+1.282*ln(GSD) 95th percentile=exp(ln(50th percentile)+1.64*ln(GSD). 99th percentile=exp(ln(50th percentile)+2.33*ln(GSD)

(c) Concentration of lead in soil (CF). CF = CS-BS (from input box). Blood lead concentration attributed to incidental soil ingestion (SPb). SPb = BSF*(CF*FA*CR*Y*Z*(WD/DY))

(d) Concentration of lead in air due to dust (CF). CF=((CS-BS)*CD*Y) (from input box). Blood lead concentration attributed to fugitive dust (APb). APb = BSF*(CF*FA*CR*HD*(WD/DY))

(e) Blood lead concentrations from incidental soil ingestion and inhalation of fugitive dust are summed (TPb). TPb = SPb +APb

(f) Estimated geometric mean blood lead concentration equals sum of background concentration plus blood lead concentrations attributed to incidental soil ingestion and inhalation exposure pathways (TPb + B).

Table H-84: Estimated Potential Blood Lead Concentrations, Based on a Biokinetic Slope Factor Model, Associated with Exposure During Construction Activities to Lead Identified in Solid Material Within Subsurface Structures in the Northern Area of the Former Thypin Steel Inc. Facility in Manorhaven, New York -- RMEI

INPUT Site-Specific Lead Concentrations in Soil (a)	
Concentration in Soil (CS) (mg/kg)	9.86E+2
Background Concentration in Soil (BS) (mg/kg)	0
Airborne Dust Concentration (CD) (µg/m^3)	30

OUTPUT Estimated Blood Lead Concentration (µg/dL) Percentile Ranges Using Geometric Standard Deviation (GSD) of 1.8 or 2.1 (b)							
	50th	90th		95th		99th	
GSD used:	none	1.8	2.1	1.8	2.1	1.8	2.1
ADULT WORKER (µg/dL)	2.8E+0	5.9E+0	7.2E+0	7.3E+0	9.4E+0	1.1E+1	1.6E+1

CONSTRUCTION EXPOSURE

Exposure Pathway		Lead Concentrations (CF)	Fractional Absorption of Lead (FA)	Contact Rate (CR)	Blood Pb (µg/dL)
Incidental Soil Ingestion	(SPb) (c)	9.86E+2 mg/kg	0.12	200 mg/day	7.8E-1
Inhalation-Airborne Dust	(APb) (d)	3.0E-2 µg/m^3	0.32	2.28 m^3/hr	5.7E-3
				Sum of Blood Lead Concentration from Ingestion and Inhalation Pathways (µg/dL) (TPb) =	7.8E-1 (e)
				ESTIMATED GEOMETRIC MEAN BLOOD LEAD CONCENTRATION (µg/dL) =	2.8E+0 (f)

CONSTANTS	Value	Reference
Baseline adult blood lead concentration (µg/dL) (B) =	2.0	Based on mixed racial population (USEPA, 1996b)
Biokinetic slope factor (µg/dL per µg/day) (BSF) =	0.4	From USEPA, 1996b
Days spent at site in one year (days) (WD) =	30	Professional judgement
Hours spent at site (hours/day) (HD) =	8	Professional judgement
Days in a year (days/year) (DY) =	365	Days per year
Conversion factor (kg/mg) (Y) =	1.0E-6	Conversion factor
Conversion factor (µg/mg) (Z) =	1.0E+3	Conversion factor

NOTES AND EQUATIONS

mg/kg indicates units of milligrams per kilograms

µg/dL indicates units of micrograms per deciliter

µg/m^3 indicates units of micrograms per cubic meter

(a) Soil lead concentration is the maximum detected lead concentration in soil in the Northern area of the site. Background concentration of lead is assumed to be zero. An airborne dust concentrations of 30 µg/m^3 is the 90th percentile for particulate matter less than 10 microns for Nassau-Suffolk County, NY in 1998 (USEPA, 2000b).

(b) Geometric mean blood lead concentration for adults is assumed to be 50th percentile. 90th percentile= exp(ln(50th percentile)+1.282*ln(GSD) 95th percentile=exp(ln(50th percentile)+1.64*ln(GSD). 99th percentile=exp(ln(50th percentile)+2.33*ln(GSD)

(c) Concentration of lead in soil (CF). CF=CS-BS (from input box). Blood lead concentration attributed to incidental soil ingestion (SPb). SPb = BSF*(CF*FA*CR*Y*Z*(WD/DY))

(d) Concentration of lead in air due to dust (CF). CF= ((CS-BS)*CD*Y) (from input box). Blood lead concentration attributed to fugitive dust (APb). APb = BSF*(CF*FA*CR*HD*(WD/DY))

(e) Blood lead concentrations from incidental soil ingestion and inhalation of fugitive dust are summed (TPb). TPb = SPb +APb

(f) Estimated geometric mean blood lead concentration equals sum of background concentration plus blood lead concentrations attributed to incidental soil ingestion and inhalation exposure pathways (TPb + B).

Table H-85: Estimated Potential Blood Lead Concentrations, Based on a Biokinetic Slope Factor Model, Associated with Exposure During Construction Activities to Lead Identified in Solid Material Within Subsurface Structures in the Western Area of the Former Thypin Steel Inc. Facility in Manorhaven, New York -- PAEI

INPUT Site-Specific Lead Concentrations in Soil (a)	
Concentration in Soil (CS) (mg/kg)	4.01E+2
Background Concentration in Soil (BS) (mg/kg)	0
Airborne Dust Concentration (CD) (µg/m^3)	18

OUTPUT
Estimated Blood Lead Concentration (µg/dL) Percentile Ranges Using Geometric Standard Deviation (GSD) of 1.8 or 2.1 (b)

	50th	90th		95th		99th	
GSD used:	none	1.8	2.1	1.8	2.1	1.8	2.1
ADULT WORKER (µg/dL)	2.1E+0	4.4E+0	5.4E+0	5.5E+0	7.0E+0	8.2E+0	1.2E+1

CONSTRUCTION EXPOSURE

Exposure Pathway		Lead Concentrations (CF)	Fractional Absorption of Lead (FA)	Contact Rate (CR)	Blood Pb (µg/dL)	
Incidental Soil Ingestion	(SPb) (c)	4.01E+2 mg/kg	0.12	100 mg/day	7.9E-2	
Inhalation-Airborne Dust	(APb) (d)	7.2E-3 µg/m^3	0.32	2.04 m^3/hr	6.2E-4	
				Sum of Blood Lead Concentration from Ingestion and Inhalation Pathways (µg/dL) (TPb) =	8.0E-2	(e)
				ESTIMATED GEOMETRIC MEAN BLOOD LEAD CONCENTRATION (µg/dL) =	2.1E+0	(f)

CONSTANTS	Value	Reference
Baseline adult blood lead concentration (µg/dL) (B) =	2.0	Based on mixed racial population (USEPA, 1996b)
Biokinetic slope factor (µg/dL per µg/day) (BSF) =	0.4	From USEPA, 1996b
Days spent at site in one year (days) (WD) =	15	Professional judgement
Hours spent at site (hours/day) (HD) =	8	Professional judgement
Days in a year (days/year) (DY) =	365	Days per year
Conversion factor (kg/mg) (Y) =	1.0E-6	Conversion factor
Conversion factor (µg/mg) (Z) =	1.0E+3	Conversion factor

NOTES AND EQUATIONS

mg/kg indicates units of milligrams per kilograms

µg/dL indicates units of micrograms per deciliter

µg/m^3 indicates units of micrograms per cubic meter

(a) Soil lead concentration is arithmetic mean concentration in soil at the Western Area of the site. Background concentration of lead is assumed to be zero. The airborne dust concentrations of 18 µg/m^3 is the weighted annual mean for particulate matter less than 10 microns for Nassau-Suffolk Co. NY in 1998 (USEPA, 2000b).

(b) Geometric mean blood lead concentration for adults is assumed to be 50th percentile. 90th percentile= exp(ln(50th percentile)+1.282*ln(GSD) 95th percentile=exp(ln(50th percentile)+1.64*ln(GSD). 99th percentile=exp(ln(50th percentile)+2.33*ln(GSD)

(c) Concentration of lead in soil (CF). CF = CS-BS (from input box). Blood lead concentration attributed to incidental soil ingestion (SPb). SPb = BSF*(CF*FA*CR*Y*Z*(WD/DY))

(d) Concentration of lead in air due to dust (CF). CF=((CS-BS)*CD*Y) (from input box). Blood lead concentration attributed to fugitive dust (APb). APb = BSF*(CF*FA*CR*HD*(WD/DY))

(e) Blood lead concentrations from incidental soil ingestion and inhalation of fugitive dust are summed (TPb). TPb = SPb +APb

(f) Estimated geometric mean blood lead concentration equals sum of background concentration plus blood lead concentrations attributed to incidental soil ingestion and inhalation exposure pathways (TPb + B).

Table H-86: Estimated Potential Blood Lead Concentrations, Based on a Biokinetic Slope Factor Model, Associated with Exposure During Construction Activities to Lead Identified in Solid Material Within Subsurface Structures in the Western Area of the Former Thypin Steel Inc. Facility in Manorhaven, New York -- RMEI

INPUT Site-Specific Lead Concentrations in Soil (a)	
Concentration in Soil (CS) (mg/kg)	1.18E+3
Background Concentration in Soil (BS) (mg/kg)	0
Airborne Dust Concentration (CD) (µg/m^3)	30

OUTPUT Estimated Blood Lead Concentration (µg/dL) Percentile Ranges Using Geometric Standard Deviation (GSD) of 1.8 or 2.1 (b)							
	50th	90th		95th		99th	
GSD used:	none	1.8	2.1	1.8	2.1	1.8	2.1
ADULT WORKER (µg/dL)	2.9E+0	6.2E+0	7.6E+0	7.7E+0	9.9E+0	1.2E+1	1.7E+1

CONSTRUCTION EXPOSURE

Exposure Pathway		Lead Concentrations (CF)	Fractional Absorption of Lead (FA)	Contact Rate (CR)	Blood Pb (µg/dL)	
Incidental Soil Ingestion	(SPb) (c)	1.18E+3 mg/kg	0.12	200 mg/day	9.3E-1	
Inhalation-Airborne Dust	(APb) (d)	3.5E-2 µg/m^3	0.32	2.28 m^3/hr	6.8E-3	
				Sum of Blood Lead Concentration from Ingestion and Inhalation Pathways (µg/dL) (TPb) =	9.4E-1	(e)
				ESTIMATED GEOMETRIC MEAN BLOOD LEAD CONCENTRATION (µg/dL) =	2.9E+0	(f)

CONSTANTS	Value	Reference
Baseline adult blood lead concentration (µg/dL) (B) =	2.0	Based on mixed racial population (USEPA, 1996b)
Biokinetic slope factor (µg/dL per µg/day) (BSF) =	0.4	From USEPA, 1996b
Days spent at site in one year (days) (WD) =	30	Professional judgement
Hours spent at site (hours/day) (HD) =	8	Professional judgement
Days in a year (days/year) (DY) =	365	Days per year
Conversion factor (kg/mg) (Y) =	1.0E-6	Conversion factor
Conversion factor (µg/mg) (Z) =	1.0E+3	Conversion factor

NOTES AND EQUATIONS

mg/kg indicates units of milligrams per kilograms

µg/dL indicates units of micrograms per deciliter

µg/m^3 indicates units of micrograms per cubic meter

(a) Soil lead concentration is the maximum detected concentration of lead in soil at the Western area of the site. Background concentration of lead is assumed to be zero. An airborne dust concentrations of 30 µg/m^3 is the 90th percentile for particulate matter less than 10 microns for Nassau-Suffolk County, NY in 1998 (USEPA, 2000b).

(b) Geometric mean blood lead concentration for adults is assumed to be 50th percentile. 90th percentile= exp(ln(50th percentile)+1.282*ln(GSD) 95th percentile=exp(ln(50th percentile)+1.64*ln(GSD). 99th percentile=exp(ln(50th percentile)+2.33*ln(GSD)

(c) Concentration of lead in soil (CF). CF = CS-BS (from input box). Blood lead concentration attributed to incidental soil ingestion (SPb). SPb = BSF*(CF*FA*CR*Y*Z*(WD/DY))

(d) Concentration of lead in air due to dust (CF). CF=((CS-BS)*CD*Y) (from input box). Blood lead concentration attributed to fugitive dust (APb). APb = BSF*(CF*FA*CR*HD*(WD/DY))

(e) Blood lead concentrations from incidental soil ingestion and inhalation of fugitive dust are summed (TPb). TPb = SPb +APb

(f) Estimated geometric mean blood lead concentration equals sum of background concentration plus blood lead concentrations attributed to incidental soil ingestion and inhalation exposure pathways (TPb + B).

Table H-87: Estimated Potential Blood Lead Concentrations, Based on a Biokinetic Slope Factor Model, Associated with Exposure During Construction Activities to Lead Identified in Solid Material Within Subsurface Structures in the Central Area of the Former Thypin Steel Inc. Facility in Manorhaven, New York -- PAEI

INPUT Site-Specific Lead Concentrations in Soil (a)	
Concentration in Soil (CS) (mg/kg)	2.60E+2
Background Concentration in Soil (BS) (mg/kg)	0
Airborne Dust Concentration (CD) (µg/m^3)	18

OUTPUT Estimated Blood Lead Concentration (µg/dL) Percentile Ranges Using Geometric Standard Deviation (GSD) of 1.8 or 2.1 (b)							
	50th	90th		95th		99th	
GSD used:	none	1.8	2.1	1.8	2.1	1.8	2.1
ADULT WORKER (µg/dL)	2.1E+0	4.4E+0	5.3E+0	5.4E+0	6.9E+0	8.1E+0	1.2E+1

CONSTRUCTION EXPOSURE

Exposure Pathway		Lead Concentrations (CF)	Fractional Absorption of Lead (FA)	Contact Rate (CR)	Blood Pb (µg/dL)	
Incidental Soil Ingestion	(SPb) (c)	2.60E+2 mg/kg	0.12	100 mg/day	5.1E-2	
Inhalation-Airborne Dust	(APb) (d)	4.7E-3 µg/m^3	0.32	2.04 m^3/hr	4.0E-4	
				Sum of Blood Lead Concentration from Ingestion and Inhalation Pathways (µg/dL) (TPb) =	5.2E-2	(e)
				ESTIMATED GEOMETRIC MEAN BLOOD LEAD CONCENTRATION (µg/dL) =	2.1E+0	(f)

CONSTANTS	Value	Reference
Baseline adult blood lead concentration (µg/dL) (B) =	2.0	Based on mixed racial population (USEPA, 1996b)
Biokinetic slope factor (µg/dL per µg/day) (BSF) =	0.4	From USEPA, 1996b
Days spent at site in one year (days) (WD) =	15	Professional judgement
Hours spent at site (hours/day) (HD) =	8	Professional judgement
Days in a year (days/year) (DY) =	365	Days per year
Conversion factor (kg/mg) (Y) =	1.0E-6	Conversion factor
Conversion factor (µg/mg) (Z) =	1.0E+3	Conversion factor

NOTES AND EQUATIONS

mg/kg indicates units of milligrams per kilograms

µg/dL indicates units of micrograms per deciliter

µg/m^3 indicates units of micrograms per cubic meter

(a) Soil lead concentration is arithmetic mean concentration of lead in soil at the Central Area of the site. Background concentration of lead is assumed to be zero. The airborne dust concentrations of 18 µg/m^3 is the weighted annual mean for particulate matter less than 10 microns for Nassau-Suffolk Co. NY in 1998 (USEPA, 2000b).

(b) Geometric mean blood lead concentration for adults is assumed to be 50th percentile. 90th percentile= exp(ln(50th percentile)+1.282*ln(GSD) 95th percentile=exp(ln(50th percentile)+1.64*ln(GSD). 99th percentile=exp(ln(50th percentile)+2.33*ln(GSD)

(c) Concentration of lead in soil (CF). CF = CS-BS (from input box). Blood lead concentration attributed to incidental soil ingestion (SPb). SPb = BSF*(CF*FA*CR*Y*Z*(WD/DY))

(d) Concentration of lead in air due to dust (CF). CF=((CS-BS)*CD*Y) (from input box). Blood lead concentration attributed to fugitive dust (APb). APb = BSF*(CF*FA*CR*HD*(WD/DY))

(e) Blood lead concentrations from incidental soil ingestion and inhalation of fugitive dust are summed (TPb). TPb = SPb +APb

(f) Estimated geometric mean blood lead concentration equals sum of background concentration plus blood lead concentrations attributed to incidental soil ingestion and inhalation exposure pathways (TPb + B).

Table H-88: Estimated Potential Blood Lead Concentrations, Based on a Biokinetic Slope Factor Model, Associated with Exposure During Construction Activities to Lead Identified in Solid Material Within Subsurface Structures in the Central Area of the Former Thypin Steel Inc. Facility in Manorhaven, New York -- RMEI

INPUT Site-Specific Lead Concentrations in Soil (a)	
Concentration in Soil (CS) (mg/kg)	2.89E+3
Background Concentration in Soil (BS) (mg/kg)	0
Airborne Dust Concentration (CD) (µg/m^3)	30

OUTPUT Estimated Blood Lead Concentration (µg/dL) Percentile Ranges Using Geometric Standard Deviation (GSD) of 1.8 or 2.1 (b)							
	50th	90th		95th		99th	
GSD used:	none	1.8	2.1	1.8	2.1	1.8	2.1
ADULT WORKER (µg/dL)	4.3E+0	9.1E+0	1.1E+1	1.1E+1	1.5E+1	1.7E+1	2.4E+1

CONSTRUCTION EXPOSURE

Exposure Pathway		Lead Concentrations (CF)	Fractional Absorption of Lead (FA)	Contact Rate (CR)	Blood Pb (µg/dL)	
Incidental Soil Ingestion	(SPb) (c)	2.89E+3 mg/kg	0.12	200 mg/day	2.3E+0	
Inhalation-Airborne Dust	(APb) (d)	8.7E-2 µg/m^3	0.32	2.28 m^3/hr	1.7E-2	
				Sum of Blood Lead Concentration from Ingestion and Inhalation Pathways (µg/dL) (TPb) =	2.3E+0	(e)
				ESTIMATED GEOMETRIC MEAN BLOOD LEAD CONCENTRATION (µg/dL) =	4.3E+0	(f)

CONSTANTS	Value	Reference
Baseline adult blood lead concentration (µg/dL) (B) =	2.0	Based on mixed racial population (USEPA, 1996b)
Biokinetic slope factor (µg/dL per µg/day) (BSF) =	0.4	From USEPA, 1996b
Days spent at site in one year (days) (WD) =	30	Professional judgement
Hours spent at site (hours/day) (HD) =	8	Professional judgement
Days in a year (days/year) (DY) =	365	Days per year
Conversion factor (kg/mg) (Y) =	1.0E-6	Conversion factor
Conversion factor (µg/mg) (Z) =	1.0E+3	Conversion factor

NOTES AND EQUATIONS

mg/kg indicates units of milligrams per kilograms

µg/dL indicates units of micrograms per deciliter

µg/m^3 indicates units of micrograms per cubic meter

(a) Soil lead concentration is the maximum detected concentration of lead in soil at the Central Area of the site. Background concentration of lead is assumed to be zero. An airborne dust concentrations of 30 µg/m^3 is the 90th percentile for particulate matter less than 10 microns for Nassau-Suffolk County, NY in 1998 (USEPA, 2000b).

(b) Geometric mean blood lead concentration for adults is assumed to be 50th percentile. 90th percentile= exp(ln(50th percentile)+1.282*ln(GSD) 95th percentile=exp(ln(50th percentile)+1.64*ln(GSD). 99th percentile=exp(ln(50th percentile)+2.33*ln(GSD)

(c) Concentration of lead in soil (CF). CF = CS-BS (from input box). Blood lead concentration attributed to incidental soil ingestion (SPb). SPb = BSF*(CF*FA*CR*Y*Z*(WD/DY))

(d) Concentration of lead in air due to dust (CF). CF=((CS-BS)*CD*Y) (from input box). Blood lead concentration attributed to fugitive dust (APb). APb = BSF*(CF*FA*CR*HD*(WD/DY))

(e) Blood lead concentrations from incidental soil ingestion and inhalation of fugitive dust are summed (TPb). TPb = SPb +APb

(f) Estimated geometric mean blood lead concentration equals sum of background concentration plus blood lead concentrations attributed to incidental soil ingestion and inhalation exposure pathways (TPb + B).

Table H-89: Comparison of Measured Soil Gas Concentrations, Modeled Indoor Air Concentrations, and Annual Guideline Concentrations Former Thypin Steel Inc. Facility, Manorhaven, New York.

		NYSDEC	3 Ft BLS				6 Ft BLS			
			PAEI		RMEI		PAEI		RMEI	
		AGCs	Soil Gas	Modeled Air	Soil Gas	Modeled Air	Soil Gas	Modeled Air	Soil Gas	Modeled Air
Volatile Organic Compounds ($\mu g/m^3$)										
1,1-Dichloroethene	75354	2.00E-2	3.69E+1	6.45E-3	2.95E+2	**5.17E-2**	2.26E+1	2.02E-3	8.30E+1	7.43E-3
Benzene	71432	1.20E-1	2.16E+1	3.74E-3	1.00E+2	1.73E-2	1.64E+1	1.45E-3	7.10E+1	6.27E-3
Methyl bromide	74839	--	3.97E+1	5.90E-3	2.00E+2	2.97E-2	ND	NP	ND	NP
Bromodichloromethane	75274	2.00E-2	ND	NP	ND	NP	1.70E+1	5.94E-4	8.30E+1	2.90E-3
Carbon disulfide	75150	7.00E+0	2.23E+1	4.36E-3	1.00E+2	1.96E-2	1.77E+1	1.80E-3	8.30E+1	8.44E-3
Carbon tetrachloride	56235	7.00E-2	2.30E+1	3.59E-3	1.00E+2	1.56E-2	1.72E+1	1.35E-3	8.30E+1	6.53E-3
Chloroform	67663	2.30E+1	2.72E+1	5.36E-3	1.00E+2	1.97E-2	2.61E+1	2.68E-3	1.59E+2	1.63E-2
Methylene chloride	75092	2.70E+0	2.33E+1	4.54E-3	1.00E+2	1.95E-2	3.02E+1	3.05E-3	1.69E+2	1.71E-2
Tetrachloroethene	127184	1.00E+2	5.03E+1	7.36E-3	1.11E+2	1.63E-2	5.60E+1	4.10E-3	1.60E+2	1.17E-2
Trichloroethene	79016	4.50E-1	7.58E+2	1.20E-1	4.20E+3	**6.65E-1**	6.16E+2	4.92E-2	3.30E+3	2.64E-1

Notes:

NYSDEC	New York State Department of Environmental Consevation
AGCs	Annual Guideline Concentrations for ambient air (NYSDEC, 1997)
Ft BLS	Feet below land surface
$\mu g/m^3$	Micrograms per cubic meter
PAEI	Plausible average exposed individual uses mean concentrations
RMEI	Reasonable maximum exposed individual uses maximum concentrations
ND	Not detected
NP	Not applicable
--	No guideline concentration
bold	Bold font indicates modeled indoor air concentration exceeds respective AGC

Table H-90: Summary of Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Surface Soil
Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Child and Youth -- Recreation Scenario

Chemical	CAS RN	Plausible Average Exposed Individual (PAEI)			Reasonable Maximum Exposed Individual (RMEI)		
		Child	Youth	Child + Youth	Child	Youth	Child + Youth
SEMIVOLATILE ORGANIC COMPOUNDS							
Benzo[a]anthracene	56553	9.37E-6	3.52E-6	1.29E-5	1.39E-4	4.44E-5	1.84E-4
Benzo[a]pyrene	50328	8.26E-5	3.11E-5	1.14E-4	1.15E-3	3.68E-4	1.52E-3
Benzo[b]fluoranthene	205992	5.18E-5	1.95E-5	7.13E-5	7.02E-4	2.23E-4	9.25E-4
Dibenzo[a,h]anthracene	53703	2.58E-6	9.70E-7	3.55E-6	4.18E-5	1.33E-5	5.51E-5
Indeno[1,2,3-cd]pyrene	193395	5.83E-5	2.19E-5	8.03E-5	8.16E-4	2.60E-4	1.08E-3
METALS							
Arsenic	7440382	2.74E-2	9.10E-3	3.65E-2	4.36E-1	1.27E-1	5.63E-1

Table H-91: **Summary of Estimated Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Surface Soil Former Thypin Steel Inc. Facility, Manorhaven, New York.-- Child and Youth -- Recreation Scenario**

Chemical	CAS RN	Plausible Average Exposed Individual (PAEI)			Reasonable Maximum Exposed Individual (RMEI)		
		Child	Youth	Child + Youth	Child	Youth	Child + Youth
SEMIVOLATILE ORGANIC COMPOUNDS							
Benzo[a]anthracene	56553	4.38E-8	3.30E-8	7.68E-8	1.09E-6	8.31E-7	1.92E-6
Benzo[a]pyrene	50328	3.86E-7	2.91E-7	6.77E-7	9.00E-6	6.88E-6	1.59E-5
Benzo[b]fluoranthene	205992	3.23E-8	2.43E-8	5.67E-8	7.30E-7	5.58E-7	1.29E-6
Dibenzo[a,h]anthracene	53703	1.21E-7	9.07E-8	2.11E-7	3.26E-6	2.49E-6	5.75E-6
Indeno[1,2,3-cd]pyrene	193395	2.73E-8	2.05E-8	4.78E-8	6.36E-7	4.87E-7	1.12E-6
METALS							
Arsenic	7440382	2.63E-7	1.75E-7	4.39E-7	7.00E-6	4.91E-6	1.19E-5

Table H-92: Summary of Estimated Baseline Hazard Quotients (HQs) for Exposure to Noncarcinogenic Chemicals Identified in Subsurface Soil
Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Child and Youth -- Vegetable Scenario

Chemical	CAS RN	Plausible Average Exposed Individual (PAEI)			Reasonable Maximum Exposed Individual (RMEI)		
		Child	Youth	Child + Youth	Child	Youth	Child + Youth
SEMIVOLATILE ORGANIC COMPOUNDS							
Benzo[a]anthracene	56553	2.68E-5	3.90E-5	6.58E-5	2.02E-4	2.94E-4	4.96E-4
Benzo[a]pyrene	50328	2.31E-4	3.36E-4	5.67E-4	1.64E-3	2.38E-3	4.02E-3
Benzo[b]fluoranthene	205992	1.50E-4	2.19E-4	3.69E-4	1.03E-3	1.50E-3	2.53E-3
Dibenzo[a,h]anthracene	53703	6.58E-6	9.61E-6	1.62E-5	5.41E-5	7.91E-5	1.33E-4
Indeno[1,2,3-cd]pyrene	193395	1.44E-4	2.11E-4	3.55E-4	1.02E-3	1.50E-3	2.52E-3
METALS							
Arsenic	7440382	5.47E-3	6.85E-3	1.23E-2	4.64E-2	5.80E-2	1.04E-1

Table H-93: Summary of Estimated Incremental Lifetime Cancer Risk (ILCR) for Exposure to Carcinogenic Chemicals Identified in Subsurface Soil. Former Thypin Steel Inc. Facility, Manorhaven, New York. -- Child and Youth -- Vegetable Scenario

Chemical	CAS RN	Plausible Average Exposed Individual (PAEI)			Reasonable Maximum Exposed Individual (RMEI)		
		Child	Youth	Child + Youth	Child	Youth	Child + Youth
SEMIVOLATILE ORGANIC COMPOUNDS							
Benzo[a]anthracene	56553	8.26E-8	2.41E-7	3.23E-7	1.25E-6	3.63E-6	4.88E-6
Benzo[a]pyrene	50328	7.12E-7	2.08E-6	2.79E-6	1.01E-5	2.94E-5	3.95E-5
Benzo[b]fluoranthene	205992	6.19E-8	1.80E-7	2.42E-7	8.49E-7	2.47E-6	3.32E-6
Dibenzo[a,h]anthracene	53703	2.03E-7	5.93E-7	7.96E-7	3.34E-6	9.76E-6	1.31E-5
Indeno[1,2,3-cd]pyrene	193395	4.46E-8	1.30E-7	1.75E-7	6.32E-7	1.85E-6	2.48E-6
METALS							
Arsenic	7440382	3.47E-8	8.68E-8	1.22E-7	5.88E-7	1.47E-6	2.06E-6