TABLE 4-1

CURRENT STATUS OF SWMUs, WATERCOURSES & AREAS OF CONCERN REQUIRING FURTHER ASSESSMENT

Sub-Area	Designation	Description	Notes
Slag Fill Sub-Areas:			
Zone 2	S-1	Surface Impoundment A	
	S-2	Surface Impoundment B	
	S-3	Surface Impoundment C (HWMU 2)	
	S-4	Surface Impoundment D	
	S-5	Surface Impoundment E	
	S-6	Surface Impoundment F	
	S-7	Surface Impoundment G	
	S-8	Surface Impoundment H (empty)	
	S-20	Drying Area for Sludge from Impoundment F	
	S-27	Sludge Disposal Area	
	S-11	Acid Tar Pit South (Landfill K)	Remediated as part of ATP-ECM
	S-22	Acid Tar Pit North (Vacuum Carbonate Blowdown)	
	S-21	Scrap Melter Dust	Remediated under OU-2, residuals relocated to ATP
Zone 3	S-10	Slag Quench Area J	
Zone 4	S-12	Asbestos Landfill L	
	S-13	Coal Tar Sludge (HWMU 1A)	
	S-14	General Rubble Landfill N	
	S-15	General Rubble Landfill O	
	S-16	Lime Stabilized Spent Pickle Liquor Sludge/Slag Landfill Basin (HWMU 1B)	
	S-17	Vacuum Carbonate Blowdown (Landfill Q)	
	S-18	Lime Dust and Kish Landfill R	
	S-23	Tar Pit Adjacent to Lime Stabilized SPL Sludge Landfill	
	S-24	Acid Tar Pit North of Lime Plant (Agitator Sludge)	Residuals relocated to ATP-ECM
	S-28	Drum Landfill	
	AOC-A	Lead-impacted soild waste/fill within SWMU S-18	
	AOC-B	Lead-impacted hazardous waste/fill within SWMU S-18	Remediated under OU-2, residuals treated and relocated to ATP
	AOC-C	Lead-impacted hazardous waste/fill within SWMU S-18	
	AOC-D	Tar-impacted solid waste slag/fill identified during Steel Winds I utility excavation and CMS	
	AOC-E	Tar-impacted solid waste slag/fill identified during Steel Winds I utility excavation	Excavated and transported off-site for disposal
Zone 5	AOC-F	Tar-Impacted solid waste slag/fill identified during slag reclamation activities	Excavated and transported off-site for disposal
	AOC-G	Tar-impacted solid waste slag/fill identified during Steel Winds II Wind Turbine 9 foundation excavation	
Coal, Coke, & Ore Handling & Storage Sub-Area:			
	S-19	Murphy's Mountain Landfill AA	
	S-25	Landfill / Impoundment under North End of Coal Pile	
Former Petroleum Bulk Storage Sub-Area:			
	P-8	Waste Oil Storage Tanks	
	P-74 (A, B, C, & D)	Solid Fuel Mix Storage Piles	
	P-75	Tank Storage Area for No. 6 Fuel Oil and Petroleum Tar	
	AOC-H	Tar-Impacted solid waste slag/fill identified during Steel Winds II transmission pole installation	Excavated and transported off-site for disposal
	AOC-I	Tar-Impacted solid waste slag/fill identified during Steel Winds II transmission pole installation	Excavated and transported off-site for disposal

TABLE 4-1

CURRENT STATUS OF SWMUs, WATERCOURSES & AREAS OF CONCERN REQUIRING FURTHER ASSESSMENT

Sub-Area	Designation	Description	Notes
Former Coke Plant & By-Products Facility:			
	P-1	Quench Water Pit, North Station	
	P-2	Quench Water Pit, Arctic Station	
	P-3	Quench Water Pit, Central Station	
	P-4	Quench Water Pit, A Station	
	P-5	Quench Water Pit, B Station	
	P-6	PA-2: Lime Sludge Settling Basin	
	P-7	PA-2: Abandoned Lime Sludge Settling Basin	
	P-9	PA-3: Abandoned Tar Decanter Sludge Pits	Remediated under OU-2, residuals treated and relocated to ATP
	P-10	PA-3: Contaminated Soil in Area Near Ball Mill	Southern portion of P-10 overlying P-9, remediated under OU-2 and relocated to ATP
	P-11	Benzol Plant Tank Storage Area	Groundwater final remedy implemented under OU-4. Source control being completed under ICM for P-11. Final remedy for slag/fill subject of CMS. P-11A added during CMS
	P-11A	Old Benzol Plant Tank Storage Area	
	P-12	Spill Cleanup Soil Storage Area	
	P-18 (A&B)	Blast Furnace Cooling Tower and Hot & Cold Wells	Remediated under OU-2, residuals treated and relocated to ATP
	S-26	Fill Area Near Coke Battery No. 8	
30-Inch Coke Oven Gas Pipeline:			
	P-76	Underground 30-inch diameter cast iron pipeline in buffer zone alone SRWT and Smokes Creek	Remediated under OU-2, residuals treated and relocated to ATP. SWMU added during CMS
Watercourses:			
	Smokes Creek	Smokes Creek	Lower Reach Sediments Dredged by Tecumseh under ICM in 2009; Upper Reach Sediments Dredged by DEC in 2015.
	Blasdell Creek	Blasdell Creek	
	Ship Canal	Gateway Metroport Ship Canal	
	NRWT	North Return Water Trench	
	SRWT	South Return Water Trench	
Galvanizing Plant Area:			
	P-73 (A&B)	Former Drum Storage Area and Flander's Field	

SWMUs	**45**
WCs	**5**
AOCs	**9**
TOTAL	**59**

= SWMU or Watercourse added by USEPA per May 17, 2006 letter.

= SWMUs where interim or partial corrective measures have been implements; refer to Notes.

= SWMU/AOC where final corrective measures have been implemented

Definitions:

AOC = Area of Concern

SWMU = Solid Waste Management Unit

HWMU = Hazardous Waste Management Unit

NRWT = North Return Water Trench

SRWT = South Return Water Trench

ATP = Acid Tar Pits

TurnKey Environmental Restoration, LLC — Benchmark Environmental Engineering & Science, PLLC

TABLE 4-2

SUMMARY OF DREDGE SPOIL DISPOSAL AREA SOIL/FILL ANALYTICAL DATA [1]

Parameter [2]	CAS No.	Industrial SCOs [3] (mg/kg)	Protection of GW [4] (mg/kg)	Shoreline Sample Location, Depth (fbgs), & Sample Date							Area Sites Reporting Similar Compounds																								
				P-25 (20.0 - 22.0)	P-28 (25.0 - 28.0)	P-29 (18.0 - 20.0)	P-30 (28.0 - 30.0)	P-31 (28.0 - 30.0)	P-32 (23.0 - 24.0)	P-32 (24.0 - 28.0)	Site Source Number [5] (see Notes)																								Dredge Sediment [6] and Spoil Disposal Site [5]
				10/06/00	10/10/00	10/11/00	10/12/00	10/23/00	10/23/00	10/23/00	1	2	3	4	5	6	120-122	126	135	138	141	147	148	162	190	196	203	206	217	220	241	249	253	254	
TCL VOCs (Method 8260B) (mg/kg) [5]																																			
Benzene	71-43-2	**89**	**0.06**			0.0035 J				**0.3 J**	x	x	x	x			x		x	x						x	x	x	x			x			241, 253, 254
Chlorobenzene	108-90-7	**1,000**	**1.1**							0.99		x	x	x			x									x								x	241, 253, 254
Ethylbenzene	100-41-4	**780**	**1**							0.41 J	x	x	x	x			x		x	x	x		x						x						241, 253
Toluene	108-88-3	**1,000**	**0.7**			0.0031 J				0.39 J	x	x	x	x			x		x	x	x					x			x			x			241, 253, 254
m-Xylene & p-Xylene	95-47-6	**1,000**	**0.6**	0.0053 J	0.14 J	0.0018 J				**1.5**	x	x	x	x			x		x	x									x						
o-Xylene	136777-61-2	**1,000**	**0.6**	0.0028 J		0.0014 J				**0.74**	x	x	x	x			x		x	x									x			x			241, 253, 254
Total VOCs (mg/kg)	--	--		*0.0081*	*0.14*	*0.0098*	*ND*			*4.33*	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***NA***
TCL SVOCs (Method 8270C) (mg/kg) (PAHs in BLUE)																																			
Acenaphthylene	208-96-8	**1,000**	**98**	2.2 J	13 J	0.92	0.75 J	0.13 J	0.029 J	2 J	x	x	x	x			x		x	x	x						x		x			x			254
Anthracene	120-12-7	**1,000**	**1,000**	3.3 J	16 J	1.7	5.5	0.8 J	0.088 J	14	x	x	x	x			x		x		x								x			x			241
Benzo(a)anthracene	56-55-3	**11**	**1**	**3.2 J**	**13 J**	**3.1 J**	**4 J**	0.6 J	0.16 J	**7.9 J**	x	x	x	x			x		x	x	x						x	x	x			x			241, Note 6
Benzo(a)pyrene	50-32-8	**1.1**	**22**	**2.5 J**	**11 J**	**3.2**	**2.6 J**	0.41 J	0.13 J	**5.6 J**	x	x	x	x			x		x	x	x						x	x	x			x			241
Bis(2-ethylhexyl) phthalate	117-81-7	--	--					R	0.055 J		x									x							x					x			241, 254
Chrysene	218-01-9	**110**	**1**	**3.8 J**	**12 J**	**3.1 J**	**3.6 J**	0.71 J	0.15 J	**7.5 J**	x	x	x	x			x		x	x	x					x	x	x	x			x			241, Note 6
1,2-Dichlorobenzene	95-50-1	**1,000**	**1.1**					0.44 J	R	**1.9 J**			x	x			x									x			x						241, 254
1,4-Dichlorobenzene	106-46-7	**250**	**1.8**					0.15 J	R				x	x			x									x									241, 254
2,4-Dimethylphenol	105-67-9	--	--					0.028 J	R			x					x		x										x			x			241
Fluoranthene	206-44-0	**1,000**	**1,000**	9.1	33	7.4	10	2 J	0.3 J	26	x	x	x	x			x		x	x	x						x	x	x			x			241, 254
Fluorene	86-73-7	**1,000**	**386**	2.9 J	24	1.3	4.6	0.7 J	0.04 J	11	x	x	x	x			x		x	x	x						x		x			x			
2-Methylphenol	95-46-7	--	--			0.062		R	R			x																	x			x			
Naphthalene	91-20-3	**1,000**	**12**	**19**	**140**	3.3	0.75 J	2 J	0.13 J	**48**	x	x	x	x			x	x	x	x	x					x	x		x			x			241, 254
Phenanthrene	85-01-8	**1,000**	**1,000**	12	62	5.2	15	2.2 J	0.25 J	38	x	x	x	x			x		x	x	x						x	x	x			x			241, 254
Phenol	108-95.2	**1,000**	**0.33**	**0.45 J**		0.074		0.12 J	R			x		x					x	x			x						x			x			
Pyrene	129-00-0	**1,000**	**1,000**	6.4	25	3.5 J	6.3	1 J	0.23 J	13	x	x	x	x			x		x	x	x						x	x	x			x			241, Note 6
1,2,4-Trichlorobenzene	120-82-1	--	--					0.078 J	R								x		x																
Total SVOCs (mg/kg)	--	--	--	*65*	*349*	*33*	*53*	*11*	*2*	*175*	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		--	--	***NA***
Total PAHs (mg/kg) [7]	--	*500*	--	*64*	*349*	*33*	*53*	*11*	*2*	*173*	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		--	--	***NA***
Total and RCRA Metals (Method 6010B/7471A) (mg/kg)																																			
Antimony	7740-36-0	--	--	8.2 J	5.4 J	4.3 J	1.5 J			5.4 JB	x		x	x			x			x						x		x	x						241, 243
Arsenic	7740-38-2	**118**	**118**	28.8	31.6	23.8	10.6			28.1	x		x	x			x		x	x			x			x		x	x	x					241, 253, 254, Note 6
Barium	7740-39-3	**10,000**	**820**	88.5	108	89.1	69			109	x		x	x					x	x			x					x	x						241, 253, 254, Note 6
Cadmium	7740-43-9	**60**	**7.5**	**8.3 J**	2.7	2.5	1.5			4.1	x		x	x			x		x	x			x		x	x		x	x	x					241, 253, 254
Calcium	7740-70-2	--	--	43200	59000	47300	17600			30400	x								x	x								x	x					x	
Chromium	7740-47-3	**6,800**	--	213	158	137	72.3			71.4	x		x	x			x	x	x	x		x	x		x	x	x	x	x	x		x			241, 253, 254, Note 6
Lead	7439-92-1	**3,900**	**450**	418	159	141	134			235	x		x	x			x		x	x	x	x	x		x	x		x	x	x					241, 253, 254, Note 6
Magnesium	7439-95-4	--	--	7900	11500 J	10500 J	7490 J			4650 J	x								x	x								x	x						254
Mercury	7439-97-5	**5.7**	**0.73**	0.19	0.47	0.44	**1.6**			**2.4**			x	x			x		x	x								x	x						241, 243, Note 6
Nickel	7440-02-0	**10,000**	**130**	109 J	50.4	42.4	27.9			17.8	x		x	x			x		x	x					x	x		x	x	x					241, 243, Note 6
Potasium	7440-09-7	--	--	1040	1010	873	605 B			561 B	x								x	x								x	x						
Silver	7440-22-4	**6,800**	**8.3**	1.4	1.4	0.95	0.44 B			1.8	x		x	x			x		x	x								x	x						
Sodium	7440-23-5	--	--	305 B	288 B	266 B	88.7 B			147 B	x								x	x								x	x						254
General Chemistry																																			
Cyanide	57-12-5	**10,000**	**2,000**	1.6	1.6	2.2	0.94			2.1	x	x	x	x					x									x	x						
Total Recoverable Phenolics	--	--	--	0.59	0.23	0.073	0.084			0.065			x	x														x							
Chloride	--	--	--	9.9	13.6	33.1	6.2			184																									
Sulfate	--	--	--			7.6												x											x						
Total Organic Carbon	--	--	--	10900	21300	10800	20400			30700		x																							

TurnKey Environmental Restoration, LLC — Benchmark Environmental Engineering & Science, PLLC

TABLE 4-2

SUMMARY OF DREDGE SPOIL DISPOSAL AREA SOIL/FILL ANALYTICAL DATA[1]

Parameter[2]	CAS No.	Industrial SCOs[3] (mg/kg)	Protection of GW[4] (mg/kg)	Shoreline Sample Location, Depth (fbgs), & Sample Date							Area Sites Reporting Similar Compounds																								
				P-25 (20.0 - 22.0)	P-28 (25.0 - 28.0)	P-29 (18.0 - 20.0)	P-30 (28.0 - 30.0)	P-31 (28.0 - 30.0)	P-32 (23.0 - 24.0)	P-32 (24.0 - 28.0)	Site Source Number[5] (see Notes)																								Dredge Sediment[6] and Spoil Disposal Site[5]
				10/06/00	10/10/00	10/11/00	10/12/00	10/23/00	10/23/00	10/23/00	1	2	3	4	5	6	120-122	126	135	138	141	147	148	162	190	196	203	206	217	220	241	249	253	254	
Tentatively Identified Compounds (SVOCs - Method 8270C) (mg/kg)																																			
Dibenz(a,h)anthracene	53-70-3	**1.1**	**1,000**	NI	NI	0.7 NJ	0.82 NJ	0.055 J	NI	NI		x					x		x	x							x		x			x			
n-Hexadecanoic acid	57-10-3	--	--	3.9 R	NI	NI	NI	NI	NI	NI																			x						
Aniline	62-53-3	--	--	NI	NI	NI	NI	0.16 J	NI	NI							x																		241
Acenaphthene	83-32-9	**1,000**	**98**	NI	14 NJ	0.81 NJ	4 NJ	0.47 J	0.028 J	6.8 NJ		x	x	x			x		x	x							x		x			x			
N-Nitrosodiphenylamine	86-30-6	--	--	NI	NI	NI	NI	0.17 J	NI	NI							x											x				x			253
Carbazole	86-74-8	--	--	0.62 NJ	8.2 NJ	2.1 NJ	1.4 NJ	0.23 J	NI	NI									x													x			
Naphthalene, 1-methyl-	90-12-0	--	--	1.2 NJ	2 NJ	0.39 NJ	2.2 NJ	NI	NI	2.1 NJ																									
Naphthalene, 2-methyl-	91-57-6	--	--	2.2 NJ	4.4 NJ	0.48 NJ	3.9 NJ	0.68 J	NI	2.4 NJ		x	x	x			x		x	x	x						x		x			x			
Biphenyl	92-52-4	--	--	NI	5.3 NJ	NI	NI	NI	NI	NI																									
Ethylbenzylaniline (Benzenemethanamine, N-ethyl-N-pheynl-)	92-59-1	--	--	NI	NI	NI	5.3 NJ	NI	NI	8.7 NJ																									
4,4'-Methylenebis(N,N-dimethylbenzenamine), common name - Michler's Base	101-61-1	--	--	NI	NI	NI	1.3 NJ	NI	NI	NI	*see Note 9*																								241
Dibenzofuran	132-64-9	**1,000**	**210**	1.2 NJ	15 NJ	0.71 NJ	2.5 NJ	0.32 J	NI	NI	x	x	x	x					x	x							x		x			x			Note 6
Benzo(ghi)perylene	191-24-2	**1,000**	**1,000**	2.4 NJ	8.4 NJ	0.95 NJ	1.3 NJ	0.11 J	0.06 J	NI		x	x	x			x		x	x	x							x	x			x			Note 6
Indeno(1,2,3-cd)pyrene	193-39-5	**11**	**8.2**	1.1 NJ	**8.7 NJ**	1.7 NJ	1.4 NJ	0.13 J	0.062 J	NI	x	x	x	x			x		x	x							x		x			x			Note 6
Benzo(b)fluoranthene	205-99-2	**11**	**1.7**	1.2 NJ	**9.2 NJ**	**5.3 NJ**	**2 NJ**	NI	0.097 J	NI		x	x	x			x		x	x	x						x	x	x			x			241, Note 6
Benzo(k)fluoranthene	207-08-9	**110**	**1.7**	NI	**10 NJ**	**7.4 NJ**	**2.3 NJ**	0.65 J	0.13 J	**3.8 NJ**		x	x	x			x		x	x	x						x	x	x			x			241, Note 6
11H-Benzo(b)fluorene	243-17-4	--	--	NI	NI	0.22 NJ	NI	NI	NI	NI																									
Naphthalene, 1,5-dimethyl-	571-91-9	--	--	NI	NI	NI	2.3 NJ	NI	NI	NI																									
Tentatively Identified Compounds (SVOCs - Method 8270C) (mg/kg)																																			
Naphthalene, 2,6-dimethyl-	581-42-0	--	--	NI	NI	NI	2 NJ	NI	NI	NI																									
Benzenamine, 4,4',4"-methyldynetris[N,N-dimethyl]	603-48-5	--	--	NI	NI	NI	NI	NI	NI	6.7 NJ																									
Hexadecane, 2,6,10,14-tetramethyl-	638-36-8	--	--	8.7 NJ	NI	NI	NI	NI	NI	NI																									
Naphthalene, 1-ethyl	1127-76-0	--	--	NI	NI	NI	2.4 NJ	NI	NI	NI																									
Benzene, 1,1'-(butenylidene)bis-	1726-14-3	--	--	4.2 NJ	NI	NI	NI	NI	NI	NI																									
Pentadecane, 2,6,10.14-tetramethyl-	1921-70-6	--	--	NI	NI	1.2 NJ	NI	NI	NI	NI																									
Cyclic oclaatomic sulfur	10544-50-0	--	--	3.7 NJ	NI	NI	NI	NI	0.18 NJ	NI																									
Benzene, 2,4-dimethyl-1-(phenylmethyl)-	28122-28-3	--	--	23 NJ	NI	NI	NI	NI	NI	NI																									
Unknown	--	--	--	6.5 J	7.6 J	2.9 J	4 J	1.9 J	NI	12 J																									
Unknown Alkane	--	--	--	NI	17 J	5.7 J	NI	1.2 J	NI	20 J																									
Unknown Branched Alkane	--	--	--	NI	NI	1.5 J	6 J	1.8 J	NI	31 J																									
Unknown Cycloalkane	--	--	--	4.4 J	5.3 J	NI	2 J	NI	NI	2.3 J																									
Unknown Organic Acid	--	--	--	NI	NI	0.16 J	NI	NI	0.14 J	NI																									
Unknown PAH	--	--	--	4.1 J	7 J	3.3 J	2.9 J	0.33 J	NI	NI																									
Unknown Straight Chain Alkane	--	--	--	7.6 J	NI	2.3 J	3.8 J	NI	NI	NI																									
Unknown Substituted Benzene	--	--	--	6.5 J	7.9 J	NI	NI	1.2 J	NI	NI																									
Unknown Substituted Naphthalene	--	--	--	29 J	15 J	NI	4.9 J	0.64 J	NI	NI																									

Notes:

1. Analytical results taken from *Investigation of Dredge Spoils Dumping at Bethlehem Steel Corporation's Lackawanna, New York Facility* , URS Corporation, January 2001, revised October 2002.
2. Only those VOC and SVOC parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect (ND).
3. Values per NYSDEC 6NYCRR Part 375 Restricted Use Industrial Soil Cleanup Objectives (December 2006).
4. Values per NYSDEC 6NYCRR Part 375 Restricted Use Protection of Groundwater Soil Cleanup Objectives (December 2006).
5. Site number as identified in *Preliminary Evaluation of Chemical Migration to Groundwater and the Niagara River from Selected Waste-Disposal Sites* , USGS, 1983, E.J. Koszalka, J.E. Paschal, Jr., T.S. Miller, and P.B. Duran. Site identification is listed below.
6. Analytical Test Locations in the Buffalo River and Harbor as identified in *Contaminated sediment in the Buffalo River area of concern - historical trends and current conditions* , 1996, K.N. Irvine, K.M Frothingham, M.C. Rossi, S. Pickard, J. Atkinson, T. Bajak.
7. The Total PAH SCO was adapted from Commissioner Policy CP 51/Soil Cleanup Guidance, dated October 21, 2010. This was the basis for determining whether significant concentrations of PAHs were present. Individual SVOC ISCOs were not used.
8. A site-specific action level of 118 mg/kg was developed for the CMS Area; see Appendix H.
9. Aromatic Amines In and Near the Buffalo River, ACS Volume 14, Number 9, September 1980, Charles R. Nelson and Ronald A. Hites.
10. Former boring/piezometer locations are presented on Plate 4-1.

TABLE 4-2

SUMMARY OF DREDGE SPOIL DISPOSAL AREA SOIL/FILL ANALYTICAL DATA[1]

Parameter[2]	CAS No.	Industrial SCOs[3] (mg/kg)	Protection of GW[4] (mg/kg)	Shoreline Sample Location, Depth (fbgs), & Sample Date							Area Sites Reporting Similar Compounds																									
				P-25 (20.0 - 22.0)	P-28 (25.0 - 28.0)	P-29 (18.0 - 20.0)	P-30 (28.0 - 30.0)	P-31 (28.0 - 30.0)	P-32 (23.0 - 24.0)	P-32 (24.0 - 28.0)	Site Source Number[5] (see Notes)																									Dredge Sediment[6] and Spoil Disposal Site[5]
				10/06/00	10/10/00	10/11/00	10/12/00	10/23/00	10/23/00	10/23/00	1	2	3	4	5	6	120-122	126	135	138	141	147	148	162	190	196	203	206	217	220	241	249	253	254	

Data Qualifiers:

B = The concentration is below the contract required detection limit, but greater than the instrument detection limit.
J = The associated numerical value is an estimation.
NA = Not analyzed.
ND = The analyte was not detected.
NI = Not identified as a tentatively identified compound in the sample
NJ = the analyte has been tentatively identified. The associated concentration is an estimation.
R = Results were rejected. The presence or absence of the analyte cannot be verified.

Color Code:

BOLD	= Result exceeds Industrial SCO
BOLD	= Result exceeds Protection of Groundwater SCO
BOLD	= Result exceeds Industrial SCO and Protection of Groundwater SCO

Dredge Spoil & Hazardous Waste Disposal Sites in the Buffalo Area:

1. Airco Alloys (ChemCore, Inc.) - NYSDEC 932001
2. Fourth Street MGP Site - NYSDEC 915167
3. Iroquois Gas / Westwood Pharm. Terrestrial Site - NYSDEC 915'
4. Iroquois Gas / Westwood Pharm. Riparian Site - NYSDEC 91514
5. MarCon Erectors Site - NYSDEC 915173
6. Shenango Steel Site - NYSDEC 915172

120-122. Buffalo Color Sites - NYSDEC 915012-a, b, c
126. Dunlop Tire and Rubber Site - NYSDEC 915018
135. Hanna Furnace Site - NYSDEC 915029
138. McNaughton Brook Site - NYSDEC 915034
141. Mobil Oil Corporation Site - NYSDEC 915040
147. Ramco Steel Site - NYSDEC 915046
148. Former Republic Steel (Marilla Street Landfill) - NYSDEC 915047
162. Alltift Landfill Site - NYSDEC 915054
190. Lehigh Valley Railroad Landfill - NYSDEC 915781
196. Niagara Frontier Port Authority (Buffalo Outer Harbor) - NYSDEC 915026
203. Squaw Island Landfill - NYSDEC 915052
206. Tifft Farm Nature Preserve Site - NYSDEC 915072
217. Donner-Hanna Coke Company Site - NYSDEC 915017
220. West Seneca Landfill & Transfer Station Site - NYSDEC 915039
241. Times Beach Containment Site - NYSDEC 915080
249. Allied Chemical (Hurwitz-Ranne) Hopkins Street Site - NYSDEC 915120
253. Small Boat Harbor Containment Site - NYSDEC 915127
254. USACE Buffalo Harbor Containment Site

TurnKey Environmental Restoration, LLC — Benchmark Environmental Engineering & Science, PLLC

TABLE 4-3

SURFACE AND SUBSURFACE SOIL/FILL CONTAINING PARAMETERS AT CONCENTRATIONS EXCEEDING PART 375 INDUSTRIAL SCOs

Groundwater Discharge Subarea	VOCs				SVOCs (PAHs in RED)																Metals								Other			
	Benzene	Ethylbenzene	Toluene	Xylenes, total	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Arsenic	Barium	Cadmium	Lead	Nickel	Mercury	Nickel	Selenium	Cyanide	TRP	TCLP	PAHs > 500
DSA 2A																																
S-1								●	●	●	●	●	●		●		●	●	●	●												●
S-2																																
S-3 (HWMU 2)																								●								
S-4 (portion)																																
S-5																		○														○
S-6																																
S-7/S-20																																
S-8 (portion) - empty									●																							
S-11 (portion)																																
S-21																																
S-27																																
DSA 2B																																
S-4 (portion)																																
S-8 (portion) - empty									●																							
S-11 (portion)																																
S-22																																
Localized Impact (MWS-02)																																
DSA 3A																																
P-8								●	□	●			●				●	○								●						□
S-24 (NFA)																																
P-74D								●	●	●	●	●	●				●									●						●
P-75 (portion)						○	○	□	□	□	□	□	□		○	○	□	○	○	○						□					○	□
DSA 4A																																
P-74 (A, B, & C)								●	●	●	●	●	●				●									●						●
P-75 (portion)						○	○	□	□	□	□	□	□		○	○	□	○	○	○						□					○	□
S-10									○																							
S-12 [1]																																
S-13 (HWMU 1A) [2]																																
S-14								○	□	○	○	○	○		○	○	○	○	○	○												○
S-15																																
S-16 (HWMU 1B) [3]																																
S-17									○																	○						
S-18								○	□															●							●	
S-19									□																							
S-23						○	○	□	□	○	○	○			○	○	○	○	○	○											○	○
S-28									○																							
Localized Impact (MWN-02 and MWN-05B)																																

TURNKEY ENVIRONMENTAL RESTORATION, LLC

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 4-3

SURFACE AND SUBSURFACE SOIL/FILL CONTAINING PARAMETERS AT CONCENTRATIONS EXCEEDING PART 375 INDUSTRIAL SCOs

Groundwater Discharge Subarea	VOCs				SVOCs (PAHs in RED)																Metals								Other			
	Benzene	Ethylbenzene	Toluene	Xylenes, total	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Arsenic	Barium	Cadmium	Lead	Nickel	Mercury	Nickel	Selenium	Cyanide	TRP	TCLP	PAHs > 500
DSA 4B																																
S-25																																
S-26 (portion)									❍																							
DSA 5																																
P-7								●	●	●			●																			
P-9																															❍	
P-10								●	●	●							●															●
P-11	❍		❍	❍														❍														❍
P-11A[4]																																
P-12	❍		❍	❍														❍														❍
P-18 (A and B)								❍	❍				❍											❍							❍	
S-26 (portion)									❍																							

Notes:

1. RFI: Part V - SWMU Assessment Report for SWMU S-12 is an asbestos landfill only.
2. RFI: Part V - SWMU Assessment Report for SWMU S-13 (HWMU 1A) did not report surface/subsurface soil/fill results as this is a closed landfill.
3. RFI: Part V - SWMU Assessment Report for SWMU S-16 (HWMU 1B) did not report surface soil/fill results as this is a closed landfill. Subsurface results were presented for total metals only; no exceedances of the Part 375 ISCO were reported.
4. Soil data associated with SWMU P-11A was not collected during the RFI or CMS; COCs associated with this SWMU are obtained from groundwater impacts identified on Table 4-13 in the vicinity of this SWMU.

Symbol Code:

●	= Surface soil/fill exceeds Part 375 Industrial SCO
❍	= Subsurface soil/fill exceeds Part 375 Industrial SCO
◘	= Both surface and subsurface soil/fill exceeds Part 375 Industrial SCO

References:

1. RFI: Part V - SWMU Assessment Report for SWMU Group SFA-1 (SWMUs S-1, S-2, S-4, S-5, S-6, S-7/S-20, S-27).
2. RFI: Part V - SWMU Assessment Report for SWMU S-3.
3. RFI: Part V - SWMU Assessment Report for SWMU S-8.
4. RFI: Part V - SWMU Assessment Report for SWMU S-10.
5. RFI: Part V - SWMU Assessment Report for SWMU S-11.
6. RFI: Part V - SWMU Assessment Report for SWMU S-13.
7. RFI: Part V - SWMU Assessment Report for SWMU S-14 and CMS analytical data from Table 4-3 of the CMS Report.
8. RFI: Part V - SWMU Assessment Report for SWMU S-15.
9. RFI: Part V - SWMU Assessment Report for SWMU S-16.
10. CMS Report (December 2011) for SWMU S-16 and 23; Table 4-5, subsurface SWMU Material COPCs.
11. RFI: Part V - SWMU Assessment Report for SWMU S-17.
12. RFI: Part V - SWMU Assessment Report for SWMU S-18 and CMS analytical data from Table 4-6 of the CMS Report.
13. RFI: Part V - SWMU Assessment Report for SWMU S-19.
14. RFI: Part V - SWMU Assessment Report for SWMU S-21.
15. RFI: Part V - SWMU Assessment Report for SWMU S-22.
16. RFI: Part V - SWMU Assessment Report for SWMU S-23 and CMS analytical data from Table 4-5 of the CMS Report.
17. RFI: Part V - SWMU Assessment Report for SWMU S-24.
18. RFI: Part V - SWMU Assessment Report for SWMU S-25.
19. RFI: Part V - SWMU Assessment Report for SWMU S-26 and CMS analytcial data from Table 4-15 of the CMS Report.
20. RFI: Part V - SWMU Assessment Report for SWMU S-28.
21. RFI: Part VI - SWMU Assessment Report for SWMU P-18 and CMS analytical data from Table 4-14 of the CMS Report.
22. RFI: Part VI - SWMU Assessment Report for SWMU P-74, 75, and 8 (Tank Farm) and CMS analytical data from Table 4-9 of the CMS Report.
23. RFI: Part VI - SWMU Assessment Report for SWMUs P-1 thru P-5.
24. RFI: Part VI - SWMU Assessment Report for SWMU P-6 and 7.
25. CMS Report (December 2011) for SWMU P-7 and P-9 and CMS analytical data from Table 4-12 of the CMS Report.
26. RFI: Part VI - SWMU Assessment Report for SWMU P-9 and P-10.
27. RFI: Part VI - SWMU Assessment Report for SWMU P-11.
28. RFI: Part VI - SWMU Assessment Report for SWMU P-12.

TABLE 4-4

SUMMARY OF SWMU S-14 TEST PIT LOCATIONS

Location	Test Pit Dimensions			Date	Visually Impacted Soil/Fill?	Olfactory Odor	Interval of Observed Impact (fbgs)	Maximum PID Scan (ppm)	Analysis & Depth Interval				Depth (fbgs) and Soil Description (ASTM D2488: Visual-Manual Procedure)
	Length (feet)	Width (feet)	Depth (fbgs)						SVOC BN (Only) 8270	TCL VOCs 8260	TAL Metals	Interval (fbgs)	
Test Pit Locations													
S14-TP-01	16.0	3.5	16.5	12/20/10	Yes	Yes	3.0 - 4.5 fbgs	10.1	Yes	--	--	3-5 fbgs	**0.0-16.5 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel cable, plastic sheeting, white soft possible lime pile at south end of test pit.
S14-TP-02	19.0	7.0	16.5	12/20/10	Yes	Yes	3.0 - 5.0 fbgs 13.0 - 14.0 fbgs	28.3 53.1	Yes	Yes	--	3-5 fbgs 5-13 fbgs 13-14 fbgs	**0.0-16.5 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel cable, plastic sheeting, very hard upper 4.0 fbgs, test pit located next to steel debris piles.
S14-TP-2A	22.0	4.0	19.0	12/21/10	Yes	Yes	6-7 fbgs	None	Yes	Yes	--	6-7 fbgs 7-9 fbgs	**0.0-16.5 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel cable, plastic sheeting, medium dense to dense.
S14-TP-03	18.0	8.0	15.0	12/20/10	No	Yes	0.0 - 15.0 fbgs	3.0	Yes	--	Yes	0.0-15.0 fbgs	**0.0-15.0 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel cable, piping and I-beams, test pit located next to steel debris piles.
S14-TP-04	19.0	5.0	17.0	12/20/10	No	No	None	None	Yes	--	Yes	0.0-17.0 fbgs	**0.0-17.0 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel debris, at 10.0 fbgs hard slag layer 1.0-foot thick, test pit located next to steel/fill debris piles.
S14-TP-05	20.0	6.0	18.0	12/20/10	No	Yes	8.0-10.0 fgbs	21.5	Yes	Yes	--	8.0-10-0 fbgs 10.0-12.0 fbgs	**0.0-18.0 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel debris, at 6.0-7.0 fbgs hard slag layer, test pit located next to steel/fill debris piles.
S14-TP-05A	21.0	12.0	16.0	12/21/10	No	No	None	None	Yes	Yes	--	0.0-16.0 fbgs	**0.0-16.0 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel and wood debris, at 6.0-7.0 fbgs hard slag layer 1.0-foot thick, test pit located next to steel/fill debris piles.
S14-TP-06	19.0	6.0	16.0	12/21/10	No	No	None	None	Yes	--	Yes	0.0 - 16.0 fbgs	**0.0-16.0 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel and wood debris.
S14-TP-08	19.0	4.5	18.0	12/21/10	No	No	None	None	--	--	Yes	0.0-18.0 fbgs	**0.0-16.0 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel and wood debris, medium dense.
S14-TP-09	20.0	4.5	16.5	12/21/10	No	No	None	None	--	--	Yes	0.0-16.5	**0.0-16.5.0 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel and wood debris, medium dense.

Notes:

1. Test pit locations are shown on Plate 4-4.

Definitions:

fbgs = feet below ground surface
PID = MiniRae photoionization detector equipped with a 10.6 eV lamp
ppm = parts per million

TABLE 4-5

SUMMARY OF SWMU S-14 SLAG/FILL ANALYTICAL DATA

Parameter [1]	Industrial SCOs [2] (mg/kg)	CMS Sample Location, Depth (fbgs), & Sample Date															RFI Sample Location, Depth (fbgs), & Sample Date							
		S14-TP-01 (3.0 - 5.0)	S14-TP-02 (3.0 - 5.0)	S14-TP-02 (5.0 - 13.0)	S14-TP-02 (13.0 - 14.0)	S14-TP-02 (14.0 - 16.0)	S14-TP-02A (6.0 - 7.0)	S14-TP-02A (7.0 - 9.0)	S14-TP-03 (0.0 - 15.0)	S14-TP-04 (0.0 - 17.0)	S14-TP-05 (8.0 - 10.0)	S14-TP-05 (10.0 - 12.0)	S14-TP-05A (0.0 - 16.0)	S14-TP-06 (0.0 - 16.0)	S14-TP-08 (0.0 - 18.0)	S14-TP-09 (0.0 - 16.5)	S14-1 (0-0.5')	S14-1C (0-15.8')	S14-1G (6-8')	S14-2 (0-0.5')	S14-2C (0-30')	S14-2G (4-6')	S14-3 (0-0.5')	S14-4 (0-0.5')
		12/20/10	12/20/10	12/20/10	12/20/10	12/20/10	12/21/10	12/21/10	12/20/10	12/20/10	12/20/10	12/20/10	12/21/10	12/21/10	12/21/10	12/21/10	02/08/95	09/05/95	09/05/95	09/05/95	09/07/95	09/07/95	02/08/95	02/08/95
TCL VOCs (Method 8260B) (mg/kg)																								
Acetone	1,000	0.14 J	0.14 J	0.0065 J	0.29 J	ND	0.61	0.015 J	--	--	0.14 J	ND	ND	--	--	--	ND	--	ND	ND	--	ND	ND	ND
Benzene	89	0.046 J	0.046 J	ND	0.091	ND	0.053 J	ND	--	--	ND	ND	ND	--	--	--	ND	--	0.087	ND	--	1.3	1.3	0.35
Carbon disulfide	--	0.048 J	0.048 J	ND	ND	ND	ND	ND	--	--	ND	ND	ND	--	--	--	ND	--	ND	ND	--	0.006	ND	ND
1,2-Dichlorobenzene	1,000	ND	ND	ND	ND	ND	ND	ND	--	--	ND	ND	ND	--	--	--	ND	--	ND	ND	--	ND	ND	ND
2-Butanone	1,000	0.13 J	ND	ND	0.16 J	ND	0.28	ND	--	--	ND	ND	ND	--	--	--	ND	--	ND	ND	--	ND	ND	ND
Cyclohexane	--	ND	0.13 J	ND	ND	ND	ND	ND	--	--	ND	ND	ND	--	--	--	ND	--	ND	ND	--	ND	ND	ND
Ethylbenzene	780	0.015 J	0.015 J	ND	0.068	ND	0.13	ND	--	--	ND	ND	ND	--	--	--	ND	--	0.13	ND	--	0.037	ND	ND
Isopropylbenzene	--	ND	ND	ND	0.017 J	ND	0.02 J	ND	--	--	ND	ND	ND	--	--	--	ND	--	ND	ND	--	ND	ND	ND
Methylene chloride	1,000	0.1 B	0.1 B	0.012 B	0.11 B	0.066 B	0.24 B	0.026 B	--	--	0.074 B	0.063 B	0.028 B	--	--	--	0.008	--	ND	ND	--	ND	0.043	0.009
Methyl Ethyl Ketone	1,000	ND	ND	ND	ND	ND	ND	ND	--	--	ND	ND	ND	--	--	--	ND	--	0.045	ND	--	0.029	ND	ND
Methylcyclohexane	--	ND	ND	ND	ND	ND	ND	ND	--	--	ND	ND	ND	--	--	--	ND	--	ND	ND	--	ND	ND	ND
Methyl Acetate	--	ND	ND	ND	ND	ND	ND	ND	--	--	ND	ND	ND	--	--	--	ND	--	ND	ND	--	ND	ND	ND
4-Methyl-2-pentanone	--	ND	ND	ND	0.39	ND	ND	ND	--	--	ND	ND	ND	--	--	--	ND	--	ND	ND	--	ND	ND	ND
Styrene	--	ND	ND	ND	ND	ND	ND	ND	--	--	0.16	ND	ND	--	--	--	ND	--	ND	ND	--	ND	ND	ND
Tetrachloroethene	300	ND	ND	ND	ND	ND	ND	ND	--	--	ND	ND	ND	--	--	--	ND	--	ND	ND	--	ND	ND	ND
Trichloroethylene	400	ND	ND	ND	ND	ND	ND	ND	--	--	ND	ND	ND	--	--	--	ND	--	ND	ND	--	0.003	ND	ND
Toluene	1,000	0.069	0.069	ND	ND	0.015 J	0.17	ND	--	--	0.027 J	ND	ND	--	--	--	ND	--	0.52	ND	--	2.7	ND	ND
Xylenes, Total	1,000	0.27	0.27	ND	ND	0.069 J	0.42	ND	--	--	0.08 J	ND	ND	--	--	--	ND	--	3.5	ND	--	0.61	ND	ND
Total VOCs (mg/kg)	--	0.82	0.82	0.019	1.1	0.15	1.9	0.041	NA	NA	0.48	0.063	0.028	NA	NA	NA	0.0080	NA	4.3	ND	NA	4.7	1.3	0.40
TCL SVOCs (Method 8270C) (mg/kg) (PAHs in BLUE)																								
Acenaphthene	1,000	100 DB	1.8 D	3.6 DJ	100 D	0.93 DJ	410 D	ND	1.2 DJ	1.8 DJ	ND	ND	0.077 J	--	--	--	ND	5.6	--	0.75	0	NA	ND	ND
Acenaphthylene	1,000	970 DB	2 DB	29 DB	330 DB	5.6 DB	31 D	ND	16 DB	1.1 DJ	1.2 DJB	0.076 DJ	0.14 J	--	--	--	ND	32	--	ND	0.29	NA	ND	ND
Anthracene	1,000	900 D	3.6 D	34 D	540 D	6.6 D	900 D	ND	16 D	4 D	ND	ND	0.49	--	--	--	ND	26	--	1.2	0.52	NA	0.16	0.1
Benzo(a)anthracene	11	810 D	6.7 D	110 D	620 D	17 D	990 D	ND	51 D	22 D	1.4 DJ	0.076 DJ	0.79 DJ	--	--	--	0.33	30	--	2.9	3	NA	0.4	0.43
Benzo(a)pyrene	1.1	690 D	7.7 D	150 D	660 D	20 D	840 D	ND	53 D	25 D	ND	ND	0.88 DJ	--	--	--	0.29	27	--	1.9	4.8	NA	0.29	0.41
Benzo(b)fluoranthene	11	680 D	7.1 D	110 D	610 D	18 D	940 D	ND	56 D	31 D	ND	ND	1.3	--	--	--	0.52	27	--	3.5	5.9	NA	0.68	0.68
Benzo(ghi)perylene	1,000	ND	2.5 D	28 D	140 D	8 D	250 D	ND	19 D	11 D	ND	ND	0.45	--	--	--	0.16	15	--	1.3	3.8	NA	0.42	0.34
Benzo(k)fluoranthene	110	350 DJ	4 D	59 D	340 D	9.2 D	210 D	ND	20 D	12 D	ND	ND	0.38	--	--	--	0.25	20	--	0.73	2.8	NA	0.15	0.26
Biphenyl	--	ND	0.63 DJ	2 DJ	170 D	1.2 DJ	69 D	ND	1.7 DJ	ND	ND	ND	0.17 J	--	--	--	ND	ND	--	ND	ND	NA	ND	ND
Bis(2-ethylhexyl) phthalate	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.19 BJ	--	--	--	0.33	ND	--	ND	ND	NA	ND	ND
Carbazole	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	ND	ND	--	ND	ND	NA	ND	ND
2-Chloronaphthalene	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	ND	ND	--	ND	ND	NA	ND	ND
Chrysene	110	760 D	6.9 D	91 D	600 D	16 D	780 D	ND	47 D	27 D	ND	0.057 DJ	0.97 DJ	--	--	--	0.38	28	--	2.5	3.6	NA	0.45	0.48
Dibenz(a,h)anthracene	1.1	ND	0.77 DJ	11 D	59 D	ND	110 D	ND	6.7 D	3.4 D	ND	ND	0.14 J	--	--	--	ND	3.5	--	0.27	0.8	NA	0.091	ND
2,4-Dimethylphenol	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	ND	ND	--	ND	ND	NA	ND	ND
Dibenzofuran	1,000	850 DB	2.7 DB	10 DB	680 DB	5 DB	400 D	ND	7.8 DB	0.94 DJ	1.4 DJ	ND	0.5	--	--	--	ND	ND	--	ND	ND	NA	ND	ND
2,4-Dintrotoluene	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	ND	ND	--	ND	ND	NA	ND	ND
Fluoranthene	1,000	2200 D	15 D	240 D	1800 D	31 D	2200 D	ND	89 D	55 D	1.4 DJ	0.076 DJ	2	--	--	--	0.48	79	--	4.1	3.4	NA	0.4	0.65
Fluorene	1,000	1100 D	3.8 D	21 D	860 D	5.7 D	610 D	ND	5.5 D	1.4 DJ	ND	ND	0.062 J	--	--	--	ND	ND	--	0.55	0.5	NA	ND	ND
Indeno(1,2,3-cd)pyrene	11	ND	2.6 D	30 D	160 D	7.9 D	270 D	ND	20 D	11 D	ND	ND	0.41	--	--	--	0.16	17	--	1.4	3.8	NA	0.32	0.33
2-Methylphenol	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	ND	ND	--	ND	ND	NA	ND	ND
4-Methylphenol	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	ND	ND	--	ND	ND	NA	ND	ND
2-Methylnaphthalene	--	ND	3.1 DB	7.9 DB	710 DB	5.5 DB	320 D	ND	6.4 D	0.29 DJ	19 DJB	0.1 DJ	1	--	--	--	ND	ND	--	ND	ND	NA	ND	ND
Naphthalene	1,000	5100 DB	19 DB	34 DB	5600 DB	31 DB	690 D	ND	25 DB	1.1 DJ	ND	5.1 D12	3	--	--	--	0.13	1400	--	0.75	5	NA	0.2	0.18
Phenanthrene	1,000	4000 DB	16 DB	100 DB	3200 DB	29 DB	2900 D	ND	58 DB	30 D	3.9 DJB	0.085 DJ	2.7	--	--	--	0.23	130	--	3.7	2.5	NA	0.75	0.42
Pyrene	1,000	1500 D	12 D08	300 D	1500 D	28 D	1800 D	ND	80 D	43 D	ND	0.085 DJ	1.5	--	--	--	0.39	56	--	3.4	3.8	NA	0.42	0.54
Total SVOCs (mg/kg) [3]	--	20010	118	1371	18679	246	14720	0	579	281	28.3	5.66	17.1	NA	NA	NA	3.65	1896	NA	29.0	44.5	NA	4.73	4.82
Total PAHs (mg/kg) [3]	500	19160	115	1359	17829	239	14251	0	570	280	26.9	5.66	16.3	NA	NA	NA	3.32	1896	NA	29.0	44.5	NA	4.73	4.82

TABLE 4-5

SUMMARY OF SWMU S-14 SLAG/FILL ANALYTICAL DATA

Parameter [1]	Industrial SCOs [2] (mg/kg)	CMS Sample Location, Depth (fbgs), & Sample Date															RFI Sample Location, Depth (fbgs), & Sample Date							
		S14-TP-01 (3.0 - 5.0)	S14-TP-02 (3.0 - 5.0)	S14-TP-02 (5.0 - 13.0)	S14-TP-02 (13.0 - 14.0)	S14-TP-02 (14.0 - 16.0)	S14-TP-02A (6.0 - 7.0)	S14-TP-02A (7.0 - 9.0)	S14-TP-03 (0.0 - 15.0)	S14-TP-04 (0.0 - 17.0)	S14-TP-05 (8.0 - 10.0)	S14-TP-05 (10.0 - 12.0)	S14-TP-05A (0.0 - 16.0)	S14-TP-06 (0.0 - 16.0)	S14-TP-08 (0.0 - 18.0)	S14-TP-09 (0.0 - 16.5)	S14-1 (0-0.5')	S14-1C (0-15.8')	S14-1G (6-8')	S14-2 (0-0.5')	S14-2C (0-30')	S14-2G (4-6')	S14-3 (0-0.5')	S14-4 (0-0.5')
		12/20/10	12/20/10	12/20/10	12/20/10	12/20/10	12/21/10	12/21/10	12/20/10	12/20/10	12/20/10	12/20/10	12/21/10	12/21/10	12/21/10	12/21/10	02/08/95	09/05/95	09/05/95	09/05/95	09/07/95	09/07/95	02/08/95	02/08/95
Total and RCRA Metals (Method 6010B/7471A) (mg/kg)																								
Aluminum	**--**	--	--	--	--	--	--	--	6930	8780	--	--	--	8770	9060	7530	--	--	--	--	--	--	ND	ND
Antimony	**--**	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	ND	ND	12.5	1.5	--	44.7	4	--	19.3	34.4
Arsenic [5]	**118**	--	--	--	--	--	--	--	18.6	33.9	--	--	--	17.4	12.1	15.2	7.5	12.8	--	6.1	11.5	--	4.2	11.3
Barium	**10,000**	--	--	--	--	--	--	--	68.8	114	--	--	--	143	77	92.4	42.4	64.8	--	57.2	84	--	29	208
Beryllium	**2,700**	--	--	--	--	--	--	--	0.925	1.23	--	--	--	1.04	1.06	0.852	--	--	--	--	--	--	ND	ND
Cadmium	**60**	--	--	--	--	--	--	--	3.93	5.89	--	--	--	1.39	1.89	2.72	10.1	7.4	--	2.1	9	--	ND	1.2
Calcium	**--**	--	--	--	--	--	--	--	46000	49000 D	--	--	--	64000 D	32300	38400	19800	--	--	41400	--	--	35400	53400
Chromium	**6,800**	--	--	--	--	--	--	--	136	201	--	--	--	62.4	46.9	68	85.6 R	149	--	156 R	180	--	130 R	175 R
Cobalt	**--**	--	--	--	--	--	--	--	6.88	10.4	--	--	--	5.09	8.77	10.8	--	--	--	--	--	--	ND	ND
Copper	**10,000**	--	--	--	--	--	--	--	146	208	--	--	--	57.5	162	384	--	--	--	--	--	--	ND	ND
Iron	**--**	--	--	--	--	--	--	--	68000 D	56700	--	--	--	39400	46000	63500 D	--	--	--	--	--	--	ND	ND
Lead	**3,900**	--	--	--	--	--	--	--	386	432	--	--	--	266	303	330	911	109	--	157	253	--	20.7	109
Magnesium	**--**	--	--	--	--	--	--	--	10900	17200	--	--	--	9180	7150	7530	--	--	--	--	--	--	ND	ND
Maganese	**10,000**	--	--	--	--	--	--	--	3480	4220 D	--	--	--	3290 D	1990	2770 D	--	--	--	--	--	--	ND	ND
Mercury	**5.7**	--	--	--	--	--	--	--	0.482	0.568	--	--	--	0.177	0.111	0.443	0.31	0.36	--	0.28	0.14	--	0.16	0.29
Nickel	**10,000**	--	--	--	--	--	--	--	231	254	--	--	--	29.1	42	27	58.6	135	--	26.6	143	--	12.2	130
Potasium	**--**	--	--	--	--	--	--	--	724	653	--	--	--	2010	1150	1030	ND	--	--	727	--	--	ND	699
Selenium	**6,800.0**	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	ND	ND	--	--	--	--	--	--	ND	ND
Silver	**6,800**	--	--	--	--	--	--	--	ND	1.11	--	--	--	ND	ND	0.636	3.3	4.7	--	--	4.9	--	ND	ND
Sodium	**--**	--	--	--	--	--	--	--	283	233	--	--	--	676	364	245	ND	--	--	632	--	--	ND	ND
Vanadium	**--**	--	--	--	--	--	--	--	81.1	81.6	--	--	--	44.2	35.9	75.6	--	--	--	--	--	--	ND	ND
Zinc	**10,000**	--	--	--	--	--	--	--	2260 D	3760 D	--	--	--	383	1110	686	--	--	--	--	--	--	ND	ND

Notes:
1. Only those VOC and SVOC parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect (ND).
2. Values per NYSDEC 6NYCRR Part 375 Industrial Soil Cleanup Objectives (December 2006).
3. The total PAH SCO was adapted from Commissioner Policy CP-51/Soil Cleanup Guidance, dated October 21, 2010. This was the basis for determining whether significant concentrations of PAHs were present. Individual SVOC ISCOs were not used.
4. Boring locations are presented on Plate 4-4.
5. Site-specific SCO for arsenic.

Definitions:
B = Analyte was detected in the associated Method Blank.
D = Compound was analyzed at the secondary dilution factor.
J = Estimated Value.
" -- " = sample was not analyzed for this parameter.

BOLD	= Total PAHs exceeds CP-51 SCO.
BOLD	= Result exceeds the Part 375 Industrial SCO or site-specific SCO

TABLE 4-6

SUMMARY OF SWMU S-23 & AOC-D SLAG/FILL ANALYTICAL DATA

Parameter[1]	Industrial SCOs[2] (mg/kg)	Sample Location, Depth (fbgs), Date, and Unit													
		RFI						CMS							
		S23-1 (4-6)	S23-1 (0-46)	S23-2 (0-41.5)	S23-2 (4-6)	AMEC S23A (0-0.5)	AMEC S23B (0-0.5)	S23-TP-01 (17.0-18.0)	S23-TP-02 (5.0-14.0)	S23-TP-04 (0.0 - 15.0)	S23-TP-06 (0.0 - 13.0)	S23-TP-08 (6.0 - 11.0)	S23-TP-15 (17.0-18.0)	S23-TP-18 (0.0-14.0)	Conduit Trench Soil
		06/09/94	06/10/94	06/13/94	06/13/94	06/06/01	06/06/01	01/03/11	01/03/11	12/22/10	12/22/10	12/23/10	01/06/11	01/07/11	05/08/07
		SWMU-23	SWMU-23	SWMU-23	SWMU-23	SWMU-23	SWMU-23	SWMU-23	SWMU-23	SWMU-23	SWMU-23	SWMU-23	AOC-D	AOC-D	AOC-D & E
TCL VOCs (Method 8260B) (mg/kg)															
Acetone	**1,000**	ND	NA	NA	ND	ND	ND	0.04 J	0.054 J	0.019 J	0.014 J	ND	ND	0.01 J	NA
Benzene	**89**	40	NA	NA	48	ND	ND	ND	ND	ND	ND	ND	0.013 J	ND	NA
2-Butanone	**1,000**	ND	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0013 J	NA
Carbon Disulfide	**--**	ND	NA	NA	ND	ND	ND	0.087	ND	ND	ND	ND	ND	ND	NA
Ethylbenzene	**780**	ND	NA	NA	ND	ND	ND	0.0079 J	ND	ND	ND	ND	0.0073 J	ND	NA
Methylene chloride	**1,000**	ND	NA	NA	ND	ND	ND	0.057 B	0.14 B	0.024 B	0.027 B	0.12 B	0.11	0.0037	NA
Styrene	**--**	ND	NA	NA	ND	ND	ND	0.019 J	0.053 J	ND	ND	0.018 J	0.04 J	ND	NA
Toluene	**1,000**	37	NA	NA	42	ND	ND	0.015 J	0.015 J,B	ND	ND	0.0099 J	0.031 J	ND	NA
Xylenes, Total	**1,000**	42	NA	NA	30	ND	ND	0.16	0.042 J	ND	ND	0.039 J	0.14	ND	NA
TCL SVOCs (Method 8270C) (mg/kg) (PAHs in BLUE)															
Acenaphthene	**1,000**	NA	ND	ND	NA	ND	ND	0.7	ND	0.43 DJ	ND	1.7 D	4	0.063 J	NA
Acenaphthylene	**1,000**	NA	**1400**	1000	NA	13	0.21	5.1	2.1 J	0.61 DJ	ND	37 D	3.2	0.56	NA
Anthracene	**1,000**	NA	1000	**1300**	NA	11	0.43	5.3	2.7 J	1.3 D	0.016 J	31 D	9	0.74	NA
Benzo(a)anthracene	**11**	NA	**650**	**1100**	NA	**57**	1.5	4	5.9 J	5 D	0.58 J	**22 D**	8.9	0.84	NA
Benzo(a)pyrene	**1.1**	NA	**310**	**780**	NA	ND	**1.7**	**2.9**	**5.4 J**	**8.1 D**	0.081 J	**18 D**	**8**	0.86	NA
Benzo(b)fluoranthene	**11**	NA	**250**	**950**	NA	ND	ND	2.9	5.4 J	7.4 D	0.084 J	**19 D**	8.2	0.95	NA
Benzo(ghi)perylene	**1,000**	NA	ND	ND	NA	ND	ND	1.2 J	3.1 J	5.3 D	0.057 J	8.4 D	4.1	0.6	NA
Benzo(k)fluoranthene	**110**	NA	**490**	**300**	NA	ND	ND	1.6 J	3.2 J	2.6 D	0.028 J	5.5 D	4.3	0.56	NA
Bis (2-ethylhexyl)phthalate	**--**	NA	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	0.12 J,B	NA
Biphenyl	**--**	NA	ND	ND	NA	ND	ND	1.3 J	ND	0.1 DJ	ND	4.6 D	1.2	0.15 J	NA
Carbazole	**--**	NA	ND	ND	NA	ND	ND	0.38 J	ND	ND	ND	ND	4.5	0.43	NA
Chrysene	**110**	NA	**610**	ND	NA	54	1.6	3.4 D	5.3 J	4.4 D	0.059 J	19 D	8.4	0.9	NA
Dibenzofuran	**1,000**	NA	ND	ND	NA	ND	ND	4.9	3.4 J	0.52 DJ	ND	21 D	5.9	0.52	NA
2,4-Dimethylphenol	**--**	NA	ND	ND	NA	ND	ND	ND	ND	ND	ND	0.64 DJ	ND	ND	NA
Fluoranthene	**1,000**	NA	**2000**	**3500**	NA	ND	2.8	12	13 J	6.6 D	0.11 J	60 D	22	2.3	NA
Fluorene	**1,000**	NA	**1100**	**1600**	NA	1.7	0.16	7.2	3.7 J	0.6 DJ	ND	27 D	9.6	0.57	NA
Indeno(1,2,3-cd)pyrene	**11**	NA	ND	**280**	NA	ND	ND	1.3	2.7 J	5.3 D	0.053 J	9.3 D	3.7	0.55	NA
2-Methylnaphthalene	**--**	NA	ND	ND	NA	ND	ND	6.5	13 J	0.47 DJ	ND	17 D	4.5 DJ	0.57	NA
2-Methylphenol (o-Cresol)	**1,000**	NA	ND	ND	NA	ND	ND	ND	ND	ND	ND	1.4 D	0.35 J	ND	NA
3 & 4 Methylphenol (m & p Cresol)	**1,000**	NA	190	ND	NA	ND	ND	ND	ND	ND	ND	3.9 D	ND	ND	NA
4-Methylpheol	**--**	NA	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	1.1 J	0.022 J	NA
Naphthalene	**1,000**	NA	**5200**	**11000**	NA	2.7	0.14	37 B	**2000 D**	1.2 D	0.038 J	100 D	16	1.5	NA
Phenanthrene	**1,000**	NA	**3000**	**5500**	NA	25	1.9	20	8.6 J	4.2 D	0.063 J	87 D	2.5	2.2	NA
Phenol	**1,000**	NA	140	270	NA	ND	ND	ND	ND	ND	ND	3.7 D	0.89 J	ND	NA
Pyrene	**1,000**	NA	**1400**	**2300**	NA	ND	2.7	8.3	9.8 J	5.6 D	0.088 J	41 D	17	1.6	NA
Total PAHs (mg/kg) [3]	**500**	NA	**17410**	**29610**	NA	164	13.1	119	**2084**	59.1	1.26	**503**	133	15.4	NA

TurnKey Environmental Restoration, LLC — Benchmark Environmental Engineering & Science, PLLC

TABLE 4-6

SUMMARY OF SWMU S-23 & AOC-D SLAG/FILL ANALYTICAL DATA

Parameter [1]	Industrial SCOs [2] (mg/kg)	Sample Location, Depth (fbgs), Date, and Unit													
		RFI						CMS							
		S23-1 (4-6)	S23-1 (0-46)	S23-2 (0-41.5)	S23-2 (4-6)	AMEC S23A (0-0.5)	AMEC S23B (0-0.5)	S23-TP-01 (17.0-18.0)	S23-TP-02 (5.0-14.0)	S23-TP-04 (0.0 - 15.0)	S23-TP-06 (0.0 - 13.0)	S23-TP-08 (6.0 - 11.0)	S23-TP-15 (17.0-18.0)	S23-TP-18 (0.0-14.0)	Conduit Trench Soil
		06/09/94	06/10/94	06/13/94	06/13/94	06/06/01	06/06/01	01/03/11	01/03/11	12/22/10	12/22/10	12/23/10	01/06/11	01/07/11	05/08/07
		SWMU-23	SWMU-23	SWMU-23	SWMU-23	SWMU-23	SWMU-23	SWMU-23	SWMU-23	SWMU-23	SWMU-23	SWMU-23	AOC-D	AOC-D	AOC-D & E
Total Metals (Method 6010B/7471A) (mg/kg)															
Arsenic [5]	**118**	NA	1.9	9.2	NA	7.1	6.4	NA	NA	NA	NA	NA	NA	NA	ND
Barium	**10,000**	NA	134	138	NA	58	58.7	NA	NA	NA	NA	NA	NA	NA	31
Cadmium	**60**	NA	ND	1.8	NA	4.1	3.9	NA	NA	NA	NA	NA	NA	NA	ND
Chromium	**800**	NA	120	37.8	NA	609	574	NA	NA	NA	NA	NA	NA	NA	ND
Lead	**3,900**	NA	27.4	21.9	NA	135	124	NA	NA	NA	NA	NA	NA	NA	ND
Mercury	**5.7**	NA	ND	0.4	NA	1.1	ND	NA	NA	NA	NA	NA	NA	NA	ND
Nickel	**10,000**	NA	ND	ND	NA	46.1	42.6	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	**6,800**	NA	1.6	2.6	NA	ND	ND	NA	NA	NA	NA	NA	NA	NA	ND
Silver	**6,800**	NA	5.7	4.5	NA	2.1	1.9	NA	NA	NA	NA	NA	NA	NA	ND
Thallium	**--**	NA	ND	ND	NA	23.4	16.1	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide	**10,000**	NA	ND	ND	NA	1.4	0.67	NA	NA	NA	NA	NA	NA	NA	NA
TCLP VOCs (Method 1311/8260B) (mg/L)															
Benzene	**0.5**	**1.6**	NA	NA	**2.9**	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.027 J
Toluene	**--**	0.72	NA	NA	1.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes, Total	**--**	0.37	NA	NA	0.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TCLP SVOCs (Method 1311/8270C) (mg/L)															
Acenaphthylene	**--**	NA	1.1	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	**--**	NA	1.1	4.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol (o-Cresol)	**200**	NA	1.8	6.9 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.33
3 & 4 Methylphenol (m & p Cresol)	**200**	NA	5.1	20 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.71 D
Naphthalene	**--**	NA	12	18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	**--**	NA	0.28 J	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	**--**	NA	5.2	22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyridine	**--**	NA	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.42
TCLP Total Metals (Method 1311/6010B/7470A) (mg/L)															
Barium	**100**	NA	0.23	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

1. Only those VOC and SVOC parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect (ND).
2. Values per NYSDEC 6NYCRR Part 375 Industrial Soil Cleanup Objectives (December 2006)
3. The total PAH SCO was adapted from Commissioner Policy CP-51/Soil Cleanup Guidance, dated October 21, 2010. This was the basis for determining whether significant concentrations of PAHs were present. Individual SVOC ISCOs were not used.
4. RFI and CMS locations are shown on Plate 4-5.
5. Site-specific SCO for arsenic.

Definitions:

B = Analyte was detected in the associated Method Blank.
D = Compound was analyzed at the secondary dilution factor.
J = Estimated Value.
ND = Compound was not detected above the method detection limit.
NA = Sample was not analyzed for this compound

BOLD	= Total PAHs exceeds CP-51 SCO.
BOLD	= Result exceeds Part 375 Industrial SCO, site-specific SCO, or TCLP criteria.

TABLE 4-7

SUMMARY OF SWMU S-23 & AOC-D TEST PIT LOCATIONS

Location	SWMU or AOC	Test Pit Dimensions			Date	Visually Impacted Soil/Fill?	Olfactory Odor	Interval of Observed Impact (fbgs)	Maximum PID Scan (ppm)	Analysis & Depth Interval				Depth (fbgs) and Soil Description (ASTM D2488: Visual-Manual Procedure)
		Length (feet)	Width (feet)	Depth (fbgs)						SVOC BNA 8270	TCL VOCs 8260	Paint Filter Test	Interval (fbgs)	
Test Pit Locations														
S23-TP-01	SWMU S-23	36.0	5.0	18.0	01/03/11	Yes	Yes	6.0 - 15.0 fbgs	10.1	Yes	Yes	--	17.0-18.0	**0.0- 2.0 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel debris, plastic sheeting, old hoses. **2.0-17.0 Sludge Like Material:** Reddish brown/black, moist with weeping lenses of water, mostly non-plastic fines, few fine sand, very soft. **17.0-18.0 Slag/Fill:** Dark Grey, moist, mostly fine gravel (slag), some coarse sand (slag), few non-plastic fines, very hard.
S23-TP-02	SWMU S-23	45.0	5.0	14.0	01/03/11	Yes	Yes	3.0 - 5.0 fbgs	15.0	Yes	Yes	Yes (3.0-5.0)	5.0-14.0	**0.0- 3.0 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel debris, dense. **3.0-5.0 Suspected Tar Like Material:** Black, moist with weeping lenses of water, mostly tar-like material mixed with few fine sand, coarse gravels (slag), plastic sheeting, steel and brick debris, dense. **5.0-14.0 Slag/Fill:** Dark Grey, moist, mostly fine to coarse gravel (slag), some coarse sand (slag), few non-plastic fines, very hard.
S23-TP-03	SWMU S-23	42.0	6.0	12.0	01/05/11	Yes	Yes	3.0 - 5.0 fbgs 7.0-10.0 fbgs	35.0 45.0	--	--	--	--	**0.0- 3.0 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel debris, dense. **3.0-5.0 Suspected Tar Like Material:** Black, moist with weeping lenses of water, mostly tar-like material mixed with few fine sand, coarse gravels (slag), plastic sheeting, steel and brick debris, dense. **5.0-7.0 Slag/Fill:** Dark Grey, moist, mostly fine to coarse gravel (slag), some coarse sand (slag), few non-plastic fines, very hard. **7.0- 10.0 Suspected Tar Like Material:** Black, moist with weeping lenses of water, mostly tar-like material mixed with few fine sand, coarse gravels (slag), steel and brick debris, dense. **10.0-12.0 Slag/Fill:** Dark Grey, moist, mostly fine to coarse gravel (slag), some coarse sand (slag), few non-plastic fines, extremely hard.
S23-TP-04	SWMU S-23	50.0	10.0	15.0	12/22/10	Yes	Yes	1.5-2.0 fbgs 3.0-4.0 fbgs	90.0	Yes	Yes	--	0.0-15.0	**0.0- 1.5 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel debris, dense. **1.5-2.5 Suspected Tar Like Material:** Black, moist, mostly tar-like material mixed with few fine sand, coarse gravels (slag), dense. **2.5-3.5 Slag/Fill:** Dark Grey, moist, mostly fine to coarse gravel (slag), some coarse sand (slag), few non-plastic fines, very hard. **3.5- 4.0 Suspected Tar Like Material:** Black, moist, mostly tar-like material mixed with few fine sand, coarse gravels (slag), dense. **4.0-15.0 Slag/Fill:** Dark Grey, moist, mostly fine to coarse gravel (slag), some coarse sand (slag), few non-plastic fines, extremely hard.
S23-TP-05	SWMU S-23	36.0	6.0	14.0	12/22/10	Yes	Yes	3.5-6.0 fbgs	85.0	--	--	--	--	**0.0- 3.5 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel debris, dense. **3.5-6.0 Suspected Tar Like Material:** Black, moist, mostly tar-like material mixed with few fine sand, coarse gravels (slag), bricks, dense. **6.0-14.0 Slag/Fill:** Dark Grey, moist, mostly fine to coarse gravel (slag), some coarse sand (slag), few non-plastic fines, very hard.
S23-TP-06	SWMU S-23	26.0	6.5	15.0	12/22/10	Yes	Yes	3.5-4.5 fbgs 4.5-8.0 fbgs	82.6	Yes	Yes	--	0.0-13.0	**0.0- 3.5 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel debris, dense. **3.5-4.5 Suspected Tar Like Material:** Black, moist, mostly tar-like material mixed with few fine sand, coarse gravels (slag), dense. **4.5-14.0 Slag/Fill:** Dark Grey, moist with perched water lenses from (5.5 to 8.0 fbgs), mostly fine to coarse gravel (slag), some coarse sand (slag), few non-plastic fines, very hard, yellow product from (4.5-8.0 fbgs), petroleum odor from (4.5-11.0 fbgs) slag is rusted in upper 4.0 fbgs.
S23-TP-07	SWMU S-23	30.0	5.0	4.0	12/23/10	Yes	Yes	1.0-4.0 fbgs	84.6	--	--	--	--	**0.0- 1.0 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel debris, plastic sheeting, dense. **1.0-4.0 Suspected Tar Like Material:** Black, moist perched water filled test pit (2.0 fbgs), mostly tar-like material mixed with few fine sand, coarse gravels (slag), plastic sheeting, three rusted non-intact drums containing possible petroleum product, dense.
S23-TP-07A	SWMU S-23	20.0	4.5	11.0	12/23/10	No	No	--	0.0	--	--	--	--	**0.0-11.0 Slag/Fill:** Dark Grey, moist, mostly fine to coarse gravel (slag), some coarse sand (slag), few non-plastic fines, slag is easily broken with excavator bucket, very dense.
S23-TP-07B	SWMU S-23	25.0	3.5	8.0	12/23/10	Yes	Yes	1.0-4.0 fbgs	22.8	--	--	--	--	**0.0- 1.0 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel debris, dense. **1.0-4.0 Suspected Tar Like Material:** Black, moist, mostly tar-like material mixed with few fine sand, coarse gravels (slag), more slag is mixed in the material from (1.5 – 4.0 fbgs), dense. **4.0-8.0 Slag/Fill:** Dark Grey, moist, mostly fine to coarse gravel (slag), some coarse sand (slag), few non-plastic fines, reddish brown coloring of slag from 4.0-6.0 fbgs, very hard.
S23-TP-08	SWMU S-23	54.0	4.5	14.0	12/23/10	Yes	Yes	2.0 - 6.0 fbgs	63.7	Yes	Yes	--	6.0-11.0	**0.0- 2.0 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel debris, dense. **2.0-6.0 Suspected Tar Like Material:** Black, moist, mostly tar-like material mixed with few fine sand, coarse gravels (slag), flows, dense. **6.0-14.0 Slag/Fill:** Dark Grey, moist, mostly fine to coarse gravel (slag), some coarse sand (slag), few non-plastic fines, reddish brown coloring of slag from 1.0-2.5 fbgs, very hard.

TABLE 4-7

SUMMARY OF SWMU S-23 & AOC-D TEST PIT LOCATIONS

Location	SWMU or AOC	Test Pit Dimensions			Date	Visually Impacted Soil/Fill?	Olfactory Odor	Interval of Observed Impact (fbgs)	Maximum PID Scan (ppm)	Analysis & Depth Interval				Depth (fbgs) and Soil Description (ASTM D2488: Visual-Manual Procedure)
		Length (feet)	Width (feet)	Depth (fbgs)						SVOC BNA 8270	TCL VOCs 8260	Paint Filter Test	Interval (fbgs)	
Test Pit Locations														
S23-TP-09	SWMU S-23	65.0	4.0	16.5	01/03/11	Yes	Yes	6.0-15.0 fbgs	0.0	--	--	--	--	**0.0- 4.0 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel debris, plastic sheeting, old hoses. **4.0-6.0 Slag/Fill:** Brown/grey, moist, mostly, mostly non-plastic fines, some coarse and fine slag, some fine sand, breaks easily with excavator bucket, rusted color at west end. **6.0-15.0 Sludge Like Material:** Reddish brown/black, moist with weeping lenses of water, mostly non-plastic fines, few fine sand, very soft,. **15.0-16.5 Slag/Fill:** Dark Grey, moist, mostly fine gravel (slag), some coarse sand (slag), few non-plastic fines, very hard**.**
S23-TP-10	SWMU S-23	24.0	4.0	14.0	01/05/11	No	No	--	0.0	--	--	--	--	**0.0-1.0 Well Graded Gravel w/ Sand:** Brown, moist, mostly fine gravel, some fine sand, loose, green tarp at 1.0 fbgs, 4-inch PVC drain line at 1.0 fbgs. **1.0-14.0 Slag/Fill:** Dark Grey, moist, mostly fine gravel (slag), some coarse sand (slag), few non-plastic fines, layered, very hard.
S23-TP-11	AOC-D	25.0	4.0	14.0	01/06/11	No	No	--	0.0	--	--	--	--	**0.0-1.0 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, some fine sand, yellow and orange brick, slag, steel debris, loose. **1.0-14.0 Slag/Fill:** Dark Grey, moist, mostly fine gravel (slag), some coarse sand (slag), few non-plastic fines, layered, very hard.
S23-TP-12	AOC-D	23.0	4.0	12.0	01/05/11	Yes	Yes	2.0-7.0 fbgs	52.5	--	--	--	--	**0.0- 2.0 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, dense. **2.0-7.0 Suspected Tar Like Material:** Black, moist weeping water, mostly tar-like material mixed with few fine sand, coarse gravels (slag), dense. **7.0-12.0 Slag/Fill:** Dark Grey, moist, mostly fine to coarse gravel (slag), some coarse sand (slag), few non-plastic fines, layered, very hard.
S23-TP-13	AOC-D	22.0	4.5	12.0	01/06/11	Yes	Yes	3.0-4.0 fbgs 10.0-12.0 fbgs	14.8 123	--	--	--	--	**0.0-2.0 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel debris, loose. **2.0-3.0 Well Graded Sand:** Brown, moist, mostly fine sand, trace non-plastic fines, loose. **3.0-4.0 Suspected Tar Like Material:** Black, moist, mostly tar-like material mixed with some coarse gravels (slag), dense. **4.0-10.0 Slag/Fill:** Dark Grey, moist, mostly fine to coarse gravel (slag), some coarse sand (slag), few non-plastic fines, very hard. **10.0- 12.0 Suspected Tar Like Material:** Black, wet (perched), mostly tar-like material mixed with few fine sand, coarse gravels (slag), soft.
S23-TP-13A	AOC-D	22.0	5.0	17.0	01/06/11	Yes	Yes	10.0-17.0 fbgs	90.0	--	--	--	--	**0.0-1.0 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel debris, loose. **1.0-2.0 Well Graded Sand:** Brown, moist, mostly fine sand, trace non-plastic fines, frozen. **2.0-10.0 Slag/Fill:** Dark Grey, moist, mostly fine to coarse gravel (slag), some coarse sand (slag), few non-plastic fines, very hard. **10.0- 17.0 Suspected Tar Like Material:** Black, moist weeping water lenses, mostly tar-like material mixed with few fine sand, coarse gravels (slag), flows, soft. **17.0 Slag/Fill:** Grey, extremely hard bottom, at excavator limit could not bring material.
S23-TP-14	AOC-D	22.0	4.0	13.5	01/05/11	No	No	--	0.0	--	--	--	--	**0.0-0.5 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, some fine sand, yellow and orange brick, slag, steel debris, loose. **0.5-1.0 Fill:** Black, moist, mostly non-plastic coal and coke fines, with some fine sand, few coarse gravel (slag), dense, dense, fines, with some fine sand, few coarse gravel (slag), dense. **1.0-2.0 Fill:** As above (0.0-0.5 fbgs). **2.0-13.05 Slag/Fill:** Dark Grey, moist, mostly fine gravel (slag), some coarse sand (slag), few non-plastic fines, layered, very hard.
S23-TP-15	AOC-D	25.0	5.0	18.0	01/06/11	Yes	Yes	3.0-14.0	134.0	Yes	Yes	--	17.0-18.0	**0.0-3.0 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, yellow and orange brick, slag, steel debris, loose. **3.0-5.0 Fill:** Brown/Black, moist, mostly non-plastic fines, with some coarse gravel (slag), 4 rusted non-intact drums containing possible petroleum product, brick and steel debris, dense. **3.0- 14.0 Suspected Tar Like Material:** Black, moist weeping water lenses, mostly tar-like material mixed with few fine sand, coarse gravels (slag), soft. **14.0-18.0 Slag/Fill:** Dark Grey, moist, mostly fine gravel (slag), some coarse sand (slag), few non-plastic fines, very hard.
S23-TP-16	AOC-D	25.0	5.0	16.0	01/07/11	No	No	--	0.0	--	--	--	--	**0.0-16.0 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, some fine sand, yellow and orange brick, slag, steel and wood debris, dense. **16.0-16.5 Slag/Fill:** Dark Grey, moist, mostly fine gravel (slag), some coarse sand (slag), few non-plastic fines, layered, very hard.

TABLE 4-7

SUMMARY OF SWMU S-23 & AOC-D TEST PIT LOCATIONS

Location	SWMU or AOC	Test Pit Dimensions			Date	Visually Impacted Soil/Fill?	Olfactory Odor	Interval of Observed Impact (fbgs)	Maximum PID Scan (ppm)	Analysis & Depth Interval				Depth (fbgs) and Soil Description (ASTM D2488: Visual-Manual Procedure)
		Length (feet)	Width (feet)	Depth (fbgs)						SVOC BNA 8270	TCL VOCs 8260	Paint Filter Test	Interval (fbgs)	
Test Pit Locations														
S23-TP-17	AOC-D	23.0	6.0	14.5	01/07/11	No	No	--	0.0	--	--	--	--	**0.0-14.0Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, some fine sand, yellow and orange brick, slag, steel and wood debris, dense. **14.0-14.5 Slag/Fill:** Dark Grey, moist, mostly fine gravel (slag), some coarse sand (slag), few non-plastic fines, layered, very hard.
S23-TP-18	AOC-D	20.0	6.0	14.0	01/07/11	No	Yes	1.0-14.0	0.0	Yes	Yes	--	0.0-14.0	**0.0-1.5 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, some fine sand, yellow and orange brick, slag, steel debris, loose. **1.5-14.0 Slag/Fill:** Dark Grey, moist, mostly fine gravel (slag), some coarse sand (slag), few non-plastic fines, layered, very hard.
S23-TP-19	AOC-D	28.0	4.0	16.0	01/07/11	No	No	--	0.0	--	--	--	--	**0.0-1.0 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, some fine sand, yellow and orange brick, slag, steel debris, loose. **1.0-14.0 Slag/Fill:** Dark Grey, moist, mostly fine gravel (slag), some coarse sand (slag), few non-plastic fines, rusted appearance in upper 1.0-foot, from (1.5-7.5 fbgs) large void space, 6-8-feet deep, layered, very hard.
S23-TP-20	SWMU S-23	25.0	4.0	14.0	01/10/11	No	No	--	0.0	--	--	--	--	**0.0-1.0 Fill:** Brown/black, moist, mostly non-plastic fines, some fine sand few coarse gravel, some fine sand, yellow and orange brick, slag, steel debris, loose. **1.0-14.0 Slag/Fill:** Dark Grey, moist, mostly fine gravel (slag), some coarse sand (slag), few non-plastic fines, layered, very hard, rusted appearance in upper 1.5-foot, upper 4.0 fbgs breaks easier with excavator.

Notes:
1. fbgs = feet below ground surface
2. PID = MiniRae photoionization detector equipped with a 10.6 eV lamp
3. ppm = parts per million
4. CMS test pit locations are shown on Plate 4-5.

TABLE 4-8

SUMMARY OF SWMU S-18 SLAG/FILL ANALYTICAL DATA
RESULTS PRIOR TO REMEDIATION OF AOCs B & C

Location	Total Lead (mg/kg)		TCLP Lead (mg/L)
	0-1 fbgs	2 fbgs	0-1 fbgs
	01/04/11	01/04/11	01/04/11
Regulatory Limit [1] (mg/kg)	*3900*		*5*
CMS Samples (January 2011)			
S18-S-01	**8,670**	27.5	--
S18-S-02	**13,200**	186	--
S18-S-03	833	--	--
S18-S-04	**5,000**	90.4	--
S18-S-05	**5,580**	101	--
S18-S-06	**5,340**	679	0.86
S18-S-07	**24,200**	404	--
S18-S-08	1,500	--	0.014
S18-S-09	**5,430**	308	--
S18-S-10	1,110	--	--
S18-S-11	**6,400**	129	0.16
S18-S-12	3,600	1310	1.5
S18-S-13	68.3	--	--
S18-S-14	774	--	--
S18-S-15	**13,600**	8.6	--
S18-S-16	**5,690**	26.1	--
S18-S-17	122	--	--
S18-S-18	20.8	--	--
S18-S-19	226	--	--
S18-S-20	71	--	--
S18-S-21	1,400	--	--
S18-S-22	1,980	--	--
S18-S-23	359	--	--
S18-S-24	435	--	--
S18-S-25	**7,620**	262	**30.1**
S18-S-26	17.4	--	--
S18-S-27	16.4	--	--
S18-S-28	1,470	--	--
S18-S-29	1,320	--	--

TURNKEY ENVIRONMENTAL RESTORATION, LLC
BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 4-8

SUMMARY OF SWMU S-18 SLAG/FILL ANALYTICAL DATA
RESULTS PRIOR TO REMEDIATION OF AOCs B & C

Location	Total Lead (mg/kg)		TCLP Lead (mg/L)
	0-1 fbgs	2 fbgs	0-1 fbgs
	01/04/11	01/04/11	01/04/11
Regulatory Limit [1] (mg/kg)	***3900***		***5***
S18-S-30	123	--	--
S18-S-31	141	--	--
S18-S-32	**9,590**	493	0.66
S18-S-33	383	--	--
S18-S-34	211	--	--
S18-S-35	245	--	--
RFI Samples (October 2000)			
S18-KISH-C01	**13,800**	--	**15.4**
S18-KISH-C02	**13,200**	--	**17.6**
S18-KISH-G01	**13,800**	--	**32.3**
S18-KISH-G02	**18,800**	--	**37.7**

Notes:
1. Regulatory limit refers to the NYSDEC Industrial SCO or the USEPA RCRA TCLP MCL.
2. " -- " not analyzed for this parameter
3. Sample locations are shown on Plate 4-6.

[yellow box] = Totals SVOCs exceeds Industrial SCO or RCRA TCLP MCL.

TABLE 4-9

SUMMARY OF SWMU S-18 TEST PIT LOCATIONS

Location	Test Pit Dimensions			Date	Analysis & Depth Interval			Depth (fbgs) and Soil Description (ASTM D2488: Visual-Manual Procedure)
	Length (feet)	Width (feet)	Depth (fbgs)		Total Lead	TCLP Lead (0-1.0) fbgs	Interval (fbgs)	
Test Pit Locations								
S18-TP-01	6.0	2.5	2.0	01/04/11	yes	no	0-1' 2'	**0.0-1.5 FILL:** Red fine waste mixed with slag. **1.5-2.0 FILL:** Grey/dark grey, slag/fill.
S18-TP-02	6.0	2.5	2.0	01/04/11	yes	no	0-1' 2'	**0.0.-1.0 FILL:** Red fine waste. **1.0-1.5 FILL:** Red fine waste mixed with slag. **1.5-2.0 FILL:** Grey/dark grey, slag/fill.
S18-TP-03	6.0	2.5	2.0	01/04/11	yes	no	0-1'	**0.0-0.5 FILL:** Lime **0.5-1.5 FILL:** Red fine waste. **1.5-2.0 FILL:** Grey/dark grey, slag/fill.
S18-TP-04	6.0	2.5	2.0	01/04/11	yes	no	0-1' 2'	**0.0-1.5 FILL:** Red fine waste mixed with slag. **1.5-2.0 FILL:** Grey/dark grey, slag/fill.
S18-TP-05	6.0	2.5	2.0	01/04/11	yes	no	0-1' 2'	**0.0-1.5 FILL:** Red fine waste. **1.5-2.0 FILL:** Grey/dark grey, slag/fill.
S18-TP-06	6.0	2.5	2.0	01/04/11	yes	Yes	0-1' 2'	**0.0-0.5 FILL:** Red fine waste. **0.5-2.0 FILL:** Grey/dark grey, slag/fill.
S18-TP-07	6.0	2.5	2.5	01/04/11	yes	no	0-1' 2'	**0.0-0.5 FILL:** Red fine waste mixed with lime and slag/fill. **0.5-2.0 FILL:** Grey/dark grey, slag/fill.
S18-TP-08	6.0	2.5	2.0	01/04/11	yes	Yes	0-1'	**0.0-1.0 FILL:** Red fine waste. **1.0-2.0 FILL:** Grey/dark grey, slag/fill.
S18-TP-09	6.0	2.5	2.0	01/04/11	yes	no	0-1' 2'	**0.0-1.0 FILL:** Red finewaste. **1.0-2.0 FILL:** Grey/dark grey, slag/fill.
S18-TP-10	6.0	2.5	2.0	01/04/11	yes	no	0-1'	**0.0-0.5 FILL:** Red fine waste mixed with slag. **0.5-2.0 FILL:** Grey/dark grey, slag/fill.
S18-TP-11	6.0	2.5	2.0	01/04/11	yes	Yes	0-1' 2'	**0.0-1.0 FILL:** Red fine waste. **1.0-2.0 FILL:** Grey/dark grey, slag/fill.
S18-TP-12	6.0	2.5	2.0	01/04/11	yes	Yes	0-1' 2'	**0.0-1.0 FILL:** Red fine waste. **1.0-2.0 FILL:** Grey/dark grey, slag/fill.
S18-TP-13	6.0	2.5	2.0	01/04/11	yes	no	0-1'	**0.0-0.5 FILL:** Red fine waste mixed with slag. **0.5-2.5 FILL:** Grey/dark grey, slag/fill.
S18-TP-14	6.0	2.5	2.0	01/04/11	yes	no	0-1'	**0.0-0.5 FILL:** Red fine waste mixed with slag. **0.5-2.0 FILL:** Grey/Dark Grey, slag/fill.
S18-TP-15	6.0	2.5	2.0	01/04/11	yes	no	0-1' 2'	**0.0-1.0 FILL:** Red fine waste. **1.0-2.0 FILL:** Grey/dark grey, slag/fill.
S18-TP-16	6.0	2.5	3.0	01/04/11	yes	no	0-1' 2'	**0.0-0.5 FILL:** Lime **0.5-1.0 FILL:** Red fine waste. **1.0-3.0 FILL:** Grey/dark grey, slag/fill.
S18-TP-17	6.0	2.5	2.0	01/04/11	yes	no	0-1'	**0.0-0.5 FILL:** Red fine waste. **0.5-2.0 FILL:** Grey/dark grey, slag/fill.
S18-TP-18	6.0	2.5	2.0	01/04/11	yes	no	0-1'	**0.0-0.5 FILL:** Red fine waste mixed with slag. **0.5-2.0 FILL:** Grey/dark grey, slag/fill.
S18-TP-19	6.0	2.5	2.0	01/04/11	yes	no	0-1'	**0.0-0.5 FILL:** Red fine waste. **0.5-2.0 FILL:** Grey/dark grey, slag/fill.
S18-TP-20	6.0	2.5	2.0	01/04/11	yes	no	0-1'	**0.0-0.5 FILL:** Red fine waste mixed with slag. **0.5-2.0 FILL:** Grey/dark grey, slag/fill.

TURNKEY ENVIRONMENTAL RESTORATION, LLC
BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 4-9

SUMMARY OF SWMU S-18 TEST PIT LOCATIONS

Location	Test Pit Dimensions			Date	Analysis & Depth Interval			Depth (fbgs) and Soil Description (ASTM D2488: Visual-Manual Procedure)
	Length (feet)	Width (feet)	Depth (fbgs)		Total Lead	TCLP Lead (0-1.0) fbgs	Interval (fbgs)	
Test Pit Locations								
S18-TP-21	6.0	2.5	2.0	01/04/11	yes	no	0-1'	**0.0-0.5 FILL:** Lime **0.5-1.0 FILL:** Red fine waste. **1.0-2.0 FILL:** Grey/dark grey, slag/fill.
S18-TP-22	6.0	2.5	2.0	01/04/11	yes	no	0-1'	**0.0-2.0 FILL:** Grey/dark grey, slag/fill with bricks.
S18-TP-23	6.0	2.5	2.0	01/04/11	yes	no	0-1'	**0.0-1.0 FILL:** Red fine waste mixed with slag. **1.0-2.0 FILL:** Grey/dark Grey, slag/fill.
S18-TP-24	6.0	2.5	2.0	01/04/11	yes	no	0-1'	**0.0-2.0 FILL:** Grey/dark grey, slag/fill with bricks.
S18-TP-25	6.0	2.5	2.5	2/9/2011	yes	no	0-1' 2'	**0.0-1.0 FILL:** Red finewaste. **1.0-2.0 FILL:** Grey/dark Grey, slag/fill.
S18-TP-26	6.0	2.5	2.5	2/9/2011	yes	no	0-1'	**0.0-2.5 FILL:** Grey/dark grey, slag/fill.
S18-TP-27	6.0	2.5	2.5	2/9/2011	yes	no	0-1'	**0.0-2.5 FILL:** Grey/dark grey, slag/fill with bricks.
S18-TP-28	6.0	2.5	3.0	2/9/2011	yes	no	0-1'	**0.0-1.0 FILL:** Red fine waste. **1.0-2.0 FILL:** Grey/dark grey, slag/fill.
S18-TP-29	6.0	2.5	2.5	2/9/2011	yes	no	0-1'	**0.0-0.5 FILL:** Red fine waste mixed with slag. **0.5-2.0 FILL:** Grey/dark grey, slag/fill.
S18-TP-30	6.0	2.5	2.0	2/9/2011	yes	no	0-1'	**0.0-2.0 FILL:** Grey/dark grey, slag/fill with bricks.
S18-TP-31	6.0	2.5	2.0	2/9/2011	yes	no	0-1'	**0.0-2.0 FILL:** Grey/dark Grey, slag/fill with bricks.
S18-TP-32	6.0	2.5	3.0	2/9/2011	yes	yes	0-1' 2'	**0.0-0.5 FILL:** Lime **0.5-1.0 FILL:** Red fine waste. **1.0-2.0 FILL:** Grey/dark grey, slag/fill.
S18-TP-33	6.0	2.0	2.0	2/22/2011	yes	no	0-1'	**0.0-2.0 FILL:** Grey/dark Grey, slag/fill with bricks.
S18-TP-34	6.0	2.0	2.0	2/22/2011	yes	no	0-1'	**0.0-2.0 FILL:** Grey/dark grey, slag/fill with bricks.
S18-TP-35	6.0	2.0	2.0	2/22/2011	yes	no	0-1'	**0.0-2.0 FILL:** Grey/dark grey/red , slag/fill with bricks.

Notes:
fbgs = feet below ground surface

TURNKEY ENVIRONMENTAL RESTORATION, LLC
BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 4-10

SUMMARY OF FORMER TANK FARM ASTs

Tank No.	Capacity (gallons)	Contents
Large Tanks		
1	3,380,000	No. 6 Fuel Oil
2	3,380,000	No. 6 Fuel Oil, Petroleum Tar, Coal Tar
3	3,380,000	No. 6 Fuel Oil, Petroleum Tar, Coal Tar
4	3,380,000	No. 6 Fuel Oil, Petroleum Tar, Coal Tar
5	4,500,000	No. 6 Fuel Oil
6	4,500,000	No. 6 Fuel Oil
7	4,873,000	No. 6 Fuel Oil
Small Tanks		
1	210,000	Tar Acid Oil, Carbolic Oil
2	210,000	Carbolic Oil
3	126,000	Crude Tar
4	105,000	Topped Tar
5	105,000	Weak Ammonia Liquor (WAL)
6	42,000	Dehydrated Tar
7	10,500	Light Oil Receiver
8	10,500	Water Receiver
9	10,500	Light Carbolic Oil Receiver
10	10,500	Heavy Carbolic Oil Receiver
11	500,000	Crude Tar
15	1,000,000	Crude Tar
16	1,500,000	Weak Ammonia Liquor (WAL)
31	247,000	Pitch Blend

Notes:
1. Former tank locations are shown on Plate 4-9.

TABLE 4-11

SUMMARY OF TANK FARM TEST PIT LOCATIONS

Location	Test Pit Length (feet)	Test Pit Width (feet)	Test Pit Depth (fbgs)	Date	Visually Impacted Slag/Fill?	Olfactory Odor	Interval of Observed Impact (fbgs)	Maximum PID Scan (ppm)	Analysis & Depth Interval: Full List	Analysis & Depth Interval: Interval (fbgs)	Approximate DTW (fbgs)	Depth to Native (fbgs)	Observed Groundwater Impact	Depth (fbgs) and Soil Description (ASTM D2488: Visual-Manual Procedure)
Boring Locations														
VSS-1			16.0	09/09/16	No	No	NA	26.8	--	--	10.5	11.0	Yes sheening	0.0 -11.0 SLAG/FILL: brown/black, moist to wet, mostly non-plastic fines with some fine sand, few coarse slag and gravel up to 1-foot in diameter, large rubble and steel debris 4 to 6-foot in diameter 11.0 - 13.0 WELL GRADED SAND: Black/grey, wet (sheening), with little non-plastic fines and few sub rounded coarse gravel and trace sub-rounded coarse cobble.
P75-TP-1	18.0	10.0	13.0	08/04/10	No	No	NA	26.8	--	--	10.5	11.0	Yes sheening	0.0 -11.0 SLAG/FILL: brown/black, moist to wet, mostly non-plastic fines with some fine sand, few coarse slag and gravel up to 1-foot in diameter, large rubble and steel debris 4 to 6-foot in diameter 11.0 - 13.0 WELL GRADED SAND: Black/grey, wet (sheening), with little non-plastic fines and few sub rounded coarse gravel and trace sub-rounded coarse cobble.
P75-TP-2	23.0	8.0	12.5	08/04/10	Yes	Yes	(1.0 - 12.5) Petroleum like NAPL, Mothball odor.	107.0	Yes	1.0 - 12.0	12.0	12.0	Yes petroleum like NAPL product	0.0 - 4.0 SLAG/FILL: Brown/black, moist, mostly 1 to 2-inch slag, with some non-plastic fines, with some fine sand, loose, with coal and coke pieces, perched water 2 - 4 foot. 4.0 -12.0 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, few coarse slag and gravel up to 1-foot in diameter, large rubble and steel debris 4 to 6-foot in diameter. 12.0 - 12.5 POORLY GRADED SAND: Black/grey, wet, with little non-plastic fines and few sub rounded coarse gravels and trace sub rounded coarse cobbles.
P75-TP-2A	18.0	10.0	11.5	08/04/10	No	No	No	0.0	--	--	11.0	Not Encountered	No	0.0 - 2.0 SLAG/FILL: Brown, mostly 1 to 2-inch slag, with some non-plastic fines, with some fine sand, loose, with coal and coke pieces. 2.0 - 3.0 SLAG/FILL: Blue/grey/ with reddish brown, very hard. 3.0 - 11.5 SLAG/FILL: Black, moist to wet, mostly non-plastic fines with some fine sand, few coarse slag and gravel up to 1-foot in diameter, large rubble and steel debris 4 to 6-foot in diameter.
P75-TP-3	23.0	6.0	12.5	08/04/10	No	Yes	(11.5 - 12.5) Mothball odor,	3.0	--	--	12.0	12.0	Yes Sheening.	0.0 - 2.0 SLAG/FILL: Brown/Black, moist, mostly non-plastic fines with some fine sand, loose, with coal and coke debris. 2.0 - 12.0 SLAG/FILL: As above, with large pieces of rubble debris (mixed slag and steel) 4 - 6-foot in diameter, dense, loose when disturbed. 12.0 12.5 WELL GRADED SAND: Black/grey, moist to wet, with little non-plastic fines and few sub rounded coarse gravels and trace sub rounded coarse cobbles.
P75-TP-4	23.0	10.0	14.0	08/04/10	Yes	Yes	(0.0 - 2.0) Petroleum like NAPL around 6-inch pipe north end of test pit.	7.9	--	--	13.5	Not Encountered	No	0.0 - 2.0 SLAG/FILL: Brown/Black, moist, mostly non-plastic fines with some fine sand, loose, with coal and coke debris, 6-inch pipe running east west at north end of test pit. 2.0 - 14.0 SLAG/FILL: As above, wet at 13.5 fbgs, with large pieces of rubble debris (mixed slag and steel) 4 - 6-foot in diameter, dense, loose when disturbed.
P75-TP-4A	18.0	6.0	6.0	08/04/10	No	No	No	0.0	--	--	NA	Not Encountered	No	0.0 - 2.0 SLAG/FILL: Brown/Black, moist mostly non-plastic fines with some fine sand, loose, with coal and coke debris, medium dense. 2.0 - 6.0 SLAG/FILL: As above with large pieces of rubble debris (mixed slag and steel) 4 - 6-foot in diameter, dense, loose when disturbed.
P75-TP-4B	18.0	3.5	12.0	08/04/10	No	No	No	0.0	--	--	NA	Not Encountered	No	0.0 - 0.5 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 12.0 SLAG/FILL: Blue/grey with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, horizontal layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-4C	18.0	10.0	13.5	08/04/10	No	Yes	(12.5 - 13.0) Mothball odor	0.0	--	--	12.5	10.5	Odors	0.0 - 10.5 SLAG/FILL: Brown/Black, moist mostly non-plastic fines with some fine sand, with coal and coke debris, with large pieces of rubble debris (mixed slag and steel) 4 - 6-foot in diameter, orange brick, dense, loose when disturbed. 10.5 - 13.5 WELL GRADED SAND: Black/grey, moist to wet, with little non-plastic fines and few sub rounded coarse gravels and trace sub rounded coarse cobbles.

TABLE 4-11

SUMMARY OF TANK FARM TEST PIT LOCATIONS

Location	Test Pit Length (feet)	Test Pit Width (feet)	Test Pit Depth (fbgs)	Date	Visually Impacted Slag/Fill?	Olfactory Odor	Interval of Observed Impact (fbgs)	Maximum PID Scan (ppm)	Analysis & Depth Interval: Full List	Analysis & Depth Interval: Interval (fbgs)	Approximate DTW (fbgs)	Depth to Native (fbgs)	Observed Groundwater Impact	Depth (fbgs) and Soil Description (ASTM D2488: Visual-Manual Procedure)
Boring Locations														
P75-TP-5	18.0	8.0	13.0	08/03/10	Yes	Yes	(3.0 - 5.0) Petroleum like NAPL, mothball odor.	94.2	--	--	12.5	Not Encountered	No	0.0 - 1.0 SLAG/FILL: Brown/grey, moist, mostly 1-inch gravel , few non-plastic fines, dense, loose when disturbed. 1.0 - 4.0 SLAG/FILL: Brown/Black, moist, mostly non-plastic fines with some fine sand, mixed with coal and coke debris, 12-inch pipe running through west side of test pit approximately 5.0 fbgs. 5.0 - 13.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist to wet, mostly coarse slag with some non-plastic fines and fine gravel , very hard, horizontal layers, large steel pieces upper 2.0-foot of slag.
P75-TP-5A	18.0	3.5	7.0	08/03/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 1.0 SLAG/FILL: Brown/grey, moist, mostly 1-inch gravel , few non-plastic fines, dense, loose when disturbed. 1.0 - 3.0 SLAG/FILL: Brown/Black, moist, mostly non-plastic fines with some fine sand, mixed with coal and coke debris, with orange and yellow brick. 3.0 - 7.0 SLAG/FILL: Blue/grey with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, horizontal layers, large steel pieces upper 2.0-foot of slag.
P75-TP-5B	23.0	7.0	12.0	08/03/10	Yes	Yes	(1.0 - 6.5) Petroleum like NAPL mixed in SLAG/FILL, mothball odors.	58.6	--	--	NA	Not Encountered	NA	0.0 - 12.0 SLAG/FILL: Brown/Black, moist, mostly non-plastic fines with some fine sand, with coal and coke debris, with large pieces of rubble debris (mixed slag and steel) 4 - 6-foot in diameter, dense, loose when disturbed.
P75-TP-5C	23.0	7.0	12.0	08/04/10	Yes	Yes	(7.0 - 9.0) Petroleum like NAPL (9.0-12.0) Discolored with odors.	100.0	--	--	NA	Not Encountered	NA	0.0 - 10.5 SLAG/FILL: Reddish brown/Black, moist, mostly non-plastic fines with some fine sand, few coarse gravel slag. with coal and coke debris, dense, loose when disturbed. 10.5 - 12.0 WELL GRADED SAND: Black/grey, moist, with little non-plastic fines and few sub rounded coarse gravels and trace sub rounded coarse cobbles.
P75-TP-5D	20.0	7.0	12.5	08/04/10	No	No	No	0.0	--	--	12.0	Not Encountered	No	0.0 - 6.0 SLAG/FILL: Reddish Brown, moist, mostly non-plastic fines with some fine sand, mixed with coal and coke debris, with orange and yellow brick, large pieces of slag and steel debris 4 to 6-foot in diameter. 6.0 - 12.5 SLAG/FILL: Blue/grey, moist to wet, mostly coarse slag with some non-plastic fines and fine gravel , horizontal layers, slag layer is 6-foot thick on west side and 4-foot thick on east side of test pit, very hard.
P75-TP-5E	18.0	10.0	11.5	08/04/10	Yes	Yes	(upper 3-inch) Petroleum like NAPL, mothball odor	0.0	--	--	11.0	Not Encountered	No	0.0 - 11.5 SLAG/FILL: Brown/Black, moist to wet, mostly non-plastic fines with some fine sand, with coal and coke debris, with large pieces of rubble debris (mixed slag and steel) 4 - 6-foot in diameter, dense, loose when disturbed.
P75-TP-6	25.0	17.0	17.5	08/02/10	Yes	Yes	(upper 3-inch) Petroleum like NAPL, mothball odor	0.0	--	--	17.0	Not Encountered	No	0.0 - 0.5 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 17.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist to wet, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-7	15.0	6.0	16.5	08/02/10	Yes	Yes	(1.0 - 4.0) Petroleum like NAPL, mothball odors.	68.5	--	--	16.0	Not Encountered	No	0.0 - 0.5 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 16.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist to wet, mostly coarse slag with some non-plastic fines and fine gravels , 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag, 0.0 - 2.0 slag is very broken.
P75-TP-7A	18.0	3.5	13.5	08/03/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 1.0 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 13.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag, 0.0 - 2.0 slag is very broken.

TABLE 4-11

SUMMARY OF TANK FARM TEST PIT LOCATIONS

Location	Test Pit			Date	Visually Impacted Slag/Fill?	Olfactory Odor	Interval of Observed Impact (fbgs)	Maximum PID Scan (ppm)	Analysis & Depth Interval		Approximate DTW (fbgs)	Depth to Native (fbgs)	Observed Groundwater Impact	Depth (fbgs) and Soil Description (ASTM D2488: Visual-Manual Procedure)
	Length (feet)	Width (feet)	Depth (fbgs)						Full List	Interval (fbgs)				
Boring Locations														
P75-TP-7B	18.0	3.5	12.0	08/03/10	Yes	Yes	(2.0 - 7.0) Discolored slag/fill ammonia odor.	97.0	Yes	2.0 - 7.0	NA	Not Encountered	NA	0.0 - 0.1 SLAG/FILL: Brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 12.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, purple color (2.0 - 7.0) fbgs, moist with perched water from 2.0 - 7.0 fbgs, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-7C	18.0	3.5	12.0	08/03/10	Yes	Yes	(2.0 - 8.0) Petroleum like NAPL, mothball odor.	47.6	--	--	NA	Not Encountered	NA	0.0 - 1.0 SLAG/FILL: Brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 12.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag, 0.0 - 2.0 slag is very broken.
P75-TP-7D	18.0	3.5	15.0	8//3/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 15.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-7E	18.0	3.5	15.5	08/03/10	Yes	Yes	(2.0 - 4.0) Petroleum like NAPL, mothball odor.	17.6	--	--	15.0	Not Encountered	No	0.0 - 1.0 SLAG/FILL: Brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 15.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist to wet, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-7F	18.0	3.5	12.0	08/03/10	Yes	Yes	(upper 3-inch) Petroleum like NAPL, mothball odor	13.5	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 12.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-7G	18.0	3.5	11.5	08/03/10	Yes	Yes	0.0 - 4.0	15.7	--	--	NA	Not Encountered	NA	0.0 - 1.0 SLAG/FILL: Brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 11.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-7H	18.0	3.5	12.0	08/04/10	Yes	Yes	(upper 4-inch) Petroleum like NAPL, mothball odor	88.2	--	--	NA	Not Encountered	NA	0.0 - 1.0 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 12.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-8	20.0	3.5	14.5	08/02/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black/reddish brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 14.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-9	15.0	3.5	16.0	08/02/10	Yes	Yes	(1.0 - 6.0) Petroleum like NAPL, mothball odor	172.0	Yes	1.0 - 6.0	15.5	14.0	No	0.0 - 0.5 SLAG/FILL: Black/reddish brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 14.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag. 14.0 15.5 WELL GRADED GRAVEL WITH SAND (FUSED): Grey, moist to wet, mostly fine sub rounded gravel and some fine few sub rounded coarse sands, and trace slag sub rounded and non plastic fines.

TABLE 4-11

SUMMARY OF TANK FARM TEST PIT LOCATIONS

Location	Test Pit			Date	Visually Impacted Slag/Fill?	Olfactory Odor	Interval of Observed Impact (fbgs)	Maximum PID Scan (ppm)	Analysis & Depth Interval		Approximate DTW (fbgs)	Depth to Native (fbgs)	Observed Groundwater Impact	Depth (fbgs) and Soil Description (ASTM D2488: Visual-Manual Procedure)
	Length (feet)	Width (feet)	Depth (fbgs)						Full List	Interval (fbgs)				
Boring Locations														
P75-TP-9A	15.0	3.5	10.0	08/02/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black/reddish brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 10.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-9B	15.0	3.5	10.0	08/02/10	Yes	Yes	(1.0 - 6.0) Petroleum like NAPL, mothball odor	73.4	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black/reddish brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 10.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag, very broken in upper 2-foot.
P75-TP-9C	15.0	3.5	10.0	08/02/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black/reddish brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 10.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag, very broken in upper 2-foot.
P75-TP-9D	15.0	3.5	14.5	08/02/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black/reddish brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 14.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist (at 11.0 fbgs material is wet but no free water in test pit.), very hard, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag, very broken in upper 2-foot.
P75-TP-9E	15.0	3.5	16.5	08/02/10	Yes	Yes	(0.0 - 10.0) Petroleum like NAPL, mothball odor	77.6	Yes	0.0 - 10.0	NA	15.0	NA	0.0 - 0.5 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 15.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist (At 13.0 fbgs material is wet but no free water in test pit.), mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag. 15.0 - 16.5 WELL GRADED GRAVEL WITH SAND (FUSED): Grey, moist (Material is wet but no free water in test pit.), mostly fine sub rounded gravel and some fine few sub rounded coarse sands, and trace slag (sub rounded) and non plastic fines.
P75-TP-9F	23.0	3.5	15.5	08/03/10	No	No	No	0.0	--	--	15.0	11.5	Yes Sheening	0.0 - 1.0 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 10.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag. 11.5 - 15.5 WELL GRADED GRAVEL WITH SAND (FUSED): Grey, moist to wet, mostly fine sub rounded gravel and some fine few sub rounded coarse sands, and trace slag (sub rounded) and non plastic fines.
P75-TP-9G	18.0	3.5	10.5	08/03/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 1.0 SLAG/FILL: Black/reddish brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 10.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-10	20.0	3.5	15.5	07/29/10	No	No	No	0.0	--	--	NA	14.5	NA	0.0 - 0.5 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 14.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag. 14.5 - 15.5 WELL GRADED GRAVEL WITH SAND (FUSED): Grey, moist (At 13.0 fbgs material is wet but no free water in test pit.), mostly fine sub rounded gravel and some fine few sub rounded coarse sands, and trace slag (sub rounded) and non plastic fines.
P75-TP-11	18.0	3.5	15.5	07/29/10	No	No	No	0.0	--	--	15.0	14.5	No	0.0 - 0.5 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 14.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag. 14.5 - 15.5 WELL GRADED GRAVEL WITH SAND (FUSED): Grey, moist to wet, mostly fine sub rounded gravel and some fine few sub rounded coarse sands, and trace slag (sub rounded) and non plastic fines.

TURNKEY ENVIRONMENTAL RESTORATION, LLC
BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 4-11

SUMMARY OF TANK FARM TEST PIT LOCATIONS

Location	Test Pit			Date	Visually Impacted Slag/Fill?	Olfactory Odor	Interval of Observed Impact (fbgs)	Maximum PID Scan (ppm)	Analysis & Depth Interval		Approximate DTW (fbgs)	Depth to Native (fbgs)	Observed Groundwater Impact	Depth (fbgs) and Soil Description (ASTM D2488: Visual-Manual Procedure)
	Length (feet)	Width (feet)	Depth (fbgs)						Full List	Interval (fbgs)				
Boring Locations														
P75-TP-12	22.0	3.5	16.0	07/27/10	Yes	Yes	(upper 4-inch) petroleum like NAPL, mothball like odor (3.0 - 15.5) petroleum like NAPL, petroleum like odors.	32.4	Yes	3.0 - 15.5	15.5	14.5	Yes	0.0 - 0.5 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 14.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist with perched water lenses, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag. 14.5 - 16.0 WELL GRADED GRAVEL WITH SAND (FUSED): Grey with yellow staining, moist to wet, mostly fine sub rounded gravel and some fine few sub rounded coarse sands, and trace slag (sub rounded) and non plastic fines.
P75-TP-12A	21.0	3.5	14.0	07/28/10	Yes	Yes	(upper 4-inch) petroleum like NAPL, mothball like odor (2.0 - 12.0) petroleum like NAPL, petroleum like odors.	22.5	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 14.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist (at 13.5 material looks wet but no free water in test pit), mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-12B	21.0	3.5	16.0	07/28/10	Yes	Yes	(upper 1-inch) petroleum like NAPL, mothball like odor 13.0 - 15.0 (petroleum like NAPL, petroleum like odors)	8.4	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 14.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist (at 13.5 material looks wet but no free water in test pit), mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag. 14.0 - 16.0 POORLY GRADED SAND (FUSED): Grey with yellow staining, moist (at 13.5 material looks wet but no free water in test pit), mostly coarse sand with few fine sand trace sub rounded fine gravel, non-plastic.
P75-TP-12C	21.0	3.5	15.5	07/28/10	Yes	No	0.0 - 1.5 Minor petroleum like NAPL mostly near surface	0.0	--	--	15.0	14.0	Yes sheening	0.0 - 0.5 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 14.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag. 14.0 - 15.5 POORLY GRADED SAND (FUSED): Yellow to grey, moist to wet, mostly coarse sand with few fine sand trace sub rounded fine gravel, non-plastic.
P75-TP-12D	21.0	3.5	15.5	07/28/10	Yes	Yes	(15.0 - 15.5) Petroleum like NAPL, petroleum like odors	35.6	--	--	15.0	15.0	Yes Petroleum like NAPL, petroleum like odors	0.0 - 0.5 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 15.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag. 15.0 - 15.5 POORLY GRADED SAND (FUSED): Grey with yellow staining, wet, mostly coarse sand with few fine sand trace sub rounded fine gravel, non-plastic.
P75-TP-12E	21.0	3.5	15.0	07/28/10	Yes	Yes	(13.5 - 15.0) Petroleum like NAPL, petroleum like odors	77.8	--	--	14.5	15.0	Yes Petroleum like NAPL, petroleum like odors	0.0 - 0.5 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 14.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist (at 13.5 material looks wet but no free water in test pit), mostly coarse slag with some non-plastic fines and fine gravels , 45 degree layers 1 to 2-foot thick, very hard, large pieces of steel in the upper 3-foot of slag. 14.5 - 15.0 WELL GRADED GRAVEL WITH SAND (FUSED): Grey with yellow staining, moist to wet, mostly fine sub rounded gravel and some fine few sub rounded coarse sands, and trace slag (sub rounded) and non plastic fines.
P75-TP-12F	20.0	3.5	15.0	07/28/10	Yes	Yes	15.0	10.6	--	--	15.0	14.0	Yes	0.0 - 0.5 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 14.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag. 14.0 - 15.0 WELL GRADED GRAVEL WITH SAND (FUSED): Grey with yellow staining, moist to wet, mostly fine sub rounded gravel and some fine few sub rounded coarse sands, and trace slag (sub rounded) and non plastic fines.
P75-TP-12G	18.0	6.0	15.0	07/29/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 14.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist (at 13.5 material looks wet but no free water in test pit), mostly coarse slag with some non-plastic fines and fine gravels , 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag, from 4 to 7-foot steel debris (4-inch square beams and rebar).
P75-TP-13	22.0	3.5	18.0	07/22/10	Yes	Yes	(0.0 - 4.0) petroleum like NAPL, Mothball odor (11.0 - 16.0) petroleum like NAPL, petroleum like odor.	12.4	--	--	16.0	15.0	Yes petroleum like NAPL, petroleum like odor.	0.0 - 1.0 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 15.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag, yellow staining ~11.0 fbgs. 15.0 - 18.0 POORLY GRADED SAND (FUSED): Grey with yellow staining, wet, mostly coarse sand with few fine sand trace sub rounded fine gravel, non-plastic.

TurnKey Environmental Restoration, LLC — Benchmark Environmental Engineering & Science, PLLC

TABLE 4-11

SUMMARY OF TANK FARM TEST PIT LOCATIONS

Location	Test Pit			Date	Visually Impacted Slag/Fill?	Olfactory Odor	Interval of Observed Impact (fbgs)	Maximum PID Scan (ppm)	Analysis & Depth Interval		Approximate DTW (fbgs)	Depth to Native (fbgs)	Observed Groundwater Impact	Depth (fbgs) and Soil Description (ASTM D2488: Visual-Manual Procedure)
	Length (feet)	Width (feet)	Depth (fbgs)						Full List	Interval (fbgs)				
Boring Locations														
P75-TP-13A	22.0	3.5	15.0	07/22/10	Yes	Yes	(2.5 - 15.0) petroleum like NAPL, petroleum like odor.	2.5	--	--	15.0	15.0	Yes petroleum like NAPL, petroleum like odor.	0.0 - 2.0 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 2.0 - 15.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist perched water from 2.5 fbgs, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, very hard, large pieces of steel in the upper 3-foot of slag. 15.0 - 18.0 POORLY GRADED SAND (FUSED): Grey with yellow staining, wet, mostly coarse sand with few fine sand trace sub rounded fine gravel, non-plastic.
P75-TP-13B	22.0	3.5	17.5	07/22/10	No	No	No	0.0	--	--	15.5	15.0	No	0.0 - 1.0 SLAG/FILL: Reddish/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose, roots in the upper 2-inch. 1.0 - 15.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag. 15.0 - 17.5 POORLY GRADED SAND (FUSED): Grey, moist to wet, mostly coarse sand with few fine sand trace sub rounded fine gravel, non-plastic.
P75-TP-13C	20.0	3.5	13.0	07/22/10	Yes	Yes	(0.0 - 3.0) petroleum like NAPL, mothball odor.	41.2	--	--	NA	Not Encountered	NA	0.0 - 1.5 SLAG/FILL: Reddish brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose, roots in the upper 2-inch. 1.5 - 2.5 SLAG/FILL: Black, perched water, mostly coarse gravel with some non plastic fines, loose, rail road ballast. 2.5 - 13.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, in 45 degree layers 1 to 2-foot thick.
P75-TP-13D	20.0	3.5	12.0	07/22/10	Yes	Yes	(5.0 - 12.0) petroleum like NAPL, mothball odor.	170.0	Yes	5.0 - 12.0	NA	Not Encountered	NA	0.0 - 2.0 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose, roots in the upper 2-inch. 2.0 - 5.0 SLAG/FILL: Reddish brown, moist, mostly non plastic fines, with some fine sand, few coarse gravels , loose. 5.0 - 12.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist with perched water intervals from 5.0 to 12.0, mostly coarse slag with some non-plastic fines and fine gravels , very hard, in 45 degree layers 1 to 2-foot thick.
P75-TP-13E	27.0	3.5	16.0	07/23/10	Yes	Yes	(0.0 -1.0) Petroleum like NAPL, mixed with fine sand	3.2	--	--	NA	Not Encountered	NA	0.0 - 5.0 SLAG/FILL: Reddish brown/black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose, roots in the upper 2-inch with rail road ties, 6-inch steel pipe running north south at approximately 3.0 fbgs. 5.0 - 16.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , in 45 degree layers 1 to 2-foot thick.
P75-TP-13F	27.0	3.5	14.0	07/23/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 4.0 SLAG/FILL: Reddish brown/black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose, roots in the upper 2-inch with rail road ties, rubble and brick on east side of test pit.. 4.0 - 14.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist , mostly coarse slag with some non-plastic fines and fine gravels , in 45 degree layers 1 to 2-foot thick.
P75-TP-13G	27.0	3.5	13.0	07/23/10	Yes	Yes	(0.0 - 0.5) Petroleum like NAPL, mixed with fine sand, mothball odor.	98.7	--	--	NA	Not Encountered	NA	0.0 - 2.0 SLAG/FILL: Reddish brown/black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose, roots in the upper 2-inch with rail road ties and rail road ballast. 2.0 - 13.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist , mostly coarse slag with some non-plastic fines and fine gravels , very hard, in 45 degree layers 1 to 2-foot thick.
P75-TP-13H	21.0	3.5	16.0	07/23/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 1.5 SLAG/FILL: Reddish brown/black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose, roots in the upper 2-inch. 1.5 - 16.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, in 45 degree layers 1 to 2-foot thick.
P75-TP-14	22.0	3.5	15.0	07/22/10	Yes	Yes	(2.0 - 5.5) Petroleum like NAPL, mothball odor.	62.3	--	--	15.0	14.5	No	0.0 - 2.0 SLAG/FILL: Reddish/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose, roots in the upper 2-inch. 2.0 - 14.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, in 45 degree layers 1 to 2-foot thick, very hard, large pieces of steel in the upper 3-foot of slag. 14.0 - 15.0 POORLY GRADED SAND (FUSED): Grey, wet, mostly coarse sand with few fine sand trace sub rounded fine gravel, non-plastic, hard.

TABLE 4-11

SUMMARY OF TANK FARM TEST PIT LOCATIONS

Location	Test Pit			Date	Visually Impacted Slag/Fill?	Olfactory Odor	Interval of Observed Impact (fbgs)	Maximum PID Scan (ppm)	Analysis & Depth Interval		Approximate DTW (fbgs)	Depth to Native (fbgs)	Observed Groundwater Impact	Depth (fbgs) and Soil Description (ASTM D2488: Visual-Manual Procedure)
	Length (feet)	Width (feet)	Depth (fbgs)						Full List	Interval (fbgs)				
Boring Locations														
P75-TP-14A	26.0	3.5	9.5	07/22/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 1.5 SLAG/FILL: Reddish brown/black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose, roots in the upper 2-inch. 1.5 - 9.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist , mostly coarse slag with some non-plastic fines and fine gravels , very hard, in 45 degree layers 1 to 2-foot thick.
P75-TP-14B	20.0	3.5	9.0	07/22/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 1.5 SLAG/FILL: Reddish brown/black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose, roots in the upper 2-inch. 1.5 - 9.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist , mostly coarse slag with some non-plastic fines and fine gravels , very hard, in 45 degree layers 1 to 2-foot thick.
P75-TP-14C	20.0	3.5	10.0	07/22/10	Yes	Yes	(1.5 - 3.0) Petroleum like NAPL, mixed with fine sand, mothball odor.	21.2	--	--	NA	Not Encountered	NA	0.0 - 1.5 SLAG/FILL: Reddish brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose, roots in the upper 2-inch. 1.5 - 2.5 SLAG/FILL: Black, perched water, mostly coarse gravel with some non plastic fines, loose, rail road ballast. 2.5 - 15.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, in 45 degree layers 1 to 2-foot thick.
P75-TP-14D	24.0	3.5	15.0	07/22/10	Yes	Yes	(0.0-1.0) Petroleum like NAPL, entrenched in rail road ties.	0.0	--	--	NA	Not Encountered	NA	0.0 - 7.5 SLAG/FILL: Reddish brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose, roots in the upper 2-inch, with rail road ties and orange and yellow brick. 7.5 - 15.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , in 45 degree layers 1 to 2-foot thick.
P75-TP-15	18.0	3.5	15.0	07/21/10	No	No	No	0.0	--	--	14.5	Not Encountered	No	0.0 - 1.0 SLAG/FILL: Reddish brown/black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose, roots in the upper 2-inch. 1.0 - 15.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist to wet, mostly coarse slag with some non-plastic fines and fine gravels , very hard, in 45 degree layers 1 to 2-foot thick.
P75-TP-16	19.0	3.5	15.0	07/21/10	No	No	No	0.0	--	--	14.0	Not Encountered	Sheen	0.0 - 1.0 SLAG/FILL: Reddish brown/black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose, roots in the upper 2-inch. 1.0 - 15.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist to wet, mostly coarse slag with some non-plastic fines and fine gravels , very hard, in 45 degree layers 1 to 2-foot thick.
P75-TP-17	16.0	3.5	17.0	07/21/10	No	No	No	0.0	--	--	16.0	Not Encountered	No	0.0 - 1.0 POORLY GRADED SAND (SLAG/FILL): Brown, moist, mostly fine sand, little non-plastic fines, trace fine and coarse gravel (rounded), loose, roots in the upper 2-inch. 1.0 - 17.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist to wet, mostly coarse slag with some non-plastic fines and fine gravels , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot.
P75-TP-18	20.0	3.5	16.5	07/21/10	No	No	No	0.0	--	--	15.5	Not Encountered	No	0.0 - 1.0 POORLY GRADED SAND (SLAG/FILL): Brown, moist, mostly fine sand, little non-plastic fines, trace fine and coarse gravel (rounded), loose, roots in the upper 2-inch. 1.0 - 15.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist to wet, mostly coarse slag with some non-plastic fines and fine gravels , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot.
P75-TP-19	22.0	3.5	16.5	07/27/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 1.5 POORLY GRADED SAND (SLAG/FILL): Brown, moist, mostly fine sand, little non-plastic fines, trace fine and coarse gravel (rounded), loose, roots in the upper 2-inch. 1.5 - 16.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot.

TABLE 4-11

SUMMARY OF TANK FARM TEST PIT LOCATIONS

Location	Test Pit			Date	Visually Impacted Slag/Fill?	Olfactory Odor	Interval of Observed Impact (fbgs)	Maximum PID Scan (ppm)	Analysis & Depth Interval		Approximate DTW (fbgs)	Depth to Native (fbgs)	Observed Groundwater Impact	Depth (fbgs) and Soil Description (ASTM D2488: Visual-Manual Procedure)
	Length (feet)	Width (feet)	Depth (fbgs)						Full List	Interval (fbgs)				
Boring Locations														
P75-TP-20	21.0	3.5	16.0	07/29/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 1.5 POORLY GRADED SAND (SLAG/FILL): Brown, moist, mostly fine sand, little non-plastic fines, trace fine and coarse gravel (rounded), loose, roots in the upper 2-inch. 1.5 - 16.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot.
P75-TP-21	20.0	3.5	15.5	08/02/10	No	No	No	0.0	--	--	NA	15.0	NA	0.0 - 0.5 SLAG/FILL: Reddish brown/black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose, roots in the upper 2-inch. 0.5 - 15.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist , mostly coarse slag with some non-plastic fines and fine gravels , very hard, in 45 degree layers 1 to 2-foot thick. 15.0 - 15.5 POORLY GRADED SAND (FUSED): Grey, moist, mostly coarse sand with few fine sand trace sub rounded fine gravel, non-plastic, hard.
P75-TP-22	20.0	3.5	16.5	08/02/10	No	No	No	0.0	--	--	16.0	15.0	No	0.0 - 0.5 SLAG/FILL: Reddish brown/black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose, roots in the upper 2-inch. 0.5 - 15.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist , mostly coarse slag with some non-plastic fines and fine gravels , in 45 degree layers 1 to 2-foot thick. 15.0 - 16.5 POORLY GRADED SAND (FUSED): Grey, moist to wet, mostly coarse sand with few fine sand trace sub rounded fine gravel, non-plastic, hard.
P75-TP-23	20.0	3.5	16.5	08/02/10	No	No	No	0.0	--	--	16.0	15.5	No	0.0 - 0.5 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 15.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels, very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag. 15.5 - 16.5 POORLY GRADED GRAVEL WITH SAND (FUSED): Grey, moist to wet, mostly fine sub rounded gravel (mixed with fine slag) and some fine few sub rounded coarse sands, and trace slag (sub rounded) and non plastic fines.
P75-TP-24	22.0	3.5	14.5	07/29/10	No	No	No	0.0	--	--	14.5	Not Encountered	No	0.0 - 0.5 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 14.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist to wet, mostly coarse slag with some non-plastic fines and fine gravels , 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-25	15.0	3.5	12.0	07/27/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 12.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-26	25.0	3.5	18.0	07/26/10	No	No	No	0.0	--	--	15.5	16.0	No	0.0 - 1.0 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 16.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist to wet, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag. 16.0 - 18.0 POORLY GRADED SAND (FUSED): Grey, wet, mostly coarse sand with few fine sand trace sub rounded fine gravel, trace fine slag, non-plastic.
P75-TP-27	21.0	3.5	16.0	07/23/10	No	No	No	0.0	--	--	15.5	14.0	No	0.0 - 1.0 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 14.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag. 14.0 -16.0 POORLY GRADED SAND (FUSED): Grey, moist to wet, mostly coarse sand with few fine sand trace sub rounded fine gravel, trace fine slag, non-plastic.
P75-TP-28	51.0	3.5	14.5	07/23/10	Yes	Yes	(1.0 - 9.0) Petroleum like NAPL, mixed with fine sand, mothball odor.	75.8	--	--	14.0	Not Encountered	No	0.0 - 1.0 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 14.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist to wet, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.

TABLE 4-11

SUMMARY OF TANK FARM TEST PIT LOCATIONS

Location	Test Pit			Date	Visually Impacted Slag/Fill?	Olfactory Odor	Interval of Observed Impact (fbgs)	Maximum PID Scan (ppm)	Analysis & Depth Interval		Approximate DTW (fbgs)	Depth to Native (fbgs)	Observed Groundwater Impact	Depth (fbgs) and Soil Description (ASTM D2488: Visual-Manual Procedure)
	Length (feet)	Width (feet)	Depth (fbgs)						Full List	Interval (fbgs)				
Boring Locations														
P75-TP-28A	18.0	3.5	8.0	07/23/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 1.0 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 8.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-28B	25.0	3.5	6.5	07/23/10	Yes	Yes	(1.0 - 4.0) Petroleum like NAPL, mixed with fine sand, mothball odor.	85.8	Yes	--	NA	Not Encountered	NA	0.0 - 1.0 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 6.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-28C	18.0	3.5	11.0	07/23/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 11.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist to wet, mostly coarse slag with some non-plastic fines and fine gravel 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-28D	21.0	3.5	10.5	07/26/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 1.0 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 10.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-29	18.0	3.5	15.0	07/21/10	No	No	No	0.0	--	--	14.5	Not Encountered	NA	0.0 - 1.0 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 15.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist to wet, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-30	16.0	3.5	15.0	07/21/10	No	No	No	0.0	--	--	14.5	Not Encountered	NA	0.0 - 1.0 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 15.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist to wet, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-31	25.0	3.5	15.0	07/26/10	Yes	Yes	(1.0 - 2.0) Petroleum like NAPL, in pockets, slight mothball	0.0	--	--	NA	Not Encountered	NA	0.0 - 1.0 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 15.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-31A	14.0	3.5	6.0	07/26/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 1.0 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 6.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-31B	12.0	3.5	4.0	07/26/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 1.0 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 4.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.

TABLE 4-11

SUMMARY OF TANK FARM TEST PIT LOCATIONS

Location	Test Pit Length (feet)	Test Pit Width (feet)	Test Pit Depth (fbgs)	Date	Visually Impacted Slag/Fill?	Olfactory Odor	Interval of Observed Impact (fbgs)	Maximum PID Scan (ppm)	Analysis & Depth Interval: Full List	Analysis & Depth Interval: Interval (fbgs)	Approximate DTW (fbgs)	Depth to Native (fbgs)	Observed Groundwater Impact	Depth (fbgs) and Soil Description (ASTM D2488: Visual-Manual Procedure)
Boring Locations														
P75-TP-31C	12.0	3.5	8.0	07/26/10	Yes	Yes	(0.0 - 8.0) Petroleum like NAPL, Thin lens less then 0.5 fbgs on 45 degree angle	21.6	Yes	0.0 - 8.0	NA	Not Encountered	NA	0.0 - 1.0 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 8.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-31D	12.0	3.5	11.0	07/26/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 1.0 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 11.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-31E	18.0	3.5	8.0	07/26/10	Yes	Yes	(3.5 - 6.5) isolated pockets, petroleum like NAPL.	22.6	--	--	NA	Not Encountered	NA	0.0 - 1.0 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 8.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-32	23.0	3.5	10.0	07/27/10	Yes	No	(upper 4-inch) Petroleum like NAPL.	0.0	--	--	NA	Not Encountered	NA	0.0 - 1.0 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 10.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-33	22.0	3.5	14.5	07/29/10	Yes	Yes	(1.0 - 8.0) Petroleum like NAPL, in pockets, mothball odor	0.0	Yes	1.0 - 8.0	NA	Not Encountered	NA	0.0 - 1.0 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 14.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-33A	23.0	3.5	10.0	07/30/10	Yes	Yes	(1.0 - 3.0) Small Pockets of petroleum like NAPL, in pockets, mothball odor	0.0	--	--	NA	Not Encountered	NA	0.0 - 1.0 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 10.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-33B	23.0	3.5	12.5	07/30/10	Yes	Yes	(3.0 - 6.5) Petroleum like NAPL, in pockets, mothball odor	0.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 12.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist perched water from 3.0 to 12.5 fbgs, mostly coarse slag with some non-plastic fines and fine gravel , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-33C	20.0	3.5	13.5	07/30/10	Yes	Yes	(1.0 - 3.0) Small Pockets of petroleum like NAPL, in pockets, mothball odor	0.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 13.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-33D	20.0	3.5	10.5	07/30/10	Yes	Yes	(1.0 - 3.0) Petroleum like NAPL, in pockets, mothball odor South East corner	0.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 10.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.

TABLE 4-11

SUMMARY OF TANK FARM TEST PIT LOCATIONS

Location	Test Pit			Date	Visually Impacted Slag/Fill?	Olfactory Odor	Interval of Observed Impact (fbgs)	Maximum PID Scan (ppm)	Analysis & Depth Interval		Approximate DTW (fbgs)	Depth to Native (fbgs)	Observed Groundwater Impact	Depth (fbgs) and Soil Description (ASTM D2488: Visual-Manual Procedure)
	Length (feet)	Width (feet)	Depth (fbgs)						Full List	Interval (fbgs)				
Boring Locations														
P75-TP-33E	15.0	3.5	5.0	07/30/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 5.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-33F	15.0	3.5	5.0	07/30/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 5.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-33G	15.0	3.5	6.0	07/30/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 6.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-33H	20.0	3.5	10.0	07/30/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 10.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-33I	20.0	3.5	10.0	07/30/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 10.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-33J	20.0	3.5	10.0	07/30/10	No	Yes	(4.0 - 8.0) mothball odors	9.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 10.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-33K	20.0	3.5	6.0	07/30/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 6.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-34	23.0	3.5	13.0	07/30/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 13.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist perched water at 12.0 fbgs, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-35	20.0	3.5	10.5	07/30/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 1.0 POORLY GRADED SAND (SLAG/FILL): Brown, moist, mostly fine sand, little non-plastic fines, trace fine and coarse gravel (rounded), loose, roots in the upper 2-inch. 1.0 - 10.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist to wet, mostly coarse slag with some non-plastic fines and fine gravels , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot.

TurnKey Environmental Restoration, LLC — Benchmark Environmental Engineering & Science, PLLC

TABLE 4-11

SUMMARY OF TANK FARM TEST PIT LOCATIONS

Location	Test Pit			Date	Visually Impacted Slag/Fill?	Olfactory Odor	Interval of Observed Impact (fbgs)	Maximum PID Scan (ppm)	Analysis & Depth Interval		Approximate DTW (fbgs)	Depth to Native (fbgs)	Observed Groundwater Impact	Depth (fbgs) and Soil Description (ASTM D2488: Visual-Manual Procedure)
	Length (feet)	Width (feet)	Depth (fbgs)						Full List	Interval (fbgs)				
Boring Locations														
P75-TP-36	25.0	3.5	14.0	07/26/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 1.5 POORLY GRADED SAND (SLAG/FILL): Brown, moist, mostly fine sand, little non-plastic fines, trace fine and coarse gravel (rounded), loose, roots in the upper 2-inch. 1.5 - 14.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist to wet, mostly coarse slag with some non-plastic fines and fine gravels , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot.
P75-TP-37	25.0	3.5	14.0	07/27/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 14.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-38	23.0	3.5	14.5	07/27/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 14.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-39	23.0	3.5	14.0	07/27/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 14.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-40	23.0	3.5	12.0	07/27/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 - 12.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-41	18.0	3.5	7.5	07/29/10	No	No	No	0.0	--	--	NA	Not Encountered	NA	0.0 - 1.5 SLAG/FILL: Black, moist, mostly non-plastic fines with some fine sand and fine and coarse gravel , mixed with coal and coke fines, loose. 1.5 - 7.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravel , very hard, 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag.
P75-TP-42	20.0	4.0	8.0	01/11/11	Yes	Yes	(1.0-2.5) Petroleum like NAPL mixed with rail road ballast, mothball odor.	2.1	Yes	6.0-8.0	NA	Not Encountered	NA	0.0 - 1.5 SLAG/FILL: Reddish brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose, roots in the upper 2-inch. 1.5 - 2.5 SLAG/FILL: Black, perched water, mostly coarse gravel with some non plastic fines, loose, rail road ballast. 2.5 – 8.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, in 45 degree layers 1 to 2-foot thick.
P75-TP-43	18.0	4.0	8.0	01/11/11	No	No	No	0.0	Yes	6.0-8.0	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 – 8.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , 45 degree layers 1 to 2-foot thick, very hard.
P75-TP-44	17.0	4.0	5.0	01/12/11	Yes	Yes	(5.0) Petroleum like NAPL, mothball odor	21.8	Yes	3.0-5.0	NA	Not Encountered	NA	0.0 – 5.0 SLAG/FILL: Brown, moist, mostly non-plastic fines with some fine sand and coarse gravel . with coal and coke debris, dense, loose when disturbed.

TABLE 4-11

SUMMARY OF TANK FARM TEST PIT LOCATIONS

Location	Test Pit			Date	Visually Impacted Slag/Fill?	Olfactory Odor	Interval of Observed Impact (fbgs)	Maximum PID Scan (ppm)	Analysis & Depth Interval		Approximate DTW (fbgs)	Depth to Native (fbgs)	Observed Groundwater Impact	Depth (fbgs) and Soil Description (ASTM D2488: Visual-Manual Procedure)
	Length (feet)	Width (feet)	Depth (fbgs)						Full List	Interval (fbgs)				
Boring Locations														
P75-TP-45	19.0	4.0	10.0	01/12/11	Yes	Yes	(0.0-1.0) Petroleum like NAPL, mothball odors (1.0 - 10.0) Mothball odor	30.6	Yes	8.0-10.0	NA	Not Encountered	NA	0.0 – 1.0 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 – 10.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist to wet, mostly coarse slag with some non-plastic fines and fine gravels , 45 degree layers 1 to 2-foot thick.
P75-TP-46	21.0	4.0	17.5	01/11/11	No	No	No	0.0	Yes	0.0-17.5	NA	Not Encountered	NA	0.0 - 1.5 POORLY GRADED SAND (SLAG/FILL): Brown, moist to wet, mostly fine sand, little non-plastic fines, trace fine and coarse gravel (rounded), loose, roots in the upper 2-inch. 1.5 – 17.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist to wet, mostly coarse slag with some non-plastic fines and fine gravels , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot.
P75-TP-47	21.0	9.0	10.5	01/11/11	No	No	No	0.0	Yes	0.0-9.0	NA	Not Encountered	NA	0.0 - 1.5 POORLY GRADED SAND (SLAG/FILL): Brown, moist to wet, mostly fine sand, little non-plastic fines, trace fine and coarse gravel (rounded), loose, roots in the upper 2-inch. 1.5 – 9.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist to wet, mostly coarse slag with some non-plastic fines and fine gravels , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot. 9.0-10.5 CONCRETE: Dark grey, sub-rounded fine and coarse gravels, very hard.
P75-TP-48	23.0	4.5	15.5	01/10/11	No	No	No	0.0	Yes	0.0-15.0	15.0	Not Encountered	NA	0.0 - 1.0 POORLY GRADED SAND (SLAG/FILL): Brown, moist, mostly fine sand, little non-plastic fines, trace fine and coarse gravel (rounded), loose, roots in the upper 2-inch. 1.0 - 15.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist to wet, mostly coarse slag with some non-plastic fines and fine gravels , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot.
P75-TP-49	19.0	4.5	15.0	01/10/11	No	No	No	0.0	Yes	0.0-14.5	15.0	Not Encountered	NA	0.0 - 1.0 POORLY GRADED SAND (SLAG/FILL): Brown, moist, mostly fine sand, little non-plastic fines, trace fine and coarse gravel (rounded), loose, roots in the upper 2-inch. 1.0 - 15.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist to wet, mostly coarse slag with some non-plastic fines and fine gravels , very hard, in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot.
P75-TP-50	24.0	4.0	16.5	01/11/11	No	No	No	0.0	Yes	0.0-16.0	16.0	Not Encountered	NA	0.0 - 1.5 POORLY GRADED SAND (SLAG/FILL): Brown, moist, mostly fine sand, little non-plastic fines, trace fine and coarse gravel (rounded), loose, roots in the upper 2-inch. 1.5 - 16.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist to wet, mostly coarse slag with some non-plastic fines and fine gravels , in 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot.
P75-TP-51	30.0	4.0	16.5	01/12/11	No	No	No	0.0	Yes	0.0-16.5	NA	Not Encountered	NA	0.0 - 1.5 POORLY GRADED SAND (SLAG/FILL): Brown, moist, mostly fine sand, little non-plastic fines, trace fine and coarse gravel (rounded), loose, roots in the upper 2-inch. 1.5 - 16.5 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , in 45 degree layers 1 to 2-foot thick.
P75-TP-52	25.0	4.0	16.0	01/12/11	No	No	No	0.0	Yes	0.0-16.0	NA	Not Encountered	NA	0.0 - 1.5 POORLY GRADED SAND (SLAG/FILL): Brown, moist, mostly fine sand, little non-plastic fines, trace fine and coarse gravel (rounded), loose, roots in the upper 2-inch. 1.5 - 16.0 SLAG/FILL: Blue/grey/white/yellow with reddish brown layers, moist, mostly coarse slag with some non-plastic fines and fine gravels , in 45 degree layers 1 to 2-foot thick.
P75-TP-53	19.0	4.0	6.0	01/12/11	Yes	Yes	(1.0-6.0) Petroleum like NAPL, mothball odors	0.0	--	1.0-4.0 4.0-6.0	NA	Not Encountered	NA	0.0 - 0.5 SLAG/FILL: Black/reddish brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 0.5 – 6.0 SLAG/FILL: Blue/grey/white, moist, mostly coarse slag with some non-plastic fines and fine gravels , very hard, 45 degree layers 1 to 2-foot thick.

TABLE 4-11

SUMMARY OF TANK FARM TEST PIT LOCATIONS

Location	Test Pit			Date	Visually Impacted Slag/Fill?	Olfactory Odor	Interval of Observed Impact (fbgs)	Maximum PID Scan (ppm)	Analysis & Depth Interval		Approximate DTW (fbgs)	Depth to Native (fbgs)	Observed Groundwater Impact	Depth (fbgs) and Soil Description (ASTM D2488: Visual-Manual Procedure)
	Length (feet)	Width (feet)	Depth (fbgs)						Full List	Interval (fbgs)				
Boring Locations														
P75-TP-54	25.0	9.0	6.0	01/10/11	Yes	Yes	1-0-5.0 Petroleum like NAPL, mothball odors	10.5	--	3.0-4.0	NA	Not Encountered	NA	0.0 - 1.0 SLAG/FILL: Black/brown, moist, mostly non-plastic fines with some fine sand, trace fine and coarse gravel , mixed with coal and coke fines, loose. 1.0 - 6.0 SLAG/FILL: Blue/grey/white, moist, mostly coarse slag with some non-plastic fines and fine gravel 45 degree layers 1 to 2-foot thick, large pieces of steel in the upper 3-foot of slag, eastern side of test pit, was brown mostly non-plastic fines with some coarse slag and fine sand, backSLAG/FILL material for ~24-inch waterline that was exposed at 5.0 fbgs

Notes:

1. CMS test pit locations are shown on Plate 4-9.

Definitions:

fbgs = feet below ground surface
DTW = depth to water
HSD = headspace determination
PID = MiniRae photoionization detector equipped with a 10.6 eV lamp
ppm = parts per million
" * " = Surface topography sloped toward the railroad right-of-way; total test pit depth and approximate depth to water (DTW) measurements reflect this elevation difference (low/high).

TurnKey Environmental Restoration, LLC | Benchmark Environmental Engineering & Science, PLLC

TABLE 4-12

SUMMARY OF TANK FARM SLAG/FILL ANALYTICAL DATA

PARAMETER [1]	Industrial SCOs [2] (mg/kg)	Sample Location, Depth (fbgs), & Sample Date																						
		P75-TP-02 (1.0 - 12.0)	P75-TP-07B (2.0 - 7.0)	P75-TP-09 (1.0 - 6.0)	P75-TP-09E (0.0 - 10.0)	P75-TP-12 (3.0 - 15.5)	P75-TP-13D (5.0 -12.0)	P75-TP-28B (1.0 - 4.0)	P75-TP-31C (0.0 - 8.0)	P75-TP-33 (1.0 - 8.0)	P75-TP-42 (6.0 - 8.0)	P75-TP-43 (6.0 - 8.0)	P75-TP-44 (3.0 - 5.0)	P75-TP-45 (8.0 - 10.0)	P75-TP-46 (0.0 - 17.5)	P75-TP-47 (0.0 - 9.0)	P75-TP-48 (0.0 - 15.0)	P75-TP-49 (0.0 - 14.5)	P75-TP-50 (0.0 - 16.0)	P75-TP-51 (0.0 - 16.5)	P75-TP-52 (0.0 - 16.0)	P75-TP-53 (1.0 - 4.0)	P75-TP-53 (4.0 - 6.0)	P75-TP-54 (3.0 - 4.0)
		08/04/10	08/03/10	08/02/10	08/02/10	07/27/10	07/22/10	07/23/10	07/26/10	07/29/10	01/11/11	01/11/11	01/12/11	01/12/11	01/11/11	01/11/11	01/10/11	01/10/11	01/11/11	01/12/11	01/12/11	01/12/11	01/12/11	01/10/11
Visual Impacts																								
Field Observation	--	NAPL	discolored	NAPL	NAPL	NAPL	NAPL	NAPL	NAPL	NAPL	below NAPL	none	NAPL	below NAPL	none	none	none	none	none	none	none	NAPL	NAPL	NAPL
TCL VOCs (Method 8260B) (mg/kg)																								
Acetone	**1,000**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.012 J	0.008 J	0.042 J	0.0083 J	0.0055 J	0.014 J	0.0071 J	0.083 J	0.005 J	ND	--	--	--
Benzene	**89**	63 D	ND	8.7 D	3.3	ND	ND	15 D	ND	ND	0.0047 J	0.00056 J	0.0026 J	0.0052 J	0.00055 J	ND	ND	ND	ND	0.0031 J	0.0038 J	--	--	--
1,2-Dichlorobenzene	**1,000**	ND	ND	ND	ND	ND	1.9 D	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
2-Butanone	**1,000**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0021 J	ND	ND	ND	ND	ND	ND	--	--	--
Ethylbenzene	**780**	3.4 D	ND	ND	ND	ND	1 D	ND	ND	ND	0.01 J	ND	ND	0.0054 J	ND	ND	ND	ND	ND	ND	ND	--	--	--
Methylene chloride	**1,000**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.011	0.0075 B	ND	0.0064	0.0076	0.0088	0.0078	0.0081	0.0098 B	0.0089 B	--	--	--
Methylcyclohexane	**--**	ND	ND	ND	ND	ND	0.52 DJ	ND	ND	0.28 DJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
Methyl Acetate	**--**	ND	ND	ND	ND	ND	ND	ND	0.27 D	0.81 D	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
Styrene	**--**	34 D	ND	23 D	3	ND	10 D	10 D	ND	ND	0.019 J	ND	ND	0.0097 J	ND	ND	ND	ND	ND	ND	ND	--	--	--
Toluene	**1,000**	50 D	ND	21 D	3.6	ND	0.6 DJ	17 D	ND	ND	0.014 J	ND	0.00081 J	0.011 J	0.00053 J	ND	ND	ND	ND	0.00068 J	0.001 J	--	--	--
Xylenes, Total	**1,000**	77 D	ND	46 D	6.5	ND	14 D	24 D	0.12 DJ	0.35 DJ	0.063 J	ND	ND	0.043 J	ND	ND	ND	ND	ND	ND	ND	--	--	--
Waste Characterization (mg/L)																								
TCLP Benzene	**0.5**	NA	--	--	NA	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.15	0.12	NA
Flashpoint (F°)	**--**	NA	--	--	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	>176	>176	>176
TCL SVOCs (Method 8270C) (mg/kg) (PAHs in BLUE)																								
Acenaphthene	**1,000**	220 D	11 D	170 DJ	180 DJ	3.8 DJ	14 DJ	89 DJ	ND	ND	5.8	ND	0.3 J	0.27	ND	ND	ND	ND	ND	ND	ND	--	--	--
Acenaphthylene	**1,000**	**1700 D**	1.6 DJ	**3100 D**	**1500 D**	14 DJ	35 DJ	**2200 DB**	ND	ND	40	0.033 J	0.76	0.99	ND	ND	ND	ND	ND	ND	ND	--	--	--
Acetophenone	**--**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.016 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
Anthracene	**1,000**	**1400 D**	1.2 DJ	**2900 D**	**1800 D**	19 D	25 DJ	**1900 D**	ND	ND	34 D	0.024 J	1.5	1	ND	ND	ND	ND	ND	ND	ND	--	--	--
Benzo(a)anthracene	**11**	**910 D**	2.9 DJ	**2000 D**	**1200 D**	**33 D**	**35 DJ**	**1200 D**	1.6 DJ	ND	**39 D**	0.053 J	3.5	1.1	0.013 J	ND	0.042 J	0.026 J	0.026 J	0.012 J	ND	--	--	--
Benzo(a)pyrene	**1.1**	**780 D**	**2.7 DJ**	**1800 D**	**1100 D**	**31 D**	**31 DJ**	**1200 D**	**1.2 DJ**	ND	**39 D**	0.058 J	**3.6**	0.98	0.014 J	ND	0.039 J	0.013 J	0.023 J	ND	ND	--	--	--
Benzo(b)fluoranthene	**11**	**760 D**	3.1 DJ	**1800 D**	**1100 D**	**32 D**	**15 DJ**	**1100 D**	ND	ND	**42 D**	0.064 J	3.9	0.96	0.013 J	ND	0.057 J	0.026 J	ND	0.0083 J	ND	--	--	--
Benzo(ghi)perylene	**1,000**	360 D	1.8 DJ	**1100 D**	630 D	**20 D**	22 DJ	560 D	1.1	ND	15 D	0.088 J	2.4	0.57	ND	ND	0.023 J	0.013 J	0.011 J	ND	ND	--	--	--
Benzo(k)fluoranthene	**110**	**260 D**	1.4 DJ	**790 D**	**380 D**	ND	5.5 DJ	**560 D**	ND	ND	17 D	0.033 J	1.8	0.42	0.0073 J	ND	0.024 J	0.01 J	0.013 J	0.0057 J	ND	--	--	--
Bis(2-ethylhexyl) phthalate	**--**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.081 J	ND	--	--	--
Biphenyl	**--**	320 D	8.6 D	560 D	220 D	2.1 DJ	9.4 DJ	280 DB	ND	ND	3.8 D	ND	0.061 J	0.089 J	ND	ND	ND	ND	ND	ND	ND	--	--	--
Carbazole	**--**	ND	ND	ND	ND	ND	ND	ND	ND	ND	17 D	0.015 J	0.45	0.42	ND	ND	ND	ND	ND	ND	ND	--	--	--
2-Chloronaphthalene	**--**	ND	0.53 DJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
Chrysene	**110**	**850 D**	2.7 DJ	**2000 D**	**1200 D**	40 D	46 D	**1200 D**	2.9 DJ	16 DJ	32 D	0.059 J	3.4	1	0.009 J	ND	0.042 J	0.024 J	0.022 J	0.0079 J	ND	--	--	--
Dibenzo(a,h)anthracene	**1.1**	ND	0.54 DJ	ND	ND	**4.3 DJ**	ND	**130 DJ**	ND	ND	**4.2 D**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
Dibenzofuran	**1,000**	**1200 D**	21 D	**2300 D**	1000 D	13 DJ	19 DJ	**1200 DB**	ND	ND	26 D	ND	0.48	0.58	ND	ND	ND	ND	0.0073 J	ND	ND	--	--	--
2,4-Dintrotoluene	**--**	ND	1.2 DJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
Fluoranthene	**1,000**	**2200 D**	6.5 D	**6200 D**	**3400 D**	62 D	44 D	**3400 D**	ND	ND	130 D	0.1 J	7.6	2.7	0.018 J	ND	0.05 J	0.045 J	0.057 J	0.018 J	0.0087 J	--	--	--
Fluorene	**1,000**	**1400 D**	3.6 DJ	**2500 D**	**1300 D**	15 DJ	30 DJ	**1400 D**	ND	ND	38 D	0.15 J	0.58	1	ND	ND	0.0072 J	0.0047 J	0.0093 J	ND	ND	--	--	--
Indeno(1,2,3-cd)pyrene	**11**	**350 D**	1.7 DJ	**1100 D**	**570 D**	**12 DJ**	7.3 DJ	**550 D**	ND	ND	**14 D**	0.43 J	2.2	ND	0.0073 J	ND	0.023 J	0.089 J	0.009 J	ND	ND	--	--	--
2-Methylnaphthalene	**--**	1400 D	47 D	1900 D	790 D	15 DJ	110 D	980 DB	2.1 DJ	ND	11 D	0.012 J	0.16 J	0.32	ND	ND	ND	ND	0.0035 J	ND	ND	--	--	--
Naphthalene	**1,000**	**16000 D**	38 DB	**16000 DB**	**5300 DB**	9.6 DJ	730 D	**7300 DB**	8.8 DJ	ND	55 D	0.077 J	0.39 J	0.99	0.017 J	ND	ND	ND	0.02 J	ND	0.024 J	--	--	--
Phenanthrene	**1,000**	**4200 D**	4.7 D	**9500 D**	**4800 D**	80 D	110 D	**4500 DB**	2 DJ	12 DJ	180 D	0.096 J	6.6 DJ	3.5	0.015 J	ND	0.031 J	0.035 J	0.057 J	0.021 J	ND	--	--	--
Pyrene	**1,000**	**1700 D**	4.8 D	**4100 D**	**2200 D**	70 D	100 D	**2600 D**	3.4 DJ	21 DJ	100 D	0.084 J	6.4 DJ	2.2	0.015 J	ND	0.044 J	0.038 J	0.042 J	ND	ND	--	--	--
Total PAHs (mg/kg) [3]	500	**34490**	135	**56960**	**27450**	461	**1360**	**30869**	23.1	49.0	**796**	1.36	45.1	18.0	0.129	ND	0.382	0.324	0.293	0.0729	0.0327			

TABLE 4-12

SUMMARY OF TANK FARM SLAG/FILL ANALYTICAL DATA

PARAMETER [1]	Industrial SCOs [2] (mg/kg)	Sample Location, Depth (fbgs), & Sample Date																						
		P75-TP-02 (1.0 - 12.0)	P75-TP-07B (2.0 - 7.0)	P75-TP-09 (1.0 - 6.0)	P75-TP-09E (0.0 - 10.0)	P75-TP-12 (3.0 - 15.5)	P75-TP-13D (5.0 -12.0)	P75-TP-28B (1.0 - 4.0)	P75-TP-31C (0.0 - 8.0)	P75-TP-33 (1.0 - 8.0)	P75-TP-42 (6.0 - 8.0)	P75-TP-43 (6.0 - 8.0)	P75-TP-44 (3.0 - 5.0)	P75-TP-45 (8.0 - 10.0)	P75-TP-46 (0.0 - 17.5)	P75-TP-47 (0.0 - 9.0)	P75-TP-48 (0.0 - 15.0)	P75-TP-49 (0.0 - 14.5)	P75-TP-50 (0.0 - 16.0)	P75-TP-51 (0.0 - 16.5)	P75-TP-52 (0.0 - 16.0)	P75-TP-53 (1.0 - 4.0)	P75-TP-53 (4.0 - 6.0)	P75-TP-54 (3.0 - 4.0)
		08/04/10	08/03/10	08/02/10	08/02/10	07/27/10	07/22/10	07/23/10	07/26/10	07/29/10	01/11/11	01/11/11	01/12/11	01/12/11	01/11/11	01/11/11	01/10/11	01/10/11	01/11/11	01/12/11	01/12/11	01/12/11	01/12/11	01/10/11
RCRA Metals (Method 6010B/7471A) (mg/kg)																								
Arsenic [5]	**118**	15.4	10.6	5	7.8	4.9	5.5	38.6	5.9	82.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	**10,000**	159	252	201	133	188	112	1140	554	153	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	**60**	ND	ND	ND	ND	ND	ND	0.897	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	**6,800**	457	3.94	2.55	19.5	2.16	6.21	18.4	8.76	10.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cyanide	**10,000**	8.1	ND	ND	ND	1.5	ND	6.8	ND	3.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	**3,900**	34.5	1.4	3.5	14.4	1.8	3.9	48.7	7.8	99.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mercury	**5.7**	**7.16**	0.0576	0.0612	0.0694	ND	ND	0.279	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

1. Only those VOC and SVOC parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect (ND).
2. Values per NYSDEC 6NYCRR Part 375 Industrial Soil Cleanup Objectives (December 2006)
3. The total SVOC SCO was adapted from Commissioner Policy CP-51/Soil Cleanup Guidance, dated October 21, 2010. This was the basis for determining whether significant concentrations of SVOCs were present. Individual SVOC ISCOs were not used.
4. CMS test pit locations are shown on Plate 4-9.
5. Site-specific SCO for arsenic.

Definitions:

B = Analyte was detected in the associated Method Blank.
D = Compound was analyzed at the secondary dilution factor.
J = Estimated Value.
"--" = Sample was not analyzed for compound.
NA = Sample was submitted for analysis, but due to sample characteristics analysis could not be performed.
ND = Sample was not detected above the method detection limit.

BOLD	= Total PAHs exceeds CP-51 SCO.
BOLD	= Result exceeds the Part 375 Industrial SCO or site-specific SCO

TABLE 4-13

SUMMARY OF SWMU GROUP P-1 TO P-6 CONTAINMENT DETAILS

SWMU	Length (feet)	Width (feet)	Depth (fbgs)	Volume of Water (gallons)	Volume of Sediment (CY)	Comments
P-1	75	15	11	60,000	105	Quench Pit sampled water and solid residuals in July 2014
P-2	77	16.5	10	24,000	None Recoverable	Quench Pit sampled water in July 2014
P-3	160	11	15	20,000	None Recoverable	Quench Pit sampled water in July 2014
P-4	51	9	10	10,500	None Recoverable	Quench Pit sampled water in July 2014
P-5	50	15	13	17,000	90	Coke Breeze Settling Basin sampled water and solid residuals in July 2014
P-6	95	10	14	90,000	None Recoverable	Lime Sludge Settling Basin sampled water in July 2014

Notes:
1. Field measurements obtained by TurnKey personnel on July 19, 2011.
2. Historic as-built drawings were used to confirm dimensions, as necessary.
3. SWMU locations are shown on Plate 4-10.

TABLE 4-14

SUMMARY OF JULY 2014 QUENCH PIT (SWMUs P1 TO P6) WATER ANALYTICAL DATA

Parameter	SWMU Sampling Location & Sample Date						
	P-1	P-2	P-3	P-4	P-5 [1]		P-6
	07/11/14	07/11/14	07/08/14	07/08/14	07/08/14	07/08/14	07/08/14
	Estimated Volume of Impoundment Water (gallons)						
	60,000	24,000	20,000	10,500	17,000		90,000
Priority Pollutant VOCs (Method 624) (mg/L)							
Acetone	ND	0.0089 J	ND	0.0037 J	ND	ND	0.0047 J
Toluene	ND	0.0730	ND	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	0.0022 J	ND	ND	ND
Priority Pollutant SVOCs (Method 625) (mg/L)							
Bis(2-ethylhexyl) phthalate	0.044	ND	ND	ND	ND	ND	ND
3-Methylphenol/4-Methylphenol	ND	0.28	ND	ND	ND	ND	ND
Total Priority Pollutant Metals [2] (Method 6010C) (mg/L)							
Antimony	0.00126 J	0.0281 J	0.00067 J	0.0006 J	0.00113 J	0.00099 J	0.00206 J
Arsenic	0.00277	0.03652	0.00023 J	0.00024 J	0.00043 J	0.00038 J	0.00216
Cadmium	ND	0.00942 J	ND	ND	ND	ND	ND
Chromium	0.00127	0.4138	0.00072 J	0.00078 J	0.00102	0.00094 J	0.00113
Copper	0.00260	0.06352	0.00115	0.00174	0.00224	0.00215	0.00286
Lead	ND	0.04182	0.00022 J	0.00038 J	0.00077 J	0.00058 J	ND
Mercury	ND	0.001	ND	ND	ND	ND	ND
Nickel	0.00178	0.8335	0.00053 J	0.00072 J	0.00042 J	0.00038 J	0.00123
Selenium	0.00047 J	0.00502 J	ND	0.00075 J	0.00034 J	ND	0.00248
Thallium	ND	0.00055 J	ND	ND	ND	ND	ND
Zinc	0.00687	3.346	0.01519	0.02713	0.00487 J	0.00242 J	0.00534
General Chemistry (mg/L)							
Cyanide, Total	0.001 J	0.003 J	0.001 J	0.002 J	0.002 J	0.002 J	0.003 J
Nitrogen, Ammonia	ND	40.0	0.265	8.18	0.199	0.531	0.445
Phenolics, Total	0.02 J	0.13	0.120	0.029 J	0.08	ND	ND

Notes:
1. Results for P-5 and blind duplicate.
2. Mercury was tested using USEPA Method 7470A.

Definitions:

B = Analyte was detected in the associated Method Blank.

ND = Parameter not detected above laboratory detection limit.

TURNKEY ENVIRONMENTAL RESTORATION, LLC
BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 4-15

SUMMARY OF JULY 2014 QUENCH PIT (SWMUs P1 TO P6) RESIDUALS ANALYTICAL DATA [1]

PARAMETER [2]	Industrial SCOs [3] (mg/kg)	Site Specific SCOs [4] (mg/kg)	Sample Location, Depth (fbgs) & Sample Date		
			P-1	Blind Duplicate (P-1)	P-5
			07/15/14	07/15/14	07/15/14
TCL VOCs (Method 8260B) (mg/kg)					
Acetone	**1,000**	**1,000**	0.034	0.044	0.12
2-Butanone	**1,000**	**1,000**	ND	ND	0.02 J
TCL SVOCs (Method 8270C) (mg/kg) (PAHs in BLUE)					
Acenaphthene	**1,000**	**See Note 5**	0.45	0.33	0.53
Acenaphthylene	**1,000**		0.37	0.3	1.1
Acetophenone	**--**	**--**	ND	0.3 J	ND
Anthracene	**1,000**	**See Note 5**	1.8	1.2	2.1
Benzo(a)anthracene	**11**		2.5	1.6	4.1
Benzo(a)pyrene	**1.1**		**1.8**	**1.3**	**4**
Benzo(b)fluoranthene	**11**		2.8	2.4	6.2
Benzo(ghi)perylene	**1,000**		1.2	0.85	3
Benzo(k)fluoranthene	**110**		0.96	0.73	2.3
Bis(2-ethylhexyl) phthalate	**--**	**--**	ND	0.64	1.9
Biphenyl	**--**	**--**	0.66 J	0.61 J	0.68 J
Carbazole	**--**	**--**	1.2	0.84	1.8
Chrysene	**110**	**See Note 5**	3	2.4	5
Dibenzo(a,h)anthracene	**1.1**		0.37	0.28	0.71
Dibenzofuran	**1,000**	**1,000**	1.6	1.3	2
Fluoranthene	**1,000**	**See Note 5**	4.3	3.7	9.4
Fluorene	**1,000**		1.2	0.94	1.4
Indeno(1,2,3-cd)pyrene	**11**		1.2	0.92	3.2
2-Methylnaphthalene	**--**		3.8	3.4	3.8
Naphthalene	**1,000**		7.6	5	14
Phenanthrene	**1,000**		5.6	5.2	8.6
Phenol	**1,000**		2	1.7	0.44
2-Methylphenol	**--**		1.5	1	0.49
3-Methylphenol/4-Methylphenol	**--**		3.2	2.2	1.3
Pyrene	**1,000**		3.6	2.9	7.1
Total PAHs (mg/kg) [5]	***500***	***500***	**49**	**38**	**79**

TurnKey Environmental Restoration, LLC

Benchmark Environmental Engineering & Science, PLLC

TABLE 4-15

SUMMARY OF JULY 2014 QUENCH PIT (SWMUs P1 TO P6) RESIDUALS ANALYTICAL DATA [1]

PARAMETER [2]	Industrial SCOs [3] (mg/kg)	Site Specific SCOs [4] (mg/kg)	Sample Location, Depth (fbgs) & Sample Date		
			P-1	Blind Duplicate (P-1)	P-5
			07/15/14	07/15/14	07/15/14
RCRA Metals (Method 6010B/7471A) (mg/kg)					
Aluminum	--	--	3,800	3,300	11,000
Antimony	--	--	1.5 J	1.8 J	1.7 J
Arsenic	**16**	**118**	**26**	**23**	**23**
Barium	**10,000**	**10,000**	140	120	200
Beryllium	**2,700**	**2,700**	0.97	0.84	2
Cadmium	**60**	**60**	1.7 J	1.6	1.9 J
Calcium	--	--	9,100	8,200	94,000
Chromium	**6,800**	**6,800**	90	97	74
Cobalt	--	--	8.6	7.4	5.6
Copper	**10,000**	**10,000**	100	90	160
Iron	--	--	29,000	23,000	63,000
Lead	**3,900**	**3,900**	250	180	150
Magnesium	--	--	1,800	1,700	9,400
Manganese	**10,000**	**10,000**	780	670	2,300
Mercury	**5.7**	**5.7**	3.3	2.9	0.75
Nickel	**10,000**	**10,000**	63	59	27
Potassium	--	--	490	400 J	880
Selenium	**6,800**	**6,800**	3 J	2.8 J	2.6 J
Sodium	--	--	110 J	76 J	880
Vanadium	--	--	25	23	33
Zinc	**10,000**	**10,000**	480	500	820
Inorganic Compounds & Miscellaneous (units as shown)					
Solids (%)	--	--	42.6	48.4	37.0
Cyanide (mg/kg)	**10,000**	**10,000**	16	12	14

Notes:

1. There were no solid residuals recovered from SWMUs P-2, P-3, P-4, and P-6.
2. Only parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect (ND).
3. Values per NYSDEC 6NYCRR Part 375 Industrial Soil Cleanup Objectives (December 2006)
4. Site specific Soil Clean-up Objectives were developed for arsenic and for PAHs. Arsenic was developed based on a statistical analysis of samples in the BCP and CMS areas of the Tecumseh Redevelopment Site to be 118 mg/kg. PAHs are discussed in Note 5 below.
5. The total PAH SCO was adapted from Commissioner Policy CP-51/Soil Cleanup Guidance, dated October 21, 2010.

Definitions:

ND = Sample was not detected above the method detection limit.

BOLD = Result exceeds Part 375 Industrial SCO

TABLE 4-16

SUMMARY OF SWMU P-7 TEST PIT LOCATION

Location	Test Pit Dimensions			Date	Visually Impacted Soil/Fill?	Olfactory Odor	Interval of Observed Impact (fbgs)	Maximum PID Scan (ppm)	Analysis & Depth Interval			Approx. DTW (fbgs)	Observed Perched Water Impact	Depth (fbgs) and Soil Description (ASTM D2488: Visual-Manual Procedure)
	Length (feet)	Width (feet)	Depth (fbgs)						TCL VOCs (8260)	TCL SVOCs (8270)	Interval (fbgs)			
Test Pit Locations														
P7-TP-01	13.0	4.5	9.5	01/13/11	Yes	Yes	2.0-9.5	26.8	Yes	Yes	2.0-9.5	3.0	sheen	**0.0-2.0 Slag/Fill:** Black, moist, mostly non-plastic coal and coke fines, with some fine sand, with brick and steel debris, medium dense loose when disturbed. **2.0-9.5 Slag/Fill:** Dark grey, moist to wet, mostly coarse sand and fine gravel, with some non-plastic fines and fine sand, larger pieces of slag/fill mixed with brick. loose, on east side of test pit concrete foundation.

Notes:

1. CMS test pit locations are shown on Plate 4-11.

Definitions:

fbgs = feet below ground surface
PID = MiniRae photoionization detector equipped with a 10.6 eV lamp
ppm = parts per million
DTW = depth to water

TurnKey Environmental Restoration, LLC

Benchmark Environmental Engineering & Science, PLLC

TABLE 4-17

SUMMARY OF SWMU P-7 FILL ANALYTICAL DATA

Parameter [1]	Industrial SCOs [2] (mg/kg)	TCLP [3] Threshold (mg/L)	Sample Location, Depth (fbgs) & Date	
			P07-1 (0.0-0.5')	P7-TP-01 (0.0 - 9.5')
			RFI	CMS
			02/21/95	01/13/11
TCL VOCs (Method 8260B) (mg/kg)				
Benzene	**89**		ND	0.058 J
Methyl Acetate	**--**		ND	1.2
Methylene chloride	**1,000**		0.013	ND
Styrene	**5**		ND	ND
Toluene	**1,000**		0.002 J	ND
1,1,1-Trichloroethane	**1,000**		0.005	ND
Xylenes, Total	**1,000**		0.002 J	ND
Total VOCs (mg/kg)	**--**		***0.022***	***1.3***
TCL SVOCs (Method 8270C) (mg/kg) (PAHs in BLUE)				
Acenaphthene	**1,000**		1.1 J	0.035 J
Acenaphthylene	**1,000**		19	0.46
Anthracene	**1,000**		23	0.34
Benzo(a)anthracene	**11**		**35**	0.4
Benzo(a)pyrene	**1.1**		**20**	0.37
Benzo(b)fluoranthene	**11**		**24**	0.5
Benzo(ghi)perylene	**1,000**		12	0.14 J
Benzo(k)fluoranthene	**110**		13	0.19
Biphenyl	**--**		ND	0.071 J
Carbazole	**--**		ND	0.25
Chrysene	**110**		31	0.42
Dibenz(a,h)anthracene	**1.1**		**2.7 J**	ND
Dibenzofuran	**1,000**		ND	0.32
2,4-Dimethylphenol	**--**		ND	0.07 J
Fluoranthene	**1,000**		62	1.2
Fluorene	**1,000**		21	0.4
Indeno(1,2,3-cd)pyrene	**11**		**13 J**	0.13 J
2-Methylnaphthalene	**--**		ND	0.26
2-Methylphenol	**--**		ND	0.28
4-Methylpheol	**--**		1.5 J	1.2
Naphthalene	**1,000**		44	2.8
Phenanthrene	**1,000**		66	1.4
Phenol	**1,000**		1.3 J	2.5
Pyrene	**1,000**		58	ND
Total PAHs (mg/kg) [4]	***500***		***445***	***9.0***

TurnKey Environmental Restoration, LLC — Benchmark Environmental Engineering & Science, PLLC

TABLE 4-17

SUMMARY OF SWMU P-7 FILL ANALYTICAL DATA

Parameter [1]	Industrial SCOs [2] (mg/kg)	TCLP [3] Threshold (mg/L)	Sample Location, Depth (fbgs) & Date	
			P07-1 (0.0-0.5')	P7-TP-01 (0.0 - 9.5')
			RFI	CMS
			02/21/95	01/13/11
Inorganic Compounds (mg/kg)				
Arsenic [5]	**118**		4 J	NA
Barium	**10,000**		32.1	NA
Calcium	**--**		115,000	NA
Chromium	**6,800**		343	NA
Lead	**3,900.0**		192 J	NA
Mercury	**6**		0.65	NA
Nickel	**10,000**		61.6	NA
Selenium	**6,800**		ND	NA
Cyanide	**1,000**		6.8	NA
Wet Chemistry (mg/kg)				
pH SOL	**6.5-8.5**		8	NA
Total Recoverable Phenolics	**--**		2.6	NA
TCLP Benzene (Method 8260C) (mg/L)				
Benzene		**0.5**	NA	NA

Notes:

1. Only those VOC and SVOC parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect (ND).
2. Values per NYSDEC 6NYCRR Part 375 Industrial Soil Cleanup Objectives (December 2006)
3. TCLP means toxic characteristic leaching procedure via USEPA Method 1311.
4. The total PAH SCO was adapted from Commissioner Policy CP-51/Soil Cleanup Guidance, dated October 21, 2010.
5. Site-specific SCO for arsenic.

Definitions:

D = Compound was analyzed at the secondary dilution factor.
J = Estimated Value.
ND = Not detected above method detection limit for this compound
NA = Not analyzed for this compound

BOLD	= Total PAHs exceeds CP-51 SCO.
BOLD	= Result exceeds Part 375 Industrial SCO or site-specific SCO.
BOLD	= Result exceeds TCLP leachable level.

TABLE 4-18

SUMMARY OF SWMU P-11 ESTIMATED BENZOL PRODUCT MASS REMOVAL

Date of Collection	Event	Event	INFLUENT VOLATILE ORGANIC CONCENTRATION COMPOUND (mg/L)				Total VOCs (mg/L)	Moving Average (mg/L)	Treated Volume		Percent Reduction	APL Mass Removed Per Event (A x B x C)			LNAPL Mass Removed Per Event [1]			Total Mass Removed (APL & LNAPL) (pounds)	
			B	E	T	X		A	gallons (B)	liters (B)	C	mg	pounds	pounds (cumulative)	gallons	pounds	pounds (cumulative)	per event	cumulative
05/04/05	start-up	Apr-05	91 D	0.42	10 D	2.7	104.12	104.12	218,276	826,262	100%	86,030,396	190	190	0.00	0	0	190	190
05/31/05	M1	May-05	57 D	0.4	6.1 D	2.6	66.10	85.11	89,216	337,718	99.98%	28,737,451	63	253	19.92	146	146	210	399
06/30/05	M2	Jun-05	65 D	0.39	6.3 D	3	74.69	81.64	384,303	1,454,741	99.99%	118,748,295	262	515	9.35	69	215	330	730
08/04/05	M3	Aug-05	69 D	0.4 J	8.7	2.6	80.70	81.40	295,121	1,117,151	99.95%	90,893,418	200	715	6.13	45	260	245	975
08/29/05	M4	Aug-05	120 D	2.9 J	16	23	161.90	97.50	305,166	1,155,175	98.91%	111,404,222	246	961	3.74	27	287	273	1,248
09/23/05	M5	Sep-05	120 D	1.1 J	13	9.5 J	143.60	105.19	510,119	1,931,004	99.97%	203,051,771	448	1,409	139.74	1,025	1,312	1,473	2,721
10/31/05	M6	Oct-05	120 D	0.81 J	12	5.7 J	138.51	109.95	484,182	1,832,823	99.98%	201,470,681	444	1,853	44.82	329	1,641	773	3,494
12/05/05	Y1Q3	Dec-05	100 D	0.79 J	14	5.6 J	120.39	111.25	1,295,322	4,903,312	99.77%	544,244,929	1,200	3,053	74.93	550	2,191	1,750	5,244
04/10/07	Y1Q4	Apr-07	120	1 J	16	7.6 J	144.60	114.96	1,040,553	3,938,909	99.54%	450,720,989	994	4,047	99.60	731	2,922	1,725	6,968
07/10/07	Y2Q1	Jul-07	110	1.2 J	15	8.5 J	134.70	116.93	942,933	3,569,379	99.97%	417,245,795	920	4,967	80.51	591	3,512	1,511	8,479
10/30/07	Y2Q2	Oct-07	63	0.69 J	8.1	4.9 J	76.69	113.27	432,400	1,636,807	99.35%	184,200,452	406	5,373	77.19	566	4,079	972	9,452
01/18/07	Y2Q3	Jan-07	93	1.1	14	7.7	115.80	113.48	521,768	1,975,101	99.90%	223,916,857	494	5,867	34.86	256	4,334	749	10,201
04/16/07	Y2Q4	Apr-07	110	0.8	12	5.7	128.50	114.64	465,708	1,762,891	99.91%	201,913,234	445	6,312	19.92	146	4,481	591	10,792
10/19/07	Y3SA1	Oct-07	81	0.74 J	5.5	4.5	91.74	113.00	377,088	1,427,429	98.86%	159,464,685	352	6,664	51.72	379	4,860	731	11,524
04/10/08	Y3SA2	Apr-08	70	< 1	4.7	2.7 J	78.40	110.70	1,186,475	4,491,282	99.76%	495,973,803	1,094	7,757	126.58	929	5,789	2,022	13,546
11/17/08	Y4SA1	Nov-08	40	0.3 J	1.6	1.3 J	43.20	106.48	784,835	2,970,914	99.93%	316,114,104	697	8,454	31.96	234	6,023	932	14,477
04/08/09	Y4SA2	Apr-09	78 D	0.66 DJ	8.5 D	4.4 D	91.56	105.60	566,020	2,142,612	99.97%	226,191,961	499	8,953	7.47	55	6,078	554	15,031
11/13/09	Y5SA1	Nov-09	100 D	0.79 DJ	8.6 D	4.4 D	113.79	106.06	779,293	2,949,936	99.89%	312,511,292	689	9,642	13.30	98	6,175	787	15,818
04/29/10	Y5SA2	Apr-10	73 D	< 1	2.9 D	2.1 D	79.00	104.63	1,639,458	6,206,004	98.90%	642,198,016	1,416	11,058	12.32	90	6,266	1,506	17,324
10/22/10	Y6SA1	Oct-10	71 D	< 1	4.7 D	2.7 D	79.40	103.37	1,208,425	4,574,372	99.76%	471,715,705	1,040	12,098	26.79	197	6,462	1,237	18,561
04/26/11	Y6SA2	Apr-11	55	< 1	6.1	3.3	65.40	101.56	1,023,146	3,873,017	99.95%	393,152,451	867	12,965	43.00	315	6,778	1,182	19,743
10/28/11	Y7SA1	Oct-12	87	1.5	17	11	116.50	102.24	1,015,933	3,845,713	99.97%	393,069,466	867	13,832	70.08	514	7,292	1,381	21,124
05/01/12	Y7SA2	Apr-11	76	< 1	5.7	2.8	85.50	101.51	858,183	3,248,566	99.99%	329,737,425	727	14,559	43.84	322	7,614	1,049	22,173
10/03/12	Y8SA1	Oct-12	49	< 1	2.4	1.1 J	53.50	99.51	769,882	2,914,311	99.99%	289,980,190	639	15,198	36.93	271	7,885	910	23,083
04/04/13	Y8SA2	Apr-11	75 D	0.43 J	6.2	29.6	111.23	99.98	1,567,627	5,934,095	99.99%	593,236,260	1,308	16,506	38.85	285	8,170	1,593	24,676
10/30/13	Y9SA1	Oct-13	48	< 2.5	4.7	1.67 J	56.87	98.32	1,450,192	5,489,556	99.98%	539,639,943	1,190	17,696	42.64	313	8,482	1,503	26,179
04/21/14	Y9SA2	Apr-14	64	0.69 J	8.3	3.8	76.79	97.53	2,058,564	7,792,488	99.99%	759,887,855	1,676	19,372	57.85	424	8,907	2,100	28,279
10/30/14	Y10SA1	Oct-14	34	< 1.2	3.6	2.15 J	40.95	95.50	1,283,541	4,858,717	99.84%	463,287,606	1,022	20,393	35.66	262	9,168	1,283	29,562
04/30/15	Y10SA2	Apr-15	67	< 2.5	4.1	1.4 J	75.00	94.80	954,826	3,614,398	99.95%	342,464,920	755	21,149	35.11	258	9,426	1,013	30,575
04/05/16	Y11SA2	Apr-16	63	< 2.5	2.6	2.4 J	70.50	93.99	1,604,223	6,072,626	99.97%	570,580,699	1,258	22,407	8.63	63	9,489	1,321	31,896
10/26/16	Y12SA1	Oct-16	90	0.88 J	8.3	5.6 J	104.78	94.34	1,182,202	4,475,107	99.98%	422,078,438	931	23,337	24.00	176	9,665	1,107	33,003
04/05/17	Y12SA2	Apr-17	94	<2.5	9	3.68 J	106.68	94.72	1,629,980	6,170,126	99.98%	584,327,114	1,288	24,626	14.50	106	9,772	1,395	34,398
12/20/17	**Y13SA1**	**Dec-18**	**27**	**<2.5**	**1 J**	**0.55 J**	**28.55**	92.72	**1,182,202**	**4,475,107**	**99.98%**	**414,832,707**	**915**	**25,541**	**24.00**	**176**	**9,948**	**1,091**	**35,489**
04/19/18	**Y13SA2**	**Apr-18**	**13**	**0.14 J**	**0.33 J**	**0.54 J**	**14.01**	90.40	**1,629,980**	**6,170,126**	**99.83%**	**556,840,250**	**1,228**	**26,768**	**14.50**	**106**	**10,054**	**1,334**	**36,823**
								TOTALS:	**31,737,142**		**99.81%**		**26,768**		**1,370.44**	**10,054**		**36,823**	

Notes:
1. LNAPL Mass removal conversion: 8.337 pounds/gallon of water x specific gravity of benzol (0.88) = 7.3366 pounds/gallon.

Definitions:
APL = aqueous-phase liquid; dissolved phase
LNAPL = light non-aqueous phase liquid; floats on water
B = benzene; E = ethylbenzene; T = toluene; X = xylene
= current monitoring period

Total Mass Removed: 36,823 pounds
(APL & LNAPL) **18.41 tons**

TABLE 4-19

SUMMARY OF SWMU S-26 SLAG/FILL ANALYTICAL DATA

Parameter [1]	Industrial SCOs [2] (mg/kg)	Sample Location, Depth (fbgs), Date of Sample Collection, SWMU Location [4]																		
		S26-1 (0.0 - 30.0) 02/15/95 S26-G	S26-2 (0.0 - 30.0) 02/15/95 S26-G	S26-B-1 (0.0 - 12.0) 12/14/06 S26-T	S26-B-1 (12.0 - 14.0) 12/14/06 S26-T	S26-B-1 (14.0 - 30.0) 12/14/06 S26-T	S26-B-2 (0.0 - 14.0) 12/14/06 S26-T	S26-B-2 (14.0 - 22.0) 12/14/06 S26-T	S26-B-3 (6.0 - 8.0) 12/15/06 S26-T	S26-B-3 (10.0 - 12.0) 12/15/06 S26-T	S26-B-3 (14.0 - 30.0) 12/15/06 S26-T	S26-B-3 COMP [3] 12/15/06 S26-T	S26-B-04 (14.0 - 16.0) 09/23/10 S26-T	S26-B-06 (14.0 - 16.0) 09/20/10 S26-G	S26-B-07 (6.0 - 8.0) 09/20/10 S26-T	S26-B-08 (14.0 - 16.0) 09/17/10 S26-G	S26-B-10 (6.0 - 8.0) 09/20/10 S26-G	S26-B-11 (4.0 - 6.0) 09/21/10 S26-T	S26-B-12 (14.0 - 16.0) 09/23/10 S26-G	S26-B-13 (14.0 - 16.0) 09/24/10 S26-T
TCL VOCs (Method 8260B) (mg/kg)																				
Acetone	**1,000**	ND	ND	NA	0.11 J	NA	NA	NA	0.046 J	0.052 J	NA	NA	ND	0.13 J	0.016 J	ND	0.089 J	NA	ND	0.17 J
Benzene	**89**	ND	4.9 J	NA	2.4 D	NA	NA	NA	0.24	0.013 J	NA	NA	0.78 DJ	0.16	0.0027 J	62 D	0.034 J	NA	ND	0.03 J
Carbon Disulfide	**--**	2.4 J	7.7	NA	0.012 J	NA	NA	NA	ND	0.009 J	NA	NA	ND	ND	ND	ND	ND	NA	ND	ND
Cyclohexane	**--**	ND	ND	NA	0.047	NA	NA	NA	ND	0.015 J	NA	NA	ND	ND	ND	ND	ND	NA	ND	ND
Ethylbenzene	**780**	ND	ND	NA	0.25	NA	NA	NA	0.055	0.08	NA	NA	ND	0.094	ND	2.6	0.02 J	NA	ND	ND
Isopropylbenzene	**--**	ND	ND	NA	0.60	NA	NA	NA	ND	0.063	NA	NA	ND	0.08	ND	1.2	ND	NA	ND	ND
Methylcyclohexane	**--**	ND	ND	NA	0.066	NA	NA	NA	ND	0.056	NA	NA	ND	0.053 J	ND	0.15 J	ND	NA	ND	ND
Methylene Chloride	**1,000**	3.7 J	4.9 J	NA	0.093 B	NA	NA	NA	0.072 B	0.065 B	NA	NA	ND	0.12	0.0042 J	ND	0.039	NA	ND	0.046 J
Methyl Ethyl Ketone (2-Butanone)	**1,000**	ND	ND	NA	ND	NA	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND	ND	NA	ND	0.036 J
Styrene	**--**	ND	ND	NA	ND	NA	NA	NA	0.28	0.012 J	NA	NA	ND	0.15	ND	ND	ND	NA	ND	ND
Toluene	**1,000**	ND	7.7	NA	0.041	NA	NA	NA	0.23	0.011 J	NA	NA	ND	0.26	ND	3.8	0.031 J	NA	ND	ND
Xylenes, Total	**1,000**	2.6 J	13	NA	1.3	NA	NA	NA	1.4	0.085 J	NA	NA	ND	0.7	ND	18	0.048 J	NA	ND	0.15
Total VOCs (mg/kg)	**--**	**8.7**	**38**	**NA**	**4.9**	**NA**	**NA**	**NA**	**2.3**	**0.46**	**NA**	**NA**	**0.78**	**1.7**	**0.023**	**88**	**0.26**	**NA**	**ND**	**0.43**
TCL SVOCs (Method 8270C) (mg/kg) (PAHs in BLUE)																				
Acenaphthene	**1,000**	0.3 J	ND	3 J	1.8 J	0.024 J	2.4 J	ND	440 J	100	0.27 J	44 J	130 D	51 D	0.19 DJ	340 D	110 D	1.9 DJ	96 D	140 D
Acenaphthylene	**1,000**	0.72 J	1.2	12 J	1.4 J	0.027 J	12 J	ND	390 J	12 J	0.028 J	24 J	11 DJ	19 D	3.9 D	34 D	12 D	14 D	10 DJ	14 D
Anthracene	**1,000**	1.1	2.6	24 J	4.1	0.074 J	21 J	ND	940 J	55 J	0.11 J	71 J	49 D	50 D	6.6 D	290 D	34 D	6.8 DJ	47 D	110 D
Benzo(a)anthracene	**11**	2.2	3.6	**48**	4.2	0.086 J	**49**	0.046 J	**1400 J**	**51 J**	0.14 J	**110**	**65 D**	**76 D**	**15 D**	**270 D**	**39 D**	**38 D**	**63 D**	**130 D**
Benzo(a)pyrene	**1.1**	**2.1**	**2.8**	**37 J**	**2.9**	0.056 J	**39**	0.031 J	**1000 J**	**50 J**	0.12 J	**80 J**	**70 D**	**76 D**	**20 D**	**230 D**	**37 D**	**55 D**	**51 D**	**140 D**
Benzo(b)fluoranthene	**11**	2.9	3.6	**65**	3.8	0.100 J	**53**	0.038 J	**1400 J**	**60 J**	0.15 J	**110**	**72 D**	**75 D**	**21 D**	**240 D**	**35 D**	**55 D**	**57 D**	**130 D**
Benzo(g,h,i)perylene	**1,000**	1.1	1.4	27 J	1.8 J	0.040 J	32 J	0.026 J	840 J	39 J	0.089 J	58 J	56 D	42 D	9.8 D	130 D	29 D	49 D	44 D	49 D
Benzo(k)fluoranthene	**110**	1	1.2	ND	1.1 J	ND	16 J	ND	**410 J**	16 J	0.045 J	35 J	20 D	25 D	5.4 D	90 D	15 D	23 D	16 D	56 D
Biphenyl	**--**	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	13 D	0.48 DJ	45 D	9.9 D	1.3 DJ	1.7 DJ	ND
Bis(2-ethylhexyl)phthalate	**--**	ND	ND	ND	ND	0.086 J	ND	0.079 J	ND	ND	0.14 BJ	ND	ND	ND	0.82 DJ	ND	ND	ND	ND	ND
Chrysene	**110**	2	3	44	3.2	0.083 J	43	0.033 J	**1300 J**	59 J	0.14 J	**110**	64 D	63 D	15 D	**220 D**	34 D	37 D	56 D	**120 D**
Dibenz(a,h)anthracene	**1.1**	0.24 J	0.29 J	**8.2 J**	0.56 J	ND	**8.3 J**	ND	**200 J**	**8.7 J**	0.024 J	**16 J**	**27 D**	**19 D**	ND	**41 D**	**15 D**	**23 D**	**26 D**	**16 D**
Dibenzofuran	**1,000**	ND	ND	7.5 J	2.5	0.036 J	6.0 J	ND	**2000**	12 J	0.088 J	170	17 D	26 D	1.3 D	180 D	50 D	5.4 DJ	16 D	73 D
Fluoranthene	**1,000**	4.7	9.5	100	10	0.200 J	85	0.063 J	**4900**	150	0.39	400	160 D	170 D	27 D	670 D	110 D	57 D	150 D	300 D
Fluorene	**1,000**	0.84	1.9	7.9 J	3.7	0.052 J	8.4 J	ND	**1400 J**	46 J	0.13 J	120	62 D	36 D	0.89 DJ	250 D	58 D	ND	54 D	110 D
Indeno(1,2,3-cd)pyrene	**11**	1.1	1.4	**25 J**	1.6 J	0.036 J	**28 J**	ND	**740 J**	**33 J**	0.079 J	**54 J**	**50 D**	**40 D**	**9.5 D**	**120 D**	**26 D**	**46 D**	**42 D**	**48 D**
2-Methylnaphthalene	**--**	ND	ND	2.6 J	1.2 J	ND	2.6 J	ND	2900	6.5 J	0.20 J	280	8.9 DJ	60 D	0.8 DJ	110 D	15 D	6 DJ	6.2 DJ	38 D
Naphthalene	**1,000**	8.2	2.7	9.4 J	5.9	0.095 J	7.4 J	0.023 J	**210000 D**	**1200**	4.5	**9700 D**	**1700 D**	**4300 D**	6.6 D	**1200 D**	**2600 D**	34 D	620 D	370 D
Phenanthrene	**1,000**	3.7	9.2	66	12	0.180 J	54	0.035 J	**7700**	170	0.48	660	200 D	140 D	11 D	860 D	160 D	26 D	160 D	380 D
Pyrene	**1,000**	3.5	6.8	89	7.4	0.150 J	77	0.054 J	**3400**	110	0.30 J	280	140 D	140 D	26 D	450 D	99 D	64 D	120 D	220 D
Total PAHs (mg/kg) [5]	**500**	35.7	51.2	**568**	66.7	1.20	**538**	0.349	**239,360**	**2166**	7.20	**12,152**	**2,885**	**5,382**	179	**5,545**	**3,428**	**536**	**1,618**	**2,371**

TurnKey Environmental Restoration, LLC — Benchmark Environmental Engineering & Science, PLLC

TABLE 4-19

SUMMARY OF SWMU S-26 SLAG/FILL ANALYTICAL DATA

Parameter [1]	Industrial SCOs [2] (mg/kg)	Sample Location, Depth (fbgs), Date of Sample Collection, SWMU Location [4]																		
		S26-1	**S26-2**	**S26-B-1**	**S26-B-1**	**S26-B-1**	**S26-B-2**	**S26-B-2**	**S26-B-3**	**S26-B-3**	**S26-B-3**	**S26-B-3**	**S26-B-04**	**S26-B-06**	**S26-B-07**	**S26-B-08**	**S26-B-10**	**S26-B-11**	**S26-B-12**	**S26-B-13**
		(0.0 - 30.0)	(0.0 - 30.0)	(0.0 - 12.0)	(12.0 - 14.0)	(14.0 - 30.0)	(0.0 - 14.0)	(14.0 - 22.0)	(6.0 - 8.0)	(10.0 - 12.0)	(14.0 - 30.0)	COMP [3]	(14.0 - 16.0)	(14.0 - 16.0)	(6.0 - 8.0)	(14.0 - 16.0)	(6.0 - 8.0)	(4.0 - 6.0)	(14.0 - 16.0)	(14.0 - 16.0)
		02/15/95	02/15/95	12/14/06	12/14/06	12/14/06	12/14/06	12/14/06	12/15/06	12/15/06	12/15/06	12/15/06	09/23/10	09/20/10	09/20/10	09/17/10	09/20/10	09/21/10	09/23/10	09/24/10
		S26-G	S26-G	S26-T	S26-T	S26-T	S26-T	S26-T	S26-T	S26-T	S26-T	S26-T	S26-T	S26-G	S26-T	S26-G	S26-G	S26-T	S26-G	S26-T
RCRA Metals (Method 6010B/7471A) (mg/kg)																				
Arsenic, Total [6]	**118**	14.9 J	8 J	3.9	6.1	2.2	6.1	7.0	40.4	2.5	2.2	15.6	NA	NA	NA	NA	NA	NA	NA	NA
Barium, Total	**10,000**	170	137	58.9	48.5	45.4	66.7	79.9	220	16	10.3	46.8	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium, Total	**60**	NA	NA	0.3	0.24	0.22	0.34	0.39	2.5	0.33	ND	0.95	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Total	**6,800**	501 J	1400 J	55.9	16.4	9.1	14.7	13.8	36.2	5.3	4.3	17	NA	NA	NA	NA	NA	NA	NA	NA
Lead, Total	**3,900**	11.5 J	10.6 J	40.6	7.6	6.0	26.5	8.5	230	23.1	4.8	130	NA	NA	NA	NA	NA	NA	NA	NA
Mercury, Total	**5.7**	0.18 J	0.19 J	4.0	ND	ND	0.31	ND	1.8	0.34	ND	3.8	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Values per NYSDEC Part 375 Soil Cleanup Objectives (December 2006). The total SVOC concentration limit is adopted from CP/Soil Cleanup Guidance dated October 21, 2010.
3. Composite sample consists of three grab samples collected from 0-6, 8-10, and 12-14 fbgs.
4. S26-T refers to the portion of SWMU S-26 on Tecumseh property; S26-G refers to the portion of SWMU S-26 on Gateway property.
5. The total PAH SCO was adapted from Commissioner Policy CP-51/Soil Cleanup Guidance, dated October 21, 2010. This was the basis for determining whether significant concentrations of PAHs were present. Individual SVOC ISCOs were not used.
6. Site-specific SCO for arsenic.

Definitions:

fbgs = Feet below ground surface.
B = Analyte was detected in the associated blank as well as in the sample.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
D = All compounds were identified in an analyisis at the secondary dilution factor.
NA = Sample not analyzed for those parameters.
ND = Not detected above method detection limit for this compound
NA = Not analyzed for this compound

BOLD	= Locations advanced on Tecumseh portion of SWMU S-26
BOLD	= Total PAHs exceeds CP-51 SCO
BOLD	= Result exceeds the Part 375 Industrial SCO or site-specific SCO

TurnKey Environmental Restoration, LLC
Benchmark Environmental Engineering & Science, PLLC

TABLE 4-20

SUMMARY OF SMOKES CREEK LOWER REACH SEDIMENT ANALYTICAL DATA

Parameter [1]	Sample Location, Analysis, and Sample Date [3,4]																				Pre-ICM Average Concentration [5] (mg/kg)	Post-ICM Average Concentration [5] (mg/kg)	Sediment Guidance Values [7] (mg/kg)		
	SC-SED-01	SC-SED-02	SC-SED-01	SC-SED-02	SC-SED-03	SC-SED-04	SC-SED-03	SC-SED-04	SC-SED-05	SC-SED-06	SC-SED-05	SC-SED-06	SC-SED-07	SC-SED-08	SC-SED-07	SC-SED-08	SC-SED-09	SC-SED-10	SC-SED-09	SC-SED-10					
	pre-ICM		post-ICM		pre-ICM		post-ICM		pre-ICM		post-ICM		pre-ICM		post-ICM		pre-ICM		post-ICM						
	06/27/07		04/01/09		06/27/07		04/23/09		06/27/07		04/24/09		06/27/07		04/24/09		06/27/07		04/24/09				Class A	Class B	Class C
TCL VOCs (Method 8260B) (mg/kg)																									
Acetone	0.17 B	0.078 B	ND	ND	0.12 B	0.088 B	0.055 B	0.046 B	0.076 B	0.035 BJ	0.039 B	0.045 BJ	0.022 BJ	0.058 B	0.067	0.059	0.082 BJ	0.022 BJ	0.041 J	0.039 J	0.075	0.049	--	--	--
Benzene	8.8 D	0.005 J	ND	ND	0.002 J	0.003 J	ND	0.0038 J	0.003 J	0.009	ND	0.0089 J	0.014	0.012	0.005 J	0.0038 J	0.44	0.008	0.0097 J	0.021	0.93	0.0087	< 0.53	0.53 - 1.9	> 1.9
2-Butanone	0.044 J	0.016 J	ND	ND	0.027 J	0.023 J	ND	ND	0.012 J	ND	ND	ND	ND	0.013 J	0.014 J	ND	ND	ND	ND	ND	0.023	0.014	--	--	--
Carbon Disulfide	0.017	0.003 J	ND	ND	0.003 J	0.006 J	ND	0.0025 J	0.002 J	0.002 J	ND	ND	0.005 J	0.005 J	0.0047 J	ND	0.029	0.006	ND	0.0053 J	0.0078	0.0042	--	--	--
Cyclohexane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.002 J	ND	ND	0.02	ND	ND	ND	0.011	ND	--	--	--
Ethylbenzene	0.002 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.49	0.006	0.0095 J	0.025	0.17	0.017	< 0.43	0.43 - 3.7	> 3.7
Isopropylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.002 J	ND	ND	ND	0.079	ND	ND	0.0062 J	0.041	0.0062	< 0.21	0.21 - 1.8	> 1.8
Methylcyclohexane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.002 J	0.004 J	ND	ND	0.13	ND	0.0023 J	0.0065 J	0.045	0.0044	--	--	--
Methylene Chloride	0.021 B	0.022 B	0.043 B	0.027 B	0.02 B	0.022 B	0.0086 B	0.011 B	0.018 B	0.013 B	0.007 B	0.0084 B	0.015 B	0.012 B	0.0019 B	0.0084 B	0.074 B	0.02 B	0.0092 B	0.0087 B	0.024	0.013	--	--	--
Stryrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.1	0.02	0.027	0.071	0.56	0.049	--	--	--
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.009 J	ND	ND	ND	0.0090	ND	< 16	16 - 57	> 57
Toluene	0.1	ND	ND	ND	ND	ND	0.017	ND	ND	ND	ND	0.0089 J	0.005 J	0.012	ND	ND	1.8 D	0.021	0.019	0.051	0.39	0.024	< 0.93	0.93 - 4.5	> 4.5
Xylenes, Total	0.013 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0069 J	0.012 J	0.012 J	ND	0.014 J	17 D	0.12	0.19	0.48	3.4	0.17	< 0.59	0.59 - 5.2	> 5.2
Total VOCs (mg/kg)	*9.17*	*0.124*	*0.043*	*0.027*	*0.172*	*0.142*	*0.0806*	*0.0633*	*0.111*	*0.059*	*0.046*	*0.0781*	*0.077*	*0.130*	*0.0926*	*0.0852*	*21.25*	*0.223*	*0.308*	*0.714*	*3.1*	*0.15*			
TCL SVOCs (Method 8270C) (mg/kg)																									
Acenaphthene	0.64 J		ND		0.1 J		0.22 DJ		0.45 J		0.12 DJ		2.3 J		0.56 DJ		3.6		2.9 D		1.42	0.95		9.82	
Acenaphthylene	0.71 J		ND		0.099 J		0.15 DJ		0.18 J		0.17 DJ		2.5 J		0.95 DJ		12		7.2 D		3.10	2.12		9.04	
Acetophenone	ND		ND		ND		ND		ND		0.11 DJ		ND		ND		ND		ND		ND	0.11		--	
Anthracene	1.1 J		0.41 DJ		0.19 J		0.38 DJ		0.62 J		0.52 DJ		4 J		1.4 DJ		3.3		3.7 D		1.84	1.28		11.88	
Benzo(a)anthracene	2.1		1.4 DJ		0.63 J		0.83 DJ		0.98 J		1.1 DJ		3.5 J		1.4 DJ		1.6		2.3 D		1.76	1.41		16.82	
Benzo(a)pyrene	2.0		1.3 DJ		0.61 J		0.73 DJ		0.79 J		0.91 DJ		1.9 J		1.2 DJ		1.2		1.6 DJ		1.30	1.15		19.28	
Benzo(b)fluoranthene	2.7		1.8 DJ		0.98 J		0.97 DJ		1.3 J		1.1 DJ		3.1 J		1.6 DJ		1.9		2.1 DJ		2.00	1.51		19.58	
Benzo(g,h,i)perylene	0.96 J		0.64 DJ		0.38 J		0.39 DJ		0.42 J		0.4 DJ		1.4 J		0.58 DJ		0.6 J		0.7 DJ		0.75	0.54		21.9	
Benzo(k)fluoranthene	0.95 J		0.46 DJ		0.36 J		0.37 DJ		0.39 J		0.36 DJ		1.5 J		0.52 DJ		0.51 J		0.76 DJ		0.74	0.49		19.6	
Biphenyl	ND		ND		ND		ND		0.1 J		ND		1.3 J		0.38 DJ		3		2.2 D		1.47	1.29		--	
Bis(2-ethylhexyl)phthalate	1.8		ND		1.8		1.2 DJ		1.6		0.71 DJ		ND		0.94 DJ		0.69 J		0.84 DJ		1.47	0.92		--	
Caprolactam	ND		ND		ND		ND		ND		2.1 D		ND		3.9 D		ND		3 D		ND	3.00		--	
Carbazole	0.61 J		0.3 DJ		ND		ND		ND		ND		ND		0.4 DJ		0.93 J		0.74 DJ		0.77	0.48		--	
Chrysene	2.1		1.6 DJ		0.87 J		0.93 DJ		1.3 J		1.1 DJ		3.6 J		1.5 DJ		1.7		2.1 D		1.91	1.45		16.86	
Dibenz(a,h)anthracene	2.7		ND		2.4		0.17 DJ		2.3		0.12 DJ		24		ND		1.9		0.2 DJ		6.66	0.16		22.44	
Dibenzofuran	0.66 J		ND		ND		0.29 DJ		0.38 J		0.14 DJ		4.4 J		1.5 DJ		7.8		6.5 DJ		3.31	2.11		--	
Diethyl phthalate	ND		ND		ND		ND		ND		ND		ND		0.14 DJ		ND		ND		ND	0.14		--	
Fluoranthene	6.1		3.8 DJ		1.7		2.2 D		3.1		1.9 D		8.9 J		4 D		6.3		7.9 D		5.22	3.96		14.16	
Fluorene	0.96 J		ND		ND		0.55 DJ		0.79 J		0.26 DJ		5.5 J		2 DJ		9		8.1 D		4.06	2.73		10.78	
Indeno(1,2,3-cd)pyrene	0.75 J		0.62 DJ		0.3 J		0.36 DJ		0.39 J		0.37 DJ		1.2 J		0.57 DJ		0.5 J		0.58 DJ		0.63	0.50		22.3	
2 - Methylnaphthalene	0.48 J		ND		0.059 J		0.25 DJ		0.42 J		0.16 DJ		4.7 J		2 DJ		22		15 D		5.53	4.35		--	
2 - Methylphenol	0.16 J		ND		ND		ND		ND		ND		ND		ND		ND		ND		0.16	ND		--	
4 - Methylphenol	0.64 J		ND		ND		ND		0.091 J		0.55 DJ		ND		ND		ND		0.21 DJ		0.37	0.38		--	
Naphthalene	4.9		ND		0.061 J		1.2 DJ		1.6		0.5 DJ		26		4.5 D		67 D		31 D		19.91	9.30		7.7	
Phenanthrene	6.4		2.3 DJ		0.96 J		1.5 DJ		2.6		1.2 DJ		15		5.8 D		18		17 D		8.59	5.56		11.94	
Pyrene	4.2 J		2.7 DJ		1.1 J		1.6 DJ		1.9		1.4 DJ		5.8 J		3 D		3		5 D		3.20	2.74		13.96	
Total SVOCs (mg/kg)	*43.6*		*17.3*		*12.6*		*14.3*		*21.7*		*15.3*		*121*		*38.8*		*167*		*122*		*73.0*	*41.5*			

TABLE 4-20

SUMMARY OF SMOKES CREEK LOWER REACH SEDIMENT ANALYTICAL DATA

Parameter [1]	Sample Location, Analysis, and Sample Date [3,4]										Pre-ICM Average Concentration [5] (mg/kg)	Post-ICM Average Concentration [5] (mg/kg)	Sediment Guidance Values [7] (mg/kg)		
	SC-SED-01 SC-SED-02	SC-SED-01 SC-SED-02	SC-SED-03 SC-SED-04	SC-SED-03 SC-SED-04	SC-SED-05 SC-SED-06	SC-SED-05 SC-SED-06	SC-SED-07 SC-SED-08	SC-SED-07 SC-SED-08	SC-SED-09 SC-SED-10	SC-SED-09 SC-SED-10					
	pre-ICM	post-ICM	pre-ICM	post-ICM	pre-ICM	post-ICM	pre-ICM	post-ICM	pre-ICM	post-ICM					
	06/27/07	04/01/09	06/27/07	04/23/09	06/27/07	04/24/09	06/27/07	04/24/09	06/27/07	04/24/09			Class A	Class B	Class C
Total PCBs (Method 8082) (mg/kg)															
Aroclor 1248	0.1	0.094 DJ	0.046 J	0.17	0.27	0.33 D	0.32	0.2	0.14	0.48	*0.18*	*0.25*	--	--	--
Aroclor 1254	0.1	ND	0.087	ND	0.26	ND	0.21	ND	0.081 J	ND	*0.15*	*ND*	--	--	--
Aroclor 1260	ND	ND	ND	ND	ND	ND	0.085 J	ND	ND	ND	*0.09*	*ND*	--	--	--
Total PCBs (mg/kg)	*0.20*	*0.094*	*0.13*	*0.17*	*0.53*	*0.33*	*0.62*	*0.20*	*0.22*	*0.48*	*0.34*	*0.25*	**< 0.1**	**0.1 - 1**	**> 1**
RCRA Metals (Method 6010B/7471A) (mg/kg)															
Arsenic	ND	4.3	ND	12.4	ND	10.8	50.7	10.9	15	18.6	*32.9*	*11.4*	**< 10**	**10 - 33**	**> 33**
Barium	76.5	47.9	76	84.6	99.8	77.2	104	74.5	93.7	95.2	*90.0*	*75.9*	--	--	--
Cadmium	1.1	ND	1.1	2.16	5.2	2.29	17.2	1.54	5.6	3.77	*6.04*	*2.44*	**< 1**	**1 - 5**	**> 5**
Chromium	57.8	14.5	37.4	51.5	101	48.3	164	47.7	134	76.2	*98.8*	*47.6*	**< 43**	**43 - 110**	**> 110**
Lead	94.9	35.7	85.4	271	369	286	1190	210	180	451	*384*	*251*	**< 36**	**36 - 130**	**> 130**
Mercury	0.25	0.0718	0.253	0.397	0.439	0.354	0.195	0.213	0.151	0.381	*0.258*	*0.283*	**< 0.2**	**0.2 - 1**	**> 1**
Silver	ND	ND	ND	1.18	2	1.3	5.4	0.917	ND	1.8	*3.7*	*1.3*	**< 1**	**1 - 2.2**	**> 2.2**
Wet Chemistry (Method 9012A) (mg/kg)															
Cyanide	17	ND	ND	2 J	ND	ND	ND	ND	ND	5.8	*17.0*	*3.9*	--	--	--
Total Organic Carbon (Method Lloyd Kahn) (mg/kg)															
TOC	38,800	19,000	47,800	60,200	43,100	54,500	36,500	59,600	19,200	93,200	*37,080*	*57,300*	--	--	--

Notes:
1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Values per NYSDEC 6NYCRR Part 375 Industrial Soil Cleanup Objectives (December 2006)
3. Discrete samples from each location were collected for VOC analysis; adjacent sediment core locations were composited for SVOC, PCB, metals, cyanide, and TOC analysis.
4. Pre-ICM samples colored **BLUE** were collected June 26-28, 2007; Post-ICM samples colored **BLACK** were collected April 23-24, 2009.
5. Average Concentrations are based on the combined average of detected concentrations.
6. Sample locations are shown on Plate 4-15.
7. NYSDEC Division of Fish, Wildlife and Marine Resources, Bureau of Habitat. Screening and Assessment of Contaminated Sediment (Tables 5 and 7). June 24, 2014.

Definitions:
B = Analyte was detected in the associated Method Blank.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
D = Indicates value obtained through dilution of sample.
ND = Parameter was analyzed but not detected in sample.

Color Code:

Class A	= Sediments considered to be of low risk to aquatic life.
Class B	= Sediments considered slightly to moderately contaminated; additional testing is required to evaluate the potential risks to aquatic life.
Class C	= Sediments considered to be highly contaminated and likely pose a risk to aquatic life; additional testing is required to evaluate the potential risks to aquatic life.

TABLE 4-21

SUMMARY OF SMOKES CREEK UPPER REACH SEDIMENT ANALYTICAL DATA

Parameter [1]	Sample Location, Analysis, and Date [2]											Average Concentrations [3] (mg/Kg)	Sediment Guidance Values [4] (mg/kg)		
	SC-SED-11	SC-SED-12	SC-SED-13	SC-SED-14	SC-SED-15	SC-SED-16	SC-SED-17	SC-SED-18	SC-SED-19	SC-SED-20	SC-SED-22		Class A	Class B	Class C
	12/04/07	12/04/07	12/04/07	12/04/07	12/04/07	12/04/07	12/05/07	12/05/07	12/05/07	12/05/07	12/05/07				
TCL VOCs (Method 8260B) (mg/kg)															
Acetone	0.18	0.14	0.059 J	0.23	0.12 J	0.21 J	0.19	0.044 J	0.067 J	0.29	0.2	*0.16*	--	--	--
Benzene	0.084	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.084*	**< 0.53**	**0.53 - 1.9**	**> 1.9**
2-Butanone	0.037 J	0.029 J	ND	0.05 J	ND	ND	ND	ND	ND	0.061 J	0.42 J	*0.12*	--	--	--
Carbon Disulfide	0.014 J	0.008 J	ND	ND	ND	ND	ND	ND	0.036	0.01 J	0.009 J	*0.015*	--	--	--
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	0.01 J	ND	ND	*0.010*	**< 0.2**	**0.20 - 1.7**	**> 1.7**
Cyclohexane	0.03 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.044	*0.037*	--	--	--
Methylcyclohexane	0.013 J	ND	ND	ND	ND	ND	ND	ND	0.005 J	ND	0.016 J	*0.011*	--	--	--
Methylene Chloride	0.092 B	0.047 B	0.024 BJ	0.068 B	0.034 B	0.056 B	0.052 B	0.064 B	0.045 B	0.055 B	0.039 B	*0.052*	--	--	--
Toluene	0.01 J	ND	ND	ND	ND	ND	ND	ND	0.011 J	ND	ND	*0.011*	**< 0.93**	**0.93 - 4.5**	**> 4.5**
Xylenes, Total	0.03 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.030*	**< 0.59**	**0.59 - 5.2**	**> 5.2**
Total VOCs (mg/kg)	*0.49*	*0.22*	*0.083*	*0.35*	*0.15*	*0.27*	*0.24*	*0.11*	*0.17*	*0.42*	*0.73*	*0.29*			
TCL SVOCs (Method 8270C) (mg/kg)															
Acenaphthene	2.5		ND		ND		0.086 J		1.4 J	ND	ND	*1.3*		**9.82**	
Acenaphthylene	1.8 J		ND		ND		ND		ND	ND	ND	*1.8*		**9.04**	
Anthracene	6.2		0.13 J		0.084 J		0.26 J		2.9 J	ND	0.06 J	*1.6*		**11.88**	
Benzo(a)anthracene	5.4		0.44 J		0.18 J		0.47 J		4.4 J	0.16 J	0.21 J	*1.6*		**16.82**	
Benzo(a)pyrene	3.7		0.38 J		ND		0.28 J		ND	0.1 J	0.12 J	*0.92*		**19.28**	
Benzo(b)fluoranthene	4.5		0.47 J		ND		0.45 J		4 J	0.14 J	0.2 J	*1.6*		**19.58**	
Benzo(g,h,i)perylene	2.5		0.31 J		ND		0.22 J		2.2 J	0.069 J	0.12 J	*0.90*		**21.9**	
Benzo(k)fluoranthene	1.8 J		0.24 J		ND		0.18 J		2.2 J	0.066 J	0.091 J	*0.76*		**19.6**	
Biphenyl	0.59 J		ND		ND		ND		ND	ND	ND	*0.59*		**--**	
Bis(2-ethylhexyl) phthalate	ND		0.52 J		ND		ND		ND	ND	ND	*0.52*		**--**	
Carbazole	1.3 J		0.071 J		ND		ND		0.95 J	ND	ND	*0.77*		**--**	
Chrysene	4.6		0.45 J		0.46 J		0.48 J		5.2 J	0.11 J	0.25 J	*1.7*		**16.86**	
Dibenz(a,h)anthracene	0.75 J		0.093 J		ND		0.098 J		ND	ND	ND	*0.31*		**22.44**	
Dibenzofuran	4.4		ND		ND		0.099 J		1.2 J	ND	ND	*1.9*		**--**	
Fluoranthene	15		0.94 J		0.31 J		0.94 J		8.5 J	0.18 J	0.38 J	*3.8*		**14.16**	
Fluorene	3.4		0.058 J		ND		0.17 J		1.8 J	ND	ND	*1.4*		**10.78**	
Indeno(1,2,3-cd)pyrene	2.4		0.28 J		ND		0.22 J		1.2 J	0.056 J	0.09 J	*0.71*		**22.3**	
2 - Methylnaphthalene	1.6 J		ND		0.13 J		0.14 J		1.6 J	ND	ND	*0.87*		**--**	
4 - Methylphenol	ND		ND		1.2 J		ND		ND	ND	ND	*1.2*		**--**	
Naphthalene	3.3		ND		ND		0.17 J		ND	ND	ND	*1.7*		**7.7**	
N-nitrosodiphenylamine	0.24 J		ND		ND		ND		ND	ND	ND	*0.24*		**--**	
Phenanthrene	24		0.63 J		0.27 J		0.96 J		14 J	0.13 J	0.3 J	*5.8*		**11.94**	
Pyrene	10		0.8 J		0.36 J		0.81 J		7.4 J	0.17 J	0.32 J	*2.8*		**13.96**	
Total SVOCs (mg/kg)	*100*		*5.8*		*3.0*		*6.0*		*59*	*1.2*	*2.1*	*25*			

TurnKey Environmental Restoration, LLC — Benchmark Environmental Engineering & Science, PLLC

TABLE 4-21

SUMMARY OF SMOKES CREEK UPPER REACH SEDIMENT ANALYTICAL DATA

<table>
<tr><th rowspan="3">Parameter [1]</th><th colspan="11">Sample Location, Analysis, and Date [2]</th><th rowspan="3">Average Concentrations [3] (mg/Kg)</th><th colspan="3">Sediment Guidance Values [4] (mg/kg)</th></tr>
<tr><th>SC-SED-11</th><th>SC-SED-12</th><th>SC-SED-13</th><th>SC-SED-14</th><th>SC-SED-15</th><th>SC-SED-16</th><th>SC-SED-17</th><th>SC-SED-18</th><th>SC-SED-19</th><th>SC-SED-20</th><th>SC-SED-22</th><th rowspan="2">Class A</th><th rowspan="2">Class B</th><th rowspan="2">Class C</th></tr>
<tr><th>12/04/07</th><th>12/04/07</th><th>12/04/07</th><th>12/04/07</th><th>12/04/07</th><th>12/04/07</th><th>12/05/07</th><th>12/05/07</th><th>12/05/07</th><th>12/05/07</th><th>12/05/07</th></tr>
<tr><td colspan="16">Total PCBs (Method 8082) (mg/kg)</td></tr>
<tr><td>Aroclor 1242</td><td colspan="2">0.034</td><td colspan="2">ND</td><td colspan="2">ND</td><td colspan="2">ND</td><td>3.6</td><td>0.0055</td><td>0.033</td><td>0.92</td><td>--</td><td>--</td><td>--</td></tr>
<tr><td>Aroclor 1254</td><td colspan="2">0.014 J</td><td colspan="2">ND</td><td colspan="2">ND</td><td colspan="2">ND</td><td>ND</td><td>ND</td><td>ND</td><td>0.014</td><td>--</td><td>--</td><td>--</td></tr>
<tr><td>Total PCBs (mg/kg)</td><td colspan="2">0.048</td><td colspan="2">ND</td><td colspan="2">ND</td><td colspan="2">ND</td><td>3.6</td><td>0.0055</td><td>0.033</td><td>0.92</td><td>< 0.1</td><td>0.1 - 1</td><td>> 1</td></tr>
<tr><td colspan="16">RCRA Metals (Method 6010B/7471A) (mg/kg)</td></tr>
<tr><td>Arsenic</td><td colspan="2">17.1</td><td colspan="2">ND</td><td colspan="2">30.6</td><td colspan="2">22.4</td><td>11.3</td><td>ND</td><td>ND</td><td>20</td><td>< 10</td><td>10 - 33</td><td>> 33</td></tr>
<tr><td>Barium</td><td colspan="2">72</td><td colspan="2">55.2</td><td colspan="2">59.8</td><td colspan="2">45.3</td><td>10.8</td><td>80</td><td>114</td><td>62</td><td>--</td><td>--</td><td>--</td></tr>
<tr><td>Cadmium</td><td colspan="2">2.6</td><td colspan="2">ND</td><td colspan="2">3.9</td><td colspan="2">9.4</td><td>ND</td><td>ND</td><td>ND</td><td>5.3</td><td>< 1</td><td>1 - 5</td><td>> 5</td></tr>
<tr><td>Chromium</td><td colspan="2">84.9</td><td colspan="2">33.2</td><td colspan="2">117</td><td colspan="2">81</td><td>44.9</td><td>27.4</td><td>22.7</td><td>59</td><td>< 43</td><td>43 - 110</td><td>> 110</td></tr>
<tr><td>Lead</td><td colspan="2">333</td><td colspan="2">134</td><td colspan="2">1370</td><td colspan="2">926</td><td>21.6</td><td>75.2</td><td>113</td><td>425</td><td>< 36</td><td>36 - 130</td><td>> 130</td></tr>
<tr><td>Mercury</td><td colspan="2">0.205</td><td colspan="2">0.207</td><td colspan="2">0.12</td><td colspan="2">0.188</td><td>0.022</td><td>0.074</td><td>0.1</td><td>0.13</td><td>< 0.2</td><td>0.2 - 1</td><td>> 1</td></tr>
<tr><td>Silver</td><td colspan="2">ND</td><td colspan="2">ND</td><td colspan="2">5.3</td><td colspan="2">3.4</td><td>ND</td><td>ND</td><td>ND</td><td>4.4</td><td>< 1</td><td>1 - 2.2</td><td>> 2.2</td></tr>
<tr><td colspan="16">Wet Chemistry (Method 9012A) (mg/kg)</td></tr>
<tr><td>Cyanide</td><td colspan="2">ND</td><td colspan="2">ND</td><td colspan="2">ND</td><td colspan="2">4.6</td><td>ND</td><td>ND</td><td>ND</td><td>4.6</td><td>--</td><td>--</td><td>--</td></tr>
<tr><td colspan="16">Total Organic Carbon (Method Lloyd Kahn) (mg/kg)</td></tr>
<tr><td>TOC</td><td colspan="2">38,500</td><td colspan="2">ND</td><td colspan="2">93,400</td><td colspan="2">42,000</td><td>66,600</td><td>ND</td><td>100,000</td><td>68,100</td><td>--</td><td>--</td><td>--</td></tr>
</table>

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Discrete samples from each location were collected for VOC analysis; adjacent sediment core locations for SC-SED-11 thru 18 were composited for SVOC, PCB, metals, cyanide, and TOC analysis. See Plate 4-15.
3. Average concentrations are based on the combined average of detected concentrations.
4. NYSDEC Division of Fish, Wildlife and Marine Resources, Bureau of Habitat. Screening and Assessment of Contaminated Sediment (Tables 5 and 7). June 24, 2014.

Definitions:

J = Estimated value; result is less than the sample quantitation limit but greater than zero.
* = Indicates analysis is not within the quality control limits.
ND = Parameter was analyzed but not detected in sample.

Color Code:

Class A	= Sediments considered to be of low risk to aquatic life.
Class B	= Sediments considered slightly to moderately contaminated; additional testing is required to evaluate the potential risks to aquatic life.
Class C	= Sediments considered to be highly contaminated and likely pose a risk to aquatic life; additional testing is required to evaluate the potential risks to aquatic life.

TURNKEY Environmental Restoration, LLC — BENCHMARK Environmental Engineering & Science, PLLC

TABLE 4-22

SUMMARY OF SHIP CANAL SEDIMENT ANALYTICAL DATA

PARAMETER [1]	Sample Location and Date [2]								Average Concentrations [3] (mg/Kg)	Sediment Guidance Values [4] (mg/kg)		
	GSC-SED-1A	GSC-SED-1B	GSC-SED-2A	GSC-SED-2B	GSC-SED-3A	GSC-SED-3B	GSC-SED-4A	GSC-SED-4B				
	11/12/09	11/12/09	11/12/09	11/12/09	11/12/09	11/12/09	11/12/09	11/12/09		Class A	Class B	Class C
TCL VOCs (Method 8260B) (mg/kg)												
Acetone	0.038 J	0.043 J	0.031 J	0.046 J	0.028 J	0.031 J	0.027 J	0.069	*0.039*	--	--	--
Benzene	ND	0.006	ND	ND	ND	ND	ND	0.00078 J	*0.0034*	**< 0.53**	**0.53 - 1.9**	**> 1.9**
2-Butanone	ND	0.0091 J	ND	ND	ND	ND	ND	0.0098 J	*0.0095*	--	--	--
Carbon Disulfide	ND	0.0017 J	ND	ND	ND	ND	ND	ND	*0.0017*	--	--	--
Cyclohexane	ND	0.0059 J	ND	ND	ND	ND	0.0073 J	0.033	*0.015*	--	--	--
Ethylbenzene	ND	0.0022 J	ND	ND	ND	ND	ND	0.0013 J	*0.0018*	**< 0.43**	**0.43 - 3.7**	**> 3.7**
Isopropylbenzene	ND	0.0034 J	ND	ND	ND	ND	ND	0.002 J	*0.0027*	**< 0.21**	**0.21 - 1.8**	**> 1.8**
Methylcyclohexane	ND	0.022	ND	ND	ND	0.0024 J	0.0094 J	0.04	*0.018*	--	--	--
Methylene chloride	ND	0.0042 JB	0.0071 JB	0.0026 JB	ND	0.0039 JB	0.0032 JB	0.003 JB	*0.0040*	--	--	--
Toluene	ND	0.0016 J	ND	ND	ND	0.0013 J	ND	0.0014 J	*0.0014*	**< 0.93**	**0.93 - 4.5**	**> 4.5**
Xylenes, Total	ND	0.025 J	ND	ND	ND	ND	0.0029 J	0.0091 J	*0.012*	**< 0.59**	**0.59 - 5.2**	**> 5.2**
Total VOCs (mg/kg)	*0.038*	*0.12*	*0.038*	*0.049*	*0.028*	*0.039*	*0.050*	*0.17*	*0.067*			
TCL SVOCs (Method 8270C) (mg/kg)												
Acenaphthene	0.87 DJ		0.8 DJ		2.1 DJ		8.5 DJ		*3.1*		**9.82**	
Acenaphthylene	1.2 DJ		0.86 DJ		2.5 DJ		3 DJ		*1.9*		**9.04**	
Anthracene	2.8 DJ		2 DJ		8 DJ		9.7 DJ		*5.6*		**11.88**	
Benzo(a)anthracene	6 DJ		4.5 DJ		14 DJ		13 DJ		*9.4*		**16.82**	
Benzo(a)pyrene	5.4 DJ		4.4 DJ		14 DJ		12 DJ		*9.0*		**19.28**	
Benzo(b)fluoranthene	8.3 DJ		4.6 DJ		15 DJ		13 DJ		*10*		**19.58**	
Benzo(ghi)perylene	3.9 DJ		3.2 DJ		10 DJ		9 DJ		*6.5*		**21.9**	
Benzo(k)fluoranthene	ND		1.9 DJ		5.7 DJ		4.9 DJ		*4.2*		**19.6**	
Carbazole	ND		ND		0.76 DJ		1.5 DJ		*1.1*		**--**	
Chrysene	5.9 DJ		4.4 DJ		15 DJ		12 DJ		*9.3*		**16.86**	
Dibenzofuran	1.2 DJ		ND		1.2 DJ		4.4 DJ		*2.3*		**--**	
Fluoranthene	12 DJ		7.5 DJ		26 DJ		32 DJ		*19*		**14.16**	
Fluorene	ND		0.89 DJ		2.3 DJ		6.5 DJ		*3.2*		**10.78**	
Indeno(1,2,3-cd)pyrene	3.4 DJ		2.9 DJ		8.8 DJ		7.6 DJ		*5.7*		**22.3**	
2-Methylnaphthalene	0.87 DJ		ND		ND		2.8 DJ		*1.8*		**--**	
Naphthalene	5.6 DJ		4 DJ		4.2 DJ		21 D		*8.7*		**7.7**	
Phenanthrene	7.6 DJ		3.8 DJ		14 DJ		29 D		*14*		**11.94**	
Pyrene	9.8 DJ		6.1 DJ		21 D		24 D		*15*		**13.96**	
Total SVOCs (mg/kg)	*75*		*52*		*165*		*214*		*126*			

TurnKey Environmental Restoration, LLC | Benchmark Environmental Engineering & Science, PLLC

TABLE 4-22

SUMMARY OF SHIP CANAL SEDIMENT ANALYTICAL DATA

PARAMETER [1]	Sample Location and Date [2]								Average Concentrations [3] (mg/Kg)	Sediment Guidance Values [4] (mg/kg)		
	GSC-SED-1A	GSC-SED-1B	GSC-SED-2A	GSC-SED-2B	GSC-SED-3A	GSC-SED-3B	GSC-SED-4A	GSC-SED-4B				
	11/12/09	11/12/09	11/12/09	11/12/09	11/12/09	11/12/09	11/12/09	11/12/09		Class A	Class B	Class C
Total PCBs (Method 8082) (mg/kg)												
Aroclor 1248	0.25		0.055		0.09 J		0.047		*0.11*	--	--	--
Aroclor 1254	ND		ND		ND		0.075		*0.075*	--	--	--
Aroclor 1260	0.086		0.046		0.064 J		0.036 J		*0.058*	--	--	--
Total PCBs (mg/kg)	*0.34*		*0.10*		*0.15*		*0.16*		*0.19*	**< 0.1**	**0.1 - 1**	**> 1**
RCRA Metals (Method 6010B/7471A) (mg/kg)												
Arsenic, Total	22.4		12.8		14.4		18.6		*17*	**< 10**	**10 - 33**	**> 33**
Barium, Total	91.3		75.5		76.1		87.7		*83*	--	--	--
Cadmium, Total	2.7		1.68		1.5		1.9		*1.9*	**< 1**	**1 - 5**	**> 5**
Chromium, Total	65.3		50.4		53.2		80		*62*	**< 43**	**43 - 110**	**> 110**
Lead, Total	404		271		139		220		*259*	**< 36**	**36 - 130**	**> 130**
Mercury, Total	1.61		1.07		0.551		0.43		*0.92*	**< 0.2**	**0.2 - 1**	**> 1**
Wet Chemistry (Method 9012A) (mg/kg)												
Cyanide, Total	3.8		7.9		ND		ND		*5.9*	--	--	--
Total Organic Carbon (Method Lloyd Kahn) (mg/kg)												
TOC	90,600		90,400		138,000		88,000		*101,750*	--	--	--

Notes:
1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect (ND).
2. Discrete samples from each location were collected for VOC analysis; adjacent transect core locations were composited for SVOC, PCB, metals, and TOC analysis. See Plate 4-16.
3. Average Concentrations are based on the combined average of detected concentrations.
4. NYSDEC Division of Fish, Wildlife and Marine Resources, Bureau of Habitat. Screening and Assessment of Contaminated Sediment (Tables 5 and 7). June 24, 2014.

Definitions:

B = Analyte was detected in the associated Method Blank.
D = Dilution required due to viscosity.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
D = Indicates value obtained through dilution of sample.
ND = Parameter was analyzed but not detected in sample.

Color Code:

Class A	= Sediments considered to be of low risk to aquatic life.
Class B	= Sediments considered slightly to moderately contaminated; additional testing is required to evaluate the potential risks to aquatic life.
Class C	= Sediments considered to be highly contaminated and likely pose a risk to aquatic life; additional testing is required to evaluate the potential risks to aquatic life.

TABLE 4-23

SUMMARY OF SHIP CANAL SURFACE WATER ANALYTICAL DATA

PARAMETER [1]	SWQS [2]	Sample Location & Date [3]	
		SHIP CANAL #1 NORTH	SHIP CANAL #2 SOUTH
		12/18/07	12/18/07
Field Parameters			
pH - Units	**6.5 - 8.5**	**6.43**	**6.13**
Temperature - C^{o}	--	1.7	1.6
Conductivity - mS	--	397.4	407.7
Turbidity - NTU	--	3.01	3.43
Eh/ORP - mV	--	122	122
Odor	--	None	None
Appearance	--	Clear	Clear
TCL VOCs (Method 8260B) (mg/L)			
Acetone	**0.05***	0.0042 J	0.0052
Benzene	**0.01**	0.0017	0.0018
TCL SVOCs (Method 8270C) (mg/L)			
Di-n-butyl phthalate	--	0.0003 BJ	0.0003 BJ
Inorganic Compounds (Method 6010B/7471A) (mg/L)			
Calcium	--	33.3	34.6
Iron	**0.3**	**0.37**	**0.36**
Magnesium	--	8	8.2
Manganese	--	0.013	0.014
Potassium	--	1.8	2
Sodium	--	31.3	42.6
Wet Chemistry (mg/L)			
Ammonia	--	0.52	0.39
Hardness (Ca & Mg)	--	116	120
Chemical Oxygen Demand	--	ND	13.3
Total Alkalinity	--	95.7	96.8
Total Dissolved Solids	--	242	242
Total Kjeldahl Nitrogen	--	0.47	0.56
Total Organic Carbon	--	2.8	2.6
Total Phosphorous	--	0.032	0.039
Total Suspended Solids	--	ND	6

Notes:

1. Only those VOCs and SVOCs detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect (ND).
2. NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, June 1998. The SRWT is a Class C water body.
3. Sample locations are shown on Plate 4-16.

Definitions:

J = Estimated Value.
B = Analyte was also detected in the method blank.
ND = Not detected above the Method Detection Limit.
* = Indicates a guidance value, which is used when there is no standard given in 6NYCRR part 703.5
BOLD = Result exceeds the individual SWQS.

TurnKey Environmental Restoration, LLC — Benchmark Environmental Engineering & Science, PLLC

TABLE 4-24

SUMMARY OF NRWT SURFACE WATER ANALYTICAL DATA

Parameter [1]	Location & Sample Date [2] NRWT-Surface Water 12/14/06	NYSDEC Class C AWGV [3] (mg/L)
TCL VOCs (Method 8260B) (mg/L)		
Methylene Chloride	0.0024 J	0.2
TCL SVOCs (Method 8270C) (mg/L)		
Total	ND	--
RCRA Metals (Method 6010B/7471A) (mg/L)		
Barium, Total	0.34	--

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Sample location is shown on Plate 4-17.
3. NYSDEC Class "C" Ambient Water Guidance Values (AWGV) for Type A(C), Fish Propagation (fresh waters), in accordance with 6NYCRR Part 703.

Definitions:

J = Estimated value.
ND = Parameter not detected above the method detection limit.
BOLD = Result exceeds the NYSDEC Class C AWGV.

TABLE 4-25

SUMMARY OF NORTH RETURN WATER TRENCH SEDIMENT ANALYTICAL DATA

Parameter [1]	Sample Location & Date [2]			Sediment Guidance Values [3] (mg/kg)		
	NRWT-SED-1	NRWT-SED-3	NRWT-SED-4			
	12/14/06	12/14/06	12/14/06	Class A	Class B	Class C
TCL VOCs (Method 8260B) (mg/kg)						
Acetone	0.14	0.022 J	0.032 J	--	--	--
2-Butanone	0.030 J	ND	ND	--	--	--
Carbon Disulfide	0.006 J	ND	ND	--	--	--
Methylene Chloride	0.054 B	0.022 B	0.029 B	--	--	--
Total VOCs (mg/kg)	*0.23*	*0.044*	*0.061*			
TCL SVOCs (Method 8270C) (mg/kg)						
Acenaphthene	ND	0.056 J	ND		**9.82**	
Acenaphthylene	ND	0.14 J	0.43 J		**9.04**	
Anthracene	ND	0.14 J	0.72 J		**11.88**	
Benzo(a)anthracene	6.8 J	0.33 J	1.5 J		**16.82**	
Benzo(a)pyrene	ND	0.27 J	1.3 J		**19.28**	
Benzo(b)fluoranthene	12 J	0.33 J	1.4 J		**19.58**	
Benzo(g,h,i)perylene	ND	0.19 J	0.87 J		**21.9**	
Benzo(k)fluoranthene	ND	0.16 J	0.61 J		**19.6**	
Chrysene	ND	0.27 J	1.5 J		**16.86**	
Dibenz(a,h)anthracene	ND	0.056 J	ND		**22.44**	
Dibenzofuran	ND	0.087 J	0.34 J		**--**	
Fluoranthene	7.7 J	0.76	2.7 J		**14.16**	
Fluorene	ND	0.12 J	0.38 J		**10.78**	
Indeno(1,2,3-cd)pyrene	ND	0.18 J	0.76 J		**22.3**	
Naphthalene	ND	0.29 J	ND		**7.7**	
Phenanthrene	ND	0.53 J	2.0 J		**11.94**	
Pyrene	8.7 J	0.57 J	2.4 J		**13.96**	
Total SVOCs (mg/kg) [3]	*35*	*4.5*	*17*			
Total PCBs (Method 8082) (mg/kg)						
Aroclor 1254	0.17	ND	0.13	--	--	--
Aroclor 1260	0.17	1.2	0.095	--	--	--
Total PCBs (mg/kg)	*0.34*	*1.2*	*0.23*	**< 0.1**	**0.1 - 1**	**> 1**
RCRA Metals (Method 6010B/7471A) (mg/kg)						
Arsenic, Total	58.7	19.8	12	**< 10**	**10 - 33**	**> 33**
Barium, Total	226	82.5	61	--	--	--
Cadmium, Total	10.2	2.4	1.3	**< 1**	**1 - 5**	**> 5**
Chromium, Total	438	62.2	45	**< 43**	**43 - 110**	**> 110**
Lead, Total	909	140	89	**< 36**	**36 - 130**	**> 130**
Mercury, Total	1.4	3.2	1.1	**< 0.2**	**0.2 - 1**	**> 1**
Selenium, Total	22.7	ND	ND	--	--	--
Wet Chemistry (Method 9012A) (mg/kg)						
Total Organic Carbon	126,000	50,900	67,900	--	--	--

Notes:
1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Sample locations are shown on Plate 4-17.
3. NYSDEC Division of Fish, Wildlife and Marine Resources, Bureau of Habitat. Screening and Assessment of Contaminated Sediment (Tables 5 and 7). June 24, 2014.

Definitions:

B = Analyte was detected in the sample as well as the associated method blank.
J = Estimated value.
ND = Parameter not detected above method detection limit.

Color Code:

Class A	= Sediments considered to be of low risk to aquatic life.
Class B	= Sediments considered slightly to moderately contaminated; additional testing is required to evaluate the potential risks to aquatic life.
Class C	= Sediments considered to be highly contaminated and likely pose a risk to aquatic life; additional testing is required to evaluate the potential risks to aquatic life.

TurnKey Environmental Restoration, LLC
Benchmark Environmental Engineering & Science, PLLC

TABLE 4-26

SUMMARY OF SRWT SURFACE WATER ANALYTICAL DATA

PARAMETER [1]	SWQS [2]	Sample Location & Date [3]					
		SRWT-SW-01 *Downstream near confluence with Smokes Creek*		SRWT-SW-02 *Midway along SRWT*		SRWT-SW-03 *Upstream Portion of SRWT*	
		09/29/09		09/29/09		09/29/09	
Field Parameters							
Field Measurement	--	First	Last	First	Last	First	Last
pH - Units	**6.5 - 8.5**	7.92	7.91	7.69	7.69	7.41	7.39
Temperature - ^{o}C	--	14.9	15.3	15.6	15.4	16.3	16.3
Conductivity - mS	--	1158	1153	2394	2393	3378	3379
Turbidity - NTU	--	5.51	3.86	5.17	5.29	5.03	6.67
Eh/ORP - mV	--	67	75	64	66	80	72
DO - mg/L	--	6.45	6.5	4.24	4.2	5.16	5.18
Odor	--	None	None	None	None	None	None
Appearance	--	Clear	Clear	Clear	Clear	Clear	Clear
TCL VOCs (Method 8260B) (mg/L)							
Benzene	**0.01**	ND		ND		0.00068 J	
TCL SVOCs (Method 82670C) (mg/L)							
Total SVOCs	--	ND		ND		ND	
RCRA Metals (Method 6010B/7471A) (mg/L)							
Barium, Total	--	0.0392		0.0691		0.0752	
Cyanide, Total	**0.0052** [4]	0.0116		0.0534		0.119	
Mercury, Total	**7.00E-7** [5]	ND		0.0007		0.0005	

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect (ND).
2. NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, June 1998. The SRWT is a Class C water body.
3. Sample locations are shown on Plate 4-17.
4. Cyanide standard applies to free cyanide: the sum of HCN and CN- expressed as CN for fish propogation (H[FC]).
5. Mercury standard applies to dissolved phase for human fish consumption (H[FC]). Samples not filtered prior to analysis.

Definitions:

J = Estimated Value.
ND = Not detected above the Method Detection Limit.

TABLE 4-27

SUMMARY OF SOUTH RETURN WATER TRENCH SEDIMENT ANALYTICAL DATA

PARAMETER [1]	Sample Location & Date [2]																	Average Concentration [3] (mg/kg)	Sediment Guidance Values [4] (mg/kg)		
	SRWT-SED-1	SRWT-SED-2	SRWT-SED-3	SRWT-SED-4	SRWT-SED-5	SRWT-SED-6	SRWT-SED-7	SRWT-SED-8	SRWT-SED-9	SRWT-SED-10	SRWT-SED-11	SRWT-SED-12	SRWT-SED-13	SRWT-SED-14	SRWT-SED-15	SRWT-SED-16	SRWT-SED-17		Class A	Class B	Class C
	09/30/09	09/30/09	10/01/09	09/30/09	09/30/09	09/30/09	09/30/09	09/30/09	09/30/09	09/30/09	09/30/09	10/01/09	10/01/09	10/01/09	10/01/09	10/01/09	10/01/09				
TCL + STARS LIST VOCs (Method 8260B) (mg/kg)																					
Acetone	0.13	0.028 J	0.016 J	0.039 J	0.027 J	0.054 J	0.077 J	ND	ND	ND	ND	0.011 J	0.056 J	0.22	0.09 J	0.25	0.13	*0.087*	--	--	--
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.032	ND	ND	*0.032*	**< 0.53**	**0.53 - 1.9**	**> 1.9**
2-Butanone	0.029 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.044 J	ND	0.037 J	0.025 J	*0.034*	--	--	--
Cyclohexane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0057 J	*0.0057*	--	--	--
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0031 J	*0.0031*	**< 0.43**	**0.43 - 3.7**	**> 3.7**
Methylene chloride	0.0079 J	ND	ND	0.0047 J	0.0049 J	0.012 J	ND	0.0062 J	0.022 J	0.0038 J	ND	0.0021 J	0.01 J	0.0042 J	0.037	0.017 J	0.012 J	*0.011*	--	--	--
Tetrachloroethene	ND	ND	ND	ND	0.0048 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.0048*	**< 16**	**16 - 57**	**> 57**
Toluene	0.0068 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.0068*	**< 0.93**	**0.93 - 4.5**	**> 4.5**
Total VOCs (mg/kg)	*0.17*	*0.028*	*0.016*	*0.044*	*0.037*	*0.066*	*0.077*	*0.0062*	*0.022*	*0.0038*	*ND*	*0.013*	*0.066*	*0.27*	*0.16*	*0.30*	*0.18*	*0.091*			
TCL SVOCs (Method 8270C) (mg/kg)																					
Acenaphthene	ND		ND	ND		ND		ND		ND		0.31 DJ		0.58 DJ		ND		*0.45*		**9.82**	
Acenaphthylene	ND		0.25 DJ	ND		ND		ND		ND		ND		0.52 DJ		ND		*0.39*		**9.04**	
Anthracene	ND		0.26 DJ	ND		ND		ND		ND		0.49 DJ		2.8 DJ		9.2 DJ		*3.2*		**11.88**	
Benzo(a)anthracene	2 DJ		1.4 DJ	1.2 DJ		2.1 DJ		1.8 DJ		0.95 DJ		1.7 DJ		7.3 DJ		ND		*2.3*		**16.82**	
Benzo(a)pyrene	2.2 DJ		1.5 DJ	1.3 DJ		2.2 DJ		1.6 DJ		1.1 DJ		1.9 DJ		6.9 DJ		8.4 DJ		*3.0*		**19.28**	
Benzo(b)fluoranthene	3.3 DJ		2 DJ	2.1 DJ		2.9 DJ		2.2 DJ		1.3 DJ		2.5 DJ		8.2 DJ		12 DJ		*4.1*		**19.58**	
Benzo(ghi)perylene	1.7 DJ		1.3 DJ	1 DJ		ND		ND		0.78 DJ		1.4 DJ		5.1 DJ		7.6 DJ		*2.7*		**21.9**	
Benzo(k)fluoranthene	1 DJ		0.74 DJ	0.59 DJ		0.89 DJ		0.78 DJ		0.62 DJ		0.92 B		3.3 DJ		5 DJ		*1.5*		**19.6**	
Carbazole	ND		ND	ND		ND		ND		ND		0.26 DJ		1.5 DJ		ND		*0.88*		--	
Chrysene	2.2 DJ		1.4 DJ	1.5 DJ		1.8 DJ		1.7 DJ		0.99 DJ		1.9 DJ		6.7 DJ		8.4 DJ		*3.0*		**16.86**	
Dibenz(a,h)anthracene	ND		0.29 DJ	ND		ND		ND		ND		0.41 DJ		1.2 DJ		ND		*0.63*		**22.44**	
Dibenzofuran	ND		ND	ND		ND		ND		ND		0.24 DJ		1.2 DJ		ND		*0.72*		--	
Fluoranthene	4.4 DJ		2.5 DJ	2.2 DJ		3.6 DJ		2.9 DJ		1.6 DJ		3.3 DJ		16 DJ		16 DJ		*5.8*		**14.16**	
Fluorene	ND		ND	ND		ND		ND		ND		0.25 DJ		1.7 DJ		ND		*0.98*		**10.78**	
Indeno(1,2,3-cd)pyrene	1.3 DJ		1 DJ	ND		1.3 DJ		ND		0.64 DJ		1.2 DJ		4.7 DJ		ND		*1.7*		**22.3**	
Naphthalene	ND		ND	ND		ND		ND		ND		0.43 DJ		1.1 DJ		ND		*0.77*		**7.7**	
Phenanthrene	1.8 DJ		0.93 DJ	0.71 DJ		1.5 DJ		ND		0.66 DJ		1.8 DJ		12 DJ		5.8 DJ		*3.2*		**11.94**	
Pyrene	3.5 DJ		2.2 DJ	1.9 DJ		3 DJ		2.6 DJ		1.3 DJ		2.5 DJ		12 DJ		12 DJ		*4.6*		**13.96**	
Total SVOCs (mg/kg)	*23*		*16*	*13*		*19*		*14*		*10*		*22*		*93*		*84*		*33*			

TABLE 4-27

SUMMARY OF SOUTH RETURN WATER TRENCH SEDIMENT ANALYTICAL DATA

PARAMETER [1]	Sample Location & Date [2]																	Average Concentration [3] (mg/kg)	Sediment Guidance Values [4] (mg/kg)		
	SRWT-SED-1	SRWT-SED-2	SRWT-SED-3	SRWT-SED-4	SRWT-SED-5	SRWT-SED-6	SRWT-SED-7	SRWT-SED-8	SRWT-SED-9	SRWT-SED-10	SRWT-SED-11	SRWT-SED-12	SRWT-SED-13	SRWT-SED-14	SRWT-SED-15	SRWT-SED-16	SRWT-SED-17		Class A	Class B	Class C
	09/30/09	09/30/09	10/01/09	09/30/09	09/30/09	09/30/09	09/30/09	09/30/09	09/30/09	09/30/09	09/30/09	10/01/09	10/01/09	10/01/09	10/01/09	10/01/09	10/01/09				
Total PCBs (Method 8082) (mg/kg)																					
Aroclor 1248	0.086 J		0.042 J	0.034 J		0.04 J		ND		0.028 J		0.025 J		0.028 J		0.069		*0.044*	--	--	--
Aroclor 1254	ND		ND	ND		ND		ND		ND		ND		0.088 DJ		ND		*0.088*	--	--	--
Aroclor 1260	0.055		0.055	0.062 J		0.054 J		ND		0.044		0.045		ND		0.12		*0.062*	--	--	--
Total PCBs (mg/kg)	*0.14*		*0.097*	*0.096*		*0.094*		*ND*		*0.072*		*0.070*		*0.12*		*0.19*		*0.11*	**< 0.1**	**0.1 - 1**	**> 1**
RCRA Metals (Method 6010B/7471A) (mg/kg)																					
Arsenic, Total	27.7		43	36.8		33.5		24		24.8		50.3		59.6		17.8		*35*	**< 10**	**10 - 33**	**> 33**
Barium, Total	81.9		77.1	71.7		57.5		57.6		73.3		75.3		112		54.2		*73*	--	--	--
Cadmium, Total	1.37		1.91	2.57		1.72		1.88		3.18		1.85		2		2.21		*2.1*	**< 1**	**1 - 5**	**> 5**
Chromium, Total	36.2 B		174	49.1 B		38.6 B		30.4 B		49.7 B		44.5		40.8		40.9		*56*	**< 43**	**43 - 110**	**> 110**
Lead, Total	147		318	295		206		204		275		247		282		330		*256*	**< 36**	**36 - 130**	**> 130**
Mercury, Total	0.335		0.381	0.416		0.22		0.347		0.433		0.737		2.1		2.5 D		*0.83*	**< 0.2**	**0.2 - 1**	**> 1**
Silver, Total	ND		ND	ND		ND		ND		1.14		ND		ND		ND		*1.1*	**< 1**	**1 - 2.2**	**> 2.2**
Wet Chemistry (Method 9012A) (mg/kg)																					
Cyanide, Total	ND		ND	ND		ND		ND		1.9		ND		ND		ND		*1.9*	--	--	--
Total Organic Carbon (Method Lloyd Kahn) (mg/kg)																					
TOC	65,500		97,400	117,000		134,000		131,000		112,000		105,000		117,000		157,000		*115,100*	--	--	--

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect (ND).
2. Each sediment location was analyzed for VOC analysis; adjacent pairs SRWT-SED-1/2, -4/5, -6/7, -8/9, -10/11, -12/13, -14/15, and -16/17 were composited for SVOC, total metals, and TOC analysis. Sediment location SRWT-SED-3 was not composited, rather only a discrete sample was analyzed.
3. Average concentrations are based on the combined average of detected concentrations.
4. NYSDEC Division of Fish, Wildlife and Marine Resources, Bureau of Habitat. Screening and Assessment of Contaminated Sediment (Tables 5 and 7). June 24, 2014.

Definitions:

B = Analyte was detected in the associated Method Blank.
D = Compound was analyzed at the secondary dilution factor.
J = Estimated Value.

Color Code:

Class A	= Sediments considered to be of low risk to aquatic life.
Class B	= Sediments considered slightly to moderately contaminated; additional testing is required to evaluate the potential risks to aquatic life.
Class C	= Sediments considered to be highly contaminated and likely pose a risk to aquatic life; additional testing is required to evaluate the potential risks to aquatic life.

TABLE 4-28

SUMMARY OF USEPA SRWT SEDIMENT ANALYTICAL DATA (NOVEMBER 7, 2011)

PARAMETER [1]	Sample Location & Date								Average Concentration [2] (mg/kg)	Sediment Guidance Values [3] (mg/kg)		
	SC11-RT-028-006 (0-6 inches)	SC11-RT-028-024 (6-24 inches)	SC11-RT-028-039 (24-39 inches)	SC11-RT-029-006 (0-6 inches)	SC11-RT-029-006-DP (0-6 inches)	SC11-RT-029-025 (6-25 inches)	SC11-RT-030-006 (0-6 inches)	SC11-RT-030-029 (6-29 inches)		Class A	Class B	Class C
	11/07/11											
TCL SVOCs (Method 8270C) (mg/kg)												
1,1'-Biphenyl	ND	ND	1.1 J	ND	ND	ND	ND	ND	*1.1*		--	
2-Methylnaphthalene	0.079	ND	4.5	0.14	0.017	0.043	0.014	0.019	*0.69*		--	
4-Chloroaniline	0.26 J	ND	ND	ND	ND	ND	ND	ND	*0.26*		--	
4-Methylphenol	0.09 J	0.11 J	0.89	0.17 J	0.073 J	0.095 J	ND	0.094 J	*0.22*		--	
Acenaphthene	0.16	0.13	2.7	0.26	0.021	0.033	0.014	0.034	*0.42*		**9.82**	
Acenaphthylene	0.04	0.039	0.46	0.49	0.034	0.15	0.093	0.055	*0.17*		**9.04**	
Acetophenone	0.11 J	0.14 J	0.39	0.33 J	ND	ND	ND	ND	*0.24*		--	
Anthracene	0.25	0.3	7.8	3.5	0.091	0.3	0.092	0.13	*1.6*		**11.88**	
Benzo(a)anthracene	0.52 J	0.36	9	13	0.38	0.65 J	0.38	0.35	*3.1*		**16.82**	
Benzo(a)pyrene	0.049	0.041	0.34 J	1.2 J	0.067	0.062	0.044	0.044	*0.23*		**19.28**	
Benzo(b)fluoranthene	0.51 J	0.28	4.2 J	10	0.45	0.46 J	0.3	0.28	*2.1*		**19.58**	
Benzo(ghi)perylene	ND	ND	ND	ND	0.0091	ND	ND	ND	*0.009*		**21.9**	
Benzo(k)fluoranthene	0.31 J	0.12 J	2.7 J	7.8	0.21 J	0.32 J	0.22 J	0.21 J	*1.5*		**19.6**	
Bis(2-ethylhexyl)phthalate	0.23 J	0.94 J	1.9 J	1	0.11 J	0.2 J	0.12 J	0.096 J	*0.57*	**<360**	**>360**	
Carbazole	ND	ND	0.42	0.19 J	ND	ND	ND	ND	*0.31*		--	
Chrysene	0.48 J	0.32	6	11	0.4	0.53 J	0.32	0.31	*2.4*		**16.86**	
Dibenz(a,h)anthracene	0.1	0.041	1 J	1.7 J	0.061	0.092	0.059	0.055	*0.39*		**22.44**	
Dibenzofuran	0.14 J	0.15 J	5.6	0.28 J	ND	0.076 J	ND	ND	*1.2*		--	
Di-n-butylphthalate	0.056 J	0.54 J	0.26 J	0.19 J	ND	ND	ND	ND	*0.26*		--	
Fluoranthene	1.1 J	0.71 J	17	24	0.56 J	1.3 J	0.57 J	0.65 J	*5.7*		**14.16**	
Fluorene	0.34	0.3	8.9	0.35	0.033	0.17	0.025	0.06	*1.3*		**10.78**	
Indeno(1,2,3-cd)pyrene	0.063	0.025	0.41 J	1.2 J	0.067	0.053	0.035	0.032	*0.24*		**22.3**	
Naphthalene	0.1	0.1	2.5	0.33	0.056	0.14	0.042	0.049	*0.41*		**7.7**	
Phenanthrene	0.69	0.64	29	8.3	0.3	0.58	0.24	0.4	*5.0*		**11.94**	
Phenol	ND	ND	0.16 J	0.28 J	ND	0.069 J	ND	ND	*0.17*		--	
Pyrene	0.27	0.16	1.6 J	4.8 J	0.28	0.33	0.14	0.16	*1.0*		**13.96**	
Total PAH-17 [4] (mg/kg)	5.06	*3.6*	*98*	*88*	*3.0*	*5.2*	*2.6*	*2.8*	*26*	**<4**	**4 - 35**	**>35**
Total SVOCs (mg/kg)	*6*	*5*	*109*	*91*	*3*	*6*	*3*	*3*	*28*	**--**	**--**	**--**
EPA-34 Polycyclic Aromatic Hydrocarbons (PAHs) (mg/kg)												
1-Methylnaphthalene	ND	--	--	0.013	0.012	--	0.0081	--	*0.011*		**--**	
2-Methylnaphthalene	ND	--	--	0.016	0.017	--	0.013	--	*0.015*		**--**	
Acenaphthene	ND	--	--	0.042	0.03	--	0.01	--	*0.027*		***9.82***	
Acenaphthylene	0.033	--	--	0.041	0.036	--	0.076	--	*0.047*		***9.04***	
Anthracene	ND	--	--	ND	ND	--	0.11	--	*0.11*		***11.88***	
Benzo(a)anthracene	0.48	--	--	0.48	0.3	--	0.31	--	*0.39*		***16.82***	
Benzo(a)pyrene	0.46	--	--	0.45	0.25	--	0.14	--	*0.33*		***19.28***	
Benzo(b)fluoranthene	0.67	--	--	0.67	0.38	--	0.37	--	*0.52*		***19.58***	

TURNKEY ENVIRONMENTAL RESTORATION, LLC — BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 4-28

SUMMARY OF USEPA SRWT SEDIMENT ANALYTICAL DATA (NOVEMBER 7, 2011)

PARAMETER [1]	Sample Location & Date								Average Concentration [2] (mg/kg)	Sediment Guidance Values [3] (mg/kg)		
	SC11-RT-028-006 (0-6 inches)	SC11-RT-028-024 (6-24 inches)	SC11-RT-028-039 (24-39 inches)	SC11-RT-029-006 (0-6 inches)	SC11-RT-029-006-DP (0-6 inches)	SC11-RT-029-025 (6-25 inches)	SC11-RT-030-006 (0-6 inches)	SC11-RT-030-029 (6-29 inches)				
	11/07/11									Class A	Class B	Class C
Benzo(e)pyrene	ND	--	--	ND	0.14 J	--	0.071	--	*0.11*		***19.34***	
Benzo(g,h,i)perylene	ND	--	--	ND	0.037	--	0.0097	--	*0.023*		***21.9***	
Benzo(k)fluoranthene	ND	--	--	ND	0.13 J	--	0.13	--	*0.13*		***19.6***	
C1-Chrysenes	0.19 J	--	--	0.23 J	0.14 J	--	0.13 J	--	*0.17*		***18.6***	
C1-Fluoranthenes/Pyrenes	0.57 J	--	--	0.49 J	0.29 J	--	0.24 J	--	*0.40*		***15.38***	
C1-Fluorenes	0.099 J	--	--	0.048 J	0.031 J	--	0.023 J	--	*0.050*		***12.22***	
C1-Naphthalenes	0.11 J	--	--	0.019 J	0.019 J	--	0.014 J	--	*0.041*		***8.9***	
C1-Phenanthrenes/Anthracenes	0.52 J	--	--	0.22 J	0.15 J	--	0.13 J	--	*0.26*		***13.4***	
C2-Chrysenes	0.11 J	--	--	0.082 J	0.042 J	--	0.042 J	--	*0.069*		***20.18***	
C2-Fluoranthenes/Pyrenes	0.33 J	--	--	0.34 J	0.14 J	--	0.1 J	--	*0.23*		***--***	
C2-Fluorenes	0.15 J	--	--	0.016 J	0.011 J	--	0.021 J	--	*0.050*		***13.74***	
C2-Naphthalenes	0.16 J	--	--	0.026 J	0.027 J	--	0.015 J	--	*0.057*		***10.2***	
C2-Phenanthrenes/Anthracenes	0.5 J	--	--	0.11 J	0.066 J	--	0.048 J	--	*0.18*		***14.9***	
C3-Chrysenes	0.091 J	--	--	0.047 J	0.024 J	--	0.035 J	--	*0.049*		***22.24***	
C3-Fluoranthenes/Pyrenes	0.17 J	--	--	0.12 J	0.035 J	--	0.027 J	--	*0.088*		***--***	
C3-Fluorenes	0.18 J	--	--	0.06 J	0.034 J	--	0.022 J	--	*0.074*		***15.36***	
C3-Naphthalenes	0.25 J	--	--	0.023 J	0.024 J	--	0.012 J	--	*0.077*		***11.62***	
C3-Phenanthrenes/Anthracenes	0.33 J	--	--	0.061 J	0.048 J	--	0.021 J	--	*0.12*		***16.6***	
C4-Chrysenes	0.034 J	--	--	0.02 J	0.014 J	--	ND	--	*0.023*		***24.26***	
C4-Naphthalenes	0.21 J	--	--	0.016 J	0.017 J	--	0.0077 J	--	*0.063*		***13.14***	
C4-Phenanthrenes/Anthracenes	0.18 J	--	--	0.059 J	0.018 J	--	0.019 J	--	*0.069*		***18.28***	
Chrysene	0.52	--	--	0.59	0.31	--	0.3	--	*0.43*		***16.86***	
Dibenz(a,h)anthracene	ND	--	--	ND	0.07	--	0.069	--	*0.070*		***22.44***	
Fluoranthene	1.3	--	--	1.2	0.65	--	0.66	--	*0.95*		***14.16***	
Fluorene	ND	--	--	0.061	0.041	--	0.03	--	*0.044*		***10.78***	
Indeno(1,2,3-cd)pyrene	0.3	--	--	ND	0.16	--	0.11	--	*0.19*		***22.3***	
Naphthalene	ND	--	--	0.049	0.05	--	0.045	--	*0.048*		***7.7***	
Perylene	ND	--	--	ND	0.05	--	0.02	--	*0.034*		***19.34***	
Phenanthrene	0.90	--	--	0.64	0.33	--	0.27	--	*0.54*		***11.94***	
Pyrene	0.85	--	--	0.97	0.54	--	0.43	--	*0.70*		***13.96***	
Total PAH-34 [4] (mg/kg)	*10*	--	--	*7.9*	*4.5*	--	*3.9*	--	*6.7*	***<4***	**4 - 45**	***>45***

TABLE 4-28

SUMMARY OF USEPA SRWT SEDIMENT ANALYTICAL DATA (NOVEMBER 7, 2011)

PARAMETER [1]	Sample Location & Date								Average Concentration [2] (mg/kg)	Sediment Guidance Values [3] (mg/kg)		
	SC11-RT-028-006 (0-6 inches)	SC11-RT-028-024 (6-24 inches)	SC11-RT-028-039 (24-39 inches)	SC11-RT-029-006 (0-6 inches)	SC11-RT-029-006-DP (0-6 inches)	SC11-RT-029-025 (6-25 inches)	SC11-RT-030-006 (0-6 inches)	SC11-RT-030-029 (6-29 inches)				
	11/07/11									Class A	Class B	Class C
Total PCBs (Method 8082) (mg/kg)												
Aroclor 1248	ND	ND	0.074 N J	ND	ND	ND	ND	ND	0.074	--	--	--
Aroclor 1254	ND	ND	0.1	ND	ND	0.054 J	ND	ND	0.077	--	--	--
Total PCBs (mg/kg) (sum of detects)	*0*	*0*	*0.17*	*0*	*0*	*0.054*	*0*	*0*	*0.029*	**< 0.1**	**0.1 - 1**	**> 1**
RCRA Metals (Method 6010B/7471A) (mg/kg)												
Aluminum, Total	3560 J	4980 J	4300 J	5750 J	7040 J	4470 J	6840 J	7560 J	*5,563*	--	--	--
Antimony, Total	0.7 J	0.64 J	2.8 J	2.3 J	2 J	3 J	2.4 J	2 J	*2.0*	--	--	--
Arsenic, Total	9.2 J	9.8 J	15.1 J	28.9 J	26.1 J	32.4 J	34.3 J	24.8 J	*23*	**< 10**	**10 - 33**	**> 33**
Barium, Total	67.3	80.9	62.9	69.1	74.5	87.4	74.3	81.8	*75*	--	--	--
Beryllium, Total	0.66 J	0.71 J	1.7	1.3	1.4	1.6	1.5	1.7	*1.3*	--	--	--
Cadmium, Total	0.88	1.3	1.8	1.2	1	3.6	1.5	1.3	*1.6*	**< 1**	**1 - 5**	**> 5**
Calcium, Total	82400 J	51000 J	99200 J	57300 J	60700 J	142000 J	111000 J	123000 J	*90,825*	--	--	--
Chromium, Total	23 J	22.4 J	48.1 J	45.5 J	29.9 J	57.7 J	46.5 J	212 J	*61*	**< 43**	**43 - 110**	**> 110**
Cobalt, Total	3.2 J	4.3 J	3.5 J	5.1 J	4.3 J	4.3 J	4.2 J	3.5 J	*4.1*	--	--	--
Copper, Total	29.5 J	39 J	44.7 J	50.8 J	38.9 J	53.6 J	57.9 J	48.9 J	*45*	**<32**	**32-150**	**>150**
Iron, Total	26500 J	22300 J	84800 J	53100 J	39000 J	88900 J	45900 J	61900 J	*52,800*	--	--	--
Lead, Total	204 J	194 J	275 J	189 J	159 J	458 J	205 J	184 J	*234*	**< 36**	**36 - 130**	**> 130**
Magnesium, Total	2920	3270	4770	4200	4320	5970	6010	14100	*5,695*	--	--	--
Manganese, Total	820 J	607 J	1500 J	3580 J	3170 J	3360 J	2240 J	7950 J	*2,903*	--	--	--
Mercury, Total	0.56	0.62	0.4	0.36	0.34	0.47	ND	0.5	*0.46*	**< 0.2**	**0.2 - 1**	**> 1**
Nickel, Total	13.7 J	16.7 J	22.9 J	20.5 J	16.4 J	24 J	17.4 J	15.2 J	*18*	**<23**	**23-49**	**>49**
Potassium, Total	346 J	483 J	351 J	528 J	532 J	379 J	718 J	652 J	*499*	--	--	--
Selenium, Total	3.2 J	7.1	ND	3.1 J	2.7 J	ND	2.8 J	1.7 J	*3.4*	--	--	--
Silver, Total	0.99 J	2.1	ND	0.33 J	0.45 J	0.6 J	0.44 J	0.38 J	*0.76*	**< 1**	**1 - 2.2**	**> 2.2**
Sodium, Total	234 J	257 J	310 J	414 J	407 J	434 J	660 J	554 J	*409*	--	--	--
Vanadium, Total	11	11.5	18	29.4	22.5	32	28.5	117	*34*	--	--	--
Zinc, Total	892	828	2,390	934	823	3,410	1,020	872	*1,396*	**<120**	**120-460**	**>460**
DRO/ORO (mg/kg)												
DRO	290	1,300	620	110	95	130	39 J	89	*334*	--	--	--
ORO	500	1,300	940	280	240	290	85	220	*482*	--	--	--
Total Organic Carbon (Method Lloyd Kahn) (mg/kg)												
TOC	54,300	50,800	65,600	53,700	52,100	75,400	62,100	46,100	*57,513*	--	--	--

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect (ND).
2. Average concentrations are based on the combined average of detected concentrations.
3. NYSDEC Division of Fish, Wildlife and Marine Resources, Bureau of Habitat. Screening and Assessment of Contaminated Sediment (Tables 5 and 7). June 24, 2014.
4. Calculated by adding detections + 1/2 of MDL for NDs).

TABLE 4-28

SUMMARY OF USEPA SRWT SEDIMENT ANALYTICAL DATA (NOVEMBER 7, 2011)

PARAMETER [1]	Sample Location & Date								Average Concentration [2] (mg/kg)	Sediment Guidance Values [3] (mg/kg)		
	SC11-RT-028-006 (0-6 inches)	SC11-RT-028-024 (6-24 inches)	SC11-RT-028-039 (24-39 inches)	SC11-RT-029-006 (0-6 inches)	SC11-RT-029-006-DP (0-6 inches)	SC11-RT-029-025 (6-25 inches)	SC11-RT-030-006 (0-6 inches)	SC11-RT-030-029 (6-29 inches)				
	11/07/11									Class A	Class B	Class C

Definitions:

ND = Not Detected
"--" - Not applicable
mg/kg = milligram per kilogram
J = Estimated Value.
N = Indicates presumptive evidence of a compound
DRO = Diesel Range Organic
ORO = Oil Range Organic
PAH 34 - Polycyclic aromatic hydrocarbons, extended list 34
PCB - Polychlorinated biphenyl
SVOC - Semivolatile organic compound
TAL - Target Analyte List
TOC - Total organic carbon
Total PAHs calculated as sum of detections plus one-half the detection limit for nondetected results
Total PCBs calculated as the sum of detections

Color Code:

Class A	= Sediments considered to be of low risk to aquatic life
Class B	= Sediments considered slightly to moderately contaminated; additional testing is required to evaluate the potential risks to aquatic life.
Class C	= Sediments considered to be highly contaminated and likely pose a risk to aquatic life; additional testing is required to evaluate the potential risks to aquatic life.

TABLE 4-29

CMS MONITORING WELL SAMPLING SUMMARY

Monitoring Location [1]	Hydrogeologic Unit	LTGWM Network Monitoring Location	LTGWM DTW (only)	Analytical Parameters and Method [2,3]										
				TCL VOCs (8260)	STARS VOCs (8021 or 8260)	SVOCs (BN) (8270)	Total Phenols via TCL SVOCs (AE) (8270)	Arsenic (6010 or 6020) [4]	Barium (6010 or 6020)	Cadmium (6010 or 6020)	Chromium (6010 or 6020)	Lead (6010 or 6020)	Selenium (6010 or 6020)	Cyanide (9010/9012)
Discharge Sub-Area 2A (18 wells)														
MW-2D2	Slag/Fill	x		May-2010	Apr-2018	Apr-2018	Aug-2013	Mar-2012	Mar-2012	May-2009	Mar-2012	Mar-2012	Mar-2012	May-2009
MW-2D2B	Sand/Dredge Spoils	x		Jan-2019		Jan-2019	Jan-2019	Mar-2012	Mar-2012	Nov-1999	Mar-2012	Mar-2012	Mar-2012	Nov-1999
MW-2D2D	Bedrock Well		x	Jan-2019		Jan-2019	Jan-2019	Mar-2012	Jan-2019	Nov-1999	Mar-2012	Mar-2012	Mar-2012	Nov-1999
MW-2D3	Slag/Fill	x		May-2010	Apr-2018	Apr-2018	May-2011	Mar-2012	Mar-2012	May-2009	Mar-2012	Mar-2012	Mar-2012	May-2009
MW-2D4	Slag/Fill	x		May-2010	Apr-2018	Apr-2018	May-2011	Mar-2012	Mar-2012	May-2009	Mar-2012	Mar-2012	Mar-2012	May-2009
MW-2U1B	Slag/Fill; Sand/Dredge Spoils		x	Apr-2013		Apr-2013	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWS-09	Slag/Fill	x		Mar-2012		Mar-2012	Nov-1999	Mar-2012	Mar-2012	Nov-1999	Mar-2012	Mar-2012	Mar-2012	Nov-1999
MWS-11A	Slag/Fill		x	May-2013	Apr-2018	Apr-2018	Aug-2013	May-2013	May-2013	Nov-1999	May-2013	May-2013	May-2013	Nov-1999
MWS-12A	Slag/Fill		x	Apr-2013		Apr-2013	Aug-2013	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWS-12B	Slag/Fill; Sand		x	Apr-2013		Apr-2013	Aug-2013	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWS-13	Slag/Fill		x	Apr-2013		Apr-2013	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWS-14	Slag/Fill; Sand		x	Apr-2013		Apr-2013	Aug-2013	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWS-14B	Slag/Fill; Sand		x	Apr-2013		Apr-2013	Aug-2013	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWS-15	Slag/Fill		x	Apr-2013		Apr-2013	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWS-25A	Slag/Fill		x	Apr-2013		Apr-2013	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWS-25B	Slag/Fill; Sand; Clay		x	Apr-2013		Apr-2013	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWS-26A	Slag/Fill; Sand/Dredge Spoils	x		Jan-2019		Jan-2019	Jan-2019	Mar-2012	Mar-2012	Nov-1999	Mar-2012	Mar-2012	Mar-2012	Nov-1999
MWS-29A	Slag/Fill		x	Apr-2013		Apr-2013	Dec-2000	Apr-2013	Apr-2013	Dec-2000	Apr-2013	Apr-2013	Apr-2013	Dec-2000
Discharge Sub-Area 2B (16 wells)														
MWS-01	Slag/Fill	x		Jan-2019		Jan-2019	Jan-2019	Mar-2012	Mar-2012	Nov-1999	Mar-2012	Mar-2012	Nov-1999	Nov-1999
MWS-01B	Slag/Fill; Sand/Dredge Spoils	x		Jan-2019		Jan-2019	Jan-2019	Mar-2012	Jan-2019	Nov-1999	Mar-2012	Mar-2012	Nov-1999	Nov-1999
MWS-02	Slag/Fill	x		Apr-2018		Apr-2018	Apr-2018	Apr-2018	Apr-2018	Nov-1999	Apr-2018	Apr-2018	Nov-1999	Apr-2018
MWS-03	Slag/Fill	x		Mar-2012		Mar-2012	Nov-1999	Mar-2012	Mar-2012	Nov-1999	Mar-2012	Mar-2012	Nov-1999	Nov-1999
MWS-10	Slag/Fill		x	Apr-2013		Apr-2013	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWS-10B	Slag/Fill; Clay; Sand/Dredge Spoils		x	Apr-2013		Apr-2013	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWS-18A	Slag/Fill	x		Apr-2018		Apr-2018	Apr-2018	Apr-2018	Apr-2018	Nov-1999	Apr-2018	Apr-2018	Nov-1999	Apr-2018
MWS-18C	Slag/Fill; Clay; Sand	x		Apr-2018		Apr-2018	Apr-2018	Apr-2018	Apr-2018	Nov-1999	Apr-2018	Apr-2018	Nov-1999	Apr-2018
MWS-19A	Slag/Fill	x		Apr-2018		Apr-2018	Apr-2018	Apr-2018	Apr-2018	Nov-1999	Apr-2018	Apr-2018	Nov-1999	Apr-2018
MWS-19B	Slag/Fill; Sand	x		Apr-2018		Apr-2018	Apr-2018	Apr-2018	Apr-2018	Nov-1999	Apr-2018	Apr-2018	Nov-1999	Apr-2018

TABLE 4-29

CMS MONITORING WELL SAMPLING SUMMARY

Monitoring Location [1]	Hydrogeologic Unit	LTGWM Network Monitoring Location	LTGWM DTW (only)	Analytical Parameters and Method [2,3]										
				TCL VOCs (8260)	STARS VOCs (8021 or 8260)	SVOCs (BN) (8270)	Total Phenols via TCL SVOCs (AE) (8270)	Arsenic (6010 or 6020) [4]	Barium (6010 or 6020)	Cadmium (6010 or 6020)	Chromium (6010 or 6020)	Lead (6010 or 6020)	Selenium (6010 or 6020)	Cyanide (9010/9012)
MWS-20A	Slag/Fill; Sand	x		Apr-2018		Apr-2018	Apr-2018	Apr-2018	Apr-2018	Nov-1999	Apr-2018	Apr-2018	Nov-1999	Apr-2018
MWS-20B	Sand; Clay	x		Apr-2018		Apr-2018	Apr-2018	Apr-2018	Apr-2018	Nov-1999	Apr-2018	Apr-2018	Nov-1999	Apr-2018
MWS-21A	Slag/Fill		x	Apr-2013		Apr-2013	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWS-21B	Slag/Fill; Clay		x	Apr-2013		Apr-2013	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWS-23A	Slag/Fill		x	Apr-2013		Apr-2013	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWS-23B	Sand		x	Apr-2013		Apr-2013	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
Discharge Sub-Area 3A (17 wells, 1 decommissioned)														
MWN-01	Slag/Fill	x		Jan-2019		Jan-2019	Jan-2019	Mar-2012	Nov-1999	Nov-1999	Mar-2012	Mar-2012	Mar-2012	Nov-1999
MWN-01B	Slag/Fill; Sand/Dredge Spoils	x		Jan-2019		Jan-2019	Jan-2019	Mar-2012	Nov-1999	Nov-1999	Mar-2012	Mar-2012	Mar-2012	Mar-2012
MWN-11	Slag/Fill	x		Oct-2010		Oct-2010	Nov-1999	Mar-2012	Nov-1999	Nov-1999	Mar-2012	Mar-2012	Mar-2012	Nov-1999
MWN-17A	Slag/Fill	x		Oct-2010		Oct-2010	Aug-2013	Mar-2012	Nov-1999	Nov-1999	Mar-2012	Mar-2012	Mar-2012	Nov-1999
MWN-17B	Slag/Fill; Sand	x		Oct-2010		Oct-2010	Aug-2013	Mar-2012	Nov-1999	Nov-1999	Mar-2012	Mar-2012	Mar-2012	Nov-1999
MWN-23B	Sand/Dredge Spoils	x		Jan-2019	Mar-2012	Jan-2019	Jan-2019	Mar-2012	Nov-1999	Nov-1999	Mar-2012	Mar-2012	Mar-2012	Nov-1999
MWN-24A	Slag/Fill; Clayey Silt; Sand	x		Jan-2019	Mar-2012	Jan-2019	Jan-2019	Mar-2012	Nov-1999	Nov-1999	Mar-2012	Mar-2012	Mar-2012	Nov-1999
MWN-24B	Till		x	Jan-2019	Mar-2012	Jan-2019	Jan-2019	Mar-2012	Nov-1999	Nov-1999	Mar-2012	Mar-2012	Mar-2012	Nov-1999
MWN-44A [5]	Slag/Fill			Dec-2000	Mar-2012	Mar-2012	Dec-2000	Mar-2012	Dec-2000	Dec-2000	Mar-2012	Mar-2012	Mar-2012	Mar-2012
MWN-80A	Slag/Fill; Sand		x	Oct-2010		Oct-2010								
MWN-81A	Slag/Fill		x	Oct-2010		Oct-2010								
MWN-82A	Slag/Fill; Sand		x	Oct-2010		Oct-2010								
MWN-83A	Slag/Fill		x	Oct-2010		Oct-2010								
MWN-84A	Slag/Fill		x	Oct-2010		Oct-2010								
MWN-85A	Slag/Fill		x	Oct-2010		Oct-2010								
MWN-94A	Slag/Fill	x		Jan-2019		Jan-2019	Jan-2019	May-2013			May-2013	May-2013	May-2013	
MWN-94B	Sand	x		May-2013		May-2013		May-2013			May-2013	May-2013	May-2013	
Discharge Sub-Area 4A (64 wells)														
MW-1D1	Slag/Fill	x		Apr-2018		Apr-2018	Jun-2012	May-2009	May-2009	May-2009	May-2009	May-2009	May-2009	May-2009
MW-1D2	Slag/Fill	x		May-2010	Apr-2018	Apr-2018	Jun-2012	May-2009	May-2009	May-2009	May-2009	May-2009	May-2009	Jun-2009
MW-1D3	Slag/Fill	x		May-2010	Apr-2018	Apr-2018	Jun-2012	May-2009	May-2009	May-2009	May-2009	May-2009	May-2009	Jun-2009
MW-1D4	Slag/Fill	x		May-2010	Apr-2018	Apr-2018	Jun-2012	May-2009	May-2009	May-2009	May-2009	May-2009	May-2009	Jun-2009
MW-1D5	Slag/Fill		x	Jan-2019		Jan-2019	Jan-2019	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999
MW-1D6	Slag/Fill	x		Apr-2018		Apr-2018	Jun-2012	May-2009	May-2009	May-2009	May-2009	May-2009	May-2009	May-2009
MW-1D7	Slag/Fill	x		Apr-2018		Apr-2018	Jun-2012	May-2009	May-2009	May-2009	May-2009	May-2009	May-2009	May-2009

TurnKey Environmental Restoration, LLC

Benchmark Environmental Engineering & Science, PLLC

TABLE 4-29

CMS MONITORING WELL SAMPLING SUMMARY

Monitoring Location [1]	Hydrogeologic Unit	LTGWM Network Monitoring Location	LTGWM DTW (only)	Analytical Parameters and Method [2,3]										
				TCL VOCs (8260)	STARS VOCs (8021 or 8260)	SVOCs (BN) (8270)	Total Phenols via TCL SVOCs (AE) (8270)	Arsenic (6010 or 6020) [4]	Barium (6010 or 6020)	Cadmium (6010 or 6020)	Chromium (6010 or 6020)	Lead (6010 or 6020)	Selenium (6010 or 6020)	Cyanide (9010/9012)
MW-1D8	Slag/Fill	x		Apr-2018		Apr-2018	Jun-2012	May-2009	May-2009	May-2009	May-2009	May-2009	May-2009	May-2009
MW-1U1	Slag/Fill; Sand/Dredge Spoils	x		Apr-2018		Apr-2018	Jun-2012	May-2009	May-2009	May-2009	May-2009	May-2009	May-2009	May-2009
MWN-02	Slag/Fill	x		Nov-1999	Jul-2011	Jul-2011	Aug-2013	Mar-2012	Mar-2012	Nov-1999	Mar-2012	Nov-1999	Mar-2012	Nov-1999
MWN-02B	Sand/Dredge Spoils	x		Nov-1999	Jul-2011	Jul-2011	Aug-2013	Jul-2011	Mar-2012	Nov-1999	Mar-2012	Nov-1999	Mar-2012	Nov-1999
MWN-02D	Bedrock			Mar-2012		Mar-2012	Nov-1999	Jul-2011	Jul-2011	Nov-1999	Jul-2011	Nov-1999	Mar-2012	Nov-1999
MWN-03	Slag/Fill	x		Nov-1999	Jul-2011	Jul-2011	Aug-2013	Mar-2012	Mar-2012	Nov-1999	Mar-2012	Nov-1999	Mar-2012	Nov-1999
MWN-03B	Sand/Dredge Spoils; Clay; Peat	x		Mar-2012		Mar-2012	Aug-2013	Jul-2011	Jul-2011	Nov-1999	Jul-2011	Nov-1999	Mar-2012	Nov-1999
MWN-03D	Bedrock			Nov-1999	Jul-2011	Jul-2011	Nov-1999	Mar-2012	Mar-2012	Nov-1999	Mar-2012	Nov-1999	Mar-2012	Nov-1999
MWN-04	Slag/Fill	x		Nov-1999	Jul-2011	Jul-2011	Aug-2013	Mar-2012	Mar-2012	Nov-1999	Mar-2012	Nov-1999	Mar-2012	Nov-1999
MWN-05A	Slag/Fill	x		Jan-2019		Jan-2019	Jan-2019	Mar-2012	Jan-2019	Nov-1999	Mar-2012	Mar-2012	Mar-2012	Nov-1999
MWN-05B	Sand/Dredge Spoils	x		Jan-2019		Jan-2019	Jan-2019	Mar-2012	Jan-2019	Mar-2012	Mar-2012	Mar-2012	Mar-2012	Nov-1999
MWN-05D	Bedrock		x	Mar-2012		Mar-2012	Nov-1999	Mar-2012	Mar-2012	Nov-1999	Mar-2012	Nov-1999	Mar-2012	Nov-1999
MWN-06A	Slag/Fill	x		Nov-1999	May-2013	May-2013	Aug-2013	Nov-1999	Nov-1999	Nov-1999	May-2013	Nov-1999	Nov-1999	Nov-1999
MWN-12	Slag/Fill	x		Apr-2018		Apr-2018	Jun-2012	May-2009	May-2009	May-2009	May-2009	May-2009	May-2009	May-2009
MWN-14A	Slag/Fill		x	Nov-1999		Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999
MWN-14B	Slag/Fill; Sand/Dredge Spoils		x	Nov-1999		Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999
MWN-15A	Slag/Fill	x		Nov-1999	Apr-2013	Apr-2013	Aug-2013	Nov-1999	Nov-1999	Nov-1999	Apr-2013	Nov-1999	Nov-1999	Nov-1999
MWN-15B	Slag/Fill; Sand; Peat	x		Nov-1999	Apr-2013	Apr-2013	Aug-2013	Nov-1999	Nov-1999	Nov-1999	Apr-2013	Nov-1999	Nov-1999	Nov-1999
MWN-15D	Bedrock		x	Mar-2012		Mar-2012	Aug-2013	Mar-2012	Mar-2012	Nov-1999	Mar-2012	Nov-1999	Mar-2012	Nov-1999
MWN-16A	Slag/Fill		x	Nov-1999	Apr-2013	Apr-2013	Aug-2013	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWN-16B	Slag/Fill		x	Nov-1999	Apr-2013	Apr-2013	Aug-2013	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWN-19A [6]	Slag/Fill; Sand; Peat		x	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999
MWN-19B [6]	Peat		x	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999
MWN-20A	Slag/Fill		x	Nov-1999	Apr-2013	Apr-2013	Aug-2013	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWN-20B	Slag/Fill; Sand		x	Nov-1999	Apr-2013	Apr-2013	Aug-2013	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWN-21AR	Slag/Fill		x	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWN-21B	Clayey Silt		x	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWN-21C	Slag/Fill; Sand; Peat		x	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWN-22B	Sand/Dredge Spoils		x	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWN-25A	Slag/Fill; Sand		x	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWN-25B	Slag/Fill; Sand		x	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWN-25D	Bedrock		x	Mar-2012		Mar-2012	Nov-1999	Mar-2012	Mar-2012	Nov-1999	Mar-2012	Nov-1999	Mar-2012	Nov-1999

TABLE 4-29

CMS MONITORING WELL SAMPLING SUMMARY

Monitoring Location [1]	Hydrogeologic Unit	LTGWM Network Monitoring Location	LTGWM DTW (only)	Analytical Parameters and Method [2,3]										
				TCL VOCs (8260)	STARS VOCs (8021 or 8260)	SVOCs (BN) (8270)	Total Phenols via TCL SVOCs (AE) (8270)	Arsenic (6010 or 6020) [4]	Barium (6010 or 6020)	Cadmium (6010 or 6020)	Chromium (6010 or 6020)	Lead (6010 or 6020)	Selenium (6010 or 6020)	Cyanide (9010/9012)
MWN-32A	Sand; Peat	x		Nov-1999	Apr-2013	Apr-2013	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999
MWN-35A	Slag/Fill		x	Dec-2000	Apr-2013	Apr-2013	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Apr-2013	Dec-2000
MWN-37A	Slag/Fill		x	Oct-2010		Oct-2010	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000
MWN-38A	Slag/Fill		x	Oct-2010		Oct-2010	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000
MWN-39A	Slag/Fill		x	Oct-2010		Oct-2010	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000
MWN-40A	Slag/Fill		x	Oct-2010		Oct-2010	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000
MWN-41A	Slag/Fill		x	Dec-2000	Apr-2013	Apr-2013	Aug-2013	Dec-2000	Dec-2000	Dec-2000	Apr-2013	Dec-2000	Apr-2013	Dec-2000
MWN-42A	Slag/Fill		x	Dec-2000		Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000
MWN-51AR	Slag/Fill	x		Dec-2000	Apr-2013	Apr-2013	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000
MWN-51BR	Peat		x	Dec-2000	Apr-2013	Apr-2013	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000
MWN-73A	Peat		x	Jan-2019		Jan-2019	Jan-2019							
MWN-75A	Peat		x	Jan-2019		Jan-2019	Jan-2019							
MWN-76AR	Slag/Fill; Peat		x	Jan-2019		Jan-2019	Jan-2019							
MWN-77A	Slag/Fill		x	Jan-2019		Jan-2019	Jan-2019							
MWN-78A	Slag/Fill; Sand		x	Jan-2019		Jan-2019	Jan-2019							
MWN-79A	Slag/Fill		x	Jan-2019		Jan-2019	Jan-2019							
MWN-86A	Slag/Fill		x	Oct-2010		Oct-2010								
MWN-87A	Slag/Fill		x	Oct-2010		Oct-2010								
MWN-88A	Slag/Fill		x	Oct-2010		Oct-2010								
MWN-89A	Slag/Fill		x	Oct-2010		Oct-2010								
MWN-90A	Slag/Fill		x	Oct-2010		Oct-2010								
MWN-91A	Slag/Fill		x	Oct-2010		Oct-2010								
WT1-07	Slag/Fill; Sand/Dredge Spoils		x	Jan-2019		Jan-2019	Jan-2019	Mar-2012	Mar-2012		Mar-2012		Mar-2012	
WT8-01	Slag/Fill; Sand/Dredge Spoils		x	Jan-2019		Jan-2019	Jan-2019	Apr-2013						
WT8-02	Slag/Fill; Sand/Dredge Spoils		x	Jan-2019		Jan-2019	Jan-2019	Apr-2013						
Discharge Sub-Area 4B (2 wells)														
MWN-18A	Slag/Fill	x		Jan-2019	Mar-2012	Jan-2019	Jan-2019	Nov-1999	Jan-2019	Nov-1999	Mar-2012	Nov-1999	Nov-1999	Nov-1999
MWN-43A	Slag/Fill	x		Jan-2019	Feb-2012	Jan-2019	Jan-2019	Dec-2000	Jan-2019	Dec-2000	Feb-2012	Dec-2000	Dec-2000	Dec-2000
Discharge Sub-Area 5 (19 wells)														
MWN-07 [6]	Slag/Fill	x		Jan-2019	Feb-2012	Jan-2019	Jan-2019	Feb-2012	Feb-2012	Nov-1999	Feb-2012	Nov-1999	Nov-1999	Feb-2012
MWN-08 [6]	Slag/Fill		x	Jan-2019		Jan-2019	Jan-2019	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999

TABLE 4-29

CMS MONITORING WELL SAMPLING SUMMARY

Monitoring Location [1]	Hydrogeologic Unit	LTGWM Network Monitoring Location	LTGWM DTW (only)	Analytical Parameters and Method [2,3]: TCL VOCs (8260)	STARS VOCs (8021 or 8260)	SVOCs (BN) (8270)	Total Phenols via TCL SVOCs (AE) (8270)	Arsenic (6010 or 6020) [4]	Barium (6010 or 6020)	Cadmium (6010 or 6020)	Chromium (6010 or 6020)	Lead (6010 or 6020)	Selenium (6010 or 6020)	Cyanide (9010/9012)
MWN-09 [6]	Slag/Fill	x		Jan-2019	Apr-2013	Jan-2019	Jan-2019	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999
MWN-26A	Slag/Fill	x		Jul-2010		Feb-2012	Nov-1999	Feb-2012	Feb-2012	Nov-1999	Feb-2012	Nov-1999	Nov-1999	Feb-2012
MWN-26B	Clayey Silt		x	Jan-2019		Jan-2019	Jan-2019	Feb-2012	Jan-2019	Nov-1999	Feb-2012	Nov-1999	Nov-1999	Nov-1999
MWN-30A [6]	Slag/Fill		x	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Nov-1999	Apr-2013	Apr-2013	Apr-2013	Nov-1999
MWN-34 [6]	Slag/Fill		x	Jan-2019		Jan-2019	Jan-2019	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999	Nov-1999
MWN-45A	Slag/Fill	x		Jan-2019	Feb-2012	Jan-2019	Jan-2019	Feb-2012	Feb-2012	Dec-2000	Feb-2012	Dec-2000	Dec-2000	Jan-2019
MWN-46A	Slag/Fill		x	Dec-2000	Apr-2013	Apr-2013	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000	Dec-2000
MWN-47A	Slag/Fill	x		Jan-2019	Feb-2012	Jan-2019	Jan-2019	Feb-2012	Feb-2012	Dec-2000	Feb-2012	Dec-2000	Dec-2000	Dec-2000
MWN-49A [6]	Clayey Silt	x		Jan-2019	Feb-2012	Jan-2019	Jan-2019	Feb-2012	Feb-2012	Dec-2000	Feb-2012	Dec-2000	Dec-2000	Dec-2000
MWN-49B [6]	Clayey Silt; Till; Peat		x	Jan-2019	Mar-2012	Jan-2019	Jan-2019	Mar-2012	Jan-2019	Dec-2000	Mar-2012	Dec-2000	Dec-2000	Dec-2000
MWN-53A	Slag/Fill	x		Jan-2019		Jan-2019	Jan-2019							Jan-2019
MWN-54A	Slag/Fill	x		Apr-2013		Apr-2013								
MWN-55AR	Slag/Fill	x		Apr-2013		Apr-2013								
MWN-66AR	Slag/Fill	x		Jan-2019		Jan-2019	Jan-2019							Jan-2019
MWN-67A	Slag/Fill	x		Jan-2019		Jan-2019	Jan-2019							Jan-2019
MWN-68A	Sand	x		Jan-2019		Jan-2019	Jan-2019							
MWN-72AR	Slag/Fill; Sand		x	Jan-2019		Jan-2019	Jan-2019							

Notes:

1. Monitoring well locations are shown on Plate 4-18. Only wells that have been sampled at least once are included in this table.
2. Analytical compounds identified on this Table were selected based on historical exceedances of NYSDEC Groundwater Quality Standards/Guidance Values (GWQS/GVs) and/or constituents of concern associated with nearby Solid Waste Management Units (SWMUs).
3. The presented date represents the most recent sampling event for each parameter/method.
4. Two methods are shown for metals (As, Ba, Cd, Cr, Pb, Se) as the origional method (6010, ICP-0ES) was updated to a new method (6020, ICP-MS) with a lower detection limit.
5. MWN-44A was decommissioned after the 2012 CMS sampling event.
6. Well location is outside the CMS Area and/or off the Tecumseh property.

Definitions:

LTGWM = Long Term Groundwater Monitoring
DTW = Depth to water
VOC = Volatile Organic Compound
TCL = Target Compound List
STARS = Spill Technology and Remediation Series
SVOC = Semivolatile Organic Compound
BN = Base/Neutral Extractables
AE = Acid Extractables

TABLE 4-30

GROUNDWATER MONITORING WATER LEVEL SUMMARY (JANUARY 2019)

Monitoring Location [1]	Hydrogeologic Unit	LTGWM Network Monitoring Location	LTGWM DTW (Only)	Northing	Easting	Ground Surface Elevation (ft)[2]	TOR Elevation[3] (ft)	Bottom (fbgs)	Bottom (fbTOR)	Bottom Elevation (ft)	Well Gauging 1/4/2019 DTP (fbTOR)	DTW (fbTOR)	PT (ft)	GWE (ft)	LLE (ft)
Discharge Sub-Area 2A (20 Wells)															
MW-2D2	Slag/Fill	x		1023523.849	1073155.919	630.69	632.11	63.78	65.20	566.91	*NP*	58.34	*NP*	573.77	573.77
MW-2D2B	Sand/Dredge Spoils	x		1023504.539	1073159.699	629.97	632.85	83.40	86.28	546.57	*NP*	59.22	*NP*	573.63	573.63
MW-2D2D	Bedrock Well		x	1023515.049	1073154.669	630.38	632.933 **	110.57	112.38	520.55	*NP*	61.85	*NP*	571.08	571.08
MW-2D3	Slag/Fill	x		1023710.709	1073125.069	634.87	635.581 **	65.55	67.20	568.38	*NP*	61.34	*NP*	574.24	574.24
MW-2D4	Slag/Fill	x		1023930.919	1073102.019	628.96	629.637 **	61.12	62.60	567.04	*NP*	55.33	*NP*	574.31	574.31
MW-2U1B	Slag/Fill; Sand/Dredge Spoils		x	1023692.869	1073522.859	626.93	629.42	66.22	68.71	560.71	*NP*	54.86	*NP*	574.56	574.56
MWS-09	Slag/Fill	x		1023036.999	1073341.959	628.41	630.82	62.49	64.90	565.92	*NP*	56.81	*NP*	574.01	574.01
MWS-11A	Slag/Fill		x	1024002.349	1073558.829	637.2	639.56	69.94	72.30	567.26	*NP*	65.12	*NP*	574.44	574.44
MWS-12A	Slag/Fill		x	1023573.689	1074214.749	598.37	601.29	30.94	33.86	567.43	*NP*	25.82	*NP*	575.47	575.47
MWS-12B	Slag/Fill; Sand		x	1023588.579	1074215.479	598.47	601.13	41.66	44.32	556.81	*NP*	25.66	*NP*	575.47	575.47
MWS-13	Slag/Fill		x	1023564.829	1073983.219	639.63	642.37	74.57	77.31	565.06	*NP*	67.40	*NP*	574.97	574.97
MWS-14	Slag/Fill; Sand		x	1024210.609	1073970.789	605.7	608.568 **	38.68	41.34	567.23	*NP*	32.77	*NP*	575.80	575.80
MWS-14B	Slag/Fill; Sand		x	1024191.189	1073995.049	605.62	607.217 **	47.66	50.15	557.07	*NP*	31.50	*NP*	575.72	575.72
MWS-15	Slag/Fill		x	1023465.139	1073589.589	625.07	627.09	58.52	60.54	566.55	*NP*	52.46	*NP*	574.63	574.63
MWS-24AR [4]	Slag/Fill; Sand		x	1024237.749	1074911.499	591.41	594.33	23.22	26.14	568.19	*NP*	18.17	*NP*	576.16	576.16
MWS-24B [4]	Sand; Clay		x	1024246.099	1074904.119	591.79	594.38	36.61	39.20	555.18	*NP*	19.37	*NP*	575.01	575.01
MWS-25A	Slag/Fill		x	1023919.649	1074447.769	598.85	601.87	31.21	34.23	567.64	*NP*	26.00	*NP*	575.87	575.87
MWS-25B	Slag/Fill; Sand; Clay		x	1023923.609	1074437.069	598.55	601.37	37.98	40.80	560.57	*NP*	25.50	*NP*	575.87	575.87
MWS-26A	Slag/Fill; Sand/Dredge Spoils	x		1023245.099	1073237.419	622.18	624.8	53.98	56.60	568.20	*NP*	51.49	*NP*	573.31	573.31
MWS-29A	Slag/Fill		x	1024024.982	1074141.648	597.166	599.004 **	28.39	30.24	568.76	*NP*	21.48	*NP*	577.52	577.52
Discharge Sub-Area 2B (16 Wells)															
MWS-01	Slag/Fill	x		1024249.149	1073028.679	629.94	632.6	63.62	66.28	566.32	*NP*	58.73	*NP*	573.87	573.87
MWS-01B	Slag/Fill; Sand/Dredge Spoils	x		1024218.009	1073035.879	629.89	632.68	83.08	85.87	546.81	59.08	59.09	*0.01*	573.59	573.60
MWS-02	Slag/Fill	x		1024778.669	1073718.369	599.58	602.39	34.17	36.98	565.41	*NP*	27.20	*NP*	575.19	575.19
MWS-03	Slag/Fill	x		1024939.229	1075241.079	585.7	587.42	18.71	20.43	566.99	*NP*	13.22	*NP*	574.20	574.20
MWS-10	Slag/Fill		x	1024296.139	1074398.169	601.43	604.43	31.50	34.50	569.93	*NP*	28.07	*NP*	576.36	576.36
MWS-10B	Slag/Fill; Clay; Sand/Dredge Spoils		x	1024272.009	1074411.149	599.95	602.67	38.89	41.61	561.06	*NP*	27.05	*NP*	575.62	575.62
MWS-18A	Slag/Fill	x		1024859.279	1074480.709	595.16	597.81	27.47	30.12	567.69	*NP*	21.55	*NP*	576.26	576.26
MWS-18C	Slag/Fill; Clay; Sand	x		1024848.236	1074474.097	594	596.44	35.77	38.21	558.23	*NP*	20.76	*NP*	575.68	575.68
MWS-19A	Slag/Fill	x		1024841.199	1074166.86	597.61	600.69	28.88	31.96	568.73	*NP*	25.62	*NP*	575.07	575.07

TurnKey Environmental Restoration, LLC
Benchmark Environmental Engineering & Science, PLLC

TABLE 4-30

GROUNDWATER MONITORING WATER LEVEL SUMMARY (JANUARY 2019)

Monitoring Location [1]	Hydrogeologic Unit	LTGWM Network Monitoring Location	LTGWM DTW (Only)	Northing	Easting	Ground Surface Elevation (ft)[2]	TOR Elevation[3] (ft)	Bottom (fbgs)	Bottom (fbTOR)	Bottom Elevation (ft)	Well Gauging 1/4/2019 DTP (fbTOR)	DTW (fbTOR)	PT (ft)	GWE (ft)	LLE (ft)
MWS-19B	Slag/Fill; Sand	x		1024842.819	1074178.739	596.93	600.04	38.79	41.90	558.14	*NP*	24.95	*NP*	575.09	575.09
MWS-20A	Slag/Fill; Sand	x		1024785.849	1074724.279	591.68	593.69	20.19	22.20	571.49	*NP*	16.56	*NP*	577.13	577.13
MWS-20B	Sand; Clay	x		1024791.859	1074735.239	591.4	594.28	28.66	31.54	562.74	*NP*	17.05	*NP*	577.23	577.23
MWS-21A	Slag/Fill		x	1024247.573	1074221.358	597.59	600.378 **	28.99	31.59	568.79	*NP*	24.32	*NP*	576.06	576.06
MWS-21B	Slag/Fill; Clay		x	1024258.664	1074219	597.65	603.243 **	41.74	44.60	558.64	*NP*	27.03	*NP*	576.21	576.21
MWS-23A	Slag/Fill		x	1024363.299	1074708.909	595.37	598.563 **	18.97	21.95	576.61	*NP*	15.85	*NP*	582.71	582.71
MWS-23B	Sand		x	1024373.289	1074709.909	595.46	598.468 **	34.98	37.72	560.75	*NP*	22.11	*NP*	576.36	576.36
Discharge Sub-Area 3A (17 wells, 2 staff gauges)															
MWN-01 [5]	Slag/Fill	x		1024541.599	1072907.429	582.99	587.91 **	17.00	19.15	568.76	*NP*	14.32	*NP*	573.59	573.59
MWN-01B [5]	Slag/Fill; Sand/Dredge Spoils	x		1024563.629	1072939.259	583.79	588.95 **	29.00	32.24	556.71	*NP*	15.21	*NP*	573.74	573.74
MWN-11	Slag/Fill	x		1025138.159	1074031.239	597.8	600.06	31.05	33.31	566.75	*NP*	25.40	*NP*	574.66	574.66
MWN-17A	Slag/Fill	x		1025472.339	1074490.589	594.96	597.82	25.49	28.35	569.47	*NP*	22.40	*NP*	575.42	575.42
MWN-17B	Slag/Fill; Sand	x		1025475.939	1074471.769	594.88	597.62	35.26	38.00	559.62	*NP*	23.20	*NP*	574.42	574.42
MWN-23B	Sand/Dredge Spoils	x		1024917.019	1073466.659	596.25	599.01	48.67	51.43	547.58	*NP*	24.90	*NP*	574.11	574.11
MWN-24A	Slag/Fill; Clayey Silt; Sand	x		1025114.169	1075097.4	585.48	588.05	18.48	21.05	567.00	*NP*	12.05	*NP*	576.00	576.00
MWN-24B	Till		x	1025112.769	1075109.349	585.05	587.88	37.86	40.69	547.19	*NP*	13.52	*NP*	574.36	574.36
MWN-61A [4]	Slag/Fill			1025362.397	1075666.551	584.72	586.91	15.84	18.03	568.88	*NP*	10.58	*NP*	576.33	576.33
MWN-80A	Slag/Fill; Sand		x	1025596.674	1074854.26	587.93	592.747 **	17.54	20.33	572.42	*NP*	15.80	*NP*	576.95	576.95
MWN-81A	Slag/Fill		x	1025791.324	1074868.44	587.99	589.72	18.58	20.31	569.41	*NP*	12.50	*NP*	577.22	577.22
MWN-82A	Slag/Fill; Sand		x	1025697.16	1074809.737	589.07	590.75	18.62	20.30	570.45	*NP*	14.00	*NP*	576.75	576.75
MWN-83A	Slag/Fill		x	1025540.11	1074749.041	591.45	593.86	22.45	24.86	569.00	*NP*	18.00	*NP*	575.86	575.86
MWN-84A	Slag/Fill		x	1025697.781	1074682.345	591.12	593.24	23.58	25.70	567.54	*NP*	17.48	*NP*	575.76	575.76
MWN-85A	Slag/Fill		x	1025804.878	1074507.225	590.3	592.41	24.63	26.74	565.67	*NP*	16.78	*NP*	575.63	575.63
MWN-94A	Slag/Fill	x		1025082.636	1074558.345	589.79	592.47	25.37	28.05	564.42	*NP*	18.12	*NP*	574.35	574.35
MWN-94B	Sand	x		1025081.236	1074570.294	589.66	591.95	36.38	38.67	553.28	*NP*	17.51	*NP*	574.44	574.44
SG-02	Smoke's Creek		x	1025099.446	1075344.632	--	582.254 **	--	--	--	--	7.99	*NP*	574.26	574.26
SG-07R [6]	Smoke's Creek		x	1024480.062	1072942.849	--	581.446 **	--	--	--	--	7.58	*NP*	573.87	573.87
Discharge Sub-Area 4A (72 Wells)															
MW-1D1	Slag/Fill	x		1028413.499	1071454.069	609.21	610.59	43.57	44.95	565.64	*NP*	32.18	*NP*	578.41	578.41
MW-1D2	Slag/Fill	x		1027772.519	1071948.079	613.04	614.46	48.08	49.50	564.96	*NP*	40.95	*NP*	573.51	573.51
MW-1D3	Slag/Fill	x		1027666.099	1071961.879	610.72	612.69	46.13	48.10	564.59	*NP*	39.12	*NP*	573.57	573.57
MW-1D4	Slag/Fill	x		1027566.049	1071977.659	609.51	612.52	37.86	40.87	571.65	*NP*	38.88	*NP*	573.64	573.64
MW-1D5	Slag/Fill		x	1027710.839	1071809.76	610.7	613.49	42.71	45.50	567.99	*NP*	39.91	*NP*	573.58	573.58

TurnKey Environmental Restoration, LLC
Benchmark Environmental Engineering & Science, PLLC

TABLE 4-30

GROUNDWATER MONITORING WATER LEVEL SUMMARY (JANUARY 2019)

Monitoring Location [1]	Hydrogeologic Unit	LTGWM Network Monitoring Location	LTGWM DTW (Only)	Northing	Easting	Ground Surface Elevation (ft)[2]	TOR Elevation[3] (ft)	Bottom (fbgs)	Bottom (fbTOR)	Bottom Elevation (ft)	Well Gauging 1/4/2019 DTP (fbTOR)	DTW (fbTOR)	PT (ft)	GWE (ft)	LLE (ft)
MW-1D6	Slag/Fill	x		1028316.649	1071506.709	608.2	610.94	39.41	42.15	568.79	*NP*	37.30	*NP*	573.64	573.64
MW-1D7	Slag/Fill	x		1028454.389	1071403.779	608.49	611.26	42.68	45.45	565.81	*NP*	36.32	*NP*	574.94	574.94
MW-1D8	Slag/Fill	x		1028646.359	1071445.319	607.97	610.74	40.78	43.55	567.19	*NP*	36.31	*NP*	574.43	574.43
MW-1U1	Slag/Fill; Sand/Dredge Spoils	x		1027965.239	1072334.069	611.38	613.18	64.70	66.50	546.68	*NP*	39.42	*NP*	573.76	573.76
MWN-05A	Slag/Fill	x		1029286.609	1071006.469	620.22	622.84	55.50	58.12	564.72	*NP*	49.48	*NP*	573.36	573.36
MWN-05B	Sand/Dredge Spoils	x		1029258.299	1071005.459	617.85	620.54	74.00	76.69	543.85	*NP*	47.46	*NP*	573.08	573.08
MWN-05D	Bedrock		x	1029211.939	1071024.379	614.07	617.17	102.29	105.39	511.78	*NP*	44.03	*NP*	573.14	573.14
MWN-12	Slag/Fill	x		1028521.969	1071684.699	606.71	608.59	38.52	40.40	568.19	*NP*	35.17	*NP*	573.42	573.42
MWN-13A	Slag/Fill		x	1027754.579	1072541.399	605.37	607.32	38.46	40.41	566.91	*NP*	33.37	*NP*	573.95	573.95
MWN-13C	Sand/Dredge Spoils; Clayey Silt		x	1027763.989	1072539.64	605.29	607.3	72.62	74.63	532.67	*NP*	33.29	*NP*	574.01	574.01
MWN-14A	Slag/Fill		x	1029612.249	1072161.079	609.78	612.38	46.47	49.07	563.31	*NP*	38.95	*NP*	573.43	573.43
MWN-14B	Slag/Fill; Sand/Dredge Spoils		x	1029590.849	1072165.679	609.84	612.9	56.65	59.71	553.19	*NP*	39.28	*NP*	573.62	573.62
MWN-15A	Slag/Fill	x		1028156.936	-1073750.122	590.798	592.727 **	21.31	23.72	569.01	*NP*	17.03	*NP*	575.70	575.70
MWN-15B	Slag/Fill; Sand; Peat	x		1028165.851	-1073749.67	590.852	592.415 **	31.62	34.19	558.23	*NP*	16.72	*NP*	575.70	575.70
MWN-15D	Bedrock		x	1028176.067	-1073749.81	590.515	591.982 **	103.22	104.61	487.37	*NP*	18.27	*NP*	573.71	573.71
MWN-16A	Slag/Fill		x	1025685.709	1073502.819	600.23	602.53	31.01	33.31	569.22	*NP*	28.06	*NP*	574.47	574.47
MWN-16B [7]	Slag/Fill		x	1025697.529	1073499.519	600.4	602.94	30.80	33.34	569.60	--	--	--	--	--
MWN-19A [4]	Slag/Fill; Sand; Peat		x	1027560.361	-1074434.676	583.188	585.385 **	16.04	18.24	567.15	*NP*	7.98	*NP*	577.41	577.41
MWN-19B [4]	Peat		x	1027550.194	-1074438.966	582.982	585.272 **	26.52	28.81	556.46	*NP*	9.21	*NP*	576.06	576.06
MWN-20A	Slag/Fill		x	1026915.759	1073083.699	599.86	602.71	30.49	33.34	569.37	*NP*	28.30	*NP*	574.41	574.41
MWN-20B	Slag/Fill; Sand		x	1026907.719	1073088.589	599.67	601.66	53.84	55.83	545.83	*NP*	27.25	*NP*	574.41	574.41
MWN-21AR	Slag/Fill		x	1028093.499	-1074253.442	582.453	585.024 **	--	--	--	*NP*	7.98	*NP*	577.04	577.04
MWN-21B	Clayey Silt		x	1028099.751	-1074266.885	582.417	584.167 **	40.01	41.76	542.41	*NP*	8.43	*NP*	575.74	575.74
MWN-21C	Slag/Fill; Sand; Peat		x	1028095.803	-1074258.813	582.623	584.404 **	19.78	21.56	562.84	*NP*	7.37	*NP*	577.03	577.03
MWN-22B	Sand/Dredge Spoils		x	1025262.739	1073198.889	609.96	612.44	59.18	61.66	550.78	*NP*	38.30	*NP*	574.14	574.14
MWN-25A	Slag/Fill; Sand		x	1029929.155	-1073427.209	590.249	591.917 **	20.66	22.33	569.59	*NP*	16.11	*NP*	575.81	575.81
MWN-25B	Slag/Fill; Sand		x	1029936.174	-1073425.025	590.318	591.488 **	23.18	24.57	566.92	*NP*	15.66	*NP*	575.83	575.83
MWN-25D	Bedrock		x	1029919.016	-1073428.787	590.349	592.433 **	55.31	57.58	534.85	*NP*	18.36	*NP*	574.07	574.07
MWN-29A	Slag/Fill		x	1027223.249	1072258.399	594.01	596.19	18.72	20.90	575.29	*NP*	24.51	*NP*	571.68	571.68
MWN-32A	Sand; Peat	x		1027726.795	-1074269.854	584.379	587.223 **	18.08	20.92	566.30	*NP*	10.37	*NP*	576.85	576.85
MWN-35A	Slag/Fill		x	1027362.152	1072052.685	606.604	608.71	42.00	44.11	564.60	*NP*	34.70	*NP*	574.01	574.01
MWN-37A	Slag/Fill		x	1025670.121	1074070.494	595.382	597.82	29.29	31.73	566.09	*NP*	22.55	*NP*	575.27	575.27

TURNKEY ENVIRONMENTAL RESTORATION, LLC — BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 4-30

GROUNDWATER MONITORING WATER LEVEL SUMMARY (JANUARY 2019)

Monitoring Location [1]	Hydrogeologic Unit	LTGWM Network Monitoring Location	LTGWM DTW (Only)	Northing	Easting	Ground Surface Elevation (ft)[2]	TOR Elevation[3] (ft)	Bottom (fbgs)	Bottom (fbTOR)	Bottom Elevation (ft)	Well Gauging				
											1/4/2019				
											DTP	DTW	PT	GWE	LLE
											(fbTOR)	(fbTOR)	(ft)	(ft)	(ft)
MWN-38A	Slag/Fill		x	1026237.836	1073698.859	598.232	600.16	28.26	30.19	569.97	*NP*	25.09	*NP*	575.07	575.07
MWN-39A	Slag/Fill		x	1026750.478	1073935.803	589.16	591.24	21.83	23.91	567.33	*NP*	15.08	*NP*	576.16	576.16
MWN-40A	Slag/Fill		x	1026195.305	1074615.333	587.86	589.96	19.73	21.83	568.13	*NP*	13.60	*NP*	576.36	576.36
MWN-41A	Slag/Fill		x	1025624.803	1073139.081	613.64	615.86	47.00	49.22	566.64	*NP*	41.45	*NP*	574.41	574.41
MWN-42A	Slag/Fill		x	1029186.615	1071856.735	576.931	579.37	14.58	17.02	562.35	*NP*	5.65	*NP*	573.72	573.72
MWN-51AR	Slag/Fill	x		1029381.939	-1073619.266	589.10	592.874 **	19.41	23.18	569.69	*NP*	17.21	*NP*	575.66	575.66
MWN-51BR	Peat		x	1029384.225	-1073622.529	589.20	592.515 **	32.77	36.08	556.44	*NP*	16.90	*NP*	575.62	575.62
MWN-62D	Bedrock Well		x	1026120.845	1074815.787	582.34	584.61	63.69	65.96	518.65	*NP*	10.60	*NP*	574.01	574.01
MWN-73A	Peat		x	1028658.335	-1074211.751	582.016	584.493 **	22.38	24.86	559.63	*NP*	4.98	*NP*	579.51	579.51
MWN-75A	Peat		x	1029321.822	-1074013.921	584.067	586.475 **	23.86	26.27	560.21	*NP*	5.92	*NP*	580.56	580.56
MWN-76AR	Slag/Fill; Peat		x	1029672.532	-1073869.002	582.922	585.91 **	--	--	--	*NP*	5.17	*NP*	580.74	580.74
MWN-77A	Slag/Fill		x	1028821.66	-1074091.09	582.994	585.342 **	10.19	12.54	572.80	*NP*	5.75	*NP*	579.59	579.59
MWN-78A	Slag/Fill; Sand		x	1029099.763	-1073996.934	582.919	584.945 **	14.75	16.78	568.17	*NP*	6.02	*NP*	578.93	578.93
MWN-79A	Slag/Fill		x	1029397.847	-1073899.795	583.472	585.982 **	9.52	12.03	573.95	*NP*	6.72	*NP*	579.26	579.26
MWN-86A	Slag/Fill		x	1026290.474	1074374.726	589.5	591.98	20.35	22.83	569.15	*NP*	16.25	*NP*	575.73	575.73
MWN-87A	Slag/Fill		x	1026410.45	1074467.17	589.28	591.49	18.06	20.27	571.22	*NP*	15.65	*NP*	575.84	575.84
MWN-88A	Slag/Fill		x	1026646.399	1074376.174	591.76	594.24	24.40	26.88	567.36	*NP*	18.40	*NP*	575.84	575.84
MWN-89A	Slag/Fill		x	1026473.246	1074307.726	589.31	591.47	22.58	24.74	566.73	*NP*	15.70	*NP*	575.77	575.77
MWN-90A	Slag/Fill		x	1026442.942	1074234.111	590.85	593.49	23.99	26.63	566.86	*NP*	17.10	*NP*	576.39	576.39
MWN-91A	Slag/Fill		x	1026651.359	1074139.396	589.92	592.4	24.30	26.78	565.62	*NP*	16.71	*NP*	575.69	575.69
OU4PZ-6	Slag/Fill		x	1029808.222	-1073873.972	583.076	585.673 **	6.10	8.70	576.98	*NP*	4.73	*NP*	580.94	580.94
OU4PZ-7	Slag/Fill		x	1029600.46	-1073706.99	584.59	587.11 **	6.10	8.62	578.49	*NP*	10.15	*NP*	576.96	576.96
OU4PZ-8	Slag/Fill		x	1028913.945	-1073883.937	588.484	591.311 **	14.70	17.53	573.78	*NP*	13.62	*NP*	577.69	577.69
OU4PZ-9	Slag/Fill		x	1028803.637	-1073842.579	589.485	591.49 **	13.90	15.91	575.59	*NP*	15.74	*NP*	575.75	575.75
OU4PZ-10	Slag/Fill		x	1028777.216	-1073980.342	585.099	587.125 **	13.90	15.93	571.20	*NP*	9.54	*NP*	577.59	577.59
OU4PZ-11	Slag/Fill		x	1028345.703	-1074114.016	582.563	585.479 **	13.90	16.82	568.66	*NP*	8.36	*NP*	577.12	577.12
OU4PZ-12	Slag/Fill		x	1027726.206	-1074234.84	586.9	589.381 **	18.50	20.98	568.40	*NP*	12.69	*NP*	576.69	576.69
OU4PZ-13	Slag/Fill		x	1027624.129	-1074394.455	582.696	585.337 **	11.10	13.74	571.60	*NP*	8.03	*NP*	577.31	577.31
BPP-05R	Slag/Fill		x	1027909.257	-1074572.34	581.332	584.265 **	--	--	--	*NP*	6.9	*NP*	577.37	577.37
BPP-13	Slag/Fill		x	1027907.446	-1074503.249	583.575	584.561 **	13.91	14.90	569.66	*NP*	9.34	*NP*	575.22	575.52
BPP-17	Slag/Fill		x	1027825.994	-1074308.294	583.638	585.188 **	13.20	14.75	570.44	*NP*	8.48	*NP*	575.22	575.52
BPP-18	Slag/Fill; Clay		x	1028124.2	-1074395.751	582.541	585.484 **	10.27	13.21	572.27	*NP*	7.82	*NP*	575.22	575.52
BPP-20	Slag/Fill; Sand		x	1028118.119	-1074480.321	582.101	585.918 **	9.37	13.19	572.73	*NP*	7.91	*NP*	578.01	578.01
BPP-23	Slag/Fill; Sand		x	1027986.487	-1074530.221	583.11	585.274 **	--	--	--	*NP*	8.73	*NP*	576.54	576.54
P-19S	Slag/Fill		x	1027649.058	-1074464.617	--	584.771 **	--	--	--	*NP*	7.21	*NP*	577.56	577.56

TurnKey Environmental Restoration, LLC — Benchmark Environmental Engineering & Science, PLLC

TABLE 4-30

GROUNDWATER MONITORING WATER LEVEL SUMMARY (JANUARY 2019)

Monitoring Location [1]	Hydrogeologic Unit	LTGWM Network Monitoring Location	LTGWM DTW (Only)	Northing	Easting	Ground Surface Elevation (ft)[2]	TOR Elevation[3] (ft)	Bottom (fbgs)	Bottom (fbTOR)	Bottom Elevation (ft)	Well Gauging 1/4/2019 DTP (fbTOR)	Well Gauging 1/4/2019 DTW (fbTOR)	Well Gauging 1/4/2019 PT (ft)	Well Gauging 1/4/2019 GWE (ft)	Well Gauging 1/4/2019 LLE (ft)
Discharge Sub-Area 4B (4 Wells)															
MWN-18A	Slag/Fill	x		1031074.099	1072841.799	592.71	594.2	26.70	28.19	566.01	*NP*	20.09	*NP*	576.54	576.54
MWN-43A	Slag/Fill	x		1030849.391	1072294.243	595.766	598.02	31.58	33.83	564.19	*NP*	24.38	*NP*	576.54	576.54
MWN-50AR	Slag/Fill		x	1030442.644	1073166.909	593.7	596.7	20.33	23.33	573.37	*NP*	21.92	*NP*	576.54	576.54
MWN-50BR	Sand		x	1030452.819	1073164.562	593.7	596.41	33.02	35.73	560.68	*NP*	21.65	*NP*	576.54	576.54
Discharge Sub-Area 5 (31 wells, 1 staff gauge)															
MWN-07 [4]	Slag/Fill	x		1031175.359	1073593.439	581.67	584.12	17.14	19.59	564.53	*NP*	9.69	*NP*	575.22	575.22
MWN-08 [4]	Slag/Fill		x	1029761.877	-1074088.693	583.429	584.604 **	18.25	19.43	565.17	*NP*	9.38	*NP*	575.22	575.22
MWN-09 [4]	Slag/Fill	x		1028322.4	-1074556.389	582.578	584.944 **	16.06	18.43	566.51	*NP*	11.01	*NP*	573.93	573.93
MWN-26A	Slag/Fill	x		1028967.767	-1074285.82	583.15	583.92	6.56	7.33	576.59	*NP*	7.33	*NP*	576.59	576.59
MWN-26B	Clayey Silt		x	1028964.179	-1074273.978	581.461	583.331 **	39.53	41.40	541.93	*NP*	6.78	*NP*	576.55	576.55
MWN-26C	Slag/Fill		x	1028968.709	1074290.476	581.21	589.86	8.50	17.15	566.85	7.06	7.71	0.65	576.29	576.83
MWN-27A	Slag/Fill		x	1027868.736	-1074619.628	581.073	583.838 **	--	--	--	*NP*	6.48	*NP*	577.36	577.36
MWN-27B	Clayey Silt		x	1027856.644	-1074622.408	580.74	583.924 **	--	--	--	*NP*	7.62	*NP*	576.30	576.30
MWN-27C	Slag/Fill		x	1027863.376	-1074620.716	581.016	583.968 **	--	--	--	*NP*	6.51	*NP*	577.46	577.46
MWN-30A [4]	Slag/Fill		x	1027634.581	-1074641.495	582.436	584.915 **	18.47	20.95	563.97	*NP*	7.26	*NP*	577.66	577.66
MWN-31A	Slag/Fill; Peat		x	1027786.992	-1074531.575	581.976	584.108 **	--	--	--	*NP*	6.78	*NP*	577.33	577.33
MWN-34A [4]	Slag/Fill		x	1029242.534	-1074277.746	582.387	584.682 **	20.45	22.75	561.93	*NP*	9.73	*NP*	574.95	574.95
MWN-45A	Slag/Fill	x		1027980.385	-1074849.825	581.85	583.803 **	18.20	20.15	563.65	*NP*	10.3	*NP*	573.50	573.50
MWN-46A	Slag/Fill		x	1027916.277	-1074863.344	580.315	582.792 **	12.71	15.19	567.60	*NP*	5.65	*NP*	577.14	577.14
MWN-47A	Slag/Fill	x		1028105.168	-1074713.948	581.837	584.816 **	--	--	--	*NP*	11.42	*NP*	573.40	573.40
MWN-49A [4]	Clayey Silt	x		1029872.294	-1074033.901	582.715	585.06 **	18.64	20.98	564.08	*NP*	10.03	*NP*	575.03	575.03
MWN-49B [4]	Clayey Silt; Till; Peat		x	1029865.51	-1074035.7	582.525	585.017 **	34.49	36.98	548.04	*NP*	11.31	*NP*	573.71	573.71
MWN-53A	Slag/Fill	x	x	1028166.859	-1074590.24	581.827	584.45 **	15.52	18.14	566.31	*NP*	8.28	*NP*	576.17	576.17
MWN-54A	Slag/Fill	x	x	1028025.897	-1074657.132	582.235	584.913 **	18.00	20.68	566.31	*NP*	9.02	*NP*	575.89	575.89
MWN-55AR	Slag/Fill	x	x	1027885.893	-1074730.213	581.795	584.635 **	14.72	17.56	566.31	*NP*	7.33	*NP*	577.31	577.31
MWN-66AR	Slag/Fill	x		1029497.054	-1074070.39	583.47	586.917 **	--	--	--	*NP*	6.73	*NP*	580.19	580.19
MWN-67A	Slag/Fill	x		1029251.64	-1074188.981	582.757	585.395 **	13.55	16.19	569.21	*NP*	5.32	*NP*	580.08	580.08
MWN-68A	Sand	x		1030225.125	-1073852.692	583.117	585.45 **	11.67	14.00	571.45	*NP*	9.29	*NP*	576.16	576.16
MWN-72AR	Slag/Fill; Sand		x	1028748.191	-1074376.24	583.193	586.245 **	--	--	--	*NP*	9.41	*NP*	576.84	576.84
MWN-74A	Slag/Fill; Sand		x	1028991.82	-1074153.592	582.64	584.445 **	12.55	14.36	570.09	*NP*	4.22	*NP*	580.23	580.23
OU4PZ-1	Slag/Fill		x	1028451.008	-1074492.124	583.459	585.758 **	15.00	17.30	568.46	*NP*	11.14	*NP*	574.62	574.62
OU4PZ-2	Slag/Fill		x	1028571.21	-1074457.13	583.238	585.68 **	15.00	17.44	568.24	*NP*	11.90	*NP*	573.78	573.78
OU4PZ-3	Slag/Fill		x	1028869.063	-1074355.747	583.361	585.902 **	15.00	17.54	568.36	*NP*	11.43	*NP*	574.47	574.47
OU4PZ-4	Slag/Fill		x	1029044.346	-1074306.037	583.814	586.033 **	15.80	18.02	568.01	*NP*	10.98	*NP*	575.05	575.05

TABLE 4-30

GROUNDWATER MONITORING WATER LEVEL SUMMARY (JANUARY 2019)

Monitoring Location [1]	Hydrogeologic Unit	LTGWM Network Monitoring Location	LTGWM DTW (Only)	Northing	Easting	Ground Surface Elevation (ft)[2]	TOR Elevation[3] (ft)	Bottom (fbgs)	Bottom (fbTOR)	Bottom Elevation (ft)	Well Gauging 1/4/2019				
											DTP	DTW	PT	GWE	LLE
											(fbTOR)	(fbTOR)	(ft)	(ft)	(ft)
OU4PZ-5	Slag/Fill		x	1029386.681	-1074140.237	583.588	586.203 **	17.80	20.42	565.79	*NP*	6.65	*NP*	579.55	579.55
OU4PZ-14	Slag/Fill		x	1027709.196	-1074622.445	581.951	584.399 **	10.70	13.15	571.25	*NP*	6.82	*NP*	577.58	577.58
SG-01 [8]	Ship Canal		x	1028168.64	1074650.681	--	581.971	--	--	--	--	9.03	*NP*	572.94	572.94
DISCHARGE AREA UNIDENTIFIED (8 wells)															
BPP-22	Slag/Fill		x	1028011.243	1074588.397	582.106	584.622 **	--	--	--	--	7.43	*NP*	577.19	577.19
RWS-3	Slag/Fill		x	1027807.248	-1074469.16	582.702	580.348	13.3	10.90	568.602	*NP*	2.94	*NP*	577.41	577.41
RWS-4	Slag/Fill		x	1027947.408	-1074366.103	582.422	579.85	11.8	9.18	568.522	*NP*	2.01	*NP*	577.84	577.84
RWS-12	Slag/Fill		x	1028445.793	-1074236.365	583.483	581.267	12.3	10.11	570.083	*NP*	3.13	*NP*	578.14	578.14
RWN-9	Slag/Fill		x	1029709.251	-1074010.934	583.834	581.767	17.8	15.68	565.234	*NP*	1.14	*NP*	580.63	580.63
RWN-10	Slag/Fill		x	1028667.792	-1074294.119	582.801	580.368	13.2	10.74	567.801	*NP*	1.23	*NP*	579.14	579.14
RWN-12	Slag/Fill		x	1028855.755	-1074231.449	583.029	580.535	12.5	10.01	568.029	*NP*	1.05	*NP*	579.49	579.49
RWN-17	Slag/Fill		x	1029408.081	-1074004.209	584.751	582.369	10.0	7.62	574.751	*NP*	1.68	*NP*	580.69	580.69

Notes:

1. Monitoring well locations are shown on Plate 4-18.
2. All elevations are measured in feet; refernce datum NAVD 88.
3. Elevation data collected during the RFI, excluding data indicated with a double asterisk (see below).
4. Well location is outside the CMS Area and/or off the Tecumseh property.
5. Depth to groundwater measured January 8, 2019.
6. Water level at staff gauge 7 was measured January 8, 2019, as the gauge had previously been destroyed.
7. Depth to groundwater could not be measured because the well casing was bent.
8. Ship Canal GWE data based on NOAAA January 4, 2019 water level data for Buffalo NY station 9063020.

Definitions:

LTGWM = Long Term Groundwater Monitoring
TOR = Top of riser
fbTOR = feet below top of riser
fbgs = feet below ground surface
DTP = depth to product; if present
DTW = depth to water
PT = product thickness
GWE = groundwater elevation
LLE = liquid level elevation
NP = no product
-- = no data available
** = TOR data collected Febrary 2019

TABLE 4-31

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 2A

PARAMETERS [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																							
		MW-2D2 — Slag/Fill																							
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	Oct-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Mar-2012	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	Jun-2017	Apr-2018
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2005b	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	CMS 2012 [5]	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018
VOCs (Method 8260B, 8260C, 8021B) - ug/L																									
1,1-Dichloroethane	**5**	ND	ND	ND	ND	ND	ND	0.41 J	0.46 J	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
1,2,4,5-Tetramethylbenzene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	**5**	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	**3**	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	**0.6**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	**3**	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	**3**	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
1,4-Diethylbenzene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Ethyltoluene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	**1**	**6.5**	ND	ND	ND	ND	ND	0.54 J	ND	0.83 J	ND	ND	ND	ND	ND	ND	0.083 J	-	0.13 J	ND	ND	ND	0.21	ND	ND
Carbon disulfide	**60**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	0.79 J	ND	ND	ND
Isopropylbenzene	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Methyl cyclohexane	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl tert butyl ether	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
n-Butylbenzene	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene (p-Cymene)	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Toluene	**5**	3.9 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.68 J	0.58 J	0.12 J	-	0.057 J	ND	ND	ND	ND	ND	ND
Trichloroethene	**5**	ND	ND	ND	ND	1 J	ND	1 J	0.89 J	0.67 J	0.92 J	ND	0.88 J	0.76 J	0.62 J	0.61 J	-	-	-	-	-	-	-	-	-
Xylenes, Total	**5**	**11**	ND	ND	ND	ND	ND	0.53 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
SVOCs (Method 8270C, 8270D) - ug/L																									
2,4,6-Trichlorophenol	**See Note 3**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	-	-	-	-	-
2,4-Dichlorophenol	**See Note 3**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	-	-	-	-	-
2,4-Dimethylphenol	**See Note 3**	ND	ND	ND	ND	ND	ND	2 J	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	-	-	-	-	-
2-Chloronaphthalene	**10**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
2-Methylphenol (o-Cresol)	**See Note 3**	ND	ND	ND	ND	ND	ND	4 J	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	-	-	-	-	-
3,4-Methylphenol (m,p-Cresol)	**See Note 3**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	**See Note 3**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	-	-	-	-	-
Acenaphthene	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	**-**	1.6 J	ND	ND	ND	ND	ND	22	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Acetophenone	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Anthracene	**50**	ND	ND	ND	ND	ND	ND	4 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	0.07 J	ND	ND	ND	ND
Benzo(a)anthracene	**0.002**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	**0 (ND)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Benzo(ghi)perylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Benzyl Alcohol	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	-	ND	ND	ND	ND	ND
Biphenyl	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate	**5**	ND	ND	ND	ND	ND	ND	ND	ND	**8 BJ**	ND	ND	ND	ND	ND	ND	3.3 BJ	-	ND	ND	ND	ND	ND	ND	ND
Caprolactam	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	-	ND	ND	4.5 J	ND	-	-	-
Carbazole	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Chrysene	**0.002**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Diethyl phthalate	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.34 J	ND	-	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	**50**	ND	ND	ND	ND	ND	ND	ND	ND	0.3 J	ND	0.3 J	0.3 BJ	0.3 BJ	ND	0.32 BJ	ND	-	ND	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4 BJ	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2 J	ND	ND	ND	ND	-	ND	ND	ND	0.08 J	ND	ND	ND
Fluorene	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)Pyrene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Naphthalene	**10**	**16**	ND	ND	ND	ND	ND	ND	0.7 J	ND	0.4 J	0.2 J	0.2 J	ND	ND	ND	ND	-	ND	ND	0.27	0.28 J	0.1 J	ND	ND
Pentachlorophenol	**See Note 3**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	0.36 J	-	-	-	ND	ND	-	-
Phenanthrene	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Phenol	**See Note 3**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	-	-	-	-	-
Pyrene	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2 J	ND	ND	ND	ND	ND	-	ND	ND	ND	0.07 J	ND	ND	ND
Pyridine	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug/L																									
Phenolic compounds (total phenols) [4]	**1**	ND	ND	ND	ND	ND	ND	**6**	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-

TABLE 4-31

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 2A

PARAMETERS [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program: MW-2D2 — Slag/Fill																							
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	Oct-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Mar-2012	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	Jun-2017	Apr-2018
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2005b	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	CMS 2012 [5]	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018
Filtered SVOCs (Method 8270D) - ug/L																									
Acenaphthene	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals - ug/L																									
Arsenic, Total	**25**	4.3 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	-	-	-	-	-	-	-
Barium, Total	**1000**	45.1 B	36	40	35	33	38.6	40	35.7	30	32.8	35	29.3	31	25.7	-	-	22	-	-	-	-	-	-	-
Cadmium, Total	**5**	0.3 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Chromium, Total	**50**	0.7 B	ND	ND	ND	ND	ND	ND	ND	8	ND	ND	ND	ND	ND	-	-	5 J	-	-	-	-	-	-	-
Cyanide, Total	**200**	60	60	60	62	54	63	68	61 J	58	64	46	80	46	31.8	-	-	-	-	-	-	-	-	-	-
Lead, Total	**25**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	-	-	-	-	-	-	-
Selenium, Total	**10**	5.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	-	-	-	-	-	-	-
Dissolved Metals - ug/L																									
Arsenic, Dissolved	**25**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Barium, Dissolved	**1000**	-	31	40	-	33	39	37	34.9	28	32.9	37	28.5	29	26.3	-	-	-	-	-	-	-	-	-	-
Cadmium, Dissolved	**5**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Chromium, Dissolved	**50**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.5 J	-	-	-	-	-	-	-	-	-	-
Lead, Dissolved	**25**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Selenium, Dissolved	**10**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Field Measurements																									
Dissolved Oxygen (mg/L)	**-**	0.3	1.7	4.8	1.93	1.2	1.53	1.02	1.4	2.67	2.21	1.26	0.89	1.18	1.45	-	3.89	1.47	1.55	2.49	2.48	1.28	1.6	2.44	3.37
Field pH (S.U.)	**12.5**	9.64	9.49	10.78	10.62	9.61	10.11	9.96	9.81	8.69	9.75	9.87	9.80	9.74	9.24	8.91	8.92	8.80	9.67	9.28	9.29	9.34	9.78	8.49	9.42
Redox Potential (mV)	**-**	266	78	-42	-96	-53	-120	22	-66	-49	-36	-58	-140	-135	-117	-81	155	-125	418	-155	39	-120	-76	129	-90
Specific Conductance (uhos/cm)	**-**	2,080	1,688	1,740	1,556	1,511	1,671	1,576	1,483	1,452	1,289	1,406	1,238	1,296	1,193	1,166	1,161	1114	1133	1071	1235	1289	1167	1168	1034
Temperature (deg C)	**-**	20.6	19.8	17.5	17.8	19.1	18.8	16.3	21.1	21.8	19.9	19.6	17.6	15.8	19.7	18.4	17.8	16.5	16.8	26.9	18.9	20.3	17.4	17.3	17.9
Turbidity (NTU)	**-**	1.1	1.27	3.36	3.82	0.11	0.98	0.79	9.05	2.14	4.16	4.49	0.73	0.37	2.57	3.56	3.63	0.35	0.73	4.78	6.53	3	1.85	0.77	4.23

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/Guidance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
\- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groudwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TABLE 4-31

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 2A

PARAMETERS [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																							
		MW-2D3 — Slag/Fill																							
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	Oct-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Mar-2012	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	May-2017	Apr-2018
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2005b	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	CMS 2012	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018
VOCs (Method 8260B, 8260C, 8021B) - ug/L																									
1,1-Dichloroethane	5	1.3 J	ND	ND	1.2 J	ND	ND	0.97 J	1.2 J	0.87 J	0.94 J	ND	0.52 J	ND	ND	ND	-	-	-	-	-	-	-	-	-
1,2,4,5-Tetramethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	5	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2 J	ND	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.6	-	8	6.5 DJ	8.8 DJ	7.2	6.2	4.6	2.9
1,2-Dichlorobenzene	3	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.9	-	3.6	ND	3.9 DJ	3.3	2.8	1.9	1.5 J
1,3-Dichlorobenzene	3	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	3	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
1,4-Diethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Ethyltoluene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	1	15	22 J	17 J	14	9.8	13 J	14 J	16	12	12	10	6.1	9.2	2.2	5.7	4.3	-	3.5	6.2 D	4.9 D	3	4.6	3.6	3.5
Carbon disulfide	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	5	4.5 J	ND	ND	5.2	3.2 J	ND	3.6 J	3 J	2.3 J	3.1	2.5	2.5	2.2 J	1.2	8.4	7	-	7.4	7 DJ	7.2 DJ	4	3	2.2 J	1.6 J
Isopropylbenzene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.27	-	0.28	ND	ND	ND	ND	ND	ND
Methyl cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl tert butyl ether	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3 J	-	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
n-Butylbenzene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.095 J	-	0.23	ND	ND	ND	ND	ND	ND
n-Propylbenzene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene (p-Cymene)	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Toluene	5	14	19 J	16 J	16	8.8	10 J	12	12 B	10	10	7.6	5.8	7	2.4	6.7	4.9	-	3.8	6.6 DJ	4.6 DJ	2.5	3.3	2.6	2.6
Trichloroethene	5	1.6 J	ND	ND	1 J	1.4 J	ND	1.5 J	1.1 J	1 J	1	1.7	0.93 J	2.9 J	0.79 J	0.7 J	-	-	-	-	-	-	-	-	-
Xylenes, Total	5	41	53	39 J	59	38	30 J	40	32	27	33	29	25.6	23.1	9.3	57	50	-	53	53 D	49 D	24.6	21	17.7	11
SVOCs (Method 8270C, 8270D) - ug/L																									
2,4,6-Trichlorophenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	See Note 3	7.2 J	5 J	4 J	2 J	ND	2 J	2 J	ND	1 J	0.9 J	4 J	2 J	5	ND	-	1.1 J	-	-	-	-	-	-	-	-
2-Chloronaphthalene	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	24	20	-	18 J	15	28 D	20 D	14 D	12	9.8
2-Methylphenol (o-Cresol)	See Note 3	5.6 J	3 J	3 J	ND	ND	ND	4 J	2 J	2 J	1 J	3 J	2 J	4 J	ND	-	0.54 J	-	-	-	-	-	-	-	-
3,4-Methylphenol (m,p-Cresol)	See Note 3	7.1 J	4 J	4 J	2 J	ND	2 J	ND	3 J	4 J	2 J	6 J	2 J	8 J	ND	-	1.5 J	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6 J	ND	ND	ND	-	ND	-	-	-	-	-	-	-	-
Acenaphthene	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.4 J	3.9 J	-	3.5 J	2.7	4.8 D	3.5 D	2.8 D	2.2	2.2
Acenaphthylene	-	24	27	31	30	23 J	22	22	18	18	14	20	21	19	4.7 J	30	21	-	20 J	9.6	27 D	17 D	14 D	14	11
Acetophenone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	-	ND
Anthracene	50	1.5 J	ND	4 J	4 J	ND	3 J	4 J	3 J	2 J	2 J	3 J	4 J	4 J	ND	2.8 J	3.3 J	-	3.7 J	1.6	2.8 D	2.3 D	1.6 DJ	1.7 J	1.5 J
Benzo(a)anthracene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2 J	ND	0.2 J	ND	ND	ND	ND	-	ND	0.08 J	ND	ND	ND	ND	ND
Benzo(a)pyrene	0 (ND)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Benzo(ghi)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Benzyl Alcohol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	-	ND	ND	ND	ND	ND
Biphenyl	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.2 J	3.4 J	-	3.5 J	3	3.6	2.8	2.8	2.5	2
Bis(2-ethylhexyl)phthalate	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3 BJ	-	ND	ND	1.1 J	ND	ND	ND	ND
Caprolactam	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	-	ND	ND	ND	ND	-	-	-
Carbazole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	35	27	-	25	20	24	16	12	8.8	7
Chrysene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2 J	0.3 J	ND	ND	ND	ND	-	ND	0.07 J	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	15	-	14 J	11	13	10	10	8.8	8.9
Diethyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	0.3 J	ND	ND	ND	ND	ND	0.4 BJ	0.33 J	-	ND	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3 BJ	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	50	ND	ND	2 J	3 J	ND	2 J	2 J	2 J	2 J	1 J	2 J	2 J	2 J	ND	2.5 J	3.3 J	-	2.7 J	1.7	2.8 D	2.3 D	2 D	1.6 J	1.7 J
Fluorene	50	9.9 J	22	22	24	16 J	19	19	19	16	13	17	18	18	5.6 J	20	21	-	19 J	15	23 D	18 D	14 D	12	13
Indeno(1,2,3-cd)Pyrene	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Naphthalene	10	200 D	210 D	160	190 D	190	130	150 E	99	94 B	100	130	110	110	47	250	200	-	220	220 D	310 D	200 D	90 D	82	57
Pentachlorophenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-	-	-	-	ND	ND	-	-
Phenanthrene	50	8.7 J	24	26	26	20 J	22	23	21	20	16	21	25	23	5.9 J	19	22	-	24	14	24 D	21 D	17 D	15	17
Phenol	See Note 3	4.4 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-	-	-	-	-	-	-	-
Pyrene	50	ND	ND	1 J	2 J	ND	ND	1 J	1 J	1 J	0.8 J	1 J	1 J	1 J	ND	1.5 J	1.8 J	-	1.6 J	0.89	1.6 D	1.2 DJ	1 DJ	0.9 J	0.93 J
Pyridine	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug/L																									
Phenolic compounds (total phenols) [4]	1	24	12	11	4	ND	4	6	5	7	3.9	19	6	17	ND	-	3.1	-	-	-	-	-	-	-	-

TABLE 4-31

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 2A

PARAMETERS [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program — MW-2D3 — Slag/Fill																							
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	Oct-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Mar-2012	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	May-2017	Apr-2018
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2005b	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	CMS 2012	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018
Filtered SVOCs (Method 8270D) - ug/L																									
Acenaphthene	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals - ug/L																									
Arsenic, Total	**25**	4.3 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	6	-	-	-	-	-	-	-
Barium, Total	**1000**	57.4 B	54	54	49	48	51.1	55	48.1	52	44.9	42	42.3	45	46.7	-	-	45	-	-	-	-	-	-	-
Cadmium, Total	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Chromium, Total	**50**	2 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	2 J	-	-	-	-	-	-	-
Cyanide, Total	**200**	78	ND	ND	ND	ND	ND	52	ND	16	36	17	ND	ND	19.3	-	-	-	-	-	-	-	-	-	-
Lead, Total	**25**	1.7 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	5 J	-	-	-	-	-	-	-
Selenium, Total	**10**	**23.7**	7.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	-	-	-	-	-	-	-
Dissolved Metals - ug/L																									
Arsenic, Dissolved	**25**	2 B	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Barium, Dissolved	**1000**	54.6 B	48	50	-	47	50.7	50	47.6	51	44.2	42	42.3	41	48.4	-	-	-	-	-	-	-	-	-	-
Cadmium, Dissolved	**5**	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Chromium, Dissolved	**50**	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Lead, Dissolved	**25**	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Selenium, Dissolved	**10**	**22.4**	8	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Field Measurements																									
Dissolved Oxygen (mg/L)	-	0.2	1.4	3.8	1.4	0.6	0.7	1.4	1.5	1.2	1.7	0.8	0.7	2.0	1.8	NA	1.0	0.1	1.23	1.98	2.63	1.31	1.16	1.1	1.24
Field pH (S.U.)	**12.5**	10.81	10.94	12.36	11.61	10.62	10.92	11.03	10.56	10.45	10.85	10.93	10.83	10.79	9.34	10.32	10.80	10.68	11.34	11.23	10.93	10.74	11.38	11.91	11.82
Redox Potential (mV)	-	32	-245	-221	-266	-234	-234	-237	-252	-235	-229	-251	-233	-237	-187	-241	-117	-274	-134	-276	-238	-285	-219	-239	-241
Specific Conductance (uhos/cm)	-	2,110	1,871	1,823	1,651	1,589	1,692	1,674	1,569	1,564	1,397	1,399	1,382	1,492	1,282	1,156	1,263	1,189	1242	1185	1271	1300	1236	1273	1208
Temperature (deg C)	-	18.5	18.8	16.5	17.7	18.8	18.5	17.0	20.3	19.9	19.3	18.6	17.2	16.1	21.2	18.5	17.2	16.8	17.4	18.6	20.1	20.0	17.8	17.8	19.0
Turbidity (NTU)	-	23.6	1.25	4.63	3.09	0.12	2.49	3.61	8.44	3.89	3.09	5.93	1	2.14	1.06	2.28	1.67	17.0	2.11	3.27	26	3.53	1.93	0.72	6.37

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/Guldance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
\- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groudwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TABLE 4-31

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 2A

PARAMETERS [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																							
		MW-2D4 — Slag/Fill																							
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	Oct-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Mar-2012	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	May-2017	Apr-2018
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2005b	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	CMS 2012	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018
VOCs (Method 8260B, 8260C, 8021B) - ug/L																									
1,1-Dichloroethane	**5**	1.5 J	ND	ND	1.6 J	ND	ND	0.59 J	ND	ND	ND	ND	0.6 J	ND	ND	ND	-	-	-	-	-	-	-	-	-
1,2,4,5-Tetramethylbenzene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	**5**	-	ND	ND	ND	ND	ND	ND	ND	ND	0.5 J	ND	ND	ND	ND	-	-	-	-	ND	ND	ND	ND	-	-
1,2,4-Trimethylbenzene	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	0.18 J	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	**3**	-	ND	ND	ND	ND	ND	ND	ND	ND	0.6 J	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	**0.6**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	**3**	-	ND	ND	ND	ND	ND	ND	ND	ND	0.6 J	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	**3**	-	ND	ND	ND	ND	ND	ND	ND	ND	0.6 J	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
1,4-Diethylbenzene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Ethyltoluene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	**1**	**27**	ND	**5.7**	ND	**1.3 J**	ND	**2.2 J**	0.66 J	ND	ND	**2.7**	0.43 J	ND	ND	ND	ND	-	0.23	ND	ND	0.53	ND	ND	ND
Carbon disulfide	**60**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	**5**	**7.9**	ND	1.6 J	ND	ND	ND	0.83 J	ND	ND	ND	1.1	ND	ND	ND	ND	ND	-	0.033 J	ND	ND	ND	ND	ND	ND
Isopropylbenzene	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Methyl cyclohexane	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl tert butyl ether	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
n-Butylbenzene	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene (p-Cymene)	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Toluene	**5**	**25**	ND	4.6 J	1.4 J	1.8 J	ND	1.5 J	ND	ND	ND	2.3	0.64 J	3.2 J	ND	ND	ND	-	0.21	ND	ND	ND	ND	ND	ND
Trichloroethene	**5**	ND	ND	ND	ND	ND	ND	0.46 J	0.4 J	1 J	0.93 J	ND	0.95 J	ND	0.69 J	0.83 J	-	-	-	-	-	-	-	-	-
Xylenes, Total	**5**	**65**	ND	**13 J**	ND	**7.6 J**	ND	**6.5 J**	2.23 J	ND	ND	**9.3**	2.33 J	ND	ND	ND	ND	-	0.88	ND	ND	0.75 J	ND	ND	ND
SVOCs (Method 8270C, 8270D) - ug/L																									
2,4,6-Trichlorophenol	**See Note 3**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	**See Note 3**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	**See Note 3**	13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-	-	-	-	-	-	-	-
2-Chloronaphthalene	**10**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	-	ND	ND	ND	0.09 J	ND	ND	ND
2-Methylphenol (o-Cresol)	**See Note 3**	13	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4 J	ND	ND	ND	-	ND	-	-	-	-	-	-	-	-
3,4-Methylphenol (m,p-Cresol)	**See Note 3**	14 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	**See Note 3**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-	-	-	-	-	-	-	-
Acenaphthene	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	**-**	15	ND	4 J	ND	ND	ND	ND	1 J	ND	ND	4 J	0.3 J	ND	ND	ND	ND	-	ND	ND	ND	0.11	ND	ND	ND
Acetophenone	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Anthracene	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	0.06 J	ND	ND	ND
Benzo(a)anthracene	**0.002**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	**0 (ND)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Benzo(ghi)perylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Benzyl Alcohol	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	-	ND	ND	ND	ND	ND
Biphenyl	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate	**5**	ND	ND	ND	ND	ND	ND	ND	ND	**6 BJ**	ND	ND	ND	ND	ND	ND	3 BJ	-	ND	ND	ND	ND	ND	ND	ND
Caprolactam	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	-	ND	ND	ND	ND	-	-	-
Carbazole	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Chrysene	**0.002**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Diethyl phthalate	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	**50**	ND	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3 BJ	0.4 BJ	ND	0.61 BJ	0.29 J	-	ND	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.5 BJ	0.4 J	ND	0.3 J	ND	ND	3.9 J	-	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4 J	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Fluorene	**50**	6.8 J	ND	2 J	ND	ND	ND	ND	0.6 J	ND	ND	1 J	ND	ND	ND	ND	ND	-	ND	ND	ND	0.06 J	ND	ND	ND
Indeno(1,2,3-cd)Pyrene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Naphthalene	**10**	**420 D**	**36**	**53**	**17**	**38**	**12**	ND	**20**	0.2 BJ	0.5 J	**60**	4 J	ND	ND	0.83 J	ND	-	2.3 J	ND	0.1 J	0.86	0.07 J	ND	ND
Pentachlorophenol	**See Note 3**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-	-	-	-	ND	ND	-	-
Phenanthrene	**50**	8.5 J	ND	4 J	ND	ND	ND	ND	0.7 J	ND	ND	1 J	0.2 J	ND	ND	ND	ND	-	ND	ND	ND	0.11 J	ND	ND	ND
Phenol	**See Note 3**	3.6 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-	-	-	-	-	-	-	-
Pyrene	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND
Pyridine	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug/L																									
Phenolic compounds (total phenols) [4]	**1**	**44**	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	ND	ND	ND	-	ND	-	-	-	-	-	-	-	-

TABLE 4-31

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 2A

PARAMETERS [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																							
		MW-2D4 — Slag/Fill																							
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	Oct-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Mar-2012	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	May-2017	Apr-2018
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2005b	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	CMS 2012	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018
Filtered SVOCs (Method 8270D) - ug/L																									
Acenaphthene	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals - ug/L																									
Arsenic, Total	**25**	4.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	4 J	-	-	-	-	-	-	-
Barium, Total	**1000**	44.4	42	41	45	40	42.3	41	31.2	39	36.7	36	36	34	30.6	-	-	26	-	-	-	-	-	-	-
Cadmium, Total	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Chromium, Total	**50**	3.3 B	4.5	9	5.7	5.3	9.2	6.3	17	15	ND	7.3	ND	ND	9.3	-	-	8 J	-	-	-	-	-	-	-
Cyanide, Total	**200**	78	51	30	43	51	ND	58	32 J	46	39	39	59	42	33.9	-	-	-	-	-	-	-	-	-	-
Lead, Total	**25**	1.7 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	-	-	-	-	-	-	-
Selenium, Total	**10**	**17.2**	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	-	-	-	-	-	-	-
Dissolved Metals - ug/L																									
Arsenic, Dissolved	**25**	4.2 B	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Barium, Dissolved	**1000**	41.6 B	39	40	-	40	41.1	38	33.5	38	35.1	35	35 B	33	30.1	-	-	-	-	-	-	-	-	-	-
Cadmium, Dissolved	**5**	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Chromium, Dissolved	**50**	0.52 B	4	4.4	-	4.2	5.1	ND	6	9.4	7.4	4	4 B	ND	8.4	-	-	-	-	-	-	-	-	-	-
Lead, Dissolved	**25**	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Selenium, Dissolved	**10**	**17**	5.1	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		-	-	-	-	-	-	-	-	-
Field Measurements																									
Dissolved Oxygen (mg/L)	**-**	0.3	4.54	4.01	4.16	3.98	4.15	1.28	3.4	5.2	5.45	1.56	5.31	1.25	7.62	-	8.5	8.6	6.27	6.27	7.96	4.75	7.98	7.92	8.67
Field pH (S.U.)	**12.5**	9.09	8.50	9.33	8.81	7.83	8.24	8.30	8.26	7.88	8.17	8.16	7.97	8.09	8.02	7.85	8.00	8.00	8.42	8.42	8.31	8.20	8.36	8.43	8.60
Redox Potential (mV)	**-**	117	-79	-109	-52	-62	-54	-84	-57	21	0	-167	-30	-128	30	26	112	103	362	362	32	-76	-1	49	-64
Specific Conductance (uhos/cm)	**-**	1,670	1,335	1,331	1,326	1,301	1,250	1,306	1,127	1,381	1,195	1,230	1,302	1,268	1,197	1,118	1,306	1167	1104	1104	1112	1064	1059	1464	1287
Temperature (deg C)	**-**	18.2	19.2	16.6	15.8	17.8	16.9	16.2	21.2	18.3	18.0	17.7	16.2	14.7	19.4	18.6	18.0	17.1	17.6	17.6	19.7	19.8	18.5	17.6	17.8
Turbidity (NTU)	**-**	18.8	0.87	3.56	2.66	0.11	1.1	2.01	9.19	2.28	3.82	3.35	0.56	0.82	1.4	2.92	2.32	0.82	0.83	0.83	3.97	2.22	3.01	2.17	6.72

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/GuIdance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groudwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TABLE 4-31

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 2A

PARAMETERS [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																			
		MW-2D2B — Sand/Dredge Spoils			MW-2D2D — Bedrock			MW-2U1B — Slag/Fill; Sand/Dredge Spoils		MWS-09 — Slag/Fill		MWS-11A — Slag/Fill				MWS-12A — Slag/Fill		MWS-12B — Slag/Fill; Sand	
		Nov-1999	Mar-2012	Jan-2019	Nov-1999	Mar-2012	Jan-2019	Nov-1999	Apr-2013	Nov-1999	Mar-2012	Nov-1999	May-2013	May-2017	Apr-2018	Nov-1999	Apr-2013	Nov-1999	Apr-2013
		RFI	CMS 2012 [5]	CMS 2019	RFI	CMS 2012	CMS 2019	RFI	CMS 2013	RFI	CMS 2012	RFI	CMS 2013 [5]	HWMU 2017	HWMU 2018	RFI	CMS 2013 [5,6]	RFI	CMS 2013 [5,6]
VOCs (Method 8260B, 8260C, 8021B) - ug/L																					
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.6	1.5 J	-	-	3.3 J	2.3 J	1.3 J	ND
1,2,4,5-Tetramethylbenzene	-	-	7	-	-	1.2 J	-	-	ND	-	ND	-	ND	-	-	-	ND	-	ND
1,2,4-Trichlorobenzene	5	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	-	ND
1,2,4-Trimethylbenzene	5	-	29	-	-	18	-	-	1.8 J	-	ND	-	3.5	2.8	2.4 J	-	ND	-	ND
1,2-Dichlorobenzene	3	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	-	ND
1,2-Dichloroethane	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND
1,3,5-Trimethylbenzene	5	-	8.9	-	-	5	-	-	0.91 J	-	ND	-	1.7 J	1.5 J	1.5 J	-	ND	-	ND
1,3-Dichlorobenzene	3	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	-	ND
1,4-Dichlorobenzene	3	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	-	ND
1,4-Diethylbenzene	-	-	3.7 J	-	-	1.4 J	-	-	ND	-	ND	-	ND	-	-	-	ND	-	ND
2-Butanone	50	-	ND	ND	-	ND	ND	-	1.8 J	-	ND	-	ND	-	-	-	ND	-	ND
4-Ethyltoluene	-	-	14	-	-	3.3	-	-	ND	-	ND	-	ND	-	-	-	ND	-	ND
Acetone	50	-	16	12 DJ	-	33	84 D	-	12	-	ND	-	2.1 J	-	-	-	ND	-	14 J
Benzene	1	35	29	23 D	710	95 D	130 D	16	13	ND	ND	7.4	2.7	2.6	2.6	55	9	44	150
Carbon disulfide	60	-	ND	ND	-	3.4 J	ND	-	6	-	ND	-	ND	-	-	-	ND	-	ND
cis-1,2-Dichloroethene	5	-	ND	ND	-	ND	ND	-	ND	-	ND	-	1.8 J	-	-	-	ND	-	ND
Cyclohexane	-	-	ND	ND	-	120	82 DJ-	-	ND	-	ND	-	ND	-	-	-	ND	-	ND
Ethylbenzene	5	23	24	20 D	53	10	8.2 D	1.7 J	2.5	ND	ND	2.4 J	ND	ND	1.6 J	ND	ND	ND	ND
Isopropylbenzene	5	-	2.5	ND	-	1.4	ND	-	ND	-	ND	-	ND	ND	ND	-	ND	-	ND
Methyl cyclohexane	-	-	ND	ND	-	76	49 DJ-	-	ND	-	ND	-	ND	-	-	-	ND	-	ND
Methyl tert butyl ether	10	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	ND	ND	-	ND	-	ND
Methylene chloride	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND
n-Butylbenzene	5	-	1.5	-	-	ND	-	-	ND	-	ND	-	ND	ND	ND	-	ND	-	ND
n-Propylbenzene	5	-	ND	-	-	1.9	-	-	ND	-	ND	-	ND	ND	ND	-	ND	-	ND
p-Isopropyltoluene (p-Cymene)	5	-	1.9	-	-	0.47 J	-	-	ND	-	ND	-	ND	ND	ND	-	ND	-	ND
sec-Butylbenzene	5	-	ND	-	-	0.38 J	-	-	ND	-	ND	-	ND	ND	ND	-	ND	-	ND
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.58	-	-	ND	ND	ND	ND
Toluene	5	18	13	11 D	29	5.8	2.3 DJ	7.6	7.7	ND	ND	2.3 J	1.6 J	1 J	1.7 J	1.5 J	ND	1.3 J	8 J
Trichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.7	2.8	-	-	ND	ND	ND	ND
Xylenes, Total	5	820 D	550	600 D	91	16	9.5 D	17	24	ND	ND	16	5.1	4.7 J	5	ND	ND	ND	ND
SVOCs (Method 8270C, 8270D) - ug/L																					
2,4,6-Trichlorophenol	See Note 3	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND	-	-	ND	ND	ND	ND
2,4-Dichlorophenol	See Note 3	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND	-	-	ND	ND	ND	ND
2,4-Dimethylphenol	See Note 3	56 J	22	17	5.1 J	-	2.4 J	ND	-	ND	-	4.9 J	3.3 J	-	-	ND	ND	ND	9.4 J
2-Chloronaphthalene	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	-	-	12	12	-	0.51	ND	-	3.5	-	ND	-	17	38 D	17	-	2.2	-	0.72 J
2-Methylphenol (o-Cresol)	See Note 3	52 J	13	-	4.6 J	-	-	78 J	-	ND	-	6.5 J	2.9 J	-	-	ND	ND	ND	8.2 J
3,4-Methylphenol (m,p-Cresol)	See Note 3	68 J	20	25	19 J	-	2.6 J	110 J	-	ND	-	6.9 J	4.3 J	-	-	5 J	ND	28 J	27 J
4,6-Dinitro-2-methylphenol	See Note 3	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND	-	-	ND	ND	ND	ND
Acenaphthene	20	-	3.8	4.3	-	ND	ND	-	0.99	-	ND	-	18	8.6	3.1	-	0.74	-	ND
Acenaphthylene	-	26 J	15	18	ND	ND	ND	ND	ND	ND	ND	24	5.8	10	13	1.6 J	0.77	ND	ND
Acetophenone	-	-	ND	ND	-	ND	ND	-	0.72 J	-	ND	-	ND	-	ND	-	ND	-	ND
Anthracene	50	ND	1.4	1.9	ND	ND	ND	ND	0.97	ND	ND	1.5 J	1.2	1.4	1.3 J	1.6 J	0.9	ND	ND
Benzo(a)anthracene	0.002	ND	0.26	0.37	ND	0.14 J	0.02 J	ND	ND	ND	ND	ND	0.65	0.28	ND	ND	0.06 J	ND	ND
Benzo(a)pyrene	0 (ND)	ND	0.14 J	0.3	ND	0.11 J	ND	ND	ND	ND	ND	ND	0.34	0.1 J	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	0.002	-	0.29	0.47	-	0.24	ND	-	ND	-	ND	-	0.48	0.14	ND	-	ND	-	ND
Benzo(ghi)perylene	-	-	0.1 J	0.07 J	-	0.08 J	ND	-	ND	-	ND	-	0.09 J	0.06 J	ND	-	ND	-	ND
Benzo(k)fluoranthene	0.002	-	0.16 J	0.18	-	0.15 J	ND	-	ND	-	ND	-	0.34	0.05 J	ND	-	ND	-	ND
Benzyl Alcohol	-	-	ND	-	-	ND	-	-	22	-	ND	-	ND	-	ND	-	ND	-	ND
Biphenyl	5	-	2.1	1.9 J	-	ND	ND	-	0.52 J	-	ND	-	7.4	-	3.6	-	ND	-	ND
Bis(2-ethylhexyl)phthalate	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND
Caprolactam	-	-	-	ND	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	-	-	49	46	-	ND	0.71 J	-	ND	-	ND	-	2.3	-	9.3	-	2.2	-	1.6 J
Chrysene	0.002	ND	0.15 J	0.31	ND	0.06 J	ND	ND	ND	ND	ND	ND	0.57	0.21	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	-	-	ND	0.03 J	-	ND	ND	-	ND	-	ND	-	ND	ND	ND	-	ND	-	ND
Dibenzofuran	-	-	8.3	5.9	-	ND	ND	-	ND	-	ND	-	13	-	10	-	ND	-	ND
Diethyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND
Di-n-butyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND
Di-n-octyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND
Fluoranthene	50	ND	1.5	2.4	ND	ND	ND	ND	1.2	ND	0.14 J	4 J	4.5	3.8	3.6	2.4 J	1.2	ND	ND
Fluorene	50	ND	8.6	11	ND	0.13 J	ND	ND	2.5	ND	ND	25	7.4	9.3	9.2	6.1 J	3.5	ND	0.82 J
Indeno(1,2,3-cd)Pyrene	0.002	-	0.2	0.1	-	0.18 J	ND	-	ND	-	ND	-	0.1 J	0.06 J	ND	-	ND	-	ND
Naphthalene	10	340	250 D	270 D	2.4 J	0.53	ND	42 J	48	ND	0.14 J	230 D	2.1	160 D	140	26	7.3	200	160
Pentachlorophenol	See Note 3	ND	1.6	1.2	ND	-	ND	ND	-	ND	-	ND	1.2	2.1	-	ND	ND	ND	ND
Phenanthrene	50	15 J	8.9	10	ND	0.2	ND	ND	4	ND	ND	33	7.9	13	13	9.4 J	5.6	ND	0.69 J
Phenol	See Note 3	ND	ND	1.9 J	ND	-	0.9 J	2600 D	-	ND	-	2.6 J	ND	-	-	18	ND	160 J	98 J
Pyrene	50	ND	1.1	1.5	ND	0.11 J	ND	ND	0.69 J	ND	0.1 J	2.4 J	3.4	2.6	2.3	1.2 J	0.62	ND	ND
Pyridine	50	ND	-	-	ND	-	-	ND	-	ND	-	ND	-	-	-	4.9 J	-	ND	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug/L																					
Phenolic compounds (total phenols) [4]	1	176	57	45	29	-	5.9	2788	-	ND	-	21	12	-	-	23	ND	188	143

TABLE 4-31

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 2A

PARAMETERS [1]	GWQS/GV [2]	MW-2D2B — Sand/Dredge Spoils			MW-2D2D — Bedrock			MW-2U1B — Slag/Fill; Sand/Dredge Spoils		MWS-09 — Slag/Fill		MWS-11A — Slag/Fill				MWS-12A — Slag/Fill		MWS-12B — Slag/Fill; Sand	
		Nov-1999	Mar-2012	Jan-2019	Nov-1999	Mar-2012	Jan-2019	Nov-1999	Apr-2013	Nov-1999	Mar-2012	Nov-1999	May-2013	May-2017	Apr-2018	Nov-1999	Apr-2013	Nov-1999	Apr-2013
		RFI	CMS 2012 [5]	CMS 2019	RFI	CMS 2012	CMS 2019	RFI	CMS 2013	RFI	CMS 2012	RFI	CMS 2013 [5]	HWMU 2017	HWMU 2018	RFI	CMS 2013 [5,6]	RFI	CMS 2013 [5,6]
Filtered SVOCs (Method 8270D) - ug/L																			
Acenaphthene	**20**	-	-	0.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	**0.002**	-	-	**0.02 J**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	**0.002**	-	-	**0.01 J**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	-	-	-	0.02 J	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**10**	-	-	**150 D**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals - ug/L																			
Arsenic, Total	**25**	**29.9**	**29**	-	5.7 B	8	-	5.4 B	ND	ND	ND	ND	1.84	-	-	ND	ND	**31.6**	21.07
Barium, Total	**1000**	204	58	-	**22200**	**1540**	710.6	**9860**	**5755**	27.2 B	20	50.9 B	44.53	-	-	130 B	77.07	776 J	**1059**
Cadmium, Total	**5**	0.25 B	-	-	0.98 B	-	-	ND	-	ND	-	ND	-	-	-	0.33 B	-	ND	-
Chromium, Total	**50**	**91.2**	ND	-	**57.9**	**210**	-	1.4 B	ND	40.4	20	1.9 B	15.34	-	-	3.3 B	ND	6	ND
Cyanide, Total	**200**	100	-	-	ND	-	-	ND	-	ND	-	0.21	-	-	-	0.062	-	0.15 J	-
Lead, Total	**25**	**31.1**	ND	-	ND	**27**	-	ND	ND	ND	ND	3.5	2.65	-	-	1.3 B	ND	ND	ND
Selenium, Total	**10**	ND	ND	-	ND	ND	-	**R**	**68.4**	5.7	6 J	**12.6**	8.18	-	-	**17.3**	**33.2 J**	6	**42.2 J**
Dissolved Metals - ug/L																			
Arsenic, Dissolved	**25**	**28.8**	-	-	4.6 B	ND	-	5.9 B	-	ND	-	3 B	-	-	-	2.5 B	-	**26.9**	-
Barium, Dissolved	**1000**	124 B	-	-	**21400**	993	970.3	**9850**	-	26.4 B	-	52.7 B	-	-	-	102 B	-	680	-
Cadmium, Dissolved	**5**	ND	-	-	ND	-	-	ND	-	0.29 B	-	ND	-	-	-	0.26 B	-	ND	-
Chromium, Dissolved	**50**	0.84 B	-	-	4.7 B	20	-	0.61 B	-	0.51 B	-	ND	-	-	-	ND	-	ND	-
Lead, Dissolved	**25**	ND	-	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	-	ND	-
Selenium, Dissolved	**10**	ND	-	-	3.1 B	ND	-	**R**	-	4.9 B	-	8.2	-	-	-	**14**	-	4.7 B	-
Field Measurements																			
Dissolved Oxygen (mg/L)	-	0.4	0.86	0.11	0.4	0.01	0.66	0.3	NA	0.9	5.4	0.5	NA	0.93	1.14	0.3	1.57	0.5	0.62
Field pH (S.U.)	**12.5**	10.39	10.48	10.74	6.20	6.95	6.70	11.95	12.10	11.72	11.46	11.92	11.86	12.33	**12.75**	12.06	11.96	10.31	10.51
Redox Potential (mV)	-	-65	-284	-270	104	-217	-294	-551	-530	128	-116	-77	-314	-305	-284	-511	-407	-412	-422
Specific Conductance (uhos/cm)	-	1,930	1174	969.6	6,630	8003	7378	8400	6631	3,210	1912	3480	2620	2297	2211	3500	1852	16000	7930
Temperature (deg C)	-	21.0	16.7	13.8	19.2	13.5	11.7	17.4	15.3	14.0	12.3	18.3	16.4	13.5	15.3	13.3	13.6	13.4	13.9
Turbidity (NTU)	-	59.9	17.22	18.8	135	203.7	36.6	140	5.62	65.8	14.59	11.3	13.7	3	5.78	190	4.17	990	14.5

Notes:

1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/Guldance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).

Definitions

B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
\- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groundwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TurnKey Environmental Restoration, LLC

Benchmark Environmental Engineering & Science, PLLC

TABLE 4-31

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 2A

PARAMETERS [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																
		MWS-13 — Slag/Fill		MWS-14 — Slag/Fill; Sand		MWS-14B — Slag/Fill; Sand		MWS-15 — Slag/Fill		MWS-25A — Slag/Fill		MWS-25B — Slag/Fill; Sand; Clay		MWS-26A — Slag/Fill; Sand/Dredge Spoils			MWS-29A — Slag/Fill	
		Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Mar-2012	Jan-2019	Dec-2000	Apr-2013
		RFI	CMS 2013	RFI	CMS 2013 [5,6]	RFI	CMS 2013 [5,6]	RFI	CMS 2013	RFI	CMS 2013	RFI	CMS 2013	RFI	CMS 2012	CMS 2019	RFI	CMS 2013
VOCs (Method 8260B, 8260C, 8021B) - ug/L																		
1,1-Dichloroethane	5	1.5 J	1.1 J	4.3 J	3.6	6.5	ND	4.4 J	ND	67	27	92	40	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	-	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	ND
1,2,4-Trichlorobenzene	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	ND	-	ND
1,2,4-Trimethylbenzene	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	ND
1,2-Dichlorobenzene	3	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	ND	-	ND
1,2-Dichloroethane	0.6	ND	ND	1.4 J	1.5	ND	ND	ND	ND	ND	7	ND	13	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	ND
1,3-Dichlorobenzene	3	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	ND	-	ND
1,4-Dichlorobenzene	3	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	ND	-	ND
1,4-Diethylbenzene	-	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	ND
2-Butanone	50	-	4 J	-	1.9 J	-	ND	-	ND	-	1.5 J	-	ND	-	ND	ND	-	ND
4-Ethyltoluene	-	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	ND
Acetone	50	-	34	-	18	-	28 J	-	1.1 J	-	22	-	ND	-	ND	ND	-	ND
Benzene	1	ND	3.5	3.6 J	2.7	42	54	8.4	10	95	37	210	62	2.8 J	ND	0.39 J	2.4 J	ND
Carbon disulfide	60	-	4.1 J	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	ND	-	ND
cis-1,2-Dichloroethene	5	-	ND	-	ND	-	ND	-	ND	-	1.1 J	-	1.7 J	-	ND	ND	-	ND
Cyclohexane	-	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	ND	-	ND
Ethylbenzene	5	ND	ND	ND	ND	ND	ND	6.7	0.79 J	ND	ND	ND	ND	5.3	ND	ND	ND	ND
Isopropylbenzene	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	ND	-	ND
Methyl cyclohexane	-	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	ND	-	ND
Methyl tert butyl ether	10	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	ND	-	ND
Methylene chloride	5	ND	ND	1.2 J	1.2 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	ND
n-Propylbenzene	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	ND
p-Isopropyltoluene (p-Cymene)	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	ND
sec-Butylbenzene	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	ND
Tetrachloroethene	5	ND	ND	ND	0.34 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ND	0.76 J	ND	ND	6.3	ND	2.2 J	ND	ND	ND	ND	0.72 J	1.7 J	ND	ND	ND	ND
Trichloroethene	5	ND	ND	ND	0.89	ND	ND	3 J	0.29 J	ND	ND	ND	ND	ND	0.28 J	0.58	ND	ND
Xylenes, Total	5	ND	ND	ND	ND	6.2	ND	34	2 J	ND	0.85 J	ND	1.1 J	37	ND	1.3 J	ND	ND
SVOCs (Method 8270C, 8270D) - ug/L																		
2,4,6-Trichlorophenol	See Note 3	ND	-	ND	ND	ND	ND	ND	-	ND	-	1.6 J	-	ND	-	ND	ND	-
2,4-Dichlorophenol	See Note 3	ND	-	ND	ND	ND	ND	ND	-	ND	-	4.3 J	-	ND	-	ND	ND	-
2,4-Dimethylphenol	See Note 3	ND	-	ND	1.7 J	23	7.9 J	ND	-	ND	-	7.1 J	-	ND	-	ND	ND	-
2-Chloronaphthalene	10	ND	ND	ND	ND	ND	ND	ND	ND	3.4 J	ND	4.5 J	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	-	-	1	-	6.3	-	60	-	0.16 J	-	0.43	-	0.54	-	ND	ND	-	0.1 J
2-Methylphenol (o-Cresol)	See Note 3	ND	-	ND	1.6 J	23	7.5 J	ND	-	ND	-	4.6 J	-	ND	-	-	ND	-
3,4-Methylphenol (m,p-Cresol)	See Note 3	ND	-	ND	4 J	84	16 J	ND	-	ND	-	ND	-	ND	-	ND	ND	-
4,6-Dinitro-2-methylphenol	See Note 3	ND	-	ND	ND	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	ND	-
Acenaphthene	20	-	0.37	-	1.6	-	26	-	1.3	-	0.27	-	0.33	-	0.11 J	ND	-	0.08 J
Acenaphthylene	-	ND	ND	29	9.6	64	53	6.1 J	0.96	ND	0.25	ND	0.3	6.3 J	0.21	ND	ND	0.14 J
Acetophenone	-	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	ND	-	ND
Anthracene	50	ND	0.34	5.6 J	2.4	7.1 J	8.9	ND	0.6	ND	0.27	ND	0.34	ND	ND	ND	ND	0.14 J
Benzo(a)anthracene	0.002	ND	ND	1.4 J	0.28 J	ND	ND	ND	0.11 J	ND	0.06 J	ND	ND	ND	0.15 J	0.05 J	ND	0.13 J
Benzo(a)pyrene	0 (ND)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12 J	ND	ND	0.08 J
Benzo(b)fluoranthene	0.002	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	0.27 J	0.02 J	-	0.1 J
Benzo(ghi)perylene	-	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	ND	-	ND
Benzo(k)fluoranthene	0.002	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	0.15 J	ND	-	0.07 J
Benzyl Alcohol	-	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	ND
Biphenyl	5	-	ND	-	1.1 J	-	12	-	ND	-	ND	-	ND	-	ND	ND	-	ND
Bis(2-ethylhexyl)phthalate	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Caprolactam	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-
Carbazole	-	-	ND	-	11	-	98	-	ND	-	ND	-	ND	-	ND	0.99 J	-	ND
Chrysene	0.002	ND	ND	ND	ND	ND	ND	ND	0.08 J	ND	ND	ND	ND	ND	0.09 J	0.04 J	ND	0.14 J
Dibenzo(a,h)anthracene	-	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	ND	-	ND
Dibenzofuran	-	-	ND	-	5.4	-	43	-	0.93 J	-	ND	-	ND	-	ND	0.52 J	-	ND
Diethyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	50	ND	0.32	10 J	4.3	10 J	8.8	1.2 J	0.82	ND	0.62	ND	0.72	1.6 J	0.32	ND	ND	0.56
Fluorene	50	ND	1.7	26	12	51	51	2.6 J	1.6	ND	1	1.4 J	1.7	2.9 J	0.07 J	ND	ND	0.33
Indeno(1,2,3-cd)Pyrene	0.002	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	0.19 J	ND	-	ND
Naphthalene	10	3.2 J	5.7	100	35	670 D	580 D	44	2	9 J	3.2	10	2.7	43	0.14 J	ND	ND	0.3
Pentachlorophenol	See Note 3	ND	-	ND	ND	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	ND	-
Phenanthrene	50	ND	2.1	41	18	56	55	4.2 J	0.85	3.2 J	2	2.2 J	2.3	4.2 J	0.09 J	ND	ND	1
Phenol	See Note 3	ND	-	17	26 J	78	ND	ND	-	ND	-	ND	-	ND	-	ND	ND	-
Pyrene	50	ND	0.2	6.5 J	2.9	8.8 J	4.8 J	ND	0.7	ND	0.37	ND	0.41	ND	0.48	0.76	ND	0.36
Pyridine	50	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	ND	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug/L																		
Phenolic compounds (total phenols) [4]	1	ND	-	17	33	208	31	ND	-	ND	-	18	-	ND	-	ND	ND	-

TABLE 4-31

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 2A

PARAMETERS [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																
		MWS-13 — Slag/Fill		MWS-14 — Slag/Fill; Sand		MWS-14B — Slag/Fill; Sand		MWS-15 — Slag/Fill		MWS-25A — Slag/Fill		MWS-25B — Slag/Fill; Sand; Clay		MWS-26A — Slag/Fill; Sand/Dredge Spoils			MWS-29A — Slag/Fill	
		Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Mar-2012	Jan-2019	Dec-2000	Apr-2013
		RFI	CMS 2013	RFI	CMS 2013 [5,6]	RFI	CMS 2013 [5,6]	RFI	CMS 2013	RFI	CMS 2013	RFI	CMS 2013	RFI	CMS 2012	CMS 2019	RFI	CMS 2013
Filtered SVOCs (Method 8270D) - ug/L																		
Acenaphthene	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals - ug/L																		
Arsenic, Total	**25**	ND	ND	2.1 B	2.06 J	5 B	3.81 J	ND	ND	7.5 B	ND	11.9	ND	3.6 B	ND	-	11.6	13.27
Barium, Total	**1000**	122 B	609	423	225.6	75.3 B	55.47	57.1 B	83.64	183 B	67.51	127 JB	28.92	39.4 B	17	-	47.9 B	26.48
Cadmium, Total	**5**	ND	-	0.53 B	-	ND	-	ND	-	0.44 B	-	ND	-	ND	-	-	ND	-
Chromium, Total	**50**	1.6 B	3.8 J	23.9 J	6.46 J	8.9	16.82	1.5 B	ND	**140**	5.87 J	46.8	ND	33.6	10	-	15.7	26.45
Cyanide, Total	**200**	0.066 J	-	ND	-	0.01	-	ND	-	0.011	-	0.02 J	-	11	-	-	0.024 J	-
Lead, Total	**25**	ND	ND	8	3.86 J	6.7	10.97	ND	ND	24.2	ND	12.1	ND	9	ND	-	ND	ND
Selenium, Total	**10**	**16.4**	7.07 J	9.2	4.23 J	ND	ND	5	ND	ND	ND	2.2 B	ND	8.1	ND	-	6.7	6.65 J
Dissolved Metals - ug/L																		
Arsenic, Dissolved	**25**	-	-	3.6 JB	-	4.3 B	-	-	-	4.8 B	-	4.1 B	-	1.9 B	-	-	11.7	-
Barium, Dissolved	**1000**	-	-	782 J	-	65.6 B	-	-	-	46.6 B	-	41.9 B	-	34.3 B	-	-	45.9 B	-
Cadmium, Dissolved	**5**	-	-	0.26 B	-	ND	-	-	-	0.28 B	-	ND	-	ND	-	-	ND	-
Chromium, Dissolved	**50**	-	-	2.7 B	-	ND	-	-	-	1.6 B	-	ND	-	0.5 B	-	-	14.4	-
Lead, Dissolved	**25**	-	-	7.5	-	ND	-	-	-	ND	-	ND	-	ND	-	-	ND	-
Selenium, Dissolved	**10**	-	-	ND	-	ND	-	-	-	2 B	-	ND	-	7.6	-	-	7.3 J	-
Field Measurements																		
Dissolved Oxygen (mg/L)	**-**	0.5	0.04	1.5	3.36	0.4	1.75	0.4	1.43	8.9	2.76	0.3	1.47	1.6	3.93	2.46	10.48	9.98
Field pH (S.U.)	**12.5**	11.70	12.20	12.37	12.04	10.74	10.64	11.84	8.19	10.70	10.85	9.40	10.98	11.20	10.53	11.55	8.42	8.38
Redox Potential (mV)	**-**	93	-495	-217	-315	-340	-354	-84	-281	-167	-131	-700	-149	94	-106	-171	-160	153
Specific Conductance (uhos/cm)	**-**	3950	4049	5900	2349	4800	2985	3830	753.6	5000	5624	5000	2803	1,960	7936	1572	5890	593.8
Temperature (deg C)	**-**	18.6	16.1	14.1	16.2	13.0	15	16.6	13.8	11.0	13.1	11.5	12.1	19.0	10.3	9.7	11.3	13
Turbidity (NTU)	**-**	4.1	18.1	53	11.4	72	115	0.4	12	400	25.9	280	7.4	60.5	0.08	9.7	55.5	29.2

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/GuIdance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
\- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groudwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TABLE 4-32

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 2B

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program: MWS-01 — Slag/Fill			MWS-01B — Slag/Fill; Sand/Dredge Spoils			MWS-02 — Slag/Fill							MWS-03 — Slag/Fill		MWS-10 — Slag/Fill		MWS-10B — Slag/Fill; Clay; Sand		MWS-18A — Slag/Fill						
		Nov-1999	Mar-2012	Jan-2019	Nov-1999	Mar-2012	Jan-2019	Nov-1999	Feb-2012	Apr-2014	Apr-2015	Apr-2016	Apr-2017	Apr-2018	Nov-1999	Mar-2012	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Feb-2012	Apr-2014	Apr-2015	Apr-2016	Apr-2017	Apr-2018
		RFI	CMS 2012 [5]	CMS 2019	RFI	CMS 2012 [5]	CMS 2019	RFI	CMS 2012 [5,6]	CMS 2014	CMS 2015	CMS 2016	CMS 2017	CMS 2018	RFI	CMS 2012	RFI	CMS 2013	RFI	CMS 2013	RFI	CMS 2012	CMS 2014	CMS 2015	CMS 2016	CMS 2017	CMS 2018
VOCs (Method 8260B, 8260C, 8021B) - ug/L																											
1,1-Dichloroethane	**5**	2.7 J	0.93 J	ND	4.1 J	1.7	ND	**8.3**	**9.8**	1.1 J	1 J	1.2 J	3	ND	ND	ND	1.9 J	4.8	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	**-**	-	ND	-	-	0.48 J	-	-	0.31 J	-	-	-	-	-	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-
1,2,4-Trimethylbenzene	**5**	-	ND	-	-	4.6	-	-	ND	ND	ND	ND	1 J	-	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	-
1,2-Dichloroethane	**0.6**	ND	ND	ND	ND	ND	ND	ND	**1.7**	ND	0.43 J	**0.91**	**2.6**	0.21 J	ND	ND	**9.2 J**	**6.1**	ND	ND	ND	ND	ND	ND	ND	**110**	ND
1,3,5-Trimethylbenzene	**5**	-	ND	-	-	2.7	-	-	0.54 J	ND	ND	ND	ND	-	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	-
1,4-Diethylbenzene	**-**	-	ND	-	-	1.8 J	-	-	0.55 J	-	-	-	-	-	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-
4-Ethyltoluene	**-**	-	ND	-	-	1.7 J	-	-	ND	-	-	-	-	-	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-
Acetone	**50**	-	ND	ND	-	2.7 J	6.9 DJ	-	ND	7.2	14	2	5.1	7.8	-	ND	-	5.6	-	**64**	-	ND	ND	ND	ND	ND	ND
Benzene	**1**	**67**	**1.4**	**34 D**	**16**	**2.9**	**11 D**	**14**	0.49 J	**2.1**	**8.5**	**4.1**	**12**	1	ND	ND	**5.4**	**75**	**740**	**510**	**140000**	**39000 D**	**4200 D**	**7100 D**	**7000 D**	**4600 D**	**1900 D**
Bromomethane	**5**	ND	ND	ND	ND	ND	**R**	ND	ND	ND	1.5 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	**60**	-	ND	ND	-	0.34 J	ND	-	ND	ND	ND	ND	ND	ND	-	0.8 J	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	**5**	-	ND	ND	-	ND	ND	-	ND	ND	ND	ND	ND	-	-	ND	-	**10**	-	ND	-	ND	ND	ND	ND	ND	-
Cyclohexane	**-**	-	ND	ND	-	0.51 J	ND	-	0.37 J	0.4 J	0.84 J	0.93 J	1.5 J	ND	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND
Ethylbenzene	**5**	**21**	0.87 J	**12 D**	ND	0.32 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	**5**	-	ND	ND	-	ND	ND	-	ND	ND	2.3 J	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND
Methyl cyclohexane	**-**	-	ND	ND	-	ND	ND	-	ND	2.2 J	3.6 J	3.3 J	8.7 J	1 J	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND
Methylene chloride	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene (p-Cymene)	**5**	-	ND	-	-	0.56	-	-	ND	ND	2.3 J	ND	ND	-	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	-
Styrene	**5**	-	ND	**9.2 DJ**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND
Tetrachloroethene	**5**	ND	ND	ND	ND	ND	ND	ND	0.38 J	ND	ND	0.3 J	0.52 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	**5**	**130**	ND	**36 D**	4.8 J	1.5	3.1 DJ	1.2 J	ND	ND	1.3 J	ND	1.1 J	ND	ND	ND	ND	3.2	**21 J**	**23 J**	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**5.4**	**6.8**	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	**5**	ND	0.91 J	ND	ND	ND	ND	ND	0.57	ND	0.32 J	0.4 J	1	ND	ND	ND	ND	0.22 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	**2**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.77 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes, Total	**5**	**350**	**5.5 J**	**152 D**	4.4 J	2.9	ND	1.9 J	ND	ND	ND	ND	0.85 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SVOCs (Method 8270C, 8270D) - ug/L																											
2,4-Dimethylphenol	**See Note 3**	ND	ND	2.4 J	24	94	12 D	**R**	ND	ND	ND	ND	ND	ND	ND	-	ND	-	ND	-	21 J	-	1.8 J	0.81 J	ND	ND	ND
2-Chloronaphthalene	**10**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.79	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	**-**	-	0.78	21	-	23 D	12 D	-	0.16 J	0.65	0.21 J	1.9	2.4	0.27	-	ND	-	ND	-	1	-	0.12 J	0.08 J	0.09 J	0.19 J	0.15 J	0.11
2-Methylphenol (o-Cresol)	**See Note 3**	ND	ND	-	16	45	-	**R**	ND	ND	ND	-	-	-	ND	-	ND	-	980 J	-	31	-	6.8	3.5 J	-	-	-
3,4-Methylphenol (m,p-Cresol)	**See Note 3**	ND	ND	5.7	42	140	39 D	**R**	ND	ND	ND	ND	ND	ND	ND	-	7.8 J	-	5400 J	-	ND	-	1.8 J	8.4	1.6 J	ND	ND
Acenaphthene	**20**	-	0.84	4.1	-	9.8	5.2 D	-	0.29	0.15 J	ND	0.46	0.53	0.1	-	ND	-	ND	-	0.65	-	0.1 J	0.08 J	0.08 J	ND	0.09 J	0.06 J
Acenaphthylene	**-**	83 J	3.8	17	18	13	6.4 D	ND	0.7	0.47	ND	1.5	1.8	0.32	ND	ND	ND	ND	ND	ND	ND	0.05 J	ND	ND	ND	0.06 J	0.05 J
Acetophenone	**-**	-	ND	ND	-	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-	ND	-	ND	-	48	1.9 J	1.1 J	ND	ND	ND
Anthracene	**50**	13 J	0.13 J	2.8	2.6 J	2.5	ND	ND	0.18 J	0.36	0.19 J	1.3 J	1.3	0.13	ND	ND	ND	ND	ND	0.54	ND	ND	0.07 J	0.07 J	ND	0.04 J	0.04 J
Benzo(a)anthracene	**0.002**	ND	**0.16 J**	**0.2**	**1.1 J**	**2.1**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	**0 (ND)**	ND	ND	**0.07 J**	ND	**1.8**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	**0.002**	-	ND	**0.1**	-	**2.4**	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND
Benzo(ghi)perylene	**-**	-	ND	0.02 J	-	1.5	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	**0.002**	-	ND	**0.04 J**	-	**1.1**	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND
Benzoic Acid	**-**	-	ND	-	-	ND	-	-	-	ND	9.1 J	-	-	-	-	-	-	-	-	-	-	-	ND	8.2 J	-	-	-
Biphenyl	**5**	-	ND	4.6	-	**5.1**	2.8 DJ	-	ND	ND	ND	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate	**5**	ND	ND	ND	ND	**11**	ND	3.8 J	ND	ND	2.3 J	ND	ND	3.9	ND	ND	ND	ND	ND	ND	ND	ND	1.3 J	**11**	ND	ND	ND
Caprolactam	**-**	-	-	ND	-	-	ND	-	-	ND	2.7 J	3.9 J	ND	ND	-	-	-	-	-	ND	-	-	ND	ND	ND	ND	ND
Carbazole	**-**	-	4.5	33	-	18	18 D	-	ND	0.5 J	ND	1.1 J	1.1 J	ND	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND
Chrysene	**0.002**	ND	**0.08 J**	**0.14**	ND	**2**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	**-**	-	ND	ND	-	0.51	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND
Dibenzofuran	**-**	-	3.3	15	-	13	5.3 D	-	ND	0.81 J	ND	2.2	ND	ND	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND
Fluoranthene	**50**	ND	1.7	4	3.6 J	3.9	ND	2.2 J	1.3	0.38	0.11 J	1.4 J	1.2	0.18	ND	0.06 J	ND	ND	ND	ND	ND	ND	0.05 J	ND	ND	ND	ND
Fluorene	**50**	**57 J**	3.6	21	12	10	5.5 D	8.6 J	1.2	1.5	0.24	4.9	4.7	0.59	ND	ND	ND	ND	ND	1	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)Pyrene	**0.002**	-	ND	**0.02 J**	-	**1.4**	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND
Naphthalene	**10**	**1000 D**	1.2	**470 D**	**630 D**	**540 D**	**280 D**	**25**	0.27	2.2	0.87	6	9.1	0.94	2.7 J	ND	ND	0.07 J	ND	9.5	ND	1.4	1.2	1.4	2.9	2.8	2.3
Pentachlorophenol	**See Note 3**	ND	ND	ND	ND	2.3	ND	**R**	ND	ND	ND	ND	1.1	ND	ND	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND
Phenanthrene	**50**	**80 J**	1	27	13	11	ND	14	0.2	2.6	0.27	9.5	8.4	0.49	ND	ND	ND	ND	ND	1.8	ND	0.16 J	0.12 J	0.09 J	ND	0.06 J	0.03 J
Phenol	**See Note 3**	ND	ND	ND	150 D	170	69 D	**R**	ND	ND	2.5 J	ND	ND	ND	ND	-	44	-	29000	-	110	-	1.4 J	12	4.2 J	ND	ND
Pyrene	**50**	ND	1.2	2.3	2.7 J	3.8	ND	1.3 J	0.88	0.26	0.11 J	0.72	ND	0.15	ND	0.06 J	ND	0.09 J	ND	0.14 J	ND	ND	ND	ND	ND	ND	ND
Pyridine	**50**	ND	-	-	ND	-	-	ND	-	-	-	-	-	-	ND	-	ND	-	ND	-	**150 J**	-	-	-	-	-	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug/L																											
Phenolic compounds (total phenols) [4]	**1**	ND	ND	**8.1**	**232**	**451**	**120**	-	ND	ND	**2.5**	ND	**1.1**	ND	ND	-	**52**	-	**35380**	-	**162**	-	**12**	**25**	**5.8**	ND	ND

TABLE 4-32

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 2B

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																									
		MWS-01 — Slag/Fill			MWS-01B — Slag/Fill; Sand/Dredge Spoils			MWS-02 — Slag/Fill							MWS-03 — Slag/Fill		MWS-10 — Slag/Fill		MWS-10B — Slag/Fill; Clay; Sand		MWS-18A — Slag/Fill						
		Nov-1999	Mar-2012	Jan-2019	Nov-1999	Mar-2012	Jan-2019	Nov-1999	Feb-2012	Apr-2014	Apr-2015	Apr-2016	Apr-2017	Apr-2018	Nov-1999	Mar-2012	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Feb-2012	Apr-2014	Apr-2015	Apr-2016	Apr-2017	Apr-2018
		RFI	CMS 2012 [5]	CMS 2019	RFI	CMS 2012 [5]	CMS 2019	RFI	CMS 2012 [5,6]	CMS 2014	CMS 2015	CMS 2016	CMS 2017	CMS 2018	RFI	CMS 2012	RFI	CMS 2013	RFI	CMS 2013	RFI	CMS 2012	CMS 2014	CMS 2015	CMS 2016	CMS 2017	CMS 2018
Filtered SVOCs (Method 8270D) - ug/L																											
Acenaphthene	**20**	-	-	-	-	-	0.91	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	**-**	-	-	-	-	-	2.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	**50**	-	-	-	-	-	0.02 J	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**10**	-	-	-	-	-	**190 D**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals - ug/L																											
Arsenic, Total	**25**	5.9 B	ND	-	17.1	**45**	-	2.3 B	4 J	1.33	1.88	4.4 J	6.19	1.33	3.5 B	4 J	**740 J**	**544.3**	20.7 J	7.37	7.7 B	4 J	3.71	3.95	7.5	3.57	5.43
Barium, Total	**1000**	58.4 B	36	-	**1620 J**	**1820**	842.3	37.6 B	41	42.29	38.94	33	18.5	31.95	76.9 B	71	596	546.9	**6010**	**2539**	40.6 B	24	26.03	27.56	24.7	19.76	17.41
Cadmium, Total	**5**	ND	-	-	2.7	-	-	ND	-	-	-	-	-	-	ND	-	ND	-	1.3 B	-	ND	-	-	-	-	-	-
Chromium, Total	**50**	2.3 B	ND	-	35.6	**90**	-	7.1	3 J	8.24	18.14 J	16 J	9.59	20.12	3.2 B	ND	**168 J**	26.84	38.1 J	**50.07**	**53.1**	5 J	9.89	8.34	ND	3.96	6.77
Cyanide, Total	**200**	120	-	-	100	-	-	**1200**	**1850**	**8250**	**8140**	**1860**	92	**6440**	16	-	0.012	-	0.3	-	**530 J**	**445**	**417**	**330**	**382**	**332**	**249**
Lead, Total	**25**	ND	ND	-	**278**	**601**	-	ND	3 J	0.27 J	0.8 J	ND	23.79	ND	ND	ND	**45.9 J**	9.77 J	4.5	2.98 J	7.3	4 J	2.09	1.24	ND	3.44	ND
Selenium, Total	**10**	8 J	-	-	ND	-	-	8	-	-	-	-	-	-	4.3 B	-	ND	ND	**R**	**105 J**	ND	-	-	-	-	-	-
Dissolved Metals - ug/L																											
Arsenic, Dissolved	**25**	6.3 B	-	-	6.9 JB	12	-	2.2 B	-	-	-	-	-	-	3.7 B	-	3.4 B	-	15	-	6.1 B	-	-	-	-	-	-
Barium, Dissolved	**1000**	58.3 B	-	-	**1520 J**	996	886.3	35.9 B	-	-	-	-	-	-	75.2 B	-	19.1 B	-	**6390**	-	20.1 B	-	-	-	-	-	-
Cadmium, Dissolved	**5**	ND	-	-	ND	-	-	ND	-	-	-	-	-	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	-
Chromium, Dissolved	**50**	ND	-	-	0.73 B	10	-	0.56 B	-	-	-	-	-	-	ND	-	ND	-	ND	-	2.8 B	-	-	-	-	-	-
Lead, Dissolved	**25**	ND	-	-	ND	12	-	ND	-	-	-	-	-	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	-
Selenium, Dissolved	**10**	9.9 J	-	-	ND	-	-	5.8	-	-	-	-	-	-	1.6 B	-	ND	-	**R**	-	ND	-	-	-	-	-	-
Field Measurements																											
Dissolved Oxygen (mg/L)	**-**	0.4	0.16	1.58	1.5	0.78	2.26	1.4	4.06	-	1.85	3.6	2.27	3.66	0.6	2.95	0.4	0.28	NA	NA	0.4	2.5	-	3.63	2.08	2.77	2.1
Field pH (S.U.)	**12.5**	11.27	9.04	10.70	8.25	8.81	8.52	11.07	10.99	10.30	10.75	10.67	11.41	10.68	10.94	9.68	7.41	7.14	11.47	11.08	9.03	9.28	9.47	8.85	8.73	10.34	9.84
Redox Potential (mV)	**-**	-386	-128	-230	366	-119	-158	-156	-156	205	210	-81	-245	221	-330	-211	226	-147	-126	-638	-474	-103	-104	-54	-92	-1.23	-120
Specific Conductance (umhos/cm)	**-**	1,960	1139	1108	4,740	2572	2794	2,590	2280	2053	1905	1803	2096	1639	1,000	713.9	3550	3450	1140	9493	4,700	3323	2649	2623	2767	2470	2725
Temperature (deg C)	**-**	17.4	16.2	11.3	15.5	10.6	9.0	14.8	10.1	13.1	13.6	11.3	12.9	7.9	14.0	10.0	15.0	15.2	15.0	15.4	15.3	12.2	13.7	13.7	9.1	13.2	8.4
Turbidity (NTU)	**-**	15	0.59	2.39	245	512	6.41	18	14.6	1.96	8.9	8	4.2	1.3	16	5.02	224	>1000	1000	>1000	91	17.4	16.4	30	14.6	5.64	3.4

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/Guidance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groundwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TABLE 4-32

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 2B

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																				
		MWS-18C — Slag/Fill; Clay; Sand							MWS-19A — Slag/Fill							MWS-19B — Slag/Fill; Sand						
		Dec-2000	Feb-2012	Apr-2014	Apr-2015	Apr-2016	Apr-2017	Apr-2018	Nov-1999	Feb-2012	Apr-2014	Apr-2015	Apr-2016	Apr-2017	Apr-2018	Nov-1999	Feb-2012	Apr-2014	Apr-2015	Apr-2016	Apr-2017	Apr-2018
		RFI	CMS 2012	CMS 2014	CMS 2015	CMS 2016	CMS 2017	CMS 2018	RFI	CMS 2012	CMS 2014	CMS 2015	CMS 2016	CMS 2017	CMS 2018	RFI	CMS 2012	CMS 2014	CMS 2015	CMS 2016	CMS 2017	CMS 2018
VOCs (Method 8260B, 8260C, 8021B) - ug/L																						
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	1.4 J	ND	1 J	1.5 J	1 J	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	-	-	ND	ND	ND	ND	-	-	-	ND	ND	ND	ND	-	-	-	ND	ND	ND	ND	-	-
1,2,4-Trimethylbenzene	5	-	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	-
1,2-Dichloroethane	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	5	-	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	-
1,4-Diethylbenzene	-	-	ND	-	-	-	-	-	-	ND	-	-	-	-	-	-	ND	-	-	-	-	-
4-Ethyltoluene	-	-	ND	-	-	-	-	-	-	ND	-	-	-	-	-	-	ND	-	-	-	-	-
Acetone	50	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND
Benzene	1	**65000 D**	**9600**	**340**	**910**	**4400**	**1400**	**43 D**	**1200**	ND	**34**	**70**	**56**	**40**	**13**	**27000**	**18000**	**2800 D**	**390 D**	**1500 D**	**5800 D**	**520 D**
Bromomethane	5	R	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	60	-	**660**	6.3 J	24 J	**480**	**140 J**	ND	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	5	-	ND	ND	ND	ND	ND	-	-	ND	ND	ND	0.77 J	ND	-	-	ND	ND	ND	ND	ND	-
Cyclohexane	-	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	0.47 J	ND	ND	-	ND	ND	1.3 J	ND	ND	ND
Ethylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	5	-	ND	ND	ND	ND	ND	ND	-	ND	ND	2.2 J	ND	ND	ND	-	ND	ND	ND	ND	ND	ND
Methyl cyclohexane	-	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND
Methylene chloride	5	1.1 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene (p-Cymene)	5	-	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	-
Styrene	5	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	**340 J**	**51 J**	ND	**11 J**	**140 J**	**72 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	2	ND	ND	ND	ND	ND	ND	ND	ND	0.84 J	ND	0.42 J	ND	0.32 J	0.21 J	ND	ND	ND	ND	ND	ND	ND
Xylenes, Total	5	**500 J**	**85 J**	ND	**9.3 J**	**150**	**54 J**	ND	**13 J**	2.6	ND	1.5 J	1.4 J	0.78 J	ND	ND	ND	ND	ND	ND	ND	ND
SVOCs (Method 8270C, 8270D) - ug/L																						
2,4-Dimethylphenol	See Note 3	20 J	-	1.8 J	5.4	12	4.8 J	ND	10	-	ND	ND	ND	ND	ND	73 J	-	19	14	ND	ND	ND
2-Chloronaphthalene	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.08 J	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	-	-	0.23	ND	ND	ND	0.07 J	ND	-	ND	ND	ND	ND	0.09 J	ND	-	ND	0.09 J	ND	ND	ND	ND
2-Methylphenol (o-Cresol)	See Note 3	19 J	-	ND	2.3 J	-	-	-	ND	-	ND	ND	-	-	-	150 J	-	ND	ND	-	-	-
3,4-Methylphenol (m,p-Cresol)	See Note 3	40 J	-	ND	9.5	31	9.9	ND	ND	-	ND	ND	ND	ND	ND	200 J	-	2.6 J	2.3 J	ND	ND	ND
Acenaphthene	20	-	ND	ND	ND	0.09 J	ND	ND	-	0.09 J	ND	0.07 J	ND	0.1	0.04 J	-	0.19 J	0.12 J	ND	0.11 J	0.1	0.05 J
Acenaphthylene	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.07 J	ND	ND	ND	ND	ND	ND	ND	ND
Acetophenone	-	-	4.6 J	2.9 J	9.3	43	11	ND	-	ND	ND	ND	ND	ND	ND	-	8.4	ND	ND	ND	ND	ND
Anthracene	50	ND	0.07 J	0.12 J	0.08 J	0.14 J	0.06 J	0.06 J	ND	0.07 J	0.07 J	0.09 J	ND	0.04 J	0.09 J	ND	ND	ND	ND	ND	0.05 J	0.04 J
Benzo(a)anthracene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.16**	ND	ND	ND	ND	ND	**0.04 J**	ND
Benzo(a)pyrene	0 (ND)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.14**	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	0.002	-	ND	ND	ND	ND	ND	ND	-	**0.16 J**	ND	ND	ND	ND	**0.18**	-	ND	ND	ND	ND	**0.05 J**	ND
Benzo(ghi)perylene	-	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	0.09 J	-	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	0.002	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	**0.08 J**	-	ND	ND	ND	ND	ND	ND
Benzoic Acid	-	-	-	ND	62	-	-	-	-	-	ND	ND	-	-	-	-	-	ND	ND	-	-	-
Biphenyl	5	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate	5	ND	ND	ND	**15**	ND	ND	**5.8**	4.4 J	ND	ND	**6.4**	ND	ND	3.6	ND	ND	ND	**11**	ND	ND	3.4
Caprolactam	-	-	-	22	16	ND	ND	ND	-	-	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND
Carbazole	-	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND
Chrysene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.16**	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	-	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	0.04 J	-	ND	ND	ND	ND	ND	ND
Dibenzofuran	-	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND
Fluoranthene	50	ND	ND	0.14 J	ND	ND	ND	ND	ND	0.08 J	ND	ND	ND	ND	0.24	ND	ND	ND	ND	ND	0.07 J	ND
Fluorene	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.06 J	0.08 J	ND	ND	0.09 J	ND	0.12 J	0.09 J	0.1
Indeno(1,2,3-cd)Pyrene	0.002	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	**0.1**	-	ND	ND	ND	ND	ND	ND
Naphthalene	10	ND	0.42	0.17 J	0.23	0.53	0.21	ND	ND	ND	ND	ND	ND	0.08 J	0.05 J	ND	0.61	0.52	0.39	ND	0.05 J	ND
Pentachlorophenol	See Note 3	ND	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND
Phenanthrene	50	ND	ND	0.08 J	ND	ND	0.04 J	ND	ND	0.07 J	ND	ND	ND	ND	0.18	ND	ND	0.12 J	0.09 J	ND	0.05 J	ND
Phenol	See Note 3	280 J	-	3.6 J	20	76	27	ND	19	-	ND	ND	ND	ND	ND	2100 D	-	1.2 J	0.59 J	ND	ND	ND
Pyrene	50	ND	ND	0.11 J	ND	ND	ND	ND	ND	0.07 J	ND	ND	ND	ND	0.2	ND	ND	ND	ND	ND	0.06 J	ND
Pyridine	50	**18000 D**	-	-	-	-	-	-	5.6 J	-	-	-	-	-	-	**3200 D**	-	-	-	-	-	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug/L																						
Phenolic compounds (total phenols) [4]	1	**359**	-	**5.4**	**37**	**119**	**42**	ND	**29**	-	ND	ND	ND	ND	ND	**2523**	-	**23**	**17**	ND	ND	ND

TABLE 4-32

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 2B

PARAMETER[1]	GWQS/GV[2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																				
		MWS-18C — Slag/Fill; Clay; Sand							MWS-19A — Slag/Fill							MWS-19B — Slag/Fill; Sand						
		Dec-2000	Feb-2012	Apr-2014	Apr-2015	Apr-2016	Apr-2017	Apr-2018	Nov-1999	Feb-2012	Apr-2014	Apr-2015	Apr-2016	Apr-2017	Apr-2018	Nov-1999	Feb-2012	Apr-2014	Apr-2015	Apr-2016	Apr-2017	Apr-2018
		RFI	CMS 2012	CMS 2014	CMS 2015	CMS 2016	CMS 2017	CMS 2018	RFI	CMS 2012	CMS 2014	CMS 2015	CMS 2016	CMS 2017	CMS 2018	RFI	CMS 2012	CMS 2014	CMS 2015	CMS 2016	CMS 2017	CMS 2018
Filtered SVOCs (Method 8270D) - ug/L																						
Acenaphthene	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals - ug/L																						
Arsenic, Total	**25**	16.1	5	6.88	9.23	**118**	8.98	4.47	5.9 B	7	3.45	3.5	7.1	3.01	2.76	21.9 J	ND	4.76	3.99	18.3	6.41	5.36
Barium, Total	**1000**	31.7 B	17	22.22	19.19	15.4	13.99	16.3	35.4 B	24	20.53	25.73	25.2	22.58	20	55.4 B	18	17.7	23.02	19	17.83	17.87
Cadmium, Total	**5**	1.9 B	-	-	-	-	-	-	1.4 B	-	-	-	-	-	-	ND	-	-	-	-	-	-
Chromium, Total	**50**	27.4	**230**	30.8	**358.3**	**240**	**260.6**	6.05	4.5 B	ND	2.91	2.93	2.6 J	1.58	8.02	**398 J**	10	9.21	11.21	7.5 J	9.38	1.48
Cyanide, Total	**200**	**2400 J**	**621**	**612**	**446**	**272**	**1050**	**484**	**500**	**271**	118	173	62	142	97	**820**	**774**	**468**	**568**	**317**	**419**	**266**
Lead, Total	**25**	9.7	25	1.98 J	ND	ND	3.38 J	ND	2.3 B	3 J	0.52 J	0.59 J	ND	0.77 J	10.73	**54**	17	1.57 J	1.3 J	ND	22.76	1.34
Selenium, Total	**10**	ND	-	-	-	-	-	-	2.8 B	-	-	-	-	-	-	ND	-	-	-	-	-	-
Dissolved Metals - ug/L																						
Arsenic, Dissolved	**25**	15.5	-	-	10.68	**128**	10.56	-	4.9 B	-	-	-	-	-	-	3.5 B	-	-	-	15.8	2.9	-
Barium, Dissolved	**1000**	32.3 B	-	-	20.5	21.7	18.58	-	35.4 B	-	-	-	-	-	-	21.9 B	-	-	-	23.6	16.22	-
Cadmium, Dissolved	**5**	2.3 B	-	-	-	-	-	-	0.38 B	-	-	-	-	-	-	ND	-	-	-	-	-	-
Chromium, Dissolved	**50**	15.3	-	-	**838.5**	**160**	**166.2**	-	2.4 B	-	-	-	-	-	-	**87.8**	-	-	-	3.1 J	0.24 J	-
Lead, Dissolved	**25**	7.7	-	-	ND	ND	4.96 J	-	ND	-	-	-	-	-	-	11.3 B	-	-	-	ND	4.54 J	-
Selenium, Dissolved	**10**	ND	-	-	-	-	-	-	ND	-	-	-	-	-	-	ND	-	-	-	-	-	-
Field Measurements																						
Dissolved Oxygen (mg/L)	-	-	3.76	-	1.57	1.83	2.03	1.84	0.5	1.71	-	1.33	1.68	1.6	2.8	0.4	1.53	-	1.06	0.92	1.44	1.33
Field pH (S.U.)	**12.5**	6.93	4.57	6.40	6.62	4.48	4.71	6.84	8.45	7.29	7.60	7.65	7.76	7.51	7.92	5.84	5.66	6.22	6.21	6.67	6.99	7.65
Redox Potential (mV)	-	-73	33	-83	-86	144	140	-78	-310	-159	-147	-163	-125	-96	-57	-136	-95	-43	-47	-67	-109	-141
Specific Conductance (umhos/cm)	-	4,100	6634	3369	2746	7342	4660	3012	4,450	2743	1957	2121	2064	2055	1612	1,030	7966	5077	4529	4433	3394	3175
Temperature (deg C)	-	11.2	12.1	13.0	12.4	10.8	13.1	9.0	13.3	10.4	15.4	13.1	11.6	12.7	9.6	13.1	10.4	15.1	13.3	12.0	12.8	8.3
Turbidity (NTU)	-	233	39.6	107	112	73.9	124	16.6	72	10.6	2.55	3.55	6	6.31	49.1	430	25.7	22.4	30	88	128	8.3

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/Guldance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
\- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groudwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TurnKey Environmental Restoration, LLC | Benchmark Environmental Engineering & Science, PLLC

TABLE 4-32

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 2B

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																					
		MWS-20A — Slag/Fill; Sand							MWS-20B — Sand; Clay							MWS-21A — Slag/Fill		MWS-21B — Slag/Fill; Clay		MWS-23A — Slag/Fill		MWS-23B — Sand	
		Nov-1999	Feb-2012	Apr-2014	Apr-2015	Apr-2016	Apr-2017	Apr-2018	Nov-1999	Feb-2012	Apr-2014	Apr-2015	Apr-2016	Apr-2017	Apr-2018	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013
		RFI	CMS 2012	CMS 2014	CMS 2015	CMS 2016	CMS 2017	CMS 2018	RFI	CMS 2012	CMS 2014	CMS 2015	CMS 2016	CMS 2017	CMS 2018	RFI	CMS 2013	RFI	CMS 2013	RFI	CMS 2013	RFI	CMS 2013
VOCs (Method 8260B, 8260C, 8021B) - ug/L																							
1,1-Dichloroethane	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2 J	ND	ND	0.79 J	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	**-**	-	ND	ND	ND	ND	-	-	-	ND	ND	ND	ND	-	-	-	ND	-	ND	-	ND	-	ND
1,2,4-Trimethylbenzene	**5**	-	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	-	-	ND	-	ND	-	ND	-	ND
1,2-Dichloroethane	**0.6**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.5**	**2.2**	**2.2**	**2.8**	**1.4**	**1.5 J**	0.37 J	ND	**3.6**	**4 J**	ND	ND	**6.2**
1,3,5-Trimethylbenzene	**5**	-	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	-	-	ND	-	ND	-	ND	-	ND
1,4-Diethylbenzene	**-**	-	ND	-	-	-	-	-	-	ND	-	-	-	-	-	-	ND	-	ND	-	ND	-	ND
4-Ethyltoluene	**-**	-	ND	-	-	-	-	-	-	ND	-	-	-	-	-	-	ND	-	ND	-	ND	-	ND
Acetone	**50**	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	1.7 J	ND	1.6 J	-	ND	-	ND	-	ND	-	ND
Benzene	**1**	**33**	ND	ND	ND	0.22 J	0.63	ND	ND	ND	0.28 J	0.63 J	0.32 J	0.5 J	0.23 J	ND	0.58	ND	**12**	ND	ND	**470**	**280**
Bromomethane	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	**60**	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-	ND	-	ND	-	ND
cis-1,2-Dichloroethene	**5**	-	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	-	-	ND	-	ND	-	ND	-	ND
Cyclohexane	**-**	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-	ND	-	ND	-	ND
Ethylbenzene	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	**5**	-	ND	ND	ND	ND	ND	ND	-	ND	ND	2.3 J	ND	ND	ND	-	ND	-	ND	-	ND	-	ND
Methyl cyclohexane	**-**	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-	ND	-	ND	-	ND
Methylene chloride	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene (p-Cymene)	**5**	-	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	-	-	ND	-	ND	-	ND	-	ND
Styrene	**5**	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-	ND	-	ND	-	ND
Tetrachloroethene	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.1 J	ND	ND	ND
Trichloroethene	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**7.5**	**6.2**	ND	ND
Vinyl chloride	**2**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes, Total	**5**	1.2 J	ND	ND	ND	ND	ND	ND	2.5 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SVOCs (Method 8270C, 8270D) - ug/L																							
2,4-Dimethylphenol	**See Note 3**	ND	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	2.9 J	-	ND	-	ND	-
2-Chloronaphthalene	**10**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	**-**	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	0.54	-	ND	-	ND	-	ND
2-Methylphenol (o-Cresol)	**See Note 3**	ND	-	ND	ND	-	-	-	ND	-	ND	ND	-	-	-	ND	-	ND	-	ND	-	ND	-
3,4-Methylphenol (m,p-Cresol)	**See Note 3**	ND	-	ND	ND	ND	ND	ND	ND	-	ND	ND	1.3 J	ND	ND	ND	-	ND	-	ND	-	ND	-
Acenaphthene	**20**	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	0.46	-	ND	-	ND	-	ND
Acenaphthylene	**-**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.85	ND	ND	ND	ND	ND	ND
Acetophenone	**-**	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-	ND	-	ND	-	ND
Anthracene	**50**	ND	0.07 J	0.12 J	ND	0.21	0.08 J	0.1 J	ND	0.09 J	0.17 J	0.07 J	0.23 J	0.05 J	0.1	ND	0.67	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	**0.002**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.02 J**	**0.02 J**	ND	**0.44**	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	**0 (ND)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.11 J**	ND	ND	ND	ND	ND	**0.26**	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	**0.002**	-	ND	ND	ND	ND	ND	ND	-	ND	**0.08 J**	ND	ND	ND	ND	-	**0.35**	-	ND	-	ND	-	ND
Benzo(ghi)perylene	**-**	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	0.13 J	-	ND	-	ND	-	ND
Benzo(k)fluoranthene	**0.002**	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	**0.21**	-	ND	-	ND	-	ND
Benzoic Acid	**-**	-	-	ND	ND	-	-	-	-	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-
Biphenyl	**5**	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-	ND	-	ND	-	ND
Bis(2-ethylhexyl)phthalate	**5**	ND	ND	ND	4.2	ND	ND	4	ND	ND	ND	**5.6**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Caprolactam	**-**	-	-	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	24	-	-	-	-	-	-	-	-
Carbazole	**-**	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	2.4	-	ND	-	ND	-	ND
Chrysene	**0.002**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.4**	ND	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	**-**	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-	ND	-	ND	-	ND
Dibenzofuran	**-**	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-	ND	-	ND	-	ND
Fluoranthene	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.09 J	ND	0.07 J	ND	ND	3.5 J	1.6	ND	0.16 J	ND	ND	ND	ND
Fluorene	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.8	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)Pyrene	**0.002**	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	**0.13 J**	-	ND	-	ND	-	ND
Naphthalene	**10**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.4	ND	0.12 J	ND	ND	ND	0.07 J
Pentachlorophenol	**See Note 3**	ND	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-	ND	-	ND	-
Phenanthrene	**50**	ND	ND	ND	ND	ND	0.03 J	ND	ND	ND	ND	ND	ND	0.02 J	ND	2.1 J	3.6	ND	0.2	ND	ND	ND	ND
Phenol	**See Note 3**	ND	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-	ND	-	ND	-
Pyrene	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.09 J	ND	0.06 J	ND	ND	2 J	0.99	ND	0.11 J	ND	ND	ND	ND
Pyridine	**50**	ND	-	-	-	-	-	-	ND	-	-	-	-	-	-	ND	-	ND	-	ND	-	ND	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug/L																							
Phenolic compounds (total phenols) [4]	**1**	ND	-	ND	ND	ND	ND	ND	ND	-	ND	ND	**1.3**	ND	ND	ND	-	**2.9**	-	ND	-	ND	-

TABLE 4-32

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 2B

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																					
		MWS-20A — Slag/Fill; Sand							MWS-20B — Sand; Clay							MWS-21A — Slag/Fill		MWS-21B — Slag/Fill; Clay		MWS-23A — Slag/Fill		MWS-23B — Sand	
		Nov-1999	Feb-2012	Apr-2014	Apr-2015	Apr-2016	Apr-2017	Apr-2018	Nov-1999	Feb-2012	Apr-2014	Apr-2015	Apr-2016	Apr-2017	Apr-2018	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013
		RFI	CMS 2012	CMS 2014	CMS 2015	CMS 2016	CMS 2017	CMS 2018	RFI	CMS 2012	CMS 2014	CMS 2015	CMS 2016	CMS 2017	CMS 2018	RFI	CMS 2013	RFI	CMS 2013	RFI	CMS 2013	RFI	CMS 2013
Filtered SVOCs (Method 8270D) - ug/L																							
Acenaphthene	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals - ug/L																							
Arsenic, Total	**25**	ND	5	4.05	5.03	7.2	4.23	3.06	3.9 B	7	3.71	3.59	6.6	2.87	2.93	ND	ND	6 B	10.65	**153**	13.83	3.3 B	7.4
Barium, Total	**1000**	27.1 B	21	16.78	12.42	17.1	21.06	20.54	54.7 B	31	39.08	24.7	39	33.75	30.93	56.6 B	31.11	42.6 B	33.56	184 B	15.88	27.2 B	37.07
Cadmium, Total	**5**	ND	-	-	-	-	-	-	ND	-	-	-	-	-	-	ND	-	**14.6**	-	ND	-	1.6 B	-
Chromium, Total	**50**	7.6	10	17.84	23.62	1.9	23.32	15.48	37.6	3 J	10.49	1.57	5.3	1.23	3.36	4.3 B	10.06	13.6	12.15	**267**	28.06	3.4 B	14.66
Cyanide, Total	**200**	120 J	-	75	29	34	124	68	44 J	-	47	48	38	68	47	ND	-	0.18	-	0.18	-	0.1	-
Lead, Total	**25**	ND	ND	ND	ND	ND	0.41 J	ND	10.2	ND	4.43	0.14	ND	0.35 J	1.23	ND	5.27 J	9.3	4.14 J	**109**	ND	2.6 B	5.88 J
Selenium, Total	**10**	5	-	-	-	-	-	-	ND	-	-	-	-	-	-	ND	7.1 J	ND	ND	4.4 B	4.32 J	ND	ND
Dissolved Metals - ug/L																							
Arsenic, Dissolved	**25**	-	-	-	-	-	-	-	3.1 B	-	-	-	-	-	-	ND	-	6.6 B	-	6.9 B	-	4.4 B	-
Barium, Dissolved	**1000**	-	-	-	-	-	-	-	34.6 B	-	-	-	-	-	-	52.7 B	-	40.6 B	-	14.2 B	-	27.8 B	-
Cadmium, Dissolved	**5**	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	ND	-	**13.6**	-	0.41 B	-	2.1	-
Chromium, Dissolved	**50**	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	ND	-	7.7 B	-	2.7 B	-	2.8 B	-
Lead, Dissolved	**25**	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	ND	-	8.9	-	ND	-	3.5	-
Selenium, Dissolved	**10**	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	2.9 B	-	ND	-	2.3 B	-	ND	-
Field Measurements																							
Dissolved Oxygen (mg/L)	**-**	1.1	2.04	-	3.7	4.12	2.55	2.4	0.4	2.11	-	0.85	2.04	1.81	2.01	4.4	4.13	0.3	1.6	2.6	2.8	0.3	1.03
Field pH (S.U.)	**12.5**	9.02	9.20	9.37	9.47	9.66	9.78	10.09	7.29	7.38	7.63	7.63	7.49	7.23	8.48	11.25	8.60	7.51	6.90	6.90	7.14	7.87	6.44
Redox Potential (mV)	**-**	416	0	-89	51	194	111	-57	204	-150	-170	-180	-118	-58	-196	344	-	169	-153	5.12	44	167	-69
Specific Conductance (umhos/cm)	**-**	2,130	985.9	926	656	895.2	1183	1193	2,500	1329	1447	1076	1375	1275	1058	3990	2133	1520	4956	2730	2520	4110	3369
Temperature (deg C)	**-**	15.9	10.5	12.5	10.6	10.6	12.0	9.2	13.2	10.7	13.5	10.9	10.2	12.7	9.6	12.7	13.2	13.5	15.4	13.2	11.4	12.5	12.6
Turbidity (NTU)	**-**	0.1	5.23	1.69	256	7.19	5.08	2.28	146	11.1	26.6	3.92	20.4	9.52	22.2	320	115.2	256	83	647	15.1	16.2	254

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/GuIdance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groudwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 10(
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TABLE 4-33

TurnKey Environmental Restoration, LLC — Benchmark Environmental Engineering & Science, PLLC

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 3A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																
		MWN-01 — Slag/Fill				MWN-01B — Slag/Fill; Sand/Dredge Spoils				MWN-11 — Slag/Fill			MWN-17A — Slag/Fill			MWN-17B — Slag/Fill; Sand		
		Nov-1999	Jul-2011	Mar-2012	Jan-2019	Nov-1999	Jul-2011	Mar-2012	Jan-2019	Nov-1999	Oct-2010	3/1/2012	Nov-1999	Oct-2010	Mar-2012	Nov-1999	Oct-2010	Mar-2012
		RFI	SWI 2011	CMS 2012 [5]	CMS 2019	RFI	SWI 2011	CMS 2012 [5]	CMS 2019	RFI	CMS 2010	CMS 2012	RFI	CMS 2010	CMS 2012 [5]	RFI	CMS 2010	CMS 2012 [5]
VOCs (Method 8260B, 8260C, 8021B) - ug/L																		
1,1-Dichloroethane	**5**	ND	-	-	ND	ND	-	-	ND	1.5 J	ND	-	ND	ND	-	ND	ND	-
1,2,4-Trimethylbenzene	**5**	-	**6.4**	-	-	-	**7.1 J**	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	**5**	-	4.2	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-
Acetone	**50**	-	-	-	ND	-	-	-	5.4	-	ND	-	-	ND	-	-	3.8 J	-
Benzene	**1**	**22**	**62**	-	**24 D**	**54**	**93**	-	**72**	**4.5 J**	0.7 J	-	ND	**5.7**	-	**10**	**51**	-
Carbon disulfide	**60**	-	-	-	ND	-	-	-	ND	-	0.98 J	-	-	0.86 J	-	-	0.87 J	-
Chloroform	**7**	ND	-	-	ND	ND	-	-	ND	ND	ND	-	**12**	ND	-	4.2 J	ND	-
Chloromethane (Methyl chloride)	**5**	ND	-	-	ND	ND	-	-	3	ND	ND	-	ND	ND	-	ND	ND	-
Cyclohexane	**-**	-	-	-	ND	-	-	-	0.39 J	-	ND	-	-	ND	-	-	ND	-
Ethylbenzene	**5**	ND	1.8 J	-	ND	ND	ND	-	0.74 J	ND	ND	-	ND	0.86 J	-	ND	ND	-
Isopropylbenzene	**5**	-	ND	-	ND	-	ND	-	1.3 J	-	ND	-	-	ND	-	-	ND	-
Methyl cyclohexane	**-**	-	-	-	ND	-	-	-	0.44 J	-	ND	-	-	ND	-	-	ND	-
p-Isopropyltoluene (p-Cymene)	**5**	-	ND	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-
Styrene	**5**	-	-	-	ND	-	-	-	ND	-	ND	-	-	1	-	-	ND	-
Toluene	**5**	**9.1**	**12**	-	**5.1 DJ**	**21**	**23**	-	**20**	ND	ND	-	ND	2	-	1.7 J	**8.4**	-
Xylenes, Total	**5**	**19**	**40**	-	**17.9 D**	**23**	**21.1 J**	-	**20.7**	ND	ND	-	ND	4.9	-	ND	**5.3**	-
SVOCs (Method 8270C, 8270D) - ug/L																		
2,4-Dimethylphenol	**See Note 3**	ND	-	2.4 J	ND	ND	-	ND	4.6 J	3.3 J	-	-	2.3 J	-	4.1 J	92 JD	-	140
2-Methylnaphthalene	**-**	-	54	-	35	-	48	-	30	-	ND	-	-	8.8	-	-	12	-
2-Methylphenol (o-Cresol)	**See Note 3**	24 J	-	8.7	-	ND	-	19	-	8.4 J	-	-	10	-	15	270 JD	-	330 D
3,4-Methylphenol (m,p-Cresol)	**See Note 3**	72 J	-	20	14	ND	-	40	34	37	-	-	43	-	46	1200 D	-	960 D
Acenaphthene	**20**	-	17	-	11	-	12	-	6.7	-	ND	-	-	2.8 J	-	-	2.5 J	-
Acenaphthylene	**-**	110	51	-	32	150 J	58	-	26	ND	0.38 J	-	ND	7.5	-	ND	8.7	-
Acetophenone	**-**	-	0.59 JB	-	ND	-	0.86 JB	-	0.72 J	-	ND	-	-	ND	-	-	ND	-
Anthracene	**50**	20 J	14	-	11	ND	11	-	3.5	ND	ND	-	ND	1.6 J	-	ND	1.4 J	-
Benzo(a)anthracene	**0.002**	ND	**0.59 J**	-	**0.45**	ND	**1.2 J**	-	**0.34**	ND	ND	-	ND	ND	-	ND	ND	-
Benzo(a)pyrene	**0 (ND)**	ND	ND	-	**0.03 J**	ND	**0.54 J**	-	**0.08 J**	ND	ND	-	ND	ND	-	ND	ND	-
Benzo(b)fluoranthene	**0.002**	-	ND	-	**0.05 J**	-	**0.65 J**	-	**0.12**	-	ND	-	-	ND	-	-	ND	-
Benzo(ghi)perylene	**-**	-	ND	-	ND	-	ND	-	0.04 J	-	ND	-	-	ND	-	-	ND	-
Benzo(k)fluoranthene	**0.002**	-	ND	-	**0.02 J**	-	ND	-	**0.05 J**	-	ND	-	-	ND	-	-	ND	-
Biphenyl	**5**	-	**14**	-	**10**	-	**8.9**	-	**5.2**	-	ND	-	-	2 J	-	-	2.5 J	-
Bis(2-chloroethyl)ether	**1**	ND	ND	-	ND	ND	ND	-	ND	ND	ND	-	ND	ND	-	**81 J**	ND	-
Bis(2-ethylhexyl)phthalate	**5**	ND	ND	-	ND	ND	ND	-	ND	ND	3.6 JB	-	ND	3.2 JB	-	ND	4 JB	-
Butyl benzyl phthalate	**50**	ND	ND	-	ND	ND	ND	-	ND	ND	1.9 JB	-	ND	ND	-	ND	ND	-
Carbazole	**-**	-	50	-	29	-	79	-	43	-	0.88 J	-	-	8	-	-	9.6	-
Chrysene	**0.002**	ND	**0.52 J**	-	**0.2**	ND	**1.1 J**	-	**0.19**	ND	ND	-	ND	ND	-	ND	ND	-
Dibenzo(a,h)anthracene	**-**	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	ND	-	-	ND	-
Dibenzofuran	**-**	-	62	-	42	-	30	-	18	-	ND	-	-	6 J	-	-	7.1 J	-
Di-n-butyl phthalate	**50**	ND	ND	-	ND	ND	ND	-	ND	ND	ND	-	ND	0.29 J	-	ND	0.46 J	-
Fluoranthene	**50**	15 J	15	-	10	ND	13	-	5.8	ND	0.5 J	-	ND	2.3 J	-	1.1 J	1.5 J	-
Fluorene	**50**	**99 J**	**82**	-	**72 D**	**63 J**	43	-	23	ND	0.55 J	-	ND	8.8	-	ND	8.2	-
Indeno(1,2,3-cd)Pyrene	**0.002**	-	ND	-	ND	-	ND	-	**0.05 J**	-	ND	-	-	ND	-	-	ND	-
Naphthalene	**10**	**630**	**290 D**	-	**250 D**	**1200**	**1300 D**	-	**920 D**	4.3 J	2.7 J	-	6.4 J	**62**	-	**22**	**110**	-
Pentachlorophenol	**See Note 3**	ND	-	2.2 D	1.1 J-	ND	-	1.4 DJ	1 J-	ND	-	-	ND	-	ND	ND	-	ND
Phenanthrene	**50**	**140**	**120**	-	**130 D**	**95 J**	**69**	-	33	1.2 J	0.93 J	-	1.1 J	8.3	-	2.2 J	8.3	-
Phenol	**See Note 3**	ND	-	ND	ND	ND	-	7.5	18	2.1 J	-	-	140 D	-	58	2400 D	-	700 D
Pyrene	**50**	ND	8.3	-	6.1	ND	7.9	-	3.5	ND	0.4 J	-	2.5 J	2 J	-	1.4 J	1.3 J	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug/L																		
Phenolic compounds (total phenols) [4]	**1**	**96**	-	**33**	**15**	ND	-	**68**	**58**	**51**	-	-	**195**	-	**123**	**3962**	-	**2130**

TABLE 4-33

TurnKey Environmental Restoration, LLC — Benchmark Environmental Engineering & Science, PLLC

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 3A

PARAMETER [1]	GWQS/GV [2]	MWN-01 — Slag/Fill				MWN-01B — Slag/Fill; Sand/Dredge Spoils				MWN-11 — Slag/Fill			MWN-17A — Slag/Fill			MWN-17B — Slag/Fill; Sand		
		Nov-1999	Jul-2011	Mar-2012	Jan-2019	Nov-1999	Jul-2011	Mar-2012	Jan-2019	Nov-1999	Oct-2010	3/1/2012	Nov-1999	Oct-2010	Mar-2012	Nov-1999	Oct-2010	Mar-2012
		RFI	SWI 2011	CMS 2012 [5]	CMS 2019	RFI	SWI 2011	CMS 2012 [5]	CMS 2019	RFI	CMS 2010	CMS 2012	RFI	CMS 2010	CMS 2012 [5]	RFI	CMS 2010	CMS 2012 [5]
Filtered SVOCs (Method 8270D) - ug/L																		
Acenaphthene	20	-	-	-	-	-	-	-	6.5	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	25	-	-	-	-	-	-	-	-	-
Anthracene	50	-	-	-	-	-	-	-	2.8	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	0.002	-	-	-	-	-	-	-	**0.34**	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	0 (ND)	-	-	-	-	-	-	-	**0.08 J**	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	0.002	-	-	-	-	-	-	-	**0.12**	-	-	-	-	-	-	-	-	-
Benzo(ghi)perylene	-	-	-	-	-	-	-	-	0.04 J	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	0.002	-	-	-	-	-	-	-	**0.05 J**	-	-	-	-	-	-	-	-	-
Chrysene	0.002	-	-	-	-	-	-	-	**0.21**	-	-	-	-	-	-	-	-	-
Fluoranthene	50	-	-	-	-	-	-	-	5.8	-	-	-	-	-	-	-	-	-
Fluorene	50	-	-	-	-	-	-	-	22	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)Pyrene	0.002	-	-	-	-	-	-	-	**0.05 J**	-	-	-	-	-	-	-	-	-
Naphthalene	10	-	-	-	-	-	-	-	**200 E**	-	-	-	-	-	-	-	-	-
Phenanthrene	50	-	-	-	-	-	-	-	32	-	-	-	-	-	-	-	-	-
Pyrene	50	-	-	-	-	-	-	-	3.4	-	-	-	-	-	-	-	-	-
Total Metals - ug/L																		
Arsenic, Total	25	4.1 B	-	5	-	12.1	-	19	-	4.3 B	-	ND	6.3 B	-	4 J	11.4	-	15
Barium, Total	1000	49.6 JB	-	-	-	58.1 JB	-	-	-	98.7 JB	-	-	92.7 JB	-	-	102 JB	-	-
Cadmium, Total	5	ND	-	-	-	ND	-	-	-	ND	-	-	ND	-	-	ND	-	-
Chromium, Total	50	6.5	-	ND	-	4 B	-	ND	-	1.1 B	-	6 J	2.7 B	-	ND	30.5	-	ND
Cyanide, Total	200	80	-	-	-	**1100**	-	**204**	-	100 J	-	-	R	-	-	50 J	-	-
Lead, Total	25	ND	-	ND	-	12.7 J	-	7 J	-	ND	-	3 J	ND	-	ND	ND	-	ND
Selenium, Total	10	6.6	-	**11**	-	6.1	-	8 J	-	**10.4**	-	**12**	**12.2**	-	6 J	**14.8**	-	ND
Dissolved Metals - ug/L																		
Arsenic, Dissolved	25	-	-	-	-	11.7 J	-	-	-	-	-	-	2 B	-	-	9.9 B	-	-
Barium, Dissolved	1000	-	-	-	-	57.7 JB	-	-	-	-	-	-	60.8 B	-	-	99.7 B	-	-
Cadmium, Dissolved	5	-	-	-	-	ND	-	-	-	-	-	-	0.27 B	-	-	ND	-	-
Chromium, Dissolved	50	-	-	-	-	ND	-	-	-	-	-	-	5.6 B	-	-	0.96 B	-	-
Lead, Dissolved	25	-	-	-	-	ND	-	-	-	-	-	-	ND	-	-	ND	-	-
Selenium, Dissolved	10	-	-	-	-	6.8 J	-	-	-	-	-	-	7.9	-	-	**12.5**	-	-
Field Measurements																		
Dissolved Oxygen (mg/L)	-	0.6	1.84	2.67	1.4	0.5	1.05	1.46	1.48	1.3	1.63	1.66	-	1.32	0.51	0.5	1.94	1.14
Field pH (S.U.)	12.5	11.50	11.67	**12.99**	11.74	11.00	11.26	11.25	11.23	11.60	11.56	12.27	-	11.28	**12.51**	11.57	11.60	**12.79**
Redox Potential (mV)	-	-354	-223	-222	-225	-328	-223	-264	-228	-326	-195	-214	-	-295	-318	-70	-270	-295
Specific Conductance (umhos/cm)	-	1,400	1285	1271	1355	1,000	907.4	917.1	874.7	1,300	1267	1449	-	906.8	878.6	1,270	1920	1887
Temperature (deg C)	-	13.5	16.6	11.2	10.2	13.2	16.1	9.7	9.7	12.6	13.5	11.1	-	14.2	11.4	14.5	13.7	10.9
Turbidity (NTU)	-	9	5.56	8.86	1.49	140	9.94	1.46	4.61	9	40.5	4.03	-	1.22	0.92	60.5	50	3.57

Monitoring Well Location, Sample Date(s), & Monitoring Program

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/Guidance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groudwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TABLE 4-33

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 3A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																			
		MWN-23B — Sand/Dredge Spoils			MWN-24A — Slag/Fill; Clayey Silt; Sand			MWN-24B — Till			MWN-44A — Slag/Fill		MWN-80A — Slag/Fill; Sand	MWN-81A — Slag/Fill	MWN-82A — Slag/Fill; Sand	MWN-83A — Slag/Fill	MWN-84A — Slag/Fill	MWN-85 — Slag/Fill	MWN-94A — Slag/Fill		MWN-94B — Sand
		Nov-1999	Mar-2012	Jan-2019	Nov-1999	Mar-2012	Jan-2019	Nov-1999	Mar-2012	Jan-2019	Dec-2000	3/2/2012	Oct-2010	Oct-2010	Oct-2010	Oct-2010	Oct-2010	Oct-2010	May-2013	Jan-2019	May-2013
		RFI	CMS 2012	CMS 2019	RFI	CMS 2012	CMS 2019	RFI	CMS 2012	CMS 2019	RFI	CMS 2012	CMS 2010	CMS 2010	CMS 2010	CMS 2010	CMS 2010	CMS 2010	CMS 2013	CMS 2019	CMS 2013
VOCs (Method 8260B, 8260C, 8021B) - ug/L																					
1,1-Dichloroethane	5	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	5	-	1.1 J	-	-	ND	-	-	ND	-	-	ND	-	-	-	-	-	-	1.6 J	-	ND
1,3,5-Trimethylbenzene	5	-	1.7 J	-	-	ND	-	-	ND	-	-	ND	-	-	-	-	-	-	ND	-	ND
Acetone	50	-	-	1.5 J	-	-	ND	-	-	ND	-	-	ND	5.4 J	ND	ND	6.8 J	4.4 J	7.4	ND	2.1 J
Benzene	1	**13**	**11**	**6.5**	ND	ND	ND	ND	ND	ND	**270**	**74 D**	0.55 J	**6**	**82**	0.75 J	**24**	**10**	**49**	**40**	0.37 J
Carbon disulfide	60	-	-	ND	-	-	ND	-	-	2.5 J	-	-	ND	1.3	ND	ND	0.52 J	0.55 J	ND	ND	ND
Chloroform	7	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	5	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cyclohexane	-	-	-	ND	-	-	ND	-	-	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	**6.8 J**	1.4 DJ	ND	ND	ND	ND	**17**	3.6	ND	ND	ND
Isopropylbenzene	5	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	ND	2.5	ND	1.1	1.7	0.74 J	ND	ND
Methyl cyclohexane	-	-	-	ND	-	-	ND	-	-	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene (p-Cymene)	5	-	0.48 J	-	-	ND	-	-	ND	-	-	ND	-	-	-	-	-	-	ND	-	ND
Styrene	5	-	-	ND	-	-	ND	-	-	ND	-	-	ND	ND	ND	ND	ND	**6.2**	ND	ND	ND
Toluene	5	1.5 J	ND	1 J	ND	ND	ND	ND	ND	ND	**53**	ND	ND	1.3	ND	ND	2.9	**5.1**	ND	ND	ND
Xylenes, Total	5	ND	2.74 J	1.72 J	ND	ND	ND	ND	ND	ND	**53**	ND	ND	2.6	2.5	ND	**13**	**23**	1.2 J	0.9 J	ND
SVOCs (Method 8270C, 8270D) - ug/L																					
2,4-Dimethylphenol	See Note 3	6.5 J	-	ND	ND	-	ND	ND	-	ND	ND	-	-	-	-	-	-	-	-	ND	-
2-Methylnaphthalene	-	-	1.7	ND	-	ND	ND	-	ND	ND	-	ND	ND	3.6 J	ND	ND	6.9	84	1.6	ND	0.1 J
2-Methylphenol (o-Cresol)	See Note 3	22	-	-	ND	-	-	ND	-	-	ND	-	-	-	-	-	-	-	-	-	-
3,4-Methylphenol (m,p-Cresol)	See Note 3	69	-	8.5	ND	-	ND	ND	-	ND	ND	-	-	-	-	-	-	-	-	ND	-
Acenaphthene	20	-	0.8	ND	-	ND	ND	-	ND	ND	-	3.4	0.99 J	3.6 J	1.2 J	0.42 J	**52**	10	2	1.6	0.08 J
Acenaphthylene	-	ND	0.55	ND	ND	0.09 J	ND	ND	ND	ND	50	0.8	0.64 J	0.65 J	0.55 J	0.42 J	7.1	38	0.89	0.68	ND
Acetophenone	-	-	ND	ND	-	ND	ND	-	ND	ND	-	2.1 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	50	ND	0.58	ND	ND	0.14 J	ND	ND	ND	ND	ND	0.94	0.56 J	0.84 J	1.3 J	ND	0.52 J	8.8	0.31	0.1	ND
Benzo(a)anthracene	0.002	ND	**0.19 J**	ND	ND	**0.16 J**	ND	ND	**0.18 J**	ND	**85 J**	**0.72**	**0.5 J**	**0.34 J**	**0.45 J**	ND	ND	ND	**0.29**	ND	**0.14 J**
Benzo(a)pyrene	0 (ND)	ND	**0.1 J**	ND	ND	**0.11 J**	ND	ND	**0.13 J**	ND	**65 J**	**0.89**	ND	ND	ND	ND	ND	ND	**0.23**	ND	ND
Benzo(b)fluoranthene	0.002	-	**0.25**	ND	-	**0.29**	ND	-	**0.28**	ND	-	**1.1**	**0.44 J**	ND	ND	ND	ND	ND	**0.26**	ND	**0.11 J**
Benzo(ghi)perylene	-	-	0.07 J	ND	-	ND	ND	-	0.1 J	ND	-	0.98	ND	ND	ND	ND	ND	ND	0.16 J	ND	ND
Benzo(k)fluoranthene	0.002	-	**0.15 J**	ND	-	**0.16 J**	ND	-	**0.18 J**	ND	-	**0.63**	ND	ND	ND	ND	ND	ND	**0.22**	ND	ND
Biphenyl	5	-	ND	ND	-	ND	ND	-	ND	ND	-	1.2 J	ND	0.81 J	ND	ND	**21**	**13**	ND	ND	ND
Bis(2-chloroethyl)ether	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate	5	ND	ND	ND	ND	ND	1.7 J	ND	ND	1.6 J	ND	ND	3.7 JB	3.7 JB	5 B	**6.2 B**	3.9 JB	4.4 JB	ND	1.7 J	ND
Butyl benzyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.9 JB	1.8 JB	1.8 JB	1.8 JB	ND	ND	ND	ND	ND
Carbazole	-	-	3	1.5 J	-	ND	ND	-	ND	ND	-	ND	0.58 J	6	1.9 J	0.33 J	9.5	36	1.8 J	1.3 J	ND
Chrysene	0.002	ND	**0.08 J**	ND	ND	**0.06 J**	ND	ND	**0.1 J**	ND	**75**	**0.55**	**0.33 J**	ND	**0.37 J**	ND	ND	ND	**0.33**	ND	**0.15 J**
Dibenzo(a,h)anthracene	-	-	ND	ND	-	ND	ND	-	0.14 J	ND	-	0.29	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	-	-	1.3 J	0.72 J	-	ND	ND	-	ND	ND	-	5	0.77 J	2.1 J	ND	ND	22	34	0.9 J	0.87 J	ND
Di-n-butyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.32 J	ND	ND	0.29 J	ND	ND	ND
Fluoranthene	50	ND	1	ND	ND	0.17 J	ND	ND	0.17 J	0.04 J	**310 JD**	0.9	1.8 J	1.5 J	2 J	0.64 J	0.48 J	8.4	0.81	ND	0.4
Fluorene	50	1.4 J	2.1	ND	ND	0.08 J	ND	ND	0.09 J	ND	**440 D**	5.2	1.2 J	3.1 J	0.75 J	0.42 J	13	37	1.3	ND	0.21
Indeno(1,2,3-cd)Pyrene	0.002	-	**0.18 J**	ND	-	ND	ND	-	**0.21**	ND	-	**0.97**	ND	ND	ND	ND	ND	ND	**0.16 J**	ND	ND
Naphthalene	10	9.4 J	8.9	ND	ND	0.43	ND	ND	0.23	ND	**1700 D**	0.68	ND	**57**	3.5 J	2.3 J	**470 DB**	**990 DB**	**34 D**	**22**	0.45
Pentachlorophenol	See Note 3	ND	-	0.49 J-	ND	-	ND	ND	-	ND	ND	-	-	-	-	-	-	-	-	ND	-
Phenanthrene	50	2.7 J	3.6	ND	ND	0.13 J	ND	ND	0.19 J	ND	**760 D**	0.66	1.5 J	1.7 J	3.5 J	1.2 J	4.4 J	**65**	1	ND	0.62
Phenol	See Note 3	3.9 J	-	0.89 J	4.8 J	-	ND	ND	-	ND	13 J	-	-	-	-	-	-	-	-	ND	-
Pyrene	50	ND	0.8	ND	ND	0.14 J	ND	ND	0.17 J	ND	**220 JD**	1.1	ND	1.1 J	1.4 J	0.5 J	0.37 J	5.1	0.63	ND	0.28
Total Phenolic Compounds (Method 8270C, 8270D)- ug/L																					
Phenolic compounds (total phenols) [4]	1	**101**	-	**9.9**	**4.8**	-	ND	ND	-	ND	**13**	-	-	-	-	-	-	-	-	ND	-

TABLE 4-33

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 3A

PARAMETER [1]	GWQS/GV [2]	MWN-23B — Sand/Dredge Spoils			MWN-24A — Slag/Fill; Clayey Silt; Sand			MWN-24B — Till			MWN-44A — Slag/Fill		MWN-80A — Slag/Fill; Sand	MWN-81A — Slag/Fill	MWN-82A — Slag/Fill; Sand	MWN-83A — Slag/Fill	MWN-84A — Slag/Fill	MWN-85 — Slag/Fill	MWN-94A — Slag/Fill		MWN-94B — Sand
		Nov-1999	Mar-2012	Jan-2019	Nov-1999	Mar-2012	Jan-2019	Nov-1999	Mar-2012	Jan-2019	Dec-2000	3/2/2012	Oct-2010	Oct-2010	Oct-2010	Oct-2010	Oct-2010	Oct-2010	May-2013	Jan-2019	May-2013
		RFI	CMS 2012	CMS 2019	RFI	CMS 2012	CMS 2019	RFI	CMS 2012	CMS 2019	RFI	CMS 2012	CMS 2010	CMS 2010	CMS 2010	CMS 2010	CMS 2010	CMS 2010	CMS 2013	CMS 2019	CMS 2013
Filtered SVOCs (Method 8270D) - ug/L																					
Acenaphthene	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	**0 (ND)**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(ghi)perylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)Pyrene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals - ug/L																					
Arsenic, Total	**25**	12.6	8	-	**73.4**	4 J	-	2.6 B	ND	-	**36.5**	**72**	-	-	-	-	-	-	11.09	-	7.29
Barium, Total	**1000**	81.9 JB	-	-	47.1 JB	-	-	198 JB	-	-	88 B	-	-	-	-	-	-	-	-	-	-
Cadmium, Total	**5**	ND	-	-	ND	-	-	ND	-	-	ND	-	-	-	-	-	-	-	-	-	-
Chromium, Total	**50**	1.7 B	5 J	-	18.5	5 J	-	24.9	5 J	-	**112**	10	-	-	-	-	-	-	6.77	-	5.37
Cyanide, Total	**200**	92 J	-	-	19 J	-	-	**R**	-	-	**230 J**	119	-	-	-	-	-	-	-	-	-
Lead, Total	**25**	ND	3 J	-	ND	6 J	-	3.1	3 J	-	**44.4**	4 J	-	-	-	-	-	-	**28.53**	-	14.56
Selenium, Total	**10**	8.1 J	6 J	-	ND	ND	-	ND	ND	-	2.6 B	ND	-	-	-	-	-	-	1.17 J	-	0.87 J
Dissolved Metals - ug/L																					
Arsenic, Dissolved	**25**	12	-	-	2.9 B	ND	-	ND	ND	-	20.3	-	-	-	-	-	-	-	-	-	-
Barium, Dissolved	**1000**	80.3 B	-	-	31.7 B	-	-	166 B	-	-	29.2 B	-	-	-	-	-	-	-	-	-	-
Cadmium, Dissolved	**5**	0.26 B	-	-	ND	-	-	ND	-	-	0.83 B	-	-	-	-	-	-	-	-	-	-
Chromium, Dissolved	**50**	ND	-	-	5	3 J	-	1.1 B	ND	-	2.7 B	-	-	-	-	-	-	-	-	-	-
Lead, Dissolved	**25**	ND	-	-	ND	4 J	-	ND	ND	-	ND	-	-	-	-	-	-	-	-	-	-
Selenium, Dissolved	**10**	**11.5 J**	-	-	ND	ND	-	ND	ND	-	ND	-	-	-	-	-	-	-	-	-	-
Field Measurements																					
Dissolved Oxygen (mg/L)	**-**	0.9	1.76	2.11	2.6	2.06	4.23	0.4	1.47	-	na	2.6	1.72	1.17	1.59	2.02	2.20	2.13	2.58	1.6	1.22
Field pH (S.U.)	**12.5**	11.60	12.08	11.74	6.48	6.60	5.85	6.58	7.43	6.80	8.30	7.16	7.33	9.52	6.75	8.20	10.81	11.62	9.71	9.50	6.97
Redox Potential (mV)	**-**	-377	-253	-237	378	-68	41	-138	-192	-103	-83	-220	-110	-214	-83	-133	-246	-257	-155	-182	-92
Specific Conductance (umhos/cm)	**-**	1,200	1243	1135	2,750	218.2	1440	1,860	1367	1338	2,400	1694	578.5	511.6	790.1	657.2	1138	1202	2000	1230	3310
Temperature (deg C)	**-**	13.2	11.4	9.1	13.4	10.4	9.6	12.6	10.5	10.1	11.4	10.8	16.1	17.7	15.3	14.7	12.9	12.5	15.5	10.8	15.6
Turbidity (NTU)	**-**	95	16.6	1.57	112	145	18.8	125	1.47	12.40	1000	12.8	201	84.3	83.7	235	107	9.42	130	3.42	296

Monitoring Well Location, Sample Date(s), & Monitoring Program

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/Guidance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
\- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groundwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																						
		MW-1D1 — Slag/Fill																						
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	Oct-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	May-2017	Apr-2018
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2005b	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018
VOCs (Method 8260B, 8260C, 8021B) - ug/L																								
1,1-Dichloroethane	5	3.4 J	1.2 J	1.6 J	2 J	1.4 J	1.8 J	0.98 J	2.8 J	ND	0.5 J	1.5	ND	ND	ND	ND	0.62 J	0.49 J	ND	ND	-	ND	ND	ND
1,1-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
1,2,4,5-Tetramethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	5	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND	ND
1,2,4-Trimethylbenzene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**58 D**	**44**	**56 D**	**63**	**51 D**	**25**
1,2-Dichlorobenzene	3	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
1,2-Dichloroethane	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
1,3,5-Trimethylbenzene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	3.1	ND	3.8	ND	ND
1,4-Dichlorobenzene	3	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	-	ND	ND	ND
1,4-Diethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-	ND	ND	ND
Acetone	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	ND	ND	1.8 J	-	ND	ND	ND
Benzene	1	**1.7 J**	ND	ND	ND	**3.4 J**	**2.1 J**	**1.8 J**	**8.5**	0.8 J	**2.3**	**15**	**6.5**	**3.7**	**28**	**20**	**48**	**29**	**25 D**	**12**	**17 D**	**17**	**15 D**	**8.5**
Bromomethane	5	ND	ND	ND	ND	ND	ND	ND	ND	3.2 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
Carbon disulfide	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	0.49 J	ND	ND	-	ND	ND	ND
Chlorobenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
Chloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
Chloroform	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
cis-1,2-Dichloroethene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.92 J	1	ND	ND	-	ND	ND	ND
Cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-	ND	ND	ND
Ethylbenzene	5	3.8 J	ND	ND	1.3 J	3.8 J	4.5 J	2.1 J	**29**	2.3 J	**5.1**	**16**	**7.5**	**5.8**	**26**	**32**	**36**	**32**	**30 D**	**19**	**30 D**	**32**	**25 D**	**14**
Isopropylbenzene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.5	2.4	ND	1.3 J	ND	ND	ND	ND
Methyl cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-	ND	ND	ND
Methylene chloride	5	ND	ND	ND	ND	ND	ND	ND	ND	0.66 J	0.78 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
n-Butylbenzene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND
n-Propylbenzene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	2.6	ND	4 J	ND	ND
p-Isopropyltoluene (p-Cymene)	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND
Styrene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	**10 DJ**	4	-	**6.9**	**5.5 DJ**	ND
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND	0.57 J	ND	ND	ND	ND	ND	0.41 J	ND	0.41 J	ND	ND	ND	-	ND	ND	ND
Toluene	5	2.6 J	ND	ND	1.4 J	**6.6**	4.8 J	3 J	**20 B**	2 J	3.7	**14**	**7.4**	**6.5**	**16**	**11**	**20**	**20**	**15 D**	**8.2**	**12 DJ**	**12**	**12 D**	**6.6 J**
trans-1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
Trichloroethene	5	2.7 J	1.5 J	2.6 J	3.5 J	**6.8**	**6.9**	4.7 J	**12**	2 J	4.2	**8.4**	4.1	3.7	**9.7**	**11**	**16**	**16**	**12 D**	**6.1**	-	**8.1**	**8.5 D**	4.2
Vinyl chloride	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
Xylenes, Total	5	**9.6**	ND	ND	ND	**10**	**9**	**6.8 J**	**84**	**7.3 J**	**14.2**	**48**	**23.1**	**16.9**	**81**	**102**	**120**	**97**	**99 D**	**64**	**92 D**	**105**	**86 D**	**41**
SVOCs (Method 8270C, 8270D) - ug/L																								
2,4-Dimethylphenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	4 J	ND	ND	10	2 J	ND	ND	-	2.8 J	ND	-	-	-	-	-	-
2,6-Dinitrotoluene	5	ND	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	-	-	-	-	-
2-Chloronaphthalene	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-
2-Methylnaphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	4.1 J	5.8 J	7	5.4	8.2 D	7.2 D	7.4	4.5
2-Methylphenol (o-Cresol)	See Note 3	ND	ND	ND	ND	ND	ND	2 J	2 J	0.5 J	0.3 J	2 J	0.4 J	ND	ND	-	ND	ND	-	-	-	-	-	-
2-Nitrophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-
3,3'-Dichlorobenzidine	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	-	ND	ND
3,4-Methylphenol (m,p-Cresol)	See Note 3	ND	ND	ND	ND	ND	ND	2 J	1 J	1.2 J	0.4 J	4 J	0.8 J	ND	ND	-	0.64 J	ND	-	-	-	-	-	-
4-Chloro-3-methylphenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	-	-	-	-
4-Chloroaniline	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	-	ND	ND
4-Nitroaniline	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	-	-	-	-
4-Nitrophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-
Acenaphthene	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	0.98 J	ND	2	1.5	2.7 DJ	2.6 DJ	2.7	2
Acenaphthylene	-	6.2 J	ND	ND	ND	ND	ND	2 J	9	3 J	4 J	19	11	3 J	17 DJ	17 DJ	25	35	48 D	31 D	43 D	ND	44	25
Acetophenone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	1.5 J	ND	ND	ND	ND	-	ND	ND
Anthracene	50	ND	ND	ND	ND	ND	ND	ND	ND	0.3 J	ND	0.3 J	0.2 J	ND	ND	ND	0.27 J	ND	0.42	0.35	ND	ND	ND	ND
Benzo(a)anthracene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.2 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	0 (ND)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(ghi)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzyl Alcohol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	-	ND	ND
Biphenyl	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	4.8	**8.7 J**	**10**	**6.2**	**15**	-	**14**	**8.4**
Bis(2-ethylhexyl)phthalate	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**11 B**	**9.6 J**	ND	ND	2.3 J	-	2.3 J	ND
Butyl benzyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.3 B	3.5 J	ND	ND	ND	-	ND	ND
Carbazole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	1.7 J	ND	1.6 J	ND	1.9 J	-	1.2 J	0.9 J
Chrysene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.6 DJ	4.4 J	7.5 J	11	6.5	15	-	15	11
Diethyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND
Dimethyl phthalate	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND
Di-n-butyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4 J	0.5 BJ	0.5 BJ	ND	ND	0.37 J	ND	ND	ND	ND	-	ND	ND
Di-n-octyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.7 BJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND
Fluoranthene	50	ND	ND	ND	ND	ND	ND	ND	ND	0.3 J	ND	0.3 J	ND	ND	ND	ND	ND	ND	0.15 J	ND	ND	ND	ND	ND
Fluorene	50	1.8 J	ND	ND	ND	ND	ND	ND	ND	1 J	0.9 J	3 J	2 J	0.5 J	ND	1.8 DJ	2.8 J	4.5 J	6.7	5.5	9 D	8.6 D	9.8	8.6
Indeno(1,2,3-cd)Pyrene	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	10	5.2 J	ND	ND	ND	10	3 J	**12 J**	**220 D**	**12 B**	**22**	**120**	**72**	**13**	**250 D**	**250 D**	**350**	**330**	**360 D**	**240 D**	**380 D**	**300 D**	**260 D**	**180**
N-Nitrosodiphenylamine (NDPA/DPA)	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	-	ND	ND
Pentachlorophenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	ND	ND	-	-
Phenanthrene	50	ND	ND	ND	ND	ND	ND	ND	ND	0.7 J	0.3 J	0.7 J	0.3 J	ND	ND	ND	ND	ND	0.89	0.87	ND	1.2 DJ	1.1 J	2.1
Phenol	See Note 3	2.1 J	ND	ND	ND	ND	ND	1 J	1 J	0.9 J	ND	2 J	4 J	1 J	ND	-	ND	ND	-	-	-	-	-	-
Pyrene	50	ND	ND	ND	ND	ND	ND	0.5 J	ND	0.6 J	0.3 J	0.7 J	0.7 J	ND	ND	ND	ND	ND	0.28	0.32	ND	ND	ND	ND
Pyridine	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug/L																								
Phenolic compounds (total phenols) [4]	1	**2.1**	ND	ND	ND	ND	ND	**5**	**8**	**2.6**	0.7	**18**	**7.2**	1	ND	-	**3.44**	ND	-	-	-	-	-	-

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program — MW-1D1 — Slag/Fill																						
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	Oct-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	May-2017	Apr-2018
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2005b	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018
Filtered SVOCs (Method 8270D) - ug/L																								
Acenaphthene	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(ghi)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)Pyrene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals - ug/L																								
Arsenic, Total	**25**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Barium, Total	**1000**	21.1 B	22	25	28	48	38.8	38	125	32	34.6	65	36.8	35	44.8	-	-	-	-	-	-	-	-	-
Cadmium, Total	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Chromium, Total	**50**	1.4 B	3.4	ND	ND	ND	9.2	ND	ND	19	6.1	ND	4.9	5.7	13.7	-	-	-	-	-	-	-	-	-
Cyanide, Total	**200**	32	ND	50	20	24	14	55	90 J	ND	13	57	31	27	45.2	-	-	-	-	-	-	-	-	-
Lead, Total	**25**	1.9 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Selenium, Total	**10**	6.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Dissolved Metals - ug/L																								
Arsenic, Dissolved	**25**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Barium, Dissolved	**1000**	-	20	26	-	36	38.2	37	128	33	34.1	69	35.6	35	44.4	-	-	-	-	-	-	-	-	-
Cadmium, Dissolved	**5**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Chromium, Dissolved	**50**	-	ND	ND	-	ND	6.4	ND	ND	13	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Lead, Dissolved	**25**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Selenium, Dissolved	**10**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Field Measurements																								
Dissolved Oxygen (mg/L)	-	2.6	4.22	2.51	2.82	1.21	1.39	1.91	1.25	2.2	1.72	1.02	1.21	1.21	1.21	1.9	1.16	1.24	1.65	2.31	1.21	1.47	2.18	3.88
Field pH (S.U.)	**12.5**	10.80	10.92	11.91	11.92	10.86	10.97	10.63	10.62	11.59	11.36	10.46	10.45	10.87	10.87	8.82	8.66	9.16	9.09	10.99	9.31	9.17	10.60	11.64
Redox Potential (mV)	-	-145	-44	-48	-69	-108	-26	-129	-159	-114	-54	-130	-87	-161	-161	-92	-60	57	-179	-156	-273	-55	-66	-152
Specific Conductance (umhos/cm)	-	2600	1946	2563	2220	4088	2710	3551	6736	4601	3227	5257	3332	3021	3021	3515	6693	3860	5341	3719	4879	4890	4205	3842
Temperature (deg C)	-	15.9	17.1	14.1	14.2	14.8	17.1	12.1	19.4	14.3	18.1	15.7	14.1	14.6	14.6	16.6	15.3	15.9	16.3	18.1	18.5	16.3	14.8	13.7
Turbidity (NTU)	-	2	3.33	1.23	1.1	0.2	0.95	1.45	4.35	2.82	3.74	2.04	20.3	21	21	4.06	3.87	6.69	12.7	3.23	5.93	8.29	23.4	11

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/Guldance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).
7. MWN-05B was resampled for Barium on January 18. The second set of field measurements represents the groundwater conditions during the Barium sampling (*italicized*).

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
\- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groudwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																						
		MW-1D2 — Slag/Fill																						
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	Oct-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	May-2017	Apr-2018
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2005b	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018
VOCs (Method 8260B, 8260C, 8021B) - ug/L																								
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-
1,1-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-
1,2,4,5-Tetramethylbenzene	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	5	-	ND	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	**9.6**	**12**	**10 D**	**9.9 D**	**11 D**	3.4	**13 D**	3.9
1,2-Dichlorobenzene	3	-	ND	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	**6**	**7.1**	5 DJ	**5.9 DJ**	**6.8 D**	**5.3**	**6.3 D**	3
1,4-Dichlorobenzene	3	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
1,4-Diethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	50	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Benzene	1	**2.3 J**	ND	**1.4 J**	**1.8 J**	**2.4 J**	**2.4 J**	**2.8 J**	0.87 J	**1.8 J**	**1.6**	**1.4**	**1.1**	**2**	**1.8**	**1.6**	**1.1**	**1.6**	**1.1 DJ**	**1.5 D**	**1.7 D**	0.9	**1.3 D**	**1.3**
Bromomethane	5	ND	ND												ND	ND	-	-	-	-	-	-	-	-
Carbon disulfide	60	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-
Chloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-
Chloroform	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	5	ND	ND	ND	ND	ND	ND	0.63 J	0.45 J	ND	ND	ND	ND	ND	ND	ND	0.29	0.34	ND	ND	ND	ND	ND	ND
Isopropylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Methyl cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene chloride	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-
n-Butylbenzene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.67	0.92	ND	ND	ND	ND	ND	ND
n-Propylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene (p-Cymene)	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-
Toluene	5	2.5 J	ND	1.4 J	1.6 J	1.9 J	1.3 J	2.1 J	ND	1.4 J	1	1.3	0.81 J	1.6	2.8	3.5	2.9	3.5	3.4 DJ	1.8 DJ	3.1 DJ	0.97 J	2.5 DJ	0.83 J
trans-1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-
Trichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-
Vinyl chloride	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-
Xylenes, Total	5	**32**	ND	**10.7 J**	**15 J**	**12.5 J**	**13.4 J**	**17.7**	**10.3 J**	**14.3 J**	**9.9**	**13**	**5.9**	**10.9**	**8.6**	**8.9**	**7.9**	**8.5**	**6.8 DJ**	**6.3 DJ**	**6.5 DJ**	3.5 J	**7.5 DJ**	4 J
SVOCs (Method 8270C, 8270D) - ug/L																								
2,4-Dimethylphenol	See Note 3	ND	ND	2 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	-	-	-	-
2,6-Dinitrotoluene	5	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-
2-Chloronaphthalene	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-
2-Methylnaphthalene	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	52	50	64	82 D	32 D	42 D	27 D	63	26
2-Methylphenol (o-Cresol)	See Note 3	ND	ND	-	-	-	-	-	-	0.5 J	-	-	-	-	ND	-	0.7 J	ND	-	-	-	-	-	-
2-Nitrophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-
3,3'-Dichlorobenzidine	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
3,4-Methylphenol (m,p-Cresol)	See Note 3	ND	ND	ND	ND	ND	1 J	ND	ND	2 J	ND	ND	ND	ND	ND	-	1.8 J	ND	-	-	-	-	-	-
4-Chloro-3-methylphenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	-	-	-	-
4-Chloroaniline	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitroaniline	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	-	-	-	-
4-Nitrophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-
Acenaphthene	20	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	1.4 J	1.2 J	ND	0.96	0.66	0.88 DJ	0.67 D	1 J	0.83 J
Acenaphthylene	-	88	46	54	51	32	34	67	28	42	23 J	39	17 J	37	14	26	26	21 J	15	13	17 D	7.8 D	19	11
Acetophenone	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	1.5 J	1.2 J	ND	ND	ND	0.53 J	ND	1.2 J	ND
Anthracene	50	2.3 J	ND	ND	ND	ND	ND	ND	0.8 J	1 J	ND	2 J	ND	2 J	ND	0.71 J	0.83 J	ND	0.3	0.32	0.37 DJ	0.18 DJ	ND	ND
Benzo(a)anthracene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	0 (ND)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(ghi)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzyl Alcohol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Biphenyl	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	**5.1**	4.8	**5.8 J**	**5.3**	3.2	3	2.8	**5.9**	2.9
Bis(2-ethylhexyl)phthalate	5	ND	ND	ND	ND	ND	ND	ND	ND	**8 BJ**	ND	ND	ND	ND	ND	ND	3.3 BJ	ND	ND	ND	ND	ND	ND	ND
Butyl benzyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	2.5 J	2.4 J	ND	1.5 J	1.3 J	1.3 J	ND	1.6 J	1.1 J
Chrysene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	8.4 J	7.5 J	7.5 J	6.6	4.4	3.8	3.6	6.8	4.7
Diethyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.32 J		ND	ND	ND	ND	ND	ND	ND
Dimethyl phthalate	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.65 BJ	0.38 J	ND	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	1 BJ	ND	ND	ND	ND	ND	3.6 J	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	50	2.9 J	ND	ND	2 J	ND	ND	ND	1 J	2 J	1 J	2 J	1 J	2 J	ND	0.74 J	0.95 J	ND	0.44	0.44	ND	0.56 DJ	ND	0.72 J
Fluorene	50	16	13	14	12	ND	8 J	17 J	6 J	9 J	5 J	ND	6 J	10 J	3.4 J	5.9	5.8	4.5 J	4.3	3.2 J	4 D	3 D	4.5	4.7
Indeno(1,2,3-cd)Pyrene	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	10	**340 D**	**150**	**220**	**490 D**	**240**	**490 D**	**370**	**360 D**	**270 BD**	**250**	**240**	**210**	**160**	**100**	**130**	**120**	**160**	**160 D**	**69 D**	**110 D**	**46 D**	**170**	**44**
N-Nitrosodiphenylamine (NDPA/DPA)	50	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	ND	ND	-	-
Phenanthrene	50	14	10	12	10	ND	5 J	14 J	4 J	7 J	4 J	11 J	5 J	10 J	2.9 J	4 J	4.5 J	3.4 J	2.6	2.2	2.3 D	2.3 D	2.7	3.8
Phenol	See Note 3	2.7 J	ND	1 J	1 J	ND	1 J	ND	ND	1 J	ND	ND	ND	ND	3.1 J	-	2.7 J	ND	-	-	-	-	-	-
Pyrene	50	1.8 J	ND	1 J	2 J	ND	ND	ND	1 J	1 J	ND	1 J	ND	1 J	ND	0.48 J	0.63 J	ND	0.28	0.34	ND	0.42 DJ	ND	ND
Pyridine	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug																								
Phenolic compounds (total phenols) [4]	1	**2.7**	ND	**3**	1	ND	**2**	ND	ND	**3.5**	ND	ND	ND	ND	**3.1**	-	**5.2**	ND	-	-	-	-	-	-

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program — MW-1D2 — Slag/Fill																						
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	Oct-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	May-2017	Apr-2018
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2005b	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018
Filtered SVOCs (Method 8270D) - ug/L																								
Acenaphthene	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(ghi)perylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)Pyrene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals - ug/L																								
Arsenic, Total	**25**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Barium, Total	**1000**	52.5	57	51	48	43	51	58	44.1	49	45.7	46	43.3	46	48.8	-	-	-	-	-	-	-	-	-
Cadmium, Total	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Chromium, Total	**50**	0.5	ND	ND	ND	ND	4.1	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Cyanide, Total	**200**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Lead, Total	**25**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Selenium, Total	**10**	6.8	5.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Dissolved Metals - ug/L																								
Arsenic, Dissolved	**25**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Barium, Dissolved	**1000**	-	52	53	-	49	49.3	53	44.5	47	44.9	45	45.1	44	48	-	-	-	-	-	-	-	-	-
Cadmium, Dissolved	**5**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Chromium, Dissolved	**50**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Lead, Dissolved	**25**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Selenium, Dissolved	**10**	-	6	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Field Measurements																								
Dissolved Oxygen (mg/L)	**-**	0.7	1.37	2.64	1.63	0.98	1.95	2.04	1.41	1.43	1.69	1.5	1.07	1.68	1.56	1.55	1.26	1.89	1.6	1.71	1.63	1.85	1.4	1.51
Field pH (S.U.)	**12.5**	12.10	11.66	**13.23**	**12.59**	11.91	11.92	11.52	11.61	11.46	11.33	11.61	11.11	11.34	11.00	11.24	11.73	**12.50**	11.98	11.59	11.35	11.95	12.08	**12.63**
Redox Potential (mV)	**-**	-336	-229	-204	-214	-241	-263	-251	-230	-239	-236	-233	-174	-251	-255	-231	-239	-194	-238	-278	-277	-154	-161	-234
Specific Conductance (umhos/cm)	**-**	3300	2347	2627	2523	2486	2406	2552	2396	2538	2406	2382	2373	2495	2370	1977	1932	2135	1952	1483	1774	1268	1936	1728
Temperature (deg C)	**-**	13.9	15.7	11.9	11.9	14.5	13.5	13.5	17.7	14.8	14.6	15.7	12.8	13.2	13.0	14.1	12.9	14.2	15.5	16.2	15.6	15.6	13.1	13.6
Turbidity (NTU)	**-**	2	20.3	1.5	7.75	1	2.23	2.53	10.3	3.27	2.79	2.31	2.43	1.5	2.69	4.58	47.6	2.28	5.82	4.29	10	2.33	0.65	8.37

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/Guldance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).
7. MWN-05B was resampled for Barium on January 18. The second set of field measurements represents the groundwater conditions during the Barium sampling (*italicized*).

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
\- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groudwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																						
		MW-1D3 — Slag/Fill																						
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	Oct-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	May-2017	Apr-2018
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2005b	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018
VOCs (Method 8260B, 8260C, 8021B) - ug/L																								
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-
1,1-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-
1,2,4,5-Tetramethylbenzene	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	5	-	ND	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	0.46	0.36	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	3	-	ND	-	-	-	-	-	-	0.3 J	0.6 J	-	0.3 J	-	ND	ND	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	0.69	0.79	ND	0.74 J	0.93 J	0.94 J	0.8 J	0.93 J
1,4-Dichlorobenzene	3	-	ND	ND	ND	ND	ND	ND	ND	0.3 J	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
1,4-Diethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	50	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Benzene	1	**4.9 J**	ND	**1.9 J**	**12**	**16**	**16 J**	**8.7**	**4.3 J**	**4.6 J**	**35**	**3.1**	**14**	**5.7**	**8.5**	**12**	**27**	**6.8**	**23**	**11**	**4.8**	**4.9**	**4.2**	**5.2**
Bromomethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND								
Carbon disulfide	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	5	ND	ND	ND	ND	1.8	ND	0.85 J	0.42 J	ND	3.5	ND	1.2	0.58 J	0.99 J	1.5	-	-	-	-	-	-	-	-
Chloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-
Chloroform	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	5	ND	ND	ND	ND	ND	ND	0.45 J	ND	ND	0.63 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene chloride	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-
n-Butylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene (p-Cymene)	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	0.15 J	ND	ND	ND	ND	ND	ND
Styrene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-
Toluene	5	2.3 J	ND	ND	2.8 J	3.7 J	ND	2.4 J	ND	2.2 J	**7.4**	1.2	3	2.3	3.6	**5.4**	**11**	3.4	**9.6**	**5.1**	2 J	2 J	1.8 J	2.3 J
trans-1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-
Trichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-
Vinyl chloride	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-
Xylenes, Total	5	**14**	ND	3.2 J	4.5	**5.8**	ND	**8 J**	**5.6 J**	**8.3 J**	**13.6**	4.9	**7.1**	**5.7**	**5.4**	**6.7**	**10.5**	**5.7**	**9.1**	**7.1**	4.6 J	4.6 J	4 J	4.8 J
SVOCs (Method 8270C, 8270D) - ug/L																								
2,4-Dimethylphenol	See Note 3	2.6 J	ND	ND	3 J	2 J	2 J	2 J	ND	1 J	2 J	ND	4 J	1 J	ND	-	3.5 J	ND	-	-	-	-	-	-
2,6-Dinitrotoluene	5	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-
2-Chloronaphthalene	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-
2-Methylnaphthalene	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	1.3 J	ND	0.8 J	0.92	0.72	0.74	0.73	ND	1.1 J
2-Methylphenol (o-Cresol)	See Note 3	ND	ND	ND	6 J	4 J	4 J	2 J	ND	2 J	9	0.7 J	7	2 J	2.4 J	-	13 J	ND	-	-	-	-	-	-
2-Nitrophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-
3,3'-Dichlorobenzidine	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.58 J	ND	ND	ND	ND	ND	ND	ND	ND
3,4-Methylphenol (m,p-Cresol)	See Note 3	ND	3 J	1 J	28	12	10	13 J	3 J	9 J	54	4 J	38	8 J	ND	-	46 J	ND	-	-	-	-	-	-
4-Chloro-3-methylphenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	-	-	-	-
4-Chloroaniline	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitroaniline	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	-	-	-	-
4-Nitrophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-
Acenaphthene	20	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	1.2 J	1.9 J	0.69 J	1.1	0.6	0.58	0.55	ND	0.84 J
Acenaphthylene	-	3.8 J	ND	ND	ND	ND	ND	1 J	1 J	0.9 J	1 J	1 J	1 J	0.9 J	ND	0.89 J	ND	0.69 J	0.65	0.52	0.69	0.75	0.92 J	1.1 J
Acetophenone	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	50	ND	ND	ND	ND	ND	ND	0.6 J	ND	0.3 J	0.9 J	0.4 J	1 J	0.5 J	ND	0.78 J	1.4 J	0.42 J	0.69	0.36	0.28	0.37	ND	ND
Benzo(a)anthracene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.2 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	0 (ND)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(ghi)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzyl Alcohol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Biphenyl	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate	5	ND	ND	ND	ND	ND	ND	ND	ND	**8 BJ**	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.8 J	ND	ND	ND	ND
Butyl benzyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	2.2 J	3.3 J	1.3 J	ND	ND	1 J	ND	1.1 J	1.9 J
Chrysene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.2 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	1.1 J	ND	0.61 J	ND	ND	ND	ND	ND	0.89 J
Diethyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.42 J	ND	ND	ND	ND	ND	ND		ND
Dimethyl phthalate	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3 BJ	0.4 BJ	ND	0.42 BJ	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	16 J	ND	ND	ND	ND	ND		ND
Fluoranthene	50	1.8 J	ND	2 J	ND	ND	ND	1 J	0.7 J	0.4 J	1 J	1 J	0.8 J	0.7 J	ND	0.68 J	ND	0.58 J	0.4	0.37	0.51	0.51	0.8 J	ND
Fluorene	50	3.9 J	ND	3 J	ND	ND	2 J	2 J	2 J	1 J	2 J	2 J	2 J	2 J	ND	2.2 J	2.7 J	1.4 J	1.7	1.2	1.3	1.5	1.2 J	1.9 J
Indeno(1,2,3-cd)Pyrene	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	10	6 J	4 J	4 J	**11**	8	8 J	7 J	6 J	6 BJ	**14 J**	4 J	9	5	5.9 J	**16**	**18 J**	5.9	**12**	6.1	4.8	4.1	3.7	7.4
N-Nitrosodiphenylamine (NDPA/DPA)	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.2 J	3.2 J	0.71 J	ND	ND	ND	ND	ND	ND
Pentachlorophenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	ND	ND	-	-
Phenanthrene	50	4.9 J	ND	4 J	4 J	3 J	3 J	3 J	2 J	2 J	4 J	3 J	4 J	3 J	2.3 J	4.1 J	6.3 J	2.1 J	2.9	1.8	1.5	1.7	1.7 J	2.5
Phenol	See Note 3	15	ND	3 J	56	41	27	15	7 J	14	100	4 J	64	11	24	-	150	ND	-	-	-	-	-	-
Pyrene	50	ND	ND	1 J	ND	ND	ND	0.8 J	0.5 J	0.3 J	0.6 J	0.7 J	0.5 J	0.4 J	ND	0.45 J	ND	0.4 J	0.23	0.27	0.35	0.32	ND	0.64 J
Pyridine	50	ND	ND	ND	1 J	ND	ND	ND	ND	ND	ND	ND	4 J	ND	ND	-	-	-	-	-	-	-	-	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug																								
Phenolic compounds (total phenols) [4]	1	**17.6**	**3**	**4**	**93**	**59**	**43**	**32**	**10**	**26**	**165**	**8.7**	**113**	**22**	**26.4**	-	**212.5**	ND	-	-	-	-	-	-

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																						
		MW-1D3 — Slag/Fill																						
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	Oct-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	May-2017	Apr-2018
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2005b	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018
Filtered SVOCs (Method 8270D) - ug/L																								
Acenaphthene	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(ghi)perylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)Pyrene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals - ug/L																								
Arsenic, Total	**25**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Barium, Total	**1000**	97.6 B	61	58	150	220	219 J	140 J	91.4	53	361	87	220	110	207	-	-	-	-	-	-	-	-	-
Cadmium, Total	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Chromium, Total	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Cyanide, Total	**200**	ND	ND	ND	130	26	ND	39	ND	ND	ND	ND	**290**	ND	17.2	-	-	-	-	-	-	-	-	-
Lead, Total	**25**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Selenium, Total	**10**	7.9	5.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Dissolved Metals - ug/L																								
Arsenic, Dissolved	**25**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Barium, Dissolved	**1000**	-	53	60	-	230	244 J	130	92.1	50	380	88	260	110	235	-	-	-	-	-	-	-	-	-
Cadmium, Dissolved	**5**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Chromium, Dissolved	**50**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Lead, Dissolved	**25**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Selenium, Dissolved	**10**	-	4.8	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Field Measurements																								
Dissolved Oxygen (mg/L)	**-**	0.6	1.59	1.93	0.91	0.77	1.64	0.57	1.46	1.03	1.55	0.89	0.51	1.01	1.19	0.85	0.62	0.74	0.64	0.68	1.05	0.89	1.2	0.74
Field pH (S.U.)	**12.5**	12.00	11.86	**13.40**	12.36	11.98	11.75	11.53	11.56	10.91	11.47	11.50	11.60	11.18	11.30	11.30	11.73	**13.39**	11.43	11.81	11.53	12.29	12.40	**12.80**
Redox Potential (mV)	**-**	-393	-269	-243	-280	-319	-320	-309	-308	-304	-349	-288	-326	-305	-317	-367	-342	-346	-478	-347	-346	-319	-314	-360
Specific Conductance (umhos/cm)	**-**	3400	2574	2650	2651	2683	2828	2727	2272	1081	3238	2485	2102	2975	3070	2572	3637	2409	3787	2572	2407	2320	2301	3652
Temperature (deg C)	**-**	14.0	15.8	12.0	12.0	14.4	12.6	12.1	16.3	14.5	14.2	13.3	12.8	12.4	13.6	13.8	14.2	14.1	16.8	15.0	15.4	15.3	12.9	14.8
Turbidity (NTU)	**-**	2	2.45	1.71	4.61	1.5	2.08	2.19	10.9	3.96	21	3.41	7.92	2.52	7.09	6.48	9.2	6.92	2.97	10.3	7.02	3.09	0.7	5.55

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/Guidance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).
7. MWN-05B was resampled for Barium on January 18. The second set of field measurements represents the groundwater conditions during the Barium sampling (*italicized*).

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
\- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groudwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																									
		MW-1D4 — Slag/Fill																							MW-1D5 — Slag/Fill		
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	Oct-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	May-2017	Apr-2018	Nov-1999	Apr-2013	Jan-2019
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2005b	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018	RFI	CMS 2013	CMS 2019
VOCs (Method 8260B, 8260C, 8021B) - ug/L																											
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	ND	ND	ND
1,1-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	ND	ND	ND
1,2,4,5-Tetramethylbenzene	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-	-	-	-	-	-	-	-	-	ND	-
1,2,4-Trichlorobenzene	5	-	ND	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	ND	ND
1,2,4-Trimethylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	0.41	0.85	ND	0.74 J	0.81 J	ND	ND	ND	-	ND	-
1,2-Dichlorobenzene	3	-	ND	-	-	-	-	-	-	-	-	0.2 J	-	-	ND	-	-	-	-	-	-	-	-	-	-	ND	ND
1,2-Dichloroethane	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	ND	ND	ND
1,3,5-Trimethylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	1.4	2.4	1.6 J	1.9 J	2.1 J	1.7 J	1.4 J	1.5 J	-	ND	-
1,4-Dichlorobenzene	3	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	ND	ND
1,4-Diethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-
2-Butanone	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND
Acetone	50	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-	-	-	-	-	-	-	-	-	4 J	ND
Benzene	1	31	17 J	18	14	14	11	8.5	14	12	15	9.2	9.4	14	8.9	12	4	11	9.3	7.6	7.1	7.5	6	5.6	18	13	9.3
Bromomethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	ND	ND	ND
Carbon disulfide	60	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-	-	-	-	-	-	-	-	-	ND	ND
Chlorobenzene	5	ND	ND	ND	ND	ND	ND	ND	0.48 J	ND	0.55 J	ND	ND	0.52 J	ND	ND	-	-	-	-	-	-	-	-	ND	ND	ND
Chloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	ND	ND	ND
Chloroform	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	ND	ND	ND
cis-1,2-Dichloroethene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-	-	-	-	-	-	-	-	-	ND	ND
Cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND
Ethylbenzene	5	ND	ND	ND	ND	ND	ND	0.69 J	0.73 J	0.58 J	0.78 J	ND	0.54 J	0.62 J	0.49 J	ND	0.23	0.45	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND
Methyl cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND
Methylene chloride	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	ND	ND	ND
n-Butylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	0.1 J	0.19 J	ND	ND	ND	ND	ND	ND	-	ND	-
n-Propylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-
p-Isopropyltoluene (p-Cymene)	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.23	0.33	ND	ND	ND	ND	ND	ND	-	ND	-
Styrene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-	-	-	-	-	-	-	-	-	ND	ND
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	ND	ND	ND
Toluene	5	8.2	5.5 J	5.7	4.8 J	4.4 J	3.4 J	3 J	ND	3.6 J	4.9	3.2	3.3	5.3	3.5	6.7	6.2	4	6	4.8	3.9	3.4	3.1	2.8	6.5	ND	1.8 J
trans-1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	ND	ND	ND
Trichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	ND	ND	ND
Vinyl chloride	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	ND	ND	ND
Xylenes, Total	5	19	7.1 J	17.2 J	15.6	15.3 J	11.8 J	12.8 J	13.5 J	11.8 J	14.4	10.2	10	12	8.4	9.7	5.5	9	7.4	7.3	6.6	6.2	5.8	5.2	22	ND	3.8 J
SVOCs (Method 8270C, 8270D) - ug/L																											
2,4-Dimethylphenol	See Note 3	2.5 J	ND	ND	2 J	ND	ND	ND	ND	1 J	1 J	ND	1 J	1 J	ND	-	ND	ND	-	-	-	-	-	-	3.7 J	-	ND
2,6-Dinitrotoluene	5	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	ND	ND	ND
2-Chloronaphthalene	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-	-	-	ND
2-Methylnaphthalene	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	3 J	2.1 J	2.4 J	2.1	2 J	1.9	1.6	1.4 J	2.2	-	3.6	2.3
2-Methylphenol (o-Cresol)	See Note 3	2.2 J	ND	2 J	-	2 J	-	-	-	1 J	1 J	-	0.9 J	1 J	ND	-	ND	ND	-	-	-	-	-	-	6.8 J	-	-
2-Nitrophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-	-	-	ND
3,3'-Dichlorobenzidine	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND
3,4-Methylphenol (m,p-Cresol)	See Note 3	5.2 J	4 J	4 J	3 J	2 J	2 J	2 J	3 J	6 J	6 J	ND	4 J	6 J	ND	-	ND	ND	-	-	-	-	-	-	16 J	-	4.8 J
4-Chloro-3-methylphenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	-	-	-	-	ND	-	ND
4-Chloroaniline	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.4 J	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND
4-Nitroaniline	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	-	-	-	-	-	ND	ND
4-Nitrophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-	-	-	ND
Acenaphthene	20	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	1.5 J	1 J	1.5 J	1	0.96	0.9	0.89	0.94 J	1.2 J	-	2.7	1.6
Acenaphthylene	-	5.7 J	5 J	8 J	4 J	4 J	5 J	3 J	4 J	3 J	4 J	3 J	4 J	4 J	2.8 J	3.3 J	2.1 J	3.2 J	1.4	1.4	1.6	1.5	1.7 J	1.8 J	10	4.4	2.4
Acetophenone	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	2.4 J	0.79 J	ND	ND	ND	ND	ND	ND	ND	-	ND	ND
Anthracene	50	ND	ND	ND	ND	ND	ND	1 J	1 J	0.7 J	1 J	1 J	1 J	1 J	ND	0.66 J	0.45 J	1.3 J	0.54	0.49	0.42	0.58	ND	ND	1.5 J	1.6	ND
Benzo(a)anthracene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.1 J**	**0.07 J**
Benzo(a)pyrene	0 (ND)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	**0.02 J**
Benzo(ghi)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND
Benzo(k)fluoranthene	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	**0.01 J**
Benzyl Alcohol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	-	1.6 J	-
Biphenyl	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	0.75 DJ	ND	0.79 J	ND	ND	0.49 J	ND	ND	ND	-	0.9 J	0.51 J
Bis(2-ethylhexyl)phthalate	5	ND	ND	ND	ND	ND	ND	**10**	ND	**6 BJ**	ND	ND	ND	ND	ND	ND	2.8 JB	ND	ND	ND	ND	ND	ND	ND	4.8 J	ND	ND
Butyl benzyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	4.5	2.4 J	4.3 J	ND	ND	ND	ND	1.8 J	2.5	-	10	4.8
Chrysene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.1 J**	**0.06 J**
Dibenz(a,h)anthracene	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND
Dibenzofuran	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	2.1 J	1.5 J	2.3 J	ND	1.5 J	1.3 J	1.2 J	1.4 J	1.7 J	-	3.2	1.8 J
Diethyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl phthalate	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3 J	0.3 BJ	0.4 BJ	ND	0.41 BJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.8 BJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	50	1.6 J	ND	2 J	2 J	ND	2 J	2 J	2 J	0.9 J	1 J	1 J	1 J	1 J	ND	0.52 J	ND	1.3 J	0.5	0.6	0.4	0.57	0.6 J	0.75 J	2.1 J	2.5	2
Fluorene	50	4.6 J	6 J	7 J	4 J	4 J	5 J	4 J	5 J	4 J	4 J	4 J	4 J	4 J	3 J	3.5 J	2.5 J	3.8 J	2.3	2.6	2.2	3	2.2	2.9	8.6 J	6.1	4
Indeno(1,2,3-cd)Pyrene	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	**0.02 J**
Naphthalene	10	**18**	**22**	**28**	**16**	**16**	**17**	**13**	**17**	**13 B**	**14**	**11**	**11**	**14**	10	**15**	8.7	10	**11**	7.9	8.2	6.4	7.1	8.1	**40**	**19**	**12**
N-Nitrosodiphenylamine (NDPA/DPA)	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND
Pentachlorophenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	ND	ND	-	-	ND	-	0.8
Phenanthrene	50	5.6 J	10	10	7 J	6 J	7 J	8 J	7 J	5 J	6	5	6 J	7	4.8 J	3.8 J	3 J	6.3	3.3	3.7	2.4	3.4	2.9	3.8	9.8 J	7.9	ND
Phenol	See Note 3	5.7 J	ND	1 J	1 J	1 J	ND	ND	ND	1 J	ND	ND	2 J	1 J	ND	-	0.9 J	ND	-	-	-	-	-	-	33	-	ND
Pyrene	50	ND	ND	ND	ND	ND	ND	1 J	0.9 J	0.6 J	0.6 J	0.9 J	0.5 J	0.6 J	ND	ND	ND	0.69 J	0.22	0.34	0.22	0.28	ND	ND	1.3 J	1.4	1.2
Pyridine	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	3.8 J	-	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug																											
Phenolic compounds (total phenols) [4]	1	**15.6**	**4**	**7**	**6**	**5**	**2**	**2**	**3**	**9**	**8**	ND	**7.9**	**9**	ND	-	0.9	ND	-	-	-	-	-	-	**59.5**	-	**5.6**

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																									
		MW-1D4 — Slag/Fill																							MW-1D5 — Slag/Fill		
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	Oct-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	May-2017	Apr-2018	Nov-1999	Apr-2013	Jan-2019
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2005b	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018	RFI	CMS 2013	CMS 2019
Filtered SVOCs (Method 8270D) - ug/L																											
Acenaphthene	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(ghi)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)Pyrene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals - ug/L																											
Arsenic, Total	**25**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	ND	-	-
Barium, Total	**1000**	71.6 B	81	140	79	64	67.8	68	70.1	77	69.3	69	67.3	77	63.5	-	-	-	-	-	-	-	-	-	158 B	-	-
Cadmium, Total	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	ND	-	-
Chromium, Total	**50**	ND	ND	ND	ND	ND	ND	ND	ND	4.3	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	1.2 B	-	-
Cyanide, Total	**200**	ND	ND	13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	0.066	-	-
Lead, Total	**25**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	ND	-	-
Selenium, Total	**10**	8.1	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	9.8	-	-
Dissolved Metals - ug/L																											
Arsenic, Dissolved	**25**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-
Barium, Dissolved	**1000**	-	73	88	-	65	67.4	66	75.5	67	68	67	68.5	76	62.5	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium, Dissolved	**5**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-
Chromium, Dissolved	**50**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-
Lead, Dissolved	**25**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-
Selenium, Dissolved	**10**	-	4.6	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	8 J	-	-	-	-	-	-	-	-	-	-	-	-
Field Measurements																											
Dissolved Oxygen (mg/L)	**-**	0.4	1.28	4	1.72	1.18	1.41	1.19	1.67	1.47	1.41	0.89	1.08	0.9	1.21	2.16	1.9	0.74	1.5	0.58	1.94	1.5	1.99	1.56	0.4	0.85	1.76
Field pH (S.U.)	**12.5**	12.00	11.62	**13.43**	**12.66**	11.75	11.89	11.54	11.65	11.62	11.61	11.62	11.61	11.17	11.28	11.34	11.40	12.28	12.09	11.92	11.48	12.33	12.17	**12.90**	12.00	11.87	12.18
Redox Potential (mV)	**-**	-434	-295	-248	-251	-275	-299	-270	-302	-281	-304	-291	-304	-311	-302	-290	-245	279	-387	-325	-339	-317	-300	-332	-458	-390	-237
Specific Conductance (umhos/cm)	**-**	3100	2615	2596	2619	2490	2455	2568	2439	2290	2351	2517	2375	2527	2313	2387	2163	2259	2311	2260	2260	2297	2232	2193	3000	2386	2896
Temperature (deg C)	**-**	13.3	15.4	10.7	11.9	13.5	12.4	11.2	16.5	14.6	14.5	13.2	14.1	12.2	13.7	14.1	13.3	14.1	16.5	16.5	17.6	15.4	13.3	14.5	13.9	14.1	10.5
Turbidity (NTU)	**-**	3	2.48	1.83	2.31	0.18	0.99	1.27	10.5	4.19	3.78	2.03	2.36	0.63	1.39	1.1	4.19	1.53	2.56	2.24	8.24	2.61	1.12	4.66	1	5.44	1.35

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/Guldance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).
7. MWN-05B was resampled for Barium on January 18. The second set of field measurements represents the groundwater conditions during the Barium sampling (*italicized*).

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
\- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groundwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																					
		MW-1D6 — Slag/Fill																					
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	May-2017	Apr-2018
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018
VOCs (Method 8260B, 8260C, 8021B) - ug/L																							
1,1-Dichloroethane	5	57	47	33	35	28	22	39	37	16	13	7.2	7.2	4.2	2.5	2.6	3.3	1.5 J	2.2 J	-	2.4 J	1.9 J	1.7 DJ
1,1-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
1,2,4,5-Tetramethylbenzene	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	5	-	ND	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	-	ND	-	ND	ND	ND
1,2,4-Trimethylbenzene	5	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	ND	0.75 J	1 J	ND	0.84 J	1.2 DJ
1,2-Dichlorobenzene	3	-	ND	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
1,2-Dichloroethane	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.47 J	ND	ND	-	0.41 J	0.3 J	0.29 DJ
1,3,5-Trimethylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	-	ND	ND	ND
1,4-Diethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-	ND	ND	ND
Acetone	50	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	2.5 J	4.8 J	-	3 J	ND	2.3 DJ
Benzene	1	ND	ND	ND	ND	ND	ND	1 J	ND	ND	1.7	0.48 J	2.4	1.3	ND	0.62 J	1.7	0.53	1.2	2	1.3	1.6	2 D
Bromomethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
Carbon disulfide	60	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	1.9	ND	ND	-	ND	ND	ND
Chlorobenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
Chloroethane	5	ND	ND	ND	ND	ND	ND	2 J	ND	2.5	ND	ND	2.1	ND	ND	0.64 J	0.85 J	ND	ND	-	ND	ND	ND
Chloroform	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
cis-1,2-Dichloroethene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	-	ND	ND	ND
Cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-	ND	ND	ND
Ethylbenzene	5	ND	ND	6.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Methyl cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-	ND	ND	ND
Methylene chloride	5	ND	ND	ND	ND	ND	ND	3.3 J	1.3 J	0.97 J	1.4	ND	1.3	ND	1.3 B	0.61 J	1.4	0.75 J	ND	-	ND	ND	0.7 DJ
n-Butylbenzene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND
n-Propylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene (p-Cymene)	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND
Styrene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	-	ND	ND	ND
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
Toluene	5	ND	ND	ND	ND	ND	ND	ND	ND	0.59 J	ND	ND	1	0.65 J	ND	ND	0.81 J	ND	ND	0.84 J	1.1 J	0.84 J	0.88 DJ
trans-1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
Trichloroethene	5	ND	ND	ND	ND	ND	ND	0.47 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
Vinyl chloride	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
Xylenes, Total	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.85 J	0.45 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
SVOCs (Method 8270C, 8270D) - ug/L																							
2,4-Dimethylphenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	2 J	ND	1 J	ND	-	ND	ND	-	-	-	-	-	-
2,6-Dinitrotoluene	5	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-
2-Chloronaphthalene	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-
2-Methylnaphthalene	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	1.4	0.85	0.84	2	2.1
2-Methylphenol (o-Cresol)	See Note 3	ND	ND	-	-	-	-	-	0.5 J	0.4 J	4 J	0.5 J	0.8 J	ND	-	ND	1.2 J	-	-	-	-	-	-
2-Nitrophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-
3,3'-Dichlorobenzidine	5	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
3,4-Methylphenol (m,p-Cresol)	See Note 3	ND	7 J	1 J	ND	ND	ND	1 J	0.5 J	0.4 J	12 J	1.8 J	4 J	1.3 J	-	0.91 J	1.7 J	-	-	-	-	-	-
4-Chloro-3-methylphenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	-	-	-	-
4-Chloroaniline	5	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitroaniline	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	-	-	-	-
4-Nitrophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-
Acenaphthene	20	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	0.09 J	0.28	0.21	0.2	ND	ND
Acenaphthylene	-	ND	ND	ND	ND	ND	ND	ND	0.2 J	ND	1 J	ND	0.5 J	ND	ND	ND	ND	ND	0.35	0.14 J	0.16 J	0.71 J	0.66 J
Acetophenone	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	50	ND	ND	ND	ND	ND	ND	ND	0.4 J	0.2 J	0.4 J	0.3 J	ND	ND	ND	ND	ND	ND	0.42	0.26	0.44	ND	ND
Benzo(a)anthracene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	0.3 J	0.3 J	0.2 J	0.3 J	ND	ND	ND	ND	0.06 J	0.16 J	0.07 J	0.19 J	ND	ND
Benzo(a)pyrene	0 (ND)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	0.002	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	0.13 J	0.04 J	0.13 J	ND	ND
Benzo(ghi)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	0.002	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	0.05 J	ND	ND
Benzyl Alcohol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Biphenyl	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate	5	3.8 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.5 JB	ND	ND	ND	ND	ND	1.8 J	ND
Butyl benzyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	0.45 J	1 J	3.1 J	ND	2.2	2.6	2.4	3.4	3.3
Chrysene	0.002	ND	ND	ND	ND	ND	ND	0.5 J	ND	0.3 J	0.3 J	ND	ND	ND	ND	ND	ND	0.12 J	0.25	0.1 J	0.29	ND	ND
Dibenz(a,h)anthracene	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	0.65 J	ND	ND	0.88 J	1.1 J	1.5 J	1.4 J
Diethyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl phthalate	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3 J	0.3 BJ	0.4 BJ	ND	0.33 BJ	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	0.7 BJ	ND	ND	ND	ND	ND	3.8 J	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	50	1.2 J	ND	4 J	2 J	ND	2 J	6 J	4 J	2 J	4 J	3 J	3 J	2 J	3.1 J	3.3 J	4.6 J	1	5	2.5	4.3	4.3	4.1
Fluorene	50	ND	ND	ND	ND	ND	ND	ND	0.9 J	ND	1 J	0.4 J	0.2 J	ND	ND	0.37 J	0.4 J	ND	0.72	0.55	0.62	0.84 J	1.8 J
Indeno(1,2,3-cd)Pyrene	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	10	ND	ND	ND	ND	ND	ND	ND	3 BJ	ND	57	9	25	20	ND	ND	ND	ND	14	7.8	7.2	28	28
N-Nitrosodiphenylamine (NDPA/DPA)	50	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	ND	ND	-	-
Phenanthrene	50	ND	ND	2 J	ND	4 J	4 J	ND	6 J	2 J	10	6	0.2 J	4.7 J	ND	1.6 J	ND	ND	7.6	5.5	8.8	11	11
Phenol	See Note 3	3 J	ND	ND	ND	ND	ND	ND	ND	ND	1 J	2 J	1 J	ND	-	ND	ND	-	-	-	-	-	-
Pyrene	50	ND	ND	2 J	1 J	1 J	1 J	3 J	2 J	1 J	2 J	1 J	2 J	ND	1.6 J	1.6 J	2.3 J	0.83	2.6	1.2	2.1	2.1	2
Pyridine	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	10 J	ND	ND	1.8 J	-	-	-	-	-	-	-	-	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug/L																							
Phenolic compounds (total phenols) [4]	1	3	7	1	ND	ND	ND	1	1	0.8	19	4.3	6.8	1.3	-	0.91	2.9	-	-	-	-	-	-

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program — MW-1D6 — Slag/Fill																					
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	May-2017	Apr-2018
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018
Filtered SVOCs (Method 8270D) - ug/L																							
Acenaphthene	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(ghi)perylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)Pyrene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals - ug/L																							
Arsenic, Total	**25**	2.7 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Barium, Total	**1000**	24.1 B	22	28 B	25	270	23.1	32.8 J	23	29.3	43	25.5	37	24.6	-	-	-	-	-	-	-	-	-
Cadmium, Total	**5**	0.32 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Chromium, Total	**50**	2.6 B	2	ND	ND	ND	5.2	ND	ND	5.9	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Cyanide, Total	**200**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Lead, Total	**25**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Selenium, Total	**10**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Dissolved Metals - ug/L																							
Arsenic, Dissolved	**25**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Barium, Dissolved	**1000**	-	22	30	-	26	22.8	36.7 J	25	27	45	25.5	36	26	-	-	-	-	-	-	-	-	-
Cadmium, Dissolved	**5**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Chromium, Dissolved	**50**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Lead, Dissolved	**25**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Selenium, Dissolved	**10**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Field Measurements																							
Dissolved Oxygen (mg/L)	**-**	2	3.1	2.72	2.94	2.83	-	1.95	3.01	2.75	1.7	1.59	2.46	1.21	1.75	-	2.04	1.6	1.78	2.93	1.91	2.81	3.08
Field pH (S.U.)	**12.5**	11.10	11.14	12.33	11.97	11.54	11.15	10.87	11.31	10.95	11.10	10.71	10.85	10.90	11.09	11.44	**12.60**	11.98	11.22	10.91	11.38	12.07	12.03
Redox Potential (mV)	**-**	-204	-106	-156	-143	-126	-156	-167	-149	-126	-235	-194	-242	-232	-154	-129	10	-238	-238	-240	-180	-194	-203
Specific Conductance (umhos/cm)	**-**	4100	2904	3839	2962	3364	2960	4218	2925	3113	5381	3268	4909	3364	3412	3954	5404	1952	4640	5300	4193	3883	4133
Temperature (deg C)	**-**	14.2	17.3	11.5	14.2	14.9	13.0	19.7	12.2	17.2	15.6	14.1	13.5	17.1	11.1	14.6	16.4	15.5	18.3	21.1	19.4	14.2	13.1
Turbidity (NTU)	**-**	6	3.71	5.18	3.25	2.5	1.51	28	4.4	11.8	10.2	1.81	4.79	2.23	3.39	3.22	11.9	5.82	9.34	3.49	1.91	3.29	5.24

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/Guidance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).
7. MWN-05B was resampled for Barium on January 18. The second set of field measurements represents the groundwater conditions during the Barium sampling (*italicized*).

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groudwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program — MW-1D7 — Slag/Fill																						
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	Oct-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	May-2017	Apr-2018
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2005b	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018
VOCs (Method 8260B, 8260C, 8021B) - ug/L																								
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	0.7 J	1 J	0.98 J	0.81 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
1,1-Dichloroethene	5	ND	ND	ND	ND	ND	ND	0.91 J	1.4 J	1.5 J	0.79 J	ND	0.43 J	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
1,2,4,5-Tetramethylbenzene	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	5	-	ND	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	-	ND	-	ND	ND	ND
1,2,4-Trimethylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	3	-	ND	-	-	-	-	-	-	0.2 J	-	0.2 J	-	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
1,2-Dichloroethane	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
1,3,5-Trimethylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	3	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3 J	ND	ND	ND	-	ND	ND	ND	ND	-	ND	ND	ND
1,4-Diethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-	ND	ND	ND
Acetone	50	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	4.3 J	ND	ND	ND	-	2.8 J	ND	ND
Benzene	1	ND	14	12	14	13	11	10	14	12	9.2	9.3	14	13	11	9.3	11	12	6.3	7.4	5.5	7	7.6	7
Bromomethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
Carbon disulfide	60	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	0.43 J	ND	ND	-	ND	ND	ND
Chlorobenzene	5	ND	1.1 J	ND	ND	ND	ND	0.74 J	0.89 J	0.84 J	0.64 J	ND	0.64 J	ND	0.59 J	ND	ND	ND	ND	ND	-	ND	ND	ND
Chloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
Chloroform	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
cis-1,2-Dichloroethene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	45	20	20	10	-	18	14	7.9
Cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-	ND	ND	ND
Ethylbenzene	5	ND	ND	ND	ND	ND	ND	1.4 J	1.3 J	1.3 J	1.1	ND	1.6	ND	ND	1.8	1.9	1.6	1 J	1 J	0.88 J	0.96 J	ND	0.78 J
Isopropylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Methyl cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-	ND	ND	ND
Methylene chloride	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
n-Butylbenzene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND
n-Propylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene (p-Cymene)	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND
Styrene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	-	ND	ND	ND
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
Toluene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.8	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	5	ND	4.8 J	4.7 J	5.6	8.9	8.5	9.1	15	16	8	12	5.7	2.9 J	4.7	10	11	5.8	4.2	3.6	-	14	15	10
Trichloroethene	5	18	31	33	23	30	27	41	61	61	28	40	18	18	10	11	11	3.4	1.2	0.53	-	0.42	0.48 J	0.44 J
Vinyl chloride	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4	2.2 J	3.5	ND	4.3	8.6	2.2	2.5	-	ND	3.3	3.4
Xylenes, Total	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SVOCs (Method 8270C, 8270D) - ug/L																								
2,4-Dimethylphenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	-	-	-	-
2,6-Dinitrotoluene	5	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-
2-Chloronaphthalene	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-
2-Methylnaphthalene	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylphenol (o-Cresol)	See Note 3	ND	ND	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	-	-	-	-	-	-
2-Nitrophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-
3,3'-Dichlorobenzidine	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
3,4-Methylphenol (m,p-Cresol)	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	-	-	-	-
4-Chloro-3-methylphenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.6 J	ND	ND	-	ND	ND	-	-	-	-	-	-
4-Chloroaniline	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitroaniline	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	2.8 J	ND	ND	-	-	-	-
4-Nitrophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-
Acenaphthene	20	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	0.7 J	0.87 J	0.66 J	0.32	0.57	0.39	0.4	ND	ND
Acenaphthylene	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.28	0.29	0.22	0.2	ND	ND
Acetophenone	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	50	ND	ND	ND	ND	ND	ND	ND	0.6 J	0.5 J	0.3 J	ND	0.6	ND	-	ND	0.43 J	0.28 J	0.4	0.72	0.45	0.46	ND	ND
Benzo(a)anthracene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	0 (ND)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	0.002	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(ghi)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzyl Alcohol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Biphenyl	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate	5	ND	ND	ND	30	ND	ND	ND	ND	ND	ND	ND	ND	ND	3 J	2.2 J	3.5 BJ	6.2	ND	ND	ND	ND	3	ND
Butyl benzyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	6.2 J	6.5 J	5.5 J	3.9	3.8	4.8	1.6 J	ND	ND
Diethyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl phthalate	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	0.3 J	ND	0.6 J	0.4 J	ND	ND	0.69 BJ	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	1 BJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	50	ND	ND	ND	ND	ND	ND	0.5 J	ND	0.8 J	0.4 J	0.9 J	0.6 J	ND	ND	ND	0.55 J	0.61 J	0.32	0.49	0.53	0.41	ND	ND
Fluorene	50	7.2 J	11	10	12	8 J	8 J	7 J	7 J	9 J	5	8	7	8	5.1 J	6.3	7.5	6	4.3	6.6	6.3	4.7	4.6	5.2
Indeno(1,2,3-cd)Pyrene	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	10	ND	ND	ND	ND	ND	ND	0.9 J	ND	0.6 BJ	0.4 J	1 J	0.5 J	0.4 J	ND	0.88 J	ND	ND	0.62	0.27	0.34	0.34	ND	ND
N-Nitrosodiphenylamine (NDPA/DPA)	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	ND	ND	-	-
Phenanthrene	50	ND	ND	ND	ND	ND	ND	ND	ND	0.4 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.07 J	0.14 J	ND	ND
Phenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1 J	ND	ND	-	ND	ND	-	-	-	-	-	-
Pyrene	50	ND	ND	ND	ND	ND	ND	ND	ND	0.4 J	0.3 J	0.6 J	0.4 J	ND	ND	ND	0.32 J	ND	0.18 J	0.26	0.27	0.2	ND	ND
Pyridine	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Total Phenolic Compounds (Method 8270C, 8270D)- u																								
Phenolic compounds (total phenols) [4]	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.6	ND	ND	-	ND	ND	-	-	-	-	-	-

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																						
		MW-1D7 — Slag/Fill																						
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	Oct-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	May-2017	Apr-2018
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2005b	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018
Filtered SVOCs (Method 8270D) - ug/L																								
Acenaphthene	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(ghi)perylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)Pyrene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals - ug/L																								
Arsenic, Total	**25**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Barium, Total	**1000**	26 B	24	22	24	21	21.2	20	32.4	46	40.1	32	52.3	47	44.8	-	-	-	-	-	-	-	-	-
Cadmium, Total	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Chromium, Total	**50**	3.6 B	ND	ND	ND	ND	5.4	5.2	ND	5.1	6.2	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Cyanide, Total	**200**	24 J	ND	ND	ND	ND	ND	17	ND	ND	ND	ND	27	ND	-	-	-	-	-	-	-	-	-	-
Lead, Total	**25**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Selenium, Total	**10**	ND	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Dissolved Metals - ug/L																								
Arsenic, Dissolved	**25**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Barium, Dissolved	**1000**	-	24	22	-	21	20.7	18	34.9	48	38.9	31	51.7	45	45.2	-	-	-	-	-	-	-	-	-
Cadmium, Dissolved	**5**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Chromium, Dissolved	**50**	-	ND	ND	-	ND	5.8	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Lead, Dissolved	**25**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Selenium, Dissolved	**10**	-	1.9	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Field Measurements																								
Dissolved Oxygen (mg/L)	**-**	0.8	1.31	2.08	0.84	0.59	0.7	2.77	1.64	1.33	2.45	0.81	1.01	0.29	1.36	1.94	1.27	0.95	1.9	0.76	1.4	2.03	1.68	2.03
Field pH (S.U.)	**12.5**	7.40	7.61	8.51	7.63	7.48	7.65	7.73	7.39	7.29	7.64	7.60	7.17	7.21	7.26	7.45	7.01	7.45	7.21	7.39	7.45	7.46	7.34	8.22
Redox Potential (mV)	**-**	-233	-213	-138	-206	-240	-235	-236	-256	-251	-185	-227	-152	-229	-140	-146	-43	123	-105	-222	-230	-170	-15	-198
Specific Conductance (umhos/cm)	**-**	3600	3515	2920	3589	3256	3187	2652	5322	7355	6351	4545	8274	6864	7255	4630	7097	6750	5260	6112	5205	5883	5398	4380
Temperature (deg C)	**-**	17.3	17.2	14.3	15.1	15.8	17.4	12.8	19.2	14.8	17.8	16.2	15.1	15.0	15.9	16.2	14.9	16.4	16.8	19.4	20.0	17.7	15.0	13.2
Turbidity (NTU)	**-**	8	4.45	1.75	1.14	0.35	1.58	2.62	3.33	1.87	3.15	1.98	1.17	1.12	4.06	3.99	0.75	4.48	11.6	2.04	3.27	1.34	1.52	5.07

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/Guldance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).
7. MWN-05B was resampled for Barium on January 18. The second set of field measurements represents the groundwater conditions during the Barium sampling (*italicized*).

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
\- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groudwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program: MW-1D8 — Slag/Fill																						
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	Oct-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	May-2017	Apr-2018
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2005b	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018
VOCs (Method 8260B, 8260C, 8021B) - ug/L																								
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
1,1-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
1,2,4,5-Tetramethylbenzene	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	5	-	ND	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	-	ND	-	ND	ND	ND
1,2,4-Trimethylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	ND	4.1	ND	1.1 J	ND	ND
1,2-Dichlorobenzene	3	-	ND	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
1,2-Dichloroethane	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
1,3,5-Trimethylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	ND	3.7	0.84 J	2.1 J	ND	ND
1,4-Dichlorobenzene	3	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	-	ND	ND	ND
1,4-Diethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-	ND	ND	ND
Acetone	50	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	1.6 J	-	ND	ND	ND
Benzene	1	ND	3.8 J	6.1	ND	1.3 J	2.7 J	2.2 J	2 J	1.6 J	0.59 J	6.9	3.1	3	4.1	0.98 J	ND	1.4	ND	1.9	0.34 J	1.1	ND	ND
Bromomethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
Carbon disulfide	60	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	0.41 J	ND	ND	-	ND	ND	ND
Chlorobenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
Chloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
Chloroform	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
cis-1,2-Dichloroethene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	-	ND	ND	ND
Cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-	ND	ND	ND
Ethylbenzene	5	2.4 J	1.7 J	2.2 J	ND	ND	ND	1.5 J	0.92 J	0.95 J	ND	1.5	0.91 J	0.93 J	1.3	0.82 J	ND	1.1	ND	0.81 J	ND	ND	ND	ND
Isopropylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Methyl cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-	ND	ND	ND
Methylene chloride	5	1.4 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
n-Butylbenzene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND
n-Propylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene (p-Cymene)	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND
Styrene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	4.2	ND	3.8	-	1.8 J	ND	ND
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
Toluene	5	17	11	14	2.6 J	3.8 J	4.8 J	8.6	6 B	5.7	2.4	8.8	5.7	6.7	8.6	4.1	ND	6.3	ND	5.5	1.3 J	3.1	ND	ND
trans-1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
Trichloroethene	5	1.6 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
Vinyl chloride	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND
Xylenes, Total	5	44	26.1	32	ND	9.1 J	7.7 J	20.3	12 J	14.5 J	5.4	21.6	10.4	13.3	15.2	11	ND	15	ND	11.2	2.4 J	5.5 J	ND	ND
SVOCs (Method 8270C, 8270D) - ug/L																								
2,4-Dimethylphenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.9 J	ND	ND	ND	-	ND	ND	-	-	-	-	-	-
2,6-Dinitrotoluene	5	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-
2-Chloronaphthalene	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-
2-Methylnaphthalene	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	6.3	ND	2.9 J	ND	3.1	0.29	1.3	ND	ND
2-Methylphenol (o-Cresol)	See Note 3	ND	ND	-	-	-	-	-	-	0.3 J	-	0.5 J	0.3 J	0.6 J	ND	-	ND	ND	-	-	-	-	-	-
2-Nitrophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-
3,3'-Dichlorobenzidine	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
3,4-Methylphenol (m,p-Cresol)	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	0.4 J	ND	2 J	1.8 J	2 J	0.57 J	-	ND	ND	-	-	-	-	-	-
4-Chloro-3-methylphenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	-	-	-	-
4-Chloroaniline	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitroaniline	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	-	-	-	-
4-Nitrophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-
Acenaphthene	20	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	0.19 J	ND	0.09 J	ND	ND
Acenaphthylene	-	26 J	12	24	4 J	5 J	ND	9	2 J	9 J	1 J	2 J	1 J	6	1.2 J	3.9 J	ND	2.9 J	0.21	2.2	0.36	1.1	ND	ND
Acetophenone	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	1.1 J	ND	0.55 J	ND	ND	ND	ND	ND	ND
Anthracene	50	ND	ND	ND	ND	ND	ND	ND	ND	0.2 J	ND	ND	ND	0.3 J	-	ND	ND	ND	0.11 J	0.18 J	0.11 J	0.18 J	ND	ND
Benzo(a)anthracene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	0 (ND)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	0.002	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(ghi)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzyl Alcohol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Biphenyl	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.3 BJ	3 J	ND	ND	ND	ND	2 J	ND
Butyl benzyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	0.58 J	ND	0.58 J	ND	ND	ND	ND	ND	ND
Chrysene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	0.68 J	ND	ND	ND	ND	ND	ND	ND	ND
Diethyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.33 J	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl phthalate	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4 BJ	0.4 BJ	ND	0.49 BJ	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4 BJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3 J	ND	0.3 J	ND	ND	ND	ND	0.08 J	0.14 J	0.06 J	0.12 J	ND	ND
Fluorene	50	ND	ND	3 J	ND	ND	ND	1 J	ND	1 J	0.2 J	0.4 J	0.3 J	1 J	ND	ND	ND	ND	ND	0.4	0.09 J	0.2	ND	ND
Indeno(1,2,3-cd)Pyrene	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	10	700	270 D	540	91	130	34	220 E	31	160 B	0.4 J	130	5	110	ND	64	ND	44	ND	26	4.5	15	ND	ND
N-Nitrosodiphenylamine (NDPA/DPA)	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	ND	ND	-	-
Phenanthrene	50	ND	ND	ND	ND	ND	ND	0.7 J	ND	0.7 J	ND	0.3 J	ND	1 J	ND	ND	ND	ND	ND	ND	ND	0.07 J	ND	ND
Phenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.6 J	2 J	0.9 J	ND	-	ND	ND	-	-	-	-	-	-
Pyrene	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.07 J	ND	ND
Pyridine	50	ND	ND	7 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-	-	-	-	-	-	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug																								
Phenolic compounds (total phenols) [4]	1	ND	ND	ND	ND	ND	ND	ND	ND	0.7	ND	4	4.1	3.5	0.57	-	ND	ND	-	-	-	-	-	-

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program — MW-1D8 — Slag/Fill																						
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	Oct-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	May-2017	Apr-2018
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2005b	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018
Filtered SVOCs (Method 8270D) - ug/L																								
Acenaphthene	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(ghi)perylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)Pyrene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals - ug/L																								
Arsenic, Total	**25**	3.5 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Barium, Total	**1000**	24.9 B	17	56	160	15	13.9	17	14.3	14	14.9	17	13.5	16	13.3	-	-	-	-	-	-	-	-	-
Cadmium, Total	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Chromium, Total	**50**	3.5 B	3.3	ND	ND	-	ND	ND	4.5	5.1	6.1	6.2	ND	ND	ND	-	-	-	-	-	-	-	-	-
Cyanide, Total	**200**	ND	ND	49	62	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Lead, Total	**25**	ND	ND	6.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Selenium, Total	**10**	**16.2**	**14**	ND	ND	ND	ND	ND	ND	ND	**16.9**	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Dissolved Metals - ug/L																								
Arsenic, Dissolved	**25**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Barium, Dissolved	**1000**	-	16	18	-	14	13.4	15	14.9	15	14.3	19	13.8	15	13.3	-	-	-	-	-	-	-	-	-
Cadmium, Dissolved	**5**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Chromium, Dissolved	**50**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Lead, Dissolved	**25**	-	ND	7	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-
Selenium, Dissolved	**10**	-	**12**	ND	-	ND	ND	ND	**15.2**	ND	**16**	ND	**158**	ND	**10.2 J**	-	-	-	-	-	-	-	-	-
Field Measurements																								
Dissolved Oxygen (mg/L)	**-**	2.1	2.62	2.81	1.96	0.68	-	2.08	1.77	1.89	2.61	2.09	1.28	2.37	2.56	2.41	4.47	2.01	2.75	0.92	1.2	1.92	4.33	4.32
Field pH (S.U.)	**12.5**	10.70	9.87	11.64	9.99	9.82	9.62	10.21	9.84	10.23	9.73	10.38	9.74	10.39	9.69	10.01	10.73	10.83	10.17	10.19	10.17	10.21	11.21	11.50
Redox Potential (mV)	**-**	-123	-70	-113	-46	-85	-83	-63	-79	-164	5	-33	0	-137	-5	-29	55	221	-150	-140	-217	-29	-42	-110
Specific Conductance (umhos/cm)	**-**	3800	2839	3156	2590	2615	2514	2744	2532	2582	2432	2925	2455	2866	2464	2453	2368	2546	2411	2415	2480	2389	2322	2268
Temperature (deg C)	**-**	15.1	16.4	12.7	14.1	15.3	16.2	13.8	21.1	13.7	16.8	13.7	15.3	14.2	16.1	16.4	15.3	16.5	16.0	20.4	19.7	15.9	18.0	13.6
Turbidity (NTU)	**-**	5	3.89	1.16	0.87	0.1	0.41	1.07	3.93	2.49	3.63	19.4	0.87	0.63	1.73	2.61	1	1.27	9.41	0.92	1.4	0.6	0.31	3.82

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/Guldance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).
7. MWN-05B was resampled for Barium on January 18. The second set of field measurements represents the groundwater conditions during the Barium sampling (*italicized*).

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
\- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groudwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program: MW-1U1 — Slag/Fill; Sand/Dredge Spoils																						MWN-02 — Slag/Fill		
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	Oct-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	May-2017	Apr-2018	Nov-1999	Jul-2011	Mar-2012
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2005b	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018	RFI	SWI 2011	CMS 2012 [5]
VOCs (Method 8260B, 8260C, 8021B) - ug/L																											
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	-	-
1,1-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	-	-
1,2,4,5-Tetramethylbenzene	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	5	-	ND	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	-	ND	-	ND	ND	ND	-	-	-
1,2,4-Trimethylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	ND	ND	0.75 J	ND	ND	ND	-	0.096 J	-
1,2-Dichlorobenzene	3	-	ND	-	-	-	-	-	-	-	-	0.6 J	-	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	-	-
1,2-Dichloroethane	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2 J	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	-	-
1,3,5-Trimethylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	0.99 J	1.1 J	1.4 J	1 J	1.1 J	1 J	-	0.29	-
1,4-Dichlorobenzene	3	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2 J	ND	ND	-	ND	ND	ND	ND	-	ND	ND	ND	-	-	-
1,4-Diethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-	ND	ND	ND	-	-	-
Acetone	50	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	-	ND	ND	1.9 J	-	-	-
Benzene	1	74	50	79	53	38	32	65	70	22	24	500	33	80	26	46	17	32	24	13	23	32	23	22	ND	0.52	-
Bromomethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	-	-
Carbon disulfide	60	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	0.88 J	0.84 J	ND	ND	-	ND	ND	ND	-	-	-
Chlorobenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	-	-
Chloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	-	-
Chloroform	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	-	-
cis-1,2-Dichloroethene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	-	ND	ND	ND	-	-	-
Cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-	ND	ND	ND	-	-	-
Ethylbenzene	5	ND	ND	ND	ND	ND	ND	0.66 J	0.59 J	0.52 J	ND	ND	0.61 J	0.66 J	0.46 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.11 J	-
Isopropylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-
Methyl cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.31 J	ND	ND	ND	-	ND	ND	ND	-	-	-
Methylene chloride	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	-	-
n-Butylbenzene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	-	ND	-
n-Propylbenzene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	ND	ND	ND	ND	ND	ND	-	ND	-
p-Isopropyltoluene (p-Cymene)	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	-	ND	-
Styrene	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	-	ND	ND	ND	-	-	-
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	-	-
Toluene	5	13	10 J	11	12	7.5	6.1	9.7	8.5 B	4.9 J	4.6	36	7.4	12	5.2	7.2	4.1	5.9	5.9	3.5	4.4	6.1	4.6	4.3	2.4 J	0.19 J	-
trans-1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	-	-
Trichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	-	-
Vinyl chloride	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	-	-
Xylenes, Total	5	34	6.7 J	16.1	19.2 J	16.7 J	11.5 J	16.6 J	13.3 J	11 J	10.8	ND	13.2	17.7	9.3	11.3	9.8	11	10	6.9	8.4	8.7	8	7	ND	0.85	-
SVOCs (Method 8270C, 8270D) - ug/L																											
2,4-Dimethylphenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	-	-	ND	-	ND	0.61 J	-	-	-	-	-	-	ND	-	2.1 J
2,6-Dinitrotoluene	5	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	ND	ND	-
2-Chloronaphthalene	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
2-Chlorophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-	-	-	ND
2-Methylnaphthalene	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	1.7 J	0.78 J	1.2 J	0.75	0.82	0.88	0.89	1 J	1 J	-	ND	-
2-Methylphenol (o-Cresol)	See Note 3	2.2 J	ND	-	-	-	1 J	-	-	0.8 J	0.5 J	7	1 J	1 J	ND	-	0.44 J	0.5 J	-	-	-	-	-	-	ND	-	2.2 J
2-Nitrophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-	-	-	ND
3,3'-Dichlorobenzidine	5	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-
3,4-Methylphenol (m,p-Cresol)	See Note 3	ND	ND	2 J	2 J	2 J	ND	3 J	2 J	4 J	2 J	28	4 J	4 J	ND	-	1.5 J	1.5 J	-	-	-	-	-	-	9.6 J	-	7.9
4-Chloro-3-methylphenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	-	ND	ND	-	-	-	-	ND	-	ND	-	ND
4-Chloroaniline	5	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-
4-Nitroaniline	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	-	-	-	-	-	ND	-
4-Nitrophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-	-	-	ND
Acenaphthene	20	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	0.93 J	0.8 J	0.9 J	0.66	0.64	0.64	0.64	0.76 J	0.68 J	-	ND	-
Acenaphthylene	-	3.7 J	ND	ND	3 J	ND	ND	2 J	1 J	2 J	1	4 J	2 J	2 J	1.4 J	2 J	1.3 J	1.5 J	1	1.2	1.2	1.3	1.7 J	1.4 J	2.8 J	ND	-
Acetophenone	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	0.61 J	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-
Anthracene	50	ND	ND	ND	ND	ND	ND	0.9 J	0.5 J	0.7 J	0.5 J	1 J	0.8 J	0.6 J	ND	0.72 J	0.51 J	0.66 J	0.26	0.51	0.33	0.38	2.7	ND	1.3 J	ND	-
Benzo(a)anthracene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3 J	ND	0.2 J	ND	ND	ND	ND	ND	ND	ND	0.06 J	ND	ND	ND	ND	ND	-
Benzo(a)pyrene	0 (ND)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Benzo(b)fluoranthene	0.002	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-
Benzo(ghi)perylene	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-
Benzo(k)fluoranthene	0.002	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-
Benzyl Alcohol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Biphenyl	5	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	0.31 J	ND	ND	ND	-	ND	-
Bis(2-ethylhexyl)phthalate	5	3.3 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.4 J	ND	ND	ND	ND	ND	-
Butyl benzyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Carbazole	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	3 J	1.5 J	2.6 J	ND	1.3 J	1.5 J	2	1.8 J	2	-	ND	-
Chrysene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.07 J	0.06 J	ND	ND	ND	ND	ND	-
Dibenz(a,h)anthracene	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-
Dibenzofuran	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	1.4 J	0.83 J	1.1 J	ND	ND	0.68 J	0.77 J	0.89 J	0.82 J	-	ND	-
Diethyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.42 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Dimethyl phthalate	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.7	ND	ND	ND	ND	-
Di-n-butyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3 BJ	0.5 BJ	ND	0.62 BJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Di-n-octyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4 BJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Fluoranthene	50	2.8 J	ND	3 J	4 J	3 J	3 J	3 J	2 J	3 J	2 J	2 J	3 J	2 J	2 J	2.5 J	2 J	2.2 J	0.95	1.7	1.2	1.3	1.8 J	1.5 J	2.6 J	1.3 J	-
Fluorene	50	3.3 J	ND	3 J	4 J	3 J	3 J	4 J	2 J	3 J	2 J	4 J	3 J	2 J	1.8 J	2.8 J	2.1 J	2.3 J	1.5	1.8	1.6	1.6	1.9 J	1.7 J	10	ND	-
Indeno(1,2,3-cd)Pyrene	0.002	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-
Naphthalene	10	29	27	29	36	22	17	30	16	7 BJ	10	75	19	24	11	23	3.1 J	12	3.4	7.1	10	11	11	14	36	ND	-
N-Nitrosodiphenylamine (NDPA/DPA)	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-
Pentachlorophenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	-	ND	ND	-	-	ND	ND	-	-	ND	-	1
Phenanthrene	50	6 J	7 J	6 J	7 J	5 J	4 J	6 J	4 J	4 J	4 J	7	5	4 J	3.4 J	4.9	3.4 J	4.2 J	2.2	3	2.4	2.7	3.1	2.9	14	ND	-
Phenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	1 J	ND	ND	0.5 J	-	ND	-	ND	ND	-	-	-	-	-	-	6.2 J	-	1.9 J
Pyrene	50	2.2 J	ND	2 J	3 J	2 J	3 J	3 J	2 J	2 J	2 J	2 J	2 J	2 J	1.8 J	2.1 J	1.8 J	2.1 J	0.79	1.7	1.2	1.2	1.8 J	1.5 J	3.2 J	0.94 J	-
Pyridine	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	-	-	-	-	-	-	-	-	-	ND	-	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug/L																											
Phenolic compounds (total phenols) [4]	1	2.2	ND	2	2	2	1	3	2	5.8	2.5	40	5.5	5	ND	-	1.94	2.61	-	-	-	-	-	-	16	-	15

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																									
		MW-1U1 — Slag/Fill; Sand/Dredge Spoils																						MWN-02 — Slag/Fill		
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	Oct-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	May-2017	Apr-2018	Nov-1999	Jul-2011	Mar-2012
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2005b	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018	RFI	SWI 2011	CMS 2012 [5]
Filtered SVOCs (Method 8270D) - ug/L																											
Acenaphthene	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(ghi)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)Pyrene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals - ug/L																											
Arsenic, Total	**25**	3.1 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	11	ND	ND	ND	-	-	-	-	-	-	-	-	-	2.8 B	-	ND
Barium, Total	**1000**	53.1 B	57	53	54	49	50.1	58	51.7	47	45	61	48.8	55	47.7	-	-	-	-	-	-	-	-	-	107 B	-	97
Cadmium, Total	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	0.31 B	-	-
Chromium, Total	**50**	6.6	5.6	ND	5.1	ND	27.6	7.9	22.4	26	19.8	9.9	5.8	20	9.8	-	-	-	-	-	-	-	-	-	20.3	-	ND
Cyanide, Total	**200**	170	ND	ND	ND	ND	ND	60	ND	40	ND	56	80	ND	35.5	-	-	-	-	-	-	-	-	-	20	-	-
Lead, Total	**25**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	2.5 B	-	-
Selenium, Total	**10**	5.1	5.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	9.5	-	8 J
Dissolved Metals - ug/L																											
Arsenic, Dissolved	**25**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	11	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-
Barium, Dissolved	**1000**	-	51	51	-	49	48.5	54	51.1	48	45.1	61	47.3	52	47.3	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium, Dissolved	**5**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-
Chromium, Dissolved	**50**	-	2.7	ND	-	ND	ND	ND	ND	5.5	ND	ND	ND	ND	0.6 J	-	-	-	-	-	-	-	-	-	-	-	-
Lead, Dissolved	**25**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-
Selenium, Dissolved	**10**	-	4.4	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-
Field Measurements																											
Dissolved Oxygen (mg/L)	-	0.6	1.71	3.02	2.19	0.98	1.26	1.9	1.66	1.67	2.19	1.66	1.21	0.87	2.24	2.11	1.51	2.1	1.95	1.02	1.32	2.28	1.58	2.03	1.2	3.47	1.88
Field pH (S.U.)	**12.5**	11.80	11.74	**13.23**	**12.62**	11.97	11.96	11.59	11.73	11.22	11.39	11.25	11.09	11.19	11.05	10.99	12.05	**13.63**	11.91	12.14	11.96	12.30	12.31	**12.95**	12.00	11.93	11.95
Redox Potential (mV)	-	-300	-252	-235	-196	-241	-225	-234	-241	-217	-201	-251	-203	-247	-200	-210	-172	-11	-199	-234	-292	-209	-209	-192	-245	-116	-252
Specific Conductance (umhos/cm)	-	3000	2634	2573	2539	2549	2672	2562	2439	2701	2408	2078	2538	2478	2519	2404	2638	2484	2444	2460	2549	2515	2573	2642	2,300	1693	1973
Temperature (deg C)	-	13.0	15.8	11.6	12.6	14.3	12.4	12.7	18.3	12.1	15.2	13.2	12.1	14.6	14.3	14.3	12.4	14.2	15.0	17.5	16.6	15.6	16.3	9.9	13.5	17.2	12.5
Turbidity (NTU)	-	2	4.57	3.02	1.77	1.2	7	1.83	5.31	4.1	7.25	1.61	1.21	8	7.24	8	1.41	2.51	12.4	7.45	7.41	4.29	1.49	4.94	2	9.27	2.77

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/Guldance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).
7. MWN-05B was resampled for Barium on January 18. The second set of field measurements represents the groundwater conditions during the Barium sampling (*italicized*).

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
\- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groundwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program: MWN-02B — Sand/Dredge Spoils			MWN-02D — Bedrock			MWN-03 — Slag/Fill			MWN-03B — Sand/Dredge Spoils; Clay; Peat			MWN-03D — Bedrock			MWN-04 — Slag/Fill			MWN-05A — Slag/Fill			MWN-05B — Sand/Dredge Spoils			MWN-05D — Bedrock		MWN-06A — Slag/Fill	
		Nov-1999	Jul-2011	Mar-2012	Nov-1999	Jul-2011	Mar-2012	Nov-1999	Jul-2011	Mar-2012	Nov-1999	Jul-2011	Mar-2012	Nov-1999	Jul-2011	Mar-2012	Nov-1999	Jul-2011	Mar-2012	Nov-1999	Mar-2012	Jan-2019	Nov-1999	Mar-2012	Jan-2019	Nov-1999	Mar-2012	Nov-1999	May-2013
		RFI	SWI 2011	CMS 2012 [5]	RFI	SWI 2011	CMS 2012	RFI	SWI 2011	CMS 2012 [5]	RFI	SWI 2011	CMS 2012 [5]	RFI	SWI 2011	CMS 2012	RFI	SWI 2011	CMS 2012 [5,6]	RFI	CMS 2012 [5]	CMS 2019 [7]	RFI	CMS 2012 [5]	CMS 2019	RFI	CMS 2012	RFI	CMS 2013 [5,6]
VOCs (Method 8260B, 8260C, 8021B) - ug/L																													
1,1-Dichloroethane	5	ND	-	-	ND	-	ND	ND	-	-	ND	-	ND	ND	-	-	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
1,1-Dichloroethene	5	ND	-	-	ND	-	ND	ND	-	-	ND	-	ND	ND	-	-	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
1,2,4,5-Tetramethylbenzene	-	-	-	-	-	-	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	-	ND	-	-
1,2,4-Trichlorobenzene	5	-	-	-	-	-	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	ND	-	ND	16 DJ	-	ND	-	-
1,2,4-Trimethylbenzene	5	-	ND	-	-	-	ND	-	0.48	-	-	-	ND	-	ND	-	-	ND	-	-	0.35 J	-	-	ND	-	-	ND	-	ND
1,2-Dichlorobenzene	3	-	-	-	-	-	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	ND	-	ND	26 D	-	ND	-	-
1,2-Dichloroethane	0.6	ND	-	-	ND	-	ND	ND	-	-	ND	-	ND	ND	-	-	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
1,3,5-Trimethylbenzene	5	-	ND	-	-	-	ND	-	1.6	-	-	-	ND	-	1	-	-	ND	-	-	0.89 J	-	-	ND	-	-	ND	-	ND
1,4-Dichlorobenzene	3	-	-	-	-	-	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	ND	-	ND	ND	-	ND	-	-
1,4-Diethylbenzene	-	-	-	-	-	-	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	0.24 J	-	-	ND	-	-	ND	-	-
2-Butanone	50	-	-	-	-	-	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	ND	-	ND	ND	-	ND	-	-
Acetone	50	-	-	-	-	-	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	ND	-	ND	28 DJ	-	ND	-	-
Benzene	1	39	120	-	ND	-	ND	14	5.8	-	ND	-	ND	ND	ND	-	ND	ND	-	5.2	ND	ND	64	37	54 D	ND	ND	ND	1.2
Bromomethane	5	ND	-	-	ND	-	ND	ND	-	-	ND	-	ND	ND	-	-	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Carbon disulfide	60	-	-	-	-	-	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	ND	-	ND	ND	-	ND	-	-
Chlorobenzene	5	ND	-	-	ND	-	ND	ND	-	-	ND	-	ND	ND	-	-	ND	-	-	2.2 J	ND	ND	46	45	49 D	ND	ND	ND	-
Chloroethane	5	ND	-	-	ND	-	ND	ND	-	-	ND	-	ND	ND	-	-	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Chloroform	7	ND	-	-	ND	-	ND	ND	-	-	ND	-	ND	ND	-	-	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
cis-1,2-Dichloroethene	5	-	-	-	-	-	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	ND	-	ND	ND	-	ND	-	-
Cyclohexane	-	-	-	-	-	-	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	ND	-	ND	5.6 DJ	-	0.51 J	-	-
Ethylbenzene	5	ND	ND	-	ND	-	ND	ND	0.25	-	ND	-	ND	2.2 J	2.8	-	ND	ND	-	ND	ND	ND	7.6	ND	ND	ND	ND	ND	ND
Isopropylbenzene	5	-	ND	-	-	-	ND	-	ND	-	-	-	ND	-	ND	-	-	ND	-	-	ND	ND	-	ND	ND	-	ND	-	ND
Methyl cyclohexane	-	-	-	-	-	-	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	ND	-	ND	9.8 DJ	-	ND	-	ND
Methylene chloride	5	ND	-	-	ND	-	ND	ND	-	-	ND	-	ND	ND	-	-	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
n-Butylbenzene	5	-	ND	-	-	-	ND	-	0.11 J	-	-	-	ND	-	ND	-	-	ND	-	-	ND	-	-	ND	-	-	ND	-	ND
n-Propylbenzene	5	-	ND	-	-	-	ND	-	ND	-	-	-	ND	-	ND	-	-	ND	-	-	ND	-	-	ND	-	-	ND	-	ND
p-Isopropyltoluene (p-Cymene)	5	-	ND	-	-	-	ND	-	ND	-	-	-	ND	-	ND	-	-	ND	-	-	ND	-	-	ND	-	-	ND	-	ND
Styrene	5	-	-	-	-	-	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	ND	-	ND	ND	-	ND	-	-
Tetrachloroethene	5	ND	-	-	ND	-	ND	ND	-	-	ND	-	ND	ND	-	-	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Toluene	5	5.5	17	-	ND	-	ND	5.1	1.7	-	ND	-	ND	ND	ND	-	ND	ND	-	2.9 J	ND	ND	32	33	39 D	ND	ND	2.5 J	ND
trans-1,2-Dichloroethene	5	ND	-	-	ND	-	ND	ND	-	-	ND	-	ND	ND	-	-	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Trichloroethene	5	ND	-	-	ND	-	ND	ND	-	-	ND	-	ND	ND	-	-	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Vinyl chloride	2	ND	-	-	ND	-	ND	ND	-	-	ND	-	ND	ND	-	-	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Xylenes, Total	5	6.5	17.4 J	-	ND	-	ND	16	4.3	-	ND	-	ND	9.8	2.9	-	ND	ND	-	5.8	ND	ND	40	16 J	36 DJ	8.6	ND	6.2	ND
SVOCs (Method 8270C, 8270D) - ug/L																													
2,4-Dimethylphenol	See Note 3	11 J	-	6.8	ND	-	-	2.8 J	-	ND	ND	-	ND	ND	-	-	ND	-	ND	3.7 J	ND	ND	ND	ND	11	ND	-	2.3 J	ND
2,6-Dinitrotoluene	5	ND	ND	-	ND	-	ND	ND	ND	-	ND	-	ND	ND	ND	-	ND	27	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloronaphthalene	10	ND	ND	-	ND	-	ND	ND	ND	-	ND	-	ND	ND	ND	-	ND	ND	-	ND	ND	0.05 J	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	See Note 3	-	-	ND	-	-	-	-	-	ND	-	-	ND	-	-	-	-	-	ND	-	ND	ND	-	ND	1 J	-	-	-	ND
2-Methylnaphthalene	-	-	8.5	-	-	-	ND	-	2.3 J	-	-	-	0.07 J	-	ND	-	-	ND	-	-	0.12 J	ND	-	31	35	-	ND	-	2.3
2-Methylphenol (o-Cresol)	See Note 3	26	-	13	ND	-	-	3.7 J	-	ND	ND	-	ND	ND	-	-	ND	-	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
2-Nitrophenol	See Note 3	-	-	ND	-	-	-	-	-	ND	-	-	ND	-	-	-	-	-	ND	-	ND	ND	-	ND	ND	-	-	-	ND
3,3'-Dichlorobenzidine	5	-	ND	-	-	-	ND	-	ND	-	-	-	ND	-	ND	-	-	ND	-	-	ND	ND	-	4.7 J	ND	-	ND	-	ND
3,4-Methylphenol (m,p-Cresol)	See Note 3	77	-	21	ND	-	-	8.3 J	-	ND	ND	-	ND	ND	-	-	ND	-	ND	5.7 J	ND	0.6 J	400	120	110	ND	-	ND	ND
4-Chloro-3-methylphenol	See Note 3	ND	-	ND	ND	-	-	ND	-	ND	ND	-	ND	ND	-	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND
4-Chloroaniline	5	-	ND	-	-	-	ND	-	ND	-	-	-	ND	-	ND	-	-	ND	-	-	ND	ND	-	ND	ND	-	ND	-	ND
4-Nitroaniline	5	-	ND	-	-	-	ND	-	ND	-	-	-	ND	-	ND	-	-	ND	-	-	ND	ND	-	ND	ND	-	ND	-	ND
4-Nitrophenol	See Note 3	-	-	ND	-	-	-	-	-	ND	-	-	ND	-	-	-	-	-	ND	-	ND	ND	-	ND	ND	-	-	-	ND
Acenaphthene	20	-	7.9	-	-	-	ND	-	1.5 J	-	-	-	1.1	-	ND	-	-	ND	-	-	0.46	ND	-	19	21	-	ND	-	1.2
Acenaphthylene	-	4.4 J	4.2 J	-	ND	-	ND	6.2 J	1.6 J	-	ND	-	0.06 J	ND	ND	-	ND	ND	-	6.7 J	0.39	ND	ND	7	6.8	ND	ND	3.8 J	1.8
Acetophenone	-	-	0.62 JB	-	-	-	ND	-	ND	-	-	-	ND	-	ND	-	-	ND	-	-	ND	ND	-	ND	ND	-	ND	-	0.67 J
Anthracene	50	2.7 J	2.9 J	-	ND	-	ND	ND	1 J	-	ND	-	0.15 J	ND	ND	-	ND	ND	-	1.4 J	0.2	ND	ND	5.1	4.5	ND	ND	1.5 J	1
Benzo(a)anthracene	0.002	ND	ND	-	ND	-	ND	ND	ND	-	ND	-	ND	ND	ND	-	ND	ND	-	ND	0.17 J	0.09 J	ND	ND	0.21	ND	ND	ND	0.12 J
Benzo(a)pyrene	0 (ND)	ND	ND	-	ND	-	ND	ND	ND	-	ND	-	ND	ND	ND	-	ND	ND	-	ND	ND	ND	ND	ND	0.03 J	ND	ND	ND	0.08 J
Benzo(b)fluoranthene	0.002	-	ND	-	-	-	ND	-	ND	-	-	-	ND	-	ND	-	-	ND	-	-	ND	0.03 J	-	ND	0.07 J	-	ND	-	0.2
Benzo(ghi)perylene	-	-	ND	-	-	-	ND	-	ND	-	-	-	ND	-	ND	-	-	ND	-	-	ND	0.02 J	-	ND	ND	-	ND	-	0.09 J
Benzo(k)fluoranthene	0.002	-	ND	-	-	-	ND	-	ND	-	-	-	ND	-	ND	-	-	ND	-	-	ND	0.02 J	-	ND	0.03 J	-	ND	-	0.09 J
Benzyl Alcohol	-	-	-	-	-	-	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	-	ND	-	ND
Biphenyl	5	-	1.5 J	-	-	-	ND	-	0.67 J	-	-	-	ND	-	ND	-	-	ND	-	-	ND	ND	-	4.5	5.6	-	ND	-	ND
Bis(2-ethylhexyl)phthalate	5	ND	ND	-	ND	-	ND	ND	ND	-	4 J	-	ND	ND	ND	-	6.1 J	ND	-	3.4 J	ND	ND	ND	ND	1.9 J	ND	ND	ND	ND
Butyl benzyl phthalate	50	ND	ND	-	ND	-	ND	ND	ND	-	ND	-	ND	ND	ND	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	-	-	24	-	-	-	ND	-	4.1 J	-	-	-	ND	-	ND	-	-	ND	-	-	ND	ND	-	31	36	-	ND	-	1.6 J
Chrysene	0.002	ND	ND	-	ND	-	ND	ND	ND	-	ND	-	ND	ND	ND	-	ND	ND	-	ND	0.07 J	0.09 J	ND	ND	0.15	ND	ND	ND	0.16 J
Dibenz(a,h)anthracene	-	-	ND	-	-	-	ND	-	ND	-	-	-	ND	-	ND	-	-	ND	-	-	ND	0.01 J	-	ND	ND	-	ND	-	ND
Dibenzofuran	-	-	5.8 J	-	-	-	ND	-	2.5 J	-	-	-	ND	-	ND	-	-	ND	-	-	ND	ND	-	13	13	-	ND	-	2.1
Diethyl phthalate	50	ND	ND	-	ND	-	ND	ND	ND	-	ND	-	ND	ND	ND	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl phthalate	-	ND	ND	-	ND	-	ND	ND	ND	-	ND	-	ND	ND	ND	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	50	ND	ND	-	ND	-	ND	ND	ND	-	ND	-	ND	ND	ND	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	50	ND	ND	-	ND	-	ND	ND	ND	-	ND	-	ND	ND	ND	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	1 J
Fluoranthene	50	3.9 J	4.3 J	-	ND	-	ND	2.7 J	3.7 J	-	ND	-	0.15 J	ND	ND	-	ND	ND	-	4.6 J	3.7	4.4	ND	3.2	3	ND	ND	1.9 J	2.3
Fluorene	50	8 J	9.8	-	ND	-	ND	8 J	4.7 J	-	ND	-	0.68	ND	ND	-	1.6 J	ND	-	7.1 J	0.45	ND	ND	20	18	ND	ND	6.4 J	4.4
Indeno(1,2,3-cd)Pyrene	0.002	-	ND	-	-	-	ND	-	ND	-	-	-	ND	-	ND	-	-	ND	-	-	ND	0.02 J	-	ND	ND	-	ND	-	ND
Naphthalene	10	200 D	260 D	-	ND	-	0.17 J	22	13	-	ND	-	ND	ND	ND	-	5.5 J	ND	-	24	0.29	ND	1500	560 D	1000 D	ND	ND	30	9.2
N-Nitrosodiphenylamine (NDPA/DPA)	50	-	0.49 J	-	-	-	ND	-	ND	-	-	-	ND	-	ND	-	-	ND	-	-	ND	ND	-	12	8.5	-	ND	-	ND
Pentachlorophenol	See Note 3	ND	-	1.1	ND	-	-	ND	-	1.3	ND	-	ND	ND	-	-	ND	-	ND	ND	0.46 J	0.27 J	ND	ND	ND	ND	-	ND	ND
Phenanthrene	50	16 J	18	-	ND	-	ND	11	9.7	-	1.1 J	-	0.61	ND	ND	-	1.9 J	ND	-	11	0.85	ND	ND	22	20	ND	ND	15	12
Phenol	See Note 3	8.2 J	-	ND	ND	-	-	7.7 J	-	ND	ND	-	ND	3.7 J	-	-	ND	-	ND	6.9 J	ND	ND	190 J	120	130 D	ND	-	12	ND
Pyrene	50	3.1 J	2.5 J	-	ND	-	ND	1.6 J	2.3 J	-	ND	-	0.1 J	ND	ND	-	1.6 J	0.45 J	-	2.7 J	2	2.6	ND	1.9 J	1.8	ND	ND	ND	1.1
Pyridine	50	ND	-	-	ND	-	-	7.9 J	-	-	ND	-	-	ND	-	-	ND	-	-	ND	-	-	ND	-	-	ND	-	ND	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug																													
Phenolic compounds (total phenols) [4]	1	122	-	42	ND	-	-	23	-	1.3	ND	-	ND	3.7	-	-	ND	-	ND	16	0.46	0.87	590	240	252	ND	-	14	ND

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																											
		MWN-02B — Sand/Dredge Spoils			MWN-02D — Bedrock			MWN-03 — Slag/Fill			MWN-03B — Sand/Dredge Spoils; Clay; Peat			MWN-03D — Bedrock			MWN-04 — Slag/Fill			MWN-05A — Slag/Fill			MWN-05B — Sand/Dredge Spoils			MWN-05D — Bedrock		MWN-06A — Slag/Fill	
		Nov-1999	Jul-2011	Mar-2012	Nov-1999	Jul-2011	Mar-2012	Nov-1999	Jul-2011	Mar-2012	Nov-1999	Jul-2011	Mar-2012	Nov-1999	Jul-2011	Mar-2012	Nov-1999	Jul-2011	Mar-2012	Nov-1999	Mar-2012	Jan-2019	Nov-1999	Mar-2012	Jan-2019	Nov-1999	Mar-2012	Nov-1999	May-2013
		RFI	SWI 2011	CMS 2012 [5]	RFI	SWI 2011	CMS 2012	RFI	SWI 2011	CMS 2012 [5]	RFI	SWI 2011	CMS 2012 [5]	RFI	SWI 2011	CMS 2012	RFI	SWI 2011	CMS 2012 [5,6]	RFI	CMS 2012 [5]	CMS 2019 [7]	RFI	CMS 2012 [5]	CMS 2019	RFI	CMS 2012	RFI	CMS 2013 [5,6]
Filtered SVOCs (Method 8270D) - ug/L																													
Acenaphthene	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.9 D	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.5 D	-	-	-	-
Anthracene	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.5 D	-	-	-	-
Benzo(ghi)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.09 DJ	-	-	-	-
Dibenzo(a,h)anthracene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.12 DJ	-	-	-	-
Fluoranthene	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.61 D	-	-	-	-
Fluorene	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.1 D	-	-	-	-
Indeno(1,2,3-cd)Pyrene	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.11 DJ**	-	-	-	-
Naphthalene	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**500 D**	-	-	-	-
Phenanthrene	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.5 D	-	-	-	-
Pyrene	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3 DJ	-	-	-	-
Total Metals - ug/L																													
Arsenic, Total	25	**40.1**	**49**	-	ND	ND	-	ND	-	ND	**84.8 J**	**34**	-	3.7 B	-	ND	4.2 B	-	ND	2.5 B	ND	-	ND	16	-	ND	ND	ND	-
Barium, Total	1000	60.7 B	-	71	528	690	-	99.9 B	-	91	384	**1100**	-	**1120**	**1400**	**1280**	28 B	-	40	102 B	100	113.1	**33400**	**8940**	**15750**	81.1 B	100	244	-
Cadmium, Total	5	ND	-	-	ND	-	-	ND	-	-	ND	-	-	0.43 B	-	-	ND	-	-	ND	-	-	**48.2 J**	ND	-	ND	-	ND	-
Chromium, Total	50	3.1 B	-	9 J	1.1 B	ND	-	1.1 B	-	ND	28.7	4	-	38.8	-	ND	17.1	-	20	2.8 B	10	-	**207**	**60**	-	13.9	4 J	2.1 B	2.65
Cyanide, Total	200	62	-	-	ND	-	-	ND	-	-	ND	-	-	ND	-	-	ND	-	-	ND	-	-	ND	-	-	ND	-	ND	-
Lead, Total	25	ND	-	-	ND	-	-	ND	-	-	5.4	-	-	ND	-	-	ND	-	-	ND	3 J	-	**25.2**	23	-	ND	-	ND	-
Selenium, Total	10	5.8	-	5 J	ND	-	ND	**10.5**	-	7 J	ND	-	ND	ND	-	ND	3.1 B	-	6 J	5.5	ND	-	ND	ND	-	ND	ND	4.2 B	-
Dissolved Metals - ug/L																													
Arsenic, Dissolved	25	-	-	**45**	ND	-	-	-	-	-	**112 J**	-	-	2.6 B	-	ND	-	-	-	-	-	-	ND	ND	-	ND	ND	-	-
Barium, Dissolved	1000	-	-	52	537	-	-	-	-	-	285	-	-	**1060**	-	**1380**	-	-	-	-	-	113.4	**31800**	**8940**	**17980**	78.1 B	94	-	-
Cadmium, Dissolved	5	-	-	-	ND	-	-	-	-	-	ND	-	-	0.55 B	-	-	-	-	-	-	-	-	**67.4 J**	ND	-	ND	-	-	-
Chromium, Dissolved	50	-	-	ND	ND	-	-	-	-	-	1.4 B	-	-	22.7	-	7 J	-	-	-	-	-	-	10.6 B	ND	-	2.5 B	ND	-	-
Lead, Dissolved	25	-	-	-	ND	-	-	-	-	-	ND	-	-	ND	-	-	-	-	-	-	-	-	8.3 B	ND	-	ND	-	-	-
Selenium, Dissolved	10	-	-	3 J	3.7 B	-	-	-	-	-	ND	-	-	ND	-	ND	-	-	-	-	-	-	ND	ND	-	ND	ND	-	-
Field Measurements																													
Dissolved Oxygen (mg/L)	-	0.5	3.47	1.27	0.4	0.87	2.83	0.5	0.48	1.03	2.1	1.28	1.67	0.5	1.71	0.41	4.1	6.36	8.7	0.7	1.59	8.28 / *3.67*	0.3	0.27	0.68	0.4	0.04	0.6	1.98
Field pH (S.U.)	12.5	11.20	11.93	11.32	7.00	7.05	7.33	12.10	**12.56**	12.06	7.50	7.44	7.30	6.20	6.69	6.13	11.20	12.07	12.11	12.40	12.00	**12.57** / ***12.65***	6.80	6.68	6.64	6.70	6.88	**12.50**	12.30
Redox Potential (mV)	-	-325	-116	-283	-142	-311	-106	-373	-311	-314	-165	-161	-175	-20	-69	-37	-82	-153	-137	-193	-0.08	-151 / *-152*	-254	-132	-108	-104	-53	-347	-280
Specific Conductance (umhos/cm)	-	1,200	1693	1145	1,300	1370	1411	3,200	2615	2592	2,200	2917	3051	2,800	25.6	26750	3400	2664	2963	4,800	4353	4781 / *4550*	82000	34.47	48.5	1,500	1382	6200	5026
Temperature (deg C)	-	13.5	17.2	13.0	14.5	16.0	12.9	14.2	18.5	12.1	15.9	19.5	12.1	14.9	20.0	14.1	21.0	22.0	11.2	14.0	11.0	7.5 / *8.2*	14.8	10.6	7.0	15.0	13.1	14.9	12.9
Turbidity (NTU)	-	1	9.27	250	330	5.18	14.8	1	4	1.57	300	15.9	1.67	79	25.8	1339	1	4.9	2.56	1	1.48	5.04 / *2.81*	320	>1000	8.32	580	>1000	1	22.5

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/Guldance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).
7. MWN-05B was resampled for Barium on January 18. The second set of field measurements represents the groundwater conditions during the Barium sampling (*italicized*).

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groundwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																										
		MWN-12 — Slag/Fill																							MWN-14A — Slag/Fill	MWN-14B — Slag/Fill; Sand/Dredge Spoils	MWN-15A — Slag/Fill	
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	Oct-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	May-2017	Apr-2018	Nov-1999	Nov-1999	Nov-1999	Apr-2013
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2005b	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018	RFI	RFI	RFI	CMS 2013 [5,6]
VOCs (Method 8260B, 8260C, 8021B) - ug/L																												
1,1-Dichloroethane	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-
1,1-Dichloroethene	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-
1,2,4,5-Tetramethylbenzene	**-**	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	**5**	-	ND	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	ND	-	ND	-	ND	ND	ND	-	-	-	-
1,2,4-Trimethylbenzene	**5**	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	ND	ND	ND	ND	ND	ND	-	-	-	**430 J**
1,2-Dichlorobenzene	**3**	-	ND	-	-	-	-	-	-	-	-	0.6 J	-	-	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	-	-	-
1,2-Dichloroethane	**0.6**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-
1,3,5-Trimethylbenzene	**5**	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	0.78 J	0.96 J	1.1 J	0.91 J	0.81 J	ND	-	-	-	**310 J**
1,4-Dichlorobenzene	**3**	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	-	ND	ND	ND	-	-	-	-
1,4-Diethylbenzene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-	ND	ND	ND	-	-	-	-
Acetone	**50**	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	9.4 J	4.2 J	1.6 J	5.1	-	ND	2.5 J	10	-	-	-	-
Benzene	**1**	ND	**4 J**	**4.3 J**	**2.9 J**	**4.1 J**	**3.1 J**	**4.4 J**	**4 J**	**2.9 J**	**3.1**	**4.9**	**3.5**	**4.7**	**3**	**3.2**	**2.9**	**2.9**	**1.8**	**2**	**1.9**	**2.4**	**1.8**	0.32 J	**130**	**690**	**12000**	**6500**
Bromomethane	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-
Carbon disulfide	**60**	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	0.89 J	0.72 J	ND	1.2 J	-	ND	ND	ND	-	-	-	-
Chlorobenzene	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	**7.6 J**	ND	-
Chloroethane	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-
Chloroform	**7**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-
cis-1,2-Dichloroethene	**5**	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	-	ND	ND	ND	-	-	-	-
Cyclohexane	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-	ND	ND	ND	-	-	-	-
Ethylbenzene	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	**5**	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	ND
Methyl cyclohexane	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	-	ND	ND	ND	-	-	-	-
Methylene chloride	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-
n-Butylbenzene	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	-	-	-	ND
n-Propylbenzene	**5**	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	ND	ND	ND	ND	ND	ND	-	-	-	ND
p-Isopropyltoluene (p-Cymene)	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	-	-	-	ND
Styrene	**5**	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	-	ND	ND	ND	-	-	-	-
Tetrachloroethene	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-
Toluene	**5**	2.1 J	1.6 J	1.5 J	1.1 J	1.5 J	1.2 J	1.6 J	ND	1 J	1.2	1.7	1.4	1.8	1.4	1.4	1.4	1.3	0.87 J	1.2 J	0.89 J	1.1 J	0.78 J	ND	**21**	**54**	**1500**	**580**
trans-1,2-Dichloroethene	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-
Trichloroethene	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	**52**	ND	-
Vinyl chloride	**2**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-
Xylenes, Total	**5**	4.7 J	4.2 J	2.2 J	ND	2.6 J	ND	4.4 J	3.6 J	2.6 J	3 J	2.6	3.2 J	4 J	2.6	2.8 J	2.4	2.3	1.3 J	1.76 J	1.74 J	1.72 J	1.51 J	ND	**22**	**51**	**2800**	**3020**
SVOCs (Method 8270C, 8270D) - ug/L																												
2,4-Dimethylphenol	**See Note 3**	ND	ND	2 J	ND	ND	ND	ND	ND	ND	1 J	3 J	1 J	1 J	ND	-	ND	0.71 J	-	-	-	-	-	-	6.7 J	ND	3.3 J	ND
2,6-Dinitrotoluene	**5**	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	ND	ND	ND	ND
2-Chloronaphthalene	**10**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	**See Note 3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-	-	-	-	ND
2-Methylnaphthalene	**-**	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	15	7.7	10	7	10 D	5.2	8.2 D	9.3	ND	-	-	-	48
2-Methylphenol (o-Cresol)	**See Note 3**	ND	ND	-	1 J	-	-	-	-	0.8 J	0.7 J	1	1 J	1 J	ND	-	0.66 J	0.64 J	-	-	-	-	-	-	7 J	24 J	ND	6.6 J
2-Nitrophenol	**See Note 3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-	-	-	-	ND
3,3'-Dichlorobenzidine	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	ND
3,4-Methylphenol (m,p-Cresol)	**See Note 3**	ND	ND	2 J	ND	2 J	2 J	3 J	3 J	4 J	4 J	8 J	3 J	6 J	ND	-	2.9 J	2.4 J	-	-	-	-	-	-	14 J	ND	ND	3.2 J
4-Chloro-3-methylphenol	**See Note 3**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	-	-	-	-	ND	ND	ND	ND
4-Chloroaniline	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	ND
4-Nitroaniline	**5**	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	ND
4-Nitrophenol	**See Note 3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-	-	-	-	ND
Acenaphthene	**20**	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	5.5	4.1 J	4.8	3.3	4.6 D	2.8	3.6 D	3	0.98 J	-	-	-	ND
Acenaphthylene	**-**	7.5 J	6 J	9 J	4 J	6 J	6 J	7 J	6 J	7 J	5	9	7	6	4.3 J	6.4	3.8 J	4.2 J	3.2	4.7 D	2.5	3.4 D	4.3	ND	6 J	ND	27	25
Acetophenone	**-**	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	32
Anthracene	**50**	4.5 J	5 J	6 J	4 J	5 J	6 J	6 J	5 J	5 J	4 J	6	6	4 J	3.8 J	5.2	3.3 J	4.3 J	2.2	3.5 D	1.4	2.7 D	2.7	ND	ND	ND	ND	ND
Benzo(a)anthracene	**0.002**	ND	ND	ND	ND	ND	ND	**0.6 J**	**0.6 J**	**0.6 J**	**0.5 J**	**0.7 J**	**0.6 J**	**0.5 J**	ND	ND	**0.34 J**	**0.54 J**	**0.25**	**0.3 DJ**	**0.16 J**	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	**0 (ND)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	**0.002**	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	**0.05 J**	ND	ND	ND	-	-	-	ND
Benzo(ghi)perylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	ND
Benzo(k)fluoranthene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	ND
Benzyl Alcohol	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	ND
Biphenyl	**5**	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	3.5 J	2 J	2.9 J	1.9 J	ND	2	2.8 D	2.6	ND	-	-	-	**8.3**
Bis(2-ethylhexyl)phthalate	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.7 BJ	ND	ND	3.4	**8.8**	ND	ND	**8.5**	ND	ND	ND	ND
Butyl benzyl phthalate	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	**-**	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	15	10	11	6.4	6.8	5.5	7.5 D	5.8	ND	-	-	-	ND
Chrysene	**0.002**	ND	ND	ND	ND	ND	ND	ND	ND	**0.3 J**	**0.2 J**	**0.3 J**	ND	**0.3 J**	ND	ND	ND	ND	**0.15 J**	ND	**0.12 J**	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	**-**	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	ND
Dibenzofuran	**-**	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	15	8.6 J	11	7.2	7	6.5	9.8 D	7.7	ND	-	-	-	7.5
Diethyl phthalate	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.38 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl phthalate	**-**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3 BJ	0.4 BJ	ND	ND	0.39 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	**50**	ND	ND	ND	ND	ND	ND	7 J	ND	0.4 J	0.8 BJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	**50**	10	8 J	11	8 J	10	11	12	10	12	8	10	12	9	7.6 J	10	7.3	8.9	5.4	8 D	3.4	6.1 D	5.6	2.4	4.8 J	ND	ND	ND
Fluorene	**50**	25	22	28	17	22	23	26	25	26	19	29	25	20	17	24	15	17	13	17 D	9.5	14 D	13	2.5	8 J	16 J	26	29
Indeno(1,2,3-cd)Pyrene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	ND
Naphthalene	**10**	**62**	**69**	**90**	**48**	**71**	**78**	**100**	**93**	**80 B**	**62**	**140**	**82**	**70**	**60**	**76**	**29**	**46**	**32 D**	**46 D**	**18**	**34 D**	**49**	0.87 J	**49**	**1100 D**	**1400 D**	**1100 D**
N-Nitrosodiphenylamine (NDPA/DPA)	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	ND
Pentachlorophenol	**See Note 3**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	-	ND	ND	-	-	ND	ND	ND	ND
Phenanthrene	**50**	46	36	45	31	41	43	46	41	49	37	50	**51**	36	34	42	25	32	20	32 D	12	24 D	22	3.7	15 J	27 J	3.3 J	3.9 J
Phenol	**See Note 3**	ND	ND	ND	ND	ND	ND	ND	ND	0.5 J	ND	0.4 J	3 J	ND	ND	-	1.5 J	0.59 J	-	ND	-	-	-	-	14 J	160	ND	ND
Pyrene	**50**	7 J	6 J	8 J	6 J	6 J	7 J	7 J	7 J	7 J	5 J	7	7	6	4.9 J	6.7	4.5 J	5.8	3.3	5 D	2.2	3.7 D	3.1	1.8 J	3.7 J	ND	ND	ND
Pyridine	**50**	ND	ND	2 J	ND	ND	ND	ND	ND	ND	ND	4 J	2 J	2 J	2 J	-	-	-	-	-	-	-	-	-	ND	ND	18 J	-
Total Phenolic Compounds (Method 8270C, 8270D)- u																												
Phenolic compounds (total phenols) [4]	**1**	ND	ND	**4**	1	**2**	**2**	**3**	**3**	**5.3**	**5.7**	**12.4**	**8**	**8**	ND	-	**5.06**	**4.34**	-	-	-	-	-	-	**41.7**	**184**	**3.3**	**9.8**

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																										
		MWN-12 — Slag/Fill																							MWN-14A — Slag/Fill	MWN-14B — Slag/Fill; Sand/Dredge Spoils	MWN-15A — Slag/Fill	
		Nov-1999	Jun-2003	Oct-2003	May-2004	Oct-2004	May-2005	Oct-2005	May-2006	Oct-2006	May-2007	Oct-2007	May-2008	Oct-2008	May-2009	May-2010	May-2011	Jun-2012	Jun-2013	Jul-2014	Sep-2015	Jun-2016	May-2017	Apr-2018	Nov-1999	Nov-1999	Nov-1999	Apr-2013
		RFI	HWMU 2003a	HWMU 2003b	HWMU 2004a	HWMU 2004b	HWMU 2005a	HWMU 2005b	HWMU 2006a	HWMU 2006b	HWMU 2007a	HWMU 2007b	HWMU 2008a	HWMU 2008b	HWMU 2009	HWMU 2010	HWMU 2011	HWMU 2012	HWMU 2013	HWMU 2014	HWMU 2015	HWMU 2016	HWMU 2017	HWMU 2018	RFI	RFI	RFI	CMS 2013 [5,6]
Filtered SVOCs (Method 8270D) - ug/L																												
Acenaphthene	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(ghi)perylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)Pyrene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals - ug/L																												
Arsenic, Total	**25**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	ND	**53.7**	5.7 B	-
Barium, Total	**1000**	59.7 B	59	62	6.5	66	68	70	66.8	66	72.1	67	68.3	66	65.5	-	-	-	-	-	-	-	-	-	538	120 B	332 J	-
Cadmium, Total	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	ND	ND	ND	-
Chromium, Total	**50**	2.8 B	ND	ND	ND	ND	ND	ND	ND	9.9	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	0.98 B	8.5	**51**	3.45 DJ
Cyanide, Total	**200**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	0.011 J	0.28 J	0.14	-
Lead, Total	**25**	ND	ND	ND	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	ND	2.6 B	13.3	-
Selenium, Total	**10**	4.9 B	5.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	5.8	3.8 B	3.7 B	-
Dissolved Metals - ug/L																												
Arsenic, Dissolved	**25**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	**51.8 J**	ND	-
Barium, Dissolved	**1000**	-	55	63	-	67	69	65	70.9	64	69	66	65.1	63	66.3	-	-	-	-	-	-	-	-	-	-	114 B	111 JB	-
Cadmium, Dissolved	**5**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	ND	ND	-
Chromium, Dissolved	**50**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	ND	ND	-
Lead, Dissolved	**25**	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	ND	ND	-
Selenium, Dissolved	**10**	-	6.3	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	3.6 B	2.8 JB	-
Field Measurements																												
Dissolved Oxygen (mg/L)	**-**	1.8	1.85	2.77	2.18	0.72	1.18	1.36	1.31	1.89	1.7	1.06	1.32	1.47	1.45	1.39	1.61	1.74	2.11	0.99	2.38	2.01	1.23	6.73	0.56	0.53	0.7	0.73
Field pH (S.U.)	**12.5**	12.10	11.81	**13.41**	**12.75**	12.28	11.89	11.89	11.78	11.73	11.70	11.48	11.07	11.37	11.26	11.17	12.23	**13.86**	12.38	12.12	12.08	**12.62**	12.46	**13.31**	12.3	11.6	11.12	10.97
Redox Potential (mV)	**-**	-310	-248	-202	-187	-251	-239	-247	-248	-244	-198	-244	-213	-258	-221	-206	-136	-25	-257	-247	-280	-189	-218	-159	-436	-413	103	-311
Specific Conductance (umhos/cm)	**-**	3100	2725	2851	2910	3141	3137	3064	2895	3086	2966	2977	3034	3033	3048	2963	3028	3206	3038	3146	3291	3516	3148	5062	4700	2300	396	829.1
Temperature (deg C)	**-**	14.6	15.6	12.0	12.8	14.1	12.5	12.0	18.3	12.2	14.5	13.8	12.7	14.9	14.1	14.1	13.3	14.7	15.4	21.7	17.6	16.6	16.8	11.0	13.5	13.4	13.4	14.1
Turbidity (NTU)	**-**	1	4.86	1.05	1.41	0.15	0.58	1.29	3.46	2.43	1.36	0.47	0.42	0.44	1.28	0.68	2.1	4.4	7.92	4.22	6.39	0.46	0.99	12.5	9	280	268	12.4

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/Guidance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).
7. MWN-05B was resampled for Barium on January 18. The second set of field measurements represents the groundwater conditions during the Barium sampling (*italicized*).

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
\- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groundwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

TurnKey Environmental Restoration, LLC — Benchmark Environmental Engineering & Science, PLLC

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																									
		MWN-15B — Slag/Fill; Sand; Peat		MWN-15D — Bedrock		MWN-16A — Slag/Fill		MWN-16B — Slag/Fill		MWN-19A — Slag/Fill; Sand; Peat		MWN-19B — Peat		MWN-20A — Slag/Fill		MWN-20B — Slag/Fill; Sand		MWN-21A — Slag/Fill	MWN-21AR — Slag/Fill	MWN-21B — Clayey Silt		MWN-21C — Slag/Fill; Sand; Peat		MWN-22B — Sand/Dredge Spoils	
		Nov-1999	Apr-2013	Nov-1999	Mar-2012	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013
		RFI	CMS 2013 [5,6]	RFI	CMS 2012 [5]	RFI	CMS 2013 [5]	RFI	CMS 2013 [5]	RFI	CMS 2013	RFI	CMS 2013	RFI	CMS 2013 [5,6]	RFI	CMS 2013 [5,6]	RFI	CMS 2013	RFI	CMS 2013	RFI	CMS 2013	RFI	CMS 2013
VOCs (Method 8260B, 8260C, 8021B) - ug/L																											
1,1-Dichloroethane	5	ND	-	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-
1,1-Dichloroethene	5	ND	-	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-
1,2,4,5-Tetramethylbenzene	-	-	-	-	0.14 J	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	5	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	5	-	490 J	-	1.9 J	-	ND	-	ND	-	ND	-	ND	-	18	-	18	-	ND	-	ND	-	3.5 J	-	3.9
1,2-Dichlorobenzene	3	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.6	ND	-	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-
1,3,5-Trimethylbenzene	5	-	360 J	-	ND	-	1.2 J	-	ND	-	ND	-	ND	-	22	-	20	-	ND	-	ND	-	1.8 J	-	5.6
1,4-Dichlorobenzene	3	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Diethylbenzene	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	50	-	-	-	4.1 J	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	50	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	1	13000	7400	6.2	ND	19	16	3.2 J	36	3300	410 D	2.5 J	0.9	890 D	160	610 D	220	150 J	1.3	340 J	0.29 J	120 J	150	94	33
Bromomethane	5	ND	-	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-
Carbon disulfide	60	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	5	ND	-	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-
Chloroethane	5	ND	-	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-
Chloroform	7	ND	-	ND	0.45 J	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-
cis-1,2-Dichloroethene	5	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	-	-	-	-	9.7 J	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	5.8 J	6.9	6.2 J	ND	ND	ND	ND	ND	ND	ND	1.5 J
Isopropylbenzene	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	2.4 J	-	ND	-	9.4	-	ND
Methyl cyclohexane	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene chloride	5	ND	-	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-
n-Butylbenzene	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND
n-Propylbenzene	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND
p-Isopropyltoluene (p-Cymene)	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND
Styrene	5	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	5	ND	-	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-
Toluene	5	1700	670	ND	ND	1.8 J	2.9	ND	4.2 J	ND	ND	ND	ND	190	34	98	35	24	ND	49	ND	5.5	ND	10	6
trans-1,2-Dichloroethene	5	ND	-	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-
Trichloroethene	5	ND	-	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-
Vinyl chloride	2	ND	-	ND	ND	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-
Xylenes, Total	5	3500	3400	1.6 J	0.82 J	3.1 J	5	ND	3.2	ND	1.8	ND	ND	430	155	200	138	2.8 J	ND	5.4 J	ND	11	6.6	16	29
SVOCs (Method 8270C, 8270D) - ug/L																											
2,4-Dimethylphenol	See Note 3	2.7 J	8 J	ND	ND	5.4 J	2.2 J	7.6 J	31	ND	-	ND	-	3.4 J	2.2 J	11	10 J	ND	-	6.8 J	-	ND	-	4.7 J	-
2,6-Dinitrotoluene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloronaphthalene	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	See Note 3	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	ND	-	ND	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	-	49	-	0.07 J	-	0.32	-	0.48	-	ND	-	ND	-	3	-	3.2	-	ND	-	ND	-	ND	-	3.5
2-Methylphenol (o-Cresol)	See Note 3	ND	ND	ND	ND	16	4.2 J	35	120	ND	-	ND	-	6.9 J	ND	42	34 J	ND	-	ND	-	ND	-	13	-
2-Nitrophenol	See Note 3	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	ND	-	ND	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND
3,4-Methylphenol (m,p-Cresol)	See Note 3	ND	4.3 J	ND	ND	58	9.8	160 D	130 D	ND	-	ND	-	21	10 J	160 JD	110 J	ND	-	ND	-	ND	-	52	-
4-Chloro-3-methylphenol	See Note 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-	ND	ND	ND	ND	ND	-	ND	-	ND	-	ND	-
4-Chloroaniline	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND
4-Nitroaniline	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND
4-Nitrophenol	See Note 3	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	ND	-	ND	-	-	-	-	-	-	-	-
Acenaphthene	20	-	ND	-	ND	-	0.11 J	-	0.42	-	0.78	-	ND	-	ND	-	0.38 J	-	2.5	-	0.08 J	-	10	-	0.92
Acenaphthylene	-	34	25	ND	ND	ND	0.15 J	ND	0.31 J	ND	ND	ND	ND	2 J	0.91 J	1.7 J	1.2	ND	ND	ND	ND	ND	0.54	ND	0.97
Acetophenone	-	-	34	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND
Anthracene	50	ND	ND	ND	ND	ND	0.09 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.24	ND	ND	ND	0.58	2.8 J	1.9
Benzo(a)anthracene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.09 J	ND	0.09 J	ND	0.22 J	ND	0.46
Benzo(a)pyrene	0 (ND)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	0.002	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	0.07 J	-	0.11 J	-	0.18 J	-	0.17 J
Benzo(ghi)perylene	-	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND
Benzo(k)fluoranthene	0.002	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND
Benzyl Alcohol	-	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND
Biphenyl	5	-	9	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND
Bis(2-ethylhexyl)phthalate	5	ND	ND	ND	2.3 J	ND	ND	ND	ND	ND	ND	ND	ND	3.7 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butyl benzyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	-	-	1.3 J	-	ND	-	ND	-	1.4 J	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	4.4
Chrysene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.11 J	ND	0.09 J	ND	0.28 J	ND	0.38 J
Dibenz(a,h)anthracene	-	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND
Dibenzofuran	-	-	8.1	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND
Diethyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl phthalate	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	50	ND	ND	ND	ND	ND	0.14 J	ND	0.1 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.41	ND	0.2	ND	0.83	6 J	4.3
Fluorene	50	25	26	ND	ND	ND	0.33	ND	0.28 J	14	8.9	ND	ND	ND	0.46 J	ND	0.79 J	1.3 J	0.52	ND	ND	17	0.72	7 J	5.4
Indeno(1,2,3-cd)Pyrene	0.002	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND
Naphthalene	10	1400 D	1200	2.9 J	ND	4.8 J	2.3	2.8 J	23	9 J	0.23	ND	ND	180 D	40	91 JD	49	ND	ND	3.3 J	0.08 J	ND	0.52	22	18
N-Nitrosodiphenylamine (NDPA/DPA)	50	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND
Pentachlorophenol	See Note 3	ND	ND	ND	ND	ND	2.1	ND	ND	ND	-	ND	-	ND	1.2 J	ND	2.3 J	ND	-	ND	-	ND	-	ND	-
Phenanthrene	50	3.6 J	3.7 J	ND	ND	ND	0.28	ND	0.4	ND	ND	ND	ND	ND	0.46 J	1.3 J	1.1	ND	0.11 J	ND	0.09 J	ND	0.27 J	19	10
Phenol	See Note 3	ND	6.2 J	ND	ND	47	ND	530 D	160 D	53	-	ND	-	43	ND	450 D	57 J	ND	-	3 J	-	5.4 J	-	51	-
Pyrene	50	ND	ND	ND	ND	ND	0.1 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.29	ND	0.14 J	ND	0.52	4.7 J	2.6
Pyridine	50	150 J	-	17 J	-	ND	-	7.6 J	-	ND	-	ND	-	ND	-	16 J	-	ND	-	ND	-	ND	-	ND	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug/L																											
Phenolic compounds (total phenols) [4]	1	2.7	18.5	ND	ND	126.4	18.3	732.6	441	53	-	ND	-	74.3	13.4	663	213.3	ND	-	9.8	-	5.4	-	120.7	-

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program: MWN-15B — Slag/Fill; Sand; Peat		MWN-15D — Bedrock		MWN-16A — Slag/Fill		MWN-16B — Slag/Fill		MWN-19A — Slag/Fill; Sand; Peat		MWN-19B — Peat		MWN-20A — Slag/Fill		MWN-20B — Slag/Fill; Sand		MWN-21A — Slag/Fill	MWN-21AR — Slag/Fill	MWN-21B — Clayey Silt		MWN-21C — Slag/Fill; Sand; Peat		MWN-22B — Sand/Dredge Spoils	
		Nov-1999	Apr-2013	Nov-1999	Mar-2012	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Apr-2013
		RFI	CMS 2013 [5,6]	RFI	CMS 2012 [5]	RFI	CMS 2013 [5]	RFI	CMS 2013 [5]	RFI	CMS 2013	RFI	CMS 2013	RFI	CMS 2013 [5,6]	RFI	CMS 2013 [5,6]	RFI	CMS 2013	RFI	CMS 2013	RFI	CMS 2013	RFI	CMS 2013
Filtered SVOCs (Method 8270D) - ug/L																									
Acenaphthene	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(ghi)perylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)Pyrene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals - ug/L																									
Arsenic, Total	**25**	ND	-	ND	4 J	ND	ND	**36.2 J**	14.7	ND	-	2.7 B	-	3 B	ND	2.8 B	ND	8.7 B	2.87	**69.4**	**26.54**	3.4 B	0.97	2.5 B	2.23 J
Barium, Total	**1000**	120 JB	-	76.5 JB	223	107 JB	61.98	97.9 JB	445	713 J	-	366 J	-	77.4 JB	55.89	195 JB	160.9	108 B	49.2	**1740**	**1300**	162 B	77.78	50 B	48.56
Cadmium, Total	**5**	ND	-	0.85 B	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-
Chromium, Total	**50**	6.8	0.91 J	**61.7**	9 J	1.1 B	ND	20.1	4.86 J	3.9 B	-	45.4	-	0.7 B	ND	1.4 B	ND	0.8 B	0.88 J	1 B	2.81	2.3 B	1.07	0.7 B	ND
Cyanide, Total	**200**	0.15	-	ND	-	0.045 J	-	R	-	0.018	-	ND	-	0.11 J	-	0.064 J	-	0.033	-	ND	-	0.053	-	0.092	-
Lead, Total	**25**	ND	-	8.8	-	ND	ND	ND	ND	ND	-	11.4	-	ND	ND	ND	ND	1.2 B	0.31 J	ND	5	2.9 B	0.63 J	ND	ND
Selenium, Total	**10**	2.8 B	-	ND	ND	**12.8**	6.83 J	1.7 B	**10.6 J**	ND	-	ND	-	6.4	4.21 J	8.3	7.29 J	ND	1.02 J	2 B	1.03 J	2 B	1.04 J	**12.9**	7.91 J
Dissolved Metals - ug/L																									
Arsenic, Dissolved	**25**	ND	-	ND	ND	-	-	**49.6 J**	-	-	-	ND	-	-	-	-	-	3.8 B	-	**70.6**	-	2.6 B	-	-	-
Barium, Dissolved	**1000**	108 JB	-	49.2 JB	115	-	-	92.9 B	-	-	-	302 J	-	-	-	-	-	98.4 B	-	**1730**	-	168 B	-	-	-
Cadmium, Dissolved	**5**	ND	-	ND	-	-	-	ND	-	-	-	ND	-	-	-	-	-	ND	-	0.31 B	-	ND	-	-	-
Chromium, Dissolved	**50**	ND	-	0.74 B	ND	-	-	1 B	-	-	-	2.1 B	-	-	-	-	-	ND	-	1 B	-	0.79 B	-	-	-
Lead, Dissolved	**25**	ND	-	ND	-	-	-	ND	-	-	-	ND	-	-	-	-	-	ND	-	ND	-	ND	-	-	-
Selenium, Dissolved	**10**	1.9 JB	-	ND	ND	-	-	1.6 B	-	-	-	ND	-	-	-	-	-	ND	-	1.6 B	-	ND	-	-	-
Field Measurements																									
Dissolved Oxygen (mg/L)	**-**	0.5	1.07	4.2	0.003	2.7	1.92	5.4	0.56	0.8	2.04	0.8	1.67	0.5	1.54	0.7	1.21	1	1.35	0.5	1.9	0.5	1.96	0.7	1.45
Field pH (S.U.)	**12.5**	11.20	11.03	8.19	7.20	12.00	11.86	9.40	10.01	6.60	7.05	6.00	6.19	12.00	11.92	12.20	12.09	6.70	6.94	6.50	6.89	6.80	7.12	12.00	11.84
Redox Potential (mV)	**-**	24	-329	444	-100	-338	-265	-331	-348	-141	-121	-51	-18	-379	-284	-387	-343	-157	-87	-116	-69	-165	-102	-387	-320
Specific Conductance (umhos/cm)	**-**	351	867.4	1,520	1390	1800	1540	740	1587	710	1181	940	1105	2600	1784	2700	2410	1100	1070	1300	1100	1400	1132	2400	1943
Temperature (deg C)	**-**	13.8	14.1	14.2	12.8	12.5	13.3	12.6	13.5	18.1	9.9	15.8	13	11.1	14.2	11.5	13.9	18.1	10.6	15.1	13	17.6	11.5	14.1	13.3
Turbidity (NTU)	**-**	125	7.87	110	606.3	10	2.02	69	3.61	1	30.7	160	32.4	3	1.82	2	4	260	8.06	290	47.5	120	31.7	2	2.8

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/Guidance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).
7. MWN-05B was resampled for Barium on January 18. The second set of field measurements represents the groundwater conditions during the Barium sampling (*italicized*).

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
\- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groudwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

TurnKey Environmental Restoration, LLC — Benchmark Environmental Engineering & Science, PLLC

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																										
		MWN-25A — Slag/Fill; Sand		MWN-25B — Slag/Fill; Sand		MWN-25D — Bedrock		MWN-32A — Sand; Peat		MWN-35A — Slag/Fill		MWN-37A — Slag/Fill		MWN-38A — Slag/Fill		MWN-39A — Slag/Fill		MWN-40A — Slag/Fill		MWN-41A — Slag/Fill		MWN-42A	MWN-51AR — Slag/Fill		MWN-51BR — Peat		MWN-73A — Peat	
		Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Mar-2012	Nov-1999	Apr-2013	Dec-2000	Apr-2013	Dec-2000	Oct-2010	Dec-2000	Oct-2010	Dec-2000	Oct-2010	Dec-2000	Oct-2010	Dec-2000	Apr-2013	Dec-2000	Dec-2000	Apr-2013	Dec-2000	Apr-2013	Oct-2010	Jan-2019
		RFI	CMS 2013	RFI	CMS 2013	RFI	CMS 2012	RFI	CMS 2013	RFI	CMS 2013	RFI	CMS 2010	RFI	CMS 2010	RFI	CMS 2010	RFI	CMS 2010	RFI	CMS 2013 [5]	RFI	RFI	CMS 2013	RFI	CMS 2013	CMS 2010	CMS 2019
VOCs (Method 8260B, 8260C, 8021B) - ug/L																												
1,1-Dichloroethane	5	ND	-	ND	-	ND	ND	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
1,1-Dichloroethene	5	ND	-	ND	-	ND	ND	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
1,2,4,5-Tetramethylbenzene	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	5	-	-	-	-	-	ND	-	-	-	-	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	-	-	ND	ND
1,2,4-Trimethylbenzene	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
1,2-Dichlorobenzene	3	-	-	-	-	-	ND	-	-	-	-	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	-	-	ND	ND
1,2-Dichloroethane	0.6	ND	-	ND	-	ND	ND	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
1,3,5-Trimethylbenzene	5	-	ND	-	ND	-	ND	-	ND	-	1.4 J	-	-	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
1,4-Dichlorobenzene	3	-	-	-	-	-	ND	-	-	-	-	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	-	-	ND	ND
1,4-Diethylbenzene	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	50	-	-	-	-	-	ND	-	-	-	-	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	-	-	ND	ND
Acetone	50	-	-	-	-	-	ND	-	-	-	-	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	-	-	ND	2.2 J
Benzene	1	ND	**120**	ND	**31**	ND	ND	**570000 J**	**440000 D**	**16**	**6.3**	**9**	**1.5**	**47**	**5.2**	**200 D**	**25**	ND	ND	**2.6 J**	**42**	**16**	**2.2 J**	**1.1**	**9.3**	0.36 J	ND	ND
Bromomethane	5	ND	-	ND	-	ND	ND	ND	-	**R**	-	**R**	ND	**R**	ND	**R**	ND	**R**	ND	**R**	-	ND	**R**	-	**R**	-	-	ND
Carbon disulfide	60	-	-	-	-	-	ND	-	-	-	-	-	0.86 J	-	0.92 J	-	0.81 J	-	0.56 J	-	-	-	-	-	-	-	ND	ND
Chlorobenzene	5	ND	-	ND	-	ND	ND	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
Chloroethane	5	ND	-	ND	-	ND	ND	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
Chloroform	7	ND	-	ND	-	ND	ND	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
cis-1,2-Dichloroethene	5	-	-	-	-	-	ND	-	-	-	-	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	-	-	ND	ND
Cyclohexane	-	-	-	-	-	-	ND	-	-	-	-	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	-	-	ND	ND
Ethylbenzene	5	ND	ND	ND	ND	ND	ND	ND	**740 J**	ND	ND	ND	ND	ND	ND	ND	0.8 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	ND	-	ND	ND	ND
Methyl cyclohexane	-	-	-	-	-	-	ND	-	-	-	-	-	0.8 J	-	ND	-	ND	-	ND	-	-	-	-	-	-	-	ND	ND
Methylene chloride	5	ND	-	ND	-	ND	ND	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
n-Butylbenzene	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
n-Propylbenzene	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
p-Isopropyltoluene (p-Cymene)	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Styrene	5	-	-	-	-	-	ND	-	-	-	-	-	ND	-	ND	-	0.87 J	-	ND	-	-	-	-	-	-	-	ND	ND
Tetrachloroethene	5	ND	-	ND	-	ND	ND	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
Toluene	5	ND	**16**	ND	4.9	ND	ND	**70000**	**31000**	4.8 J	1.5 J	ND	ND	ND	ND	ND	1.3	ND	ND	ND	**9.2 J**	3.1 J	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	5	ND	-	ND	-	ND	ND	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
Trichloroethene	5	ND	-	ND	-	ND	ND	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
Vinyl chloride	2	ND	-	ND	-	ND	ND	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
Xylenes, Total	5	ND	ND	ND	ND	ND	ND	ND	**4000**	**19**	**5.8**	ND	0.92 J	1.7 J	ND	ND	4.6	ND	ND	2.2 J	**9.2**	**13**	ND	ND	ND	ND	ND	ND
SVOCs (Method 8270C, 8270D) - ug/L																												
2,4-Dimethylphenol	See Note 3	ND	-	ND	-	ND	-	70 J	-	ND	-	ND	-	ND	-	ND	-	ND	-	**R**	ND	ND	**R**	-	ND	-	-	ND
2,6-Dinitrotoluene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND
2-Chloronaphthalene	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND
2-Chlorophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	ND
2-Methylnaphthalene	-	-	ND	-	ND	-	ND	-	7.9	-	1.4	-	6.9	-	ND	-	5.6	-	ND	-	24	-	-	ND	-	ND	-	ND
2-Methylphenol (o-Cresol)	See Note 3	ND	-	ND	-	ND	-	140 J	-	ND	-	12	-	14	-	ND	-	ND	-	**R**	2.9 J	ND	**R**	-	15 J	-	-	-
2-Nitrophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	ND
3,3'-Dichlorobenzidine	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	ND	-	ND	-	ND
3,4-Methylphenol (m,p-Cresol)	See Note 3	ND	-	ND	-	ND	-	220 J	-	ND	-	48	-	57	-	9.7 J	-	ND	-	**R**	7.7	ND	**R**	-	ND	-	-	ND
4-Chloro-3-methylphenol	See Note 3	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	**R**	ND	ND	**R**	-	ND	-	-	ND
4-Chloroaniline	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	ND	-	ND	-	ND
4-Nitroaniline	5	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	ND	-	ND	-	ND
4-Nitrophenol	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	ND
Acenaphthene	20	-	0.66	-	0.79	-	ND	-	0.46 J	-	1	-	1.6 J	-	ND	-	0.83 J	-	1.8 J	-	6.6	-	-	ND	-	ND	-	0.54
Acenaphthylene	-	ND	ND	ND	ND	ND	ND	ND	5.9	ND	1.3	ND	0.96 J	ND	0.5 J	4.9 J	5.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND
Acetophenone	-	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	0.71 J	-	ND	-	5.9	-	-	ND	-	ND	-	ND
Anthracene	50	ND	0.11 J	ND	0.12 J	ND	ND	ND	ND	ND	0.94	ND	0.58 J	ND	ND	ND	0.79 J	ND	ND	ND	7.7	ND	ND	ND	ND	ND	-	ND
Benzo(a)anthracene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.12 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**4.3**	ND	ND	ND	ND	ND	-	**0.17**
Benzo(a)pyrene	0 (ND)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.4**	ND	ND	ND	ND	ND	-	**0.16**
Benzo(b)fluoranthene	0.002	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	**2.7**	-	-	ND	-	ND	-	**0.22**
Benzo(ghi)perylene	-	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	1.1	-	-	ND	-	ND	-	0.12
Benzo(k)fluoranthene	0.002	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	**2.2**	-	-	ND	-	ND	-	**0.08 J**
Benzyl Alcohol	-	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Biphenyl	5	-	ND	-	ND	-	ND	-	1.5 J	-	ND	-	ND	-	ND	-	1.1 J	-	ND	-	**9.5**	-	-	ND	-	ND	-	ND
Bis(2-ethylhexyl)phthalate	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.5 JB	ND	3.7 JB	4.5 J	3.4 JB	ND	**5.7 B**	5 J	3.7	ND	ND	ND	ND	ND	-	1.7 J
Butyl benzyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.7 JB	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND
Carbazole	-	-	ND	-	ND	-	ND	-	ND	-	2	-	1.8 J	-	1.7 J	-	4.6 J	-	0.95 J	-	110	-	-	ND	-	ND	-	ND
Chrysene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.11 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.4**	ND	ND	ND	ND	ND	-	**0.14**
Dibenz(a,h)anthracene	-	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	0.38 J	-	-	ND	-	ND	-	0.04 J
Dibenzofuran	-	-	ND	-	ND	-	ND	-	ND	-	1.4 J	-	1.4 J	-	0.54 J	-	3 J	-	1.1 J	-	43	-	-	ND	-	ND	-	ND
Diethyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND
Dimethyl phthalate	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND
Di-n-butyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.46 J	ND	ND	ND	0.3 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND
Di-n-octyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND
Fluoranthene	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.4	ND	0.64 J	ND	0.56 J	ND	1.6 J	ND	ND	22	19	ND	ND	ND	ND	ND	-	ND
Fluorene	50	ND	ND	ND	ND	ND	ND	ND	0.78 J	3.8 J	4.4	ND	3.3 J	ND	0.75 J	3.4 J	4.7	ND	1.2 J	28	31	3.5 J	ND	ND	ND	ND	-	ND
Indeno(1,2,3-cd)Pyrene	0.002	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	**1.1**	-	-	ND	-	ND	-	**0.11**
Naphthalene	10	ND	0.35	ND	0.39	ND	ND	**1400 D**	**780 D**	**11**	7.2	8.7 J	4.5 J	7.6 J	3.7 J	**55**	**54**	ND	1.1 J	**220 JD**	**350 D**	9.4 J	ND	0.08 J	ND	ND	**25 ****	ND
N-Nitrosodiphenylamine (NDPA/DPA)	50	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	ND	-	ND	-	ND
Pentachlorophenol	See Note 3	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	**R**	ND	ND	**R**	-	ND	-	-	ND
Phenanthrene	50	ND	ND	ND	ND	ND	ND	ND	0.42 J	5.5 J	5.9	ND	4 J	ND	1.2 J	ND	4.4 J	ND	ND	40	**53 D**	7.5 J	ND	ND	ND	ND	-	ND
Phenol	See Note 3	ND	-	ND	-	ND	-	540	-	ND	-	190 D	-	190 D	-	23	-	ND	-	**R**	8.4	ND	**R**	-	43	-	-	ND
Pyrene	50	ND	ND	ND	0.07 J	ND	ND	ND	ND	ND	1.4	ND	ND	ND	0.52 J	ND	1.5 J	ND	ND	14	12	ND	ND	ND	ND	ND	-	ND
Pyridine	50	ND	-	ND	-	ND	-	**200 J**	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	ND	-	ND	-	-	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug/L																												
Phenolic compounds (total phenols) [4]	1	ND	-	ND	-	ND	-	**970**	-	ND	-	**250**	-	**261**	-	**32.7**	-	ND	-	-	**19**	ND	-	-	**58**	-	-	ND

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																										
		MWN-25A — Slag/Fill; Sand		MWN-25B — Slag/Fill; Sand		MWN-25D — Bedrock		MWN-32A — Sand; Peat		MWN-35A — Slag/Fill		MWN-37A — Slag/Fill		MWN-38A — Slag/Fill		MWN-39A — Slag/Fill		MWN-40A — Slag/Fill		MWN-41A — Slag/Fill		MWN-42A	MWN-51AR — Slag/Fill		MWN-51BR — Peat		MWN-73A — Peat	
		Nov-1999	Apr-2013	Nov-1999	Apr-2013	Nov-1999	Mar-2012	Nov-1999	Apr-2013	Dec-2000	Apr-2013	Dec-2000	Oct-2010	Dec-2000	Oct-2010	Dec-2000	Oct-2010	Dec-2000	Oct-2010	Dec-2000	Apr-2013	Dec-2000	Dec-2000	Apr-2013	Dec-2000	Apr-2013	Oct-2010	Jan-2019
		RFI	CMS 2013	RFI	CMS 2013	RFI	CMS 2012	RFI	CMS 2013	RFI	CMS 2013	RFI	CMS 2010	RFI	CMS 2010	RFI	CMS 2010	RFI	CMS 2010	RFI	CMS 2013 [5]	RFI	RFI	CMS 2013	RFI	CMS 2013	CMS 2010	CMS 2019
Filtered SVOCs (Method 8270D) - ug/L																												
Acenaphthene	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(ghi)perylene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)Pyrene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals - ug/L																												
Arsenic, Total	**25**	ND	ND	ND	ND	6.9 B	ND	21.4	-	ND	-	2.8 B	-	2.8 B	-	3.8 B	-	ND	-	3 B	-	ND	3.4 B	-	ND	-	-	-
Barium, Total	**1000**	65.3 B	49.83	72.3 JB	60.2	433	284	293	-	219	-	**1810**	-	114 B	-	196 B	-	15.4 B	-	50.2 B	-	599	106 B	-	267	-	-	-
Cadmium, Total	**5**	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	0.64 B	-	ND	ND	-	ND	-	-	-
Chromium, Total	**50**	1 B	ND	1.7 B	ND	**110**	3 J	1.3 B	-	5.7 J	-	**91.7**	-	9	-	9.7	-	4.1 B	-	**109**	**86.84 D**	5.1	4.2 B	-	23.6	-	-	-
Cyanide, Total	**200**	0.045	-	0.063	-	ND	-	0.029	-	ND	-	24 J	-	190 J	-	34 J	-	**220 J**	-	0.021 J	-	ND	0.044 J	-	0.013 J	-	-	-
Lead, Total	**25**	ND	ND	ND	ND	11.7	-	ND	-	ND	-	ND	-	ND	-	ND	-	2 B	-	4.4	-	ND	ND	-	ND	-	-	-
Selenium, Total	**10**	1.8 B	ND	ND	ND	ND	ND	ND	-	**17.4**	6.41 DJ	**14.3 J**	-	9.6	-	2.9 B	-	ND	-	**27.7 J**	6.59 DJ	ND	5.6	-	ND	-	-	-
Dissolved Metals - ug/L																												
Arsenic, Dissolved	**25**	ND	-	ND	-	2.1 B	ND	20.8	-	ND	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	5.2 B	-	-	-
Barium, Dissolved	**1000**	65.5 B	-	69.2 JB	-	276	265	292	-	214	-	-	-	-	-	-	-	-	-	47.7 B	-	-	-	-	267	-	-	-
Cadmium, Dissolved	**5**	ND	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	ND	-	-	-
Chromium, Dissolved	**50**	0.55 B	-	0.87 B	-	2.1 B	ND	0.76 B	-	3.3 B	-	-	-	-	-	-	-	-	-	**97.4**	-	-	-	-	1.5 B	-	-	-
Lead, Dissolved	**25**	ND	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	ND	-	-	-
Selenium, Dissolved	**10**	ND	-	ND	-	1.5 B	ND	ND	-	**16.4**	-	-	-	-	-	-	-	-	-	**28.1 J**	-	-	-	-	ND	-	-	-
Field Measurements																												
Dissolved Oxygen (mg/L)	**-**	0.4	1.26	0.3	2.22	0.3	2.18	0.8	1.41	1.45	2.58	NA	1.84	NA	1.6	NA	1.96	NA	2.24	10.65	6.77	1.4	NA	2.12	NA	2.17	2.33	1.72
Field pH (S.U.)	**12.5**	7.90	8.45	8.13	8.28	7.24	7.82	6.80	6.83	12.15	11.90	12.20	11.89	11.98	11.64	12.00	11.47	8.10	7.64	11.97	12.26	12.48	10.35	11.07	9.75	6.60	6.76	6.89
Redox Potential (mV)	**-**	89	-202	102	-192	239	-152	-160	-82	-291	-324	-343	-264	-278	-214	-250	-210	-251	-170	-117	159	-275	-325	-127	-440	-69	-61	-118
Specific Conductance (umhos/cm)	**-**	1960	1750	2910	1880	1,360	1148	3100	1620	3380	2669	2,160	1903	1,380	1283	1,510	1018	806	682.4	2720	3577	3870	6580	1083	9430	2272	747	1802
Temperature (deg C)	**-**	19.2	12	18.6	13.2	15.2	10.2	15.7	11.6	11.1	14	13.5	13.4	12.6	13.2	8.4	13.7	14.0	15.6	12.1	14.2	11.7	18.0	12.6	17.1	13	13.8	8.9
Turbidity (NTU)	**-**	52.8	7.25	106	6.8	456	410	NA	26.1	40	3.5	NA	0.91	NA	1.19	NA	2.51	4.27	4.34	61.1	93.7	ND	9.4	127	10.5	9.7	4.31	1.44

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/GuIdance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).
7. MWN-05B was resampled for Barium on January 18. The second set of field measurements represents the groundwater conditions during the Barium sampling (*italicized*).

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groudwater monitoring data

Color Code:
(green) = concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold = concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold = concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold = concentration exceeds 100 times the GWQS/GV
Bold = pH exceeds 12.5

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

TurnKey Environmental Restoration, LLC — Benchmark Environmental Engineering & Science, PLLC

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																								
		MWN-75A — Peat		MWN-76A — Slag/Fill; Peat	MWN-76AR — Slag/Fill; Peat	MWN-77A — Slag/Fill		MWN-78A — Slag/Fill; Sand		MWN-79A — Slag/Fill		MWN-86A — Slag/Fill	MWN-87A — Slag/Fill	MWN-88A — Slag/Fill	MWN-89A — Slag/Fill	MWN-90A — Slag/Fill	MWN-91A — Slag/Fill	WT1-07 — Slag/Fill; Sand/Dredge Spoils			WT8-01 — Slag/Fill; Sand/Dredge Spoils			WT8-02 — Slag/Fill; Sand/Dredge Spoils		
		Oct-2010	Jan-2019	Oct-2010	Jan-2019	Oct-2010	Jan-2019	Oct-2010	Jan-2019	Oct-2010	Jan-2019	Oct-2010	Oct-2010	Oct-2010	Oct-2010	Oct-2010	Oct-2010	Jun-2007	Mar-2012	Jan-2019	Jun-2007	Apr-2013	Jan-2019	Jun-2007	Apr-2013	Jan-2019
		CMS 2010	CMS 2019	CMS 2010	CMS 2019	CMS 2010	CMS 2019	CMS 2010	CMS 2019	CMS 2010	CMS 2019	CMS 2010	CMS 2010	CMS 2010	CMS 2010	CMS 2010	CMS 2010	SWI BCP	CMS 2012	CMS 2019	SF1 RI	SF1 GWM	CMS 2019	SF1 RI	SF1 GWM	CMS 2019
VOCs (Method 8260B, 8260C, 8021B) - ug/L																										
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	ND	-	-	ND	-
1,2,4-Trichlorobenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.6 J	2.9 J	-	**5.5 J**	**6 J**	-	ND	ND	-
1,2-Dichlorobenzene	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.6	ND	ND	ND	ND	ND	ND	ND	**180 D**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.2 J	3.2 J	-	ND	ND	-	ND	ND	-
1,4-Dichlorobenzene	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Diethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	ND	-	-	ND	-
2-Butanone	50	36 D	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3 J	ND
Acetone	50	**310 D**	**190 D**	16 D	ND	ND	ND	ND	ND	ND	ND	3.2 J	ND	ND	ND	ND	27	5 J	ND	ND	16 J	10 J	3.5 J	33	16	2.4 J
Benzene	1	**1900 D**	**750 D**	**100 D**	**120 D**	**1300 D**	**310 D**	**8400 D**	**7000 D**	**110 D**	**2.7**	**6.3**	ND	**3.6**	**190 D**	**36**	**380 D**	**61**	**41**	**23**	**4.1 J**	**1.3 J**	**2.5**	ND	ND	0.21 J
Bromomethane	5	-	ND	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	60	ND	ND	ND	ND	ND	ND	3.5 DJ	ND	ND	ND	ND	ND	1.2	0.72 J	ND	2.6	1 J	ND	ND	ND	ND	ND	1.2 J	ND	ND
Chlorobenzene	5	**110 D**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cyclohexane	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	5	**8 D**	ND	**47 D**	ND	**59 D**	**53 D**	**700 D**	**600 D**	ND	ND	0.98 J	ND	ND	1.6	ND	**12**	1.4 J	1.6 J	ND	ND	ND	2 J	ND	ND	ND
Isopropylbenzene	5	ND	ND	ND	ND	ND	ND	**20 D**	ND	ND	ND	ND	ND	ND	ND	ND	3.6	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl cyclohexane	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.6	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	-	ND	ND	-
n-Propylbenzene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	-	ND	ND	-
p-Isopropyltoluene (p-Cymene)	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	-	ND	ND	-
Styrene	5	ND	ND	ND	ND	**77 D**	ND	**48 D**	ND	4.2 D	ND	**6.1**	ND	ND	2	4.4	**40**	0.94 J	ND	ND	ND	ND	1.7 J	ND	ND	ND
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	**210 D**	**210 D**	**76 D**	ND	**420 D**	**34 DJ**	**1100 D**	**320 D**	**34 D**	ND	0.7 J	ND	0.64 J	3	1.1	**130 D**	**9.3**	**8.1**	4.5 J	**7.2 J**	**5.9 J**	**7.4**	ND	ND	ND
trans-1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes, Total	5	**153 D**	**178 J**	**166 D**	**45 DJ**	**430 D**	**82 DJ**	**1640 D**	**1460 D**	**80 D**	ND	**13**	ND	ND	**11**	**10**	**130**	**26**	**28**	**15.5**	ND	**5.7**	**12.4**	ND	ND	ND
SVOCs (Method 8270C, 8270D) - ug/L																										
2,4-Dimethylphenol	See Note 3	-	ND	-	50 DJ-	-	27	-	420 DJ-	-	ND	-	-	-	-	-	-	-	-	ND	-	-	3.2 J	-	-	ND
2,6-Dinitrotoluene	5	-	ND	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloronaphthalene	10	-	ND	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	See Note 3	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	-	-	-	ND	-	-	ND	-	-	ND
2-Methylnaphthalene	-	-	200 D	-	270 D	-	45 D	-	360 D	-	1.2	11	9.1	0.62 J	9.6	9.7	150 D	19 J	36	16	12 J	6.1	9.5	4 J	0.17 J	ND
2-Methylphenol (o-Cresol)	See Note 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	See Note 3	-	260 D	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	-	-	-	ND	-	-	ND	-	-	ND
3,3'-Dichlorobenzidine	5	-	ND	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3,4-Methylphenol (m,p-Cresol)	See Note 3	-	220 D	-	11 D	-	10	-	350 D	-	ND	-	-	-	-	-	-	-	-	7	-	-	3.4 J	-	-	0.64 J
4-Chloro-3-methylphenol	See Note 3	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	-	-	-	ND	-	-	ND	-	-	ND
4-Chloroaniline	5	-	ND	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitroaniline	5	-	ND	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitrophenol	See Note 3	-	210 D	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	-	-	-	ND	-	-	ND	-	-	ND
Acenaphthene	20	-	4.3 DJ	-	**180 D**	-	**210 D**	-	**190 D**	-	2.2	1.6 J	6.8	9.4	2 J	1.7 J	9.2 DJ	7 J	11	5.1	3 J	0.74	1	ND	0.08 J	ND
Acenaphthylene	-	-	21 D	-	200 D	-	ND	-	4.4	-	2.1	2.5 J	3 J	0.44 J	3.5 J	2.5 J	190 D	19 J	21	13	3 J	1.4	2.2	ND	0.12 J	ND
Acetophenone	-	-	ND	-	ND	-	ND	-	ND	-	ND	0.88 J	ND	ND	ND	ND	99 D	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	50	-	ND	-	10	-	6.2	-	18	-	1.4	0.51 J	0.87 J	ND	1.3 J	0.9 J	18 DJ	5 J	9	4.9	4 J	1.1	ND	6 J	0.26	ND
Benzo(a)anthracene	0.002	-	ND	-	**1.4**	-	**0.78**	-	**7.5**	-	**1.4**	ND	ND	ND	**0.38 J**	**0.34 J**	**8.8 DJ**	**2 J**	**1.4 J**	**0.08 J**	**3 J**	**0.96**	**0.12**	**26 J**	**0.92**	**0.27**
Benzo(a)pyrene	0 (ND)	-	ND	-	**0.8**	-	**0.23**	-	**5.6**	-	**0.89**	ND	ND	ND	ND	ND	**8.1 DJ**	**1 J**	ND	ND	**4 J**	**0.76**	**0.07 J**	**35 J**	**1.2**	**0.3**
Benzo(b)fluoranthene	0.002	-	ND	-	**1.1**	-	**0.28**	-	**7.7**	-	**1.2**	ND	ND	ND	ND	ND	**6.5 DJ**	**2 J**	ND	ND	**2 J**	**0.96**	**0.12**	**58**	**1.8**	**0.49**
Benzo(ghi)perylene	-	-	ND	-	0.23	-	0.1	-	1	-	0.21	ND	ND	ND	ND	ND	3.8 DJ	ND	ND	ND	1 J	0.42	0.02 J	36 J	1	0.26
Benzo(k)fluoranthene	0.002	-	ND	-	**0.47**	-	**0.11**	-	**3**	-	**0.53**	ND	ND	ND	ND	ND	**3.5 DJ**	ND	ND	ND	**1 J**	**0.43**	**0.05 J**	ND	**0.67**	**0.21**
Benzyl Alcohol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	ND	ND	-	ND	ND	-
Biphenyl	5	-	**22 DJ**	-	**56 D**	-	**46**	-	**68 D**	-	1.3 J	1.3 J	2.1 J	ND	1.2 J	1.2 J	**22 DJ**	4 J	**6.5**	4.2	ND	0.83 J	0.74 J	ND	ND	ND
Bis(2-ethylhexyl)phthalate	5	-	ND	-	ND	-	1.5 J	-	ND	-	ND	3.1 JB	4.1 JB	4.3 JB	**5.6 B**	**9.9 B**	**19 DJB**	ND	ND	1.8 J	ND	ND	ND	ND	ND	ND
Butyl benzyl phthalate	50	-	ND	-	ND	-	ND	-	ND	-	ND	ND	1.9 JB	1.8 JB	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	-	-	29 DJ	-	200 D	-	180 D	-	330 D	-	3.4	0.75 J	2.3 J	0.45 J	1.6 J	1.2 J	240 D	-	24	13	-	5.4	5.1	-	ND	ND
Chrysene	0.002	-	ND	-	**1.2**	-	**0.42**	-	**7.4**	-	**1.9**	ND	ND	ND	ND	ND	**8.4 DJ**	**1 J**	ND	**0.04 J**	**3 J**	**0.99**	**0.15**	**29 J**	**1.1**	**0.32**
Dibenz(a,h)anthracene	-	-	ND	-	0.07 J	-	0.04 J	-	0.4	-	0.09 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13 J	ND	9 J	0.24	0.07 J
Dibenzofuran	-	-	ND	-	130 D	-	120	-	140 D	-	3.2	1.4 J	3 J	1.8 J	2.4 J	1.7 J	51 D	17 J	34	18	4 J	1.4 J	1.3 J	3 J	ND	ND
Diethyl phthalate	50	-	ND	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl phthalate	-	-	ND	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	50	-	ND	-	ND	-	ND	-	ND	-	ND	ND	0.3 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	50	-	ND	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	50	-	ND	-	15	-	12	-	26	-	5.8	0.78 J	0.47 J	ND	2.2 J	1.8 J	24 D	7 J	12	4.1	12 J	3.4	ND	37 J	1.3	ND
Fluorene	50	-	16 D	-	**150 D**	-	**150 D**	-	**130 D**	-	3.2	1.5 J	2.6 J	0.87 J	3.5 J	2.1 J	**52 D**	26	**54**	24	8 J	1.6	ND	3 J	0.11 J	ND
Indeno(1,2,3-cd)Pyrene	0.002	-	ND	-	**0.3**	-	**0.11**	-	**1.5**	-	**0.31**	ND	ND	ND	ND	ND	**2.9 DJ**	ND	ND	ND	**2 J**	**0.52**	**0.03 J**	**27 J**	**1.1**	**0.26**
Naphthalene	10	**2100 D ****	**3500 D**	**3800 D ****	**12000 D**	**20000 D ****	**3200 D**	**24000 D ****	**12000 D**	**5700 D ****	**20**	**180 DB**	**86**	**24**	**110 B**	**110 B**	**3200 DB**	**100**	**140**	**58**	**210**	**110 D**	**170 D**	9 J	0.57	ND
N-Nitrosodiphenylamine (NDPA/DPA)	50	-	ND	-	ND	-	ND	-	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	See Note 3	-	ND	-	ND	-	ND	-	ND	-	ND	-	-	-	-	-	-	-	-	0.73 J-	-	-	ND	-	-	0.18 J
Phenanthrene	50	-	7.2 DJ	-	**150 D**	-	**150 D**	-	**170 D**	-	5.2	2.7 J	3.4 J	0.93 J	7.8	4.7	**81 D**	35	**83**	36	23 J	4.6	ND	29 J	0.72	ND
Phenol	See Note 3	-	1000 D	-	5 DJ	-	7.2	-	250 D	-	ND	-	-	-	-	-	-	-	-	ND	-	-	0.8 J	-	-	ND
Pyrene	50	-	ND	-	9.5	-	8	-	20	-	4	ND	ND	ND	1.8 J	1.7 J	19 DJ	5 J	6.6	2.3	7 J	2.3	0.67	33 J	1.1	ND
Pyridine	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug																										
Phenolic compounds (total phenols) [4]	1	-	**1690**	-	**66**	-	**44.2**	-	**1020**	-	ND	-	-	-	-	-	-	-	-	**7.73**	-	-	**7.4**	-	-	0.82

TABLE 4-34

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB AREA 4A

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program																								
		MWN-75A — Peat		MWN-76A — Slag/Fill; Peat	MWN-76AR — Slag/Fill; Peat	MWN-77A — Slag/Fill		MWN-78A — Slag/Fill; Sand		MWN-79A — Slag/Fill		MWN-86A — Slag/Fill	MWN-87A — Slag/Fill	MWN-88A — Slag/Fill	MWN-89A — Slag/Fill	MWN-90A — Slag/Fill	MWN-91A — Slag/Fill	WT1-07 — Slag/Fill; Sand/Dredge Spoils			WT8-01 — Slag/Fill; Sand/Dredge Spoils			WT8-02 — Slag/Fill; Sand/Dredge Spoils		
		Oct-2010	Jan-2019	Oct-2010	Jan-2019	Oct-2010	Jan-2019	Oct-2010	Jan-2019	Oct-2010	Jan-2019	Oct-2010	Oct-2010	Oct-2010	Oct-2010	Oct-2010	Oct-2010	Jun-2007	Mar-2012	Jan-2019	Jun-2007	Apr-2013	Jan-2019	Jun-2007	Apr-2013	Jan-2019
		CMS 2010	CMS 2019	CMS 2010	CMS 2019	CMS 2010	CMS 2019	CMS 2010	CMS 2019	CMS 2010	CMS 2019	CMS 2010	CMS 2010	CMS 2010	CMS 2010	CMS 2010	CMS 2010	SWI BCP	CMS 2012	CMS 2019	SF1 RI	SF1 GWM	CMS 2019	SF1 RI	SF1 GWM	CMS 2019
Filtered SVOCs (Method 8270D) - ug/L																										
Acenaphthene	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(ghi)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)Pyrene	**0.002**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals - ug/L																										
Arsenic, Total	**25**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4 J	-	-	ND	-	-	2.96 J	-
Barium, Total	**1000**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	53	-	-	-	-	-	-	-
Cadmium, Total	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium, Total	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-	-	-	-	-	-	-
Cyanide, Total	**200**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead, Total	**25**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium, Total	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9 J	-	-	-	-	-	-	-
Dissolved Metals - ug/L																										
Arsenic, Dissolved	**25**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4 J	-	-	-	-	-	-	-
Barium, Dissolved	**1000**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32	-	-	-	-	-	-	-
Cadmium, Dissolved	**5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium, Dissolved	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-
Lead, Dissolved	**25**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium, Dissolved	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8 J	-	-	-	-	-	-	-
Field Measurements																										
Dissolved Oxygen (mg/L)	-	1.6	0.34	1.27	1.79	1.08	1.06	1.54	1.33	2.67	2.64	1.56	1.13	2.09	1.02	1.18	1.18	-	1.76	1.58	0.2	1.99	1.95	-	4.62	5.06
Field pH (S.U.)	**12.5**	8.56	8.90	7.22	7.27	7.28	6.88	7.26	7.25	8.09	6.95	11.48	9.61	11.13	11.56	11.51	11.51	-	10.89	11.06	10.89	9.76	10.84	11.85	12.37	**12.61**
Redox Potential (mV)	-	-148	-296	-107	-138	-142	-172	-250	-210	-93	-64	-261	-222	-262	-261	-252	-252	-	-285	-195	-253	-104	-147	-168	-80	-172
Specific Conductance (umhos/cm)	-	38.48	26.16	4483	1413	1175	869.8	1475	1189	3270	3429	906.9	508.6	823.7	990	965.5	965.5	-	883.6	994.7	4570	2621	2600	2070	5442	4170
Temperature (deg C)	-	16.9	10.3	15.0	4.3	16.3	6.4	16.8	5.2	17.1	4.4	13.0	15.4	14.8	13.0	13.8	13.8	-	12.5	9.7	21.1	16	11.9	20.1	11	4.3
Turbidity (NTU)	-	104	637	798	26.5	17.5	10.3	100	38.3	164	5.26	1.47	16.6	120	12.8	377	377	-	61.6	2	>1000	99.1	34	>1000	474	100

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/GuIdance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.
5. VOCs, SVOCs, and Total Metals were analyzed for during CMS 2012 and CMS 2013 sampling events. The wells sampled during this event were resampled and analyzed for individual phenolic compounds via Method 8270D in August 2013. All results are reported in this column.
6. Surrogate recoveries for individual phenolic compounds for CMS 2012 and CMS 2013 were below acceptance criteria, re-extraction was performed outside holding time of 7 days, but within 14 days for analysis. Therefore, re-extracted results are presented as estimated (J qualified).
7. MWN-05B was resampled for Barium on January 18. The second set of field measurements represents the groundwater conditions during the Barium sampling (*italicized*).

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
\- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groudwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TABLE 4-35

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 4B

PARAMETER [1]	GWQS/GV [2]	Monitoring Well Location, Sample Date(s), & Monitoring Program					
		MWN-18A — Slag/Fill			MWN-43A — Slag/Fill		
		Nov-1999	Mar-2012	Jan-2019	Dec-2000	Feb-2012	Jan-2019
		RFI	CMS 2012	CMS 2019	RFI	CMS 2012	CMS 2019
VOCs (Method 8260B, 8260C, 8021B) - ug/L							
1,2,4-Trimethylbenzene	**5**	-	0.88 J	-	-	0.34 J	-
1,3,5-Trimethylbenzene	**5**	-	0.89 J	-	-	0.95 J	-
Acetone	**50**	-	-	7	-	-	3.3 J
Benzene	**1**	**15**	ND	**3.2**	**8.5**	**1.1**	0.44 J
Toluene	**5**	3.1 J	1.8 J	ND	2.1 J	0.34 J	ND
Xylenes, Total	**5**	4.3 J	2.22 J	ND	3.7 J	1.79 J	ND
SVOCs (Method 8270C, 8270D) - ug/L							
2-Chloronaphthalene	**10**	ND	ND	ND	ND	ND	0.4
2-Methylnaphthalene	**-**	-	2.4	ND	-	1.3	ND
3,4-Methylphenol (m,p-Cresol)	**See Note 3**	**R**	-	1.4 J	**R**	-	5.1
Acenaphthene	**20**	-	1.6 J	ND	-	1.6	0.88
Acenaphthylene	**-**	ND	4.9	ND	6.5 J	2.8	ND
Acetophenone	**-**	-	ND	ND	-	5	ND
Anthracene	**50**	ND	2.6	ND	ND	1.1	ND
Benzo(a)anthracene	**0.002**	ND	ND	**0.22**	ND	**0.21**	**0.14**
Benzo(a)pyrene	**0 (ND)**	ND	ND	**0.13**	ND	ND	ND
Benzo(b)fluoranthene	**0.002**	-	ND	**0.26**	-	ND	**0.03 J**
Benzo(ghi)perylene	**-**	-	ND	0.06 J	-	ND	ND
Benzo(k)fluoranthene	**0.002**	-	ND	**0.11**	-	ND	**0.01 J**
Bis(2-ethylhexyl)phthalate	**5**	ND	2.9 J	2.5 J	ND	ND	ND
Carbazole	**-**	-	4.5	0.87 J	-	1.6 J	0.66 J
Chrysene	**0.002**	ND	ND	**0.22**	ND	**0.12 J**	**0.12**
Dibenzo(a,h)anthracene	**-**	-	ND	0.02 J	-	ND	ND
Dibenzofuran	**-**	-	3.7	ND	-	1.3 J	ND
Fluoranthene	**50**	ND	8.1	1.2	4 J	4.4	5.1
Fluorene	**50**	ND	7.4	ND	7.8 J	3	ND
Indeno(1,2,3-cd)Pyrene	**0.002**	-	ND	**0.07 J**	-	ND	ND
Naphthalene	**10**	**26 J**	**13**	ND	**70**	10	ND
Phenanthrene	**50**	21 J	17	ND	14	6.2	ND
Phenol	**See Note 3**	**R**	-	4.4 J	**R**	-	1.6 J
Pyrene	**50**	ND	7	0.89	ND	2.5	3
Total Phenolic Compounds (Method 8270C, 8270D)- ug/L							
Phenolic compounds (total phenols) [4]	**1**	-	-	**5.8**	-	-	**6.7**
Total Metals - ug/L							
Barium, Total	**1000**	521 J	-	246.7	647	-	537.5
Chromium, Total	**50**	**322**	40	-	6.9	ND	-
Lead, Total	**25**	10.3	-	-	2.9 B	-	-
Selenium, Total	**10**	7.1	-	-	ND	-	-
Dissolved Metals - ug/L							
Barium, Dissolved	**1000**	501 J	-	212.6	-	-	537.8
Chromium, Dissolved	**50**	17.5	-	-	-	-	-
Cyanide, Total	**200**	33	-	-	ND	-	-
Selenium, Dissolved	**10**	5.2 J	-	-	-	-	-
Field Measurements							
Dissolved Oxygen (mg/L)	**-**	-	7.93	9.03	-	2.15	2.87
Field pH (S.U.)	**12.5**	-	11.45	12.28	12.46	**12.91**	**12.57**
Redox Potential (mV)	**-**	-	-143	18	-392	-156	-151
Specific Conductance (umhos/cm)	**-**	-	2852	2872	5,580	5091	4956
Temperature (deg C)	**-**	-	16.5	6.3	12.2	8.9	8.7
Turbidity (NTU)	**-**	-	46.9	29.9	4	0.41	1.63

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/Guidance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.

Definitions
B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groudwater monitoring data

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TABLE 4-36

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 5

PARAMETER [1]	GWQS/GV [2]	MWN-07 — Slag/Fill			MWN-08 — Slag/Fill		MWN-09 — Slag/Fill			MWN-26A — Slag/Fill			MWN-26B — Clayey Silt				MWN-30A — Slag/Fill		MWN-34A — Slag/Fill		MWN-45A — Slag/Fill			MWN-46A — Slag/Fill		MWN-47A — Slag/Fill		
		Nov-1999	Feb-2012	Jan-2019	Nov-1999	Jan-2019	Nov-1999	Apr-2013	Jan-2019	Nov-1999	Jul-2010	Feb-2012	Nov-1999	Jul-2010	Feb-2012	Jan-2019	Nov-1999	Apr-2013	Nov-1999	Jan-2019	Dec-2000	Feb-2012	Jan-2019	Dec-2000	Apr-2013	Dec-2000	Feb-2012	Jan-2019
		RFI	**CMS 2012**	**CMS 2019**	**RFI**	**CMS 2019**	**RFI**	**CMS 2013**	**CMS 2019**	**RFI**	**CMS 2010**	**CMS 2012**	**RFI**	**CMS 2010**	**CMS 2012**	**CMS 2019**	**RFI**	**CMS 2013**	**RFI**	**CMS 2019**	**RFI**	**CMS 2012**	**CMS 2019**	**RFI**	**CMS 2013**	**RFI**	**CMS 2012**	**CMS 2019**
VOCs (Method 8260B, 8260C, 8021B) - ug/L																												
1,2,4-Trimethylbenzene	**5**	-	ND	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	**120**	-	-	-	ND	-	-	ND	-	ND	-
Acetone	**50**	-	-	3.6 J	-	1.9 J	-	-	1.8 J	-	ND	-	-	ND	-	4.7 J	-	-	-	3.6 J	-	-	ND	-	-	-	-	2.6 J
Benzene	**1**	**4.6 J**	ND	ND	**14**	0.18 J	**6300**	**3.1**	0.4 J	**1800**	ND	-	**240**	**290 D**	-	**53**	**14000**	**2800**	**2.1 J**	0.3 J	**7.2**	0.97	**7.2**	**17**	**9.3**	**37**	ND	**28**
Bromomethane	**5**	ND	-	2.5	ND	ND	ND	-	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	R	-	ND	R	-	R	-	ND
Carbon disulfide	**60**	-	-	ND	-	ND	-	-	ND	-	ND	-	-	ND	-	ND	-	-	-	ND	-	-	ND	-	-	-	-	ND
Chloromethane (Methyl chloride)	**5**	ND	-	0.73 J	ND	ND	ND	-	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	ND	-	ND	ND	-	ND	-	ND
Cyclohexane	**-**	-	-	ND	-	0.63 J	-	-	ND	-	ND	-	-	ND	-	ND	-	-	-	ND	-	-	ND	-	-	-	-	ND
Ethylbenzene	**5**	ND	ND	ND	**66**	1.3 J	ND	ND	ND	**28 J**	ND	-	**27**	**24 D**	-	**5.1**	**180 J**	**96 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	**5**	-	ND	ND	-	1.2 J	-	ND	ND	-	ND	-	-	ND	-	1.1 J	-	ND	-	ND	-	ND	ND	-	ND	-	ND	ND
Methyl cyclohexane	**-**	-	-	ND	-	0.4 J	-	-	ND	-	ND	-	-	ND	-	ND	-	-	-	ND	-	-	ND	-	-	-	-	ND
Styrene	**5**	-	-	ND	-	ND	-	-	ND	-	ND	-	-	ND	-	ND	-	-	-	ND	-	-	ND	-	-	-	-	ND
Toluene	**5**	1 J	ND	ND	ND	ND	ND	ND	ND	**11 J**	ND	-	ND	4 D	-	ND	**360 J**	**55 J**	ND	ND	ND	ND	1.2 J	ND	ND	ND	ND	ND
Xylenes, Total	**5**	ND	ND	ND	**560**	**49**	ND	ND	ND	**74**	ND	-	**64**	**7.8 D**	-	4.9 J	**980**	**236**	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.8 J
SVOCs (Method 8270C, 8270D) - ug/L																												
2,4-Dimethylphenol	**See Note 3**	R	-	ND	2.4 J	ND	ND	-	ND	5.4 J	-	-	ND	-	-	ND	ND	-	ND	ND	ND	-	ND	ND	-	ND	-	ND
2-Methylnaphthalene	**-**	-	ND	ND	-	ND	-	ND	ND	-	-	ND	-	-	61	39 D	-	18	-	ND	-	0.26	ND	-	ND	-	ND	ND
2-Methylphenol (o-Cresol)	**See Note 3**	R	-	-	ND	-	ND	-	-	22	-	-	ND	-	-	-	ND	-	ND	-	ND	-	-	ND	-	ND	-	-
3,4-Methylphenol (m,p-Cresol)	**See Note 3**	R	-	ND	ND	ND	ND	-	ND	ND	-	-	ND	-	-	ND	ND	-	ND	ND	ND	-	0.54 J	ND	-	ND	-	0.66 J
Acenaphthene	**20**	-	0.18 J	ND	-	ND	-	ND	ND	-	-	2.9	-	-	**49**	**38 D**	-	ND	-	ND	-	0.63	0.71	-	0.08 J	-	ND	ND
Acenaphthylene	**-**	ND	0.08 J	ND	ND	ND	2.7 J	0.63	ND	9.2 J	-	0.47	ND	-	ND	ND	35 J	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetophenone	**-**	-	ND	ND	-	ND	-	ND	ND	-	-	ND	-	-	ND	0.62 J	-	ND	-	ND	-	ND	ND	-	ND	-	ND	ND
Anthracene	**50**	ND	ND	ND	ND	ND	ND	0.1 J	ND	ND	-	0.15 J	ND	-	5.4 J	3.9 D	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	**0.002**	ND	**0.14 J**	**0.03 J**	ND	**0.04 J**	ND	ND	ND	ND	-	ND	ND	-	ND	**0.97 DJ**	ND	**3 J**	ND	ND	ND	ND	**0.03 J**	ND	ND	ND	ND	ND
Benzo(a)pyrene	**0 (ND)**	ND	**0.1 J**	ND	ND	**0.02 J**	ND	ND	ND	ND	-	ND	ND	-	ND	**0.55 DJ**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	**0.002**	-	**0.2**	**0.04 J**	-	**0.03 J**	-	ND	ND	-	-	ND	-	-	ND	**0.71 DJ**	-	ND	-	ND	-	ND	ND	-	ND	-	ND	ND
Benzo(ghi)perylene	**-**	-	0.07 J	0.04 J	-	ND	-	ND	ND	-	-	ND	-	-	ND	0.33 DJ	-	ND	-	ND	-	ND	ND	-	ND	-	ND	ND
Benzo(k)fluoranthene	**0.002**	-	**0.14 J**	**0.03 J**	-	**0.01 J**	-	ND	ND	-	-	ND	-	-	ND	**0.27 DJ**	-	ND	-	ND	-	ND	ND	-	ND	-	ND	ND
Biphenyl	**5**	-	ND	ND	-	ND	-	ND	ND	-	-	ND	-	-	ND	ND	-	**6.3**	-	ND	-	ND	ND	-	ND	-	ND	ND
Bis(2-ethylhexyl)phthalate	**5**	3.8 J	ND	ND	4.1 J	4	ND	ND	2.4 J	ND	-	ND	ND	-	ND	3.3	ND	ND	3.5 J	2.9 J	ND	ND	2.4 J	ND	ND	ND	ND	2.5 J
Carbazole	**-**	-	ND	ND	-	ND	-	ND	ND	-	-	ND	-	-	21	11	-	ND	-	ND	-	ND	ND	-	ND	-	ND	ND
Chrysene	**0.002**	ND	**0.07 J**	**0.03 J**	ND	**0.01 J**	ND	ND	ND	ND	-	ND	ND	-	ND	**0.63 DJ**	ND	**2.8 J**	ND	ND	ND	ND	**0.02 J**	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	**-**	-	ND	0.07 J	-	0.02 J	-	ND	ND	-	-	ND	-	-	ND	0.13 DJ	-	ND	-	ND	-	ND	ND	-	ND	-	ND	ND
Dibenzofuran	**-**	-	ND	ND	-	ND	-	ND	ND	-	-	ND	-	-	18	12	-	ND	-	ND	-	ND	ND	-	ND	-	ND	ND
Fluoranthene	**50**	1.6 J	0.43	ND	ND	ND	ND	0.1 J	ND	ND	-	0.45	ND	-	5.5 J	4.6 D	ND	7.6 J	ND	ND	ND	ND	0.23	ND	0.13 J	ND	ND	ND
Fluorene	**50**	2.9 J	0.16 J	ND	ND	ND	10	ND	ND	3.3 J	-	0.13 J	40 J	-	29	23 D	**1700 D**	ND	ND	ND	ND	0.14 J	ND	ND	ND	ND	ND	ND
Hexachloroethane	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)Pyrene	**0.002**	-	**0.18 J**	**0.05 J**	-	**0.01 J**	-	ND	ND	-	-	ND	-	-	ND	**0.34 DJ**	-	ND	-	ND	-	ND	ND	-	ND	-	ND	ND
Naphthalene	**10**	**230 D**	1.1	ND	**70 D**	ND	**18**	0.09 J	ND	**150 D**	ND **	ND	**2000 D**	**1100 ** **	**590**	**120 D**	**2400 D**	**940**	ND	ND	ND	3.5	ND	ND	0.2	ND	ND	ND
Pentachlorophenol	**See Note 3**	R	-	ND	ND	ND	ND	-	ND	ND	-	-	ND	-	-	ND	ND	-	ND	ND	ND	-	0.19 J	ND	-	ND	-	0.15 J
Phenanthrene	**50**	3.2 J	0.2	ND	2 J	ND	ND	ND	ND	1.1 J	-	ND	43 J	-	34	24 D	48 J	19	ND	ND	ND	ND	1.3	ND	0.12 J	ND	ND	ND
Phenol	**See Note 3**	R	-	ND	2.3 J	ND	150 D	-	ND	16	-	-	ND	-	-	2.6 J	ND	-	ND	ND	ND	-	ND	ND	-	ND	-	ND
Pyrene	**50**	1.3 J	0.55	ND	ND	ND	ND	0.08 J	ND	ND	-	0.33	ND	-	3.2 J	2.9 D	ND	2.9 J	ND	ND	ND	ND	ND	ND	0.1 J	ND	ND	ND
Pyridine	**50**	6.5 J	-	-	ND	-	4 J	-	-	ND	-	-	ND	-	-	-	ND	-	ND	-	ND	-	-	ND	-	ND	-	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug/L																												
Phenolic compounds (total phenols) [4]	**1**	-	-	ND	**4.7**	ND	**150**	-	ND	**43**	-	-	ND	-	-	**2.6**	ND	-	ND	ND	ND	-	0.73	ND	-	ND	-	0.81
Total Metals - ug/L																												
Arsenic, Total	**25**	ND	ND	-	4.6 B	-	3.2 B	-	-	10.1	-	4 J	**485 J**	-	**623**	-	8.2 B	1.96	ND	-	ND	ND	-	6.3 B	-	ND	ND	-
Barium, Total	**1000**	398 J	41	-	148 JB	-	150 JB	-	-	31.1 B	-	42	**1790**	-	**2320**	**1754**	250 J	69.94	62.3 JB	-	120 B	109	-	42.9 B	-	35.7 B	71	-
Cadmium, Total	**5**	ND	-	-	ND	-	ND	-	-	ND	-	-	ND	-	-	-	0.25 B	-	ND	-	ND	-	-	0.64 B	-	ND	-	-
Chromium, Total	**50**	19.1	40	-	2.7 B	-	2.4 B	-	-	0.8 B	-	ND	2.7 B	-	3 J	-	12.1	1.64	**295**	-	12.3	3 J	-	6.2	-	4.2 B	10	-
Cyanide, Total	**200**	**510**	49	-	0	-	0.14	-	-	**220**	-	186	89	-	-	-	0.61	-	0.11	-	**290 J**	**1080**	191	0.02 J	-	ND	-	-
Lead, Total	**25**	ND	-	-	ND	-	ND	-	-	2.3 B	-	-	ND	-	-	-	1.9 B	0.64 J	2.9 B	-	ND	-	-	6.8	-	ND	-	-
Selenium, Total	**10**	4.8 B	-	-	ND	-	ND	-	-	1.9 B	-	-	ND	-	-	-	ND	0.56 J	6.3	-	2.3 B	-	-	2.1 B	-	3.3 B	-	-
Dissolved Metals - ug/L																												
Arsenic, Dissolved	**25**	ND	-	-	-	-	-	-	-	-	-	-	**541 J**	-	**152**	-	4.5 JB	-	-	-	-	-	-	6.6 B	-	-	-	-
Barium, Dissolved	**1000**	418 J	-	-	-	-	-	-	-	-	-	-	**1740**	-	**1890**	**1792**	204 J	-	-	-	-	-	-	36.2 B	-	-	-	-
Cadmium, Dissolved	**5**	ND	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	ND	-	-	-	-	-	-	ND	-	-	-	-
Chromium, Dissolved	**50**	19.2	-	-	-	-	-	-	-	-	-	-	0.62 B	-	ND	-	ND	-	-	-	-	-	-	1.3 B	-	-	-	-
Selenium, Dissolved	**10**	4.2 JB	-	-	-	-	-	-	-	-	-	-	1.6 B	-	-	-	ND	-	-	-	-	-	-	ND	-	-	-	-
Field Measurements																												
Dissolved Oxygen (mg/L)	**-**	0.9	9.23	8.11	0.80	1.93	0.4	1.52	1.75	0.8	2.35	2.39	0.5	1.72	2.33	1.62	0.5	2.66	1.40	3.60	-	3.1	1.63	3.65	3	-	5.27	0.85
Field pH (S.U.)	**12.50**	11.77	**12.55**	12.06	7.29	7.27	7.10	7.21	7.42	7.96	7.15	7.19	6.66	6.51	7.33	6.57	7.40	7.80	7.28	7.34	11.28	11.56	11.26	9.55	9.26	11.41	11.55	11.91
Redox Potential (mV)	**-**	-173	-83	-140	-205	-105	-204	-15	-115	-158	-118	-114	-107	-74	-55	-63	-296	-285	-86	-76	-127	-154	-218	7	-7	-299	-144	-263
Specific Conductance (umhos/cm)	**-**	2,960	2494	2431	3,470	1,004	1400	1015	766.7	1,150	754.2	970.6	1,630	1408	1689	1500	600	1499	3,060	1,485	6,450	11.54	8187	1260	3740	1,350	800.6	5060
Temperature (deg C)	**-**	18.2	9.3	10.1	16.7	9.6	16.9	11.0	10.0	13.0	17.5	7.2	11.8	14.1	6.6	9.0	16.3	11.4	18.1	9.6	13.6	6.5	8.8	10.3	8.9	12.6	7.0	10.8
Turbidity (NTU)	**-**	180	7.44	0.79	200	13.8	190	33.2	10.7	8	11.2	2.58	44	8.21	269	21.4	150	20	300	36.6	-	20.9	0.83	13	13	4	37.5	2.56

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/GuIdance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.

Definitions

B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
\- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groudwater monitoring data
** = Indicates Naphthalene was analyzed using Method 8260B

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TABLE 4-36

GROUNDWATER ANALYTICAL SUMMARY
DISCHARGE SUB-AREA 5

Monitoring Well Location, Sample Date(s), & Monitoring Program

PARAMETER [1]	GWQS/GV [2]	MWN-49A — Clayey Silt			MWN-49B — Clayey Silt; Till; Peat			MWN-52A — Slag/Fill	MWN-52B — Sand	MWN-53A — Slag/Fill			
		Dec-2000	Feb-2012	Jan-2019	Dec-2000	Mar-2012	Feb-2019	Dec-2000	Dec-2000	Mar-2005	Apr-2013	Apr-2013	Jan-2019
		RFI	CMS 2012	CMS 2019	RFI	CMS 2012	CMS 2019	RFI	RFI	ICM 2005	ICM 2013	CMS 2013	CMS 2019
VOCs (Method 8260B, 8260C, 8021B) - ug/L													
1,2,4-Trimethylbenzene	**5**	-	ND	-	-	ND	-	-	-	-	-	-	-
Acetone	**50**	-	-	1.8 J	-	-	ND	-	-	ND	ND	-	2.4 J+
Benzene	**1**	**2.8 J**	ND	0.51	ND	ND	ND	ND	ND	**74**	ND	-	**31**
Bromomethane	**5**	R	-	ND	R	-	ND	ND	ND	ND	ND	-	ND
Carbon disulfide	**60**	-	-	ND	-	-	ND	-	-	ND	ND	-	ND
Chloromethane (Methyl chloride)	**5**	ND	-	ND	ND	-	ND	ND	ND	ND	ND	-	ND
Cyclohexane	**-**	-	-	ND	-	-	ND	-	-	ND	ND	-	ND
Ethylbenzene	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND
Isopropylbenzene	**5**	-	ND	ND	-	ND	ND	-	-	ND	ND	-	ND
Methyl cyclohexane	**-**	-	-	ND	-	-	ND	-	-	ND	ND	-	ND
Styrene	**5**	-	-	ND	-	-	ND	-	-	ND	ND	-	ND
Toluene	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND
Xylenes, Total	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND
SVOCs (Method 8270C, 8270D) - ug/L													
2,4-Dimethylphenol	**See Note 3**	ND	-	ND	ND	-	ND	ND	ND	-	-	-	ND
2-Methylnaphthalene	**-**	-	ND	ND	-	ND	ND	-	-	-	-	ND	ND
2-Methylphenol (o-Cresol)	**See Note 3**	ND	-	-	ND	-	-	ND	ND	-	-	-	-
3,4-Methylphenol (m,p-Cresol)	**See Note 3**	ND	-	ND	ND	-	ND	ND	ND	-	-	-	ND
Acenaphthene	**20**	-	ND	ND	-	ND	ND	-	-	-	-	0.8	ND
Acenaphthylene	**-**	ND	0.08 J	ND	ND	ND	ND	ND	ND	-	-	ND	ND
Acetophenone	**-**	-	ND	ND	-	ND	ND	-	-	-	-	ND	ND
Anthracene	**50**	ND	ND	ND	ND	ND	ND	ND	ND	-	-	0.09 J	ND
Benzo(a)anthracene	**0.002**	ND	ND	**0.02 J**	ND	ND	**0.04 J**	ND	ND	-	-	ND	ND
Benzo(a)pyrene	**0 (ND)**	ND	ND	ND	ND	ND	**0.03 J**	ND	ND	-	-	ND	ND
Benzo(b)fluoranthene	**0.002**	-	ND	ND	-	ND	**0.04 J**	-	-	-	-	ND	ND
Benzo(ghi)perylene	**-**	-	ND	ND	-	ND	ND	-	-	-	-	ND	ND
Benzo(k)fluoranthene	**0.002**	-	ND	ND	-	ND	**0.03 J**	-	-	-	-	ND	ND
Biphenyl	**5**	-	ND	ND	-	ND	ND	-	-	-	-	ND	ND
Bis(2-ethylhexyl)phthalate	**5**	ND	ND	2.6 J	**6.6 J**	ND	1.6 J	ND	ND	-	-	ND	ND
Carbazole	**-**	-	ND	ND	-	ND	ND	-	-	-	-	ND	ND
Chrysene	**0.002**	ND	ND	ND	ND	ND	**0.04 J**	ND	ND	-	-	ND	ND
Dibenzo(a,h)anthracene	**-**	-	ND	ND	-	ND	ND	-	-	-	-	ND	ND
Dibenzofuran	**-**	-	ND	ND	-	ND	ND	-	-	-	-	ND	ND
Fluoranthene	**50**	ND	ND	0.23	ND	ND	ND	ND	ND	-	-	ND	ND
Fluorene	**50**	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND
Hexachloroethane	**5**	ND	0.07 J	ND	ND	ND	ND	ND	ND	-	-	ND	ND
Indeno(1,2,3-cd)Pyrene	**0.002**	-	ND	ND	-	ND	ND	-	-	-	-	ND	ND
Naphthalene	**10**	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND
Pentachlorophenol	**See Note 3**	ND	-	ND	ND	-	ND	ND	ND	-	-	-	ND
Phenanthrene	**50**	ND	0.08 J	ND	ND	ND	ND	ND	ND	-	-	ND	ND
Phenol	**See Note 3**	ND	-	ND	ND	-	ND	ND	ND	-	-	-	1 J
Pyrene	**50**	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND
Pyridine	**50**	ND	-	-	ND	-	-	ND	ND	-	-	-	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug/L													
Phenolic compounds (total phenols) [4]	**1**	ND	-	ND	ND	-	ND	ND	ND	-	-	-	1.0
Total Metals - ug/L													
Arsenic, Total	**25**	ND	ND	-	6.6 B	17	-	4.5 B	ND	-	-	-	-
Barium, Total	**1000**	146 B	90	-	**1160**	**1360**	**1155**	136 B	356	-	-	-	-
Cadmium, Total	**5**	ND	-	-	0.97 B	-	-	ND	ND	-	-	-	-
Chromium, Total	**50**	4.3 B	20	-	3.5 B	40	-	6.6	7.6	-	-	-	-
Cyanide, Total	**200**	16 J	-	-	17 J	-	-	40 J	53 J	-	-	-	199
Lead, Total	**25**	ND	-	-	ND	-	-	ND	ND	-	-	-	-
Selenium, Total	**10**	ND	-	-	ND	-	-	ND	ND	-	-	-	-
Dissolved Metals - ug/L													
Arsenic, Dissolved	**25**	-	ND	-	4.2 B	4 J	-	-	-	-	-	-	-
Barium, Dissolved	**1000**	-	78	-	**1040**	**1110**	**1151**	-	-	-	-	-	-
Cadmium, Dissolved	**5**	-	-	-	0.65 B	-	-	-	-	-	-	-	-
Chromium, Dissolved	**50**	-	ND	-	1.4 B	ND	-	-	-	-	-	-	-
Selenium, Dissolved	**10**	-	-	-	ND	-	-	-	-	-	-	-	-
Field Measurements													
Dissolved Oxygen (mg/L)	**-**	-	0.93	1.74	-	4.71	2.19	-	-	-	1.95	1.97	1.7
Field pH (S.U.)	**12.50**	7.35	7.75	7.14	8.21	7.20	6.79	8.42	7.26	6.22	7.03	7.05	7.14
Redox Potential (mV)	**-**	-292	-250	-113	-97	-48	-35	-98	-124	63	-58	-73	-90
Specific Conductance (umhos/cm)	**-**	3,600	1531	1534	1,700	1540	1754	3250	3130	1001	1051	1060	1137
Temperature (deg C)	**-**	14.8	9.9	10.9	11.3	7.2	9.3	13.2	13.5	7.4	11.0	11.9	3.6
Turbidity (NTU)	**-**	7.23	150	62.1	950	>1000	22.1	7.1	-	100	15.4	6.59	1.41

PARAMETER [1]	MWN-54A - Slag/Fill			MWN-55A - Slag/Fill			MWN-66A — Slag/Fill	MWN-66AR — Slag/Fill	MWN-67A —Slag/Fill		MWN-68A - Sand		MWN-72A —Slag/Fill; Sand	MWN-72AR Slag/Fill; Sand
	Mar-2005	Apr-2013	Apr-2013	Mar-2005	Apr-2013	Apr-2013	Jul-2010	Jan-2019	Jul-2010	Jan-2019	Jul-2010	Jan-2019	Jul-2010	Jan-2019
	ICM 2005	ICM 2013	CMS 2013	ICM 2005	ICM 2013	CMS 2013	CMS 2010	CMS 2019	CMS 2010	CMS 2019	CMS 2010	CMS 2019	CMS 2010	CMS 2019
VOCs (Method 8260B, 8260C, 8021B) - ug/L														
1,2,4-Trimethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	ND	ND	-	ND	ND	-	**53 D**	ND	40 DJ	ND	ND	ND	ND	7.6 DJ
Benzene	**180000 B**	**50000**	-	**2400 DB**	**700**	-	**10000 D**	**6600 D**	**4100 D**	**4400 D**	ND	ND	**4 D**	**510 D**
Bromomethane	ND	ND	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	ND	ND	-	ND	ND	-	ND	ND	4.3 DJ	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	ND	ND	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND
Cyclohexane	ND	ND	-	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	**1300 J**	**450 J**	-	**140**	**62**	-	**110 D**	**100 DJ**	**58 D**	**44 DJ**	ND	ND	ND	ND
Isopropylbenzene	ND	ND	-	**8.2**	ND	-	ND	ND	ND	ND	ND	ND	ND	ND
Methyl cyclohexane	ND	ND	-	4.8 J	ND	-	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	-	**7.8**	ND	-	**470 D**	**410 D**	ND	**72 DJ**	ND	ND	ND	ND
Toluene	**9400**	**200 J**	-	**23**	ND	-	**3600 D**	**3200 D**	**2200 D**	**1100 D**	ND	ND	ND	ND
Xylenes, Total	ND	**1060 J**	-	**340**	**1250 J**	-	**2170 D**	**2070 D**	**1390 D**	**630 D**	ND	ND	ND	ND
SVOCs (Method 8270C, 8270D) - ug/L														
2,4-Dimethylphenol	-	-	-	-	-	-	-	120 DJ-	-	53 D	-	ND	-	ND
2-Methylnaphthalene	-	-	39	-	-	22	-	470 D	-	160 D	-	ND	-	ND
2-Methylphenol (o-Cresol)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,4-Methylphenol (m,p-Cresol)	-	-	-	-	-	-	-	1100 D	-	450 D	-	ND	-	ND
Acenaphthene	-	-	3.8 J	-	-	5.4 J	-	**21 D**	-	12 D	-	ND	-	12 D
Acenaphthylene	-	-	21	-	-	8.3 J	-	150 D	-	160 D	-	ND	-	ND
Acetophenone	-	-	ND	-	-	ND	-	ND	-	ND	-	ND	-	ND
Anthracene	-	-	ND	-	-	ND	-	24 D	-	14 D	-	ND	-	ND
Benzo(a)anthracene	-	-	ND	-	-	ND	-	**17 DJ**	-	**0.96 DJ**	-	ND	-	**0.39 D**
Benzo(a)pyrene	-	-	ND	-	-	ND	-	**12 DJ**	-	**0.41 DJ**	-	ND	-	**0.16 DJ**
Benzo(b)fluoranthene	-	-	ND	-	-	ND	-	**14 DJ**	-	**0.55 DJ**	-	ND	-	ND
Benzo(ghi)perylene	-	-	ND	-	-	ND	-	7 DJ	-	ND	-	0.06 J	-	ND
Benzo(k)fluoranthene	-	-	ND	-	-	ND	-	**5.3 DJ**	-	**0.21 DJ**	-	ND	-	**0.08 DJ**
Biphenyl	-	-	4.2	-	-	4.8	-	**27 DJ**	-	**22 D**	-	ND	-	ND
Bis(2-ethylhexyl)phthalate	-	-	ND	-	-	ND	-	ND	-	ND	-	2.4 J	-	2.8 J
Carbazole	-	-	ND	-	-	ND	-	89 D	-	120 D	-	ND	-	2.9
Chrysene	-	-	ND	-	-	ND	-	**14 DJ**	-	**0.62 DJ**	-	ND	-	**0.37 D**
Dibenzo(a,h)anthracene	-	-	ND	-	-	ND	-	ND	-	ND	-	ND	-	ND
Dibenzofuran	-	-	5.1	-	-	5.4	-	41 D	-	49 D	-	ND	-	2.7
Fluoranthene	-	-	3.5 J	-	-	ND	-	46 D	-	9.7 D	-	ND	-	1.1 D
Fluorene	-	-	ND	-	-	5.8 J	-	**64 D**	-	**59 D**	-	ND	-	4.3 D
Hexachloroethane	-	-	ND	-	-	ND	-	ND	-	ND	-	ND	-	ND
Indeno(1,2,3-cd)Pyrene	-	-	ND	-	-	ND	-	**6.7 DJ**	-	ND	-	ND	-	ND
Naphthalene	-	-	**2700 D**	-	-	**730**	**18000 D ****	**11000 D**	**8700 D ****	**2800 D**	0.7 J **	ND	7.8 D **	**22 D**
Pentachlorophenol	-	-	-	-	-	-	-	ND	-	ND	-	ND	-	ND
Phenanthrene	-	-	9.3 J	-	-	3.4 J	-	**110 D**	-	**59 D**	-	ND	-	4.7 D
Phenol	-	-	-	-	-	-	-	1200 D	-	880 D	-	ND	-	7.5
Pyrene	-	-	ND	-	-	ND	-	34 D	-	5.8 D	-	ND	-	0.94 D
Pyridine	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phenolic Compounds (Method 8270C, 8270D)- ug/L														
Phenolic compounds (total phenols) [4]	-	-	-	-	-	-	-	**2420**	-	**1383**	-	ND	-	**7.5**
Total Metals - ug/L														
Arsenic, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide, Total	-	-	-	-	-	-	-	**291**	-	**561**	-	-	-	-
Lead, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Metals - ug/L														
Arsenic, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Measurements														
Dissolved Oxygen (mg/L)	-	1.3	1.29	-	0.98	2.25	1.57	0.85	0.27	1.09	2.35	1.69	2.22	1.07
Field pH (S.U.)	7.01	7.14	7.25	8.78	8.79	8.67	8.86	9.00	10.31	10.16	7.00	6.97	7.12	7.38
Redox Potential (mV)	-24	-88	-176	-29	-213	-216	-104	-144	-516	-253	-76	-122	-100	-130
Specific Conductance (umhos/cm)	947	2164	1996	2145	4542	4682	5885	2900	3164	1637	830.1	1483	1094	1301
Temperature (deg C)	6.5	11.3	11.1	6.2	9.0	9.8	15.8	7.5	16.8	7.8	16.9	8.1	14.8	9.7
Turbidity (NTU)	12.9	17	8.11	10.6	1.66	1.6	189	544	>1000	12	7.41	4.43	29.3	55

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Groundwater Quality Standards/Guldance Values (GWQS/GV) as per Divison of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)
3. Refer to GWQS/GV for "Phenolic compounds (total phenols)."
4. GWQS/GV for Phenolic compounds (total phenols) applies to sum of these substances.

Definitions

B = The analyte was also detected above the reporting limit in the associated method blank.
J = Estimated value.
J+ = Estimated value that may be biased high.
J- = Estimated value that may be biased low.
D = Concentration of analyte was quantified from diluted analysis.
E = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
ND = Not detected at the method detection limit.
\- = No GWQS/GV, or parameter was not analyzed for.
R = Sample result was rejected by third party validator.
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
RFI = Final RCRA Facility Investigation (October 2004)
CMS = Corrective Measures Study
HWMU = Hazardous Waste Management Unit groudwater monitoring data
** = Indicates Naphthalene was analyzed using Method 8260B

Color Code:

	= concentration is less than or equal to the GWQS/GV (includes non-detect)
Bold	= concentration exceeds the GWQS/GV, but is less than 10 times the GWQS/GV
Bold	= concentration exceeds 10 times the GWQS/GV, but is less than 100 times the GWQS/GV
Bold	= concentration exceeds 100 times the GWQS/GV
Bold	= pH exceeds 12.5

TurnKey Environmental Restoration, LLC
Benchmark Environmental Engineering & Science, PLLC

TABLE 4-37

TOTAL GROUNDWATER VOLUMETRIC DISCHARGE BY DISCHARGE SUB-AREA

Discharge Sub-Area	Discharge Sub-Area Description	Surface Area	Total Discharge "X" (RFI) [1]	Total Discharge "X" (CMS 2019) [2]				
		(SF)	CF/YR [3]	CF/YR	L/YR [4]	L/Day [5]	GPM [6]	GPD [7]
2A	Lake Erie, south of Smokes Creek, along SFA-2	2,150,338	2,687,923	2,687,923	76,113,498	208,530	38	55,051
2B	South bank of Smokes Creek, along SFA-2	1,337,383	1,671,729	1,514,009	42,871,979	117,457	22	31,008
3A	North bank of Smokes Creek, along SFA-3	1,976,503	2,470,629	2,470,629	69,960,424	191,672	35	50,601
4A	Lake Erie, north of Smokes Creek	16,748,890	20,936,113	20,430,223	578,519,547	1,584,985	291	418,431
4B	Lake Erie, north of Smokes Creek, Outer Harbor	2,227,484	2,784,355	2,784,355	78,844,163	216,011	40	57,026
5	Ship Canal, west side	1,046,629	1,308,286	0	0	0	0	0
	Totals for CMS Area:	***25,487,227***	***31,859,034***	***29,887,138***	***846,309,611***	***2,318,656***	***425***	***612,118***

Notes:

1. Represents total discharge at the time of the final RCRA Facility Investigatin (RFI).
2. Includes a pumping of ATP area pumping wells in DSA 2B (ATP-PW1 through ATP-PW-4) and OU4 area recovery wells in DSA 4A and DSA 5 (RW-1 through RW-3, RW-A through RW-I, RWS-1 through RWS-14, and RWN-1 through RWN-27).
3. Per RFI (and USEPA comments), Area x 1.25 feet/year (site-wide infiltration to groundwater).
4. Conversion factor: 1 CF/YR = 28.3168499 L/year.
5. Conversion factor: 1 L/year = 0.0027397 L/day.
6. Conversion factor: 1 L/year = 5.0227716E-7 GPM
7. Conversion factor: 1 GPM = 1440 GPD.

Definitions:

SF = square feet
CF/YR = cubic feet per year
L/YR = liters per year
GPM = gallons per minute
GPD = gallons per day

TABLE 4-38

RFI SHORELINE SEGMENT LENGTH & SATURATED THICKNESS SUMMARY

Groundwater Discharge Sub-Area	Discharge Sub-Area Description	Hydrologic Unit	Segment / Well	Saturated Thickness [1] (feet)	Shoreline Segment Length [2] (feet)	Average Total Saturated Thickness of Fill Unit " B " (feet)	Average Total Saturated Thickness of Sand Unit " A " (feet)	Average Total Saturated Thickness " Z " (feet)
2A	Lake Erie, south of Smokes Creek, along SFA-2	Slag/Fill	MW-2D4	16	469	15		25
			MW-2D3	16	220			
			MW-2D2	14	291			
			MWS-26A	14	278			
			MWS-09	15	230			
		Sand/Dredge Spoil	MW-2D2B	10	1,488		10	
		Total Length of Sub-Area 2 Lake Erie Shoreline:			**1,488**			
2B	South bank of Smokes Creek, along SFA-2	Slag/Fill	MWS-01	14	769	12		18
			MWS-02	13	684			
			MWS-19A	12	386			
			MWS-18A	12	331			
			MWS-20A	9	301			
			MWS-03	12	344			
		Sand/Dredge Spoil	MWS-01B	10	1,012		6	
		Sand	MWS-19B	4	809			
			MWS-18C	3	312			
			MWS-20B	2	682			
		Total Length of Sub-Area 2 Smokes Creek Shoreline:			**2,815**			
3A	North bank of Smokes Creek, along SFA-3	Slag/Fill	MWN-01	18	1,011	12		18
			MWN-11	12	1,114			
			MWN-44A	5	530			
			MWN-24A	2	204			
		Sand/Dredge Spoil	MWN-01B	10	729		6	
			MWN-23B	6	1,217			
		Till	MWN-24B	4	913			
		Total Length of Sub-Area 3A Shoreline:			**2,859**			
4A	Lake Erie, north of Smokes Creek	Slag/Fill	MWN-06A	13	646	15		24
			MWN-05A	14	1,209			
			MWN-04	10	1,164			
			MWN-03	18	1,343			
			MWN-02	16	2,194			
		Sand/Dredge Spoil	MWN-05B	10	2,439		9	
			MWN-03B	8	1,913			
			MWN-02B	10	2,204			
		Total Length of Sub-Area 4A Shoreline:			**6,556**			

TURNKEY ENVIRONMENTAL RESTORATION, LLC
BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 4-38

RFI SHORELINE SEGMENT LENGTH & SATURATED THICKNESS SUMMARY

Groundwater Discharge Sub-Area	Discharge Sub-Area Description	Hydrologic Unit	Segment / Well	Saturated Thickness [1] (feet)	Shoreline Segment Length [2] (feet)	Average Total Saturated Thickness of Fill Unit " B " (feet)	Average Total Saturated Thickness of Sand Unit " A " (feet)	Average Total Saturated Thickness " Z " (feet)
4B	Lake Erie, north of Smokes Creek, Outer Harbor	Slag/Fill	MWN-43A	5	1,943	6		14
			MWN-18A	8	1,270			
		Sand	(see Note 3)	8	3,213		8	
			Total Length of Sub-Area 4B Shoreline:		**3,213**			
5	Ship Canal, west side [4]	Slag/Fill	MWN-45A	1.5	109	8		8
			MWN-47A	4.5	240			
			MWN-09	6	480			
			MWN-26A	10	460			
			MWN-34A	12	429			
			MWN-08A	13	344			
			MWN-49A	10	464			
			MWN-52A	3.5	686			
			MWN-07	9.5	728			
			Total Length of Sub-Area 5 Shoreline:		**3,940**			

Notes:
1. Saturated thicknesses for the RFI were calculated using groundwater elevations measured on 11/20/2001 (RFI Table 2-12).
2. Shoreline Segment Length = Total Length of Discharge Sub-Area between wells (see Plate 4-19).
3. Derived during the RFI from interpretation of data from nearby sand unit wells MWN-05B and MWN-50B.
4. Based on geologic cross sections (and boring logs), there was no discernable sand layer identified for CMS Discharge Sub-Area 5. Therefore the total saturated thickness was calculated without incorporating a sand layer.

Formula:
" Z " = Average Total Saturated Thickness per CMS Discharge Sub-Area = Average Total Saturated Thickness (fill) + Average Total Saturated Thickness (sand)
" B " = Average Total Saturated Thickness (fill) = $[(B_1 \times C_1) + (B_2 \times C_2) + (B_3 \times C_3) + \ldots] / Y$
" A " = Average Total Saturated Thickness (sand) = $[(A_1 \times D_1) + (A_2 \times D_2) + (A_3 \times D_3) + \ldots] / Y$

Definitions:
" A_N " = Saturated thickness of sand along shoreline segment " N "
" B_N " = Saturated thickness of fill along shoreline segment " N "
" C_N " = length of fill shoreline segment " N "
" D_N " = length of sand shoreline segment " N "
" Y " = total length of CMS Discharge Sub-Area Shoreline

TABLE 4-39

CMS SHORELINE SEGMENT LENGTH & SATURATED THICKNESS SUMMARY

Groundwater Discharge Sub-Area	Discharge Sub-Area Description	Hydrologic Unit	Segment / Well	Saturated Thickness [1] (feet)	Shoreline Segment Length [2] (feet)	Average Total Saturated Thickness of Fill Unit " B " (feet)	Average Total Saturated Thickness of Sand Unit " A " (feet)	Average Total Saturated Thickness " Z " (feet)
2A	Lake Erie, south of Smokes Creek, along SFA-2	Slag/Fill	MW-2D4	17	469	17		27
			MW-2D3	17	220			
			MW-2D2	16	291			
			MWS-26A	16	278			
			MWS-09	17	230			
		Sand/Dredge Spoil	MW-2D2B	10	1,488		10	
		Total Length of Sub-Area 2 Lake Erie Shoreline:			**1,488**			
2B	South bank of Smokes Creek, along SFA-2	Slag/Fill	MWS-01	16	769	14		19
			MWS-02	14	684			
			MWS-19A	13	386			
			MWS-18A	13	331			
			MWS-20A	9	301			
			MWS-03	12	344			
		Sand/Dredge Spoil	MWS-01B	10	1,012		6	
		Sand	MWS-19B	4	809			
			MWS-18C	3	312			
			MWS-20B	2	682			
		Total Length of Sub-Area 2 Smokes Creek Shoreline:			**2,815**			
3A	North bank of Smokes Creek, along SFA-3 [3]	Slag/Fill	MWN-01	20	1,011	13		20
			MWN-11	13	1,114			
			MWN-94A	5	530			
			MWN-24A	2	204			
		Sand/Dredge Spoil	MWN-01B	10	729		6	
			MWN-23B	6	1,217			
			MWN-94B	4	913			
		Total Length of Sub-Area 3A Shoreline:			**2,859**			
4A	Lake Erie, north of Smokes Creek	Slag/Fill	MWN-06A	12	646	15		25
			MWN-05A	17	1,209			
			MWN-04	11	1,164			
			MWN-03	18	1,343			
			MWN-02	16	2,194			
		Sand/Dredge Spoil	MWN-05B	10	2,439		9	
			MWN-03B	8	1,913			
			MWN-02B	10	2,204			
		Total Length of Sub-Area 4A Shoreline:			**6,556**			

TABLE 4-39

CMS SHORELINE SEGMENT LENGTH & SATURATED THICKNESS SUMMARY

Groundwater Discharge Sub-Area	Discharge Sub-Area Description	Hydrologic Unit	Segment / Well	Saturated Thickness [1] (feet)	Shoreline Segment Length [2] (feet)	Average Total Saturated Thickness of Fill Unit " B " (feet)	Average Total Saturated Thickness of Sand Unit " A " (feet)	Average Total Saturated Thickness " Z " (feet)
4B	Lake Erie, north of Smokes Creek, Outer Harbor	Slag/Fill	MWN-43A	11	1,943	11		20
			MWN-18A	12	1,270			
		Sand	(see Note 4)	8	3,213		8	
		Total Length of Sub-Area 4B Shoreline:			**3,213**			
5	Ship Canal, west side [5,6]	Slag/Fill	MWN-45A	3.6	109	10		10
			MWN-47A	6.8	240			
			MWN-09	8.5	480			
			MWN-26A	8.4	501			
			MWN-67A	12.1	313			
			MWN-66A	12.2	266			
			MWN-49A	12.2	424			
			MWN-68A	4.2	661			
			MWN-07	13.8	946			
		Total Length of Sub-Area 5 Shoreline:			**3,940**			

Notes:

1. Saturated thicknesses for the CMS were calculated using groundwater elevations measured on 01/04/2019 and 01/08/2019 (see Table 4-30).
2. Shoreline Segment Length = Total Length of Discharge Sub-Area between wells (see Plate 4-19).
3. Well MWN-44A was decommissioned and replaced with MWN-94A. Well MWN-24B, which is screened in the till layer and therefore unlikely to be contributing to Smoke's Creek, was replaced with MWN-94B, which is screened in the sand layer.
4. Derived during the CMS from interpretation of data from nearby sand unit wells MWN-05B and MWN-50B.
5. Based on geologic cross sections (and boring logs), there was no discernable sand layer identified for CMS Discharge Sub-Area 5. Therefore the total saturated thickness was calculated without incorporating a sand layer.
6. Wells MWN-34A, MWN-08A, and MWN-52A used during the RFI (see Table 4-41) were not sampled during the CMS; therefore, nearby wells MWN-67A, MWN-66A, and MWN-68A were used to calculate the respective CMS values

Formula:

" Z " = Average Total Saturated Thickness per CMS Discharge Sub-Area = Average Total Saturated Thickness (fill) + Average Total Saturated Thickness (sand)

" B " = Average Total Saturated Thickness (fill) = $[(B_1 \times C_1) + (B_2 \times C_2) + (B_3 \times C_3) + \ldots] / Y$

" A " = Average Total Saturated Thickness (sand) = $[(A_1 \times D_1) + (A_2 \times D_2) + (A_3 \times D_3) + \ldots] / Y$

Definitions:

" A_N " = Saturated thickness of sand along shoreline segment " N "

" B_N " = Saturated thickness of fill along shoreline segment " N "

" C_N " = length of fill shoreline segment " N "

" D_N " = length of sand shoreline segment " N "

" Y " = total length of CMS Discharge Sub-Area Shoreline

TurnKey Environmental Restoration, LLC — Benchmark Environmental Engineering & Science, PLLC

TABLE 4-40

RFI DISCHARGE RATE CALCULATIONS BY DSA

Discharge Sub-Area	Unit	Well I.D.	Discharge Rate " Q " CF/YR [1]	L/YR [2]	GPM [3]	CFS [4]
2A	Slag/Fill	MW-2D4	794,982	22,511,391	11	0.025
		MW-2D3	372,913	10,559,714	5	0.012
		MW-2D2	493,262	13,967,622	7	0.016
		MWS-26A	471,226	13,343,639	7	0.015
		MWS-09	389,863	11,039,701	6	0.012
	Sand/Dredge Spoil	MW-2D2B	165,676	4,691,430	2	0.005
2B	Slag/Fill	MWS-01	437,357	12,384,574	6	0.014
		MWS-02	389,015	11,015,668	6	0.012
		MWS-19A	219,532	6,216,444	3	0.007
		MWS-18A	188,251	5,330,681	3	0.006
		MWS-20A	171,189	4,847,538	2	0.005
		MWS-03	195,645	5,540,044	3	0.006
	Sand/Dredge Spoil	MWS-01B	25,431	720,135	0.362	0.001
	Sand	MWS-19B	20,330	575,681	0.289	0.001
		MWS-18C	7,840	222,018	0.112	0.0002
		MWS-20B	17,139	485,308	0.244	0.001
3A	Slag/Fill	MWN-01	830,325	23,512,178	12	0.026
		MWN-11	914,918	25,907,583	13	0.029
		MWN-44A	435,284	12,325,870	6	0.014
		MWN-24A	167,543	4,744,297	2	0.005
	Sand/Dredge Spoil	MWN-01B	31,251	884,922	0.4	0.001
		MWN-23B	52,170	1,477,297	1	0.002
	Till	MWN-24B	39,138	1,108,276	0.6	0.001
4A	Slag/Fill	MWN-06A	1,939,704	54,926,309	28	0.061
		MWN-05A	3,630,189	102,795,522	52	0.115
		MWN-04	3,495,070	98,969,386	50	0.110
		MWN-03	4,032,543	114,188,905	57	0.127
		MWN-02	6,587,787	186,545,389	94	0.208
	Sand/Dredge Spoil	MWN-05B	465,337	13,176,867	7	0.015
		MWN-03B	364,981	10,335,116	5	0.012
		MWN-02B	420,501	11,907,264	6	0.013

TurnKey Environmental Restoration, LLC
Benchmark Environmental Engineering & Science, PLLC

TABLE 4-40

RFI DISCHARGE RATE CALCULATIONS BY DSA

Discharge Sub-Area	Unit	Well I.D.	Discharge Rate " Q "			
			CF/YR [1]	L/YR [2]	GPM [3]	CFS [4]
4B	Slag/Fill	MWN-43A	1,487,292	42,115,436	21	0.047
		MWN-18A	972,137	27,527,845	14	0.031
	Sand	(see Note 5)	324,926	9,200,882	5	0.010
5	Slag/Fill	MWN-45A	36,194	1,024,892	0.515	0.001
		MWN-47A	79,693	2,256,642	1.133	0.003
		MWN-09	159,385	4,513,285	2.267	0.005
		MWN-26A	152,744	4,325,231	2.172	0.005
		MWN-34A	142,450	4,033,748	2.026	0.004
		MWN-08A	114,226	3,234,521	1.625	0.004
		MWN-49A	154,072	4,362,842	2.191	0.005
		MWN-52A	227,788	6,450,236	3.240	0.007
		MWN-07	241,734	6,845,149	3.438	0.008

Notes:

1. Represents RFI discharge of each well. See below for discharge formula, and Tables 4-37 and 4-38 for parameter calculations.
2. Conversion factor: 1 CF/YR = 28.3168499 L/year.
3. Conversion factor: 1 L/year = 5.0227716E-7 GPM
4. Conversion factor: 1 GPM = 0.00222 cfs.
5. Derived from interpretation of data from nearby boring logs MWN-05B and MWN-50B.

Formula:

" Q (Fill Wells) " = $X(C/Y)[K_F B/((K_S A)+(K_F B))]$

" Q (Sand Wells) " = $X(D/Y)[K_S A/((K_S A)+(K_F B))]$

Definitions:

CF/YR = cubic feet per year
L/YR = liters per year
GPM = gallons per minute
CFS = cubic feet per second
" X " = Total Discharge for each CMS Discharge Sub-Area
" B " = Average saturated thickness of fill
" C " = Length of fill shoreline segment
" A " = Average saturated thickness of sand
" D " = Length of sand shoreline segment
" Y " = total length of CMS Discharge Sub-Area Shoreline
" K_F " = Site-wide Fill Unit Hydraulic Conductivity (6.693E-4 ft/sec)
" K_S " = Site-wide Sand Unit Hydraulic Conductivity (6.63E-5 ft/sec)

TABLE 4-41

CMS DISCHARGE RATE CALCULATIONS BY DSA

Discharge Sub-Area	Unit	Well I.D.	Discharge Rate " Q "				
			CF/YR - No Pumping [1]	CF/YR - With Pumping [2]	L/YR [3]	GPM [4]	CFS [5]
2A	Slag/Fill	MW-2D4	799,635	799,635	22,643,138	11	0.025
		MW-2D3	375,095	375,095	10,621,514	5	0.012
		MW-2D2	496,149	496,149	14,049,367	7	0.016
		MWS-26A	473,984	473,984	13,421,732	7	0.015
		MWS-09	392,145	392,145	11,104,311	6	0.012
	Sand/Dredge Spoil	MW-2D2B	150,915	150,915	4,273,437	2	0.005
2B	Slag/Fill	MWS-01	438,835	438,835	12,426,414	6	0.014
		MWS-02	390,329	390,329	11,052,884	6	0.012
		MWS-19A	220,273	144,496	4,091,657	2	0.005
		MWS-18A	188,887	113,109	3,202,902	2	0.004
		MWS-20A	171,768	171,768	4,863,915	2	0.005
		MWS-03	196,306	196,306	5,558,760	3	0.006
	Sand/Dredge Spoil	MWS-01B	23,487	23,487	665,074	0.334	0.001
	Sand	MWS-19B	18,776	15,694	444,396	0.223	0.000
		MWS-18C	7,241	4,159	117,774	0.059	0.0001
		MWS-20B	15,828	15,828	448,202	0.225	0.000
3A	Slag/Fill	MWN-01	834,040	834,040	23,617,381	12	0.026
		MWN-11	919,011	919,011	26,023,504	13	0.029
		MWN-94A	437,232	437,232	12,381,021	6	0.014
		MWN-24A	168,293	168,293	4,765,525	2	0.005
	Sand/Dredge Spoil	MWN-01B	28,572	28,572	809,063	0.4	0.001
		MWN-23B	47,698	47,698	1,350,659	1	0.002
		MWN-94B	35,783	35,783	1,013,271	0.5	0.001
4A	Slag/Fill	MWN-06A	1,945,383	1,898,376	53,756,028	27	0.060
		MWN-05A	3,640,818	3,552,843	100,605,321	51	0.112
		MWN-04	3,505,304	3,420,603	96,860,706	49	0.108
		MWN-03	4,044,349	3,946,624	111,755,952	56	0.125
		MWN-02	6,607,076	6,447,426	182,570,781	92	0.204
	Sand/Dredge Spoil	MWN-05B	443,895	433,169	12,265,968	6	0.014
		MWN-03B	348,163	339,750	9,620,663	5	0.011
		MWN-02B	401,125	391,432	11,084,130	6	0.012
4B	Slag/Fill	MWN-43A	1,570,235	1,570,235	44,464,097	22	0.050
		MWN-18A	1,026,350	1,026,350	29,062,997	15	0.032
	Sand	(see Note 6)	187,770	187,770	5,317,069	3	0.006

TABLE 4-41

CMS DISCHARGE RATE CALCULATIONS BY DSA

Discharge Sub-Area	Unit	Well I.D.	Discharge Rate "Q"				
			CF/YR - No Pumping [1]	CF/YR - With Pumping [2]	L/YR [3]	GPM [4]	CFS [5]
5	Slag/Fill	MWN-45A	36,194	0	0	0.000	0.000
		MWN-47A	79,693	37,535	1,062,875	0.534	0.001
		MWN-09	159,385	0	0	0.000	0.000
		MWN-26A	166,358	0	0	0.000	0.000
		MWN-67A	103,932	0	0	0.000	0.000
		MWN-66A	88,326	0	0	0.000	0.000
		MWN-49A	140,790	98,633	2,792,967	1.403	0.003
		MWN-68A	219,487	219,487	6,215,169	3.122	0.007
		MWN-07	314,122	314,122	8,894,932	4.468	0.010

Notes:

1. Represents discharge of each well without pumping. See below for discharge formula, and Tables 4-37 and 4-39 for parameter calculations.
2. Includes pumping of ATP area pumping wells in DSA 2B (ATP-PW1 through ATP-PW-4) and OU4 area recover wells in DSA 4A and 5 (RW-1 through RW-3, RW-A through RW-I, RWS-1 through RWS-14, and RWN-1 through RWN-27). See below for discharge formula.
3. Conversion factor: 1 CF/YR = 28.3168499 L/year.
4. Conversion factor: 1 L/year = 5.0227716E-7 GPM
5. Conversion factor: 1 GPM = 0.00222 cfs.
6. Derived from interpretation of data from nearby boring logs MWN-05B and MWN-50B.

Formula:

Without Pumping

" Q (Fill Wells) " = $X(C/Y)[K_F B/((K_S A)+(K_F B))]$

" Q (Sand Wells) " = $X(D/Y)[K_S A/((K_S A)+(K_F B))]$

With Pumping

" Q (Fill Wells) " = $X(C/Y)[K_F B/((K_S A)+(K_F B))]$ - nP[KFB/((KSA)+(KFB))]

" Q (Sand Wells) " = $X(D/Y)[K_S A/((K_S A)+(K_F B))]$ -nP[KSA/((KSA)+(KFB))]

Definitions:

CF/YR = cubic feet per year
L/YR = liters per year
GPM = gallons per minute
CFS = cubic feet per second
" X " = Total Discharge for each CMS Discharge Sub-Area
" B " = Average saturated thickness of fill
" C " = Length of fill shoreline segment
" A " = Average saturated thickness of sand
" D " = Length of sand shoreline segment
" Y " = total length of CMS Discharge Sub-Area Shoreline
" K_F " = Site-wide Fill Unit Hydraulic Conductivity (6.693E-4 ft/sec)
" K_S " = Site-wide Sand Unit Hydraulic Conductivity (6.63E-5 ft/sec)
" n " = Number of pumping wells in segment
" P " = Pumping rate of individual pumping wells

TABLE 4-42

PAST (RFI) COC MASS LOADINGS FROM CMS AREA GROUNDWATER TO ADJACENT WATER BODIES

Discharge Sub-Area	Unit	Well I.D.	Compounds of Concern, Loading Calculations [1,2]																	
			1,1-Dichloroethane	1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dichloroethane	1,2-Dichlorobenzene	1,3,5-Trimethylbenzene	Acetone	Benzene	Chlorobenzene	Ethylbenzene	Isopropylbenzene	Styrene	Toluene	Trichloroethene	Vinyl Chloride	Xylenes, Total	2,6-Dinitrotoluene	Acenaphthene
			Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)
2A	Slag/Fill	MW-2D4	0.00020	ND	na	ND	ND	na	na	0.00367	ND	0.00107	na	na	0.00340	ND	ND	0.00884	ND	na
		MW-2D3	0.00008	ND	na	ND	ND	na	na	0.00096	ND	0.00029	na	na	0.00089	0.00010	ND	0.00262	ND	na
		MW-2D2	ND	ND	na	ND	ND	na	na	0.00055	ND	ND	na	na	0.00033	ND	ND	0.00093	ND	na
		MWS-26A	ND	ND	na	ND	ND	na	na	0.00023	ND	0.00043	na	na	0.00014	ND	ND	0.00298	ND	na
		MWS-09	ND	ND	na	ND	ND	na	na	ND	ND	ND	na	na	ND	ND	ND	ND	ND	na
	Sand/Dredge Spoil	MW-2D2B	ND	ND	na	ND	ND	na	na	0.00099	ND	0.00065	na	na	0.00051	ND	ND	0.02324	ND	na
2B	Slag/Fill	MWS-01	0.00020	ND	na	ND	ND	na	na	0.00501	ND	0.00157	na	na	0.00973	ND	ND	0.02619	ND	na
		MWS-02	0.00055	ND	na	ND	ND	na	na	0.00093	ND	ND	na	na	0.00008	ND	ND	0.00013	ND	na
		MWS-19A	ND	ND	na	ND	ND	na	na	0.04506	ND	ND	na	na	ND	ND	ND	0.00049	ND	na
		MWS-18A	ND	ND	na	ND	ND	na	na	4.50844	ND	ND	na	na	ND	ND	ND	ND	ND	na
		MWS-20A	ND	ND	na	ND	ND	na	na	0.00097	ND	ND	na	na	ND	ND	ND	0.00004	ND	na
		MWS-03	ND	ND	na	ND	ND	na	na	ND	ND	ND	na	na	ND	ND	ND	ND	ND	na
	Sand/Dredge Spoil	MWS-01B	0.00002	ND	na	ND	ND	na	na	0.00007	ND	ND	na	na	0.00002	ND	ND	0.00002	ND	na
	Sand	MWS-19B	ND	ND	na	ND	ND	na	na	0.09390	ND	ND	na	na	ND	ND	ND	ND	ND	na
		MWS-18C	ND	ND	na	ND	ND	na	na	0.08718	ND	ND	na	na	0.00046	ND	ND	0.00067	ND	na
		MWS-20B	ND	ND	na	ND	ND	na	na	ND	ND	ND	na	na	ND	ND	ND	0.00001	ND	na
3A	Slag/Fill	MWN-01	ND	ND	na	ND	ND	na	na	0.00312	ND	ND	na	na	0.00129	ND	ND	0.00270	ND	na
		MWN-11	0.00023	ND	na	ND	ND	na	na	0.00070	ND	ND	na	na	ND	ND	ND	ND	ND	na
		MWN-44A	ND	ND	na	ND	ND	na	na	0.02010	ND	0.00051	na	na	0.00395	ND	ND	0.00395	ND	na
		MWN-24A	ND	ND	na	ND	ND	na	na	ND	ND	ND	na	na	ND	ND	ND	ND	ND	na
	Sand/Dredge Spoil	MWN-01B	ND	ND	na	ND	ND	na	na	0.00029	ND	ND	na	na	0.00011	ND	ND	0.00012	ND	na
		MWN-23B	ND	ND	na	ND	ND	na	na	0.00012	ND	ND	na	na	0.00001	ND	ND	ND	ND	na
	Till	MWN-24B	ND	ND	na	ND	ND	na	na	ND	ND	ND	na	na	ND	ND	ND	ND	ND	na
4A	Slag/Fill	MWN-06A	ND	ND	na	ND	ND	na	na	ND	ND	ND	na	na	0.00083	ND	ND	0.00206	ND	na
		MWN-05A	ND	ND	na	ND	ND	na	na	0.00323	0.00137	ND	na	na	0.00180	ND	ND	0.00360	ND	na
		MWN-04	ND	ND	na	ND	ND	na	na	ND	ND	ND	na	na	ND	ND	ND	ND	ND	na
		MWN-03	ND	ND	na	ND	ND	na	na	0.00966	ND	ND	na	na	0.00352	ND	ND	0.01104	ND	na
		MWN-02	ND	ND	na	ND	ND	na	na	ND	ND	ND	na	na	0.00270	ND	ND	ND	ND	na
	Sand/Dredge Spoil	MWN-05B	ND	ND	na	ND	ND	na	na	0.00509	0.00366	0.00060	na	na	0.00255	ND	ND	0.00318	ND	na
		MWN-03B	ND	ND	na	ND	ND	na	na	ND	ND	ND	na	na	ND	ND	ND	ND	ND	na
		MWN-02B	ND	ND	na	ND	ND	na	na	0.00281	ND	ND	na	na	0.00040	ND	ND	0.00047	ND	na
4B	Slag/Fill	MWN-43A	ND	ND	na	ND	ND	na	na	0.00382	ND	ND	na	na	0.00079	ND	ND	0.00109	ND	na
		MWN-18A	ND	ND	na	ND	ND	na	na	0.00141	ND	ND	na	na	0.00035	ND	ND	0.00062	ND	na
	Sand	(see Note 3)	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
5	Slag/Fill	MWN-45A	ND	ND	na	ND	ND	na	na	0.00004	ND	ND	na	na	ND	ND	ND	ND	ND	na
		MWN-47A	ND	ND	na	ND	ND	na	na	0.00050	ND	ND	na	na	ND	ND	ND	ND	ND	na
		MWN-09	ND	ND	na	ND	ND	na	na	0.17177	ND	ND	na	na	ND	ND	ND	ND	ND	na
		MWN-26A	ND	ND	na	ND	ND	na	na	0.04703	ND	0.00073	na	na	0.00029	ND	ND	0.00193	ND	na
		MWN-34A [4]	ND	ND	na	ND	ND	na	na	0.00005	ND	ND	na	na	ND	ND	ND	ND	ND	na
		MWN-08 [4]	ND	ND	na	ND	ND	na	na	0.00027	ND	0.00129	na	na	ND	0.00006	ND	0.01094	ND	na
		MWN-49A	ND	ND	na	ND	ND	na	na	0.00007	ND	ND	na	na	ND	ND	ND	ND	ND	na
		MWN-52A [4]	ND	ND	na	ND	ND	na	na	ND	ND	ND	na	na	ND	ND	ND	ND	ND	na
		MWN-07	ND	ND	na	ND	ND	na	na	0.00019	ND	ND	na	na	0.00004	ND	ND	ND	ND	na

Notes:
1. Loading = Discharge Rate x Concentration. See Table 4-40 for discharge calculations and Tables 4-31 through 4-36 for concentrations.
2. Compounds of Concern (COC) include any parameter detected above its respective GWQS/GV in at least one monitoring well in the RFI or 2019 CMS sampling.
3. Discharge Sub-Area 4B wells were not advanced beyond the fill layer; as a result the depth and thickness of the underlying sand layer was derived from interpretation from nearby wells (i.e., MWN-05B and MWN-50B). Even though it is assumed that a sand unit exists, there are no sand wells installed within this CMS Discharge Sub-Area; therefore, only the wells in the screened fill unit could be utilized for loading calculations.
4. Monitoring well was not sampled during the CMS, either because it was not selected (MWN-08A and MWN-34A) or could not be located (MWN-52A), and was subsequently replaced by nearby wells MWN-66A, MWN-67A, and MWN-68A (respectively).

Formula/Conversion Factors:
Loading (g/yr) = Discharge Rate (L/YR) x Concentration (ug/L) x 1.0E-6
Loading (lb/yr) = Discharge Rate (L/YR) x Concentration (ug/L) x 1.0E-6 x 2.205E-3

Definitions:
lbs/day = pounds per day
na = not analyzed
ND = compound was not detected at the method detection limit
R = Sample result was rejected by third party validator.

Color Code:
= Parameter designated a Primary Compounds of Concern, bars show relative contributions of each well.

TABLE 4-42

PAST (RFI) COC MASS LOADINGS FROM CMS AREA GROUNDWATER TO ADJACENT WATER BODIES

Discharge Sub-Area	Unit	Well I.D.	Benzo(a) Anthracene	Benzo(a) Pyrene	Benzo(b) Fluoranthene	Benzo(k) Fluoranthene	Biphenyl	Bis(2-ethylhexyl)phthalate	Chrysene	Fluorene	Indeno(1,2,3-cd) Pyrene	Naphthalene	Phenanthrene	Pyridine	Total Phenolic Compounds	Arsenic	Barium	Cadmium	Chromium	Lead	Selenium	Cyanide
			Compounds of Concern, Loading Calculations [1,2]																			
			Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)
2A	Slag/Fill	MW-2D4	ND	ND	na	na	na	ND	ND	0.00092	na	0.05712	0.00116	ND	0.00593	0.00057	0.00604	ND	0.00045	0.00023	0.00234	0.01061
		MW-2D3	ND	ND	na	na	na	ND	ND	0.00063	na	0.01276	0.00055	ND	0.00155	0.00027	0.00366	ND	0.00013	0.00011	0.00151	0.00498
		MW-2D2	ND	ND	na	na	na	ND	ND	ND	na	0.00135	ND	ND	ND	0.00036	0.00381	0.00003	0.00006	ND	0.00044	0.00506
		MWS-26A	ND	ND	na	na	na	ND	ND	0.00023	na	0.00347	0.00034	ND	ND	0.00029	0.00318	ND	0.00271	0.00073	0.00065	0.00089
		MWS-09	ND	ND	na	na	na	ND	ND	ND	na	ND	ND	ND	ND	ND	0.00181	ND	0.00269	ND	0.00038	ND
	Sand/Dredge Spoil	MW-2D2B	ND	ND	na	na	na	ND	ND	ND	na	0.00964	0.00043	ND	0.00499	0.00085	0.00578	0.00001	0.00258	0.00088	ND	0.00283
2B	Slag/Fill	MWS-01	ND	ND	na	na	na	ND	ND	0.00426	na	0.07482	0.00599	ND	ND	0.00044	0.00437	ND	0.00017	ND	0.00060	0.00898
		MWS-02	ND	ND	na	na	na	0.00025	ND	0.00057	na	0.00166	0.00093	ND	na	0.00015	0.00250	ND	0.00047	ND	0.00053	0.07986
		MWS-19A	ND	ND	na	na	na	0.00017	ND	ND	na	ND	ND	0.00021	0.00109	0.00022	0.00133	0.00005	0.00017	0.00009	0.00011	0.01878
		MWS-18A	ND	ND	na	na	na	ND	ND	ND	na	ND	ND	0.00483	0.00522	0.00025	0.00131	ND	0.00171	0.00024	ND	0.01707
		MWS-20A	ND	ND	na	na	na	ND	ND	ND	na	ND	ND	ND	ND	ND	0.00079	ND	0.00022	ND	0.00015	0.00351
		MWS-03	ND	ND	na	na	na	ND	ND	ND	na	0.00009	ND	ND	ND	0.00012	0.00257	ND	0.00011	ND	0.00014	0.00054
	Sand/Dredge Spoil	MWS-01B	0.000005	ND	na	na	na	ND	ND	0.00005	na	0.00274	0.00006	ND	0.00101	0.00007	0.00705	0.00001	0.00015	0.00121	ND	0.00044
	Sand	MWS-19B	ND	ND	na	na	na	ND	ND	ND	na	ND	ND	0.01113	0.00877	0.00008	0.00019	ND	0.00138	0.00019	ND	0.00285
		MWS-18C	ND	ND	na	na	na	ND	ND	ND	na	ND	ND	0.02414	0.00048	0.00002	0.00004	2.55E-06	0.00004	0.000013	ND	0.00322
		MWS-20B	ND	ND	na	na	na	ND	ND	ND	na	ND	ND	ND	ND	0.00001	0.00016	ND	0.00011	0.00003	ND	0.00013
3A	Slag/Fill	MWN-01	ND	ND	na	na	na	ND	ND	0.01406	na	0.08948	0.01989	ND	0.01364	0.00058	0.00705	ND	0.00092	ND	0.00094	0.01136
		MWN-11	ND	ND	na	na	na	ND	ND	ND	na	0.00067	0.00019	ND	0.00795	0.00067	0.01545	ND	0.00017	ND	0.00163	0.01565
		MWN-44A	0.00633	0.00484	na	na	na	ND	0.00558	0.03276	na	0.12658	0.05659	0.00745	0.00097	0.00272	0.00655	ND	0.00834	0.00331	0.00019	0.01713
		MWN-24A	ND	ND	na	na	na	ND	ND	ND	na	ND	ND	ND	0.00014	0.00210	0.00135	ND	0.00053	ND	ND	0.00054
	Sand/Dredge Spoil	MWN-01B	ND	ND	na	na	na	ND	ND	0.00034	na	0.00642	0.00051	ND	ND	0.00006	0.00031	ND	0.00002	0.00007	0.00003	0.00588
		MWN-23B	ND	ND	na	na	na	ND	ND	0.00001	na	0.00008	0.00002	ND	0.00090	0.00011	0.00073	ND	0.00002	ND	0.00007	0.00082
	Till	MWN-24B	ND	ND	na	na	na	ND	ND	ND	na	ND	ND	ND	ND	0.00002	0.00133	ND	0.00017	0.00002	ND	R
4A	Slag/Fill	MWN-06A	ND	ND	na	na	na	ND	ND	0.00212	na	0.00995	0.00498	ND	0.00474	ND	0.08096	ND	0.00070	ND	0.00139	ND
		MWN-05A	ND	ND	na	na	na	0.00211	ND	0.00441	na	0.01490	0.00683	ND	0.01012	0.00155	0.06334	ND	0.00174	ND	0.00342	ND
		MWN-04	ND	ND	na	na	na	0.00365	ND	0.00096	na	0.00329	0.00114	ND	ND	0.00251	0.01674	ND	0.01022	ND	0.00185	ND
		MWN-03	ND	ND	na	na	na	ND	ND	0.00552	na	0.01518	0.00759	0.00545	0.01552	ND	0.06891	ND	0.00076	ND	0.00724	ND
		MWN-02	ND	ND	na	na	na	ND	ND	0.01127	na	0.04057	0.01578	ND	0.01781	0.00316	0.12058	0.00035	0.02288	0.00282	0.01071	0.02254
	Sand/Dredge Spoil	MWN-05B	ND	ND	na	na	na	ND	ND	ND	na	0.11940	ND	ND	0.04697	ND	2.65873	0.00384	0.01648	0.00201	ND	ND
		MWN-03B	ND	ND	na	na	na	0.00025	ND	ND	na	ND	0.00007	ND	ND	0.00529	0.02398	ND	0.00179	0.00034	ND	ND
		MWN-02B	ND	ND	na	na	na	ND	ND	0.00058	na	0.01439	0.00115	ND	0.00879	0.00288	0.00437	ND	0.00022	ND	0.00042	0.00446
4B	Slag/Fill	MWN-43A	ND	ND	na	na	na	ND	ND	ND	na	0.00662	0.00534	ND	na	ND	0.13255	ND	0.08192	0.00262	0.00181	0.00840
		MWN-18A	ND	ND	na	na	na	ND	ND	0.00130	na	0.01164	0.00233	ND	na	ND	0.10760	ND	0.00115	0.00048	ND	ND
	Sand	(see Note 3)	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
5	Slag/Fill	MWN-45A	ND	ND	na	na	na	ND	ND	ND	na	ND	ND	ND	ND	ND	0.00074	ND	0.00008	ND	0.00001	0.00180
		MWN-47A	ND	ND	na	na	na	ND	ND	ND	na	ND	ND	ND	ND	ND	0.00049	ND	0.00006	ND	0.00004	ND
		MWN-09	ND	ND	na	na	na	ND	ND	0.00027	na	0.00049	ND	0.00011	0.00409	0.00009	0.00409	ND	0.00007	ND	ND	3.82E-06
		MWN-26A	ND	ND	na	na	na	ND	ND	0.000086	na	0.00392	0.00003	ND	0.00113	0.00026	0.00081	ND	0.00002	0.00006	0.00005	0.00575
		MWN-34A [4]	ND	ND	na	na	na	0.00009	ND	ND	na	ND	ND	ND	ND	ND	0.00152	ND	0.00719	0.00007	0.00015	2.68E-06
		MWN-08 [4]	ND	ND	na	na	na	0.00008	ND	ND	na	0.00137	0.00004	ND	0.00009	0.00009	0.00289	ND	0.00005	ND	ND	5.67E-07
		MWN-49A	ND	ND	na	na	na	ND	ND	ND	na	ND	ND	ND	ND	ND	0.00385	ND	0.00011	ND	ND	0.00042
		MWN-52A [4]	ND	ND	na	na	na	ND	ND	ND	na	ND	ND	ND	ND	0.00018	0.00530	ND	0.00026	ND	ND	0.00156
		MWN-07	ND	ND	na	na	na	0.00016	ND	0.00012	na	0.00951	0.00013	0.00027	na	ND	0.01646	ND	0.00079	ND	0.00020	0.02109

Notes:

1. Loading = Discharge Rate x Concentration. See Table 4-40 for discharge calculations and Tables 4-31 through 4-36 for concentrations.
2. Compounds of Concern (COC) include any parameter detected above its respective GWQS/GV in at least one monitoring well in the RFI or 2019 CMS sampling.
3. Discharge Sub-Area 4B wells were not advanced beyond the fill layer; as a result the depth and thickness of the underlying sand layer was derived from interpretation from nearby wells (i.e., MWN-05B and MWN-50B). Even though it is assumed that a sand unit exists, there are no sand wells installed within this CMS Discharge Sub-Area; therefore, only the wells in the screened fill unit could be utilized for loading calculations.
4. Monitoring well was not sampled during the CMS, either because it was not selected (MWN-08A and MWN-34A) or could not be located (MWN-52A), and was subsequently replaced by nearby wells MWN-66A, MWN-67A, and MWN-68A (respectively).

Formula/Conversion Factors:

Loading (g/yr) = Discharge Rate (L/YR) x Concentration (ug/L) x 1.0E-6
Loading (lb/yr) = Discharge Rate (L/YR) x Concentration (ug/L) x 1.0E-6 x 2.205E-3

Definitions:

lbs/day = pounds per day
na = not analyzed
ND = compound was not detected at the method detection limit
R = Sample result was rejected by third party validator.

Color Code:

= Parameter designated a Primary Compounds of Concern, bars show relative contributions of each well.

TABLE 4-43

CURRENT (CMS) COC MASS LOADINGS FROM CMS AREA GROUNDWATER TO ADJACENT WATER BODIES

Discharge Sub-Area	Unit	Well I.D.	Sample Event Year (Most Recent Data Presented in Table)	Compounds of Concern (COC), Loading Calculations [1,2]																
				1,1-Dichloroethane Loading (lb/day)	1,2,4-Trichlorobenzene Loading (lb/day)	1,2,4-Trimethylbenzene Loading (lb/day)	1,2-Dichloroethane Loading (lb/day)	1,2-Dichlorobenzene Loading (lb/day)	1,3,5-Trimethylbenzene Loading (lb/day)	Acetone Loading (lb/day)	Benzene Loading (lb/day)	Chlorobenzene Loading (lb/day)	Ethylbenzene Loading (lb/day)	Isopropylbenzene Loading (lb/day)	Styrene Loading (lb/day)	Toluene Loading (lb/day)	Trichloroethene Loading (lb/day)	Vinyl Chloride Loading (lb/day)	Xylenes, Total Loading (lb/day)	Acenaphthene Loading (lb/day)
2A	Slag/Fill	MW-2D4	2009, 2010, 2011, 2012 2015, 2016, 2018 [5]	ND	ND	ND	ND	ND	ND	na	ND	ND	ND	ND	na	ND	0.00011	ND	ND	ND
		MW-2D3	2009, 2010, 2011, 2012 2015, 2016, 2018 [5]	ND	ND	0.00019	ND	ND	0.00010	na	0.00022	ND	0.00010	ND	na	0.00017	0.00004	ND	0.00071	0.00014
		MW-2D2	2009, 2010, 2011, 2012 2015, 2016, 2018 [5]	ND	ND	ND	ND	ND	ND	na	ND	ND	ND	ND	na	ND	0.00005	ND	ND	ND
		MWS-26A	2012, 2019 [6]	ND	ND	ND	ND	ND	ND	ND	0.00003	ND	ND	ND	ND	ND	0.00005	ND	0.00011	ND
		MWS-09	2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Sand/Dredge Spoil	MW-2D2B	2012, 2019 [6]	ND	ND	0.00075	ND	ND	0.00023	0.00031	0.00059	ND	0.00052	ND	ND	0.00028	ND	ND	0.01549	0.00011
2B	Slag/Fill	MWS-01	2012, 2019 [6]	ND	ND	ND	ND	ND	ND	ND	0.00255	ND	0.00090	ND	0.00069	0.00270	ND	ND	0.01141	0.00031
		MWS-02	2015, 2017, 2018 [7]	ND	ND	0.00007	0.00001	ND	ND	0.00052	0.00007	ND	ND	ND	ND	ND	ND	ND	ND	0.00001
		MWS-19A	2015, 2017, 2018 [7]	ND	ND	ND	ND	ND	ND	ND	0.00032	ND	ND	ND	ND	ND	ND	0.00001	ND	9.89E-07
		MWS-18A	2015, 2017, 2018 [7]	ND	ND	ND	ND	ND	ND	ND	0.03676	ND	ND	ND	ND	ND	ND	ND	ND	1.16E-06
		MWS-20A	2015, 2017, 2018 [7]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		MWS-03	2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Sand/Dredge Spoil	MWS-01B	2012, 2019 [8]	ND	ND	0.00002	ND	ND	0.00001	0.00003	0.00004	ND	ND	ND	ND	0.00001	ND	ND	ND	0.00002
	Sand	MWS-19B	2015, 2017, 2018 [7]	ND	ND	ND	ND	ND	ND	ND	0.00140	ND	ND	ND	ND	ND	ND	ND	ND	1.34E-07
		MWS-18C	2015, 2017, 2018 [7]	ND	ND	ND	ND	ND	ND	ND	0.00003	ND	ND	ND	ND	ND	ND	ND	ND	ND
		MWS-20B	2015, 2017, 2018 [7]	ND	ND	ND	3.79E-06	ND	ND	4.33E-06	0.000001	ND	ND	ND	ND	ND	ND	ND	ND	ND
3A	Slag/Fill	MWN-01	2012, 2019 [9]	ND	ND	0.00091	ND	ND	0.00060	ND	0.00342	ND	ND	ND	ND	0.00073	ND	ND	0.00255	0.00157
		MWN-11	2010, 2012 [10]	ND	na	na	ND	ND	na	ND	0.00011	ND	ND	ND	ND	ND	ND	ND	ND	ND
		MWN-94A	2019	ND	ND	0.00012	ND	ND	ND	ND	0.00299	ND	ND	ND	ND	ND	ND	ND	0.00007	0.00012
		MWN-24A	2012, 2019 [6]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Sand/Dredge Spoil	MWN-01B	2012, 2019 [9]	ND	ND	0.00003	ND	ND	ND	0.00003	0.00035	ND	3.62E-06	0.00001	ND	0.00010	ND	ND	0.00010	0.00003
		MWN-23B	2012, 2019 [6]	ND	ND	0.00001	ND	ND	0.00001	0.00001	0.00005	ND	ND	ND	ND	0.00001	ND	ND	0.00001	ND
	Sand	MWN-94B	2013	ND	ND	ND	ND	ND	ND	0.00001	0.00000	ND	ND	ND	ND	ND	ND	ND	ND	4.90E-07
4A	Slag/Fill	MWN-06A	2013	na	na	ND	na	na	ND	na	0.00039	na	ND	ND	na	ND	na	na	ND	0.00039
		MWN-05A	2012, 2019 [8]	ND	ND	0.00021	ND	ND	0.00054	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		MWN-04	2011, 2012, 2013 [11]	na	na	ND	na	na	ND	na	ND	na	ND	ND	na	ND	na	na	ND	ND
		MWN-03	2011, 2012, 2013 [11]	na	na	0.00032	na	na	0.00108	na	0.00392	na	0.00017	ND	na	0.00115	na	na	0.00290	0.00101
		MWN-02	2011, 2012, 2013 [11]	na	na	0.00011	na	na	0.00032	na	0.00057	na	0.00012	ND	na	0.00021	na	na	0.00094	ND
	Sand/Dredge Spoil	MWN-05B	2012, 2019 [8]	ND	0.00119	ND	ND	0.00193	ND	0.00207	0.00400	0.00363	ND	ND	ND	0.00289	ND	ND	0.00267	0.00156
		MWN-03B	2011, 2012, 2013 [12]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00006
		MWN-02B	2011, 2012, 2013 [11]	na	na	ND	na	na	ND	na	0.00804	na	ND	ND	na	0.00114	na	na	0.00117	0.00053
4B	Slag/Fill	MWN-43A	2012, 2019 [8]	ND	ND	0.00009	ND	ND	0.00026	0.00089	0.00012	ND	ND	ND	ND	ND	ND	ND	ND	0.00024
		MWN-18A	2012, 2019 [8]	ND	ND	0.00015	ND	ND	0.00016	0.00123	0.00056	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Sand	(see Note 3)	--	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
5	Slag/Fill	MWN-45A	2012, 2019 [8]	ND	ND	ND	ND	ND	ND	ND	0	ND	ND	ND	ND	0	ND	ND	ND	0
		MWN-47A	2012, 2019 [6]	ND	ND	ND	ND	ND	ND	0.00002	0.00018	ND	ND	ND	ND	ND	ND	ND	0.00002	ND
		MWN-09	2013, 2019 [13]	ND	ND	ND	ND	ND	ND	0	0	ND	ND	ND	ND	ND	ND	ND	ND	ND
		MWN-26A	2010, 2012 [14]	ND	na	na	ND	ND	na	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
		MWN-67A/MWN-34A [4]	2019	ND	ND	na	ND	ND	na	0	0	ND	0	ND	0	0	ND	ND	0	0
		MWN-66AR/MWN-08 [4]	2019	ND	ND	na	ND	ND	na	0	0	ND	0	0	0	0	ND	ND	0	0
		MWN-49A	2012, 2019 [6]	ND	ND	ND	ND	ND	ND	3.03707E-05	8.605E-06	ND	ND	ND	ND	ND	ND	ND	ND	ND
		MWN-68A [4]	2019	ND	ND	na	ND	ND	na	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		MWN-07	2012, 2019 [6]	ND	ND	ND	ND	ND	ND	0.00019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

1. Loading = Discharge Rate x Concentration. See Table 4-41 for discharge calculations and Tables 4-31 through 4-36 for concentrations.
2. Compounds of Concern (COC) include any parameter detected above its respective GWQS/GV in at least one monitoring well in the RFI or 2019 CMS sampling.
3. Discharge Sub-Area 4B wells were not advanced beyond the fill layer; as a result the depth and thickness of the underlying sand layer was derived from interpretation from nearby wells (i.e., MWN-05B and MWN-50B). Even though it is assumed that a sand unit exists, there are no sand wells installed within this CMS Discharge Sub-Area; therefore, only the wells in the screened fill unit could be utilized for loading calculations.
4. Monitoring well was not sampled during the CMS, either because it was not selected (MWN-08A and MWN-34A) or could not be located (MWN-52A), and was subsequently replaced by nearby wells MWN-66A, MWN-67A, and MWN-68A (respectively).
5. STARS VOCs and TCL SVOCs without phenols sampled in 2018. Added data from 2009 (1,2,4-TCB, 1,2-DCB, 1,3-DCB, 1,4-DCB), 2010 (1,1-DCA, 1,2-DCA, methylene chloride, PCE, TCE, bromomethane, chlorobenzene, chloromethane, vinyl chloride), 2011 (phenols, excluding pentachlorophenol), 2012 (metals) , 2015 (caprolactam), and 2016 (pentachlorophenol)
6. TCL VOCs and TCL SVOCs with phenols sampled in 2019. Added data from 2012 (metals, 1,2,3-TMB, 1,3,5-TMB, and n-Butylbenzene).
7. TCL VOCs and SVOCs with phenols (excluding 2-Methylphenol), and metals sampled in 2018. Added data from 2015 (2-Methylphenol) and 2017 (1,2,4-TMB, 1,3,5-TMB, and n-Butylbenzene).
8. TCL VOCs and TCL SVOCs with phenols, and barium or cyanide sampled in 2019. Added data from 2012 (remaining metals, 1,2,3-TMB, 1,3,5-TMB, n-Butylbenzene).
9. TCL VOCs and TCL SVOCs with phenols sampled in 2019. Added data from 2012 (metals) and 2011 (1,2,3-TMB, 1,3,5-TMB, and n-Butylbenzene).
10. Metals sampled in 2012. Added data from 2010 (TCL VOCs and TCL SVOCs).
11. Metals sampled in 2012. Added data from 2011 (STARS VOCs, TCL SVOCs, and arsenic for MWN-02B) and 2013 (phenols).
12. TCL VOCs, TCL SVOCs without phenols, and selenium sampled in 2012. Added data from 2011 (remaining metals) and 2013 (phenols).
13. TCL VOCs and TCL SVOCs with phenols sampled in 2019. Added data from 2013 (1,2,3-TMB, 1,3,5-TMB, and n-Butylbenzene).
14. TCL SVOCs and metals sampled in 2012. Added data from 2010 (TCL VOCs).

Formula/Conversion Factors:

Loading (g/yr) = Discharge Rate (L/YR) x Concentration (ug/L) x 1.0E-6
Loading (lb/yr) = Discharge Rate (L/YR) x Concentration (ug/L) x 1.0E-6 x 2.205E-3

Definitions:

lbs/day = pounds per day
na = not analyzed
ND = compound was not detected at the method detection limit
R = Sample result was rejected by third party validator.

Color Code:

= Parameter designated a Primary Compound of Concern, bars show relative contributions of each well.

TURNKEY ENVIRONMENTAL RESTORATION, LLC | BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 4-43

CURRENT (CMS) COC MASS LOADINGS FROM CMS AREA GROUNDWATER TO ADJACENT WATER BODIES

Discharge Sub-Area	Unit	Well I.D.	Sample Event Year (Most Recent Data Presented in Table)	Benzo(a) Anthracene Loading (lb/day)	Benzo(a) Pyrene Loading (lb/day)	Benzo(b) Fluoranthene Loading (lb/day)	Benzo(k) Fluoranthene Loading (lb/day)	Biphenyl Loading (lb/day)	Bis(2-ethylhexyl)phthalate Loading (lb/day)	Chrysene Loading (lb/day)	Fluorene Loading (lb/day)	Indeno(1,2,3-cd) Pyrene Loading (lb/day)	Naphthalene Loading (lb/day)	Phenanthrene Loading (lb/day)	Pyridine Loading (lb/day)	Total Phenolic Compounds Loading (lb/day)	Arsenic Loading (lb/day)	Barium Loading (lb/day)	Cadmium Loading (lb/day)	Chromium Loading (lb/day)	Lead Loading (lb/day)	Selenium Loading (lb/day)	Cyanide Loading (lb/day)
				Compounds of Concern (COC), Loading Calculations [1,2]																			
2A	Slag/Fill	MW-2D4	2009, 2010, 2011, 2012 2015, 2016, 2018 [5]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00055	0.00356	na	0.00109	ND	ND	na
		MW-2D3	2009, 2010, 2011, 2012 2015, 2016, 2018 [5]	ND	ND	ND	ND	0.00013	ND	ND	0.00083	ND	0.00366	0.00109	ND	0.00020	0.00038	0.00289	na	0.00013	0.00032	ND	na
		MW-2D2	2009, 2010, 2011, 2012 2015, 2016, 2018 [5]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00187	na	0.00042	ND	ND	na
		MWS-26A	2012, 2019 [6]	4.05E-06	ND	1.62E-06	ND	ND	ND	3.24E-06	ND	ND	ND	ND	na	ND	ND	0.00138	na	0.00081	ND	ND	na
		MWS-09	2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00001	ND	na	na	ND	0.00134	na	0.00134	ND	0.00040	na
	Sand/Dredge Spoil	MW-2D2B	2012, 2019 [6]	0.00001	7.74E-06	0.00001	4.65E-06	0.00005	ND	8.00E-06	0.00028	2.58E-06	0.00697	0.00026	na	0.00116	0.00075	0.00150	na	ND	ND	ND	na
2B	Slag/Fill	MWS-01	2012, 2019 [6]	0.00002	0.00001	0.00001	3.00E-06	0.00035	ND	0.00001	0.00158	1.50E-06	0.08528	0.00203	na	0.00061	ND	0.00270	na	ND	ND	na	na
		MWS-02	2015, 2017, 2018 [7]	ND	ND	ND	ND	ND	0.00026	ND	0.00004	ND	0.00006	0.00003	na	ND	0.00009	0.00213	na	0.00134	na	na	0.43001
		MWS-19A	2015, 2017, 2018 [7]	3.95E-06	3.46E-06	4.45E-06	1.98E-06	ND	0.00009	3.95E-06	1.98E-06	2.47E-06	1.24E-06	4.45E-06	na	ND	0.00007	0.00049	na	0.00020	0.00027	na	0.00240
		MWS-18A	2015, 2017, 2018 [7]	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00004	5.80E-07	na	0.00007	0.00011	0.00034	na	0.00013	ND	na	0.00482
		MWS-20A	2015, 2017, 2018 [7]	ND	ND	ND	ND	ND	0.00012	ND	ND	ND	ND	ND	na	ND	0.00009	0.00060	na	0.00045	ND	na	0.00200
		MWS-03	2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	na	na	0.00013	0.00238	na	ND	ND	na	na
	Sand/Dredge Spoil	MWS-01B	2012, 2019 [8]	ND	ND	ND	ND	0.00001	ND	ND	0.00002	ND	0.00112	ND	na	0.00048	0.00018	0.00338	na	0.00036	0.00241	na	na
	Sand	MWS-19B	2015, 2017, 2018 [7]	ND	ND	ND	ND	ND	0.00001	ND	2.68E-07	ND	ND	ND	na	ND	0.00001	0.00005	na	3.97E-06	3.60E-06	na	0.00071
		MWS-18C	2015, 2017, 2018 [7]	ND	ND	ND	ND	ND	4.13E-06	ND	ND	ND	ND	ND	na	1.64E-06	3.18E-06	0.00001	na	4.30E-06	ND	na	0.00034
		MWS-20B	2015, 2017, 2018 [7]	5.42E-08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	na	ND	0.00001	0.00008	na	0.00001	3.33E-06	na	0.00013
3A	Slag/Fill	MWN-01	2012, 2019 [9]	0.00006	4.28E-06	0.00001	2.85E-06	0.00143	ND	0.00003	0.01027	ND	0.08567	0.01855	na	0.00215	0.00071	na	na	ND	ND	0.00157	na
		MWN-11	2010, 2012 [10]	ND	ND	ND	ND	ND	0.00057	ND	0.00009	ND	0.00042	0.00015	na	na	ND	na	na	0.00094	0.00047	0.00189	na
		MWN-94A	2019	ND	ND	ND	ND	ND	0.00013	ND	ND	ND	0.00165	ND	na	ND	0.00083	na	na	0.00051	0.00213	0.00009	na
		MWN-24A	2012, 2019 [6]	ND	ND	ND	ND	ND	0.00005	ND	ND	ND	ND	ND	na	ND	0.00012	na	na	0.00014	0.00017	ND	na
	Sand/Dredge Spoil	MWN-01B	2012, 2019 [9]	1.66E-06	3.91E-07	5.87E-07	2.44E-07	0.00003	ND	9.29E-07	0.00011	2.44E-07	0.00450	0.00016	na	0.00028	0.00009	na	na	ND	0.00003	0.00004	0.00100
		MWN-23B	2012, 2019 [6]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	na	0.00008	0.00007	na	na	0.00004	0.00002	0.00005	na
	Sand	MWN-94B	2013	8.57E-07	ND	6.73E-07	ND	ND	ND	9.18E-07	1.29E-06	ND	2.75E-06	3.80E-06	na	na	0.00004	na	na	0.00003	0.00009	0.00001	na
4A	Slag/Fill	MWN-06A	2013	0.00004	0.00003	0.00006	0.00003	ND	ND	0.00005	0.00143	ND	0.00299	0.00390	na	ND	na	na	na	0.00086	na	na	na
		MWN-05A	2012, 2019 [8]	0.00005	ND	0.00002	0.00001	ND	ND	0.00005	ND	0.00001	ND	ND	na	0.00053	ND	0.06874	na	0.00608	0.00182	ND	na
		MWN-04	2011, 2012, 2013 [11]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	na	ND	ND	0.02341	na	0.01170	na	0.00351	na
		MWN-03	2011, 2012, 2013 [11]	ND	ND	ND	ND	0.00045	ND	ND	0.00317	ND	0.00878	0.00655	na	0.00088	ND	0.06144	na	ND	na	0.00473	na
		MWN-02	2011, 2012, 2013 [11]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	na	0.01665	ND	0.10698	na	ND	na	0.00882	na
	Sand/Dredge Spoil	MWN-05B	2012, 2019 [8]	0.00002	2.22E-06	0.00001	2.22E-06	0.00041	0.00014	0.00001	0.00133	ND	0.07410	0.00148	na	0.01867	0.00119	1.16707	ND	0.00445	0.00170	ND	na
		MWN-03B	2011, 2012, 2013 [12]	ND	ND	ND	ND	ND	ND	ND	0.00004	ND	ND	0.00004	na	ND	0.00198	0.06393	na	0.00023	na	ND	na
		MWN-02B	2011, 2012, 2013 [11]	ND	ND	ND	ND	0.00010	ND	ND	0.00066	ND	0.01741	0.00121	na	0.00281	0.00328	0.00475	na	0.00060	na	0.00033	na
4B	Slag/Fill	MWN-43A	2012, 2019 [8]	0.00004	ND	0.00001	2.69E-06	ND	ND	0.00003	ND	ND	ND	ND	na	0.00180	na	0.14438	na	ND	na	na	na
		MWN-18A	2012, 2019 [8]	0.00004	0.00002	0.00005	0.00002	ND	0.00044	0.00004	ND	0.00001	ND	ND	na	0.00102	na	0.04331	na	0.00702	na	na	na
	Sand	(see Note 3)	--	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
5	Slag/Fill	MWN-45A	2012, 2019 [8]	0	ND	ND	ND	ND	0	0	ND	ND	ND	0	na	0	ND	0	na	0	na	na	0
		MWN-47A	2012, 2019 [6]	ND	ND	ND	ND	ND	0.00002	ND	ND	ND	ND	ND	na	5.20E-06	ND	0.00046	na	0.00006	na	na	na
		MWN-09	2013, 2019 [13]	ND	ND	ND	ND	ND	0	ND	ND	ND	ND	ND	na	ND	na	na	na	na	na	na	na
		MWN-26A	2010, 2012 [14]	ND	ND	ND	ND	ND	ND	ND	0	ND	ND	ND	na	na	0	0	na	ND	na	na	0
		MWN-67A/MWN-34A [4]	2019	0	0	0	0	0	0	0	0	ND	0	0	na	0	na	na	na	na	na	na	0
		MWN-66AR/MWN-08 [4]	2019	0	0	0	0	0	0	0	0	0	0	0	na	0	na	na	na	na	na	na	0
		MWN-49A	2012, 2019 [6]	3.37452E-07	ND	ND	ND	ND	4.38687E-05	ND	ND	ND	ND	ND	na	ND	ND	0.001518533	na	0.000337452	na	na	na
		MWN-68A [4]	2019	ND	ND	ND	ND	ND	0.00009	ND	ND	ND	ND	ND	na	ND	na	na	na	na	na	na	na
		MWN-07	2012, 2019 [6]	1.61E-06	ND	2.15E-06	1.61E-06	ND	ND	1.61E-06	ND	2.69E-06	ND	ND	na	ND	ND	0.00220	na	0.00215	na	na	0.00263

Notes:

1. Loading = Discharge Rate x Concentration. See Table 4-41 for discharge calculations and Tables 4-31 through 4-36 for concentrations.
2. Compounds of Concern (COC) include any parameter detected above its respective GWQS/GV in at least one monitoring well in the RFI or 2019 CMS sampling.
3. Discharge Sub-Area 4B wells were not advanced beyond the fill layer; as a result the depth and thickness of the underlying sand layer was derived from interpretation from nearby wells (i.e., MWN-05B and MWN-50B). Even though it is assumed that a sand unit exists, there are no sand wells installed within this CMS Discharge Sub-Area; therefore, only the wells in the screened fill unit could be utilized for loading calculations.
4. Monitoring well was not sampled during the CMS, either because it was not selected (MWN-08A and MWN-34A) or could not be located (MWN-52A), and was subsequently replaced by nearby wells MWN-66A, MWN-67A, and MWN-68A (respectively).
5. STARS VOCs and TCL SVOCs without phenols sampled in 2018. Added data from 2009 (1,2,4-TCB, 1,2-DCB, 1,3-DCB, 1,4-DCB), 2010 (1,1-DCA, 1,2-DCA, methylene chloride, PCE, TCE, bromomethane, chlorobenzene, chloromethane, vinyl chloride), 2011 (phenols, excluding pentachlorophenol), 2012 (metals) , 2015 (caprolactam), and 2016 (pentachlorophenol)
6. TCL VOCs and TCL SVOCs with phenols sampled in 2019. Added data from 2012 (metals, 1,2,3-TMB, 1,3,5-TMB, and n-Butylbenzene).
7. TCL VOCs and SVOCs with phenols (excluding 2-Methylphenol), and metals sampled in 2018. Added data from 2015 (2-Methylphenol) and 2017 (1,2,4-TMB, 1,3,5-TMB, and n-Butylbenzene).
8. TCL VOCs and TCL SVOCs with phenols, and barium or cyanide sampled in 2019. Added data from 2012 (remaining metals, 1,2,3-TMB, 1,3,5-TMB, n-Butylbenzene).
9. TCL VOCs and TCL SVOCs with phenols sampled in 2019. Added data from 2012 (metals) and 2011 (1,2,3-TMB, 1,3,5-TMB, and n-Butylbenzene).
10. Metals sampled in 2012. Added data from 2010 (TCL VOCs and TCL SVOCs).
11. Metals sampled in 2012. Added data from 2011 (STARS VOCs, TCL SVOCs, and arsenic for MWN-02B) and 2013 (phenols).
12. TCL VOCs, TCL SVOCs without phenols, and selenium sampled in 2012. Added data from 2011 (remaining metals) and 2013 (phenols).
13. TCL VOCs and TCL SVOCs with phenols sampled in 2019. Added data from 2013 (1,2,3-TMB, 1,3,5-TMB, and n-Butylbenzene).
14. TCL SVOCs and metals sampled in 2012. Added data from 2010 (TCL VOCs).

Formula/Conversion Factors:

Loading (g/yr) = Discharge Rate (L/YR) x Concentration (ug/L) x 1.0E-6
Loading (lb/yr) = Discharge Rate (L/YR) x Concentration (ug/L) x 1.0E-6 x 2.205E-3

Definitions:

lbs/day = pounds per day
na = not analyzed
ND = compound was not detected at the method detection limit
R = Sample result was rejected by third party validator.

Color Code:

= Parameter designated a Primary Compound of Concern, bars show relative contributions of each well.

TABLE 4-44

PAST (RFI) VS. CURRENT (CMS) SURFACE WATER LOADING COMPARISON BY DSA

Compounds of Concern [1]

Discharge Sub-Area	Unit	1,1-Dichloroethane Loading (lbs/day) RFI	1,1-Dichloroethane Loading (lbs/day) CMS	1,1-Dichloroethane % Change	1,2,4-Trichlorobenzene Loading (lbs/day) RFI	1,2,4-Trichlorobenzene Loading (lbs/day) CMS	1,2,4-Trichlorobenzene % Change	1,2,4-Trimethylbenzene Loading (lbs/day) RFI	1,2,4-Trimethylbenzene Loading (lbs/day) CMS	1,2,4-Trimethylbenzene % Change	1,2-Dichloroethane Loading (lbs/day) RFI	1,2-Dichloroethane Loading (lbs/day) CMS	1,2-Dichloroethane % Change	1,2-Dichlorobenzene Loading (lbs/day) RFI	1,2-Dichlorobenzene Loading (lbs/day) CMS	1,2-Dichlorobenzene % Change
2A	Slag/Fill	0.00029	ND	↓	ND	ND	na	na	0.00019	na	ND	ND	na	ND	ND	na
2A	Sand/Dredge Spoil	ND	ND	na	ND	ND	na	na	0.00075	na	ND	ND	na	ND	ND	na
2B	Slag/Fill	0.00075	ND	↓	ND	ND	na	na	0.00007	na	ND	0.00001	↑	ND	ND	na
2B	Sand/Dredge Spoil	0.00002	ND	↓	ND	ND	na	na	0.00002	na	ND	ND	na	ND	ND	na
2B	Sand	ND	ND	na	ND	ND	na	na	ND	na	ND	0.000004	↑	ND	ND	na
3A	Slag/Fill	0.0002	ND	↓	ND	ND	na	na	0.00103	na	ND	ND	na	ND	ND	na
3A	Sand/Dredge Spoil	ND	ND	na	ND	ND	na	na	0.00004	na	ND	ND	na	ND	ND	na
3A	Till/Sand [2]	ND	ND	na	ND	ND	na	na	ND	na	ND	ND	na	ND	ND	na
4A	Slag/Fill	ND	ND	na	ND	ND	na	na	0.00064	na	ND	ND	na	ND	ND	na
4A	Sand/Dredge Spoil	ND	ND	na	ND	0.001186	↑	na	ND	na	ND	ND	na	ND	0.001927	↑
4B	Slag/Fill	ND	ND	na	ND	ND	na	na	0.00025	na	ND	ND	na	ND	ND	na
4B	Sand [3]	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
5 [4]	SlagFill	ND	ND	na	ND	ND	na	na	ND	na	ND	ND	na	ND	ND	na
TOTAL SLAG/FILL LOADINGS:		**0.00128**	**ND**	↓	**ND**	**ND**	na	**na**	**0.00217**	na	**ND**	**0.00001**	↑	**ND**	**ND**	na
TOTAL SLAG/FILL LOADINGS:		**0.00128**	**ND**	↓	**ND**	**ND**	na	**na**	**0.00217**	na	**ND**	**0.00001**	↑	**ND**	**ND**	na
TOTAL SAND/DREDGE SPOIL LOADINGS:		**0.00002**	**ND**	↓	**ND**	**0.00119**	↑	**na**	**0.00081**	na	**ND**	**ND**	na	**ND**	**0.00193**	↑
TOTAL NATIVE SAND LOADINGS:		**ND**	**ND**	na	**ND**	**ND**	na	**na**	**ND**	na	**ND**	**3.79E-06**	↑	**ND**	**ND**	na

Discharge Sub-Area	Unit	1,3,5-Trimethylbenzene Loading (lbs/day) RFI	1,3,5-Trimethylbenzene Loading (lbs/day) CMS	1,3,5-Trimethylbenzene % Change	Acetone Loading (lbs/day) RFI	Acetone Loading (lbs/day) CMS	Acetone % Change	Benzene Loading (lbs/day) RFI	Benzene Loading (lbs/day) CMS	Benzene % Change	Chlorobenzene Loading (lbs/day) RFI	Chlorobenzene Loading (lbs/day) CMS	Chlorobenzene % Change	Ethylbenzene Loading (lbs/day) RFI	Ethylbenzene Loading (lbs/day) CMS	Ethylbenzene % Change
2A	Slag/Fill	na	0.00010	na	na	ND	na	0.00540	0.00026	-95%	ND	ND	na	0.00179	0.00010	-94%
2A	Sand/Dredge Spoil	na	0.00023	na	na	0.00031	na	0.00099	0.00059	-40%	ND	ND	na	0.00065	0.00052	-21%
2B	Slag/Fill	na	ND	na	na	0.00052	na	4.56042	0.03970	-99%	ND	ND	na	0.00157	0.00090	-43%
2B	Sand/Dredge Spoil	na	0.00001	na	na	0.00003	na	0.00007	0.00004	-37%	ND	ND	na	ND	ND	na
2B	Sand	na	ND	na	na	0.000004	na	0.18108	0.00143	-99%	ND	ND	na	ND	ND	na
3A	Slag/Fill	na	0.00060	na	na	ND	na	0.02393	0.00653	-73%	ND	ND	na	0.00051	ND	↓
3A	Sand/Dredge Spoil	na	0.00001	na	na	0.00004	na	0.00040	0.00040	0%	ND	ND	na	ND	3.62E-06	↑
3A	Till/Sand [2]	na	ND	na	na	1.29E-05	na	ND	2.26E-06	↑	ND	ND	na	ND	ND	na
4A	Slag/Fill	na	0.00194	na	na	ND	na	0.01289	0.00488	-62%	0.00137	ND	↓	ND	0.00029	↑
4A	Sand/Dredge Spoil	na	ND	na	na	0.00207	na	0.00790	0.01204	52%	0.00366	0.00363	-1%	0.00060	ND	↓
4B	Slag/Fill	na	0.00041	na	na	0.00212	na	0.00523	0.00068	-87%	ND	ND	na	ND	ND	na
4B	Sand [3]	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
5 [4]	SlagFill	na	ND	na	na	0.00024	na	0.21994	0.00019	-100%	ND	ND	na	0.00202	ND	↓
TOTAL SLAG/FILL LOADINGS:		**na**	**0.00305**	na	**na**	**0.00288**	na	**4.82781**	**0.05223**	-99%	**0.00137**	**ND**	↓	**0.00589**	**0.00129**	-78%
TOTAL SLAG/FILL LOADINGS:		**na**	**0.00305**	na	**na**	**0.00264**	na	**4.60787**	**0.05204**	-99%	**0.00137**	**ND**	↓	**0.00387**	**0.00129**	-67%
TOTAL SAND/DREDGE SPOIL LOADINGS:		**na**	**0.00025**	na	**na**	**0.00245**	na	**0.00937**	**0.01308**	40%	**0.00366**	**0.00363**	-1%	**0.00126**	**0.00052**	-59%
TOTAL NATIVE SAND LOADINGS:		**na**	**ND**	na	**na**	**0.00002**	na	**0.18108**	**0.00143**	-99%	**ND**	**ND**	na	**ND**	**ND**	na

Notes:

1. See Tables 4-42 and 4-43 for loading calculations.
2. The well used in the RFI was in the till layer (MWN-24B). Well MWN-94B was used in the CMS to more accurately represent loading from the native sand layer.
3. Discharge Sub-Area 4B wells were not advanced beyond the fill layer; as a result the depth and thickness of the underlying sand layer was derived from interpretation from nearby wells (i.e., MWN-05B and MWN-50B). Even though it is assumed that a sand unit exists, there are no sand wells installed within this CMS Discharge Sub-Area; therefore, only the wells in the screened fill unit could be utilized for loading calculations.
4. Discharge Sub-Area 5 monitoring locations MWN-08A, MWN-09, MWN-34A, and MWN-52A were sampled during the RFI, but not during CMS; instead, wells MWN-66A, MWN-67A, and MWN-68A were used; therefore, direct comparisons between RFI & CMS loadings could not be performed.

Formula:

% Change = ([CMS]/[RFI])-1

Conversion Factors:

Loading (lbs/day) = Discharge Rate (L/YR) x Concentration (ug/L) x 1.0E-6 x 2.205E-3

Definitions:

lbs/day = pounds per day
na = not applicable or not analyzed for this compound
R = Sample result was rejected by third party validator.
ND = compound was not detected at the method detection limit at any wells included in the sum (where the compound was analyzed).

Color Code:

- = recent contaminant loadings improved or generally stayed the same
- = recent contaminant loadings generally degraded (by greater than 20%)
- ↓ = recent contaminant loadings improved, extent of improvement unknown as the CMS concentration was non-detect.
- ↑ = recent contaminat loadings degraded, extent of degredation unknown as the RFI concentration was non-detect.
- = parameter designated a Primary Compound of Concern.

TABLE 4-44

PAST (RFI) VS. CURRENT (CMS) SURFACE WATER LOADING COMPARISON BY DSA

Compounds of Concern [1]

Discharge Sub-Area	Unit	Isopropylbenzene			Styrene			Toluene			Trichloroethene			Vinyl Chloride		
		Loading (lbs/day) RFI	Loading (lbs/day) CMS	% Change	Loading (lbs/day) RFI	Loading (lbs/day) CMS	% Change	Loading (lbs/day) RFI	Loading (lbs/day) CMS	% Change	Loading (lbs/day) RFI	Loading (lbs/day) CMS	% Change	Loading (lbs/day) RFI	Loading (lbs/day) CMS	% Change
2A	Slag/Fill	na	ND	na	na	ND	na	0.00476	0.00017	-96%	0.00010	0.00026	152%	ND	ND	na
2A	Sand/Dredge Spoil	na	ND	na	na	ND	na	0.00051	0.00028	-44%	ND	ND	na	ND	ND	na
2B	Slag/Fill	na	ND	na	na	0.00069	na	0.00981	0.00270	-72%	ND	ND	na	ND	0.00001	↑
2B	Sand/Dredge Spoil	na	ND	na	na	ND	na	0.00002	0.00001	-40%	ND	ND	na	ND	ND	na
2B	Sand	na	ND	na	na	ND	na	0.00046	ND	↓	ND	ND	na	ND	ND	na
3A	Slag/Fill	na	ND	na	na	ND	na	0.00524	0.00073	-86%	ND	ND	na	ND	ND	na
3A	Sand/Dredge Spoil	na	0.00001	na	na	ND	na	0.00013	0.00011	-16%	ND	ND	na	ND	ND	na
3A	Till/Sand [2]	na	ND	na	na	ND	na	ND	ND	na	ND	ND	na	ND	ND	na
4A	Slag/Fill	na	ND	na	na	ND	na	0.00885	0.00136	-85%	ND	ND	na	ND	ND	na
4A	Sand/Dredge Spoil	na	ND	na	na	ND	na	0.00294	0.00403	37%	ND	ND	na	ND	ND	na
4B	Slag/Fill	na	ND	na	na	ND	na	0.00114	ND	↓	ND	ND	na	ND	ND	na
4B	Sand [3]	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
5 [4]	SlagFill	na	ND	na	na	ND	na	0.00033	ND	↓	0.00006	ND	↓	ND	ND	na
TOTAL SLAG/FILL LOADINGS:		**na**	**ND**	na	**na**	**0.00069**	na	**0.03012**	**0.00495**	-84%	**0.00016**	**0.00026**	56%	**ND**	**0.00001**	↑
TOTAL SLAG/FILL LOADINGS:		**na**	**ND**	na	**na**	**0.00069**	na	**0.02980**	**0.00495**	-83%	**0.00010**	**0.00026**	152%	**ND**	**0.00001**	↑
TOTAL SAND/DREDGE SPOIL LOADINGS:		**na**	**0.00001**	na	**na**	**ND**	na	**0.00360**	**0.00443**	23%	**ND**	**ND**	na	**ND**	**ND**	na
TOTAL NATIVE SAND LOADINGS:		**na**	**ND**	na	**na**	**ND**	na	**0.00046**	**ND**	↓	**ND**	**ND**	na	**ND**	**ND**	na

Discharge Sub-Area	Unit	Xylenes, Total			2,6-Dinitrotoluene			Acenaphthene			Benzo(a)anthracene			Benzo(a)pyrene		
		Loading (lbs/day) RFI	Loading (lbs/day) CMS	% Change	Loading (lbs/day) RFI	Loading (lbs/day) CMS	% Change	Loading (lbs/day) RFI	Loading (lbs/day) CMS	% Change	Loading (lbs/day) RFI	Loading (lbs/day) CMS	% Change	Loading (lbs/day) RFI	Loading (lbs/day) CMS	% Change
2A	Slag/Fill	0.01537	0.00081	-95%	ND	ND	na	na	0.00014	na	ND	4.05E-06	↑	ND	ND	na
2A	Sand/Dredge Spoil	0.02324	0.01549	-33%	ND	ND	na	na	0.00011	na	ND	0.00001	↑	ND	0.00001	↑
2B	Slag/Fill	0.02684	0.01141	-57%	ND	ND	na	na	0.00032	na	ND	0.00002	↑	ND	0.00001	↑
2B	Sand/Dredge Spoil	0.00002	ND	↓	ND	ND	na	na	0.00002	na	4.79E-06	ND	↓	ND	ND	na
2B	Sand	0.00068	ND	↓	ND	ND	na	na	0.00000	na	ND	5.42E-08	↑	ND	ND	na
3A	Slag/Fill	0.00665	0.00262	-61%	ND	ND	na	na	0.00169	na	0.00633	0.00006	-99%	0.00484	4.28E-06	-100%
3A	Sand/Dredge Spoil	0.00012	0.00012	-6%	ND	ND	na	na	0.00003	na	ND	1.66E-06	↑	ND	3.91E-07	↑
3A	Till/Sand [2]	ND	ND	na	ND	ND	na	na	0.00000	na	ND	8.57E-07	↑	ND	ND	na
4A	Slag/Fill	0.01670	0.00384	-77%	ND	0.01580	↑	na	0.00140	na	ND	0.00009	↑	ND	0.00003	↑
4A	Sand/Dredge Spoil	0.00365	0.00383	5%	ND	ND	na	na	0.00215	na	ND	0.00002	↑	ND	2.22E-06	↑
4B	Slag/Fill	0.00171	ND	↓	ND	ND	na	na	0.00024	na	ND	0.00008	↑	ND	0.00002	↑
4B	Sand [3]	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
5 [4]	SlagFill	0.01288	0.00002	-100%	ND	ND	na	na	ND	na	ND	1.95E-06	↑	ND	ND	na
TOTAL SLAG/FILL LOADINGS:		**0.08013**	**0.01870**	-77%	**ND**	**0.01580**	↑	**na**	**0.00379**	na	**0.00633**	**0.00026**	-96%	**0.00484**	**0.00006**	-99%
TOTAL SLAG/FILL LOADINGS:		**0.06725**	**0.01868**	-72%	**ND**	**0.01580**	↑	**na**	**0.00379**	na	**0.00633**	**0.00026**	-96%	**0.00484**	**0.00006**	-99%
TOTAL SAND/DREDGE SPOIL LOADINGS:		**0.02703**	**0.01944**	-28%	**ND**	**ND**	na	**na**	**0.00231**	na	**4.79E-06**	**0.00003**	460%	**ND**	**0.00001**	↑
TOTAL NATIVE SAND LOADINGS:		**0.00068**	**ND**	↓	**ND**	**ND**	na	**na**	**6.24E-07**	na	**ND**	**9.11E-07**	↑	**ND**	**ND**	na

Notes:
1. See Tables 4-42 and 4-43 for loading calculations.
2. The well used in the RFI was in the till layer (MWN-24B). Well MWN-94B was used in the CMS to more accurately represent loading from the native sand layer.
3. Discharge Sub-Area 4B wells were not advanced beyond the fill layer; as a result the depth and thickness of the underlying sand layer was derived from interpretation from nearby wells (i.e., MWN-05B and MWN-50B). Even though it is assumed that a sand unit exists, there are no sand wells installed within this CMS Discharge Sub-Area; therefore, only the wells in the screened fill unit could be utilized for loading calculations.
4. Discharge Sub-Area 5 monitoring locations MWN-08A, MWN-09, MWN-34A, and MWN-52A were sampled during the RFI, but not during CMS; instead, wells MWN-66A, MWN-67A, and MWN-68A were used; therefore, direct comparisons between RFI & CMS loadings could not be performed.

Formula
% Change = ([CMS]/[RFI])-1

Conversion Factors:
Loading (lbs/day) = Discharge Rate (L/YR) x Concentration (ug/L) x 1.0E-6 x 2.205E-3

Definitions:
lbs/day = pounds per day
na = not applicable or not analyzed for this compound
R = Sample result was rejected by third party validator.
ND = compound was not detected at the method detection limit at any wells included in the sum (where the compound was analyzed).

Color Code:

(green)	= recent contaminant loadings improved or generally stayed the same
(red)	= recent contaminant loadings generally degraded (by greater than 20%)
↓	= recent contaminant loadings improved, extent of improvement unknown as the CMS concentration was non-detect.
↑	= recent contaminat loadings degraded, extent of degredation unknown as the RFI concentration was non-detect.
(light blue)	= parameter designated a Primary Compound of Concern.

TABLE 4-44

PAST (RFI) VS. CURRENT (CMS) SURFACE WATER LOADING COMPARISON BY DSA

Discharge Sub-Area	Unit	Compounds of Concern [1]																										
		Benzo(b)fluoranthene			Benzo(k)fluoranthene			Biphenyl			Bis(2-ethylhexyl)phthalate			Chrysene			Fluorene			Indeno(1,2,3-cd)pyrene			Naphthalene			Phenanthrene		
		Loading (lbs/day)		% Change	Loading (lbs/day)		% Change	Loading (lbs/day)		% Change	Loading (lbs/day)		% Change	Loading (lbs/day)		% Change	Loading (lbs/day)		% Change	Loading (lbs/day)		% Change	Loading (lbs/day)		% Change	Loading (lbs/day)		% Change
		RFI	CMS		RFI	CMS		RFI	CMS		RFI	CMS		RFI	CMS		RFI	CMS		RFI	CMS		RFI	CMS		RFI	CMS	
2A	Slag/Fill	na	1.62E-06	na	na	ND	na	na	0.00013	na	ND	ND	na	ND	3.24E-06	↑	0.00179	0.00083	-53%	na	ND	na	0.07469	0.00367	-95%	0.00205	0.00109	-47%
	Sand/Dredge Spoil	na	0.00001	na	na	4.65E-06	na	na	0.00005	na	ND	ND	na	ND	0.00001	↑	ND	0.00028	↑	na	2.58E-06	na	0.00964	0.00697	-28%	0.00043	0.00026	-39%
2B	Slag/Fill	na	0.00001	na	na	4.98E-06	na	na	0.00035	na	0.00042	0.00047	12%	ND	0.00001	↑	0.00484	0.00162	-67%	na	3.97E-06	na	0.07657	0.03539	-54%	0.00692	0.00206	-70%
	Sand/Dredge Spoil	na	ND	na	na	ND	na	na	0.00001	na	ND	ND	na	ND	ND	na	0.00005	0.00002	-58%	na	ND	na	0.00274	0.00112	-59%	0.00006	ND	↓
	Sand	na	ND	na	na	ND	na	na	ND	na	ND	0.00001	↑	ND	ND	na	ND	2.68E-07	↑	na	ND	na	ND	ND	na	ND	ND	na
3A	Slag/Fill	na	0.00001	na	na	2.85E-06	na	na	0.00143	na	ND	0.00074	↑	0.00558	0.00003	-99%	0.04683	0.01036	-78%	na	ND	na	0.21674	0.03774	-83%	0.07666	0.01869	-76%
	Sand/Dredge Spoil	na	5.87E-07	na	na	2.44E-07	na	na	0.00003	na	ND	ND	na	ND	9.29E-07	↑	0.00035	0.00011	-68%	na	2.44E-07	na	0.00650	0.00450	-31%	0.00053	0.00016	-70%
	Till/Sand [2]	na	6.73E-07	na	na	ND	na	na	ND	na	ND	ND	na	ND	9.18E-07	↑	ND	1.29E-06	↑	na	ND	na	ND	2.75E-06	↑	ND	3.80E-06	↑
4A	Slag/Fill	na	0.00008	na	na	0.00004	na	na	0.00045	na	0.00576	ND	↓	ND	0.00011	↑	0.02428	0.00460	-81%	na	0.00001	na	0.08389	0.01176	-86%	0.03631	0.01045	-71%
	Sand/Dredge Spoil	na	0.00001	na	na	2.22E-06	na	na	0.00052	na	0.00025	0.00014	-44%	ND	0.00001	↑	0.00058	0.00203	253%	na	ND	na	0.13379	0.09151	-32%	0.00122	0.00272	123%
4B	Slag/Fill	na	0.00005	na	na	0.00002	na	na	ND	na	ND	0.00044	↑	ND	0.00007	↑	0.00130	ND	↓	na	0.00001	na	0.01826	ND	↓	0.00767	ND	↓
	Sand [3]	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
5 [4]	SlagFill	na	2.15E-06	na	na	1.61E-06	na	na	ND	na	0.00032	0.00015	-53%	ND	1.61E-06	↑	0.00048	ND	↓	na	2.69E-06	na	0.01529	ND	↓	0.00020	ND	↓
TOTAL SLAG/FILL LOADINGS:		**na**	**0.00016**	**na**	**na**	**0.00007**	**na**	**na**	**0.00235**	**na**	**0.00650**	**0.00180**	**-72%**	**0.00558**	**0.00023**	**-96%**	**0.07951**	**0.01741**	**-78%**	**na**	**0.00003**	**na**	**0.48544**	**0.08856**	**-82%**	**0.12981**	**0.03230**	**-75%**
TOTAL SLAG/FILL LOADINGS:		**na**	**0.00016**	**na**	**na**	**0.00007**	**na**	**na**	**0.00235**	**na**	**0.00618**	**0.00165**	**-73%**	**0.00558**	**0.00022**	**-96%**	**0.07903**	**0.01741**	**-78%**	**na**	**0.00003**	**na**	**0.47015**	**0.08856**	**-81%**	**0.12961**	**0.03230**	**-75%**
TOTAL SAND/DREDGE SPOIL LOADINGS:		**na**	**0.00002**	**na**	**na**	**0.00001**	**na**	**na**	**0.00060**	**na**	**0.00025**	**0.00014**	**-44%**	**ND**	**0.00002**	↑	**0.00098**	**0.00245**	**151%**	**na**	**2.83E-06**	**na**	**0.15267**	**0.10410**	**-32%**	**0.00223**	**0.00314**	**41%**
TOTAL NATIVE SAND LOADINGS:		**na**	**6.73E-07**	**na**	**na**	**ND**	**na**	**na**	**ND**	**na**	**ND**	**0.00001**	↑	**ND**	**9.18E-07**	↑	**ND**	**1.55E-06**	↑	**na**	**ND**	**na**	**ND**	**2.75E-06**	↑	**ND**	**3.80E-06**	↑

Notes:

1. See Tables 4-42 and 4-43 for loading calculations.
2. The well used in the RFI was in the till layer (MWN-24B). Well MWN-94B was used in the CMS to more accurately represent loading from the native sand layer.
3. Discharge Sub-Area 4B wells were not advanced beyond the fill layer; as a result the depth and thickness of the underlying sand layer was derived from interpretation from nearby wells (i.e., MWN-5D, MWN-6A, & MWN-50B). Even though it is assumed that a sand unit exists, there are no sand wells installed within this CMS Discharge Sub-Area; therefore, only the wells in the screened fill unit could be utilized for loading calculations.
4. Discharge Sub-Area 5 monitoring locations MWN-08A, MWN-09, MWN-34A, and MWN-52A were sampled during the RFI, but not during CMS; instead, wells MWN-66A, MWN-67A, and MWN-68A were used; therefore, direct comparisons between RFI & CMS loadings could not be performed.

Formula

% Change = ([CMS]/[RFI])-1

Conversion Factors:

Loading (lbs/day) = Discharge Rate (L/YR) x Concentration (ug/L) x 1.0E-6 x 2.205E-3

Definitions:

lbs/day = pounds per day
na = not applicable or not analyzed for this compound
R = Sample result was rejected by third party validator.
ND = compound was not detected at the method detection limit at any wells included in the sum (where the compound was analyzed).

Color Code:

= recent contaminant loadings improved or generally stayed the same
= recent contaminant loadings generally degraded (by greater than 20%)
↓ = recent contaminant loadings improved, extent of improvement unknown as the CMS concentration was non-detect.
↑ = recent contaminat loadings degraded, extent of degredation unknown as the RFI concentration was non-detect.
= parameter designated a Primary Compound of Concern.

TABLE 4-44

PAST (RFI) VS. CURRENT (CMS) SURFACE WATER LOADING COMPARISON BY DSA

Discharge Sub-Area	Unit	Compounds of Concern[1]																										
		Pyridine			Total Phenolic Compounds			Arsenic			Barium			Cadmium			Chromium			Lead			Selenium			Cyanide		
		Loading (lbs/day)		% Change	Loading (lbs/day)		% Change	Loading (lbs/day)		% Change	Loading (lbs/day)		% Change	Loading (lbs/day)		% Change	Loading (lbs/day)		% Change	Loading (lbs/day)		% Change	Loading (lbs/day)		% Change	Loading (lbs/day)		% Change
		RFI	CMS		RFI	CMS		RFI	CMS		RFI	CMS		RFI	CMS		RFI	CMS		RFI	CMS		RFI	CMS		RFI	CMS	
2A	Slag/Fill	ND	ND	**na**	0.00748	0.00020	**-97%**	0.00150	0.00093	**-38%**	0.01850	0.01103	**-40%**	0.00003	na	**na**	0.00604	0.00380	**-37%**	0.00107	0.00032	**-70%**	0.00532	0.00040	**-92%**	0.02153	na	**na**
	Sand/Dredge Spoil	ND	na	**na**	0.00499	0.00116	**-77%**	0.00085	0.00075	**-12%**	0.00578	0.00150	**-74%**	0.00001	na	**na**	0.00258	ND	↓	0.00088	ND	↓	ND	ND	**na**	0.00283	na	**na**
2B	Slag/Fill	0.00504	na	**na**	0.00631	0.00068	**-89%**	0.00118	0.00049	**-59%**	0.01288	0.00865	**-33%**	0.00005	na	**na**	0.00285	0.00213	**-25%**	0.00032	0.00027	**-17%**	0.00153	na	**na**	0.12873	0.43922	**241%**
	Sand/Dredge Spoil	ND	na	**na**	0.00101	0.00048	**-52%**	0.00007	0.00018	**143%**	0.00705	0.00338	**-52%**	0.00001	na	**na**	0.00015	0.00036	**133%**	0.00121	0.00241	**100%**	ND	na	**na**	0.00044	na	**na**
	Sand	0.03527	na	**na**	0.00926	1.64E-06	**-100%**	0.00011	0.00003	**-77%**	0.00040	0.00014	**-64%**	2.55E-06	na	**na**	0.00153	0.00002	**-99%**	0.00023	0.00001	**-97%**	ND	na	**na**	0.00620	0.00119	**-81%**
3A	Slag/Fill	0.00745	na	**na**	0.02269	0.00215	**-91%**	0.00608	0.00166	**-73%**	0.03040	na	**na**	ND	na	**na**	0.00997	0.00159	**-84%**	0.00331	0.00278	**-16%**	0.00276	0.00354	**28%**	0.04468	na	**na**
	Sand/Dredge Spoil	ND	na	**na**	0.00090	0.00036	**-60%**	0.00018	0.00016	**-11%**	0.00104	na	**na**	ND	na	**na**	0.00004	0.00004	**12%**	0.00007	0.00006	**-14%**	0.00010	0.00009	**-16%**	0.00670	0.00100	**-85%**
	Till/Sand[2]	ND	na	**na**	ND	na	**na**	0.00002	0.00004	**156%**	0.00133	na	**na**	ND	na	**na**	0.00017	0.00003	**-80%**	0.00002	0.00009	**329%**	ND	0.00001	↑	**R**	na	**na**
4A	Slag/Fill	0.00545	na	**na**	0.04819	0.01806	**-63%**	0.00722	ND	↓	0.35054	0.26056	**-26%**	0.00035	na	**na**	0.03630	0.01864	**-49%**	0.00282	0.00182	**-35%**	0.02461	0.01706	**-31%**	0.02254	na	**na**
	Sand/Dredge Spoil	ND	na	**na**	0.05576	0.02148	**-61%**	0.00818	0.00644	**-21%**	2.68707	1.23576	**-54%**	0.00384	ND	↓	0.01849	0.00528	**-71%**	0.00234	0.00170	**-27%**	0.00042	0.00033	**-20%**	0.00446	na	**na**
4B	Slag/Fill	ND	na	**na**	na	0.00282	**na**	ND	na	**na**	0.24015	0.18769	**-22%**	ND	na	**na**	0.08307	0.00702	**-92%**	0.00310	na	**na**	0.00042	na	**na**	0.00840	na	**na**
	Sand[3]	na	na	**na**	na	na	**na**	na	na	**na**	na	na	**na**	na	na	**na**	na	na	**na**	na	na	**na**	na	na	**na**	na	na	**na**
5[4]	SlagFill	0.00038	na	**na**	0.00532	0.00001	**-100%**	0.00062	ND	↓	0.03615	0.00418	**-88%**	ND	na	**na**	0.00862	0.00255	**-70%**	0.00013	na	**na**	0.00046	na	**na**	0.03062	0.00263	**-91%**
TOTAL SLAG/FILL LOADINGS:		**0.01831**	**ND**	↓	**0.08999**	**0.02392**	-73%	**0.01659**	**0.00308**	-81%	**0.68861**	**0.47212**	-31%	**0.00043**	**na**	na	**0.14685**	**0.03574**	-76%	**0.01074**	**0.00519**	-52%	**0.03510**	**0.02101**	-40%	**0.25650**	**0.44186**	72%
TOTAL SLAG/FILL LOADINGS:		**0.01794**	**ND**	↓	**0.08467**	**0.02391**	-72%	**0.01598**	**0.00308**	-81%	**0.65246**	**0.46794**	-28%	**0.00043**	**na**	na	**0.13822**	**0.03318**	-76%	**0.01061**	**0.00519**	-51%	**0.03464**	**0.02101**	-39%	**0.22588**	**0.43922**	94%
TOTAL SAND/DREDGE SPOIL LOADINGS:		**ND**	**na**	na	**0.06266**	**0.02349**	-63%	**0.00928**	**0.00753**	-19%	**2.70094**	**1.24064**	-54%	**0.00386**	**ND**	↓	**0.02127**	**0.00568**	-73%	**0.00450**	**0.00418**	-7%	**0.00052**	**0.00042**	-19%	**0.01443**	**0.00100**	-93%
TOTAL NATIVE SAND LOADINGS:		**0.03527**	**na**	na	**0.00926**	**1.64E-06**	-100%	**0.00013**	**0.00007**	-45%	**0.00172**	**0.00014**	-92%	**2.55E-06**	**na**	na	**0.00170**	**0.00005**	-97%	**0.00025**	**0.00010**	-62%	**ND**	**0.00001**	↑	**0.00620**	**0.00119**	-81%

Notes:

1. See Tables 4-42 and 4-43 for loading calculations.
2. The well used in the RFI was in the till layer (MWN-24B). Well MWN-94B was used in the CMS to more accurately represent loading from the native sand layer.
3. Discharge Sub-Area 4B wells were not advanced beyond the fill layer; as a result the depth and thickness of the underlying sand layer was derived from interpretation from nearby wells (i.e., MWN-5D, MWN-6A, & MWN-50B). Even though it is assumed that a sand unit exists, there are no sand wells installed within this CMS Discharge Sub-Area; therefore, only the wells in the screened fill unit could be utilized for loading calculations.
4. Discharge Sub-Area 5 monitoring locations MWN-08A, MWN-09, MWN-34A, and MWN-52A were sampled during the RFI, but not during CMS; instead, wells MWN-66A, MWN-67A, and MWN-68A were used; therefore, direct comparisons between RFI & CMS loadings could not be performed.

Formula

% Change = ([CMS]/[RFI])-1

Conversion Factors:

Loading (lbs/day) = Discharge Rate (L/YR) x Concentration (ug/L) x 1.0E-6 x 2.205E-3

Definitions:

lbs/day = pounds per day
na = not applicable or not analyzed for this compound
R = Sample result was rejected by third party validator.
ND = compound was not detected at the method detection limit at any wells included in the sum (where the compound was analyzed).

Color Code:

= recent contaminant loadings improved or generally stayed the same
= recent contaminant loadings generally degraded (by greater than 20%)
↓ = recent contaminant loadings improved, extent of improvement unknown as the CMS concentration was non-detect.
↑ = recent contaminat loadings degraded, extent of degredation unknown as the RFI concentration was non-detect.
= parameter designated a Primary Compound of Concern.

TurnKey Environmental Restoration, LLC — Benchmark Environmental Engineering & Science, PLLC

TABLE 4-45A

CURRENT (CMS) COC MASS LOADINGS FROM CMS AREA GROUNDWATER TO LAKE ERIE

Compounds of Concern	Lake Erie North			Lake Erie South		Lake Erie Total
	DSA 4A (lbs/day) [1]		DSA 4B (lbs/day)	DSA 2A (lbs/day)		lbs/day
	Slag/Fill	Sand/Dredge Spoils	Slag/Fill	Slag/Fill	Sand/Dredge Spoils	TOTAL [2]
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	0.0011856	ND	ND	ND	0.001186
1,2,4-Trimethylbenzene	0.0006427	ND	0.0002458	0.0001861	0.0007487	0.001823
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	0.0019266	ND	ND	ND	0.001927
1,3,5-Trimethylbenzene	0.0019410	ND	0.0004114	0.0000962	0.0002298	0.002678
Acetone	ND	0.0020748	0.0021154	ND	0.0003098	0.004500
Benzene	0.0048790	0.0120366	0.0006800	0.0002562	0.0005938	0.018446
Chlorobenzene	ND	0.0036309	ND	ND	ND	0.003631
Ethylbenzene	0.0002901	ND	ND	0.0001027	0.0005163	0.000909
Isopropylbenzene	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND
Toluene	0.0013573	0.0040282	ND	0.0001668	0.0002840	0.005836
Trichloroethene	ND	ND	ND	0.0002573	ND	0.000257
Vinyl Chloride	ND	ND	ND	ND	ND	ND
Xylenes, Total	0.0038405	0.0038327	ND	0.0008112	0.0154897	0.023974
Total VOCs	**0.0129505**	**0.0287154**	**0.0034527**	**0.0018765**	**0.0181721**	**0.065167**
Percentage	**19.9%**	**44.1%**	**5.3%**	**2.9%**	**27.9%**	**100%**
2,6-Dinitrotoluene	0.0157989	ND	ND	ND	ND	0.015799
Acenaphthene	0.0014024	0.0021490	0.0002364	0.0001412	0.0001110	0.004040
Benzo(a)anthracene	0.0000937	0.0000156	0.0000762	0.0000041	0.0000096	0.000199
Benzo(a)pyrene	0.0000260	0.0000022	0.0000228	ND	0.0000077	0.000059
Benzo(b)fluoranthene	0.0000832	0.0000052	0.0000537	0.0000016	0.0000121	0.000156
Benzo(k)fluoranthene	0.0000414	0.0000022	0.0000220	ND	0.0000046	0.000070
Biphenyl	0.0004523	0.0005154	ND	0.0001283	0.0000491	0.001145
Bis(2-ethylhexyl)phthalate	ND	0.0001408	0.0004389	ND	ND	0.000580
Chrysene	0.0001067	0.0000111	0.0000709	0.0000032	0.0000080	0.000200
Fluorene	0.0046020	0.0020295	ND	0.0008342	0.0002840	0.007750
Indeno(1,2,3-cd)pyrene	0.0000122	ND	0.0000123	ND	0.0000026	0.000027
Naphthalene	0.0117643	0.0915096	ND	0.0036668	0.0069704	0.113911
Phenanthrene	0.0104457	0.0027227	ND	0.0010908	0.0002582	0.014517
Pyridine	na	na	na	ND	na	ND
Total Phenolics	0.0180606	0.0214788	0.0028180	0.0002015	0.0011643	0.043723
Total SVOCs	**0.0628893**	**0.1205821**	**0.0037512**	**0.0060717**	**0.0088816**	**0.202176**
Percentage	**31.1%**	**59.6%**	**1.9%**	**3.0%**	**4.4%**	**100%**
Arsenic	ND	0.0064427	na	0.0009322	0.0007487	0.008124
Barium	0.2605648	1.2357587	0.1876926	0.0110312	0.0014973	1.696545
Cadmium	na	na	na	na	na	na
Chromium	0.0186411	0.0052811	0.0070229	0.0037995	ND	0.034745
Lead	0.0018233	0.0017043	na	0.0003208	ND	0.003848
Selenium	0.0170602	0.0003348	na	0.0004025	ND	0.017797
Total Metals	**0.2980895**	**1.2495216**	**0.1947155**	**0.0164862**	**0.0022460**	**1.761059**
Percentage	**16.9%**	**71.0%**	**11.1%**	**0.9%**	**0.1%**	**100%**
Cyanide	na	na	na	na	na	na

TURNKEY ENVIRONMENTAL RESTORATION, LLC — BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 4-45B

CURRENT (CMS) COC MASS LOADINGS FROM CMS AREA GROUNDWATER TO SMOKES CREEK

Compounds of Concern	Smokes Creek (south bank)			Smokes Creek (north bank)			Smokes Creek Total
	DSA 2B (lbs/day) [1]			DSA 3A (lbs/day)			lbs/day
	Slag/Fill	Sand/Dredge Spoils	Sand	Slag/Fill	Sand/Dredge Spoils	Sand	TOTAL [2]
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	0.0000668	0.0000185	ND	0.0010328	0.0000437	ND	0.001162
1,2-Dichloroethane	0.0000140	ND	0.0000038	ND	ND	ND	0.000018
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	ND	0.0000108	ND	0.0005992	0.0000139	ND	0.000624
Acetone	0.0005208	0.0000277	0.0000043	ND	0.0000386	0.0000129	0.000604
Benzene	0.0397036	0.0000442	0.0014272	0.0065260	0.0004049	0.0000023	0.048108
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	0.0009008	ND	ND	ND	0.0000036	ND	0.000904
Isopropylbenzene	ND	ND	ND	ND	0.0000064	ND	0.000006
Styrene	0.0006906	ND	ND	ND	ND	ND	0.000691
Toluene	0.0027025	0.0000125	ND	0.0007276	0.0001059	ND	0.003548
Trichloroethene	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	0.0000052	ND	ND	ND	ND	ND	0.000005
Xylenes, Total	0.0114105	ND	ND	0.0026212	0.0001152	ND	0.014147
Total VOCs	**0.0560149**	**0.0001137**	**0.0014354**	**0.0115069**	**0.0007322**	**0.0000151**	**0.069818**
Percentage	**80.2%**	**0.163%**	**2.06%**	**16.5%**	**1.05%**	**ND**	**100%**
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	0.0003166	0.0000209	0.0000001	0.0016891	0.0000327	0.0000005	0.002060
Benzo(a)anthracene	0.0000190	ND	0.0000001	0.0000642	0.0000017	0.0000009	0.000086
Benzo(a)pyrene	0.0000087	ND	ND	0.0000043	0.0000004	ND	0.000013
Benzo(b)fluoranthene	0.0000120	ND	ND	0.0000071	0.0000006	0.0000007	0.000020
Benzo(k)fluoranthene	0.0000050	ND	ND	0.0000029	0.0000002	ND	0.000008
Biphenyl	0.0003453	0.0000112	ND	0.0014267	0.0000254	ND	0.001809
Bis(2-ethylhexyl)phthalate	0.0004669	ND	0.0000133	0.0007421	ND	ND	0.001222
Chrysene	0.0000145	ND	ND	0.0000285	0.0000009	0.0000009	0.000045
Fluorene	0.0016178	0.0000221	0.0000003	0.0103591	0.0001124	0.0000013	0.012113
Indeno(1,2,3-cd)pyrene	0.0000040	ND	ND	ND	0.0000002	ND	0.000004
Naphthalene	0.0353910	0.0011250	ND	0.0377387	0.0044966	0.0000028	0.078754
Phenanthrene	0.0020646	ND	ND	0.0186939	0.0001613	0.0000038	0.020924
Pyridine	na	na	na	na	na	na	na
Total Phenolics	0.0006758	0.0004821	0.0000016	0.0021544	0.0003621	0.0000000	0.0036761
Total SVOCs	**0.0409411**	**0.0016613**	**0.0000153**	**0.0729110**	**0.0051947**	**0.0000108**	**0.1207343**
Percentage	**33.9%**	**1.38%**	**0.0127%**	**60.4%**	**4.30%**	**0.0089%**	**100%**
Arsenic	0.0004863	0.0001808	0.0000255	0.0016580	0.0001581	0.0000446	0.002553
Barium	0.0086549	0.0033842	0.0001433	na	na	na	0.012182
Cadmium	na	na	na	na	na	na	na
Chromium	0.0021275	0.0003616	0.0000174	0.0015936	0.0000408	0.0000329	0.004174
Lead	0.0002652	0.0024147	0.0000069	0.0027783	0.0000587	0.0000891	0.005613
Selenium	na	na	na	0.0035435	0.0000881	0.0000053	0.003637
Total Metals	**0.0115339**	**0.0063413**	**0.0001931**	**0.0095733**	**0.0003457**	**0.0001719**	**0.028159**
Percentage	**41.0%**	**22.5%**	**0.686%**	**34.0%**	**1.23%**	**0.611%**	**100%**
Cyanide	0.4392223	na	0.0011857	ND	0.0009971	na	0.441405

TABLE 4-45C

CURRENT (CMS) COC MASS LOADINGS FROM CMS AREA GROUNDWATER TO SHIP CANAL

Compounds of Concern	Ship Canal DSA 5 (lbs/day) [1] Slag/Fill	Ship Canal Total lbs/day TOTAL [2]
1,1-Dichloroethane	ND	ND
1,2,4-Trichlorobenzene	ND	ND
1,2,4-Trimethylbenzene	ND	ND
1,2-Dichloroethane	ND	ND
1,2-Dichlorobenzene	ND	ND
1,3,5-Trimethylbenzene	ND	ND
Acetone	0.0002405	0.000241
Benzene	0.0001884	0.000188
Chlorobenzene	ND	ND
Ethylbenzene	ND	ND
Isopropylbenzene	ND	ND
Styrene	ND	ND
Toluene	ND	ND
Trichloroethene	ND	ND
Vinyl Chloride	ND	ND
Xylenes, Total	0.0000180	0.000018
Total VOCs	**0.0004469**	**0.000447**
Percentage	**100%**	**100%**
2,6-Dinitrotoluene	ND	ND
Acenaphthene	ND	ND
Benzo(a)anthracene	0.0000019	0.000002
Benzo(a)pyrene	ND	ND
Benzo(b)fluoranthene	0.0000021	0.000002
Benzo(k)fluoranthene	0.0000016	0.000002
Biphenyl	ND	ND
Bis(2-ethylhexyl)phthalate	0.0001500	0.000150
Chrysene	0.0000016	0.000002
Fluorene	ND	ND
Indeno(1,2,3-cd)pyrene	0.0000027	0.000003
Naphthalene	ND	ND
Phenanthrene	ND	ND
Pyridine	na	na
Total Phenolics	0.0000052	0.000005
Total SVOCs	**0.0001652**	**0.000165**
Percentage	**100%**	**100%**
Arsenic	ND	ND
Barium	0.0041776	0.004178
Cadmium	na	na
Chromium	0.0025511	0.002551
Lead	na	na
Selenium	na	na
Total Metals	**0.0067286**	**0.006729**
Percentage	**100%**	**100%**
Cyanide	0.0026330	0.002633

TABLE 4-45D

CURRENT (CMS) COC MASS LOADINGS FROM CMS AREA GROUNDWATER TO ALL WATER BODIES

Compounds of Concern	TOTALS lbs/day [1]			
	Slag/Fill	Sand/Dredge Spoils	Sand	All [2]
1,1-Dichloroethane	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	0.001186	ND	0.001186
1,2,4-Trimethylbenzene	0.002174	0.000811	ND	0.002985
1,2-Dichloroethane	0.000014	ND	0.000004	0.000018
1,2-Dichlorobenzene	ND	0.001927	ND	0.001927
1,3,5-Trimethylbenzene	0.003048	0.000254	ND	0.003302
Acetone	0.002877	0.002464	0.000017	0.005358
Benzene	0.052233	0.013082	0.001429	0.066745
Chlorobenzene	ND	0.003631	ND	0.003631
Ethylbenzene	0.001294	0.000520	ND	0.001814
Isopropylbenzene	ND	0.000006	ND	0.000006
Styrene	0.000691	ND	ND	0.000691
Toluene	0.004954	0.004431	ND	0.009385
Trichloroethene	0.000257	ND	ND	0.000257
Vinyl Chloride	0.000005	ND	ND	0.000005
Xylenes, Total	0.018701	0.019438	ND	0.038139
Total VOCs	**0.0862484**	**0.0477485**	**0.0014505**	**0.1354474**
Percentage	**63.7%**	**35.3%**	**1.07%**	**100%**
2,6-Dinitrotoluene	0.015799	ND	ND	0.015799
Acenaphthene	0.003786	0.002314	0.000001	0.006100
Benzo(a)anthracene	0.000259	0.000028	0.000001	0.000288
Benzo(a)pyrene	0.000062	0.000010	ND	0.000072
Benzo(b)fluoranthene	0.000160	0.000019	0.000001	0.000179
Benzo(k)fluoranthene	0.000073	0.000007	ND	0.000080
Biphenyl	0.002353	0.000601	ND	0.002954
Bis(2-ethylhexyl)phthalate	0.001798	0.000141	0.000013	0.001952
Chrysene	0.000225	0.000021	0.000001	0.000247
Fluorene	0.017413	0.002449	0.000002	0.019864
Indeno(1,2,3-cd)pyrene	0.000031	0.000003	ND	0.000034
Naphthalene	0.088561	0.104104	0.000003	0.192668
Phenanthrene	0.032295	0.003146	0.000004	0.035445
Pyridine	ND	na	na	na
Total Phenolics	0.0239155	0.0234874	0.0000016	0.0474045
Total SVOCs	**0.1867296**	**0.1363305**	**0.0000261**	**0.3230862**
Percentage	**57.8%**	**42.2%**	**0.00808%**	**100%**
Arsenic	0.003076	0.007575	0.000070	0.010722
Barium	0.472121	1.240640	0.000143	1.712905
Cadmium	na	na	ND	ND
Chromium	0.035736	0.005716	0.000050	0.041502
Lead	0.005188	0.004267	0.000096	0.009550
Selenium	0.021006	0.000428	0.000005	0.021440
Total Metals	**0.5371270**	**1.2586265**	**0.0003651**	**1.7961185**
Percentage	**29.9%**	**70.1%**	**0.0203%**	**100%**
Cyanide	0.441855	0.000997	0.001186	0.444038
Total (lbs/day):	**1.25**	**1.44**	**0.00303**	**2.70**
Percentage:	**46.4%**	**53.5%**	**0.112%**	**100%**

Notes:

1. See Tables 4-42 and 4-43 for loading calculations.
2. Bars show relative contribution of each compound to total VOCs, SVOCs, and metals for each waterbody.

Color Code:

[light blue] = Parameter designated a Primary Compound of Concern.

Definitions:

na = Not applicable or not analyzed for this compound

ND = Compound was not detected at the method detection limit at any wells included in the sum (where the compound was analyzed).

TURNKEY ENVIRONMENTAL RESTORATION, LLC
BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 4-46

SWMU WASTE/FILL & USACE SAND/DREDGE SPOIL MATERIAL CONTAINING COMPOUNDS AT CONCENTRATIONS EXCEEDING PART 375 PROTECTION OF GROUNDWATER SCOs [1]

Groundwater Discharge Sub-area	VOCs										SVOCs (PAHs in RED)																			Metals							Other	
	Benzene	1,1-Dichloroethane	1,2-Dichloroethane	1,1,1-Trichloroethane	Ethylbenzene	Methylene chloride	Methyl Ethyl Ketone	Toluene	Trichloroethene	Xylenes, total	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzofuran	2-Methylphenol	3- and 4-Methylphenol	4-Methylphenol	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Phenol	Pyrene	Arsenic	Barium	Cadmium	Lead	Mercury	Nickel	Selenium	Cyanide	TCLP Hazardous
DSA 2A																																						
S-1	●				●	●	●	●		●	●	●		●	●	●	●	●					●	●	●	●	●	●	●					●	●	●		
S-2																																●	●					
S-3 (HWMU 2)														●				●														●	●			●		
S-4 (portion)																																●	●	●				
S-5	●							●		●																						●						
S-6	●				●	●		●	●																							●	●					
S-7/S-20	●		●																													●	●			●		
S-8 (portion) - empty														●		●	●	●														●	●					
S-21																																●	●		●			
S-27														●		●		●														●		●		●		
USACE Dredge Spoils														●		●	●	●							●	●		●				●		●				
DSA 2B																																						
S-4 (portion)																																●	●	●				
S-8 (portion) - empty														●		●	●	●														●	●					
S-11	●			●	●	●	●	●	●	●				●		●		●		●	●	●				●		●		●		●	●	●		●	●	
S-22	●	●		●	●	●	●	●	●	●				●		●		●		●	●	●				●		●		●		●	●	●		●	●	
USACE Dredge Spoils														●		●	●	●							●	●		●				●		●				
DSA 3A																																						
P-8 (Tank Farm)						●								●	●	●	●	●						●	●	●		●					●	●		●		
S-24 (NFA)	●							●		●				●	●	●	●	●			●				●	●		●		●				●		●		
P-74D														●	●	●	●	●							●										●			
P-75 (portion)	●				●	●		●		●	●	●	●	●	●	●	●	●	●				●	●	●	●	●	●	●		●			●	●			●

TurnKey Environmental Restoration, LLC
Benchmark Environmental Engineering & Science, PLLC

TABLE 4-46

SWMU WASTE/FILL & USACE SAND/DREDGE SPOIL MATERIAL CONTAINING COMPOUNDS AT CONCENTRATIONS EXCEEDING PART 375 PROTECTION OF GROUNDWATER SCOs [1]

Groundwater Discharge Sub-area	VOCs										SVOCs (PAHs in RED)																			Metals							Other	
	Benzene	1,1-Dichloroethane	1,2-Dichloroethane	1,1,1-Trichloroethane	Ethylbenzene	Methylene chloride	Methyl Ethyl Ketone	Toluene	Trichloroethene	Xylenes, total	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzofuran	2-Methylphenol	3- and 4-Methylphenol	4-Methylphenol	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Phenol	Pyrene	Arsenic	Barium	Cadmium	Lead	Mercury	Nickel	Selenium	Cyanide	TCLP Hazardous
USACE Dredge Spoils														●		●	●	●							●	●		●				●		●				
DSA 4A																																						
P-74 (A, B, & C)														●	●	●	●	●							●										●			
P-75 (portion)	●				●	●		●		●	●	●	●	●	●	●	●	●	●				●	●	●	●	●	●	●		●			●	●			●
S-10														●		●		●														●		●		●		
S-12 [2]																																						
S-13 (HWMU 1A) [3]																																						
S-14	●				●	●	●	●		●	●	●		●	●	●	●	●					●	●	●	●	●		●			●	●					
S-15														●																								
S-16 (HWMU 1B) [4]																																					●	
S-17														●		●	●	●														●		●				
S-18 (AOCs A, B, C)														●				●														●	●	●	●	●		
S-19														●		●		●																	●	●		
S-23	●					●		●		●		●	●	●	●	●	●	●					●	●	●	●	●	●	●					●				●
S-28														●				●																				
USACE Dredge Spoils														●		●	●	●							●	●		●				●		●				
DSA 4B																																						
S-25																																●						
S-26 (portion)	●				●	●		●		●	●	●		●	●	●	●	●	●				●	●	●	●	●		●									
USACE Dredge Spoils														●		●	●	●							●	●		●				●		●				

TURNKEY ENVIRONMENTAL RESTORATION, LLC — BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 4-46

SWMU WASTE/FILL & USACE SAND/DREDGE SPOIL MATERIAL CONTAINING COMPOUNDS AT CONCENTRATIONS EXCEEDING PART 375 PROTECTION OF GROUNDWATER SCOs [1]

Groundwater Discharge Sub-area	VOCs										SVOCs (PAHs in RED)																			Metals							Other	
	Benzene	1,1-Dichloroethane	1,2-Dichloroethane	1,1,1-Trichloroethane	Ethylbenzene	Methylene chloride	Methyl Ethyl Ketone	Toluene	Trichloroethene	Xylenes, total	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzofuran	2-Methylphenol	3- and 4-Methylphenol	4-Methylphenol	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Phenol	Pyrene	Arsenic	Barium	Cadmium	Lead	Mercury	Nickel	Selenium	Cyanide	TCLP Hazardous
DSA 5																																						
P-7														●		●	●	●										●										
P-9																																						●
P-10														●	●	●	●	●							●	●											●	
P-11	●				●			●		●																●						●		●				
P-11A [5]																																						
P-12	●				●			●		●																●								●				
P-18 (A and B)														●		●	●	●										●				●	●			●	●	●
S-26 (portion)	●					●					●	●		●	●	●	●	●	●				●	●	●	●	●		●					●				

Notes:
1. Compounds detected in surface and/or subsurface waste/fill at each SWMU exceeding the Protection of Groundwater SCO are shown.
2. RFI: Part V - SWMU Assessment Report for SWMU S-12 is an asbestos landfill only.
3. RFI: Part V - SWMU Assessment Report for SWMU S-13 (HWMU 1A) did not report surface/subsurface soil/fill results as this is a closed landfill.
4. RFI: Part V - SWMU Assessment Report for SWMU S-16 (HWMU 1B) did not report surface soil/fill results as this is a closed landfill. Subsurface results were presented for total metals only; only cyanide exceeded the Part 375 Protection of GW SCO.
5. Soil data associated with SWMU P-11A was not collected during the RFI or CMS.

References:
1. RFI: Part V - SWMU Assessment Reports and/or CMS Report (December 2011).

TABLE 4-47

DETERMINATION OF POTENTIAL GROUNDWATER CONTAMINATION SOURCES

Groundwater Discharge Sub-Area	Downgradient Wells	VOCs					SVOCs (PAHs in RED)								Metals		Other
		Benzene	Ethylbenzene	Toluene	Trichloroethene	Xylenes, total	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Indeno(1,2,3-cd)pyrene	Naphthalene	Arsenic	Lead	Cyanide
DSA 2A																	
S-1	MWS-09, MWS-26A							■		■		■					
S-2	MWS-26A, MW-2D2, MW-2D2B, MW-2D2D															■	
S-3 (HWMU 2)	MW-2D2, MW-2D2B, MW-2D2D, MW-2D3, MW-2D4							■				■				■	
S-4 (portion)	MW-2D4	Contains dredge spoils from Smokes Creek and could be potential source. No contaminant detected in S-4 samples above PGWSCOs and GWQS (MW-2D4).															
S-5	MWS-15, MWS-09, MWS-26A	■															
S-6	MWS-13, MWS-15, MWS-09, MWS-26A	■															
S-7/S-20	MWS-15, MW-2U1, MW-2U1B, MW-2D2, MW-2D2B, MW-2D2D, MW-2D3, MW-2D4	■														■	
S-8 (portion) - empty	MWS-11A																
S-11/S-22 (ATP-ICM)	MWS-14A , MWS-14B Primary groundwater flow from S-11/S-22 is north and northwesterly.	■						■						■			
USACE Dredge Spoils	MW-2D2B, MW-2U1B, MWS-26A, MWS-29A							■		■	■	■	■	■			
DSA 2B																	
S-4 (portion)	MWS-01, MWS-01B															■	
S-11/S-22 (ATP-ICM)	MWS-18A, MWS-18C, MWS-19A, MWS-19B, MWS-20A, MWS-20B, MWS-23A, MWS-23B, MWS-10, MWS-10B, MWS-21A, MSWS-21B	■		■	■			■		■		■			■		■
USACE Dredge Spoils	MWS-01B													■			
DSA 3A																	
P-8 (Tank Farm)	MWN-84A, MWN-82A							■				■		■			
S-10	MWN-01, MWN-01B, MWN-23B							■		■		■					
S-24 (NFA)	MWN-24A, MWN-24B, MWN-44A	■						■	■	■	■	■	■		■		
P-74D	MWN-17A, MWN-17B, MWN-94A, MWN-94B							■		■		■					
P-75 (portion)	MWN-17A, MWN-17B, MWN-83A, MWN-94A, MWN-94B	■		■		■		■		■		■		■			
USACE Dredge Spoils	BCP-ORC-1, MWN-01B, MWN-23B, WT1-03, WT1-04, WT1-05R							■		■	■	■	■	■			
DSA 4A																	
P-75 (portion)	MWN-37A, MWN-38A, MWN-39A	■												■			
S-10	MWN-22B, MWN-41A, MWN-07, MWN-01B, WTI-07, MWN-02, MWN-02B							■		■		■					
S-14	WT8-01, WT8-02	■		■		■		■	■	■	■	■	■	■			
S-15	MWN-35A							■									
S-17	MWN-12																
S-18 (AOCs A, B, C)	MWN-05A, MWN-05B, MWN-05D							■				■					
S-23	MW-1D1, MW-1D6, MW-1D7, MW-1D8	■		■		■								■			
S-28	MWN-35A							■				■					
USACE Dredge Spoils	MWN-02B, MWN-03B, MWN-05B, MWN-13B, MWN-13C, MWN-14B, MWN-22B, WT1-01, WT1-02, WT1-06, WT1-07, WT8-01, WT8-02							■		■	■	■	■	■			
DSA 4B																	
S-26 (portion)	MWN-18A	■						■	■	■	■	■	■				
USACE Dredge Spoils	MWN-43A							■		■	■	■					
DSA 5																	
P-11	MWN-21A, MWN-21B, MWN-21C, MWN-32A, MWN-19A, MWN-19B, MWN-30A, MWN-53A, MWN-54A, MWN-55A	■	■	■		■								■			
P-11A [3]	MWN-34A, MWN-08, MWN-49A, MWN-49B, MWN-68A, MWN-76A, MWN-79A, MWN-78A	■	■	■		■		■	■	■	■	■	■	■			
P-12	MWN-21A, MWN-21B, MWN-21C, MWN-32A, MWN-19A, MWN-19B, MWN-30A, MWN-53A, MWN-54A, MWN-55A	■	■	■		■								■			
P-18 (A and B)	MWN-45A, MWN-47A							■		■	■	■					
S-26 (portion)	MWN-52A, MWN-52B, MWN-07							■		■	■	■	■				

Notes:

1. Compounds detected in surface and/or subsurface waste/fill at each SWMU exceeding the Protection of Groundwater SCO are shown.
2. Downgradient wells in RED indicate those wells screened within and representative of the USACE sand/dredge spoil unit.
3. No soil data was collected from SWMU P-11A during RFI or CMS. Highlighted compounds reflect groundwater contaminants.

Color Code:

■ = Compound detected in SWMU waste/fill or USACE sand/dredge spoil material above the Part 375 GWP SCO <u>and</u> downgradient groundwater concentration detected above the Class GA GWQS/GV.

TABLE 4-48

PROJECTED PRIMARY COMPOUNDS OF CONCERN MASS LOADING TO ADJACENT WATER BODIES MASS LOADINGS AFTER IMPLEMENTATION OF GROUNDWATER ALTERNATIVE 3
SECONDARY & TERTIARY GROUNWATER EXTRACTION AND TREATMENT

Discharge Sub-Area	Unit	Well I.D.	Primary Compounds of Concern Detected in Groundwater [1,2,3]																						
			Benzene	Ethylbenzene	Toluene	Xylenes, Total	TOTAL BTEX	Total BTEX without Selected Well Segments	Percent Change	Naphthalene	Total Naphthalene	Naphthalene without Selected Well Segments	Percent Change	Barium	Total Barium	Total Barium without Selected Well Segements	Percent Change	Cyanide	Total Cyanide	Total Cyanide without Selected Well Segements	Percent Change	Phenolic compounds (total phenols)	Total Phenols	Total Phenols without Selected Well Segments	Percent Change
			Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Percent (%)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Percent (%)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Percent (%)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Percent (%)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Percent (%)
2A	Slag/Fill	MW-2D4	ND	ND	ND	ND	0.0182	0.0013	93	ND	0.01099	0.00402	63	0.00356	0.01253	0.01103	12	na	na	na	na	ND	0.00138	0.00021	85
		MW-2D3	0.00022	0.00010	0.00017	0.00071				0.00366				0.00289				na				0.00020			
		MW-2D2	ND	ND	ND	ND				ND				0.00187				na				ND			
		MWS-26A	0.00003	ND	ND	0.00011				0.00035				0.00138				na				0.00001			
		MWS-09	ND	ND	ND	ND				0.00001				0.00134				na				na			
	Sand/Dredge Spoil	MW-2D2B	0.00059	0.00052	0.00028	0.01549				0.00697				0.00150				na				0.00116			
2B	Slag/Fill	MWS-01	0.00255	0.00090	0.00270	0.01141	0.0562	0.0385	31	0.03528	3.65E-02	1.09E-04	99.7	0.00270	0.01218	0.00396	67	na	0.4404	0.0104	98	0.00064	0.0012	0.0001	94
		MWS-02	0.00007	ND	ND	ND				0.00006				0.00213				0.43001				ND			
		MWS-19A	0.00032	ND	ND	ND				1.24E-06				0.00049				0.00240				ND			
		MWS-18A	0.03676	ND	ND	ND				0.00004				0.00034				0.00482				0.00007			
		MWS-20A	ND	ND	ND	ND				ND				0.00060				0.00200				ND			
		MWS-03	ND	ND	ND	ND				ND				0.00238				na				na			
	Sand/Dredge Spoil	MWS-01B	0.00004	ND	0.00001	ND				0.00112				0.00338				na				0.00048			
	Sand	MWS-19B	0.00140	ND	ND	ND				ND				0.00005				0.00071				ND			
		MWS-18C	0.00003	ND	ND	ND				ND				0.00001				0.00034				1.64E-06			
		MWS-20B	0.000001	ND	ND	ND				ND				0.00008				0.00013				ND			
3A	Slag/Fill	MWN-01	0.00342	ND	0.00073	0.00255	0.0105	0.00325	69	0.03567	0.04232	2.16E-03	95	na	na	na	na	na	0.0010	0.0000	100	0.00215	0.00252	0.00008	97
		MWN-11	0.00011	ND	ND	ND				0.00042				na				na				na			
		MWN-94A	0.00299	ND	ND	0.00007				0.00165				na				na				ND			
		MWN-24A	ND	ND	ND	ND				0.00003				na				na				ND			
	Sand/Dredge Spoil	MWN-01B	0.00035	3.62E-06	0.00010	0.00010				0.00450				na				0.00100				0.00028			
		MWN-23B	0.00005	ND	0.00001	0.00001				0.00005				na				na				0.00008			
	Sand	MWN-94B	0.00000	ND	ND	ND				2.75E-06				na				na				na			
4A	Slag/Fill	MWN-06A	0.00040	ND	ND	ND	0.03101	0.0185	40	0.00306	0.10617	0.08833	17	na	1.53338	1.41887	7	na	na	na	na	ND	0.04052	0.02058	49
		MWN-05A	ND	ND	ND	ND				0.00034				0.07044				na				0.00054			
		MWN-04	ND	ND	ND	ND				ND				0.02399				na				ND			
		MWN-03	0.00401	0.00017	0.00118	0.00297				0.00899				0.06296				na				0.00090			
		MWN-02	0.00059	0.00012	0.00021	0.00096				ND				0.10963				na				0.01707			
	Sand/Dredge Spoil	MWN-05B	0.00410	ND	0.00296	0.00273				0.07593				1.19597				na				0.01914			
		MWN-03B	ND	ND	ND	ND				ND				0.06551				na				ND			
		MWN-02B	0.00823	ND	0.00117	0.00119				0.01784				0.00487				na				0.00288			

Notes:
1. Loading = Discharge Rate x Concentration. See Table 4-41 for discharge calculations and Tables 4-31 through 4-36 for concentrations.
2. Only Primary Compounds of Concern are shown on this table.
3. Table 4-43 Current CMS COC Mass Loading from CMS Area Groundwater to Adjacent Water Bodies was used as base table to develop Projected Mass Loadings after Secondary and Tertiary Groundwater Extraction and Treatment

Definitions:
lbs/day - pounds per day
na = not analyzed
ND = compound was not detected at the method detection limit
Total BTEX = total benzene, toluene, ethylbenzene, and xylene concentrations

Color Code:
= Well Shoreline Segment Selected for Groundwater Extraction and Treatment. See Plate 4-19 for Shoreline Segments and Plate 5-2 for extraction well locations.

TABLE 5-1

POTENTIAL CHEMICAL-SPECIFIC STANDARDS, CRITERIA, AND GUIDANCE (SCGs)

Standard, Criteria or Guidance	Citation or Reference	Description	Applicability
Groundwater:			
RCRA Groundwater Protection Standards and Maximum Concentration Limits	40 CFR 264, Subpart F	Criteria for groundwater consumption.	On-site groundwater use is prohibited. Potentially relevant for off-site groundwater quality.
NYSDEC Groundwater Quality Standards and Groundwater Effluent Limitations	6NYCRR Parts 703.5 and 703.6	Groundwater quality criteria.	Applicable to on-site and off-site groundwater quality.
Ambient Water Quality Standards and Guidance Values	TOGS 1.1.1, October 1993, reissued 1998	Groundwater water quality standards and guidance values.	Applicable to on-site and off-site groundwater quality.
Surface Water:			
NYSDEC Surface Water Quality Standards	6NYCRR Parts 703.5 and 703.6	Surface water quality criteria.	Applicable to on-site and off-site surface water quality.
Ambient Water Quality Standards and Guidance Values	TOGS 1.1.1, October 1993, reissued 1998	Surface water quality standards and guidance values.	Applicable to on-site and off-site surface water quality.
Soil/Fill:			
NYSDEC Environmental Remedial Programs Regulations	6NYCRR Part 375-6.8(b)	Soil Cleanup Objectives based on human health, ecological protection, and groundwater protection.	Applicable to soil/fill.
DER-10 / Technical Guidance for Site Investigation and Remediation Chapters 4 & 5	NYSDEC Program Policy (May 3, 2010)	Guidance provides an overview of the site investigation and remediation process.	Applicable to soil/fill.
NYSDEC CP-51/Soil Cleanup Guidance	NYSDEC Policy (October 21, 2010)	Policy provides the framework and procedures for the selection of soil cleanup levels.	Applicable to soil/fill.
USEPA Preliminary Remediation Goals	EPA Region IX, Oct. 2002, updated per EPA Toxicity Guidance Memo (12/12/04)	Presents residential and non-residential soil cleanup goals based on human health criteria and groundwater protection.	Potentially relevant.
USEPA Soil Screening Guidance	Technical Background Document and Users Guide, May 1996 revisions	Guidance for developing risk-based, soil screening levels for protection of human health for Superfund sites.	Potentially relevant.
USEPA CAMU Regulations	40 CFR 264.552 promulgated February 16, 1993 (58 FR 8658)	RCRA Corrective measure regulations regarding Corrective Action Management Units (CAMUs) to facilitate treatment, storage, and disposal of hazardous wastes managed for implementing cleanup. The 2000 amendments "grandfathered" certain categories of CAMUs.	Applicable to grandfathered SW-CAMU and HW-CAMU.

TABLE 5-1

POTENTIAL CHEMICAL-SPECIFIC STANDARDS, CRITERIA, AND GUIDANCE (SCGs)

Standard, Criteria or Guidance	Citation or Reference	Description	Applicability
Sediment:			
NYSDEC Screening and Assessment of Contaminated Sediment	NYSDEC Division of Fish, Wildlife and Marine Resources, Bureau of Habitat (June 24, 2014)	Provide sediment guidance values to determine whether a given sediment is toxic and poses a risk to aquatic life.	Applicable to sediment.

TABLE 5-1

POTENTIAL CHEMICAL-SPECIFIC STANDARDS, CRITERIA, AND GUIDANCE (SCGs)

Standard, Criteria or Guidance	Citation or Reference	Description	Applicability
Air:			
New York State Air Quality Classifications and Standards	6NYCRR Parts 256 and 257	Establishes air quality standards protective of public health.	Potentially applicable to intrusive activities that may release constituents to air.
National Primary and Secondary Ambient Air Quality Standards (NAAQS)	40 CFR Part 50	Establishes primary and secondary ambient air quality standards to protect public health and welfare.	Potentially applicable to intrusive activities.
New York State DOH Soil Vapor Intrusion Guidance	New York State DOH, Oct. 2006 (updated May 2017)	Establishes sub-slab and indoor air thresholds for sites impacted by VOCs.	Potentially relevant to portions of CMS Area with subsurface VOCs.
Multiple Media/Other:			
USEPA Integrated Risk Information System (IRIS)	www.epa.gov/iris	Database of human health effects that may result from exposure to various substances found in the environment.	To be considered.

TABLE 5-2

POTENTIAL LOCATION-SPECIFIC STANDARDS, CRITERIA, AND GUIDANCE (SCGs)

Standard, Requirement, Criteria or Limitation	Citation or Reference	Description	Applicability
Other:			
National Historic Preservation Act	16 CFR Part 470	Requires avoiding impacts on cultural resources having historical significance.	Not applicable; no historic features or structures in CMS area
NYSDEC Environmental Remedial Programs	6NYCRR Part 375-6.4 Restricted use soil cleanup objectives for protection of public health	Requires consideration of future land use in remedy selection and soil cleanup criteria.	Applicable to soil/fill.

TABLE 5-3

POTENTIAL ACTION-SPECIFIC STANDARDS, CRITERIA, AND GUIDANCE (SCGs)

Standard, Requirement, Criteria or Limitation	Citation or Reference	Description	Applicability
Groundwater:			
Clean Water Act, National Pretreatment Standards	40 CFR 403.5	General pretreatment regulations for discharge to POTWs.	Potentially applicable for alternatives involving discharges of groundwater to POTW.
Surface water:			
Protection of Waters	6NYCRR Part 608	Regulations for protecting surface water bodies from intrusive activities in the surface water body or along the banks	Potentially applicable for alternatives involving work in or on the banks of the surface water body
Stormwater:			
SPDES General Permit for Stormwater Discharges from Construction Activity	GP-0-15-002 January 29, 2015 - January 28, 2020	Regulations for stormwater discharges from intrusive construction/remedial activities	Potentially applicable for alternatives involving intrusive ground work.
Air:			
NYSDEC DER-10; Appendix 1B - Fugitive Dust and Particulate Monitoring	DER-10 / Technical Guidance for Site Investigation and Remediation (May 3, 2010 Program Policy)	Establishes guidance for community air monitoring and controls to monitor and mitigate fugitive dusts during intrusive activities at NY State inactive hazardous waste sites.	Applicable to intrusive activities that may release contaminants to air.
OSHA General Industry Air Contaminants Standard	29 CFR 1910.1000	Establishes Permissible Exposure Limits for workers exposed to airborne contaminants.	Applicable to intrusive activities that may release contaminants to air.
Solid, Hazardous, and Non-Hazardous Waste:			
NYSDEC Inactive Hazardous Waste Disposal Sites	6NYCRR Part 375	Establishes procedures for inactive hazardous waste disposal site identification, classification, and investigation activities, as well as remedy selection and interim remedial actions.	To be considered.
NY State Solid Waste Transfer Permits	6NYCRR Part 364	Establishes procedures to protect the environment from mishandling and mismanagement of all regulated waste transported from a site of generation to the site of ultimate treatment, storage, or disposal.	Potentially applicable for alternatives involving off-site disposal.
DOT Rules for Hazardous Materials Transport	(49 CFR 107, 171.1 - 171.5).	Establishes requirements for shipping of hazardous materials.	Potentially applicable for alternatives involving off-site disposal
Occupational Safety and Health Act (29 USC 651 *et seq.*)	29 CFR Part 1910 and 1926	Describes procedures for maintaining worker safety.	Applicable to site construction activities.
USEPA CAMU Regulations	40 CFR 264.552 promulgated February 16, 1993 (58 FR 8658)	RCRA Corrective measure regulations regarding Corrective Action Management Units (CAMUs) to facilitate treatment, storage, and disposal of hazardous wastes managed for implementing cleanup. The 2000 amendments "grandfathered" certain categories of CAMUs.	Applicable to grandfathered SW-CAMU and HW-CAMU.

TABLE 5-4

EVALUATION OF CORRECTIVE MEASURE ALTERNATIVES
SFA ZONES 2 & 3 SUB-AREAS

Alternatives by CAMU and SWMU	Summary of Alternative	Overall Protectiveness of Public Health and the Environment	Compliance with SCGs	Long-Term Effectiveness & Permanence	Reduction in Toxicity, Mobility or Volume of Contamination through Treatment	Short-Term Impacts & Effectiveness	Implementability	Cost-Effectiveness
SFA ZONE 2 SUB-AREA:								
IMPOIUNDMENTS AND SW-CAMU								
Alternative 1: Grandfathered SW-CAMU	24-acre SW-CAMU. Pull back existing waste along western and northern slag bluff in SWMUs S-1 thru S-4 to create minimum 50-ft separation distance between waste and edge of bluff. Consolidate 27,000 to 150,000 CY of solid waste from various SWMUs plus slag from other areas of the Site to provide a minimum 4% grade into SWMUs S-1 thru S-6, S-7/20 and S-27 under geocomposite cover system similar to grandfathered application with hummocky profile. Install revetment for shoreline protection.	Protective of public health and the environment as wastes will be moved from several SWMUs, consolidated into SW-CAMU and placed beneath geosynthetic cap; thereby isolating waste from direct contact and reducing/eliminating migration potential.	Compliant with SCGs; SW-CAMU will be constructed and operated in accordance with 1993 CAMU Rule.	Effective and permanent in the long term with maintenance, and engineering and institutional controls.	Reduces mobility of contamination by consolidation of waste under geosynthetic cover with stormwater drainage improvements. Does not reduce toxicity or volume of waste.	This CAMU will be operated (open) for a period of 5-6 years to allow for consolidation of SWMUs waste/fills, followed by final cover construction in year 7. Impact to the community will be limited as community air monitoring will be completed, and dust suppression and typical landfill O&M techniques will be employed. Off-site truck traffic will increase due to the need to import soil and other materials (~2,000 truck loads) for the final cover system.	This involves the use of proven technologies and construction methodologies. Construction of final cap will need to occur during the spring/summer/fall construction season.	30-yr Present Worth Cost: $18,800,000; Capital Cost: $18,300,000; 30-yr O&M Cost: $460,000
Alternative 2: Close In-Place SWMUs S-1, S-2, S-3, S-4, S-5, S-6, Use SWMU S-7 & S-20 for SW-CAMU, Incorporate Waste from S-27 to the impoundments beneath cover system.	4.3 acre SW-CAMU in the footprint of SWMU-S7/20 consisting of a low-permeability geocomposite liner, leachate collection system and low-permeability cover. Relocate between 27,000 and 115,000 CY of waste/slag fill from various SWMUs across the CMS area for encapsulation in the SW-CAMU. Close in-place SWMUs (S-1 to S-6, the "impoundments"). Waste from SWMUs S-27 and SWMU-S-7/20, and demolition and construction debris from the Tecumseh Site (Est. 15,000 to 94,000 CY) plus slag generated from the Site would be relocated into the impoundments to provide minimum grades beneath a low-premeability geocompsite cover (same construction as used for the SW-CAMU).	Protective of public health and the environment as wastes will be moved from several SWMUs, consolidated into SW-CAMU and placed between low permeability liner and cap with leachate collection nominally 40 feet above the water table; thereby isolating waste from direct contact and eliminating migration potential. Reduced foot print easier to maintain.	Compliant with SCGs; SW-CAMU will be constructed and operated in accordance with 1993 CAMU Rule.	Effective and permanent in the long term with maintenance, and engineering and institutional controls.	Reduces mobility of contamination by stabilization of the wastes prior to consolidation into the SW-CAMU (geosynthetic liner, leachate collection and of waste under geosynthetic cover with stormwater drainage improvements. Does not reduce toxicity or volume of waste.	This CAMU will be operated (open) for a period of 5-6 years to allow for consolidation of SWMUs waste/fills, followed by final cover construction in year 7. Impact to the community will be limited as community air monitoring will be completed, and dust suppression and typical landfill O&M techniques will be employed. Off-site truck traffic will increase due to the need to import soil and other materials (~2,000 truck loads) for the final cover system.	This involves the use of proven technologies and construction methodologies. Construction of final cap will need to occur during the spring/summer/fall construction season.	This is the most cost effective method for proper on-site management of residual solid waste requires further action throughout the CMS Area. 30-yr Present Worth Cost: $17,500,000; Capital Cost: $16,900,000; 30-yr O&M Cost: $610,000
SFA ZONE 3 SUB-AREA:								
SWMU S-10 Slag Quench Area J								
Alternative 1: No Further Action	No further action; leave pit as-is	Protective of public health and the environment.	Compliant with SCGs; slag meets ISCOs and site-specific SCOs.	This alternative is effective in the long-term and a permanent remedy for managing the SWMU slag; however, a physical hazard remains.	No impact; therefore no need for reduction in toxicity, mobility, or volume of contamination.	No short-term impacts are associated with implementation of this alternative.	No technical or administrative implementability issues are associated with alternative.	There are no capital or O&M costs associated with this alternative.
Alternative 2: Cover In-Place	Grade the sides of the pit to eliminate vertical drop and steep side slopes	Protective of public health and the environment. Added protection from physical hazard.	Compliant with SCGs; slag meets ISCOs and site-specific SCOs.	This alternative is effective in the long-term and a permanent remedy for managing the SWMU slag and physical hazard.	No impact; therefore no need for reduction in toxicity, mobility, or volume of contamination.	Filling and grading of the SWMU is a short-term action on the order of one month. Short-term exposures to workers and the community would be effectively controlled through implementation of community air monitoring, PPE, and dust controls.	No technical or administrative implementability issues are associated with alternative.	Total Capital Cost: $134,000; No O&M Costs.

TABLE 5-5

EVALUATION OF CORRECTIVE MEASURE ALTERNATIVES
SFA ZONE 4 SUB-AREA

Alternative by SWMU	Summary of Alternative	Overall Protectiveness of Public Health and the Environment	Compliance with SCGs	Long-Term Effectiveness & Permanence	Reduction in Toxicity, Mobility or Volume of Contamination through Treatment	Short-Term Impacts & Effectiveness	Implementability	Cost-Effectiveness
SFA ZONE 4 SUB-AREA:								
SWMU S-12 Asbestos Landfill L								
Alternative 1: No Further Action (NFA)	The bagged asbestos waste would remain within the existing landfill. The eroding cover of fine slag (1- to 3-foot thick) would remain.	Not protective of public health and the environment as the existing cap is eroding and may eventually expose/ release waste to the environment.	Not compliant with SCGs. While the landfill was operated and closed following permit requirements, the eroding cap no longer complies with these requirements.	No long-term effectiveness or permanence. Eroding of slag cover is expected to continue.	No reduction in toxicity, mobility, or volume of contamination.	No short-term impacts are associated with implementation of this alternative.	No technical or administrative implementability issues are associated with alternative.	There are no capital or O&M costs associated with the NFA alternative.
Alternative 2: Excavate and Consolidate in SW-CAMU	Excavate and consolidate the asbestos waste into the SW-CAMU.	Protective of public health and the environment in the long-term as the asbestos waste will be removed from the SWMU and encapsulated in the SW-CAMU (liner, leachate collection, geocomposite CAMU cover system).	Compliant with SCGs long-term. May exceed SCGs in short-term during excavation and handling.	Effective and permanent once the waste is consolidated in the SW-CAMU celll; subject to continuing cap OM&M, and engineering and institutional controls	Long-term mobility of contamination would be reduced as the asbestos-containing bags would be overpacked in plastic and sealed before placing in the SW-CAMU cell. No reduction in toxicity or volume of contamination.	This alternative is expected to require 2 to 3 months for completion. Short-term risks to workers and the community exist under this alternative due to potential exposure to friable asbestos if bags are damaged or become damaged during removal. Dust suppression, prudent construction & transportation techniques, and PPE would lower these risks. However, the risks of asbestos release remains higher than Alternatives 1 and 3. Short-term risks to the environment from exposed asbestos entering the atmosphere would be discovered through monitoring and controlled.	No administrative implementability issues are associated with the alternative. Although this alternative is technically implementable, extreme care must be taken to prevent the release of asbestos during excavation, transportation, and interment at the SW-CAMU.	Consolidation in the SW-CAMU has a significant short-term risk of asbestos release during excavation and handling with no added protection to the environment. However, by utilizing safe work practices and PPE, the removal of the asbestos can be done safely and relocating the waste to the SW-CAMU has the advantage of opening up land for slag reclamation and redevelopment, and makes the administration of the waste easier as it would be located in the SW-CAMU. Capital Cost: $73,000; No annual O&M costs.
Alternative 3: Upgrade Cover System	Upgrade cap by adding sufficient slag for 1-foot slag cover; mound cap to promote drainage away from this area thereby eliminating potential for cap erosion	Protective of public health and the environment with maintenance of the cap.	Compliant with SCGs; once repaired, the cap will exceed permit requirements	Effective and permanent in the long term with cap maintenance, and engineering and institutional controls.	Reduces potential short- and long-term mobility of asbestos by repairing eroded cap. No reduction in toxicity or volume of contamination.	This alternative is expected to require one to two weeks for construction of cap improvements. Short-term exposures will be minimized through proper use of PPE, safe work practices, and dust control.	No technical or administrative implementability issues are associated with alternative.	This is the most cost effective means for achieving the goal of long-term permanent storage of the asbestos waste. 30-yr Present Worth Cost: $31,000; Capital Cost: $22,000; 30-yr O&M Cost: $8,000.
Alternative 2: Excavate and Off-Site Disposal at TSDF	Similar to Alternative 2 except waste is transported to a TSDF	Protective of public health and the environment in the long-term as the asbestos waste will be removed from the SWMU and encapsulated at commercial TSDF (liner, leachate collection, geocomposite cover system).	Compliant with SCGs long-term. May exceed SCGs in short-term during excavation and handling.	Effective and permanent once the waste is consolidated in a commercial TSDF	Long-term mobility of contamination would be reduced as the asbestos-containing bags would be overpacked in plastic and sealed before transporting off-site. No reduction in toxicity or volume of contamination.	This alternative is expected to require 2 to 3 months for completion. Short-term risks to workers and the community exist under this alternative due to potential exposure to friable asbestos if bags are damaged or become damaged during removal. Dust suppression, prudent construction & transportation techniques, and PPE would lower these risks. However, the risks of asbestos release remains higher than Alternatives 1 and 3. Short-term risks to the environment from exposed asbestos entering the atmosphere would be discovered through monitoring and controlled.	No administrative implementability issues are associated with the alternative. Although this alternative is technically implementable, extreme care must be taken to prevent the release of asbestos during excavation, transportation, and off-site transportation.	Excavating and transporting the waste has a significant but controllable short-term risk of asbestos release during excavation and handling with no added protection to the environment. However, by utilizing safe work practices and PPE, the removal of the asbestos can be done safely and relocating the waste off-site has the advantage of opening up land for slag reclamation and redevelopment. Capital Cost: $150,000; No annual O&M costs.
SWMU S-13 (HWMU1A)								
Alternative 1: No Further Action	This SWMU was closed in accordance with NYSDEC requirements, which included a cap consisting of slag to provide grade for promoting drainage, 2 feet of low-permeability clay (<$1x10^{-7}$ cms), 60 mil-HDPE geomembrane, 1.5-foot thick vegetative support soil layer, and 6 inches of topsoil. Landfill 30-year post-closure care began January 1989.	Protective of public health and the environment as the waste is contained under a low permeability cap and waste sits above the groundwater table.	Compliant with SCGs; VOC and PAH concentrations in groundwater downgradient of Unit are decreasing or staying the same	Effective and permanent in the long term with continued post-closure O&M, and engineering and institutional controls.	No reduction in toxicity or volume of contamination. Mobility is reduced by cover system.	No short-term impacts are associated with implementation of this alternative.	No technical or administrative implementability issues are associated with alternative.	There are no capital costs associated with the NFA alternative. 30-Year O&M Cost: $31,000
Alternative 2: Excavate, Transport and Dispose off-Site at TSDF	Excavate.load, and transport the estimated 5,600-23,000 CY of hazardous waste off-site to commercial TSDF. Backfill with slag or grade area to reduce physical hazards. Costs include provisions for off-site disposal as hazardous waste and as hazardous TENORM waste.	Protective of public health and the environment as the waste will be contained in a secure landfill on-site.	Compliant with SCGs; removal would meet ISCOs with exception of some VOCs and naphthalene in groundwater localized to the unit.	Provides long-term effectiveness and permanence	Would reduce the volume of waste on-site, would not affect the toxicity or volume of waste. Once reloacted to a TSDF with cover, the mobility of the soluble constituents in the waste fill may be further reduced as there would be a bottom liner and leachate collection; although, the reduction in mobility from its current situation is expected to be minor and would potentially result in short-term mobility of wastes (odors, volatiles and dust) during excavation, transportation, and off-site consolidation in TSDF.	Remedial implementation time is expected to require 2-3 months. Public health and the environment would potentially be impacted during the excavation, transportation and consolidation as the waste would be exposed to precipitation and atmospheric conditions. Dust suppression, prudent construction & transportation techniques, and proper use of PPE would help mitigate these risks.	No technical or administrative implementability issues are associated with alternative, other than potential complications from TENORM waste which may protract identifying an appropriate out-of-state disposal facility.	Capital Cost: $13,000,000 to 52,000,000 depending upon the TENORM conditions; No annual O&M costs.
SWMU S-14 General Rubble Landfill N								
Alternative 1: No Further Action	No further action; leave waste in-place.	Not protective of public health and the environment. Although primarily in the subsurface where direct contact, and exposure to wind or storm water erosion, total PAH concentrations exceed CP-51 SCO.	Subsurface samples exceed CP-51 total PAH concentration of 500 mg/kg in samples up to 16 fbgs below top of mound. Surface samples did not contain exceedances of ISCOs.	Does not provide long-term effectiveness and permanence.	No reduction in toxicity, mobility, or volume of contamination.	No short-term impacts are associated with implementation of this alternative.	No technical or administrative implementability issues are associated with alternative.	There are no capital or O&M costs associated with the NFA alternative.

TABLE 5-5

EVALUATION OF CORRECTIVE MEASURE ALTERNATIVES
SFA ZONE 4 SUB-AREA

Alternative by SWMU	Summary of Alternative	Overall Protectiveness of Public Health and the Environment	Compliance with SCGs	Long-Term Effectiveness & Permanence	Reduction in Toxicity, Mobility or Volume of Contamination through Treatment	Short-Term Impacts & Effectiveness	Implementability	Cost-Effectiveness
SFA ZONE 4 SUB-AREA:								
Alternative 2: Excavate and Consolidate in SW-CAMU	Excavate PAH-impacted slag (~16,000 CY) and consolidate in SW-CAMU.	Protective of public health and the environment as the slag/fill exceeding ISCOs and CP-51 SCO would be moved from the SWMU and encapsulated in the SW-CAMU cell (liner, leachate collection and low-permeability cover.)	Compliant with SCGs	Provides long-term effectiveness and permanence, provided lower 20 feet of mound are not impacted.	Reduces mobility of contamination as PAH impacted slag would be placed in SW-CAMU containment cell (liner, leachate collection, and low permeability cover); however, toxicity or volume of contamination would not be reduced.	Short-term exposures to workers during excavation and disposition of the waste in the SW-CAMU would be effectively controlled through PPE, safe work practices, and dust control measures. There are no significant risks to the community, workers, or the environment.	Excavations in slag/fill can be extremely difficult particularly if the excavation needs to proceed beyond 20 feet into the mound and/or involves molten slag. No administrative implementability issues are associated with alternative, once the SW-CAMU has been constructed.	Consolidation in SW-CAMU is not as cost-effective as NFA. Capital Cost: $365,000; Annual O&M costs are associated with the SW-CAMU.
Alternative 3: Geocompsite Cover System	Grade residuals, cap in-place with a demarcation layer, bedding layer, 30-mil GCL liner, 12" barrier protection layer. Engineering and institutional controls required.	Protective of public health and the environment as the waste will be contained beneath a low-permeability cover.	PAH impacts would remain beneath the cover system.	Provides long-term effectiveness and permanence.	Reduces mobility of contamination as PAH-impacted slag would be contained beneath a low-permeability cover similar to that used for the SW-CAMU; however, toxicity or volume of contamination would not be reduced.	Short-term exposures to workers during grading of slag/fill would be effectively controlled through PPE and dust controls. There are no significant risks to the community, workers, or the environment.	No technical or administrative implementability issues are associated with alternative.	Low permeability cap is equally effective as consolidation in SW-CAMU or offsite TSDF. Present Worth Cost: $177,000; Capital Cost: $166,000; 30-yr OM&M costs for Cap Maintenance: $15,000.
Alternatives 4A Excavation and Off-Site Disposal of Entire Mound Contents	Excavate entire mound contents (est. at 57,000 CY), Load, transport off-site at TSDF. TENORM considerations for disposal of material	Protective of public health and the environment as the waste will be reloacted off-site and disposed in a lined, cell with leachate collection and a low permeability cap.	Compliant with SCGs	Provides long-term effectiveness and permanence.	Reduces mobility of contamination as PAH impacted slag would be placed in TSDF containment cell (liner, leachate collection, and low permeability cover); however, toxicity or volume of contamination would not be reduced.	Short-term exposures to workers during grading of slag/fill would be effectively controlled through PPE and dust controls. There are no significant risks to the community, workers, or the environment.	No technical or administrative implementability issues are associated with alternative, other than potential complications from TENORM waste which may protract identifying an appropriate out-of-state disposal facility.	Off-site disposal is the most expensive cost option for this SWMU remediation. Present Worth Cost: $7,800,000 to $50,000,000 assuming waste is high TENORM and non-hazardous.
Alternatives 4B: Slag/Scrap Steel Reclamation; Excavation and Off-Site Disposal at TSDF for PAH-Impacted Slag/Fill	Reclaim slag/scrap steel; PAH-impacted slag/fill; load and transport off-site for disposal at TSDF (est. 16,000 CY). TENORM considerations for disposal of material	Protective of public health and the environment as the waste will be reloacted off-site and disposed in a lined, cell with leachate collection and a low permeability cap.	Compliant with SCGs	Provides long-term effectiveness and permanence.	Reduces mobility of contamination as PAH impacted slag would be placed in TSDF containment cell (liner, leachate collection, and low permeability cover); however, toxicity or volume of contamination would not be reduced.	Short-term exposures to workers during grading of slag/fill would be effectively controlled through PPE and dust controls. There are no significant risks to the community, workers, or the environment.	No technical or administrative implementability issues are associated with alternative, other than potential complications from TENORM waste which may protract identifying an appropriate out-of-state disposal facility.	This alternative is also expensive but less than Alternative 4A. Present Worth Cost: $2,800,000 to $15,000,000 assuming waste is high TENORM and non-hazardous.
SWMU S-15 General Rubble Landfill O								
Alternative 1: No Further Action	Leave in place the estimated 1,000 CY of debris consisting of tires, bricks, steel, etc. that resides on the surface of this SWMU.	Not protective of public health and the environment as the debris is a nuisance condition.	Compliant with SCGs; only one slight exceedance of Protection of Groundwater SCO.	Does not provide long-term effectiveness and permanence due to nuisance condition.	There are no exceedances of the ISCOs	No short-term impacts are associated with implementation of the NFA alternative.	No technical or administrative implementability issues are associated with the NFA alternative.	There are no capital or O&M costs associated with the NFA alternative.
Alternative 2: Remove Debris for Salvage with Unsalvageable C&D Debris to SFA Zone 2 Impoundments	Reclaim salvageable materials with leftover debris consolidated into SFA Zone 2 Impoundments prior to cap installation. This alternative allows this SWMU area to be opened for slag reclamation or redevelopment.	Protective of public health and the environment. Improves Site conditions by removing solid waste (e.g., tires) and enhances natural resource recovery by reclaiming salvageable materials (e.g., steel)	Compliant with SCGs; alternative removes nuisance condition.	Provides long-term effectiveness and permanence.	There are no exceedances of the ISCOs	Short-term exposures to workers during removal of salvageable material would be effectively controlled through PPE and dust controls. There are no significant risks to the community or environment.	No technical or administrative implementability issues are associated with this alternative.	This is the most cost effective alternative for dealing with the debris in this SWMU. The capital costs associated with salvaging debris and relocation of the unsalvageable materials to the impoundments are estimated at $26,000.
Alternative 3: Remove Debris for Salvage with Unsalvageable C&D Debris to OFF-Site TSDF	Essentially the same as Alternative 2; Except send unsuitable materials to off-site TSDF							This is the most expensive alternative. The capital costs associated with salvaging debris and relocation of the unsalvageable materials to an off-site TSDF are estimated at $75,000.
Alternative 4: Cover In-Place	Reclaim salvageable materials; grade remaining C&D; cap in-place with a minimum 12" BUD slag.	Protective of public health and the environment by eliminating direct contact and reducing/eliminating migration potential from wind and stormwater migration.	Compliant with SCGs; alternative removes nuisance condition.	Provides long-term effectiveness and permanence.	There are no exceedances of the ISCOs	Short-term exposures to workers during removal of salvageable material would be effectively controlled through PPE and dust controls. There are no significant risks to the community or environment.	No technical or administrative implementability issues are associated with this alternative.	Recovering recyclables and covering debris with a slag cap is more costly than Alternatives 1 and 2. Present Worth Cost: $34,000; Capital Cost: $26,000; 30-yr OM&M costs for Cap Maintenance; $7,700.
SWMU S-16, S-23 and AOC-D								
Alternative 1: No Further Action	To remain in SWMU S-16, an estimated 6,000 CY of spent pickle liquor (SPL)-impacted slag; PVC cover damaged in 2005. To remain in SWMU-23 and ACO-D, an estimated 9,500 CY of coal tar impacted slag	Not protective of public health and the environment due to the significantly damaged cover system and presence of potentially hazardous waste fill at or near the surface of the Unit.	SWMU S-16: Slag/fill compliant with ISCOs and the samples did not fail hazardous waste characteristics per EP Toxicity testing. Downgradient groundwater impacts observed. SWMU S-23 is tar-waste buried beneath slag cover contains exceedances of CP-51 SCO for total PAHs. Two tar samples (RFI) exhibited hazardous waste characteristics for benzene. Samples of tar waste from AOC-D did not exhibit hazardous waste characteristics. Slag fill samples collected adjacent to and beneath the tar waste fill in S-23 and AOC-D did not contain any significant concentrations of benzene.	NFA is not a long term and permanent remedy.	No reduction in toxicity, mobility, or volume of contamination.	No short-term impacts are associated with implementation of the NFA alternative.	No technical or administrative implementability issues are associated with the NFA alternative.	There are no capital or O&M costs associated with this alternative.

TABLE 5-5

EVALUATION OF CORRECTIVE MEASURE ALTERNATIVES
SFA ZONE 4 SUB-AREA

Alternative by SWMU	Summary of Alternative	Overall Protectiveness of Public Health and the Environment	Compliance with SCGs	Long-Term Effectiveness & Permanence	Reduction in Toxicity, Mobility or Volume of Contamination through Treatment	Short-Term Impacts & Effectiveness	Implementability	Cost-Effectiveness
SFA ZONE 4 SUB-AREA:								
Alternative 2: Excavate and Dispose Off-Site	Same as Alternative 2 except the hazardous waste would be disposed off-site at a TSDF.	Protective of public health and the environment as the waste will be removed, treated, and contained in a secure off-site landfill.	Compliant with SCGs for slag/fill; groundwater impacts would be monitored for natural attenuation.	Provides long-term effectiveness and permanence. This alternative is more protective than Alternatives 1 or 3.	Toxicity, mobility, and volume of contamination on-site would be permanently reduced. The waste would be treated off-site at the TSDF prior to land disposal and/or the waste would be recycled (used for fuel); therefore, the mobility, toxicity, and possibly the volume of waste would ultimately be reduced.	This remedial effort is expected to require ~8 to 12 months. Short term releases to the groundwater are expected during the removal action due to increases in infiltration of water contacting soluble waste constituents and shortened distances of travel as the excavation proceeds with depth. Commingling of the waste will be inevitable as the waste will need to be excavated simultaneously. Short-term exposure to workers during excavation and transporting of the waste would be effectively controlled through PPE, dust controls, and performance of community air monitoring to assess migration of airborne vapors and particulates. Minor potential for disruption of community due to truck traffic and transporting hazardous waste on city roads.	Very deep excavation (~40ft) may required to remove the SPL sludge from S-16. Technically feasible, but extremely difficult with a large over excavation required , complicated by the presence of S-23 that surround S-16 on three sides. Administrative implementability issues include the need for off-site disposal approval by the TSDF and potential complications from TENORM waste which may protract identifying an appropriate out-of-state disposal facility.	Not a cost effective alternative to achieving the RAO for the SWMUs as the cost is a factor of 10+ times the cost of Alternative 3. Capital Cost: $9,000,000 to $35,000,000 depending upon the TENORM considerations. No annual O&M costs.
Alternative 3: Contain In-Place under Geocomposite Cover System	Construct geocomposite cover system consisting of: geotextile cushion, 40-mil HDPE liner, drainage layer, 12-inch barrier protection soil, and 6-inch vegetated topsoil layer.	Protective of public health and the environment as the waste will be contained beneath low-permeability cover system and graded to promote storm drainage away from the area. S-16 distance to groundwater from base of impacted slag a minimum of 10 feet. S-23 distance to groundwater from base of tar waste is a minimum of 20 +feet. Downgradient groundwater impacts expected to improve with reduced infiltration due to cover system.	Does not meet SCGs; however, low permeability cover, physical barrier, and institutional controls will prevent direct contact with waste. Groundwater impacts are localized and marginal in this area, and are expected to significantly improve in response to covering the wastes.	Effective and permanent in the long term with cap maintenance, and engineering and institutional controls.	Reduces mobility of contamination through physical isolation; however, toxicity or volume of contamination is not reduced.	Estimated construction time is 2-3 months. Short-term exposures to workers during construction of the cap would be effectively controlled through PPE. There are no significant risks to the community, workers, or the environment.	No technical or administrative implementability issues are associated with alternative.	Containing the waste in-place is a cost-effective approach as a similar degree of protection is achieved and is significantly less than off-site disposal. 30-yr present worth cost: $501,000; Capital Cost: $470,000; 30-yr O&M Cost: $31,000.
SWMU S-17 Vacuum Carbonate Landfill Q								
Alternative 1: No Further Action	Non-hazarous liquid waste (spent carbonate waste liquid containing thiocyanate, cyanide, and selenium) disposed in two parallel trenches excavated in slag approx. 300 feet long, 6-10 feet wide, and 2-4 feet deep would remain as-is.	Protective of public health and the environment as the only exceedance of an ISCO was mercury found in one slag fill sample at a depth of 6 to 7 fbgs.	Generally compliant with SCGs; only one sample exceeded an ISCO (mercury) in the subsurface but did not exhibit hazardous waste characteristics (TCLP). Mercury was not part of the waste stream that was disposed in this SWMU. Mercury not detected in downgradient groundwater.	Provides long-term effectiveness and permanence due to the depth of the one mercury detection and the unlikely probability of any widespread mercury contamination of the slag.	No reduction in toxicity, mobility, or volume of contamination. However, mercury is generally not mobile in subsurface unsaturated fill slag.	No short-term impacts are associated with implementation of the NFA alternative.	No technical or administrative implementability issues are associated with the NFA alternative.	There are no capital costs associated with the NFA alternative.
Alternative 2: Placement of Supplemental Slag Cover	Grading and placement of a minimum 12" slag over SWMU area to prevent direct contact and eliminate potential physical safety hazards.	Protective of public health and the environment. Increased cover thickness over waste/fill with one ISCO exceedance reduces direct exposure potential and physical hazard.	Generally compliant with SCGs; one sample exceeded ISCO for mercury but did not fail the TCLP test. Mercury not detected in downgradient groundwater.	Provides long-term effectiveness and permanence with institutional controls.	No reduction in toxicity or volume of contamination. No reduction in mobility as mercury is generally immobile in unsaturated subsurface slag fill.	Remedial action would require ~ 2 weeks. Short-term exposures to workers during construction of the slag cover would be effectively controlled through PPE and dust controls. There are no significant risks to the community, workers, or the environment.	No technical or administrative implementability issues are associated with alternative.	Present Worth Cost: $47,000 Capital Cost: $39,000. OMM Costs $7,700 for 30 years of cap maintenance
Alternative 3: Excavate and Dispose Off-Site at TSDF	Excavation of mercury-impacted slag/fill, loading and transportation off-site to TSDF. Consideration for TENORM.	Protective of public health and the environment as the waste will be removed from the site and relocated to a commercial TSDF in a cell with liner, leachate collection and low-permeability cover.	Compliant with SCGs	Provides long-term effectiveness and permanence.	Eliminates mobility of contamination due to relocation to off-site TSDF, but does not reduce toxicity or volume of contamination.	Excavation, loading and transportation of waste is a short-term action on the order of one week. Short-term exposures to workers and the community would be effectively controlled through implementation of community air monitoring, PPE and dust controls. The RAO would be achieved once the waste has relocated off-site.	No technical or administrative implementability issues are associated with alternative, other than potential complications from TENORM waste which may protract identifying an appropriate out-of-state disposal facility.	Off-site disposal is more costly that Alternatives 1 and 2. Capital Cost: $82,000 to $1,200,000; No annual O&M costs. High cost reflects TENORM considerations.
SWMU S-18 (AOC-A) Lime Dust and Kish Landfill								
Alternative 1: No Further Action	The exposed piles of lime dust and Kish placed on the slag fill surface would remain as-is	Not protective of public health or the environment due to potential exposure to lead-bearing waste (TCLP > 5mg/L) waste and elevated levels of lead (>ISCO) on the ground surface.	Not compliant with SCGs; exceedances of ISCO for lead.	No long-term effectiveness or permanence.	No reduction in toxicity, mobility, or volume of contamination.	No short-term impacts are associated with implementation of this alternative.	No technical or administrative implementability issues are associated with alternative.	There are no costs associated with the NFA alternative.
Alternative 2: Excavate and Consolidate Lead-Impacted Waste Exceeding ISCO and Lime Waste in SW-CAMU	Excavate waste/fill with lead >ISCO & lime piles and consolidate in SW-CAMU; remainder of slag could be reclaimed.	Protective of public health and the environment as the waste will be moved from the SWMU and encapsulated in SW-CAMU.	Compliant with SCGs; residuals would meet ISCOs.	Provides long-term effectiveness and permanence with proper SW-CAMU OM&M.	Reduces mobility of contamination through physical isolation in SW-CAMU. Volume and toxicity of contamination unaffected.	Remedial action is expected to require approximately 1-2 months for completion. Short-term exposures to workers during waste excavation and relocation would be effectively controlled through PPE, safe work practices, and dust controls. There are no significant risks to the community, workers, or the environment.	No technical or administrative implementability issues are associated with alternative. The SW-CAMU need to be prepared to receive this waste.	This is a cost effective alternative that achieves the RAOs and provides improved level of protection over Alternatives 1 and 4. Capital Cost: $117,000; no annual O&M cost.

TABLE 5-5

EVALUATION OF CORRECTIVE MEASURE ALTERNATIVES
SFA ZONE 4 SUB-AREA

Alternative by SWMU	Summary of Alternative	Overall Protectiveness of Public Health and the Environment	Compliance with SCGs	Long-Term Effectiveness & Permanence	Reduction in Toxicity, Mobility or Volume of Contamination through Treatment	Short-Term Impacts & Effectiveness	Implementability	Cost-Effectiveness
SFA ZONE 4 SUB-AREA:								
Alternative 3: Excavate Lead-Impacted Waste Exceeding ISCO and Lime Waste and Dispose Off-Site	Excavate waste/fill with lead >ISCO & lime piles and consolidate in SW-CAMU; TENORM considerations for off-site disposal.	Protective of public health and the environment as the waste will be moved from the SWMU and encapsulated in off-site TSDF	Compliant with SCGs; residuals would meet ISCOs.	Provides long-term effectiveness and permanence	Reduces mobility of contamination through physical isolation in TSDF. Volume and toxicity of contamination unaffected.	Remedial action is expected to require approximately 1-2 months for completion. Short-term exposures to workers during waste excavation and relocation would be effectively controlled through PPE, safe work practices, and dust controls. There are no significant risks to the community, workers, or the environment.	No technical or administrative implementability issues are associated with alternative other than potential complications from TENORM waste which may protract identifying an appropriate out-of-state disposal facility.	This is more costly than alternatives 1 and 2, the low cost (non-TENORM) is approximately the same as Alternative 4. Capital Cost: $646,000 to $3,700,000 depending upon TENORM consideration; no annual O&M cost.
Alternative 4: Low-Permeability Cover System	A geocomposite liner would be installed consisting of 30-mil GCL, geocushion geotextile, and one foot of BUD slag or select fill would be placed over the remaining lead- and lime-impacted waste/fill (entire SWMU footprint) with no slag reclamation or redevelopment.	The cover would require maintenance to eliminate direct exposure risks.	Waste/fill left in place exceed ISCOs.	Effective and permanent in the long term with cap maintenance, and engineering and institutional controls.	The toxicity, mobility, and volume of contamination in the remaining waste/fill would not be reduced.	Remedial action is expected to require approximately 1 month for completion. Short-term exposures to workers during cap placement would be effectively controlled through PPE, safe work practices, and dust controls. There are no significant risks to the community, workers, or the environment.	No technical implementability issues are associated with alternative. Administrative implementability issues include the need for NYSDEC approval for containing waste/fill in-place.	This is more expensive than Alternative 2, and is approximately the same as Alterantive 3 non-TENORM cost. Long-term maintenance would be required and slag reclamation would be prohibited. 30-yr Present Worth Cost: $601,000; Capital Cost: $570,000; 30-yr O&M Cost: $31,000.
SWMU S-28 "Drum" Landfill								
Alternative 1: No Further Action	No corrective measures on SWMU	Protective of public health and the environment as no drums or contamination were found during test trench investigation	Compliant with SCGs; slag fill samples only identified benzo(a)pyrene at a concentration slightly above the ISCO; no samples exceeded site-specific SCOs or Protection of Groundwater	This alternative is effective in the long-term and a permanent remedy.	No reduction in toxicity, mobility, or volume of contamination.	No short-term impacts are associated with implementation of this NFA alternative.	No technical or administrative implementability issues are associated with the NFA alternative.	There are no capital or O&M costs associated with the NFA alternative.

TABLE 5-6

EVALUATION OF CORRECTIVE MEASURE ALTERNATIVES
COAL, COKE, & ORE HANDLING & STORAGE SUB-AREA AND TANK FARM SWMU GROUP SUB-AREA

Alternative by SWMU	Summary of Alternative	Overall Protectiveness of Public Health and the Environment	Compliance with SCGs	Long-Term Effectiveness & Permanence	Reduction in Toxicity, Mobility or Volume of Contamination through Treatment	Short-Term Impacts & Effectiveness	Implementability	Cost-Effectiveness
COAL, COKE & ORE HANDLING AND STORAGE SUB-AREA								
SWMU S-19 Murphy's Mountain								
Alternative 1: No Further Action	Pile containing an estimated 51,000 CY of slag and C&D debris would remain in-place.	Protective of public health and the environment.	Two slag/fill samples slightly exceeded benzo(a)pyrene ISCO; Protection of GW SCOs exceed for 3 PAHs, nickel, and selenium.	Provides long-term effectiveness and permanence.	No reduction in toxicity, mobility, or volume of contamination.	No short-term impacts are associated with implementation of this alternative.	No technical or administrative implementability issues are associated with alternative.	There are no capital or O&M costs associated with the NFA alternative.
Alternative 2: Excavate, Reclaim Slag/Scrap Metal and Relocate Unsuitable Materials to SW-CAMU	Excavate, reclaim slag and scrap metals, reuse slag as on-site backfill or sell as slag product. Assumes 10,000 CY of unsuitable materials will be identified and dealt with according to the SFMP.	Protective of public health and the environment.	Two slag/fill samples slightly exceeded benzo(a)pyrene ISCO; Protection of GW SCOs exceed for 3 PAHs, nickel, and selenium.	Provides long-term effectiveness and permanence. Improves Site redevelopment potential by removing the slag pile thereby opening up 10 acres of land.	No reduction in toxicity, mobility, or volume of contamination.	No short-term impacts.	No technical or administrative implementability issues are associated with alternative.	Total Capital Cost: $310,000; No O&M costs
Alternative 3: Cover In-Place	Grade residuals, cap in-place with a minimum of 12" of slag. Engineering and institutional controls required.	Protective of public health and the environment by eliminating direct contact and reducing/eliminating migration potential from wind and storm water erosion.	Two slag/fill samples slightly exceeded benzo(a)pyrene ISCO; Protection of GW SCOs exceed for 3 PAHs, nickel, and selenium.	Provides long-term effectiveness and permanence.	No reduction in toxicity, mobility, or volume of contamination.	Short-term exposures to workers during grading and cap placement would be effectively controlled through PPE and dust controls. There are no significant risks to the community, workers, or the environment.	No technical or administrative implementability issues are associated with alternative.	Covering debris with a slag cap is more costly than Alternatives 1 and 2. Present Worth Cost: $350,000; Capital Cost: $319,000; 30-yr O&M costs for Cap Maintenance; $31,000.
Alternatives 4 Excavation and Off-Site Disposal at TSDF	Excavate entire mound contents (est. at 51,000 CY), Load, transport off-site at TSDF. TENORM considerations for disposal of material	Protective of public health and the environment as the waste will be reloacted off-site and disposed in a lined, cell with leachate collection and a low permeability cap.	Compliant with SCGs	Provides long-term effectiveness and permanence.	Reduces mobility of contamination as PAH impacted slag would be placed in TSDF containment cell (liner, leachate collection, and low permeability cover); however, toxicity or volume of contamination would not be reduced.	Short-term exposures to workers during grading of slag/fill would be effectively controlled through PPE and dust controls. There are no significant risks to the community, workers, or the environment.	No technical or administrative implementability issues are associated with alternative, other than potential complications from TENORM waste which may protract identifying an appropriate out-of-state disposal facility.	Off-site disposal is the most expensive cost option for this SWMU remediation. Present Worth Cost: $7,000,000 to $45,000,000 assuming waste is high TENORM and non-hazardous.
SWMU S-25 Landfill/Impoundment under North End of Coal Pile								
Alternative 1: No Further Action	1.4-acre SWMU formerly used to store scrap metal for reclamation would remain as-is.	Protective of public health and the environment.	Slag samples are compliant with ISCOs and site specific background for arsenic.	Provides long-term effectiveness and permanence.	There are no exceedances of the ISCOs	No short-term impacts are associated with implementation of this alternative.	No technical or administrative implementability issues are associated with alternative.	There are no capital or O&M costs associated with the NFA alternative.
TANK FARM SWMU GROUP SUB-AREA								
SWMU GROUP P-8, 74, 75 Tank Farm								
Tank Farm Slag/Fill								
Alternative 1: No Further Action	No corrective measures to address the approx. 4-acre area containing petroleum and coal tar constituents in slag fil.	Not protective of public health or the environment due to potential exposure to SVOC-impacted slag at the ground surface.	Not compliant with SCGs; SVOCs exceed ISCOs and gross impact observed.	This alternative is not effective in the long-term or a permanent remedy.	No reduction in toxicity, mobility, or volume of contamination.	No short-term impacts are associated with implementation of this alternative.	No technical or administrative implementability issues are associated with alternative.	There are no capital or O&M costs associated with the NFA alternative.
Alternative 2:Excavate Petroleum Source Material and Consolidate in SW-CAMU, Excavate Mercury-Impacted Slag/Fill and Dispose Off-Site	Excavate, stabilize NAPL-impacted slag/fill (primarily No. 6 oil), and place into SW-CAMU (est. volume 70,000 CY). Excavate mercury-impactred slag/fill, load and transport off-site to TSDF for disposal (est. volume 1,800 CY). TENORM is a complicating factor for the mercury impacted slag/fill to be sent off-site for disposal. Partially backfill and grade area for restoration.	Protective of public health and the environment as the waste will be removed from the SWMU and encapsulated in an engineered containment cell with liner, leachate collection and low-permeability cover system.	Compliant with SCGs, removal would meet ISCOs.	Effective and permanent for contaminated slag/fill removal. Localized residual groundwater contamination will exist.	Reduces mobility and toxicity of contamination through stabilization of NAPL and physical isolation in an engineered cell. Volume of contamination would not be reduced.	This remedial effort is expected to extend over a 12-month period due to the cemented nature and depth of impacted slag/fill. During removal activities, release of petroleum products to the groundwater will be unavoidable as the product will become mobilized once pockets of NAPL are encountered. Additionally, odors and vapors will be generated from this operation. Short-term exposures to workers during excavation and disposition of the waste in the SW-CAMU would be effectively controlled through safe work practices, PPE, and dust controls; although use of explosives would add risk to workers. Risks to the community would be controlled by implementation of the community air monitoring plan.	Although technically implementable, excavation of the slag/fill would be extremely difficult and slow as the slag was placed in a molten state (making it massive and compact) throughout much of this area. Potential complications from TENORM waste which may protract identifying an appropriate out-of-state disposal facility.	Consolidation in SW-CAMU is most cost-effective approach to achieve RAOs. Provides protection to the environment but residual groundwater issue remains. Capital Cost: $5,100,000 to $6,400,000; No annual O&M cost.

TABLE 5-6

EVALUATION OF CORRECTIVE MEASURE ALTERNATIVES
COAL, COKE, & ORE HANDLING & STORAGE SUB-AREA AND TANK FARM SWMU GROUP SUB-AREA

Alternative by SWMU	Summary of Alternative	Overall Protectiveness of Public Health and the Environment	Compliance with SCGs	Long-Term Effectiveness & Permanence	Reduction in Toxicity, Mobility or Volume of Contamination through Treatment	Short-Term Impacts & Effectiveness	Implementability	Cost-Effectiveness
Alternative 3: Excavate Petroleum-Impacted and Mercury-Impacted Slag/Fill and Off-Site Disposal	Essentially the same as Alternative 2 except all impacted sla/fill would be sent off-site for disposal at a TSDF. TENORM is a complicating factor for all slag/fill to be sent off-site for disposal.	Protective of public health and the environment as the waste will be removed from the SWMU and encapsulated in an engineered containment cell with liner, leachate collection and low-permeability cover system.	Compliant with SCGs, removal would meet ISCOs.	Effective and permanent for contaminated slag/fill removal. Localized residual groundwater contamination will exist.	Reduces mobility and toxicity of contamination through stabilization of NAPL and physical isolation below a low permeability geosynthetic cover; volume of contamination would not be reduced.	This remedial effort is expected to extend over a 12-month period due to the cemented nature and depth of impacted slag/fill. During removal activities, release of petroleum products to the groundwater will be unavoidable as the product will become mobilized once pockets of NAPL are encountered. Additionally, odors and vapors will be generated from this operation. Short-term exposures to workers during excavation and disposition of the waste in the SW-CAMU would be effectively controlled through safe work practices, PPE, and dust controls; although use of explosives would add risk to workers. Risks to the community would be controlled by implementation of the community air monitoring plan.	Although technically implementable, excavation of the slag/fill would be extremely difficult and slow as the slag was placed in a molten state (making it massive and compact) throughout much of this area. Potential complications from TENORM waste that will require identifying a facility that can handle the waste volumes.	This is the most costly alternative. Capital Cost: $13,000,000 to $66,000,000; No annual O&M cost.

TABLE 5-7

EVALUATION OF CORRECTIVE MEASURE ALTERNATIVES
FORMER COKE PLANT & BY-PRODUCTS FACILITY SUB-AREA

Alternative by SWMU	Summary of Alternative	Overall Protectiveness of Public Health and the Environment	Compliance with SCGs	Long-Term Effectiveness & Permanence	Reduction in Toxicity, Mobility or Volume of Contamination through Treatment	Short-Term Impacts & Effectiveness	Implementability	Cost-Effectiveness
FORMER COKE PLANT & BY-PRODUCTS FACILITY SUB-AREA								
SWMU GROUP P-1 to P-6								
Alternative 1: No Further Action	NFA entails leaving the six open-topped concrete quench pits containing water and residual sediment as-is.	Not protective of public health and the environment due to the physical hazards associated with the unprotected sidewalls and potential for falling into the pits.	Not compliant with SCGs as residuals would remain in pits; minor exceedances of ISCOs.	Does not provide long-term effectiveness or permanence	No reduction in toxicity, mobility, or volume of contamination with the NFA alternative.	No short-term impacts are associated with implementation of the NFA alternative.	No technical or administrative implementability issues are associated with the NFA alternative.	There are no capital or O&M costs associated with the NFA alternative.
Alternative 2: Clean-out Pits and Consolidate in SW-CAMU	Pump-out approx. 200,000 gallons of water, pretreat if necessary, and discharge to ECSD #6 via sanitary sewer. Remove residuals (~195 CY) for solidification and consolidation in SW-CAMU. Remove above grade pit walls and backfill to grade with slag.	Protective of public health and the environment.	Compliant with SCGs	Effective and permanent.	Permanent reduction in toxicity, mobility, and volume of impounded water through treatment and off-site disposal. Solid residuals may require dewatering and possibly solidification thereby increasing their volume prior to consolidation in the SW-CAMU; however, toxicity and mobility would be reduced through stabilization and consolidation beneath geocomposite cover system.	Short-term exposure to workers during removal of residuals would be effectively controlled through safe work practices, use of PPE, and dust controls. Risks to the community would be controlled by implementation of the community air monitoring plan.	Readily implementable once the SW-CAMU has been constructed. Administrative implementability issues include receiving approval from ECSD #6 for discharge of pretreated water.	Consolidation in SW-CAMU is a cost-effective approach; provides equal level of protection as Alternatives 3 and 4. Capital Cost: $145,000; no O&M costs.
Alternative 3: Backfill Quench Pits	Pump-out water, pretreat water if necessary, and discharge to ECSD #6 via sanitary sewer. Leave solid residuals in-place and backfill to grade with slag; remove aboveground portion of pits.	Protective of public health and the environment.	Compliant with SCGs	Effective and permanent.	Permanent reduction in toxicity, mobility, and volume of impounded water through treatment and off-site disposal. No reduction in toxicity, mobility, or volume of solid residuals.	Short-term exposure to workers during water treatment and backfilling of the tanks would be effectively controlled through safe work practices, use of PPE, and dust controls. Risks to the community would be controlled by implementation of the community air monitoring plan.	No technical implementability issues are associated with alternative.Administrative implementability issues include receiving approval from ECSD #6 for discharge of pretreated water.	Consolidation in-place is a cost-effective approach; provides equal level of protection as Alternatives 2 and 4. Capital Cost: $139,000. No O&M costs.
Alternative 4: Excavation and Off-Site Disposal at TSDF	Pump-out water, pretreat water if necessary, and discharge to ECSD #6 via sanitary sewer. Remove residuals (~195 CY) for solidification, transportation and disposal off-site at TSDF. Backfill to grade with slag; remove aboveground portion of pits.	Protective of public health and the environment.	Compliant with SCGs	Effective and permanent.	Permanent reduction in toxicity, mobility, and volume of impounded water through treatment and off-site disposal. No reduction in toxicity, mobility, or volume of solid residuals.	Short-term exposure to workers during water treatment and backfilling of the tanks would be effectively controlled through safe work practices, use of PPE, and dust controls. Risks to the community would be controlled by implementation of the community air monitoring plan.	No technical implementability issues are associated with alternative.Administrative implementability issues include receiving approval from ECSD #6 for discharge of pretreated water.	Off-site disposal is the most costly of the alternatives. Capital Cost: $171,000. No O&M costs.
SWMU GROUP P-7/P-9/P-10								
Alternative 1: No Further Action	No further action to remove hazardous residuals from P-9 or tar-impacted residuals from P-7 and P-10	Not protective of public health and the environment.	Not compliant with SCGs; P-9 residuals (~1,000 CY) exceed ISCOs and the tar portion contains leachable levels of benzene > 5 mg/L. P-10 contains ~200 CY of tar-impacted surface slag/fill with total PAHs > 500 mg/kg.	Does not provide long-term effectiveness or permanence	No reduction in toxicity, mobility, or volume of contamination.	No short-term impacts are associated with implementation of the NFA alternative.	No technical or administrative implementability issues are associated with the NFA alternative.	There are no capital or O&M costs associated with the NFA alternative.
Alternative 2: Excavate, Treat (if necessary) and Consolidate Residuals in SW-CAMU	Excavate non-haz residuals from P-7 (~800 CY) and P-10 (~200 CY), treat if required to solidify the residuals so they can be transported to SW-CAMU for consolidation; backfill P-7 with slag.	Protective of public health and the environment	Compliant with SCGs	Effective and permanent	Mobility of waste residuals would be reduced through placement in SW-CAMU (low-permeability geocomposite liner, leachate collection and low-permeability cover); however, volume of contamination will not be reduced.	This remedial effort is expected to require ~1 month. Short-term exposure for workers during removal of residuals would be effectively controlled through PPE and dust controls. Risks to the community would be controlled by implementation of the community air monitoring plan.	Technically implementable once the SW-CAMU has been constructed. Administrative implementability issues include requiring approval from ECSD #6 for discharge of P-7 water.	This is the most cost effective and protective solution for the managing SWMU wastes. Capital Cost: $88,000; no annual O&M cost. Fractional cost for construction and O&M of SW-CAMU not included with the cost estimate.
Alternative 3: Construct Geocomposite Cover System	Leave residuals in place and construct geocomposite cover system consisting of: geotextile cushion, 60-mil HDPE liner, 12-inch barrier protection layer, and 6-inch seeded topsoil layer.	Protective of public health and the environment with maintenance of the cap.	Does not meet media specific SCGs; however, geocomposite cover system, and institutional controls will prevent direct contact with the waste.	Effective and permanent in the long term with maintenance of the cap, and engineering and institutional controls.	Reduces mobility of contamination through physical isolation, but does not reduce the toxicity or volume of contamination.	This remedial effort is expected to require ~1 month. Short-term exposure for workers during removal of residuals would be effectively controlled through PPE and dust controls. Risks to the community would be controlled by implementation of the community air monitoring plan.	No technical implementability issues are associated with alternative. Administrative implementability issues include the need for NYSDEC approval for containing the waste in-place.	This is more expensive than Alternative 2, and requires long-term maintenance institutional and engineering controls that are not required for Alternatives 2 or 4. 30-yr Present Worth Cost: $106,000; Capital Cost: $91,000; 30-yr O&M Cost: $15,000.

TABLE 5-7

EVALUATION OF CORRECTIVE MEASURE ALTERNATIVES
FORMER COKE PLANT & BY-PRODUCTS FACILITY SUB-AREA

Alternative by SWMU	Summary of Alternative	Overall Protectiveness of Public Health and the Environment	Compliance with SCGs	Long-Term Effectiveness & Permanence	Reduction in Toxicity, Mobility or Volume of Contamination through Treatment	Short-Term Impacts & Effectiveness	Implementability	Cost-Effectiveness
Alternative 4: Excavate and Off-Site Disposal at TSDF	Similar to Alternative 2 except residuals would be disposed off-site instead of consolidating on-site. TENORM considerations may complicate disposal of residuals off-site.	Protective of public health and the environment	Compliant with SCGs.	Effective and permanent	Mobility of cheical consitiuents in residuals would be reduced through placement in engineered off-site containment cell; however, volume of contamination will not be reduced.	This remedial effort is expected to require ~1 month. Short-term exposure for workers during removal of residuals would be effectively controlled through PPE and dust controls. Risks to the community would be controlled by implementation of the community air monitoring plan.	Technically implementable. Administrative implementability issues include requiring approval from ECSD #6 for discharge of P-7 water, and TENORM considerations.	This is much more expensive than managing wastes on-site per Alternative 2 and does not provide additional benefit. Capital Cost: $205,000 to $788,000; no annual O&M cost.
COKE PLANT BY-PRODUCTS SUB-AREA								
OPERABLE UNIT 4 (P-11, P-12, P-11A)								
Alternative 1: No Further Action	Shut-down SVE operations in the P-11 area. Groundwater pump and treatment to continue.	Not protective of public health and the environment due to residual levels of contamination (e.g., tar) in the surface soils.	Not compliant with chemical-specific SCGs.	Not a long-term effective or permanent alternative.	No reduction in toxicity, mobility, or volume of contamination.	No short-term impacts are associated with implementation of the NFA alternative.	No technical or administrative implementability issues are associated with the NFA alternative.	There are no capital or O&M costs associated with the NFA alternative.
Alternative 2A: Vegetated Soil Cover	Install a one foot vegetated soil cap over the OU-4 area (27 acres). The cap will prevent direct contact with the surficial materials in this area and will be designed to provide a hummocky appearance with vegetation including trees to provide a natural setting. Most if not all structure will be demolished. Groundwater pump and treatment will continue.	Protective of public health and the environment.	Compliant with SCGs by preveting direct contact with surficial materials.	Effective and permanent in the long term with cap maintenance.	No reduction in toxicity, mobility, or volume of contamination.	No short-term impacts are associated with implementation of this alternative.	No technical or administrative implementability issues are associated with alternative.	This is equally effective as Alternative 2B but is more costly. 30-yr Present Worth Cost: $1,680,000; Capital Cost: $1,640,000; 30-yr O&M Cost: $31,000.
Alternative 2B: BUD-Approved Slag Cover	Essentially the same as Alternative 2A, except slag would be used in lieu of a vegetated soil cover, landscaping would not be done.	Protective of public health and the environment.	Compliant with SCGs by preveting direct contact with surficial materials.	Effective and permanent in the long term with cap maintenance.	No reduction in toxicity, mobility, or volume of contamination.	No short-term impacts are associated with implementation of this alternative.	No technical or administrative implementability issues are associated with alternative.	This is equally effective as Alternative 2A and is lower cost. 30-yr Present Worth Cost: $1,040,000; Capital Cost: $1,020,000; 30-yr O&M Cost: $8,000.
SWMU S-26 Fill Area Near Coke Battery No. 8								
Alternative 1: No Further Action	NFA would leave the coal-tar impacted slag/fill in place.	Protective of public health and the environment due to de minimis quantity of tar waste which is buried beneath 6 feet of slag above the water table which thereby eliminates concerns from direct human contact and threats to groundwater.	Not fully compliant with chemical-specific SCGs but de minimis quantity of tar waste present at a depth of 6 to 7 feet.	Long-term effective and permanent alternative with institutional controls (Soil Fill Management Plan).	No reduction in toxicity, mobility, or volume of contamination.	No short-term impacts are associated with implementation of this alternative.	No technical or administrative implementability issues are associated with alternative.	There are no costs associated with the NFA alternative
Alternative 2: Excavation and Off-Site Disposal in TSDF	Excavate ~20,000 CY of coal-tar impacted slag/fill proximate to 60" water line to 16 fbgs. Load and transport to off-site TSDF. TENORM consideration; backfill with BUD slag or other fill meeting ISCOs.	Protective of public health and the environment as the waste will be moved from the SWMU and contained in a secure impoundment.	Compliant with SCGs.	Effective and permanent	Reduces mobility of contamination, but does not reduce toxicity or volume of contamination.	Potential damage to the 60" industrial water line and shut-down of the line during remediation is a concern for the businesses served by the water supply. Short-term exposures to workers during excavation and transfer of waste to disposal location would be effectively controlled through PPE and dust controls. There are no significant risks to the community, workers, or the environment.	Technical implementability concern excavating proximate to 60" industrial water line. Administrative implementability is associated with shutting down the water, impacting local businesses. TENORM is a consideration for the disposal of the waste slag/fill.	This is not a cost effective means for handling the tar waste due to proximity to major water industrial line. Capital Cost: $3,600,000 to $18,200,000; no annual O&M cost.

TABLE 5-7

EVALUATION OF CORRECTIVE MEASURE ALTERNATIVES
FORMER COKE PLANT & BY-PRODUCTS FACILITY SUB-AREA

Alternative by SWMU	Summary of Alternative	Overall Protectiveness of Public Health and the Environment	Compliance with SCGs	Long-Term Effectiveness & Permanence	Reduction in Toxicity, Mobility or Volume of Contamination through Treatment	Short-Term Impacts & Effectiveness	Implementability	Cost-Effectiveness
Alternative 3: Excavation and Relocation to SW-CAMU	Similar to Alternative 2; waste relocated to SW-CAMU.	Protective of public health and the environment as the waste will be moved from the SWMU and contained in a secure impoundment.	Compliant with SCGs.	Effective and permanent	Reduces mobility of contamination, but does not reduce toxicity or volume of contamination.	Potential damage to the 60" industrial water line and shut-down of the line during remediation is a concern for the businesses served by the water supply. Short-term exposures to workers during excavation and transfer of waste to disposal location would be effectively controlled through PPE and dust controls. There are no significant risks to the community, workers, or the environment.	Technical implementability concern excavating proximate to 60" industrial water line. Administrative implementability is associated with shutting down the water, impacting local businesses.	This is not a cost effective means for handling the tar waste due to proximity to major water industrial line. Capital Cost: $1,170,000; no annual O&M cost.

TABLE 5-8

EVALUATION OF CORRECTIVE MEASURE ALTERNATIVES
WATERCOURSES AND GROUNDWATER DISCHARGE SUB-AREAS

Alternative by Watercourse and Groundwater DischargeSub- Area	Summary of Alternative	Overall Protectiveness of Public Health and the Environment	Compliance with SCGs	Long-Term Effectiveness & Permanence	Reduction in Toxicity, Mobility or Volume of Contamination through Treatment	Short-Term Impacts & Effectiveness	Implementability	Cost-Effectiveness
WATERCOURSES								
Smokes Creek								
Lower Reach Alternative 1: No Further Action, beyond the Completed ICM	An ICM was completed in the Lower Reach in 2009 by removing soft sediments and placing the sediments in the USCOE Confined Disposal Facility at the north side of the Tecumseh property. After dredging, the chemical nature of sediment in the Lower Reach contains similar compounds and concentrations to the levels that exist in the Upper Reach.	Protective of human health and the environment	Compliant with SCGs	Provides long-term effectiveness and permanence.	The ICM substantially removed the most contaminated sediments from the Lower Reach. Sediments were placed into the USCOE Confined Disposal Facility for containment; thereby reducing mobility of contamination.	No short-term impacts are associated with implementation of this alternative.	No technical or administrative implementability issues are associated with alternative.	There are no costs associated with NFA. Biennial dredging is not part of the CMS.
Upper Reach Alternative 1: Maintenance Dredging	Maintenance dredging to restore the floodway is required to be performed by others. As part of restoration of the flood control design stream configuration, residual contamination in the Upper Reach will be removed to the depth dredged. Dredged spoils are anticipated to be placed in CDF at the north end of the Tecumseh site.	Protective of human health and the environment	Compliant with SCGs	Provides long-term effectiveness and permanence together with corrective measures along Smokes Creek.	Compound concentrations in the Upper Reach and the sediments would likely be placed into the USACE CDF; thereby reducing toxicity, and mobility of the sediment.	Short-term impacts include disruption of the bottom sediments that will impact wildlife; impacts will be controlled by implementing sediment control techniques such as silt curtains.	No technical implementability issues are associated with alternative. Administrative implementability issues include USACE approval for the maintenance dredging and disposal in the CDF.	There are no costs associated with the Upper Reach as dredging is the responsibility of others.
North Return Water Trench								
Alternative 1: No Further Action	No remedial measures would be implemented in the NRWT	Protective of public health and the environment based on the human health & ecological risk assessment.[1] Residual contamination is isolated from discharging from NRWT into an environmental receptor.	Compliant with SCGs.	Provides long-term effectiveness and permanence.	There is no significant contamination in the NRWT.	No short-term impacts are associated with implementation of this alternative.	No technical or administrative implementability issues are associated with alternative.	There are no costs associated with NFA.
Alternative 2: Remove Debris	Removal of C&D debris from the NRWT; install concrete bulkhead at northern property limit; backfill with slag or other fill meeting ISCOs.	Protective of public health and the environment based on the human health & ecological risk assessment.[1] Residual contamination is isolated from discharging from NRWT into an environmental receptor.	Compliant with SCGs	Provides long-term effectiveness and permanence.	There is no significant contamination in the NRWT.	Short-term exposures to workers during debris removal and backfilling would be effectively controlled through PPE, dust controls, and safe work practices. There are no significant risks to the community, workers, or the environment.	No technical or administrative implementability issues are associated with alternative.	Capital Cost: $183,000. No O&M Costs.
South Return Water Trench								
Alternative 1: No Further Action	Sediment results from the SRWT showed the presence of SVOCs, PCBs, and several inorganic compounds similar to those identified in the sediments in Smokes Creek.	Not protective of public health based on the public health risk assessment.[1]	Similar types of compounds at similar concentrations (same order of magnitude) are detected in Smokes Creek and SRWT. The sediments in the SRWT are more isolated from the public as a weir exists limiting water craft access to the trench.	NFA does not provide long-term effectiveness or permanence.	No reduction in toxicity, mobility, or volume of contamination.	No short-term impacts are associated with implementation of this alternative.	No technical or administrative implementability issues are associated with alternative.	There are no costs associated with NFA.
Alternative 2: Dredge Sediment and Consolidate in SW-CAMU, CDF or Off-Site TSDF	Mechanical/hydraulic dredging to remove contaminated sediments (est. 8,000 CY), dewater, and dispose in SW-CAMU or the USACE CDF at the north end of the Tecumseh Site. Option provided for off-site disposal at TSDF. Restore channel by placing filter fabric and 12 inches of 2"+- sized BUD-Approved slag.	Protective of public health and the environment. However, the flow conditions in Smokes Creek will at times (e.g., flooding during spring thaws) reverse flow into the SRWT potentially causing recontamination of the sediments. Therefore, dredging would occur following maintenance dredging of Smokes Creek.	Compliant with SCGs; impacted sediment will be removed. Action-specific SCGs required for working within the stream include approval of the NYSDEC and USACE.	Long-term effectiveness and permanence depends on maintenance dredging of Smokes Creek occuring prior to implementation of this alternative.	Reduces mobility of contamination through physical isolation in SW-CAMU or CDF, and reduces volume through dewatering of sediment; no reduction in toxicity.	Short-term impacts to aquatic wildlife will occur during removal/capping as sediment will become entrained in the water. Sediment migration will be limited by using temporary silt curtains during sediment removal. Silt curtains will be installed immediately downgradient of the work area, reducing the area affected. Silt curtains will be removed and moved as necessary and at least daily to enable trapped aquatic wildlife to escape the work zone. Minimal disturbance to terrestrial animals is expected as the sides of the trench are sheet-piled or brick lined and nearly vertical.	Sediment removal is technically implementable using proven technologies. Administrative implementability issues include the need for USACE and NYSDEC approval of this removal action.	Capital Cost: $690,000 to $1,370,000 (off-site disposal); no annual O&M cost.
Alternative 3: Contain In-Place	Capping of contaminated sediments in-place with a nominal 0.5- to 1-ft cover layer of stone over geotextile fabric.	Protective of public health and the environmental by capping contaminated sediment reducing potential impact to the food chain. However, the flow conditions in Smokes Creek will at times (e.g., flooding during spring thaws) reverse flow into the SRWT thereby potentially causing recontamination of the sediment. Therefore, dredging would occur following maintenance dredging of Smokes Creek.	Not compliant with chemical-specific SCGs. Action-specific SCGs required for working within the stream include approval of the NYSDEC and USACE.	Long-term effectiveness and permanence depends on maintenance dredging of Smokes Creek occuring prior to implementation of this alternative.	Reduces mobility of contamination through capping; no reduction in toxicity or volume of contamination.		Sediment capping is technically implementable using proven technologies. Administrative implementability issues include the need for USACE and NYSDEC approval of the capping.	Total Present Worth: $331,000; Capital Cost: $254,000; $77,000 for 30-years of O&M.

TABLE 5-8

EVALUATION OF CORRECTIVE MEASURE ALTERNATIVES
WATERCOURSES AND GROUNDWATER DISCHARGE SUB-AREAS

Alternative by Watercourse and Groundwater DischargeSub- Area	Summary of Alternative	Overall Protectiveness of Public Health and the Environment	Compliance with SCGs	Long-Term Effectiveness & Permanence	Reduction in Toxicity, Mobility or Volume of Contamination through Treatment	Short-Term Impacts & Effectiveness	Implementability	Cost-Effectiveness
GROUNDWATER DISCHARGE SUB-AREAS								
Discharge Sub-Areas 2A, 2B, 3A, 4A, 4B, and 5 (not previously addressed)								
Alternative 1: No Further Action	No further action	This is protective of public health. The use of groundwater on the CMS area and the entire former Bethlehem Steel property is restricted to remedial purposes only under a deed restriction. Thus, public health impacts from groundwater consumption is not a factor. This may not be protective of environment if groundwater quality degradation occurs.	This is mostly compliant with SCGs (i.e., the NYS GWQS) at the property limits. Residual levels of groundwater contamination are expected to continue to diminish due to the proposed consolidation of wastes into the SW CAMUs, Off-Site TSDF, or close/cover in place.	Not effective in the long-term since monitoring of the groundwater would not be performed.	The consolidation of the wastes into the SW CAMUs, Off-Site TSDF, or close/cover in place proposed will reduce the toxicity, leaching and volume of contamination to the groundwater; however, this would not be confirmed without monitoring.	There is no short term impacts or effectiveness associated with implemention of this alternative.	No technical or administrative implementability issues are associated with the NFA alternative.	There are no costs associated with the NFA alternative.
Alternative 2: Monitored Natural Attenuation	Implementation of the Long-Term Groundwater Monitoring Plan	This alternative is protective of human health and the environment. The use of groundwater on the CMS area and the entire former Bethlehem Steel property is restricted to remedial purposes only under a deed restriction. Thus, public health impacts from groundwater consumption is not a factor. As discussed in Section 4.8.7.1, of the 123 wells in which comparative data was available from the RFI and CMS, over 50% of the wells have shown improvement in the 20 year period. Therefore, natural attenuation is occurring. This may not be protective of environment if groundwater quality degradation occurs which would be monitored under this alternative and addressed, if necessary. This alternative coupled with the consolidation of wastes into the SW CAMUs, Off-Site TSDF, or close/cover in place proposed will remove and /or isolate groundwater contamination source areas and allow natural attenuation further enhance groundwater quality within the CMS area.	This alterative is mostly compliant with SCGs (i.e., NYSDEC GWQS) at the property limits. Residual levels of contamination are expected to continue to diminish and this alternative coupled with the consolidation of wastes into the SW CAMUs, Off-Site TSDF, or close/cover in place proposed will remove and /or isolate groundwater contamination source areas and allow natural attenuation further enhance groundwater quality within the CMS area. Compliace with SCG would be monitored under this alternative.	This alternative is effective in the long-term as the groundwater will be monitored and, if necessary, the remedial approach can be adjusted if groundwater conditions change. Long-term monitoring is expected to show decreasing trends in the contaminant levels as have been seen over the past 20 years with over 50% of the wells indicating improving groundwater quality conditions.	As discussed in Section 4.8.7.1, over 50% of the wells that that have comparative date from the RFI and CMS have shown improvement in the past 20 year period. Therefore, natural attenuation is occurring. Continued reduction in toxicity, mobility and volume would be monitored under this alternative. This alternative coupled with the consolidation of wastes into the SW CAMUs, Off-Site TSDF, or close/cover in place proposed will reduce the toxicity, mobility and volume of groundwater contamination source areas and to the groundwater, which would be confirmed through monitoring.	There are no short-term impacts associated with implementation of this alternative. This alternative coupled with the groundwater use institutional control and SW CAMU, Off-Site TSDF disposal, and close/cover system installations proposed will generally meet the short-term goals discussed in Section 3.3 – Groundwater Quality Objectives by preventing, minimizing, or eliminating: unacceptable exposes to contaminated groundwater; source of groundwater contamination; and spread of contamination. The short-term impacts and effectiveness would be monitored under this alternative.	No technical or administrative implementability issues are associated with this alternative.	This is a cost effective method for managing the residual groundwater contamination. 30-yr Present Worth Cost: $976,000; Capital Cost $126,000; 30-yr Present Worth O&M Costs $850,000.
Alternative 3: Secondary and Tertiery Groundwater Extraction & Treatment	Installation of groundwater extraction wells (estimated at 26, subject to further engineering analysis) in DSAa 2A, 2B, 3A and 4A to collect groundwater contamination that has migrated from source areas to protect discharge to surface water bodies (e.g., Lake Erie). Groundwater collected would be conveyed via force main to the existing ATP and/or OU-4 treatment systems.	This alternative is protective of human health and the environment. The use of groundwater on the CMS area and the entire former Bethlehem Steel property is restricted to remedial purposes only under a deed restriction. Thus, public health impacts from groundwater consumption is not a factor. The secondary GWE&T of contamination migrating from source areas will reduce groundwater contaminant levels. The tertiary GWE&T of groundwater discharging along the water bodies will reduce contaminant loadings to the water bodies. Thus, the secondary and tertiary GWE&T will further protect the environment. This alternative coupled with the consolidation of wastes into the SW CAMU or Off-Site TSDF disposal (as appropriate) or close/cover in place will eliminate sources of groundwater contamination present in the subsurface (SW CAMU/Off-Site TSDF disposal) and eliminate infiltration contact with source materials (close/cover in place) which will reduce migration of contaminants into the groundwater.	This alternative is mostly compliant with SCGs (i.e., the NYS GWQS) at the property limits. Secondary and tertiary GWE&T will further reduce contaminants in the groundwater associated with source areas and the contaminant mass loadings to the surface water bodies. Groundwater contaminant levels are expected to further reduce with the removal and consolidation of source areas in to the SW CAMU, Off-Site TSDF disposal, and close/cover system installations proposed. This alternative coupled with the groundwater use institutional control and SW CAMU, Off-Site TSDF disposal, and close/cover system installations proposed will meet the short-term goals discussed in Section 3.3 – Groundwater Quality Objectives by preventing, minimizing, or eliminating: unacceptable exposes to contaminated groundwater; source of groundwater contamination; and spread of contamination; The long-term goals are met by protecting human health and the environment; achieve cleanup objectives appropriate to current and future expected land use (industrial); and remediate the sources of releases.	This alternative is effective in the long-term as the groundwater will be extracted and treated downgradient of source areas and along water body discharge locations to reduce contaminant loadings. This alternative coupled with the groundwater use institutional control, SW CAMU, Off-Site TSDF disposal, and close/cover system installations proposed will eliminated sources and is expected to show decreasing trends in the groundwater contaminant levels and water body loadings as source areas will be removed. Monitoring will be completed as part of the LTGWMP and, if necessary, the remedial approach can be adjusted if groundwater conditions change.	The secondary & tertiary GE&T of groundwater will reduce the toxicity, mobility and volume of contaminants present in the groundwater and discharging to the water bodies. The consolidation of the wastes into the SW CAMU, Off-Site TSDF disposal, or covering the wastes in-place proposed will reduce the toxicity, leaching and volume of source contamination to the groundwater. This would be confirmed through the implementation of the LTGWMP.	There are no short-term impacts associated with implementation of this alternative. As discussed in compliance with SCGs section, this alternative coupled with the groundwater use institutional control and SW CAMU, Off-Site TSDF disposal, and close/cover system installations proposed the short-term goals by preventing, minimizing, or eliminating: unacceptable exposes to contaminated groundwater; source of groundwater contamination; and spread of contamination.	No technical or administrative Implementability issues are associated with this alternative. Need to increase discharge quantity from the ATP treatment system to accommodate the increased flow (with ECSD #6) and/or obtain an underground injection permit from USEPA for the treated groundwater.	This is a cost effective method for managing groundwater migration from source areas and reducing the contaminant mass loadings to the surface water bodies. Total Capital Cost: $1,410,000. The 30-yr O&M Costs for treatment of groundwater are covered under the ATP and OU-4 OMM (Estimated at $1,500,000 each, for a total of $3,000,000 refer to Table 5-9).

Notes: 1. RFI, URS.

TURNKEY ENVIRONMENTAL RESTORATION, LLC | BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 5-9

SUMMARY OF RECOMMENDED CORRECTIVE MEASURES AND ESTIMATED COSTS

SWMU Name	SWMU Designation	SMWU Description	Waste/Fill Characterization and Estimated Volume	Description of Recommended Corrective Measures	Capital Cost [1, 2]	Operation & Maintenance Costs (present worth) [1, 2]	Total Estimated Cost of Recommended Alternative [1, 2]	Notes and Assumptions
SFA ZONE 2 SUB-AREA:								
Closure of Impoundments S-1, S-2, S-3, S-4, S-5, & S-6 and construct SW-CAMU in SWMU S-7/20	S-1, S-2, S-3, S-4, S-5, S-6, S-7/-20 & S-27	The Impoundments: Approx.11.5 acres of this area designated for closure in-place; SW-CAMU consisting of S-7/-20 approx. 4.3 acres.	Impoundments: Estimated in-place volume of residuals in S-1 to S-6 = 570,000 CY, relocate waste from SWMU S-27 (up to 24,000 CY), 14,000 to 35,000 CY of waste from SWMU S-7/20 and C&D debris from Tecumseh site. SW-CAMU In-place volume of residuals in S-7/20 = 283,000 CY; consolidate 27,000 to 115,000 CY of solid waste from other SWMUs	*Alternative 2: Close In-Place SWMUs S-1, S-2, S-3, S-4, S-5, S-6 and Reduced SW-CAMU Footprint* Enhanced with Base Liner and Leachate Collection System- Construct revetment along shoreline; close impoundments by relocating SWMU S-27 waste, S-7/20 wastes, and C&D debris into SWMUs S-1 to S-6, grade waste to otain a minimum 4% slope and install low-premeability geocompsite vegetated cover. Construct SW-CAMU low permeabiility geocomposite liner, leachate collection system, consolidate solid waste/fill from selected SWMUs & C&D debris over a 7-year period; construct geosynthetic/soil cover system, and storm water controls.	$15,980,000	$1,480,000	$17,500,000	30-year post-closure period. Capital costs includes revetment and slope stabilization of Approx. $4,500,000
SFA ZONE 3 SUB-AREA:								
Slag Quench Area J	S-10	Approx. 3-acre open pit historically used for staging and quenching molten slag from BOF (quenching fluid including water and weak ammonia liquor)	No waste present	*Alternative 2: Cover In-Place* - Grade pit to create stable side slopes and eliminate physical hazard posed by deep depression	$134,000	$0	$134,000	Allows this area to released for slag reclamation
SFA ZONE 4 SUB-AREA:								
Asbestos Landfill	S-12	Asbestos Landfill L: 100' L x 25' W x 16' D (Permitted LF No. 2278; Facility No. 15S12); bagged, tagged, and sealed asbestos	Approx. 450 CY of bagged asbestos	*Alternative 2: Excavate and Consolidate in SW-CAMU* - Relocate bagged asbestos to SW-CAMU, grade depression to remove physical hazards	$73,000	$0	$73,000	
Coal Tar Sludge Landfill (HWMU-1A)	S-13	HWMU-1A closed in October 1988 under Consent Order. Waste covered with Part 373 multi-layer geosynthetic/ soil cover system 9 feet thick; groundwater at approx. 40 fbgs	Approx. 5,600 to 23,000 CY of sludge, slag, coke fines, coal tar tank bottoms, and acid tar from 1 to 13 fbgs	*Alternative 1: No Further Action* - Includes continued monitoring and cap maintenance for 30-year post-closure period	$0	$31,000	$31,000	Assume 30-year post-closure period
General Rubble Landfill N	S-14	Mound covering approx. 1 acre; 35-45 feet above surrounding grade with steeply-sloped sides; groundwater 40-50 fbgs (from base of mound)	Approx. 57,000 CY of slag with scrap, construction debris, wood, and glass; estimated 16,000 CY of PAH-impacted slag (>500 mg/kg total PAHs)	*Alternative 2: Excavate and Consolidate PAH-Impacted Waste/Fill in SW-CAMU* - Excavate impacted waste approx. 16 feet from top of mound in central area of SWMU; reclaim slag under BUD	$365,000	$0	$365,000	Quantity of impacted slag expected to vary as lower approx. 20 feet of mound not investigated
General Rubble Landfill O	S-15	Approx. 150' by 60' pile of deposited metal/debris intermingled with slag fill; groundwater approx. 24 fbgs (from base of pile)	Approx. 1,000 CY of scrap metal/billets, brick, rubble, steel/iron buttons, and tires mixed with slag. No exceedances of ISCOs	*Alternative 2: Remove Debris for Salvage with Unsalvageable Debris to SW-CAMU and/or Off-Site Disposal* - Recycle scrap metal and tires off-site; consolidate debris in SW-CAMU; reclaim slag under BUD	$26,000	$0	$26,000	

TABLE 5-9

SUMMARY OF RECOMMENDED CORRECTIVE MEASURES AND ESTIMATED COSTS

SWMU Name	SWMU Designation	SMWU Description	Waste/Fill Characterization and Estimated Volume	Description of Recommended Corrective Measures	Capital Cost [1, 2]		Operation & Maintenance Costs (present worth) [1, 2]	Total Estimated Cost of Recommended Alternative [1, 2]		Notes and Assumptions
SFA ZONE 4 SUB-AREA:										
SPL Landfill (HWMU-1-B) and Adjacent Tar Pit	S-16, S-23 & AOC-D	S16: HWMU-1B, Lime Stabilized Spent Pickle Liquor (SPL) Landfill; SPL sprayed onto lime-rich slag; approx. 0.25 acres; 30-mil PVC moisture barrier installed over waste in 1986, cover destroyed by wind in 2005. S-23: Tar pit around three sides of S-16 with portion of deposit in AOC-D; extends 1-17 fbgs, 6-ft avg. thickness	S-16: Approx. 6,000 CY of SPL-impacted slag; no exceedances of ISCOs; not hazardous S-23 and AOC-D: Approx. 10,000 CY of tar waste fill; S-23 samples exhibited hazardous waste characteristic for benzene; total PAHs >500 mg/kg, gross impact	*Alternative 3: Construct Geocomposite Cover System* - Relocate tar waste from AOC-D to S-23 foot print; grade and cap S-16/S-23 waste with low-permeability geosynthetic/soil cover system	$470,000		$31,000	$501,000		Quantity of waste associated with S-23 expected to increase as limits of waste appear to extend beneath SWMU S-14 footprint
Vacuum Carbonate Blowdown Landfill Q	S-17	Two parallel trenches (approx. 300' L x 6-10' W x 2-4' D) used for disposal of vacuum carbonate blowdown solution containing thiocyanate, cyanide, and selenium from coke oven gas desulfurization process; liquid quantities disposed are unknown	Mercury detected above ISCO in one sample; mercury not a known constituent of waste stream; mercury not detected in nearest downgradient well (MWN-12). Volume of mercury-impacted slag/fill not know, assumed 1,000 CY	*Alternative 3: Excavate and Disposa Off-Site at TSDF* - Excavate mercuty-impacted slag fill and dipose off-Site at TSDF, grade area to eliminate physical safety hazard	$82,000	$1,200,000	$0	$82,000	$1,200,000	Higher of two costs reflects off-site disposal of mercury-impacted slag/fill as TENORM non-hazardous waste
Lime Dust and Kish Landfill R	S-18; AOC-A	Irregular shaped area with surficial waste piles	Approx. 1,800 CY of lead above ISCO and 2,400 CY of spent lime impacted residuals in AOC-A	*Alternative 2: Excavate and Consolidate Lead-Impacted and Lime Waste in SW-CAMU* - Relocate waste to SW-CAMU with lined cell, leachate collection and beneath low-permeability geosynthetic/soil cover system	$117,000		$0	$117,000		
Drum Landfill	S-28	Identified in RFI as a pit; however, area is relatively flat and moderately vegetated	No drums found; one slight exceedance of ISCO for benzo(a)pyrene	*Alternative 1: No Further Action* - Option to reclaim slag under BUD	$0		$0	$0		Slag reclamation not considered a remedial cost
COAL, COKE & ORE HANDLING AND STORAGE SUB-AREA:										
Landfill AA (Murphy's Mountain)	S-19	Stockpiled slag with C&D debris constructed as a wind break for coal storage area; approx. 15' H x 1,300' L x 350' W covering 10 acres	Estimated 51,000 CY of steel-making slag mixed with C&D debris; one slight exceedance of ISCO for benzo(a)pyrene	*Alternative 1: No Further Action* OR *Alternative 2: Excavate, Reclaim Slag/Scrap Metal and Relocate Unsuitable Materials to SW-CAMU or Dispose Off-Site at TSDF* - Resell processed slag and reclaimed scrap metal under SFMP. Unsuitable fill to be deposited into SW-CAMU or sent off-Site to TSDF	$310,000		$0	$310,000		Slag reclamation not considered a remedial cost
Landfill Impoundment Under North End of Coal Pile	S-25	Approx. 1.4-acre circular area west of Coke Oven Battery No. 8 used for storage of scrap metal	Area generally flat, no depression, covered by coal fines; no suspect fill materials or exceedances of ISCOs	*Alternative 1: No Further Action* - Area may be developed in accordance with City zoning requirements	$0		$0	$0		
TANK FARM SWMU GROUP SUB-AREA										
Tank Farm	P-8, P-74 & P-75	Approx. 18.6-acre former waste oil storage area (P-8); solid fuel mix storage piles (P-74); and No. 6 fuel oil and petroleum tar ASTs (P-75); very dense slag impacted by No. 6 oil and other petroleum products (some surface) in two main areas; vicinity GW is marginally impacted by BTEX	Approx.; 2,400-3,200 CY of near-surface PAH-impacted material and 400 CY of near-surface mercury-impacted material	*Alternative 2: Excavate Petroleum Source Slag and Consolidate in SW-CAMU; Excavate Mercury-Impacted Slag/Fill and Dispose Off-Site* - Approximately 22,000 to 55,000 CY of petroleum-impacted slag/fill (used 70,000 CY for costing due to excavation difficulty and cross-contamination); 1,800 CY of mercury-impacted slag/fill; grade and partially backfill excavations	$5,100,000	$6,400,000	$0	$5,100,000	$6,400,000	Higher of two costs reflects off-site disposal of mercury-impacted slag/fill as TENORM non-hazardous waste

TABLE 5-9

SUMMARY OF RECOMMENDED CORRECTIVE MEASURES AND ESTIMATED COSTS

SWMU Name	SWMU Designation	SMWU Description	Waste/Fill Characterization and Estimated Volume	Description of Recommended Corrective Measures	Capital Cost [1, 2]	Operation & Maintenance Costs (present worth) [1, 2]	Total Estimated Cost of Recommended Alternative [1, 2]	Notes and Assumptions
FORMER COKE PLANT & BY-PRODUCTS FACILITY SUB-AREA:								
Coke Quench Tanks (P-1 thru P-5), Lime Sludge Settling Basin (P-6)	P-1 through P-6	P-1 through P-5 are reinforced concrete pits that received and recycled quench water used in coke-making operations; P-6 is a reinforced concrete pit used as a lime sludge settling basin	Approx. 220,000 gallons of water; approx. 195 CY of residuals	*Alternative 3: Backfill Quench Pits* - Collect and pretreat water (if necessary) prior to conveyance and discharge to ECSD #6; backfill pits with slag or other fill meeting ISCOs	$139,000	$0	$139,000	
Lime Sludge Settling Basin (P-7) & Tar Spill (P-10)	P-7 & P-10	P-7 is below grade reinforced concrete pit, backfilled with slag in ~1960	Approx. 800 CY of PAH-impacted residuals in P-7; and approx. 200 CY of PAH/tar-impacted surface waste material in P-10	*Alternative 2: Excavate, Treat (if necessary) and Consolidate Residuals in SW-CAMU* - Excavate approx. 1,000 CY of PAH-impacted slag/fill and relocated to SW-CAMU (lined cell, leachate collection and beneath low-permeability geosynthetic/soil cover system)	$88,000	$0	$88,000	
FORMER COKE PLANT & BY-PRODUCTS FACILITY SUB-AREA:								
OPERABLE UNIT 4								
Benzol Plant Tank Storage Sub-Area	P-11, P-11A, & P-12	P-11 and P-11A are the former Benzol Plant areas for the site. P-12 was the area of a former tar spill. Area of OU-4 is approx. 27 acres with surficial impacts of tar	Slag/fill impacted by Benzol spills with residual LNAPL	*Alternative 2: Vegetated Soil Cover (* Continued operation of existing soil vapor extraction system in SWMU P-11 to address source areas, and long-term operation of groundwater collection wells and on-site treatment)	$1,640,000	$31,000	$1,680,000	
			Groundwater impacted by Benzol product	Long-term groundwater collection and treatment	$0	$1,500,000	$1,500,000	Capital costs for groundwater collection and treatment have been expended by Tecumseh; OMM costs for SVE off-gas collection/treatment and groundwater treatment are carried under OU-4; and are included here for completeness.
OTHER SWMUs:								
Fill Area near Coke Battery No. 8	S-26	SWMU approx. 8.2 acres; 3.8 acres owned by Tecumseh (S-26T) and 4.2 acres by GTC (S-26G); slag/fill from 0-16 fbgs overlying interbedded sand and clay; 60-inch industrial water line runs along northern boundary serving local businesses	Tar identified in one boring (S26-B-03 from 4-7') proximate to 60" industrial water line. Approx. 0.5-acre area with elevated PIDs, mothball odor, and sheen in smear and saturated zones	*Alternative 1: No Further Action* - Tar impacts are at depth thus no direct contact risks, and only low levels of PAHs in groundwater sample, PAHs are not mobile in groundwater.	$0	$0	$0	

TABLE 5-9

SUMMARY OF RECOMMENDED CORRECTIVE MEASURES AND ESTIMATED COSTS

SWMU Name	SWMU Designation	SMWU Description	Waste/Fill Characterization and Estimated Volume	Description of Recommended Corrective Measures	Capital Cost [1, 2]	Operation & Maintenance Costs (present worth) [1, 2]	Total Estimated Cost of Recommended Alternative [1, 2]	Notes and Assumptions
WATERCOURSES:								
Smokes Creek	Smokes Creek Lower Reach	ICM completed to remove contaminated sediments for the purpose of improving drainage channel flow conditions and to reduce the 100-year flood plain in Lackawanna. ICM was successful in removing impacted sediment.	Post-dredging sample analyses detected VOCs, SVOCs, inorganics, and PCBs. Compound concentrations are comparable between the Upper and Lower reaches.	*No Further Action* - Beyond biennial mechanical dredging of accumulated sediments at the Lake Erie outlet to maintain the navigability and flow characteristics of the Creek (not part of CMS)	$0	$0	$0	
	Smokes Creek Upper Reach	Sediments in the Upper Reach have been dredged in 2015 under contract with NYSDEC to improve the flow capacity of the channel and to remove contaminated sediments	Approx. 40,300 CY of sediment		$0	$0	$0	Not part of the CMS
North Return Water Trench	NRWT	3,100 foot long trench of which approx. 1,400 LF on Tecumseh Site; approx. 10 feet wide and 10 feet deep with concrete and wood lining the bottom. One-half of trench on Tecumseh property covered with asphalt and concrete; no longer used for drainage.	Contains approx. 100 CY of debris consisting of wood, bricks and general trash	*Alternative 2: Remove Debris* - Mechanically remove debris and dispose in SW-CAMU; putrescible wastes to be disposed off-site. Backfill NRWT with slag or other fill material meeting ISCOs.	$183,000	$0	$183,000	
South Return Water Trench	SRWT	Man-made drainage channel approx. 5,000 LF that dishcarges to Smokes Creek	Detected similar concentrations of VOCs, PCBs, total metals, and cyanide in Smokes Creek Upper and Lower Reaches; SVOC (PAH) concentrations are marginally elevated over concentrations in Smokes Creek. Estimate approx. 8,000 CY of sediments.	*Alternative 2: Dredge Sediment Consolidate in SW-CAMU or CDF* - Dredge sediments, Dewater, Load and Transport sediments to SW-CAMU. Restore channel by placing filter fabric and 2 inch plus BUD-Approved Slag	$690,000	$0	$690,000	
CMS Area-Wide Groundwater	CMS Area-Wide	Primary areas of groundwater contamination have been addressed by OU-4 and the ATP-ECM including the internal and external groundwater collection wells. There are much less significant areas of groundwater contamination in Groundwater Discharge Sub-Areas 2A, 3A, 4A, 4B, and 5 (i.e., secondary and tertiary impacts).	Not applicable	*Alternative 2: Monitored Natural Attenuation and Alternative 3 Secondary and Tertiary Groundwater Extraction and Treatment* - Involves modifications to and execution of the LTGWM Plan, with evaluation of trends in GW concentrations in response to remediaiton of wastes by relocating wastes to the SW-CAMU, capping by low-permeability geocomposite covers for several of the SWMUs, and the results of groundwater pumping and treatment at OU-4 and at the ATP; Focused groundwater collection and treatment from areas of the site where secondary and tertiary groundwater contamination is migratring to surface water	$1,536,000	$850,000	$2,386,000	Assumes 61 wells (+123 wells for water level only); annual sampling 30 years. Includes installation of 26 groundwater collection wells with conveyance tot he ATP or OU-4 groundwater treatment systems
ATP Groundwater Collection and Treatment					$0	$1,500,000	$1,500,000	Costs for groundwater treatment are carried under the ATP-ECM. They are provided here for completeness and includes the costs associated with the collection and treatment of groundwater from the 26 wells recommended under Alternative 2 above..
				TOTALS	**$26,900,000** **$29,000,000**	**$5,400,000**	**$32,400,000** **$34,500,000**	

Notes:

1. The total costs exclude costs expended by Tecumseh associated with Interim Corrective Measures (e.g., Smokes Creek) and Expedited Corrective Measures (e.g., ATP-ECM, OU-4 groundwater corrective measure)
2. Present worth costs calculated using a discount factor of 5%.

TABLE 5-10

SWMU SLAG/FILL QUANTITIES AND POTENTIAL DISPOSITION

Site Sub-Area	SWMUs	Estimated Slag/Fill Volume (CY) and Potential Disposition				Comments
		SW-CAMU	Close In-Place	OFF-SITE TSDF	Other	
SFA -Zone 2 SWMUs	S-1		81,500			Residuals consisting of iron oxide mill scale, water quality control station sludges, dredged spoils from Smokes Creek, and other solid waste. SWMUs S-1, S-2, S-3, S-4, S-5, and S-6 to remain in-place and covered with low-permeability geocomposite cover. Approx. 14,000 to 35,000 CY of S-7/20 & 24,000 CY of S-27 wastes are proposed to be moved from current location and consolidated in the impoundments to provide materials to raise subgrade prior to installing the cover system to promote postive stormwater drainage. SWMU S7/20 to be location for SW-CAMU for relocation of wastes from other areas of the CMS into a cell consisting of a low-permeability geocomposite liner, leachate collection and vegetated low-permeability geocompsite cover system.
	S-2		96,200			
	S-3		120,000			
	S-4		150,000			
	S-5		54,000			
	S-6		66,300			
	S-7/20	283,000			See Comment	
	S-8	None				
	S-27				24,000	
SFA Zone 3 - SWMUs	S-10	None				SWMU did not contain wastes materials; slag/fill did not contain exceedances of ISCOs or site-specific SCOs.
SFA Zone 4 - SWMUs	S-12	450				Bagged asbestos
	S-13		23,000			Tar-waste mixed with slag; SWMU covered with geocomposite cover system. Has been closed for 30 years.
	S-14	16,000			41,000	Slag, bricks, concrete, wire, and demolition debris in mound consisting of 57,000 CY. Assumes 16,000 CY of slag/fill impacted with PAHs; 41,000CY of slag/scrap to be reclaimed. See Note 1.
	S-15	1,000				Scrap metal, bricks, billets and tires. Scrap metal to be salvaged. Tires to be disposed or recycled off-site. Quantity reflects non-salvageable material only.
	Group S-16/23		16,000			See Notes 1 and 2. ~6,000 CY of spent pickle liquor impacted slag in S-16; ~9,500 CY of tar-impacted slag in S-23. Volume of tar-impacted slag beneath and adjacent to S-14 footprint is not defined.
	S-17			1,000		Non-hazardous waste slag impacted with spent carbonate waste liquid. Volume of impacted slag is unknown as only one sample contained an exceedance of ISCOs (Hg). Assumed 1,000 CY of slag impacted by mercury.
	S-18	4,200				Residuals in SWMU footprint contains non-hazardous waste fill with exceedances of Pb ISCO (AOC-A) and weathered lime waste.
	S-28	None				"Suspected" drum disposal area; no drums or suspect waste materials found: slag does not contain exceedances of ISCOs or the site-specific SCOs.
North Coal Field SWMUs	S-19	10,000			41,000	Slag and demolition debris pile (51,000 CY). One parameter in two sample slightly exceeded its ISCO but less than site specific SCO. Designated for reuse after slag/scrap reclamation as on-site fill. Potential reuse to fill S-10. Assume approx 10,000 CY to SW-CAMU.
	S-25	None				Former metal scrap and salvage pile location. Residual slag did not exceed ISCOs.
Tank Farm SWMUs	Group P-8, 74, 75	70,000		1,800		Estimated 70,000 CY of petroleum-impacted slag (primarily No. 6 oil). Some fill contains NAPL above the water table. Mercury-impacted (1,800 CY) slag would be designated for off-site disposal.
Coke Plant SWMUs	GROUP P-1 to P-6	None				Residuals do not contain exceedances of ISCOs or the site-specific SCOs.
	P-7 & P-10	1,000				Waste fill in P-7 is contaminated slag (~800 CY); P-10 is PAH- and tar-impacted slag (~200 cy).
	OU-4 (P-11, P-11A, & P12)	None				Groundwater Final Remedy consisting of groundwater pumping and treatment installed and operational by March 2019. Source area remediation consisitng of soil vapor extraction in P-11 underway as ICM March 2019.
	S-26	None				See Note 4. Residual slag impacted with PAHs.
	Totals	**386,000**	**607,000**	**2,800**	**106,000**	

Notes:

1. Volume shown is estimate from existing data. Amount exceeding SCOs may be higher.
2. Spent pickle liquor waste in S-16 has been petitioned to be delisted, on the basis it has been treated with lime-rich slag.
3. Volume of waste shown is average estimate. Actual amount may vary significantly from this estimate.
4. Tar waste identified in 1 of 137 slag/fill samples - to be segregated, if encountered, and handled as hazardous waste.

TABLE 5-11

EXISTING CONDITION AND POST-CONSTRUCTION INFILTRATION ESTIMATES
IMPOUNDMENT AREA AND SW-CAMU

SWMU	AREA (SF)	INFILTRATION (GAL/YEAR) [1]		TOTAL REDUCTION OF INFILTRATION
		EXISTING CONDITION	POST-CONSTRUCTION CONDITION [2]	
S-1	59,000	457,000	820	99.82%
S-2	49,000	380,000	680	
S-3	155,000	1,201,000	2,160	
S-4	61,000	473,000	850	
S-5	40,000	310,000	560	
S-6	33,000	256,000	460	
S-7/20	166,000	1,286,000	2,310	
S-27	40,000	310,000	560	
TOTAL SW-CAMU	**603,000**	**4,673,000**	**8,400**	

Notes:

1. Existing conditions and post-cover infiltration rates estimed using the Hydrologic Evaluation of Landfill Performance (HELP)
2. Cover includes a 6" topsoil layer, 12" barrier protection layer, geosynthetic drainage layer, 40 mil HDPE layer & 6" bedding layer.

TABLE 5-12

EXISTING CONDITION AND POST-CONSTRUCTION INFILTRATION ESTIMATES
SWMU S-14

SWMU	AREA (SF) [1]	INFILTRATION (GAL/YEAR) [2]			TOTAL REDUCTION OF INFILTRATION	
		EXISTING CONDITION	POST-CONSTRUCTION CONDITION			
		No Cover	Geosynthetic Cover [3]	Soil Cover [4]	No Cover vs Geosynthetic Cover	No Cover vs Soil Cover
S-14	22,000	170,000	310	121,000	**99.82%**	**28.82%**

Notes:

1. Areal extent of identified PAHs.
2. Existing conditions and post-cover infiltration rates estimated using the Hydrologic Evaluation of Landfill Performance (HELP) Model.
3. Cover includes a 6" topsoil layer, 12" barrier protection layer, geosynthetic drainage layer, 40 mil HDPE layer & 6" bedding layer.
4. Cover includes a 6" topsoil layer and 6" soil K=1E-5 cm/s.

TABLE 5-13

EXISTING CONDITION AND POST-CONSTRUCTION INFILTRATION ESTIMATES
SWMU GROUP S-16 AND 23

SWMU	AREA (SF) [1]	INFILTRATION (GAL/YEAR) [2]		TOTAL REDUCTION OF INFILTRATION
		EXISTING CONDITION	POST-CONSTRUCTION CONDITION	
		No Cover	Geosynthetic Cover [3]	No Cover vs Geosynthetic Cover
SWMU S-16 and 23	62,000	480,000	860	**99.82%**

Notes:
1. Area includes SWMU S-16, S-23, and AOC-D.
2. Existing conditions and post-cover infiltration rates estimed using the Hydrologic Evaluation of Landfill Performance (HELP)
3. Cover includes a 6" topsoil layer, 12" barrier protection layer, geosynthetic drainage layer, 40 mil HDPE layer & 6" bedding layer.

TABLE 5-14

PROJECTED COC MASS LOADINGS FROM CMS AREA GROUNDWATER TO ADJACENT WATER BODIES AFTER PROPOSED CORRECTIVE ACTIONS

Discharge Sub-Area	Unit	Well I.D.	Compounds of Concern (COC), Loading Calculations [1,2,3] 1,1-Dichloroethane Loading (lb/day)	1,2,4-Trichlorobenzene Loading (lb/day)	1,2,4-Trimethylbenzene Loading (lb/day)	1,2-Dichloroethane Loading (lb/day)	1,2-Dichlorobenzene Loading (lb/day)	1,3,5-Trimethylbenzene Loading (lb/day)	Acetone Loading (lb/day)	Benzene Loading (lb/day)	Chlorobenzene Loading (lb/day)	Ethylbenzene Loading (lb/day)	Isopropylbenzene Loading (lb/day)	Styrene Loading (lb/day)	Toluene Loading (lb/day)	Trichloroethene Loading (lb/day)	Vinyl Chloride Loading (lb/day)	Xylenes, Total Loading (lb/day)	Acenaphthene Loading (lb/day)
2A	Slag/Fill	MW-2D4	ND	ND	ND	ND	ND	ND	na	ND	ND	ND	ND	na	ND	0.0000002	ND	ND	ND
		MW-2D3	ND	ND	0.0000003	ND	ND	0.0000002	na	0.0000004	ND	0.0000002	ND	na	0.0000003	0.0000001	ND	0.0000013	0.0000003
		MW-2D2	ND	ND	ND	ND	ND	ND	na	ND	ND	ND	ND	na	ND	0.0000001	ND	ND	ND
		MWS-26A	ND	ND	ND	ND	ND	ND	ND	0.0000001	ND	ND	ND	ND	ND	0.0000001	ND	0.0000002	ND
		MWS-09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Sand/Dredge Spoil	MW-2D2B	ND	ND	0.00000	ND	ND	0.00000	0.00000	0.00000	ND	0.00000	ND	ND	0.00000	ND	ND	0.00000	0.00000
2B	Slag/Fill	MWS-01	ND	ND	ND	ND	ND	ND	ND	0.00000	ND	0.00000	ND	0.00000	0.00000	ND	ND	0.00000	0.00000
		MWS-02	ND	ND	0.00000	0.00000	ND	ND	0.00000	0.00000	ND	ND	ND	ND	ND	ND	ND	ND	0.00000
		MWS-19A	ND	ND	ND	ND	ND	ND	ND	0.00000	ND	ND	ND	ND	ND	ND	0.00000	ND	0.00E+00
		MWS-18A	ND	ND	ND	ND	ND	ND	ND	0.00000	ND	ND	ND	ND	ND	ND	ND	ND	0.00E+00
		MWS-20A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		MWS-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Sand/Dredge Spoil	MWS-01B	ND	ND	0.00000	ND	ND	0.00000	0.00000	0.00000	ND	ND	ND	ND	0.00000	ND	ND	ND	0.00000
	Sand	MWS-19B	ND	ND	ND	ND	ND	ND	ND	0.00000	ND	ND	ND	ND	ND	ND	ND	ND	0.00E+00
		MWS-18C	ND	ND	ND	ND	ND	ND	ND	0.00000	ND	ND	ND	ND	ND	ND	ND	ND	ND
		MWS-20B	ND	ND	ND	3.79E-06	ND	ND	4.33E-06	0.000001	ND	ND	ND	ND	ND	ND	ND	ND	ND
3A	Slag/Fill	MWN-01	ND	ND	0.00000	ND	ND	0.00000	ND	0.00000	ND	ND	ND	ND	0.00000	ND	ND	0.00000	0.00000
		MWN-11	ND	na	na	ND	ND	na	ND	0.00006	ND	ND	ND	ND	ND	ND	ND	ND	ND
		MWN-94A	ND	ND	0.00006	ND	ND	ND	ND	0.00150	ND	ND	ND	ND	ND	ND	ND	0.00003	0.00006
		MWN-24A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Sand/Dredge Spoil	MWN-01B	ND	ND	0.00000	ND	ND	ND	0.00000	0.00000	ND	0.00E+00	0.00000	ND	0.00000	ND	ND	0.00000	0.00000
		MWN-23B	ND	ND	0.00001	ND	ND	0.00001	0.00001	0.00005	ND	ND	ND	ND	0.00001	ND	ND	0.00001	ND
	Sand	MWN-94B	ND	ND	ND	ND	ND	ND	0.00001	0.00000	ND	ND	ND	ND	ND	ND	ND	ND	4.90E-07
4A	Slag/Fill	MWN-06A	na	na	ND	na	na	ND	na	0.00039	na	ND	ND	na	ND	na	na	ND	0.00039
		MWN-05A	ND	ND	0.0000004	ND	ND	0.0000010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		MWN-04	na	na	ND	na	na	ND	na	ND	na	ND	ND	na	ND	na	na	ND	ND
		MWN-03	na	na	0.000001	na	na	0.000002	na	0.00001	na	0.0000003	ND	na	0.000002	na	na	0.00001	0.000002
		MWN-02	na	na	0.00000	na	na	0.00000	na	0.00000	na	0.00000	ND	na	0.00000	na	na	0.00000	ND
	Sand/Dredge Spoil	MWN-05B	ND	0.00119	ND	ND	0.00193	ND	0.00207	0.00400	0.00363	ND	ND	ND	0.00289	ND	ND	0.00267	0.00156
		MWN-03B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00006
		MWN-02B	na	na	ND	na	na	ND	na	0.00000	na	ND	ND	na	0.00000	na	na	0.00000	0.00000
4B	Slag/Fill	MWN-43A	ND	ND	0.00009	ND	ND	0.00026	0.00089	0.00012	ND	ND	ND	ND	ND	ND	ND	ND	0.00024
		MWN-18A	ND	ND	0.00008	ND	ND	0.00008	0.00061	0.00028	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Sand	(see Note 4)	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
5	Slag/Fill	MWN-45A	ND	ND	ND	ND	ND	ND	ND	0	ND	ND	ND	ND	0	ND	ND	ND	0
		MWN-47A	ND	ND	ND	ND	ND	ND	0.00000	0.00000	ND	ND	ND	ND	ND	ND	ND	0.00000	ND
		MWN-09	ND	ND	ND	ND	ND	ND	0	0	ND	ND	ND	ND	ND	ND	ND	ND	ND
		MWN-26A	ND	na	na	ND	ND	na	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
		MWN-67A/MWN-34A [5]	ND	ND	na	ND	ND	na	0	0	ND	0	ND	0	0	ND	ND	0	0
		MWN-66AR/MWN-08 [5]	ND	ND	na	ND	ND	na	0	0	ND	0	0	0	0	ND	ND	0	0
		MWN-49A	ND	ND	ND	ND	ND	ND	0	0	ND	ND	ND	ND	ND	ND	ND	ND	ND
		MWN-68A [5]	ND	ND	na	ND	ND	na	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		MWN-07	ND	ND	ND	ND	ND	ND	0.00019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
1. Loading = Discharge Rate x Concentration. See Table 4-41 for discharge calculations and Tables 4-31 through 4-36 for concentrations.
2. Compounds of Concern (COC) include any parameter detected above its respective GWQS/GV in at least one monitoring well in the RFI or 2019 CMS sampling.
3. Table 4-43 Current CMS COC Mass Loading from CMS Area Groundwater to Adjacent Water Bodies was used as base table to develop Projected Mass Loadings after Proposed Corrective Actions.
4. Discharge Sub-Area 4B wells were not advanced beyond the fill layer; as a result the depth and thickness of the underlying sand layer was derived from interpretation from nearby wells (i.e., MWN-05B & MWN-50B). Even though it is assumed that a sand unit exists, there are no sand wells installed within this CMS Discharge Sub-Area; therefore, only the wells in the screened fill unit could be utilized for loading calculations.
5. Monitoring well was not sampled during the CMS, either because it was not selected (MWN-08A and MWN-34A) or could not be located (MWN-52A), and was subsequently replaced by nearby wells MWN-66A, MWN-67A, and MWN-68A (respectively).

Formula/Conversion Factors:
Loading (g/yr) = Discharge Rate (L/YR) x Concentration (ug/L) x 1.0E-6
Loading (lb/yr) = Discharge Rate (L/YR) x Concentration (ug/L) x 1.0E-6 x 2.205E-3

Definitions:
lbs/day = pounds per day
na = not analyzed
ND = compound was not detected at the method detection limit

Color Code:
= Parameter designated a Primary Compound of Concern.
= Well Location/Shoreline Segment to be addressed by Capping, consolidation, waste removal. Assume 99.8% reduction to contaminant loading within shoreline segment.
= Well Location/Shoreline Segment to be addressed by tertiary groundwater extraction and treatment along shoreline segments. Assume 100% reduction to contaminant loading within shoreline segment.
= Well Location/Shoreline Segment to be addressed by secondary groundwater extraction and treatment. Assume 50% reduction to contaminant loading within shoreline segment.

TABLE 5-14

PROJECTED COC MASS LOADINGS FROM CMS AREA GROUNDWATER TO ADJACENT WATER BODIES AFTER PROPOSED CORRECTIVE ACTIONS

Discharge Sub-Area	Unit	Well I.D.	Compounds of Concern (COC), Loading Calculations [1,2,3]																			
			Benzo(a) Anthracene	Benzo(a) Pyrene	Benzo(b) Fluoranthene	Benzo(k) Fluoranthene	Biphenyl	Bis(2-ethylhexyl)phthalate	Chrysene	Fluorene	Indeno(1,2,3-cd) Pyrene	Naphthalene	Phenanthrene	Pyridine	Total Phenolic Compounds	Arsenic	Barium	Cadmium	Chromium	Lead	Selenium	Cyanide
			Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)	Loading (lb/day)
2A	Slag/Fill	MW-2D4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0000010	0.00001	na	0.000002	ND	ND	na
		MW-2D3	ND	ND	ND	ND	0.0000002	ND	ND	0.0000015	ND	0.00001	0.0000020	ND	0.0000004	0.0000007	0.00001	na	0.0000002	0.0000006	ND	na
		MW-2D2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0000034	na	0.0000008	ND	ND	na
		MWS-26A	7.30E-09	ND	2.92E-09	ND	ND	ND	5.84E-09	ND	ND	ND	ND	na	ND	ND	0.0000025	na	0.0000015	ND	ND	na
		MWS-09	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00000002	ND	na	na	ND	0.0000024	na	0.0000024	ND	0.0000007	na
	Sand/Dredge Spoil	MW-2D2B	0.00000	0.00E+00	0.00000	0.00E+00	0.00000	ND	0.00E+00	0.00000	0.00E+00	0.00000	0.00000	na	0.00000	0.00000	0.00000	na	ND	ND	ND	na
2B	Slag/Fill	MWS-01	0.00000	0.00000	0.00000	0.00E+00	0.00000	ND	0.00000	0.00000	0.00E+00	0.00000	0.00000	na	0.00000	ND	0.00000	na	ND	ND	na	na
		MWS-02	ND	ND	ND	ND	ND	0.00000	ND	0.00000	ND	0.00000	0.00000	na	ND	0.00000	0.00000	na	0.00000	na	na	0.00000
		MWS-19A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	0.00000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	na	ND	0.00000	0.00000	na	0.00000	0.00000	na	0.00000
		MWS-18A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00000	0.00E+00	na	0.00000	0.00000	0.00000	na	0.00000	ND	na	0.00000
		MWS-20A	ND	ND	ND	ND	ND	0.00012	ND	ND	ND	ND	ND	na	ND	0.00009	0.00060	na	0.00045	ND	na	0.00200
		MWS-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	na	na	0.00013	0.00238	na	ND	ND	na	na
	Sand/Dredge Spoil	MWS-01B	ND	ND	ND	ND	0.00000	ND	ND	0.00000	ND	0.00000	ND	na	0.00000	0.00000	0.00000	na	0.00000	0.00000	na	na
	Sand	MWS-19B	ND	ND	ND	ND	ND	0.00000	ND	0.00E+00	ND	ND	ND	na	ND	0.00000	0.00000	na	0.00E+00	0.00E+00	na	0.00000
		MWS-18C	ND	ND	ND	ND	ND	0.00E+00	ND	ND	ND	ND	ND	na	0.00E+00	0.00E+00	0.00000	na	0.00E+00	ND	na	0.00000
		MWS-20B	5.42E-08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	na	ND	0.00001	0.00008	na	0.00001	3.33E-06	na	0.00013
3A	Slag/Fill	MWN-01	0.00000	0.00E+00	0.00000	0.00E+00	0.00000	ND	0.00000	0.00000	ND	0.00000	0.00000	na	0.00000	0.00000	na	na	ND	ND	0.00000	na
		MWN-11	ND	ND	ND	ND	ND	0.00028	ND	0.00004	ND	0.00021	0.00007	na	na	ND	na	na	0.00047	0.00024	0.00094	na
		MWN-94A	ND	ND	ND	ND	ND	0.00006	ND	ND	ND	0.00082	ND	na	ND	0.00041	na	na	0.00025	0.00107	0.00004	na
		MWN-24A	ND	ND	ND	ND	ND	0.00005	ND	ND	ND	ND	ND	na	ND	0.00012	na	na	0.00014	0.00017	ND	na
	Sand/Dredge Spoil	MWN-01B	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00000	ND	0.00E+00	0.00000	0.00E+00	0.00000	0.00000	na	0.00000	0.00000	na	na	ND	0.00000	0.00000	0.00000
		MWN-23B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	na	0.00008	0.00007	na	na	0.00004	0.00002	0.00005	na
	Sand	MWN-94B	8.57E-07	ND	6.73E-07	ND	ND	ND	9.18E-07	1.29E-06	ND	2.75E-06	3.80E-06	na	na	0.00004	na	na	0.00003	0.00009	0.00001	na
4A	Slag/Fill	MWN-06A	0.00004	0.00003	0.00006	0.00003	ND	ND	0.00005	0.00143	ND	0.00299	0.00390	na	ND	na	na	na	0.00086	na	na	na
		MWN-05A	0.0000001	ND	0.00000003	0.00000002	ND	ND	0.0000001	ND	0.00000002	ND	ND	na	0.000001	ND	0.00012	na	0.00001	0.000003	ND	na
		MWN-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	na	ND	ND	0.00004	na	0.00002	na	0.00001	na
		MWN-03	ND	ND	ND	ND	0.000001	ND	ND	0.00001	ND	0.00002	0.00001	na	0.000002	ND	0.00011	na	ND	na	0.00001	na
		MWN-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	na	0.00000	ND	0.00000	na	ND	na	0.00000	na
	Sand/Dredge Spoil	MWN-05B	0.00002	2.22E-06	0.00001	2.22E-06	0.00041	0.00014	0.00001	0.00133	ND	0.07410	0.00148	na	0.01867	0.00119	1.16707	ND	0.00445	0.00170	ND	na
		MWN-03B	ND	ND	ND	ND	ND	ND	ND	0.00004	ND	ND	0.00004	na	ND	0.00198	0.06393	na	0.00023	na	ND	na
		MWN-02B	ND	ND	ND	ND	0.00000	ND	ND	0.00000	ND	0.00000	0.00000	na	0.00000	0.00000	0.00000	na	0.00000	na	0.00000	na
4B	Slag/Fill	MWN-43A	0.00004	ND	0.00001	2.69E-06	ND	ND	0.00003	ND	ND	ND	ND	na	0.00180	na	0.14438	na	ND	na	na	na
		MWN-18A	0.00002	0.00001	0.00002	0.00001	ND	0.00022	0.00002	ND	0.000006	ND	ND	na	0.00051	na	0.02166	na	0.00351	na	na	na
	Sand	(see Note 4)	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
5	Slag/Fill	MWN-45A	0	ND	ND	ND	ND	0	0	ND	ND	ND	0	na	0	ND	0	na	0	na	na	0
		MWN-47A	ND	ND	ND	ND	ND	0.00000	ND	ND	ND	ND	ND	na	0.00E+00	ND	0.00000	na	0.00000	na	na	na
		MWN-09	ND	ND	ND	ND	ND	0	ND	ND	ND	ND	ND	na	ND	na	na	na	na	na	na	na
		MWN-26A	ND	ND	ND	ND	ND	ND	ND	0	ND	ND	ND	na	na	0	0	na	ND	na	na	0
		MWN-67A/MWN-34A [5]	0	0	0	0	0	0	0	0	ND	0	0	na	0	na	na	na	na	na	na	0
		MWN-66AR/MWN-08 [5]	0	0	0	0	0	0	0	0	0	0	0	na	0	na	na	na	na	na	na	0
		MWN-49A	0	ND	ND	ND	ND	0	ND	ND	ND	ND	ND	na	ND	ND	0	na	0	na	na	na
		MWN-68A [5]	ND	ND	ND	ND	ND	0.00009	ND	ND	ND	ND	ND	na	ND	na	na	na	na	na	na	na
		MWN-07	1.61E-06	ND	2.15E-06	1.61E-06	ND	ND	1.61E-06	ND	2.69E-06	ND	ND	na	ND	ND	0.00220	na	0.00215	na	na	0.00263

Notes:
1. Loading = Discharge Rate x Concentration. See Table 4-41 for discharge calculations and Tables 4-31 through 4-36 for concentrations.
2. Compounds of Concern (COC) include any parameter detected above its respective GWQS/GV in at least one monitoring well in the RFI or 2019 CMS sampling.
3. Table 4-43 Current CMS COC Mass Loading from CMS Area Groundwater to Adjacent Water Bodies was used as base table to develop Projected Mass Loadings after Proposed Corrective Actions.
4. Discharge Sub-Area 4B wells were not advanced beyond the fill layer; as a result the depth and thickness of the underlying sand layer was derived from interpretation from nearby wells (i.e., MWN-05B & MWN-50B). Even though it is assumed that a sand unit exists, there are no sand wells installed within this CMS Discharge Sub-Area; therefore, only the wells in the screened fill unit could be utilized for loading calculations.
5. Monitoring well was not sampled during the CMS, either because it was not selected (MWN-08A and MWN-34A) or could not be located (MWN-52A), and was subsequently replaced by nearby wells MWN-66A, MWN-67A, and MWN-68A (respectively).

Formula/Conversion Factors:
Loading (g/yr) = Discharge Rate (L/YR) x Concentration (ug/L) x 1.0E-6
Loading (lb/yr) = Discharge Rate (L/YR) x Concentration (ug/L) x 1.0E-6 x 2.205E-3

Definitions
lbs/day = pounds per day
na = not analyzed
ND = compound was not detected at the method detection limit

Color Code:
= Parameter designated a Primary Compound of Concern.
= Well Location/Shoreline Segment to be addressed by Capping, consolidation, waste removal. Assume 99.8% reduction to contaminant loading within shoreline segment.
= Well Location/Shoreline Segment to be addressed by tertiary groundwater extraction and treatment along shoreline segments. Assume 100% reduction to contaminant loading within shoreline segment.
= Well Location/Shoreline Segment to be addressed by secondary groundwater extraction and treatment. Assume 50% reduction to contaminant loading within shoreline segment.