

**Table 1. Sediment Sampling Summary**

Amoco Fish and Wildlife Habitat Restoration  
1640 Lakeshore Drive, Muskegon, MI

Location ID	Date	Sampling Method	Recovery (ft)	Recovery (%)	Lithology	Description of Observable Impacts	Highest PID Response at Location (ppm)	Depth of Highest Response (feet below sediment surface)
NO8-ID34	6/5/2019	Piston Core	3.8/4.8	79.17%	0.0-3.8' Poorly graded sand, shells (0-5%), light tan from 0.0-2.3', dark tan/brown from 2.3' to EOB, loose to firm with depth, moist to wet with depth.	No visible evidence, no odors	0.2	1.2
H7-ID41	6/5/2019	Piston Core	3.2/5.1	62.75%	0.0-2.2' Poorly graded sand, shells (0-5%) and wood, very dark brown, loose, wet 2.2-2.7' Wood, poorly graded sand (30-35%), silt (0-10%), very dark brown, loose, wet 2.7-3.2' Poorly graded sand, wood (0-10%), dark tan/brown, loose, wet.	No visible evidence, no odors	0	0
A3West-ID77	6/5/2019	Piston Core	2.0/5.0	40.00%	0.0-0.8' Organic silt, poorly graded sand (5-15%), wood (0-10%), shells (0-5%), roots (0-5%), very dark brown, loose, wet 0.8-2.0' Poorly graded sand, organic silt (10-20%), wood (0-10%), shells (0-5%), brown to gray, loose, moist.	No visible evidence, no odors	0.2	0.2
E2	6/5/2019	Piston Core	2.1/2.5	84.00%	0.0-2.1' Well-graded sand, fine to coarse, shells (0-10%), light tan/gray, dark gray brown from 0.8-1.2', loose, moist, homogenous.	No visible evidence, faint odor	15.1	1.6
DE9-ID16	6/5/2019	Piston Core	4.5/5.0	90.00%	0.0-4.5' Poorly graded sand, fine to medium, shells (0-5%), loose, moist, from 3.1-3.9' dense/compressed, from 3.9'-EOB loose, light tan gray.	No visible evidence, no odors	0	0
JK8-ID32/33	6/5/2019	Ponar Grab	NA	100.00%	0.0-0.5' Poorly graded sand, fine to medium, silt (5-10%), shells (0-5%), roots (0-5%), brown/ dark tan, loose, wet, homogenous.	No visible evidence, no odors	0	0
C5-ID69	6/6/2019	Ponar Grab	NA	100.00%	0.0-0.5' Poorly graded sand, fine to medium, silt (0-5%), shells (0-5%), aquatic vegetation(0-5%), medium to dark brown, slightly gray, loose, wet, homogenous.	No visible evidence, no odors	0	0
C8West-ID36	6/6/2019	Ponar Grab	NA	100.00%	0.0-0.5' Poorly graded sand, fine to medium, silt (0-5%), shells (0-5%), aquatic vegetation(0-5%), medium to dark brown, slightly gray, loose, wet, homogenous.	No visible evidence, no odors	0	0
DE8-ID31	6/6/2019	Ponar Grab	NA	30.00%	0.0-0.5' Poorly graded sand, fine, silt (0-5%), wood (0-5%), shells (0-5%), aquatic vegetation(0-5%), medium to dark brown, slightly gray, loose, wet, homogenous.	No visible evidence, no odors	0	0
FG8-ID27	6/6/2019	Ponar Grab	NA	100.00%	0.0-0.5' Poorly graded sand, fine, roots (0-5%), shells (0-5%), aquatic vegetation(0-5%), piece of fiber/string, medium to dark brown, slightly gray, loose, wet, homogenous.	No visible evidence, no odors	0	0

Notes:

Ponar grab sample recoveries are approximated

**Table 2. Sediment Sampling Analytical Results Compared Against Screening Criteria**

Amoco Fish and Wildlife Habitat Restoration  
1640 Lakeshore Drive, Muskegon, MI

Analyte Name	CAS	Units	Part 201 & 213-	Part 201 & 213-	Part 201 & 213-	Part 201 & 213-	Part 201 & 213-	Part 201 & 213-	Part 201 & 213-	Part 201 & 213-	Part 201 & 213-	Part 201 & 213-	Part 201 & 213-	Part 201 & 213-	Part 201 & 213-	WRD-048 Sediment Testing for Dredging Projects (04-13-18)	NO8 - ID34	H7 - ID41	A3West - ID77	E2 - Shallow	E2 - Deep	E2 - Deep QC	DE9 - ID16
			Soil GW Surface Water Interface Protection Criteria (12-30- 13)	Soil NonResidential Direct Contact Criteria (12-30- 13)	Soil NonResidential Drinking Water Protection Criteria (12-30- 13)	Soil Residential Drinking Water Protection Criteria (12-30- 13)	Soil Residential Direct Contact Criteria (12-30- 13)	Soil Statewide Default Background Level (12-30-13)	Soil Residential Particulate Soil Inhalation Criteria (12-30- 13)	Soil Residential Volatilization to Indoor Air Inhalation Criteria (12-30- 13)	Soil Residential Saturation Concentration Screening Levels (12-30-13)	Soil Residential Infinite Source Volatile Soil Inhalation Criteria (VSIC) (12-30-13)	Soil NonResidential Infinite Source Volatile Soil Inhalation Criteria (12-30- 13)	Soil NonResidential Volatilization to Indoor Air Inhalation (12- 30-13)									
Lab Sample ID																19060409-01	19060409-02	19060409-03	19060409-04	19060409-05	19060409-06	19060409-07	
Sample Interval (feet below sediment surface)																0-2	0-2	0-2	0.8-1.0	1.1-1.4	1.1-1.4	0-2	
Collection Date																06/05/19	06/05/19	06/05/19	06/05/19	06/05/19	06/05/19	06/05/19	
Method: Volatile Organic Compounds																							
1,1,1-Trichloroethane	71-55-6	ug/Kg	1800	1000000000	4000	4000	500000000	N/A	67000000000	250000	460000	3800000	4500000	29000000000	460000	N/A	<38	<60	<51	<35	<38	<36	<37
1,1,2,2-Tetrachloroethane	79-34-5	ug/Kg	1600	240000	700	170	53000	N/A	54000000	4300	870000	10000	34000	68000000	23000	N/A	<38	<60	<51	<35	<38	<36	<37
1,1,2-Trichloroethane	79-00-5	ug/Kg	6600	840000	100	100	180000	N/A	190000000	4600	920000	17000	57000	250000000	24000	N/A	<38	<60	<51	<35	<38	<36	<37
1,1,2-Trichlorotrifluoroethane	76-13-1	ug/Kg	1700	1000000000	9000000	9000000	1000000000	N/A	5.1E+12	5100000	550000	180000000	210000000	2.3E+12	9300000	N/A	<38	<60	<51	<35	<38	<36	<37
1,1-Dichloroethane	75-34-3	ug/Kg	15000	87000000	50000	18000	27000000	N/A	33000000000	230000	890000	2100000	2500000	15000000000	430000	N/A	<38	<60	<51	<35	<38	<36	<37
1,1-Dichloroethene	75-35-4	ug/Kg	2600	660000	140	140	200000	N/A	62000000	62	570000	1100	3700	78000000	330	N/A	<38	<60	<51	<35	<38	<36	<37
1,2,4-Trichlorobenzene	120-82-1	ug/Kg	5900	5800000	4200	4200	990000	N/A	25000000000	9600000	1100000	28000000	34000000	11000000000	18000000	N/A	<130	<200	<170	<120	<130	<120	<120
1,2-Dibromo-3-chloropropane	96-12-8	ug/Kg	N/A	20000	4	4	4400	N/A	560000	220	1200	260	900	700000	1200	N/A	<130	<200	<170	<120	<130	<120	<120
1,2-Dibromoethane	106-93-4	ug/Kg	110	430	1	1	92	N/A	14000000	670	890000	1700	5800	18000000	3600	N/A	<38	<60	<51	<35	<38	<36	<37
1,2-Dichlorobenzene	95-50-1	ug/Kg	280	63000000	14000	14000	19000000	N/A	1E+11	11000000	210000	39000000	46000000	44000000000	20000000	N/A	<38	<60	<51	<35	<38	<36	<37
1,2-Dichloroethane	107-06-2	ug/Kg	7200	420000	100	100	91000	N/A	120000000	2100	1200000	6200	21000	150000000	11000	N/A	<130	<200	<170	<120	<130	<120	<120
1,2-Dichloropropane	78-87-5	ug/Kg	4600	660000	100	100	140000	N/A	270000000	4000	550000	25000	30000	120000000	7400	N/A	<38	<60	<51	<35	<38	<36	<37
1,3-Dichlorobenzene	541-73-1	ug/Kg	680	660000	480	170	200000	N/A	200000000	26000	170000	79000	94000	88000000	48000	N/A	<38	<60	<51	<35	<38	<36	<37
1,4-Dichlorobenzene	106-46-7	ug/Kg	360	1900000	1700	1700	400000	N/A	450000000	19000	N/A	77000	260000	570000000	100000	N/A	<38	<60	<51	<35	<38	<36	<37
2-Butanone	78-93-3	ug/Kg	44000	700000000	760000	260000	120000000	N/A	67000000000	54000000	27000000	29000000	35000000	29000000000	99000000	N/A	<250	<400	<340	<230	<250	<240	<240
2-Hexanone	591-78-6	ug/Kg	N/A	100000000	58000	20000	32000000	N/A	2700000000	990000	2500000	1100000	1300000	1200000000	18000000	N/A	<38	<60	<51	<35	<38	<36	<37
4-Methyl-2-pentanone	108-10-1	ug/Kg	N/A	180000000	100000	36000	56000000	N/A	1.4E+11	37000000	2700000	45000000	53000000	60000000000	69000000	N/A	<38	<60	<51	<35	<38	<36	<37
Acetone	67-64-1	ug/Kg	34000	73000000	42000	15000	23000000	N/A	3.9E+11	290000000	110000000	130000000	1600000000	5400000000	990000000	N/A	<130	<200	<170	<120	<130	<120	150
Benzene	71-43-2	ug/Kg	4000	840000	100	100	180000	N/A	380000000	1600	400000	13000	45000	470000000	8400	N/A	<38	<60	<51	<35	<38	<36	<37
Bromodichloromethane	75-27-4	ug/Kg	N/A	490000	1600	1600	110000	N/A	84000000	1200	1500000	9100	31000	110000000	6400	N/A	<38	<60	<51	<35	<38	<36	<37
Bromoform	75-25-2	ug/Kg	N/A	3800000	1600	1600	820000	N/A	2800000000	150000	870000	900000	3100000	3600000000	770000	N/A	<38	<60	<51	<35	<38	<36	<37
Bromomethane	74-83-9	ug/Kg	700	1000000	580	200	320000	N/A	330000000	860	2200000	11000	13000	150000000	1600	N/A	<130	<200	<170	<120	<130	<120	<120
Carbon disulfide	75-15-0	ug/Kg	N/A	43000000	46000	16000	7200000	N/A	47000000000	76000	280000	1300000	1600000	21000000000	140000	N/A	<38	<60	<51	<35	<38	<36	<37
Carbon tetrachloride	56-23-5	ug/Kg	900	440000	100	100	96000	N/A	130000000	190	390000	3500	12000	170000000	990	N/A	<38	<60	<51	<35	<38	<36	<37
Chlorobenzene	108-90-7	ug/Kg	500	14000000	2000	2000	4300000	N/A	4700000000	120000	2600000	770000	920000	2100000000	220000	N/A	<38	<60	<51	<35	<38	<36	<37
Chloroethane	75-00-3	ug/Kg	22000	12000000	34000	8600	2600000	N/A	6.7E+11	29000000	950000	30000000	36000000	2.9E+11	53000000	N/A	<130	<200	<170	<120	<130	<120	<120
Chloroform	67-66-3	ug/Kg	7000	5500000	1600	1600	1200000	N/A	1300000000	7200	1500000	45000	150000	1600000000	38000	N/A	<38	<60	<51	<35	<38	<36	<37
Chloromethane	74-87-3	ug/Kg	N/A	7400000	22000	5200	1600000	N/A	4900000000	2300	1100000	40000	120000	2600000000	10000	N/A	<130	<200	<170	<120	<130	<120	<120
cis-1,2-Dichloroethene	156-59-2	ug/Kg	12000	8000000	1400	1400	2500000	N/A	2300000000	22000	640000	180000	210000	1000000000	41000	N/A	<38	<60	<51	<35	<38	<36	<37
cis-1,3-Dichloropropene	10061-01-5	ug/Kg	180	0	N/A	170	10000	N/A	780000000	1000	620000	18000	N/A	N/A	N/A	N/A	<38	<60	<51	<35	<38	<36	<37
Cyclohexane	110-82-7	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<130	<200	<170	<120	140	<120	<120
Dibromochloromethane	124-48-1	ug/Kg	N/A	5000000	1600	1600	110000	N/A	1300000000	3900	610000	24000	80000	160000000	21000	N/A	<38	<60	<51	<35	<38	<36	<37
Dichlorodifluoromethane	75-71-8	ug/Kg	N/A	17000000	270000	95000	5200000	N/A	3.3E+12	900000	1000000	53000000	63000000	1.5E+12	1700000	N/A	<130	<200	<170	<120	<130	<120	<120
Ethylbenzene	100-41-4	ug/Kg	360	71000000	1500	1500	22000000	N/A	10000000000	87000	140000	720000	2400000	13000000000	460000	N/A	<38	<60	<51	<35	<38	<36	<37
Isopropylbenzene	98-82-8	ug/Kg	3200	80000000	260000	91000	25000000	N/A	5800000000	400000	390000	1700000	2000000	2600000000	730000	N/A	<38	<60	<51	79	62	62	<37
Methyl acetate	79-20-9	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<320	<500	<420	<290	400	<300	1,100
Methyl tert-butyl ether	1634-04-4	ug/Kg	140000	7100000	800	800	1500000	N/A	2E+11	9900000	5900000	25000000	30000000	88000000000	18000000	N/A	<38	<60	<51	<35	<38	<36	<37
Methylcyclohexane	108-87-2	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<38	<60	<51	<35	<38	<36	<37
Methylene chloride	75-09-2	ug/Kg	30000	5800000	100	100	1300000	N/A	6600000000	45000	2000000	210000	700000	8300000000	240000	N/A	<320	<500	<420	<290	<310	<300	<310
Styrene	100-42-5	ug/Kg	2100	1900000	2700	2700	400000	N/A	5500000000	250000	520000	970000	3300000	6900000000	1300000	N/A	<38	<60	<51	<35	<38	<36	<37
Tetrachloroethene	127-18-4	ug/Kg	1200	930000	10																		

**Table 2. Sediment Sampling Analytical Results Compared Against Screening Criteria**

Amoco Fish and Wildlife Habitat Restoration  
1640 Lakeshore Drive, Muskegon, MI

Analyte Name	CAS	Units	Part 201 & 213- Soil GW Surface	Part 201 & 213- Soil	Part 201 & 213- Soil	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	WRD-048 Sediment Testing for Dredging Projects (04-13-18)	JK8 ID32/33	C5 - ID69	C8West - ID36	DE8 - ID31	FG8 - ID27	Trip Blank
			Water Interface Protection Criteria (12-30- 13)	NonResidential Direct Contact Criteria (12-30- 13)	NonResidential Drinking Water Protection Criteria (12-30- 13)	Soil Residential Drinking Water Protection Criteria (12-30- 13)	Soil Residential Direct Contact Criteria (12-30- 13)	Soil Statewide Default Background Level (12-30-13)	Particulate Soil Inhalation Criteria (12-30- 13)	Soil Residential Volatilization to Indoor Air Inhalation Criteria (12-30- 13)	Soil Residential Saturation Concentration Screening Levels (12-30-13)	Soil Residential Infinite Source Volatilization Criteria (VSIC) (12-30-13)	Soil Residential Infinite Source Volatilization Criteria (12-30- 13)	Soil Residential Infinite Source Volatilization to Indoor Air Inhalation (12- 30-13)	Soil Residential Infinite Source Volatilization to Indoor Air Inhalation (12- 30-13)	Soil Residential Infinite Source Volatilization to Indoor Air Inhalation (12- 30-13)	Soil Residential Infinite Source Volatilization to Indoor Air Inhalation (12- 30-13)		19060409-08	19060409-10	19060409-11	19060409-12
Method: Volatile Organic Compounds																	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	NA
Collection Date																	06/05/19	06/06/19	06/06/19	06/06/19	06/06/19	06/06/19
1,1,1-Trichloroethane	71-55-6	ug/Kg	1800	1000000000	4000	4000	500000000	N/A	67000000000	250000	460000	3800000	4500000	29000000000	460000	N/A	<40	<45	<92	<42	<37	<27
1,1,2,2-Tetrachloroethane	79-34-5	ug/Kg	1600	240000	700	170	53000	N/A	54000000	4300	870000	10000	34000	68000000	23000	N/A	<40	<45	<92	<42	<37	<27
1,1,2-Trichloroethane	79-00-5	ug/Kg	6600	840000	100	100	180000	N/A	190000000	4600	920000	17000	57000	250000000	24000	N/A	<40	<45	<92	<42	<37	<27
1,1,2-Trichlorotrifluoroethane	76-13-1	ug/Kg	1700	1000000000	9000000	9000000	1000000000	N/A	5.1E+12	5100000	550000	180000000	210000000	2.3E+12	9300000	N/A	<40	<45	<92	<42	<37	<27
1,1-Dichloroethane	75-34-3	ug/Kg	15000	87000000	50000	18000	27000000	N/A	33000000000	230000	890000	2100000	2500000	15000000000	430000	N/A	<40	<45	<92	<42	<37	<27
1,1-Dichloroethene	75-35-4	ug/Kg	2600	660000	140	140	200000	N/A	62000000	62	570000	1100	3700	78000000	330	N/A	<40	<45	<92	<42	<37	<27
1,2,4-Trichlorobenzene	120-82-1	ug/Kg	5900	5800000	4200	4200	990000	N/A	25000000000	9600000	1100000	28000000	34000000	11000000000	18000000	N/A	<130	<150	<310	<140	<120	<89
1,2-Dibromo-3-chloropropane	96-12-8	ug/Kg	N/A	20000	4	4	4400	N/A	560000	220	1200	260	900	700000	1200	N/A	<130	<150	<310	<140	<120	<89
1,2-Dibromoethane	106-93-4	ug/Kg	110	430	1	1	92	N/A	14000000	670	890000	1700	5800	18000000	3600	N/A	<40	<45	<92	<42	<37	<27
1,2-Dichlorobenzene	95-50-1	ug/Kg	280	63000000	14000	14000	19000000	N/A	1E+11	11000000	210000	39000000	46000000	44000000000	20000000	N/A	<40	<45	<92	<42	<37	<27
1,2-Dichloroethane	107-06-2	ug/Kg	7200	420000	100	100	91000	N/A	120000000	2100	1200000	6200	21000	150000000	11000	N/A	<130	<150	<310	<140	<120	<89
1,2-Dichloropropane	78-87-5	ug/Kg	4600	660000	100	100	140000	N/A	270000000	4000	550000	25000	30000	120000000	7400	N/A	<40	<45	<92	<42	<37	<27
1,3-Dichlorobenzene	541-73-1	ug/Kg	680	660000	480	170	200000	N/A	200000000	26000	170000	79000	94000	88000000	48000	N/A	<40	<45	<92	<42	<37	<27
1,4-Dichlorobenzene	106-46-7	ug/Kg	360	1900000	1700	1700	400000	N/A	450000000	19000	N/A	77000	260000	570000000	100000	N/A	<40	<45	<92	<42	<37	<27
2-Butanone	78-93-3	ug/Kg	44000	700000000	760000	260000	120000000	N/A	67000000000	54000000	27000000	29000000	35000000	29000000000	99000000	N/A	<260	<300	<610	<280	<250	<180
2-Hexanone	591-78-6	ug/Kg	N/A	100000000	58000	20000	32000000	N/A	2700000000	990000	2500000	1100000	1300000	1200000000	1800000	N/A	<40	<45	<92	<42	<37	<27
4-Methyl-2-pentanone	108-10-1	ug/Kg	N/A	180000000	100000	36000	56000000	N/A	1.4E+11	37000000	2700000	45000000	53000000	60000000000	69000000	N/A	<40	<45	<92	<42	<37	<27
Acetone	67-64-1	ug/Kg	34000	73000000	42000	15000	23000000	N/A	3.9E+11	290000000	110000000	130000000	1600000000	5400000000	990000000	N/A	<130	<150	<310	<140	150	<89
Benzene	71-43-2	ug/Kg	4000	840000	100	100	180000	N/A	380000000	1600	400000	13000	45000	470000000	8400	N/A	<40	<45	<92	<42	<37	<27
Bromodichloromethane	75-27-4	ug/Kg	N/A	490000	1600	1600	110000	N/A	84000000	1200	1500000	9100	31000	110000000	6400	N/A	<40	<45	<92	<42	<37	<27
Bromoform	75-25-2	ug/Kg	N/A	3800000	1600	1600	820000	N/A	2800000000	150000	870000	900000	3100000	3600000000	770000	N/A	<40	<45	<92	<42	<37	<27
Bromomethane	74-83-9	ug/Kg	700	1000000	580	200	320000	N/A	330000000	860	2200000	11000	13000	150000000	1600	N/A	<130	<150	<310	<140	<120	<89
Carbon disulfide	75-15-0	ug/Kg	N/A	43000000	46000	16000	7200000	N/A	47000000000	76000	280000	1300000	1600000	21000000000	140000	N/A	<40	<45	<92	<42	<37	<27
Carbon tetrachloride	56-23-5	ug/Kg	900	440000	100	100	96000	N/A	130000000	190	390000	3500	12000	170000000	990	N/A	<40	<45	<92	<42	<37	<27
Chlorobenzene	108-90-7	ug/Kg	500	14000000	2000	2000	4300000	N/A	4700000000	120000	260000	770000	920000	2100000000	220000	N/A	<40	<45	<92	<42	<37	<27
Chloroethane	75-00-3	ug/Kg	22000	12000000	34000	8600	2600000	N/A	6.7E+11	2900000	950000	30000000	36000000	2.9E+11	5300000	N/A	<130	<150	<310	<140	<120	<89
Chloroform	67-66-3	ug/Kg	7000	5500000	1600	1600	1200000	N/A	1300000000	7200	1500000	45000	150000	1600000000	38000	N/A	<40	<45	<92	<42	<37	<27
Chloromethane	74-87-3	ug/Kg	N/A	7400000	22000	5200	1600000	N/A	4900000000	2300	1100000	40000	120000	2600000000	10000	N/A	<130	<150	<310	<140	<120	<89
cis-1,2-Dichloroethene	156-59-2	ug/Kg	12000	8000000	1400	1400	2500000	N/A	2300000000	22000	640000	180000	210000	1000000000	41000	N/A	<40	<45	<92	<42	<37	<27
cis-1,3-Dichloropropene	10061-01-5	ug/Kg	180	0	N/A	170	10000	N/A	780000000	1000	620000	18000	N/A	N/A	N/A	N/A	<40	<45	<92	<42	<37	<27
Cyclohexane	110-82-7	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<130	<150	<310	<140	<120	<89
Dibromochloromethane	124-48-1	ug/Kg	N/A	5000000	1600	1600	110000	N/A	130000000	3900	610000	24000	80000	160000000	21000	N/A	<40	<45	<92	<42	<37	<27
Dichlorodifluoromethane	75-71-8	ug/Kg	N/A	17000000	270000	95000	5200000	N/A	3.3E+12	900000	1000000	53000000	63000000	1.5E+12	1700000	N/A	<130	<150	<310	<140	<120	<89
Ethylbenzene	100-41-4	ug/Kg	360	71000000	1500	1500	22000000	N/A	10000000000	87000	140000	720000	2400000	13000000000	460000	N/A	<40	<45	<92	<42	<37	<27
Isopropylbenzene	98-82-8	ug/Kg	3200	80000000	260000	91000	25000000	N/A	5800000000	400000	390000	1700000	2000000	2600000000	730000	N/A	<40	<45	<92	<42	<37	<27
Methyl acetate	79-20-9	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	370	1,200	1,400	1,100	1,100	<220
Methyl tert-butyl ether	1634-04-4	ug/Kg	140000	7100000	800	800	1500000	N/A	2E+11	9900000	5900000	25000000	30000000	88000000000	18000000	N/A	<40	<45	<92	<42	<37	<27
Methylcyclohexane	108-87-2	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<40	<45	<92	<42	<37	<27
Methylene chloride	75-09-2	ug/Kg	30000	5800000	100	100	1300000	N/A	6600000000	45000	2000000	210000	700000	8300000000	240000	N/A	<330	<380	<770	<350	<310	<220
Styrene	100-42-5	ug/Kg	2100	1900000	2700	2700	400000	N/A	5500000000	250000	520000	970000	3300000	6900000000	1300000	N/A	<40	<45	<92	<42	<37	<27
Tetrachloroethene	127-18-4	ug/Kg	1200	930000	100	100	200000	N/A	2700000000	11000	88000	170000	210000	1200000000	21000	N/A	<40	<45	<92	<42	<37	<27
Toluene	108-88-3	ug/Kg	5400	16000000	16000	16000	50000000	N/A	27000000000	330000	250000	2800000	3300000	12000000000	610000	N/A	<40	<45	<92	<42	<37	<27
trans-1,2-Dichloroethene	156-60-5	ug/Kg	N/A	N/A	N/A	N/A	N/A	N/A	4700000000	230												

**Table 2. Sediment Sampling Analytical Results Compared Against Screening Criteria**

Amoco Fish and Wildlife Habitat Restoration  
1640 Lakeshore Drive, Muskegon, MI

Analyte Name	CAS	Units	Part 201 & 213- Soil GW Surface	Part 201 & 213- Soil	Part 201 & 213- Soil	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	WRD-048 Sediment Testing for Dredging Projects (04-13-18)	N08 - ID34	H7 - ID41	A3West - ID77	E2 - Shallow	E2 - Deep	E2 - Deep QC	DE9 - ID16
			Water Interface Protection Criteria (12-30- 13)	NonResidential Direct Contact Criteria (12-30- 13)	NonResidential Drinking Water Protection Criteria (12-30- 13)	NonResidential Drinking Water Protection Criteria (12-30- 13)	NonResidential Direct Contact Criteria (12-30- 13)	NonResidential Direct Contact Criteria (12-30- 13)	NonResidential Default Background Level (12-30-13)	Particulate Soil Inhalation Criteria (12-30- 13)	Indoor Air Inhalation Criteria (12-30- 13)	Saturation Concentration Screening Levels (12-30-13)	Volatile Soil Inhalation Criteria (VSIIC) (12-30-13)	Volatile Soil Inhalation Criteria (12-30- 13)	NonResidential Particulate Soil Inhalation (12- 30-13)	Soil Volatilization to Indoor Air Inhalation (12- 30-13)	Soil Volatilization to Indoor Air Inhalation (12- 30-13)	Soil Volatilization to Indoor Air Inhalation (12- 30-13)		19060409-01	19060409-02	19060409-03	19060409-04	19060409-05
Method: Semi-Volatile Organic Compounds																		06/05/19	06/05/19	06/05/19	06/05/19	06/05/19	06/05/19	06/05/19
1,1'-Biphenyl	92-52-4	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
2,4,5-Trichlorophenol	95-95-4	ug/Kg	N/A	73000000	110000	39000	23000000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
2,4,6-Trichlorophenol	88-06-2	ug/Kg	100	33000000	9400	2400	710000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
2,4-Dichlorophenol	120-83-2	ug/Kg	220	39000000	4200	1500	660000	N/A	N/A	1800000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
2,4-Dimethylphenol	105-67-9	ug/Kg	7600	36000000	20000	7400	11000000	N/A	N/A	4700000000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
2,4-Dinitrophenol	51-28-5	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
2,4-Dinitrotoluene	121-14-2	ug/Kg	N/A	220000	640	430	48000	N/A	N/A	16000000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
2,6-Dinitrotoluene	606-20-2	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
2-Chloronaphthalene	91-58-7	ug/Kg	N/A	180000000	1800000	620000	56000000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<7	<10	<8.4	<38	<38	<38	<7.7
2-Chlorophenol	95-57-8	ug/Kg	360	4500000	2600	900	1400000	N/A	N/A	1200000000	430000	19000000	960000	1100000	530000000	800000	N/A	<34	<51	<42	<190	<190	<190	<38
2-Methylnaphthalene	91-57-6	ug/Kg	4200	26000000	170000	57000	8100000	N/A	N/A	670000000	2700000	N/A	1500000	1800000	290000000	4900000	N/A	<7	<10	12	<38	<38	<38	<7.7
2-Methylphenol	95-48-7	ug/Kg	600	36000000	20000	7400	11000000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
2-Nitroaniline	88-74-4	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
2-Nitrophenol	88-75-5	ug/Kg	N/A	2000000	1200	400	630000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
3&4-Methylphenol	34METPH	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
3,3'-Dichlorobenzidine	91-94-1	ug/Kg	7.4	30000	110	28	6600	N/A	N/A	6500000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<170	<260	<210	<940	<940	<960	<190
3-Nitroaniline	99-09-2	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
4,6-Dinitro-2-methylphenol	534-52-1	ug/Kg	N/A	260000	400	400	79000	N/A	N/A	130000000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
4-Bromophenyl phenyl ether	101-55-3	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
4-Chloro-3-methylphenol	59-50-7	ug/Kg	280	15000000	16000	5800	4500000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
4-Chloroaniline	106-47-8	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<70	<100	<85	<380	<380	<380	<78
4-Chlorophenyl phenyl ether	7005-72-3	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
4-Nitroaniline	100-01-6	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<170	<260	<210	<940	<940	<960	<190
4-Nitrophenol	100-02-7	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
Acenaphthene	83-32-9	ug/Kg	8700	130000000	880000	300000	41000000	N/A	N/A	1400000000	190000000	N/A	81000000	97000000	620000000	350000000	N/A	<7	13	<8.4	<38	<38	<38	<7.7
Acenaphthylene	208-96-8	ug/Kg	N/A	5200000	17000	5900	1600000	N/A	N/A	230000000	1600000	N/A	2200000	2700000	100000000	30000000	N/A	<7	<10	10	<38	<38	<38	<7.7
Acetophenone	98-86-2	ug/Kg	N/A	150000000	88000	30000	47000000	N/A	N/A	3300000000	120000000	1100000	44000000	52000000	1400000000	210000000	N/A	<34	<51	<42	<190	<190	<190	<38
Anthracene	120-12-7	ug/Kg	N/A	730000000	41000	41000	230000000	N/A	N/A	6700000000	1000000000	N/A	1400000000	1600000000	2900000000	1000000000	845	<7	<10	24	<38	<38	<38	<7.7
Atrazine	1912-24-9	ug/Kg	150	330000	60	60	71000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
Benzaldehyde	100-52-7	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<70	<100	<85	<380	<380	<380	<78
Benzo(a)anthracene	56-55-3	ug/Kg	N/A	80000	N/A	N/A	20000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1050	<7	45	95	68	79	54	<7.7
Benzo(a)pyrene	50-32-8	ug/Kg	N/A	8000	N/A	N/A	2000	N/A	N/A	1500000	N/A	N/A	N/A	N/A	1900000	N/A	1450	<7	44	93	56	100	73	<7.7
Benzo(b)fluoranthene	205-99-2	ug/Kg	N/A	80000	N/A	N/A	20000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<7	50	160	98	110	88	<7.7
Benzo(g,h,i)perylene	191-24-2	ug/Kg	N/A	7000000	N/A	N/A	2500000	N/A	N/A	800000000	N/A	N/A	N/A	N/A	350000000	N/A	N/A	<7	27	70	64	71	46	<7.7
Benzo(k)fluoranthene	207-08-9	ug/Kg	N/A	800000	N/A	N/A	200000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<7	25	57	38	53	50	<7.7
Bis(2-chloroethoxy)methane	111-91-1	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
Bis(2-chloroethyl)ether	111-44-4	ug/Kg	20	58000	170	100	13000	N/A	N/A	9400000	8300	2200000	3800	13000	12000000	44000	N/A	<34	<51	<42	<190	<190	<190	<38
Bis(2-chloroisopropyl)ether	39638-32-9	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
Bis(2-ethylhexyl)phthalate	117-81-7	ug/Kg	N/A	12000000	N/A	N/A	2800000	N/A	N/A	700000000	N/A	10000000	N/A	N/A	890000000	N/A	N/A	450	<51	<42	<190	<190	<190	<38
Butyl benzyl phthalate	85-68-7	ug/Kg	120000	120000000	5000000	2200000	36000000	N/A	N/A	47000000000	N/A	310000	N/A	N/A	21000000000	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
Caprolactam	105-60-2	ug/Kg	N/A	310000000	340000	120000	53000000	N/A	N/A	670000000	N/A	N/A	N/A	N/A	290000000	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
Carbazole	86-74-8	ug/Kg	1100	2400000	39000	9400	530000	N/A	N/A	62000000	N/A	N/A	N/A	N/A	78000000	N/A	N/A	<34	<51	<42	<190	<190	<190	<38
Chrysene	218-01-9	ug/Kg	N/A	8000000	N/A	N/A	2000000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1290	<7	36	110	49	45	38	<7.7
Dibenzo(a,h)anthracene	53-70-3	ug/Kg	N/A	8000	N/A	N/A	2000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<7	<10	16	<38	<38	<38	<7.7
Dibenzofuran	132-64-9	ug/Kg	1700	N/A	N/A	N/A	N/A	N/A	N/A	6700000	2000000	N/A	130000	160000	2900000	3600000	N/A	<34	<51	<42	<190	<190	<190	<38

**Table 2. Sediment Sampling Analytical Results Compared Against Screening Criteria**

Amoco Fish and Wildlife Habitat Restoration  
1640 Lakeshore Drive, Muskegon, MI

Analyte Name	CAS	Units	Part 201 & 213- Soil GW Surface	Part 201 & 213- Soil	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	WRD-048 Sediment Testing for Dredging Projects (04-13-18)	JK8 ID32/33	C5 - ID69	C8West - ID36	DE8 - ID31	FG8 - ID27	Trip Blank
			Water Interface Protection Criteria (12-30- 13)	NonResidential Direct Contact Criteria (12-30- 13)	NonResidential Drinking Water Protection Criteria (12-30- 13)	NonResidential Drinking Water Protection Criteria (12-30- 13)	NonResidential Direct Contact Criteria (12-30- 13)	NonResidential Default Background Level (12-30-13)	Particulate Soil Inhalation Criteria (12-30- 13)	Indoor Air Inhalation Criteria (12-30- 13)	Saturation Concentration Screening Levels (12-30-13)	Volatile Soil Inhalation Criteria (VSIC) (12-30-13)	Volatile Soil Inhalation Criteria (12-30- 13)	NonResidential Particulate Soil Inhalation (12- 30-13)	Volatilization to Indoor Air Inhalation (12- 30-13)	Testing for Dredging Projects (04-13-18)	19060409-08	19060409-10	19060409-11	19060409-12	19060409-13	19060409-14	
Method: Semi-Volatile Organic Compounds																	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	NA	
Collection Date																	06/05/19	06/06/19	06/06/19	06/06/19	06/06/19	06/06/19	
1,1'-Biphenyl	92-52-4	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<39	<41	<40	<39	<38	
2,4,5-Trichlorophenol	95-95-4	ug/Kg	N/A	73000000	110000	39000	23000000	N/A	23000000000	N/A	N/A	N/A	N/A	N/A	10000000000	N/A	N/A	<39	<41	<40	<39	<38	
2,4,6-Trichlorophenol	88-06-2	ug/Kg	100	33000000	9400	2400	710000	N/A	10000000000	N/A	N/A	N/A	N/A	N/A	13000000000	N/A	N/A	<39	<41	<40	<39	<38	
2,4-Dichlorophenol	120-83-2	ug/Kg	220	39000000	4200	1500	660000	N/A	51000000000	N/A	18000000	N/A	N/A	N/A	23000000000	N/A	N/A	<39	<41	<40	<39	<38	
2,4-Dimethylphenol	105-67-9	ug/Kg	7600	360000000	20000	7400	11000000	N/A	47000000000	N/A	N/A	N/A	N/A	N/A	21000000000	N/A	N/A	<39	<41	<40	<39	<38	
2,4-Dinitrophenol	51-28-5	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<39	<41	<40	<39	<38	
2,4-Dinitrotoluene	121-14-2	ug/Kg	N/A	220000	640	430	48000	N/A	160000000	N/A	N/A	N/A	N/A	N/A	200000000	N/A	N/A	<39	<41	<40	<39	<38	
2,6-Dinitrotoluene	606-20-2	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<39	<41	<40	<39	<38	
2-Chloronaphthalene	91-58-7	ug/Kg	N/A	180000000	1800000	620000	56000000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<8	<8.2	<8.1	<8	<7.7	
2-Chlorophenol	95-57-8	ug/Kg	360	4500000	2600	900	1400000	N/A	12000000000	430000	190000000	960000	1100000	5300000000	800000	N/A	N/A	<39	<41	<40	<39	<38	
2-Methylnaphthalene	91-57-6	ug/Kg	4200	26000000	170000	57000	8100000	N/A	6700000000	2700000	N/A	15000000	1800000	2900000000	4900000	N/A	N/A	<8	<8.2	<8.1	<8	<7.7	
2-Methylphenol	95-48-7	ug/Kg	600	360000000	20000	7400	11000000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<39	<41	<40	<39	<38	
2-Nitroaniline	88-74-4	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<39	<41	<40	<39	<38	
2-Nitrophenol	88-75-5	ug/Kg	N/A	2000000	1200	400	630000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<39	<41	<40	<39	<38	
3&4-Methylphenol	34METPH	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<39	<41	<40	<39	<38	
3,3'-Dichlorobenzidine	91-94-1	ug/Kg	7.4	30000	110	28	6600	N/A	6500000	N/A	N/A	N/A	N/A	N/A	8200000	N/A	N/A	<200	<210	<200	<200	<190	
3-Nitroaniline	99-09-2	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<39	<41	<40	<39	<38	
4,6-Dinitro-2-methylphenol	534-52-1	ug/Kg	N/A	260000	400	400	79000	N/A	1300000000	N/A	N/A	N/A	N/A	N/A	590000000	N/A	N/A	<39	<41	<40	<39	<38	
4-Bromophenyl phenyl ether	101-55-3	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<39	<41	<40	<39	<38	
4-Chloro-3-methylphenol	59-50-7	ug/Kg	280	150000000	16000	5800	4500000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<39	<41	<40	<39	<38	
4-Chloroaniline	106-47-8	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<80	<83	<81	<80	<78	
4-Chlorophenyl phenyl ether	7005-72-3	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<39	<41	<40	<39	<38	
4-Nitroaniline	100-01-6	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<200	<210	<200	<200	<190	
4-Nitrophenol	100-02-7	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<39	<41	<40	41	<38	
Acenaphthene	83-32-9	ug/Kg	8700	130000000	880000	3000000	41000000	N/A	14000000000	190000000	N/A	81000000	97000000	6200000000	350000000	N/A	N/A	<8	<8.2	<8.1	<8	10	
Acenaphthylene	208-96-8	ug/Kg	N/A	52000000	17000	5900	1600000	N/A	2300000000	1600000	N/A	22000000	27000000	1000000000	30000000	N/A	N/A	<8	<8.2	<8.1	<8	<7.7	
Acetophenone	98-86-2	ug/Kg	N/A	150000000	88000	30000	47000000	N/A	33000000000	120000000	11000000	44000000	52000000	14000000000	210000000	N/A	N/A	<39	<41	<40	<39	<38	
Anthracene	120-12-7	ug/Kg	N/A	730000000	41000	41000	230000000	N/A	67000000000	10000000000	N/A	14000000000	16000000000	29000000000	10000000000	845	N/A	<8	<8.2	<8.1	<8	<7.7	
Atrazine	1912-24-9	ug/Kg	150	330000	60	60	71000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<39	<41	<40	<39	<38	
Benzaldehyde	100-52-7	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<80	<83	<81	<80	<78	
Benzo(a)anthracene	156-55-3	ug/Kg	N/A	80000	N/A	N/A	20000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1050	N/A	9.5	17	<8.1	<8	<7.7	
Benzo(a)pyrene	50-32-8	ug/Kg	N/A	8000	N/A	N/A	2000	N/A	1500000	N/A	N/A	N/A	N/A	N/A	1900000	N/A	1450	8.8	20	12	<8	8.5	
Benzo(b)fluoranthene	205-99-2	ug/Kg	N/A	80000	N/A	N/A	20000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	15	28	19	<8	11	
Benzo(g,h,i)perylene	191-24-2	ug/Kg	N/A	70000000	N/A	N/A	25000000	N/A	8000000000	N/A	N/A	N/A	N/A	N/A	3500000000	N/A	N/A	<8	21	11	<8	<7.7	
Benzo(k)fluoranthene	207-08-9	ug/Kg	N/A	800000	N/A	N/A	2000000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<8	13	<8.1	<8	<7.7	
Bis(2-chloroethoxy)methane	111-91-1	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<39	<41	<40	<39	<38	
Bis(2-chloroethyl)ether	111-44-4	ug/Kg	20	58000	170	100	13000	N/A	9400000	8300	22000000	3800	13000	12000000	44000	N/A	N/A	<39	<41	<40	<39	<38	
Bis(2-chloroisopropyl)ether	39638-32-9	ug/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<39	<41	<40	<39	<38	
Bis(2-ethylhexyl)phthalate	117-81-7	ug/Kg	N/A	12000000	N/A	N/A	2800000	N/A	700000000	N/A	100000000	N/A	N/A	890000000	N/A	N/A	N/A	<39	<41	<40	280	<38	
Butyl benzyl phthalate	85-68-7	ug/Kg	120000	120000000	5000000	2200000	36000000	N/A	47000000000	N/A	3100000	N/A	N/A	21000000000	N/A	N/A	N/A	<39	<41	<40	<39	<38	
Caprolactam	105-60-2	ug/Kg	N/A	310000000	340000	120000	53000000	N/A	6700000000	N/A	N/A	N/A	N/A	2900000000	N/A	N/A	N/A	<39	<41	<40	<39	<38	
Carbazole	86-74-8	ug/Kg	1100	2400000	39000	9400	530000	N/A	62000000	N/A	N/A	N/A	N/A	78000000	N/A	N/A	N/A	<39	<41	<40	<39	<38	
Chrysene	218-01-9	ug/Kg	N/A	8000000	N/A	N/A	2000000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1290	N/A	<8	18	<8.1	<8	<7.7	
Dibenzo(a,h)anthracene	53-70-3	ug/Kg	N/A	8000	N/A	N/A	2000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<8	<8.2	<8.1	<8	<7.7	
Dibenzofuran	132-64-9	ug/Kg	1700	N/A	N/A	N/A	N/A	N/A	6700000	2000000	N/A	1300000	1600000	2900000	3600000	N/A	N/A	<39	<41	<40	<39	<38	
Diethyl phthalate	84-66-2	ug/Kg	2200	550000000	320000	110000	170000000	N/A	3300000000	N/A	740000	N/A	N/A	1500000000	N/A	N/A	N/A	<39	<41	<40	<39	<38	
Dimethyl phthalate	131-11-3	ug/Kg	N/A	1000000000	4200000	1500000	1000000000	N/A	3300000000	N/A	790000	N/A	N/A	1500000000	N/A	N/A	N/A	<39	<41	<40	<39	<38	
Di-n-butyl phthalate	84-74-2	ug/Kg	11000	87000000	2700000	960000	27000000	N/A	3300000000	N/A	760000	N/A	N/A	1500000000	N/A	N/A	N/A	<39	<41</				



**Table 2. Sediment Sampling Analytical Results Compared Against Screening Criteria**

Amoco Fish and Wildlife Habitat Restoration  
1640 Lakeshore Drive, Muskegon, MI

Analyte Name	CAS	Units	Part 201 & 213- Soil GW Surface Water Interface Protection Criteria (12-30- 13)	Part 201 & 213- Soil NonResidential Direct Contact Criteria (12-30- 13)	Part 201 & 213- Soil NonResidential Drinking Water Protection Criteria (12-30- 13)	Part 201 & 213- Soil Residential Drinking Water Protection Criteria (12-30- 13)	Part 201 & 213- Soil Residential Direct Contact Criteria (12-30- 13)	Part 201 & 213- Soil Statewide Default Background Level (12-30-13)	Part 201 & 213- Soil Residential Particulate Soil Inhalation Criteria (12-30- 13)	Part 201 & 213- Soil Residential Volatilization to Indoor Air Inhalation Criteria (12-30- 13)	Part 201 & 213- Soil Residential Saturation Concentration Screening Levels (12-30-13)	Part 201 & 213- Soil Residential Infinite Source Volatile Soil Inhalation Criteria (VSIC) (12-30-13)	Part 201 & 213- Soil NonResidential Infinite Source Volatile Soil Inhalation Criteria (12-30- 13)	Part 201 & 213- Soil NonResidential Particulate Soil Inhalation (12- 30-13)	Part 201 & 213- Soil NonResidential Volatilization to Indoor Air Inhalation (12- 30-13)	WRD-048 Sediment Testing for Dredging Projects (04-13-18)	N08 - ID34	H7 - ID41	A3West - ID77	E2 - Shallow	E2 - Deep	E2 - Deep QC	DE9 - ID16		
			19060409-01	19060409-02	19060409-03	19060409-04	19060409-05	19060409-06	19060409-07																
Lab Sample ID																		0-2	0-2	0-2	0.8-1.0	1.1-1.4	1.1-1.4	0-2	
Sample Interval (feet below sediment surface)																		06/05/19	06/05/19	06/05/19	06/05/19	06/05/19	06/05/19	06/05/19	
Collection Date																									
Method: Metals Analysis by ICP																									
Arsenic	7440-38-2	ug/Kg	4600	37000	4600	4600	7600	5800	720000	N/A	N/A	N/A	N/A	910000	N/A	33000		870	1000	1200	640	570	470	590	
Barium	7440-39-3	ug/Kg	N/A	13000000	1300000	1300000	37000000	75000	330000000	N/A	N/A	N/A	N/A	150000000	N/A	N/A		2900	6800	23000	5000	5200	4500	2300	
Cadmium	7440-43-9	ug/Kg	N/A	2100000	6000	6000	550000	1200	1700000	N/A	N/A	N/A	N/A	2200000	N/A	4980		<860	<1100	<1100	<720	<840	<740	<860	
Chromium	7440-47-3	ug/Kg	3300	9200000	30000	30000	790000000	N/A	N/A	N/A	N/A	N/A	240000	240000	240000	111000		870	3500 (1)	14000 (1)	1800	2200	1600	1000	
Copper	7440-50-8	ug/Kg	N/A	73000000	5800000	5800000	20000000	32000	130000000	N/A	N/A	N/A	N/A	59000000	N/A	149000		<860	1300	9900	2500	1200	860	<860	
Lead	7439-92-1	ug/Kg	N/A	900000	700000	700000	400000	21000	100000000	N/A	N/A	N/A	N/A	44000000	N/A	128000		<430	2900	12000	5700	5300	3300	<430	
Nickel	7440-02-0	ug/Kg	N/A	150000000	100000	100000	40000000	20000	13000000	N/A	N/A	N/A	N/A	16000000	N/A	48600		<430	790	2000	660	810	800	<430	
Selenium	7782-49-2	ug/Kg	400	9600000	4000	4000	2600000	410	130000000	N/A	N/A	N/A	N/A	59000000	N/A	1900		<860	<1100	<1100	<720	<840	<740	<860	
Silver	7440-22-4	ug/Kg	27	9000000	13000	4500	2500000	1000	6700000	N/A	N/A	N/A	N/A	29000000	N/A	N/A		<430	<530	<530	<360	<420	<370	<430	
Zinc	7440-66-6	ug/Kg	N/A	630000000	5000000	2400000	170000000	47000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	459000		1000	8600	30000	8900	7400	4200	1200	
Method: Biochemical Oxygen Demand																									
Biochemical Oxygen Demand	BOD	mg/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	250		100	160	140	110	110	110	120	
Method: Mercury by CVAA																									
Mercury	7439-97-6	ug/Kg	1.2	580000	1700	1700	160000	130	20000000	48000	N/A	52000	62000	8800000	89000	1060		<14 (1)	<23 (1)	18 (1)	<14 (1)	<15 (1)	<15 (1)	<17 (1)	
Method: Moisture																									
Moisture	MOIST	% of sample	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		5.7	37	25	12	14	14	15	

**Notes**

Above MDL/RL

J flag

Result above guideline

No matching guideline

Guideline Less than RL

**Table 2. Sediment Sampling Analytical Results Compared Against Screening Criteria**

Amoco Fish and Wildlife Habitat Restoration  
1640 Lakeshore Drive, Muskegon, MI

Analyte Name	CAS	Units	Part 201 & 213- Soil GW Surface	Part 201 & 213- Soil	Part 201 & 213- Soil	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	Part 201 & 213- Soil Residential	WRD-048 Sediment Testing for Dredging Projects (04-13-18)	JK8 ID32/33	C5 - ID69	C&West - ID36	DE8 - ID31	FG8 - ID27	Trip Blank
			Water Interface Protection Criteria (12-30- 13)	NonResidential Direct Contact Criteria (12-30- 13)	NonResidential Drinking Water Protection Criteria (12-30- 13)	Soil Residential Drinking Water Protection Criteria (12-30- 13)	Soil Residential Direct Contact Criteria (12-30- 13)	Soil Statewide Default Background Level (12-30-13)	Particulate Soil Inhalation Criteria (12-30- 13)	Soil Residential Volatilization to Indoor Air Inhalation Criteria (12-30- 13)	Soil Residential Saturation Concentration Screening Levels (12-30-13)	Soil Residential Infinite Source Volatile Soil Inhalation Criteria (VSIC) (12-30-13)	Soil Residential Infinite Source Volatile Soil Inhalation Criteria (12-30- 13)	Soil Residential Infinite Source Volatile Soil Inhalation Criteria (12-30- 13)	Soil Residential Infinite Source Volatile Soil Inhalation Criteria (12-30- 13)	Soil Residential Infinite Source Volatile Soil Inhalation Criteria (12-30- 13)	Soil Residential Infinite Source Volatile Soil Inhalation Criteria (12-30- 13)	19060409-08	19060409-10	19060409-11	19060409-12	19060409-13
Lab Sample ID																	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	NA
Sample Interval (feet below sediment surface)																	06/05/19	06/06/19	06/06/19	06/06/19	06/06/19	06/06/19
Collection Date																						
Method: Metals Analysis by ICP																						
Arsenic	7440-38-2	ug/Kg	4600	37000	4600	4600	7600	5800	720000	N/A	N/A	N/A	N/A	910000	N/A	33000	740	810	810	720	600	
Barium	7440-39-3	ug/Kg	N/A	130000000	1300000	1300000	37000000	75000	330000000	N/A	N/A	N/A	N/A	150000000	N/A	N/A	5000	8300	6600	4800	4100	
Cadmium	7440-43-9	ug/Kg	N/A	2100000	6000	6000	550000	1200	1700000	N/A	N/A	N/A	N/A	2200000	N/A	4980	<930	<1000	<1000	<830	<890	
Chromium	7440-47-3	ug/Kg	3300	9200000	30000	30000	790000000	N/A	N/A	N/A	N/A	N/A	240000	240000	240000	111000	3400 (1)	6400 (1)	9000 (1)	2500	2200	
Copper	7440-50-8	ug/Kg	N/A	73000000	5800000	5800000	20000000	32000	130000000	N/A	N/A	N/A	N/A	59000000	N/A	149000	<930	1000 J	<1000	40000 (6)	<890	
Lead	7439-92-1	ug/Kg	N/A	900000	700000	700000	400000	21000	100000000	N/A	N/A	N/A	N/A	44000000	N/A	128000	1400	2700	2700	4700	1100	
Nickel	7440-02-0	ug/Kg	N/A	150000000	100000	100000	40000000	20000	13000000	N/A	N/A	N/A	N/A	16000000	N/A	48600	570	1000	1200	590	600	
Selenium	7782-49-2	ug/Kg	400	9600000	4000	4000	2600000	410	130000000	N/A	N/A	N/A	N/A	59000000	N/A	1900	<930	<1000	<1000	<830	<890	
Silver	7440-22-4	ug/Kg	27	9000000	13000	4500	2500000	1000	6700000	N/A	N/A	N/A	N/A	2900000	N/A	N/A	<470	<510	<520	<410	<440	
Zinc	7440-66-6	ug/Kg	N/A	630000000	5000000	2400000	170000000	47000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	459000	4700	12000	11000	4400	3500	
Method: Biochemical Oxygen Demand																						
Biochemical Oxygen Demand	BOD	mg/Kg-dry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	250						
Method: Mercury by CVAA																						
Mercury	7439-97-6	ug/Kg	1.2	580000	1700	1700	160000	130	20000000	48000	N/A	52000	62000	8800000	89000	1060	<16 (1)	<17 (1)	<15 (1)	<14 (1)	<14 (1)	
Method: Moisture																						
Moisture	MOIST	% of sample	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	19	23	20	21	17	

**Notes**

Above MDL/RL

J flag

Result above guideline

No matching guideline

Guideline Less than RL

**Table 3. Sediment Sampling Disposal Characterization Analytical Results**

Amoco Fish and Wildlife Habitat Restoration  
1640 Lakeshore Drive, Muskegon, MI

Analyte Name 60519009  
Lab Sample ID 19060409-09  
Collection Date 06/05/19

	CAS	Result	Units
<b>Method: TCLP Volatile Organics</b>			
1,1-Dichloroethene	75-35-4	<20	ug/L
1,2-Dichloroethane	107-06-2	<20	ug/L
2-Butanone	78-93-3	<100	ug/L
Benzene	71-43-2	<20	ug/L
Carbon tetrachloride	56-23-5	<20	ug/L
Chlorobenzene	108-90-7	<20	ug/L
Chloroform	67-66-3	<20	ug/L
Tetrachloroethene	127-18-4	<20	ug/L
Trichloroethene	79-01-6	<20	ug/L
Vinyl chloride	75-01-4	<20	ug/L
<b>Method: TCLP Semi-Volatile Organics</b>			
1,4-Dichlorobenzene	106-46-7	<100	ug/L
2,4,5-Trichlorophenol	95-95-4	<100	ug/L
2,4,6-Trichlorophenol	88-06-2	<100	ug/L
2,4-Dinitrotoluene	121-14-2	<100	ug/L
Hexachloro-1,3-butadiene	87-68-3	<100	ug/L
Hexachlorobenzene	118-74-1	<100	ug/L
Hexachloroethane	67-72-1	<100	ug/L
m-Cresol	108-39-4	<100	ug/L
Nitrobenzene	98-95-3	<100	ug/L
o-Cresol	95-48-7	<100	ug/L
p-Cresol	106-44-5	<100	ug/L
Pentachlorophenol	87-86-5	<100	ug/L
Pyridine	110-86-1	<200	ug/L
<b>Method: TCLP Metals Analysis by ICP-MS</b>			
Arsenic	7440-38-2	<0.050	mg/L
Barium	7440-39-3	0.17	mg/L
Cadmium	7440-43-9	<0.0020	mg/L
Chromium	7440-47-3	<0.050	mg/L
Copper	7440-50-8	<0.050	mg/L
Lead	7439-92-1	<0.050	mg/L
Selenium	7782-49-2	<0.050	mg/L
Silver	7440-22-4	<0.050	mg/L
Zinc	7440-66-6	0.11	mg/L
<b>Method: TCLP Mercury by CVAA</b>			
Mercury	7439-97-6	<0.0020	mg/Kg

Above MDL/RL

J flag