

## 1.4.2 Site-Related Treatment Systems

AOC3 includes a treatment system for groundwater as part of the Former Tappan Terminal site remedy and will be addressed by a separate SMP (refer to Section 4.0).

### 1.4.3 Remaining Contamination

Soil confirmation samples taken at the excavation area were in compliance with the ROD-specific criterion for Total SVOCs of 500 ppm, and results ranged from 0.57 to 53 ppm Total SVOCs.

The Site was overlain by a two foot cap with filter fabric and concrete pads at an approximate depth of two feet or more below grade that demark the bottom of the cap and location of Site material that may potentially be impacted (refer to Figure 2 and Appendix C).

The selected remedy for the Site included excavation and removal of soil that was grossly contaminated with weathered petroleum as measured by a shake test or soil that contained in excess of the site-specific criterion established in the ROD of 500 ppm Total SVOCs+TICs. Remedial actions were conducted in the vicinity of well OW-5A as summarized in Table 2 and shown on Figure 6. This area also contains a 42" diameter storm sewer pipe (also depicted on Figure 6 and refer to Figure 2).

The future construction of clean utility corridors during any site development will follow the Excavation Work Plan (EWP, Appendix D). The clean utility corridors will be constructed such that the demarcation layer will be placed a minimum of 1 foot below (vertically) the respective utilities to minimize the potential for worker exposure and damage to the cover system. The lateral distance to the demarcation layer will be determined by the type and size of the utility to allow any future maintenance work in a way that minimizes the potential for worker exposure and damage to the cover system. The utility corridors will have soil or clean material meeting the unrestricted soil cleanup objectives (refer to Table 3).

Figures 6 and 7 summarize the results of all soil and groundwater samples remaining at the site after completion of Remedial Action that exceed the Track 1 (unrestricted) SCOs or Action Levels, respectively.

## **2.0 ENGINEERING AND INSTITUTIONAL CONTROL PLAN**

### **2.1 INTRODUCTION**

#### **2.1.1 General**

Since remaining contaminated soil and groundwater/soil vapor exists beneath the Site, Engineering Controls and Institutional Controls (EC/ICs) are required to protect human health and the environment. This Engineering and Institutional Control Plan describes the procedures for the implementation and management of all EC/ICs at the Site. The EC/IC Plan is one component of the SMP and is subject to revision by NYSDEC.

#### **2.1.2 Purpose**

This plan provides:

- A description of all EC/ICs on the Site;
- The basic implementation and intended role of each EC/IC;
- A description of the key components of the ICs set forth in the Environmental Easement;
- A description of the features to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of EC/ICs, such as the implementation of the EWP (Appendix D) for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the Site; and
- Any other provisions necessary to identify or establish methods for implementing the EC/ICs required by the Site remedy, as determined by the NYSDEC.

Table 2. Summary of Remaining Soil Contamination Above Unrestricted Levels - Results of Soil Samples Under Concrete Structures, Former Tappan Terminal, Hastings-on-Hudson, New York (2010)

Parameter (Concentrations in µg/kg)	Site-Specific Standards	Unrestricted Use Criteria	Sample Designation: Sample Date: Sample Depth (ft bls):	CP	CP	TP1-1	TP1-1	TP1-2	TP1-2	TP1-3	TP1-3	TP2-1	TP2-1	TP2-2	TP2-2	TP2-3	TP2-3	TP2-3DUP	TP3	TP3	TP4	TP4
				9/15/2010	9/15/2010	9/23/2010	9/23/2010	9/23/2010	9/23/2010	9/23/2010	9/23/2010	9/23/2010	9/23/2010	9/23/2010	9/20/2010	9/20/2010	9/20/2010	9/20/2010	9/20/2010	9/20/2010	9/20/2010	9/14/2010
1,2,4,5-Tetrachlorobenzene				250 U	280 U	270 U	300 U	210 U	280 U	250 U	360 U	270 U	200 U	240 U	270 U	290 U	260 U	220 U	1400 U	240 U	1300 U	1300 U
2,2'-oxybis (1-chloropropane)				98 U	110 U	110 U	120 U	85 U	110 U	99 U	140 U	110 U	79 U	94 U	110 U	110 U	100 U	90 U	570 U	96 U	530 U	520 U
2,3,4,6-Tetrachlorophenol				250 U	280 U	270 U	300 U	210 U	280 U	250 U	360 U	270 U	200 U	240 U	270 U	290 U	260 U	220 U	1400 U	240 U	1300 U	1300 U
2,4,5-Trichlorophenol				250 U	280 U	270 U	300 U	210 U	280 U	250 U	360 U	270 U	200 U	240 U	270 U	290 U	260 U	220 U	1400 U	240 U	1300 U	1300 U
2,4,6-Trichlorophenol				250 U	280 U	270 U	300 U	210 U	280 U	250 U	360 U	270 U	200 U	240 U	270 U	290 U	260 U	220 U	1400 U	240 U	1300 U	1300 U
2,4-Dichlorophenol				250 U	280 U	270 U	300 U	210 U	280 U	250 U	360 U	270 U	200 U	240 U	270 U	290 U	260 U	220 U	1400 U	240 U	1300 U	1300 U
2,4-Dimethylphenol				250 U	280 U	270 U	300 U	210 U	280 U	250 U	360 U	270 U	200 U	240 U	270 U	947	217 J	187 J	1400 U	240 U	1300 U	1300 U
2,4-Dinitrophenol				980 U	1100 U	1100 U	1200 U	850 U	1100 U	990 U	1400 U	1100 U	790 U	940 U	1100 U	1100 U	1000 U	900 U	5700 U	960 U	5300 U	5200 U
2,4-Dinitrotoluene				98 U	110 U	110 U	120 U	85 U	110 U	99 U	140 U	110 U	79 U	94 U	110 U	110 U	100 U	90 U	570 U	96 U	530 U	520 U
2,6-Dinitrotoluene				98 U	110 U	110 U	120 U	85 U	110 U	99 U	140 U	110 U	79 U	94 U	110 U	110 U	100 U	90 U	570 U	96 U	530 U	520 U
2-Chloronaphthalene				98 U	110 U	110 U	120 U	85 U	110 U	99 U	140 U	110 U	79 U	94 U	110 U	110 U	100 U	90 U	570 U	96 U	530 U	520 U
2-Chlorophenol				250 U	280 U	270 U	300 U	210 U	280 U	250 U	360 U	270 U	200 U	240 U	270 U	290 U	260 U	220 U	1400 U	240 U	1300 U	1300 U
2-Methylnaphthalene				448	110 U	110 U	120 U	85 U	110 U	99 U	140 U	84.3 J	46.3 J	94 U	110 U	175	89.8 J	76.3 J	570 U	96 U	2460	1860
2-Methylphenol		330		98 U	110 U	110 U	120 U	85 U	110 U	99 U	140 U	110 U	79 U	94 U	110 U	104 J	100 U	90 U	570 U	96 U	530 U	520 U
2-Nitroaniline				250 U	280 U	270 U	300 U	210 U	280 U	250 U	360 U	270 U	200 U	240 U	270 U	290 U	260 U	220 U	1400 U	240 U	1300 U	1300 U
2-Nitrophenol				250 U	280 U	270 U	300 U	210 U	280 U	250 U	360 U	270 U	200 U	240 U	270 U	290 U	260 U	220 U	1400 U	240 U	1300 U	1300 U
3&4-Methylphenol		330		98 U	110 U	110 U	120 U	85 U	110 U	99 U	140 U	110 U	79 U	94 U	110 U	764	100 U	90 U	570 U	96 U	530 U	520 U
3,3'-Dichlorobenzidine				250 U	280 U	270 U	300 U	210 U	280 U	250 U	360 U	270 U	200 U	240 U	270 U	290 U	260 U	220 U	1400 U	240 U	1300 U	1300 U
3-Nitroaniline				250 U	280 U	270 U	300 U	210 U	280 U	250 U	360 U	270 U	200 U	240 U	270 U	290 U	260 U	220 U	1400 U	240 U	1300 U	1300 U
4,6-Dinitro-2-methylphenol				980 U	1100 U	1100 U	1200 U	850 U	1100 U	990 U	1400 U	1100 U	790 U	940 U	1100 U	1100 U	1000 U	900 U	5700 U	960 U	5300 U	5200 U
4-Bromophenyl phenyl ether				98 U	110 U	110 U	120 U	85 U	110 U	99 U	140 U	110 U	79 U	94 U	110 U	110 U	100 U	90 U	570 U	96 U	530 U	520 U
4-Chloro-3-methylphenol				250 U	280 U	270 U	300 U	210 U	280 U	250 U	360 U	270 U	200 U	240 U	270 U	290 U	260 U	220 U	1400 U	240 U	1300 U	1300 U
4-Chloroaniline				250 U	280 U	95.5 J	300 U	210 U	280 U	250 U	55.1 J	270 U	200 U	240 U	270 U	7140	376	522	1400 U	240 U	1300 U	1300 U
4-Chlorophenyl phenyl ether				98 U	110 U	110 U	120 U	85 U	110 U	99 U	140 U	110 U	79 U	94 U	110 U	110 U	100 U	90 U	570 U	96 U	530 U	520 U
4-Nitroaniline				250 U	280 U	270 U	300 U	210 U	280 U	250 U	360 U	270 U	200 U	240 U	270 U	1360	260 U	220 U	1400 U	240 U	1300 U	1300 U
4-Nitrophenol				490 U	560 U	540 U	600 U	430 U	550 U	490 U	710 U	530 U	390 U	470 U	530 U	570 U	520 U	450 U	2800 U	480 U	2600 U	2600 U
Acenaphthene		20,000		2120	56 U	80	38.9 J	28.3 J	55 U	34.4 J	145	613	224	47 U	53 U	150	173	158	280 U	48 U	2620	1040
Acenaphthylene		100,000		97.9	56 U	42.6 J	27 J	43 U	55 U	49 U	71 U	53 U	39 U	47 U	53 U	57 U	52 U	45 U	280 U	48 U	260 U	260 U
Acetophenone				250 U	280 U	270 U	300 U	210 U	280 U	250 U	360 U	270 U	200 U	240 U	270 U	290 U	260 U	220 U	1400 U	240 U	1300 U	1300 U
Anthracene		100,000		1030	56 U	185	70.6	53.3	55 U	29.3 J	117	144	161	57.2	95.1	985	350	346	214 J	48 U	1480	1070
Atrazine				250 U	280 U	270 U	300 U	210 U	280 U	250 U	360 U	270 U	200 U	240 U	270 U	290 U	260 U	220 U	1400 U	240 U	1300 U	1300 U
Benzaldehyde				250 U	280 U	270 U	300 U	210 U	280 U	250 U	360 U	270 U	200 U	240 U	270 U	290 U	260 U	220 U	1400 U	240 U	1300 U	1300 U
Benzo[a]anthracene		1,000		693	41 J	356	145	129	55 U	107	96.8	178	270	140	194	3400	676	805	205 J	32.5 J	397	1280
Benzo[a]pyrene		1,000		317	30.5 J	306	143	113	55 U	97.7	61 J	137	231	126	146	2930	606	718	280 U	22.3 J	209 J	1040
Benzo[b]fluoranthene		1,000		554	43.2 J	276	157	114	55 U	115	77.1	130	249	136	188	3830	548	665	280 U	24.9 J	369	1420
Benzo[g,h,i]perylene		100,000		152	56 U	152	108	70.7	55 U	69.9	38.4 J	78.1	130	70	100	1700	362	448	280 U	48 U	153 J	617
Benzo[k]fluoranthene		800		232	22.6 J	199	103	82.6	55 U	69.7	49.4 J	128	82.6	107	139	1640	458	458	280 U	19.8 J	155 J	512
Bis(2-chloroethoxy)methane				98 U	110 U	110 U	120 U	85 U	110 U	99 U	140 U	110 U	79 U	94 U	110 U	110 U	100 U	90 U	570 U	96 U	530 U	520 U
Bis(2-chloroethyl) ether				98 U	110 U	110 U	120 U	85 U	110 U	99 U	140 U	110 U	79 U	94 U	110 U	110 U	100 U	90 U	570 U	96 U	530 U	520 U
Bis(2-ethylhexyl) phthalate				98 U	110 U	110 U	120 U	85 U	110 U	99 U	140 U	110 U	79 U	142	110 U	110 U	100 U	90 U	570 U	84 J	356 J	423 J
Butylbenzyl phthalate				98 U	110 U	110 U	120 U	85 U	110 U	99 U	140 U	110 U	79 U	94 U	110 U	110 U	100 U	90 U	570 U	96 U	530 U	520 U
Caprolactam				98 U	110 U	110 U	120 U	85 U	110 U	99 U	140 U	110 U	79 U	94 U	110 U	110 U	100 U	90 U	570 U	96 U	530 U	520 U
Carbazole				324	110 U	110 U	120 U	85 U	110 U	99 U	37.9 J	110 U	45 J	94 U	110 U	271	103	97	570 U	96 U	530 U	165 J
Chrysene		1,000		680	50.4 J	387	167	141	55 U	139	133	214	262	159	227	3220	749	858	201 J	45.6 J	503	1450
Dibenzo[a,h]anthracene		330		79.6	56 U	57.4	37.3 J	22.7 J	55 U	24.5 J	71 U	53 U	82.2	47 U	53 U	848	184	274	280 U	48 U	260 U	323
Dibenzofuran				1230	110 U	56.2 J	120 U	18 J	110 U	99 U	47.7 J	166	88.4	94 U	110 U	80.8 J	108	129	570 U	96 U	1190	451 J
Diethyl phthalate				98 U	110 U	110 U	120 U	85 U	110 U	99 U	140 U	110 U	79 U	94 U	110 U	110 U	100 U	90 U	570 U	96 U	530 U	520 U
Dimethyl phthalate				103	98.5 J	128	120 U	85 U	110 U	63.9 J	140 U	110 U	79 U	94 U	110 U	110 U	100 U	90 U	316 J	81 J	530 U	520 U
Di-n-butyl phthalate				98 U	110 U	110 U	120 U	85 U	110 U	99 U	140 U	110 U	79 U	94 U	110 U	110 U	100 U	90 U	570 U	96 U	530 U	520 U
Di-n-octyl phthalate				98 U	110 U	110 U	120 U	85 U	110 U	99 U	140 U	110 U	79 U	94 U	110 U	110 U	100 U	90 U	570 U	96 U	530 U	520 U
Diphenyl				186	110 U	110 U	120 U	85 U	110 U	99 U	140 U	110 U	79 U	94 U	110 U	61.9 J	36.4 J	32.7 J	570 U	96 U	530 U	520 U
Fluoranthene		100,000		3660	80.5	769	273	267	55 U	206	502	470	557	348	476	9930	1610	1660	5290	86.9	1530	2560
Fluorene		30,000		1830	56 U	185	37.8 J	36.2 J	55 U	30 J	103	295	112	47 U	81.3	247	206	199	162 J	48 U	5020	1600
Hexachlorobenzene				98 U	110 U	110 U	120 U	85 U	110 U	99 U	140 U	110 U	79 U	94 U	110 U	110 U	100 U	90 U	570 U	96 U	530 U	520 U
Hexachlorobutadiene				49 U	56 U	54 U	60 U	43 U	55 U	49 U	71 U	53 U	39 U	47 U	53 U	57 U	52 U	45 U	280 U	48 U	260 U	260 U
Hexachlorocyclopentadiene				980 U	1100 U	1100 U	1200 U	850 U	1100 U	990 U	1400 U	1100 U	790 U	940 U	1100 U	1100 U	1000 U	900 U	5700 U	960 U	5300 U	5200 U
Hexachloroethane				250 U	280 U	270 U	300 U	210 U	280 U	250 U	360 U	270 U	200 U	240 U	270 U	290 U	260 U	220 U	1400 U	240 U	1300 U	1300 U
Indeno[1,2,3-cd]pyrene		500		151	56 U	136	96.7	67.3	55 U	68.5	37.7 J	90.5	120	69.2	89.7	1730	335	396	280 U	48 U	260 U	630
Isophorone				98 U	110 U	110 U	120 U	85 U	110 U	99 U	140 U	110 U	79 U	94 U	110 U	110 U	100 U	90 U	570 U			

Table 2. Summary of Remaining Soil Contamination Above Unrestricted Levels - Results of Soil Samples in the Excavation Area, Former Tappan Terminal, Hastings-on-Hudson, New York

Parameter (Concentrations in µg/kg)	Site-Specific Criteria	Unrestricted Use Criteria	Sample Designation: Sample Date: Sample Depth (ft bls):	B1	B2	B3	B4	B5	B6	B6 DUP	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	B18	B19
				11/18/2010	11/18/2010	11/18/2010	11/19/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/19/2010	11/23/2010	11/22/2010	11/22/2010	11/22/2010	11/22/2010	11/23/2010	11/23/2010	11/22/2010	11/22/2010
1,2,4,5-Tetrachlorobenzene				340 U	250 U	370 U	350 U	240 U	270 U	320 U	270 U	220 U	260 U	180 U	190 U	280 U	240 UJ	400 U	270 U	200 U	270 U	210 U	350 U
2,2'-oxybis (1-chloropropane)				140 U	99 U	150 U	140 U	95 U	110 U	130 U	110 U	89 U	100 U	72 U	75 U	110 U	98 U	160 U	110 U	80 U	110 U	84 U	140 U
2,3,4,6-Tetrachlorophenol				340 U	250 U	370 U	350 U	240 U	270 U	320 U	270 U	220 U	260 U	180 U	190 U	280 U	240 UJ	400 U	270 U	200 U	270 U	210 U	350 U
2,4,5-Trichlorophenol				340 U	250 U	370 U	350 U	240 U	270 U	320 U	270 U	220 U	260 U	180 U	190 U	280 U	240 UJ	400 U	270 U	200 U	270 U	210 U	350 U
2,4,6-Trichlorophenol				340 U	250 U	370 U	350 U	240 U	270 U	320 U	270 U	220 U	260 U	180 U	190 U	280 U	240 UJ	400 U	270 U	200 U	270 U	210 U	350 U
2,4-Dichlorophenol				340 U	250 U	370 U	350 U	240 U	270 U	320 U	270 U	220 U	260 U	180 U	190 U	280 U	240 UJ	400 U	270 U	200 U	270 U	210 U	350 U
2,4-Dimethylphenol				340 U	250 U	370 U	350 U	649	270 U	320 U	270 U	220 U	260 U	180 U	190 U	280 U	240 U	400 U	270 U	200 U	270 U	210 U	350 U
2,4-Dinitrophenol				1400 U	990 U	1500 U	1400 U	950 U	1100 U	1300 U	1100 U	890 U	1000 U	720 U	750 U	1100 U	980 UJ	1600 U	1100 U	800 U	1100 U	840 U	1400 U
2,4-Dinitrotoluene				140 U	99 U	150 U	140 U	95 U	110 U	130 U	110 U	89 U	100 U	72 U	75 U	110 U	98 UJ	160 U	110 U	80 U	110 U	84 U	140 U
2,6-Dinitrotoluene				140 U	99 U	150 U	140 U	95 U	110 U	130 U	110 U	89 U	100 U	72 U	75 U	110 U	98 UJ	160 U	110 U	80 U	110 U	84 U	140 U
2-Chloronaphthalene				140 U	99 U	150 U	140 U	95 U	110 U	130 U	110 U	89 U	100 U	72 U	75 U	110 U	98 UJ	160 U	51.7 J	80 U	110 U	84 U	140 U
2-Chlorophenol				340 U	250 U	370 U	350 U	240 U	270 U	320 U	270 U	220 U	260 U	180 U	190 U	280 U	240 U	400 U	270 U	200 U	270 U	210 U	350 U
2-Methylnaphthalene				9310	281	59.6 J	3740	348	59.3 J	270	264	89 U	398	664	62.3 J	5470	98 U	160 U	36.8 J	270	110 U	356	140 U
2-Methylphenol	330			140 U	99 U	150 U	140 U	95 U	110 U	130 U	110 U	89 U	100 U	72 U	75 U	110 U	98 U	160 U	110 U	80 U	110 U	84 U	140 U
2-Nitroaniline				340 U	250 U	370 U	350 U	240 U	270 U	320 U	270 U	220 U	260 U	180 U	190 U	280 U	240 UJ	400 U	270 U	200 U	270 U	210 U	350 U
2-Nitrophenol				340 U	250 U	370 U	350 U	240 U	270 U	320 U	270 U	220 U	260 U	180 U	190 U	280 U	240 U	400 U	270 U	200 U	270 U	210 U	350 U
3&4-Methylphenol	330			140 U	99 U	150 U	140 U	95 U	110 U	130 U	110 U	89 U	100 U	72 U	75 U	110 U	98 U	160 U	110 U	80 U	110 U	84 U	140 U
3,3'-Dichlorobenzidine				340 U	250 U	370 U	350 U	240 U	270 U	320 U	270 U	220 UJ	260 U	180 U	190 U	280 U	240 UJ	400 U	270 U	200 U	270 U	210 U	350 U
3-Nitroaniline				340 U	250 U	370 U	350 U	240 U	270 U	320 U	270 U	220 U	260 U	180 U	190 U	280 U	240 UJ	400 U	270 U	200 U	270 U	210 U	350 U
4,6-Dinitro-2-methylphenol				1400 U	990 U	1500 U	1400 U	950 U	1100 U	1300 U	1100 U	890 U	1000 U	720 U	750 U	1100 U	980 UJ	1600 U	1100 U	800 U	1100 U	840 U	1400 U
4-Bromophenyl phenyl ether				140 U	99 U	150 U	140 U	95 U	110 U	130 U	110 U	89 U	100 U	72 U	75 U	110 U	98 UJ	160 U	110 U	80 U	110 U	84 U	140 U
4-Chloro-3-methylphenol				340 U	250 U	370 U	350 U	240 U	270 U	320 U	270 U	220 U	260 U	180 U	190 U	280 U	240 U	400 U	270 U	200 U	270 U	210 U	350 U
4-Chloroaniline				340 U	250 U	370 U	350 U	240 U	270 U	320 U	270 U	220 U	260 U	180 U	190 U	280 U	240 U	400 U	270 U	200 U	270 U	210 U	350 U
4-Chlorophenyl phenyl ether				140 U	99 U	150 U	140 U	95 U	110 U	130 U	110 U	89 U	100 U	72 U	75 U	110 U	98 UJ	160 U	110 U	80 U	110 U	84 U	140 U
4-Nitroaniline				340 U	250 U	370 U	350 U	240 U	270 U	320 U	270 U	220 U	260 U	180 U	190 U	280 U	240 UJ	400 U	270 U	200 U	270 U	210 U	350 U
4-Nitrophenol				680 U	500 U	750 U	710 U	480 U	530 U	640 U	540 U	440 U	520 U	360 U	380 U	550 U	490 UJ	810 U	530 U	400 U	530 U	420 U	700 U
Acenaphthene		20,000		1120	137	75 U	323	216	53 U	30.5 J	122	44 U	283	297	38 U	2710	1950 J	468	53 U	20.8 J	52 J	278	56.6 J
Acenaphthylene		100,000		68 U	50 U	75 U	71 U	48 U	53 U	64 U	54 U	44 U	52 U	44.5	38 U	55 U	49 UJ	81 U	53 U	40 U	42.5 J	42 U	70 U
Acetophenone				340 U	250 U	370 U	350 U	240 U	270 U	320 U	270 U	220 U	260 U	180 U	190 U	280 U	240 U	400 U	270 U	200 U	270 U	210 U	350 U
Anthracene		100,000		68 U	50 U	75 U	130	48 U	53 U	64 U	294	44 U	52 U	605	38 U	541	1550 J	81 U	53 U	40 U	125	186	60.8 J
Atrazine				340 U	250 U	370 U	350 U	240 U	270 U	320 U	270 U	220 U	260 U	180 U	190 U	280 U	240 U	400 U	270 U	200 U	270 U	210 U	350 U
Benzaldehyde				340 U	250 U	327 J	350 U	240 U	270 U	320 U	270 U	220 U	260 U	180 U	190 U	280 U	240 U	400 U	270 U	200 U	270 U	210 U	350 U
Benzo[a]anthracene		1,000		367	43.3 J	75 U	156	48 U	59.1	64 U	667	235 J	69.4	989	105	510	2390 J	454	53 U	97.8	210	363	168
Benzo[a]pyrene		1,000		410	40.8 J	75 U	123	48 U	67.2	64 U	649	171 J	61.7	929	104	515	2520 J	475	58.7	107	243	318	139
Benzo[b]fluoranthene		1,000		423	42 J	75 U	71 U	48 U	108	64 U	561	199 J	79.2	957	108	480	2560 J	519	84.3	146	84.7	255	141
Benzo[g,h,i]perylene		100,000		255	50 U	75 U	71.1	48 U	60.8	64 U	440	103 J	45.4 J	538	71.9	371	1790 J	218	53 U	84.6	169	183	76.5
Benzo[k]fluoranthene		800		133	50 U	75 U	71 U	48 U	36.6 J	64 U	387	71.7 J	52 U	723	65.5	312	2250 J	230	53 U	45.6	193	229	71.3
Bis(2-chloroethoxy)methane				140 U	99 U	150 U	140 U	95 U	110 U	130 U	110 U	89 U	100 U	72 U	75 U	110 U	98 U	160 U	110 U	80 U	110 U	84 U	140 U
Bis(2-chloroethyl) ether				140 U	99 U	150 U	140 U	95 U	110 U	130 U	110 U	89 U	100 U	72 U	75 U	110 U	98 U	160 U	110 U	80 U	110 U	84 U	140 U
Bis(2-ethylhexyl) phthalate				365	56.5 J	150 U	159	340	111	130 U	1420	89 UJ	100 U	72 U	75 U	110 U	146 J	1670	1150	80 U	110 U	72.8 J	140 U
Butylbenzyl phthalate				140 U	99 U	150 U	140 U	95 U	110 U	130 U	110 U	89 UJ	100 U	72 U	75 U	110 U	98 UJ	160 U	110 U	80 U	110 U	84 U	140 U
Caprolactam				140 U	99 U	150 U	140 U	95 U	110 U	130 U	110 U	89 U	100 U	72 U	75 U	110 U	98 U	160 U	110 U	80 U	110 U	84 U	140 U
Carbazole				140 U	99 U	150 U	57.1 J	95 U	110 U	130 U	135	51.6 J	100 U	236	244 J	110 U	538 J	160 U	110 U	80 U	32 J	65.6 J	140 U
Chrysene		1,000		418	50 U	75 U	172	48 U	53 U	64 U	780	220 J	52 U	1100	79.2	782	2740 J	504	53 U	67.3	308	403	212
Dibenzo[a,h]anthracene		330		135	50 U	75 U	31.2 J	48 U	31 J	64 U	168	59.7 J	52 U	254	34.1 J	176	734 J	108	53 U	40 U	70.9	79.9	70 U
Dibenzofuran				390	89.3 J	150 U	258	165	110 U	130 U	110 U	30.9 J	144	211	25.9 J	1410	957 J	127 J	34.9 J	48.3 J	110 U	112	140 U
Diethyl phthalate				140 U	99 U	150 U	140 U	95 U	110 U	119 J	110 U	89 U	100 U	72 U	75 U	110 U	98 UJ	160 U	110 U	80 U	110 U	84 U	140 U
Dimethyl phthalate				140 U	87.4 J	133 J	140 U	95 U	113	145	140	89 U	62.5 J	63.3 J	45.3 J	110 U	98 UJ	451	73.9 J	66.7 J	87.8 JB	122 B	119 J
Di-n-butyl phthalate				140 U	99 U	150 U	140 U	95 U	110 U	488	110 U	89 U	100 U	72 U	75 U	110 U	98 UJ	160 U	110 U	80 U	110 U	84 U	102 J
Di-n-octyl phthalate				140 U	99 U	150 U	140 U	95 U	110 U	130 U	110 U	89 UJ	100 U	72 U	75 U	110 U	98 UJ	160 U	110 U	80 U	110 U	84 U	140 U
Diphenyl				140 U	99 U	150 U	140 U	95 U	110 U	130 U	47.2 J	89 U	100 U	41.5 J	75 U	110 U	98 UJ	160 U	110 U	80 U	110 U	30.1 J	140 U
Fluoranthene		100,000		444	80.9	33.3 J	365	64.3	84.8	64 U	970	304	124	2200	239	1150	5720	506	195	193	452	633	355
Fluorene		30,000		1320	271	123	618	433	53 U	220	201	48.5	461	404	59.8	3420	2620 J	514	171	142	53.7	349	46.7 J
Hexachlorobenzene				140 U	99 U	150 U	140 U	95 U	110 U	130 U	110 U	89 U	100 U	72 U	75 U	110 U	98 UJ	160 U	110 U	80 U	110 U	84 U	140 U
Hexachlorobutadiene				68 U	50 U	75 U	71 U	48 U	53 U	64 U	54 U	44 U	52 U	36 U	38 U	55 U	49 U	81 U	53 U	40 U	53 U	42 U	70 U
Hexachlorocyclopentadiene				1400 U	990 U	1500 U	1400 U	950 U	1100 U	1300 U	1100 U	890 U	1000 U	720 U	750 U	1100 U	980 UJ	1600 U	1100 U	800 U	1100 U	840 U	1400 U
Hexachloroethane				340 U	250 U	370 U	350 U	240 U	270 U	320 U	270 U	220 U</											

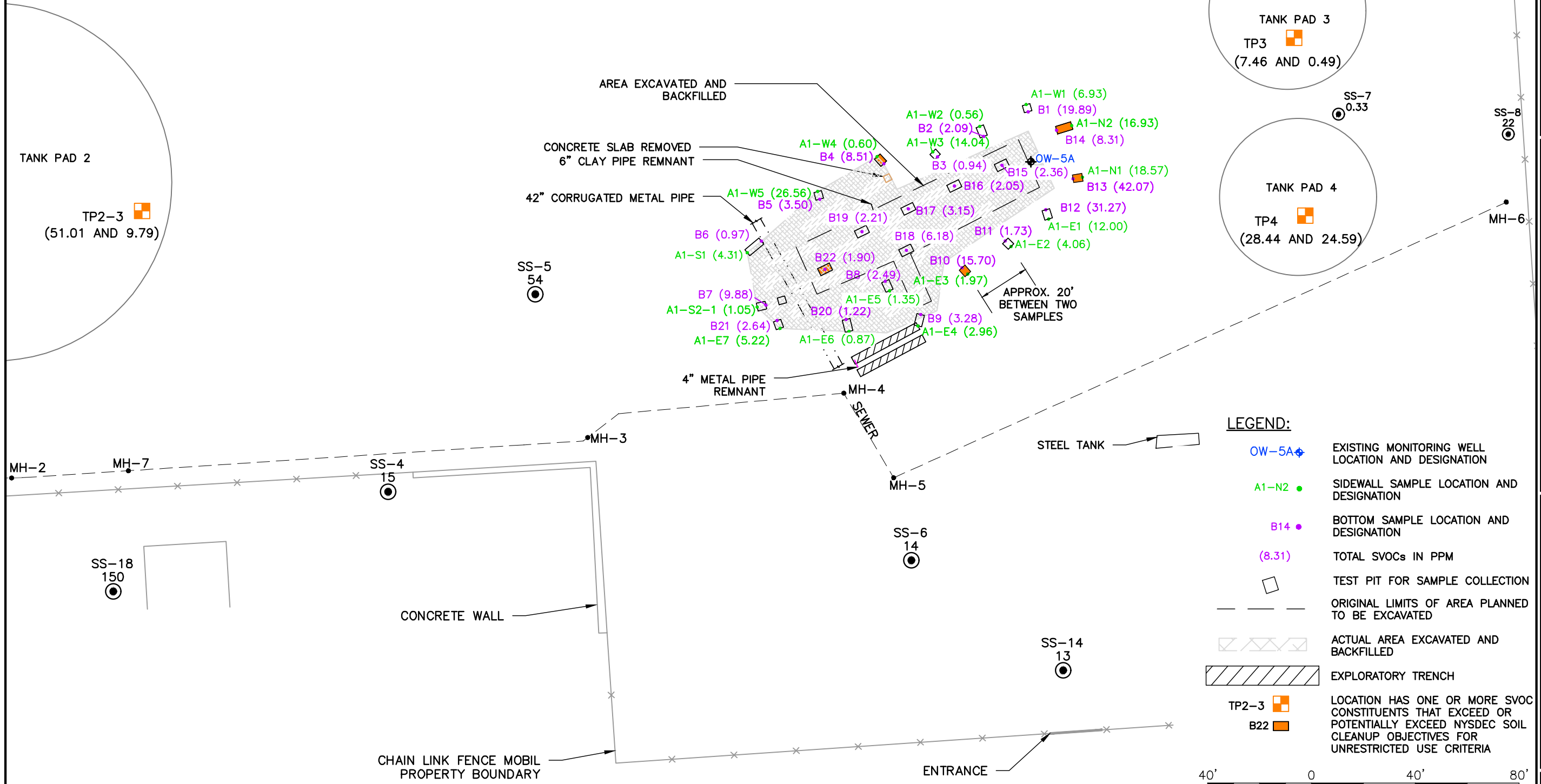
Table 2. Summary of Remaining Soil Contamination Above Unrestricted Levels - Results of Soil Samples in the Excavation Area, Former Tappan Terminal, Hastings-on-Hudson, New York

Parameter (Concentrations in µg/kg)	Site-Specific Criteria	Unrestricted Use Criteria	Sample Designation: Sample Date: Sample Depth (ft bls):	B19 DUP	B20	B21	B22	B22-1	A1-E1	A1-E2	A1-E3	A1-E4	A1-E5	A1-E6	A1-E7	A1-N1	A1-N2	A1-S1	A1-S2-1	A1-W1	A1-W2	A1-W3	A1-W4	A1-W5
				12/3/2010	12/16/2010	12/16/2010	1/25/2011	2/10/2011	11/17/2010	11/17/2010	11/17/2010	11/22/2010	11/23/2010	12/16/2010	12/16/2010	12/16/2010	11/23/2010	11/23/2010	11/18/2010	11/19/2010	11/17/2010	11/18/2010	11/18/2010	11/18/2010
1,2,4,5-Tetrachlorobenzene				350 U	240 U	230 U	399 J	330 U	320 U	320 U	240 U	180 U	240 U	180 U	200 U	380 UJ	350 U	360 U	340 U	270 U	250 U	210 U	290 U	220 U
2,2'-oxybis (1-chloropropane)				140 U	98 U	91 U	390 U	130 U	130 U	130 U	97 U	71 U	95 U	71 U	80 U	150 U	140 U	140 U	140 U	110 U	99 U	85 U	120 U	89 U
2,3,4,6-Tetrachlorophenol				350 U	240 U	230 U	970 U	330 U	320 U	320 U	240 U	180 U	240 U	180 U	200 U	380 UJ	350 U	360 U	340 U	270 U	250 U	210 U	290 U	220 U
2,4,5-Trichlorophenol				350 U	240 U	230 U	970 U	330 U	320 U	320 U	240 U	180 U	240 U	180 U	200 U	380 UJ	350 U	360 U	340 U	270 U	250 U	210 U	290 U	220 U
2,4,6-Trichlorophenol				350 U	240 U	230 U	970 U	330 U	320 U	320 U	240 U	180 U	240 U	180 U	200 U	380 UJ	350 U	360 U	340 U	270 U	250 U	210 U	290 U	220 U
2,4-Dichlorophenol				350 U	240 U	230 U	970 U	330 U	320 U	320 U	240 U	180 U	240 U	180 U	200 U	380 U	350 U	360 U	340 U	270 U	250 U	210 U	290 U	220 U
2,4-Dimethylphenol				350 U	240 U	230 U	970 U	330 U	320 U	320 U	240 U	180 U	240 U	180 U	200 U	380 U	350 U	360 U	340 U	270 U	250 U	210 U	290 U	220 U
2,4-Dinitrophenol				1400 U	980 U	910 U	3900 U	1300 U	1300 U	1300 U	970 U	710 U	950 U	710 U	800 U	1500 UJ	1400 U	1400 U	1400 U	1100 U	990 U	850 U	1200 U	890 U
2,4-Dinitrotoluene				140 U	98 U	91 U	390 U	130 U	130 U	130 U	97 U	71 U	95 U	71 U	80 U	150 UJ	140 U	140 U	140 U	110 U	99 U	85 U	120 U	89 U
2,6-Dinitrotoluene				140 U	98 U	91 U	390 U	130 U	130 U	130 U	97 U	71 U	95 U	71 U	80 U	150 UJ	140 U	140 U	140 U	110 U	99 U	85 U	120 U	89 U
2-Chloronaphthalene				140 U	98 U	91 U	390 U	130 U	130 U	130 U	97 U	71 U	95 U	71 U	80 U	150 UJ	140 U	140 U	140 U	110 U	99 U	85 U	120 U	89 U
2-Chlorophenol				350 U	240 U	230 U	970 U	330 U	320 U	320 U	240 U	180 U	240 U	180 U	200 U	380 U	350 U	360 U	340 U	270 U	250 U	210 U	290 U	220 U
2-Methylnaphthalene				140 U	98 U	206	660	66.2 J	718	70.3 J	103	396	117	71 U	40.3 J	150 U	101 J	100 J	140 U	110 U	113	1050	100 J	12600
2-Methylphenol		330		140 U	98 U	91 U	390 U	130 U	130 U	130 U	97 U	71 U	95 U	71 U	80 U	150 U	140 U	140 U	140 U	110 U	99 U	85 U	120 U	89 U
2-Nitroaniline				350 U	240 U	230 U	970 U	330 U	320 U	320 U	240 U	180 U	240 U	180 U	200 U	380 UJ	350 U	360 U	340 U	270 U	250 U	210 U	290 U	220 U
2-Nitrophenol				350 U	240 U	230 U	970 U	330 U	320 U	320 U	240 U	180 U	240 U	180 U	200 U	380 U	350 U	360 U	340 U	270 U	250 U	210 U	290 U	220 U
3&4-Methylphenol		330		140 U	98 U	91 U	390 U	130 U	130 U	130 U	97 U	71 U	95 U	71 U	80 U	150 U	140 U	140 U	140 U	177	99 U	85 U	120 U	89 U
3,3'-Dichlorobenzidine				350 U	240 U	230 U	970 U	330 U	320 U	320 U	240 U	180 U	240 U	180 U	200 U	380 UJ	350 UJ	360 U	340 U	270 U	250 U	210 U	290 U	220 U
3-Nitroaniline				350 U	240 U	230 U	970 U	330 U	320 U	320 U	240 U	180 U	240 U	180 U	200 U	380 UJ	350 U	360 U	340 U	270 U	250 U	210 U	290 U	220 U
4,6-Dinitro-2-methylphenol				1400 U	980 U	910 U	3900 U	1300 U	1300 U	1300 U	970 U	710 U	950 U	710 U	800 U	1500 UJ	1400 U	1400 U	1400 U	1100 U	990 U	850 U	1200 U	890 U
4-Bromophenyl phenyl ether				140 U	98 U	91 U	390 U	130 U	130 U	130 U	97 U	71 U	95 U	71 U	80 U	150 UJ	140 U	140 U	140 U	110 U	99 U	85 U	120 U	89 U
4-Chloro-3-methylphenol				350 U	240 U	230 U	970 U	330 U	320 U	320 U	240 U	180 U	240 U	180 U	200 U	380 U	350 U	360 U	340 U	270 U	250 U	210 U	290 U	220 U
4-Chloroaniline				350 U	240 U	230 U	970 U	330 U	320 U	320 U	240 U	180 U	240 U	180 U	200 U	380 U	350 U	360 U	340 U	270 U	250 U	210 U	290 U	220 U
4-Chlorophenyl phenyl ether				140 U	98 U	91 U	390 U	130 U	130 U	130 U	97 U	71 U	95 U	71 U	80 U	150 UJ	140 U	140 U	140 U	110 U	99 U	85 U	120 U	89 U
4-Nitroaniline				350 U	240 U	230 U	970 U	330 U	320 U	320 U	240 U	180 U	240 U	180 U	200 U	380 UJ	350 U	360 U	340 U	270 U	250 U	210 U	290 U	220 U
4-Nitrophenol				700 U	490 U	450 U	1900 U	660 U	650 U	650 U	490 U	360 U	480 U	350 U	400 U	750 UJ	710 U	710 U	680 U	530 U	490 U	420 U	590 U	450 U
Acenaphthene		20,000		63.2 J	50.1	58	1730	57.9 J	1390	65 U	63.2	305	48 U	35 U	88.7	3400 J	551	71 U	68 U	90.2	49 U	1510	23.3 J	1310
Acenaphthylene		100,000		70 U	49 U	34 J	190 U	66 U	65 U	53.7 J	49 U	36 U	48 U	19.3 J	40 U	75 UJ	97.4	103	68 U	53 U	49 U	42 U	59 U	45 U
Acetophenone				350 U	240 U	230 U	970 U	330 U	320 U	320 U	240 U	180 U	240 U	180 U	200 U	380 U	350 U	360 U	340 U	270 U	250 U	210 U	290 U	220 U
Anthracene		100,000		101	88.3	81.6	2600	65.3 J	65 U	119	40.1 J	36 U	48 U	17.8 J	285	75 UJ	519	71 U	138	49 U	189	25.2 J	45 U	
Atrazine				350 U	240 U	230 U	970 U	330 U	320 U	320 U	240 U	180 U	240 U	180 U	200 U	380 U	350 U	360 U	340 U	270 U	250 U	210 U	290 U	220 U
Benzaldehyde				350 U	240 U	230 U	970 U	330 U	320 U	320 U	240 U	180 U	240 U	180 U	200 U	380 U	350 U	360 U	340 U	110 J	250 U	210 U	290 U	220 U
Benzo[a]anthracene		1,000		126	135	206	3350	167	86.8	288	124	72	84.4	73.8	370	210 J	797 J	380	61.3 J	647	34.9 J	92.5	25 J	209
Benzo[a]pyrene		1,000		93.9	89.5	143	2360	114	77.8	255	173	67.2	66.8 J	71.6	265	199 J	793 J	451	68 U	562	32.2 J	96	59 U	185
Benzo[b]fluoranthene		1,000		99.6	162	233	1300	98.9	74.8	213	161	75.8	92.6 J	152	324	257 J	1160 J	506	68 U	567	38.7 J	145	59 U	232
Benzo[g,h,i]perylene		100,000		62.6 J	55.8	102	1820	91.3	61.5 J	188	122	44.3	46.4 J	66.9	152	134 J	441 J	284	68 U	321	49 U	104	59 U	132
Benzo[k]fluoranthene		800		65.2 J	49 U	34 J	467	49.3 J	53.7 J	234	85.6	29 J	48 UJ	65.7	117	65.7 J	380 J	351	68 U	357	49 U	46.6	59 U	71.6
Bis(2-chloroethoxy)methane				140 U	98 U	91 U	390 U	130 U	130 U	130 U	97 U	71 U	95 U	71 U	80 U	150 UJ	140 U	140 U	140 U	110 U	99 U	85 U	120 U	89 U
Bis(2-chloroethyl) ether				140 U	98 U	91 U	390 U	130 U	130 U	130 U	97 U	71 U	95 U	71 U	80 U	150 UJ	140 U	140 U	140 U	110 U	99 U	85 U	120 U	89 U
Bis(2-ethylhexyl) phthalate				140 U	98 U	91 U	390 U	130 U	96.7 J	130 U	97 U	71 U	95 U	71 U	80 U	150 UJ	1810 J	140 U	465	612	81.1 J	189	70.6 J	603
Butylbenzyl phthalate				140 U	98 U	91 U	390 U	130 U	130 U	130 U	97 U	71 U	95 U	71 U	80 U	150 UJ	140 UJ	140 U	140 U	110 U	99 U	85 U	120 U	89 U
Caprolactam				140 U	98 U	91 U	390 U	130 U	130 U	130 U	97 U	71 U	95 U	71 U	80 U	150 UJ	140 U	140 U	140 U	110 U	99 U	85 U	120 U	89 U
Carbazole				140 U	98 U	91 U	390 U	130 U	130 U	130 U	97 U	71 U	95 U	71 U	24.5 J	150 UJ	101 J	140 U	140 U	82.7 J	99 U	85 U	120 U	89 U
Chrysene		1,000		122	207	262	5330	257	157	361	158	24.7 J	48.6	80.8	355	130 J	1050 J	485	98.8	638	49 U	74.4	59 U	305
Dibenzo[a,h]anthracene		330		70 U	49 U	28.9 J	190 U	66 U	65 U	96.6	53.8	36 U	48 UJ	23.6 J	52.9	75 UJ	199 J	147	68 U	140	49 U	52.4	59 U	45 U
Dibenzofuran				140 U	98 U	23.8 J	1090	26.6 J	726	130 U	97 U	142	95 U	71 U	57.7 J	150 UJ	259	140 U	140 U	110 U	99 U	739	24.7 J	616
Diethyl phthalate				140 U	98 U	91 U	390 U	130 U	130 U	130 U	97 U	71 U	95 U	71 U	80 U	150 UJ	140 U	140 U	140 U	110 U	99 U	85 U	120 U	89 U
Dimethyl phthalate				281	98 U	91 U	390 U	130 U	130 U	130 U	97 U	71.2	402	71 U	80 U	150 UJ	343	179	141	110 U	99 U	85 U	120 U	8



**NOTES:**

- TEST PITS WERE COMPLETED AROUND THE EXCAVATION APPROXIMATELY 6 FEET FROM THE SIDEWALL LOCATION AT THE TIME OF THE TEST PIT TO COLLECT SIDEWALL AND BOTTOM SAMPLES.
- THE SITE IS COMPRISED OF FILLED LAND AND ADDITION LOCATIONS MAY EXCEED OR POTENTIALLY EXCEED UNRESTRICTED USE CRITERIA FOR SVOCs OR OTHER CONSTITUENTS.



BAR SCALE  
1" = 40'

CHECK GRAPHIC SCALE BEFORE USING

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**EXTENT OF REMEDIAL EXCAVATION AND LOCATION OF REMAINING SOIL ABOVE UNRESTRICTED LEVELS**

FORMER TAPPAN TERMINAL  
HASTINGS-ON-HUDSON, NY

SITE MANAGEMENT PLAN

JOB NO: 206925.09  
DATE: AUGUST 2013  
SCALE: AS NOTED

FIGURE 6

DESIGNED BY: AP PFF  
CHECKED BY: AP  
DRAWN BY: PFF  
206925\_U6-SMP.dwg

COMMITMENT & INTEGRITY DRIVE RESULTS

