APPENDIX A

CLEAN WATER ACT SECTION 404 (b)(1) EVALUATION

U.S. ARMY CORPS OF ENGINEERS

CLEAN WATER ACT SECTION 404 (b)(1) EVALUATION
U.S. ARMY CORPS OF ENGINEERS

PROJECT: Maurice River Federal Channel Maintenance and Beneficial Use of Dredged Material

PROJECT MANAGER: Monica A. Chasten Phone: 215-656-6683

FORM COMPLETED BY: Barbara E. Conlin Phone: 215-656-6557

PROJECT DESCRIPTION: The Maurice River Federal Navigation Channel, adopted as HD 59-644 in 1910 and modified as HD 73-275 in 1935, provides for a channel 7 feet deep and 150 feet wide in Delaware Bay across Maurice Cove to the mouth; thence a channel 7 feet deep, 100 feet wide to the fixed bridge at Millville, 21.5 miles above the mouth, and then 60 feet wide to the mill dam, a further distance of one-half mile, including a turning basin 7 feet deep at Millville. The USACE proposes to conduct maintenance dredging of a portion of the lower Maurice River federal navigation channel in the cove to authorized depth of 7 ft MLLW with 2 ft allowable overdepth in winter 2022. Dredging will remove critical shoaling in priority areas identified by channel users to maintain a safe and reliable navigation channel for commercial and recreational vessels.

The USACE has prepared an Environmental Assessment that evaluates a No Action alternative and alternative placement plans to restore protective wetland habitat within an area that is now flooded marsh. Along with channel maintenance dredging, the beneficial use placement component supports ecosystem restoration. The operation will initially employ a hydraulic pipeline dredge to pump approximately 75,000 cubic yards of dredged material into the adjacent flooded marsh area (approximately 20 acres with the first placement, potentially 35 acres total in future placements) within the Heislerville Wildlife Management Area. Subsequent placements for additional sediment enrichment, following a period of consolidation, may also employ methods of spraying and spreading dredged material to distribute across degraded marsh lost to erosion and subsidence, creating a landscape of marsh elevation and intertidal shallows. The environmental benefits include storm surge protection to the vulnerable Heislerville dike, improvement of water quality through the reduction of marsh edge erosion, and wetland habitat restoration.

Impacts associated with implementing the maintenance dredging/ecosystem restoration project include short-term impacts from construction such as temporary impacts to approximately 20 acres during the first-year placement and approximately 35 total acres in subsequent placement operations of existing mudflats, shallow water and marsh vegetation. Other temporary impacts are increased turbidity and noise; temporary impacts to aesthetics, and the temporary displacement of wildlife from the area.

1. Review of Compliance (Section 230.10(a)-(d)).

a.	The discharge represents the least environmentally damaging practicable alternative and if in a special aquatic site, the activity associated with the discharge must have direct access or proximity to, or be located in the aquatic ecosystem to fulfill its basic purpose.	| X_ | YES	| NO
b.	The activity does not appear to: 1) violate applicable state water quality standards or effluent standards prohibited under Section 307 of the CWA; 2) jeopardize the existence of Federally listed threatened and endangered species or their critical habitat; and 3) violate requirements of any Federally designated marine sanctuary	| X_ | YES	| NO
c.	The activity will not cause or contribute to significant degradation of waters of the U.S. including adverse effects on human health, life stages of organisms dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values	|X _ | YES	| NO
d.	Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem	| X_ | YES	| NO

Technical Evaluation Factors (Subparts C-F).

	N/A	Not Signif cant	Signif cant
a. Potential Impacts on Physical and Chemical Characteristics of the Aquatic Ecosystem (Subpart C) (Sec. 230.20-230.25).			
1) Substrate.		X	
2) Suspended particulates/turbidity.		X	
3) Water.		X	
4) Current patterns and water circulation.		X	
5) Normal water fluctuations.	X		
6) Salinity gradients.	X		
b. Potential Impacts on Biological Characteristics of the Aquatic Ecosystem (Subpart D)(Sec. 230.30-230.32).			
1) Threatened and endangered species.		X	
2) Fish, crustaceans, mollusks and other aquatic organisms in the food web.		X	
3) Other wildlife.		X	
c. Potential Impacts on Special Aquatic Sites (Subpart E)(Sec. 230.40-230.45).			
1) Sanctuaries and refuges.		X	
2) Wetlands.		X	
3) Mud flats.		X	
4) Vegetated shallows.		X	
5) Coral reefs.	X		
6) Riffle and pool complexes.	X		
d. Potential Effects on Human Use Characteristics (Subpart F)(Sec 230.50-230.45)			
1) Municipal and private water supplies.	X		
2) Recreational and commercial fisheries.		X	
3) Water-related recreation.		x	
4) Aesthetics.		X	
5) Parks, national and historic monuments, national seashores, wilderness areas, research sites, and similar preserves.		X	

2. Evaluation and Testing (Subpart G) (Sec. 230.60-230.61)

a. The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material. (Check only those appropriate.)

1)	Physical characteristics.....	| X|
2)	Hydro-geography in relation to known or anticipated sources of contaminants.....	| X|
3)	Results from previous testing of the material or similar material in the vicinity of the project ..	| X|
4)	Known, significant sources of persistent pesticides from land runoff or percolation	| X|
5)	Spill records for petroleum products or designated hazardous substances (Section 311 of CWA)	| X|
6)	Public records of significant introduction of contaminants from industries, municipalities, or other sources	| X|
7)	Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge activities	| X|
8)	Other sources (specify)	| |

List appropriate references.

Draft Environmental Assessment for

b. An evaluation of the appropriate information in 3a above indicates that there is reason to believe the proposed dredge or fill material is not a carrier of contaminants, or that levels of contaminants are substantively similar at extraction and disposal sites and not likely to require constraints. The material meets the testing exclusion criteria.

|X|	| |
YES	NO

3. Disposal Site Delineation (Section 230.11(f)).

a. The following factors, as appropriate, have been considered in evaluating the disposal site.

1)	Depth of water at disposal site	| X|
2)	Current velocity, direction, and variability at the disposal site	| X|
3)	Degree of turbulence	| X|
4)	Water column stratification	| X|
5)	Discharge vessel speed and direction	| X|
6)	Rate of discharge	| X|
7)	Dredged material characteristics (constituents, amount, and type of material, settling velocities)	| X|
8)	Number of discharges per unit of time	| |

9) Other factors affecting rates and patterns of mixing (specify) ..... | X|

List appropriate references:

Draft Environmental Assessment for

b. An evaluation of the appropriate factors in 4a above indicates that the disposal site and/or size of mixing zone are acceptable

| X | | |
YES NO

4. Actions To Minimize Adverse Effects (Subpart H)(Sec. 230.70-230.77).

All appropriate and practicable steps have been taken, through application of recommendation of Section 230.70-230.77 to ensure minimal adverse effects of the proposed discharge. | X | | |
NO

List actions taken:

a. Operations will be scheduled during nonproductivity periods of the year.

b. Lessons learned from previous similar operations will be implemented to minimize adverse effects to the environment such as employing stabilization measures such as turbidity curtains, earthern berms, and/or coir logs.

5. Factual Determination (Section 230.11).

A review of appropriate information as identified in items 2 - 5 above indicates that there is minimal potential for short or long term environmental effects of the proposed discharge as related to:

a. Physical substrate (review sections 2a, 3, 4, and 5 above). YES | X| NO | |

b. Water circulation, fluctuation and salinity (review sections 2a, 3, 4, and 5). YES | X| NO | |

c. Suspended particulates/turbidity (review sections 2a, 3, 4, and 5). YES | X| NO | |

d. Contaminant availability (review sections 2a, 3, and 4). YES | X| NO | |

e. Aquatic ecosystem structure, function and organisms(review sections 2b and c, 3, and 5) YES | X| NO | |

f.	Proposed disposal site (review sections 2, 4, and 5).	YES | X|	NO | |
g.	Cumulative effects on the aquatic ecosystem.	YES | X|	NO | |
h.	Secondary effects on the aquatic ecosystem.	YES | X|	NO | |

6. **Findings of Compliance or non-compliance.** (Sec. 230.12)

The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines ...	YES | X |	NO | |

APPENDIX B

SEDIMENT CHEMICAL ANALYSES TABLES

Maurice River Bulk Sediment Samples 2017

Sample ID:	NJ	NJ	MR-1		MR-2		MR-3		MR-4	
Sample Date:	Residential Soil	Non-Residential Soil	7/26/17		7/26/17		7/26/17		7/26/17	
MISCELLANEOUS PARAMETERS										
	mg/kg	mg/kg	mg/kg		mg/kg		mg/kg		mg/kg	
Cyanide, Total	47.00	680.00	1.8		ND		ND		ND	
Total Organic Carbon	---	---	48000		94000		58000		28000	
INORGANICS	mg/kg	mg/kg	mg/kg		mg/kg		mg/kg		mg/kg	
Aluminum	78000.00	---	14000		13000		17000		12000	
Antimony	31.00	450.00	0.32		0.18	J	0.11	J	0.083	J
Arsenic	19.00	19.00	23		13		13		6.6	
Barium	16000.00	59000.00	55		46		54		38	
Beryllium	16.00	140.00	1		0.76		0.98		0.66	
Cadmium	78.00	78.00	0.69		0.26		0.21		0.11	
Calcium	---	---	3400		3500		4300		99000	
Chromium	---	---	58		46		50		36	
Cobalt	1600.00	590.00	13		10		12		7.2	
Copper	3100.00	45000.00	29		17		14		7.4	
Iron	---	---	31000		30000		32000		22000	
Lead	400.00	800.00	45		24		17		7.7	
Magnesium	---	---	7900		7600		9000		7300	
Manganese	11000.00	5900.00	920		550		460		430	
Mercury (ug/kg)	23000.00	5900000.00	260		240		57		8.6	F1
Nickel	1600.00	23000.00	28		22		29		18	
Potassium	---	---	3500		3300		4200		3200	
Selenium	390.00	5700.00	1.6		1.1		1.4		0.77	
Silver	390.00	5700.00	0.31		0.13	J	0.1	J	0.047	J
Sodium	---	---	8500		12000		9400		7800	

Thallium	---	---	0.24		0.18		0.21		0.14	
Vanadium	78.00	1100.00	52		40		52		35	
Zinc	23000.00	110000.00	240		120		79		49	
SEMIVOLATILES	**mg/kg**	**mg/kg**	**ug/kg**		**ug/kg**		**ug/kg**		**ug/kg**	
1,1'-Biphenyl	61.00	240.00	3.8	J	ND		ND		ND	
2,2'-oxybis[1-chloropropane]	23.00	67.00	ND		ND		ND		ND	
2,4,5-Trichlorophenol	6100.00	68000.00	ND		ND		ND		ND	
2,4,6-Trichlorophenol	19.00	74.00	ND		ND		ND		ND	
2,4-Dichlorophenol	180.00	2100.00	ND		ND		ND		ND	
2,4-Dimethylphenol	1200.00	14000.00	ND		ND		ND		ND	
2,4-Dinitrophenol	120.00	1400.00	ND		ND		ND		ND	
2,4-Dinitrotoluene	0.70	3.00	ND		ND		ND		ND	
2,6-Dinitrotoluene	0.70	3.00	ND		ND		ND		ND	
2-Chloronaphthalene	---	---	ND		ND		ND		ND	
2-Chlorophenol	310.00	2200.00	ND		ND		ND		ND	
2-Methylnaphthalene	230.00	2400.00	17		6.6	J	ND		ND	
2-Methylphenol	310.00	3400.00	ND		ND		ND		ND	
2-Nitroaniline	39.00	23000.00	ND		ND		ND		ND	
2-Nitrophenol	---	---	ND		ND		ND		ND	
3,3'-Dichlorobenzidine	1.00	4.00	ND		ND		ND		ND	
3-Nitroaniline	---	---	ND		ND		ND		ND	
4,6-Dinitro-2-methylphenol	6.00	68.00	ND		ND		ND		ND	
4-Bromophenyl phenyl ether	---	---	ND		ND		ND		ND	
4-Chloro-3-methylphenol	---	---	ND		ND		ND		ND	
4-Chloroaniline	---	---	ND		ND		ND		ND	
4-Chlorophenyl phenyl ether	---	---	ND		ND		ND		ND	
4-Nitroaniline	---	---	ND		ND		ND		ND	
4-Nitrophenol	---	---	ND		ND		ND		ND	
Acenaphthene	3400.00	37000.00	3.4	J	ND		ND		ND	
Acenaphthylene	---	300000.00	5.7	J	ND		ND		ND	
Acetophenone	2.00	5.00	ND		ND		ND		ND	
Anthracene	17000.00	30000.00	10		5.1	J	ND		ND	
Atrazine	210.00	2400.00	ND		ND		ND		ND	
Benzaldehyde	6100.00	68000.00	12	J *	16	J *	8.5	J *	5	J *
Benzo[a]anthracene	5.00	17.00	21		10		ND		ND	
Benzo[a]pyrene	0.50	2.00	20		7.5	J	ND		ND	

Benzo[b]fluoranthene	17.00	5.00	28		11		ND		ND	
Benzo[g,h,i]perylene	380000.00	30000.00	20		12		ND		ND	
Benzo[k]fluoranthene	45.00	170.00	8	J	4.5	J	ND		ND	
Bis(2-chloroethoxy)methane	---	---	ND		ND		ND		ND	
Bis(2-chloroethyl)ether	0.40	2.00	ND		ND		ND		ND	
Bis(2-ethylhexyl) phthalate	35.00	140.00	ND		ND		ND		ND	
Butyl benzyl phthalate	1200.00	14000.00	ND		ND		ND		ND	
Caprolactam	31000.00	340000.00	ND		ND		ND		ND	
Carbazole	24.00	96.00	ND		ND		ND		ND	
Chrysene	450.00	1700.00	21		12		ND		ND	
Dibenz(a,h)anthracene	0.50	2.00	3.6	J	ND		ND		ND	
Dibenzofuran	---	---	5.8	J	ND		ND		ND	
Diethyl phthalate	49000.00	550000.00	ND		ND		5.5	J	ND	
Dimethyl phthalate	---	---	ND		ND		ND		ND	
Di-n-butyl phthalate	---	---	3.3	J	ND		ND		3.5	J
Di-n-octyl phthalate	2400.00	27000.00	ND		ND		ND		ND	
Fluoranthene	2300.00	24000.00	24		12		ND		ND	
Fluorene	2300.00	24000.00	11		ND		ND		ND	
Hexachlorobenzene	0.30	1.00	ND		ND		ND		ND	
Hexachlorobutadiene	6.00	25.00	ND		ND		ND		ND	
Hexachlorocyclopentadiene	45.00	110.00	ND		ND		ND		ND	
Hexachloroethane	12.00	48.00	ND		ND		ND		ND	
Indeno[1,2,3-cd]pyrene	12.00	17.00	18		9.5	J	ND		ND	
Isophorone	510.00	2000.00	ND		ND		ND		ND	
Methylphenol, 3 & 4	31.00	340.00	17	J	13	J	5.7	J	4.3	J
Naphthalene	6.00	17.00	33		15		ND		ND	
Nitrobenzene	5.00	14.00	ND		ND		ND		ND	
N-Nitrosodi-n-propylamine	0.20	0.30	ND		ND		ND		ND	
N-Nitrosodiphenylamine	99.00	390.00	ND		ND		ND		ND	
Pentachlorophenol	0.90	3.00	ND		ND		ND		ND	
Phenanthrene	---	300000.00	27		12		ND		ND	
Phenol	18000.00	210000.00	ND		ND		ND		ND	
Pyrene	1700.00	18000.00	35		16		ND		ND	
VOLATILES	**mg/kg**	**mg/kg**	**ug/kg**		**ug/kg**		**ug/kg**		**ug/kg**	
1,1,1-Trichloroethane	160000.00	---	ND		ND		ND		ND	
1,1,2,2-Tetrachloroethane	1.00	3.00	ND		ND		ND		ND	

1,1,2-Trichloro-1,2,2-trifluoroethane	---	---	ND		ND		ND		ND	
1,1,2-Trichloroethane	2.00	6.00	ND		ND		ND		ND	
1,1-Dichloroethane	8.00	24.00	ND		ND		ND		ND	
1,1-Dichloroethene	11.00	150.00	ND		ND		ND		ND	
1,2,4-Trichlorobenzene	73.00	820.00	ND		ND		ND		ND	
1,2-Dibromo-3-Chloropropane	0.08	0.20	ND		ND		ND		ND	
1,2-Dibromoethane (EDB)	0.01	0.04	ND		ND		ND		ND	
1,2-Dichlorobenzene	5300.00	59000.00	ND		ND		ND		ND	
1,2-Dichloroethane	0.90	3.00	ND		ND		ND		ND	
1,2-Dichloropropane	2.00	5.00	ND		ND		ND		ND	
1,3-Dichlorobenzene	5300.00	59000.00	ND		ND		ND		ND	
1,4-Dichlorobenzene	5.00	13.00	ND		ND		ND		ND	
2-Butanone (MEK)	3100.00	44000.00	ND		ND		ND		ND	
2-Hexanone	---	---	ND		ND		ND		ND	
4-Methyl-2-pentanone (MIBK)	---	---	ND		ND		ND		ND	
Acetone	70000.00	---	13	J B	17	J B	15	J B	17	J B
Benzene	2.00	5.00	ND		ND		ND		ND	
Bromodichloromethane	1.00	3.00	ND		ND		ND		ND	
Bromoform	81.00	280.00	ND		ND		ND		ND	
Bromomethane	25.00	59.00	ND		ND		ND		ND	
Carbon disulfide	7800.00	110000.00	ND		ND		ND		18	
Carbon tetrachloride	2.00	4.00	ND		ND		ND		ND	
Chlorobenzene	510.00	7400.00	ND		ND		ND		ND	
Chloroethane	220.00	1100.00	ND		ND		ND		ND	
Chloroform	0.60	2.00	ND		ND		ND		ND	
Chloromethane	4.00	12.00	ND		ND		ND		ND	
cis-1,2-Dichloroethene	230.00	560.00	ND		ND		ND		ND	
cis-1,3-Dichloropropene	---	---	ND		ND		ND		ND	
Cyclohexane	---	---	ND		ND		ND		ND	
Dibromochloromethane	3.00	8.00	ND		ND		ND		ND	
Dichlorodifluoromethane	490.00	230000.00	ND		ND		ND		ND	
Ethylbenzene	7800.00	110000.00	ND		ND		ND		ND	
Isopropylbenzene	---	---	ND		ND		ND		ND	
Methyl acetate	78000.00	---	ND		ND		ND		ND	
Methyl tert-butyl ether	110.00	320.00	ND		ND		ND		ND	
Methylcyclohexane	---	---	ND		ND		ND		ND	

Methylene Chloride	46.00	230.00	ND		ND		ND		ND	
Styrene	90.00	260.00	ND		ND		ND		ND	
Tetrachloroethene	43.00	1500.00	ND		ND		ND		ND	
Toluene	6300.00	91000.00	ND		ND		ND		ND	
trans-1,2-Dichloroethene	300.00	720.00	ND		ND		ND		ND	
trans-1,3-Dichloropropene	---	---	ND		ND		ND		ND	
Trichloroethene	3.00	10.00	ND		ND		ND		ND	
Trichlorofluoromethane	23000.00	340000.00	ND		ND		ND		ND	
Vinyl chloride	0.70	2.00	ND		ND		ND		ND	
Xylenes, Total	12000.00	170000.00	ND		ND		ND		ND	
PESTICIDES	**mg/kg**	**mg/kg**	**ug/kg**		**ug/kg**		**ug/kg**		**ug/kg**	
4,4'-DDD	3.00	13.00	0.34	p	0.021	J p	0.015	J p	ND	
4,4'-DDE	2.00	9.00	0.9		0.043	J p	0.038	J p	0.061	J p
4,4'-DDT	2.00	8.00	0.16	p	ND		ND		ND	
Aldrin	0.04	0.20	ND		ND		ND		ND	
alpha-BHC	0.10	0.50	ND		ND		ND		ND	
alpha-Chlordane	---	---	ND		ND		ND		ND	
beta-BHC	0.40	2.00	ND		ND		ND		ND	
delta-BHC	---	---	ND		ND		ND		ND	
Dieldrin	0.04	0.20	ND		ND		ND		ND	
Endosulfan I	---	---	ND		ND		ND		ND	
Endosulfan II	---	---	ND		ND		ND		ND	
Endosulfan sulfate	470.00	6800.00	ND		ND		ND		ND	
Endrin	23.00	340.00	ND		ND		ND		ND	
Endrin aldehyde	---	---	ND		ND		ND		ND	
Endrin ketone	---	---	ND		ND		ND		ND	
gamma-BHC (Lindane)	0.40	2.00	ND		ND		ND		ND	
gamma-Chlordane	---	---	ND		ND		ND		ND	
Heptachlor	0.10	0.70	ND		ND		ND		ND	
Heptachlor epoxide	0.07	0.30	ND		ND		ND		ND	
Methoxychlor	0.07	390.00	ND		ND		ND		ND	
Toxaphene	0.60	3.00	ND		ND		ND		ND	
PCBs	**mg/kg**	**mg/kg**	**ug/kg**		**ug/kg**		**ug/kg**		**ug/kg**	
PCB-1016	0.20	1.00	ND		ND		ND		ND	
PCB-1221	0.20	1.00	ND		ND		ND		ND	

PCB-1232	0.20	1.00	ND		ND		ND		ND	
PCB-1242	0.20	1.00	ND		ND		ND		ND	
PCB-1248	0.20	1.00	1.7		ND		ND		ND	
PCB-1254	0.20	1.00	2		ND		ND		ND	
PCB-1260	0.20	1.00	ND		ND		ND		ND	

Notes:
NJV=Cape May Canal; MR=Maurice River; OC=Oyster Creek

Results compared to NJ DEP Soil Remediation Residential and Non-Residential Standards

ND -- Not Detected
yellow shaded--Exceeds NJ DEP Soil Remediation Standard

--- No standard available

EB--Equipment Blank

Data Qualifiers:
B -- Analyte was found in the blank and sample.

E -- Results exceeded calibration range

F1--MS and/or MSD Recovery is outside acceptance limits.

F2--MS/MSD RPD exceeds control limits

J -- Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.

I -- Value is Estimated maximum possible concentration (EMPC)

q -- Estimated maximum possible concentration (EMPC).

p -- The % Relative Percent Difference between the primary and confirmation column/detector is > 40%. The lower value has been reported.

* -- Isotope Dilution analyte is outside acceptance limits.

Maurice River Bulk Sediment Samples 2022

Sample ID:	NJ	NJ	MR 5		MDL	MR 6		MDL	MR 7		MDL	MR 8		MDL	MR 9		MDL	MR 10		MDL	MR 11		MDL	MR 12		MDL
Sample Date:	Residential Soil	Non-Residential Soil	7/15/22			7/14/22			7/14/22			7/14/22			7/15/22			7/14/22			7/14/22			7/14/22		
MISCELLANEOUS PARAMETERS																										
	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg		
Cyanide, Total	47.00	680.00	ND		0.25	0.54		0.34	ND		0.3	0.43	J	0.33	ND		0.32	0.35	J	0.31	0.52		0.35	ND		0.36
Total Organic Carbon	---	---	15,000		1700	35,000		2100	26000		2100	52,000		2400	29000		2100	47,000		2500	60,000		2500	61000		2500
INORGANICS	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg		
Aluminum	78000.00	---	14000		3.7	12000		5.6	13000		5.9	17000		6.6	10000		4.5	15000		6.1	9000		5.6	4200		7
Antimony	31.00	450.00	ND		0.094	0.19	J F1	0.14	ND		0.15	0.27	J	0.16	0.14	J	0.11	0.38		0.15	0.24	J	0.14	ND		0.18
Arsenic	19.00	19.00	8.1		0.051	10	B F1	0.077	6.4	B	0.081	18	B	0.09	11		0.061	7.9	B	0.083	5.1	B	0.077	1.2	B	0.096
Barium	16000.00	59000.00	41		0.54	35	F1	0.81	34		0.85	51		0.95	25		0.64	40		0.88	30		0.81	9.1		1
Beryllium	16.00	140.00	0.64		0.064	0.65	F1	0.095	0.67		0.1	0.9		0.11	0.41		0.076	0.78		0.1	0.42		0.095	0.2		0.12
Cadmium	78.00	78.00	ND		0.049	0.24	F1	0.074	0.086	J	0.078	0.41		0.087	0.22		0.059	0.37		0.081	0.26		0.074	ND		0.093
Calcium	---	---	1800		18	2000	F1	27	2800		28	3600		32	2300		21	1700		29	54000		27	470		34
Chromium	---	---	36		0.16	35	F1	0.24	31		0.25	49		0.28	25		0.19	40		0.26	26		0.24	9		0.3
Cobalt	1600.00	590.00	9.8		0.032	6.9	F1	0.048	6.2		0.05	10		0.056	5.5		0.038	6.7		0.052	4.1		0.048	1.6		0.06
Copper	3100.00	45000.00	8.5		0.18	14	F1	0.27	6.3		0.29	24		0.32	12		0.22	15		0.3	12		0.27	1.6		0.34
Iron	---	---	21000		4.2	18000		6.3	20000		6.7	25000		7.4	16000		5	20000		6.9	13000		6.3	6100		7.9
Lead	400.00	800.00	9.3		0.058	22	F1	0.087	7.3		0.092	37		0.1	18		0.069	28		0.095	20		0.087	1.7		0.11
Magnesium	---	---	6000		4	4700	F1	6	5100		6.3	6800		7	3600		4.8	4900		6.5	3100		6	1500		7.5
Manganese	11000.00	5900.00	170		0.38	500		0.57	270		0.6	920		0.67	410		0.45	260		0.62	160		0.57	46		0.71
Mercury (ug/kg)	23000.00	5900000.00	24		0.71				28		0.87	290		9.7	180		8.8	350		9.5	370		9.8	24		0.97
Nickel	1600.00	23000.00	24		0.083	20	F1	0.12	16		0.13	22		0.15	12		0.099	16		0.14	10		0.12	4.1		0.16
Potassium	---	---	2900		13	2400	F1	19	2700		20	3500		22	1800		15	3000		21	1800		19	850		24
Selenium	390.00	5700.00	0.17	J	0.11	0.37	J F1	0.16	0.31	J	0.17	0.56	J	0.19	0.37	J	0.13	0.54	J	0.18	0.3	J	0.16	ND		0.2

Silver	390.00	5700.00	0.025	J	0.025	0.11	J F1	0.037	ND		0.039	0.17		0.043	0.072	J	0.029	0.18		0.04	0.14		0.037	ND		0.046
Sodium	---	---	4500		23	4000	B F1	34	3900	B	36	6400	B	40	4200		27	4300	B	37	3300	B	34	1400	B	42
Thallium	---	---	0.16		0.062	0.2	F1	0.093	0.15		0.098	0.24		0.11	0.13		0.074	0.33		0.1	0.1	J	0.093	ND		0.12
Vanadium	78.00	1100.00	35		0.083	31	F1	0.12	33		0.13	45		0.15	24		0.099	39		0.14	24		0.12	9.6		0.16
Zinc	23000.00	110000.00	60		0.43	120	F1	0.64	43		0.67	210		0.75	110		0.51	120		0.69	88		0.64	12		0.8
SEMIVOLATILES	**ug/kg**	**ug/kg**	**ug/kg**			**ug/kg**			**ug/kg**			**ug/kg**			**ug/kg**			**ug/kg**			**ug/kg**			**ug/kg**		
1,1'-Biphenyl	61000.00	240000.00	ND	F1	11	ND		13	ND		13	ND		15	ND		13	ND		15	ND		15	ND		15
2,2'-oxybis[1-chloropropane]	23000.00	67000.00	ND		2.2	ND		2.6	ND		2.7	ND		3	ND		2.6	ND		3.1	ND		3.2	ND		3.1
2,4,5-Trichlorophenol	6100000.00	680000000	ND	F1	10	ND		12	ND		12	ND		14	ND		12	ND		15	ND		15	ND		15
2,4,6-Trichlorophenol	19000.00	74000.00	ND	F1	9.7	ND		12	ND		12	ND		13	ND		12	ND		14	ND		14	ND		14
2,4-Dichlorophenol	180000.00	2100000.00	ND	F1	2.3	ND		2.8	ND		2.8	ND		3.1	ND		2.7	ND		3.3	ND		3.3	ND		3.3
2,4-Dimethylphenol	1200000.00	140000000	ND	F1	9.8	ND		12	ND		12	ND		14	ND		12	ND		14	ND		14	ND		14
2,4-Dinitrophenol	120000.00	1400000.00	ND	F1	180	ND	F1	220	ND		220	ND		250	ND		220	ND		260	ND		260	ND		260
2,4-Dinitrotoluene	700.00	3000.00	ND	F1	17	ND		21	ND		21	ND		24	ND		21	ND		25	ND		25	ND		25
2,6-Dinitrotoluene	700.00	3000.00	ND	F1	11	ND		14	ND		14	ND		16	ND		14	ND		16	ND		16	ND		16
2-Chloronaphthalene	---	---	ND	F1	1.3	ND	F1	1.6	ND		1.6	ND		1.9	ND		1.6	ND		1.9	ND		1.9	ND		1.9
2-Chlorophenol	310000.00	2200000.00	ND	F1	11	ND	F1	13	ND		13	ND		15	ND		13	ND		15	ND		16	ND		15
2-Methylnaphthalene	230000.00	2400000.00	ND	F1	1.4	2	J	1.7	ND		1.7	3.1	J	1.9	12		1.7	ND		2	ND		2	ND		2
2-Methylphenol	310000.00	3400000.00	ND	F1	8.4	ND		10	ND		10	ND		12	ND		10	ND		12	ND		12	ND		12
2-Nitroaniline	39000.00	230000000	ND		13	ND		16	ND		16	ND		18	ND		16	ND		19	ND		19	ND		19
2-Nitrophenol	---	---	ND	F1	11	ND		13	ND		13	ND		15	ND		13	ND		16	ND		16	ND		16
3,3'-Dichlorobenzidine	1000.00	4000.00	ND	F1	27	ND		33	ND		34	ND		38	ND		33	ND		39	ND		40	ND		40
3-Nitroaniline	---	---	ND		7.4	ND		9	ND		9.1	ND		10	ND		9	ND		11	ND		11	ND		11
4,6-Dinitro-2-methylphenol	6000.00	68000.00	ND	F1	50	ND	F1	61	ND		62	ND		70	ND		61	ND		73	ND		73	ND		73
4-Bromophenyl phenyl ether	---	---	ND		12	ND		15	ND		15	ND		17	ND		15	ND		18	ND		18	ND		18
4-Chloro-3-methylphenol	---	---	ND	F1	10	ND		12	ND		13	ND		14	ND		12	ND		15	ND		15	ND		15
4-Chloroaniline	---	---	ND	F1	7.7	ND		9.3	ND		9.4	ND		11	ND		9.3	ND		11	ND		11	ND		11
4-Chlorophenyl phenyl ether	---	---	ND	F1	9.7	ND		12	ND		12	ND		13	ND		12	ND		14	ND		14	ND		14
4-Nitroaniline	---	---	ND	F1	11	ND		13	ND		13	ND		15	ND		13	ND		16	ND		16	ND		16
4-Nitrophenol	---	---	ND	F1	20	ND		25	ND		25	ND		28	ND		25	ND		30	ND		30	ND		30
Acenaphthene	3400000.00	370000000	ND	F1	1.7	ND		2	ND		2.1	ND		2.3	2.1	J	2	ND		2.4	ND		2.4	ND		2.4
Acenaphthylene	---	##########	ND	F1	1.3	ND		1.6	ND		1.6	2.5	J	1.8	4.3	J	1.6	ND		1.8	ND		1.9	ND		1.8
Acetophenone	2000.00	5000.00	ND	F1	10	ND		13	ND		13	ND		14	ND		13	ND		15	ND		15	ND		15
Anthracene	##########	300000000	ND	F1	1.5	ND		1.8	ND		1.9	2.6	J	2.1	7.2		1.8	ND		2.2	ND		2.2	ND		2.2

Atrazine	210000.00	2400000.00	ND	F1	13	ND		16	ND		16	ND		18	ND		16	ND		18	ND		19	ND		18
Benzaldehyde	6100000.00	68000000.00	ND	F1	3.6	ND		4.4	ND		4.5	ND		5	ND		4.4	ND		5.2	ND		5.3	ND		5.2
Benzo[a]anthracene	5000.00	17000.00	ND	F1	2.6	ND		3.2	ND		3.2	5.7	J	3.7	11		3.2	ND		3.8	ND		3.8	ND		3.8
Benzo[a]pyrene	500.00	2000.00	ND	F1	2.5	ND		3.1	ND		3.1	5.6	J	3.5	12		3.1	ND		3.6	ND		3.7	ND		3.7
Benzo[b]fluoranthene	17000.00	5000.00	ND	F1	1.4	2.9	J	1.7	ND		1.8	7.2	J	2	18		1.7	ND		2.1	3.3	J	2.1	ND		2.1
Benzo[g,h,i]perylene	##########	30000000.00	ND		1.3	2.3	J	1.5	ND		1.6	5.5	J	1.8	13		1.5	ND		1.8	2.4	J	1.8	ND		1.8
Benzo[k]fluoranthene	45000.00	170000.00	ND	F1	1.7	ND	F1	2.1	ND		2.2	ND		2.4	4.1	J	2.1	ND		2.5	ND		2.5	ND		2.5
Bis(2-chloroethoxy)methane	---	---	ND	F1	11	ND	F1	13	ND		13	ND		15	ND		13	ND		15	ND		16	ND		15
Bis(2-chloroethyl)ether	400.00	2000.00	ND	F1	1.1	ND	F1	1.3	ND		1.3	ND		1.5	ND		1.3	ND		1.5	ND		1.5	ND		1.5
Bis(2-ethylhexyl) phthalate	35000.00	140000.00	ND		31	ND		38	ND		38	ND		43	ND		38	ND		45	ND		45	ND		45
Butyl benzyl phthalate	1200000.00	14000000.00	ND		20	ND		25	ND		25	ND		28	ND		24	ND		29	ND		29	ND		29
Caprolactam	##########	##########	ND	F1	19	ND		23	ND		23	ND		27	ND		23	ND		28	ND		28	ND		28
Carbazole	24000.00	96000.00	ND	F1	1.4	ND		1.7	ND		1.7	ND		1.9	ND		1.7	ND		2	ND		2	ND		2
Chrysene	450000.00	1700000.00	ND	F1	3.2	ND		3.9	ND		4	6.3	J	4.5	12		3.9	ND		4.7	ND		4.7	ND		4.7
Dibenz(a,h)anthracene	500.00	2000.00	ND		3.7	ND		4.6	ND		4.6	ND		5.2	18		4.5	ND		5.4	ND		5.4	ND		5.4
Dibenzofuran	---	---	ND	F1	11	ND	F1	13	ND		13	ND		15	ND		13	ND		15	ND		16	ND		15
Diethyl phthalate	##########	##########	ND	F1	10	ND		12	ND		13	ND		14	ND		12	ND		15	ND		15	ND		15
Dimethyl phthalate	---	---	ND	F1	11	ND		14	ND		14	ND		16	ND		14	ND		17	ND		17	ND		17
Di-n-butyl phthalate	---	---	ND	F1	13	29	J	16	24	J	16	ND		18	ND		16	26	J	18	28	J	19	37	J	18
Di-n-octyl phthalate	2400000.00	27000000.00	ND		17	ND		21	ND		21	ND		24	ND		21	ND		25	ND		25	ND		25
Fluoranthene	2300000.00	24000000.00	ND	F1	1.5	3.9	J F1	1.9	ND		1.9	8.1	J	2.1	19		1.9	2.3	J	2.2	4.3	J	2.2	ND		2.2
Fluorene	2300000.00	24000000.00	ND	F1	1.1	ND		1.4	ND		1.4	1.9	J	1.6	6	J	1.4	ND		1.7	ND		1.7	ND		1.7
Hexachlorobenzene	300.00	1000.00	ND	F1	2.1	ND		2.6	ND		2.6	ND		2.9	ND		2.6	ND		3	ND		3.1	ND		3
Hexachlorobutadiene	6000.00	25000.00	ND	F1	1.7	ND	F1	2.1	ND		2.1	ND		2.4	ND		2.1	ND		2.5	ND		2.5	ND		2.5
Hexachlorocyclopentadiene	45000.00	110000.00	ND	F1	3	ND	F1	3.6	ND		3.7	ND		4.1	ND		3.6	ND		4.3	ND		4.3	ND		4.3
Hexachloroethane	12000.00	48000.00	ND	F1	10	ND	F1 F2	13	ND		13	ND		14	ND		13	ND		15	ND		15	ND		15
Indeno[1,2,3-cd]pyrene	12000.00	17000.00	ND	F1	2.9	ND		3.5	ND		3.6	5	J	4	10		3.5	ND		4.2	ND		4.2	ND		4.2
Isophorone	510000.00	2000000.00	ND	F1	11	ND	F1	13	ND		13	ND		15	ND		13	ND		16	ND		16	ND		16
Methylphenol, 3 & 4	31000.00	340000.00	ND	F1	8.6	ND		10	ND		11	ND		12	ND		10	ND		12	ND		12	ND		12
Naphthalene	6000.00	17000.00	ND	F1	1.1	3.6	J F1	1.4	ND		1.4	5.6	J	1.6	19		1.4	ND		1.6	2.2	J	1.7	ND		1.6
Nitrobenzene	5000.00	14000.00	ND	F1	11	ND	F1	13	ND		13	ND		15	ND		13	ND		15	ND		16	ND		15
N-Nitrosodi-n-propylamine	200.00	300.00	ND	F1	2	ND		2.4	ND		2.4	ND		2.7	ND		2.4	ND		2.9	ND		2.9	ND		2.9
N-Nitrosodiphenylamine	99000.00	390000.00	ND	F1	9.7	ND		12	ND		12	ND		14	ND		12	ND		14	ND		14	ND		14
Pentachlorophenol	900.00	3000.00	ND	F1	47	ND	F1	57	ND		58	ND		65	ND		57	ND		68	ND		68	ND		68

Phenanthrene	---	##########	ND	F1	1.6	4.5	J	1.9	ND		1.9	6.9	J	2.2	17		1.9	ND		2.3	4.1	J	2.3	ND		2.3
Phenol	##########	##########	ND	F1	8.8	ND		11	ND		11	ND		12	ND		11	ND		13	ND		13	ND		13
Pyrene	1700000.00	180000000	ND	F1	1.4	4.2	J	1.7	ND		1.7	7.9	J	1.9	18		1.7	2.5	J	2	4.6	J	2	ND		2
VOLATILES	**ug/kg**	**ug/kg**	**ug/kg**			**ug/kg**			**ug/kg**			**ug/kg**			**ug/kg**			**ug/kg**			**ug/kg**			**ug/kg**		
1,1,1-Trichloroethane	##########	---	ND		2.9	ND		3.6	ND		3.6	ND		4.1	ND		3.5	ND		4.2	ND		4.2	ND		4.2
1,1,2,2-Tetrachloroethane	1000.00	3000.00	ND		2.7	ND		3.3	ND		3.3	ND		3.7	ND		3.2	ND		3.9	ND		3.9	ND		3.9
1,1,2-Trichloro-1,2,2-trifluoroethane	---	---	ND		3.5	ND		4.3	ND		4.3	ND		4.9	ND		4.2	ND		5.1	ND		5.1	ND		5.1
1,1,2-Trichloroethane	2000.00	6000.00	ND		1.7	ND		2.1	ND		2.1	ND		2.4	ND		2.1	ND		2.5	ND		2.5	ND		2.5
1,1-Dichloroethane	8000.00	24000.00	ND		2.8	ND		3.4	ND		3.4	ND		3.9	ND		3.4	ND		4.1	ND		4.1	ND		4.1
1,1-Dichloroethene	11000.00	150000.00	ND		4	ND		4.9	ND		4.9	ND		5.5	ND		4.8	ND		5.7	ND		5.7	ND		5.7
1,2,4-Trichlorobenzene	73000.00	820000.00	ND		4.5	ND		5.5	ND		5.5	ND		6.2	ND		5.4	ND		6.5	ND		6.4	ND		6.5
1,2-Dibromo-3-Chloropropane	80.00	200.00	ND		5.7	ND		7	ND		7	ND		7.9	ND		6.8	ND		8.2	ND		8.2	ND		8.2
1,2-Dibromoethane	8.00	40.00	ND		2.4	ND		2.9	ND		2.9	ND		3.3	ND		2.9	ND		3.5	ND		3.5	ND		3.5
1,2-Dichlorobenzene	5300000.00	590000000	ND		3	ND		3.6	ND		3.6	ND		4.1	ND		3.6	ND		4.3	ND		4.3	ND		4.3
1,2-Dichloroethane	900.00	3000.00	ND		2.5	ND		3.1	ND		3.1	ND		3.5	ND		3.1	ND		3.7	ND		3.7	ND		3.7
1,2-Dichloroethene, Total	2000.00	5000.00	ND		7.2	ND		8.8	ND		8.8	ND		10	ND		8.7	ND		10	ND		10	ND		10
1,2-Dichloropropane	5300000.00	590000000	ND		2.3	ND		2.9	ND		2.9	ND		3.2	ND		2.8	ND		3.4	ND		3.4	ND		3.4
1,3-Dichlorobenzene	5000.00	13000.00	ND		5.4	ND		6.6	ND		6.6	ND		7.5	ND		6.5	ND		7.8	ND		7.8	ND		7.8
1,4-Dichlorobenzene	3100000.00	440000000	ND		2.6	ND		3.2	ND		3.2	ND		3.7	ND		3.2	ND		3.8	ND		3.8	ND		3.8
2-Butanone (MEK)	---	---	ND		4.5	ND		5.5	ND		5.5	ND		6.2	ND		5.4	ND		6.5	ND		6.4	ND		6.5
2-Hexanone	---	---	ND		2.8	ND		3.4	ND		3.4	ND		3.8	ND		3.3	ND		4	ND		4	ND		4
4-Methyl-2-pentanone (MIBK)	##########	---	ND		3.2	ND		3.9	ND		3.9	ND		4.5	ND		3.9	ND		4.7	ND		4.6	ND		4.7
Acetone	2000.00	5000.00	ND		6.9	15	J	8.4	ND		8.4	ND		9.5	ND		8.3	ND		9.9	ND		9.9	ND		9.9
Benzene	1000.00	3000.00	ND		2.5	ND		3	ND		3	ND		3.4	ND		3	ND		3.6	ND		3.6	ND		3.6
Bromoform	81000.00	280000.00	ND		4.4	ND		5.4	ND		5.4	ND		6.2	ND		5.3	ND		6.4	ND		6.4	ND		6.4
Bromomethane	25000.00	59000.00	ND		4	ND		4.9	ND		4.9	ND		5.6	ND		4.8	ND		5.8	ND		5.8	ND		5.8
Carbon disulfide	7800000.00	##########	ND		7	ND		8.6	ND		8.6	ND		9.8	ND		8.5	ND		10	ND		10	ND		10
Carbon tetrachloride	2000.00	4000.00	ND		3.6	ND		4.4	ND		4.4	ND		5	ND		4.3	ND		5.2	ND		5.2	ND		5.2
Chlorobenzene	510000.00	7400000.00	ND		2.3	ND		2.8	ND		2.8	ND		3.2	ND		2.8	ND		3.3	ND		3.3	ND		3.3
Chlorodibromomethane	3000.00	8000.00	ND		4.4	ND		5.3	ND		5.3	ND		6.1	ND		5.3	ND		6.3	ND		6.3	ND		6.3
Chloroethane	220000.00	1100000.00	ND		5.1	ND		6.3	ND		6.3	ND		7.1	ND		6.2	ND		7.4	ND		7.4	ND		7.4
Chloroform	600.00	2000.00	3.2	JB	2.8	4	J B	3.5	4	JB	3.5	4.5	JB	3.9	4.1	JB	3.4	4.8	JB	4.1	5	JB	4.1	4.2	JB	4.1
Chloromethane	4000.00	12000.00	ND		3.5	ND		4.3	ND		4.3	ND		4.8	ND		4.2	ND		5	ND		5	ND		5

cis-1,2-Dichloroethene	230000.00	560000.00	ND		2.7	ND		3.3	ND		3.3	ND		3.7	ND		3.2	ND		3.8	ND		3.8	ND		3.8
cis-1,3-Dichloropropene	---	---	ND		3.9	ND		4.8	ND		4.8	ND		5.4	ND		4.7	ND		5.6	ND		5.6	ND		5.6
Cyclohexane	---	---	ND		4.2	ND		5.1	ND		5.1	ND		5.8	ND		5.1	ND		6.1	ND		6.1	ND		6.1
Dichlorobromomethane	1000.00	3000.00	ND		4.1	ND		5	ND		5	ND		5.7	ND		4.9	ND		5.9	ND		5.9	ND		5.9
Dichlorodifluoromethane	490000.00	##########	ND		4.4	ND		5.4	ND		5.4	ND		6.1	ND		5.3	ND		6.3	ND		6.3	ND		6.3
Ethylbenzene	7800000.00	##########	ND		3.3	ND		4	ND		4	ND		4.5	ND		3.9	ND		4.7	ND		4.7	ND		4.7
Isopropylbenzene	---	---	ND		4.6	ND		5.6	ND		5.6	ND		6.3	ND		5.5	ND		6.6	ND		6.6	ND		6.6
Methyl acetate	##########	---	ND		13	ND		16	ND		16	ND		18	ND		16	ND		19	ND		19	ND		19
Methyl tert-butyl ether	110000.00	320000.00	ND		2.6	ND		3.2	ND		3.2	ND		3.6	ND		3.1	ND		3.7	ND		3.7	ND		3.7
Methylcyclohexane	---	---	ND		4.2	ND		5.2	ND		5.2	ND		5.9	ND		5.1	ND		6.1	ND		6.1	ND		6.1
Methylene Chloride	46000.00	230000.00	ND		7.9	ND		9.7	ND		9.7	ND		11	11		9.6	ND		11	ND		11	ND		11
m-Xylene & p-Xylene	---	---	ND		3.1	ND		3.8	ND		3.8	ND		4.3	ND		3.8	ND		4.5	ND		4.5	ND		4.5
o-Xylene	---	---	ND		3.5	ND		4.3	ND		4.3	ND		4.9	ND		4.3	ND		5.1	ND		5.1	ND		5.1
Styrene	90000.00	260000.00	ND		2.6	ND		3.2	ND		3.2	ND		3.7	ND		3.2	ND		3.8	ND		3.8	ND		3.8
Tetrachloroethene	43000.00	1500000.00	ND		3.5	ND		4.3	ND		4.3	ND		4.9	ND		4.3	ND		5.1	ND		5.1	ND		5.1
Toluene	6300000.00	91000000.00	ND		2.5	ND		3.1	ND		3.1	ND		3.5	ND		3.1	ND		3.7	ND		3.7	ND		3.7
trans-1,2-Dichloroethene	300000.00	720000.00	ND		3.1	ND		3.8	ND		3.8	ND		4.3	ND		3.7	ND		4.4	ND		4.4	ND		4.4
trans-1,3-Dichloropropene	---	---	ND		4	ND		4.8	ND		4.8	ND		5.5	ND		4.8	ND		5.7	ND		5.7	ND		5.7
Trichloroethene	3000.00	10000.00	ND		2.8	ND		3.4	ND		3.4	ND		3.8	ND		3.3	ND		4	ND		4	ND		4
Trichlorofluoromethane	##########	##########	ND		7.3	ND		8.9	ND		8.9	ND		10	ND		8.8	ND		11	ND		11	ND		11
Vinyl chloride	700.00	2000.00	ND		6.3	ND		7.8	ND		7.8	ND		8.8	ND		7.6	ND		9.2	ND		9.1	ND		9.2
Xylenes, Total	##########	##########	ND		13	ND		16	ND		16	ND		18	ND		15	ND		18	ND		18	ND		18
PESTICIDES	**ug/kg**	**ug/kg**	**ug/kg**			**ug/kg**			**ug/kg**			**ug/kg**			**ug/kg**			**ug/kg**			**ug/kg**			**ug/kg**		
4,4'-DDD	3000.00	13000.00	ND		0.015	ND	F1	0.019	ND		0.019	ND		0.021	ND		0.019	ND		0.022	ND		0.022	ND		0.022
4,4'-DDE	2000.00	9000.00	0.017	J	0.015	0.055	J F1	0.018	ND		0.018	ND		0.021	ND		0.018	ND		0.022	ND		0.021	ND		0.022
4,4'-DDT	2000.00	8000.00	ND		0.053	ND		0.065	ND		0.065	ND		0.073	ND		0.064	ND		0.076	ND		0.075	ND		0.076
Aldrin	40.00	200.00	ND		0.023	ND	F2	0.028	ND		0.028	ND		0.031	ND		0.028	ND		0.033	ND		0.033	ND		0.033
alpha-BHC	100.00	500.00	ND		0.018	ND	F1	0.022	ND		0.022	ND		0.025	ND		0.022	ND		0.026	ND		0.026	ND		0.026
beta-BHC	400.00	2000.00	ND		0.02	ND	F2 F1	0.025	ND		0.025	ND		0.028	ND		0.024	ND		0.029	ND		0.029	ND		0.029
cis-Chlordane	---	---	ND		0.018	ND	F1	0.023	ND		0.023	ND		0.025	ND		0.022	ND		0.027	ND		0.026	ND		0.026
delta-BHC	---	---	0.12		0.023	ND	F2	0.028	ND		0.029	ND		0.032	ND		0.028	ND		0.034	ND		0.033	ND		0.033
Dieldrin	40.00	200.00	ND		0.018	ND	F1	0.023	ND		0.023	ND		0.025	ND		0.022	ND		0.027	ND		0.026	ND		0.026

Endosulfan I	---	---	ND		0.02	ND		0.024	ND		0.024	ND		0.027	ND		0.024	ND		0.029	ND		0.028	ND		0.029
Endosulfan II	---	---	ND		0.016	ND	F1	0.02	ND		0.02	ND		0.022	ND		0.02	ND		0.023	ND		0.023	ND		0.023
Endosulfan sulfate	470000.00	6800000.00	ND		0.034	ND	F1	0.041	ND		0.041	ND		0.047	ND		0.041	ND		0.049	ND		0.048	ND		0.048
Endrin	23000.00	340000.00	ND		0.014	ND	F1	0.017	ND		0.017	ND		0.019	ND		0.017	ND		0.02	ND		0.02	ND		0.02
Endrin aldehyde	---	---	ND		0.026	ND	F1	0.032	ND		0.032	ND		0.036	ND		0.032	ND		0.038	ND		0.038	ND		0.038
Endrin ketone	---	---	ND		0.01	ND	F1	0.012	ND		0.012	ND		0.014	ND		0.012	ND		0.015	ND		0.014	ND		0.015
gamma-BHC (Lindane)	400.00	2000.00	ND		0.019	ND	F1	0.023	ND		0.023	ND		0.026	ND		0.023	ND		0.027	ND		0.027	ND		0.027
Heptachlor	100.00	700.00	ND		0.023	ND	F2	0.028	ND		0.028	ND		0.032	ND		0.028	ND		0.033	ND		0.033	ND		0.033
Heptachlor epoxide	70.00	300.00	ND		0.019	ND	F2	0.023	ND		0.023	ND		0.026	ND		0.023	ND		0.027	ND		0.027	ND		0.027
Methoxychlor	70.00	390000.00	ND		0.029	ND	F1	0.035	ND		0.035	ND		0.039	ND		0.035	ND		0.041	ND		0.041	ND		0.041
Toxaphene	600.00	3000.00	ND		2	ND		2.4	ND		2.4	ND		2.7	ND		2.4	ND		2.9	ND		2.8	ND		2.9
trans-Chlordane	---	---	ND		0.017	ND	F1	0.021	ND		0.021	ND		0.024	ND		0.021	ND		0.025	ND		0.024	ND		0.025
PCB Aroclors	**ug/Kg**	**ug/Kg**	**ug/Kg**			**ug/Kg**			**ug/Kg**			**ug/Kg**			**ug/Kg**			**ug/Kg**			**ug/Kg**			**ug/Kg**	
PCB-1016	200	1000	ND		0.24	ND		0.29	ND		0.29	ND		0.33	ND		0.28	ND		0.34	ND		0.34	ND		0.34
PCB-1221	200	1000	ND		0.26	ND		0.32	ND		0.32	ND		0.36	ND		0.31	ND		0.37	ND		0.37	ND		0.37
PCB-1232	200	1000	ND		0.18	ND		0.22	ND		0.22	ND		0.25	ND		0.22	ND		0.26	ND		0.26	ND		0.26
PCB-1242	200	1000	ND		0.11	ND		0.13	ND		0.13	ND		0.15	ND		0.13	ND		0.15	ND		0.15	ND		0.15
PCB-1248	200	1000	ND		0.18	ND		0.22	ND		0.22	ND		0.24	ND		0.21	ND		0.25	ND		0.25	ND		0.26
PCB-1254	200	1000	ND		0.22	ND		0.27	ND		0.27	ND		0.3	ND		0.26	ND		0.31	ND		0.31	ND		0.32
PCB-1260	200	1000	ND		0.21	ND		0.25	ND		0.26	ND		0.29	ND		0.25	ND		0.3	ND		0.3	ND		0.3

Notes:
Results compared to NJ DEP Soil Remediation Residential and Non-Residential Standards

ND -- Not Detected
yellow shaded--Exceeds NJ DEP Soil Remediation Standard

--- No standard available

MDL--Method Detection Limit

Data Qualifiers:
B -- Analyte was found in the blank and sample.

J -- Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.

I -- Value is Estimated maximum possible concentration (EMPC)

q -- Estimated maximum possible concentration (EMPC).
p -- The % Relative Percent Difference between the primary and confirmation column/detector is > 40%. The lower value has been reported.

* -- LCS or LCSD is outside acceptance limits.

Maurice River Bulk Sediment Samples 2022 (cont.)

Sample ID:	NJ Residential Soil	NJ Non-Residential Soil
Sample Date:		
MISCELLANEOUS PARAMETERS		
	mg/kg	**mg/kg**
Cyanide, Total	47.00	680.00
Total Organic Carbon	---	---
INORGANICS	**mg/kg**	**mg/kg**
Aluminum	78000.00	---
Antimony	31.00	450.00
Arsenic	19.00	19.00
Barium	16000.00	59000.00
Beryllium	16.00	140.00
Cadmium	78.00	78.00
Calcium	---	---
Chromium	---	---
Cobalt	1600.00	590.00
Copper	3100.00	45000.00
Iron	---	---
Lead	400.00	800.00
Magnesium	---	---
Manganese	11000.00	5900.00
Mercury (ug/kg)	23000.00	5900000.00
Nickel	1600.00	23000.00
Potassium	---	---
Selenium	390.00	5700.00
Silver	390.00	5700.00
Sodium	---	---
Thallium	---	---
Vanadium	78.00	1100.00

Zinc	23000.00	110000.00
SEMIVOLATILES	**ug/kg**	**ug/kg**
1,1'-Biphenyl	61000.00	240000.00
2,2'-oxybis[1-chloropropane]	23000.00	67000.00
2,4,5-Trichlorophenol	6100000.00	68000000.00
2,4,6-Trichlorophenol	19000.00	74000.00
2,4-Dichlorophenol	180000.00	2100000.00
2,4-Dimethylphenol	1200000.00	14000000.00
2,4-Dinitrophenol	120000.00	1400000.00
2,4-Dinitrotoluene	700.00	3000.00
2,6-Dinitrotoluene	700.00	3000.00
2-Chloronaphthalene	---	---
2-Chlorophenol	310000.00	2200000.00
2-Methylnaphthalene	230000.00	2400000.00
2-Methylphenol	310000.00	3400000.00
2-Nitroaniline	39000.00	23000000.00
2-Nitrophenol	---	---
3,3'-Dichlorobenzidine	1000.00	4000.00
3-Nitroaniline	---	---
4,6-Dinitro-2-methylphenol	6000.00	68000.00
4-Bromophenyl phenyl ether	---	---
4-Chloro-3-methylphenol	---	---
4-Chloroaniline	---	---
4-Chlorophenyl phenyl ether	---	---
4-Nitroaniline	---	---
4-Nitrophenol	---	---
Acenaphthene	3400000.00	37000000.00
Acenaphthylene	---	###########
Acetophenone	2000.00	5000.00
Anthracene	###########	30000000.00
Atrazine	210000.00	2400000.00
Benzaldehyde	6100000.00	68000000.00
Benzo[a]anthracene	5000.00	17000.00
Benzo[a]pyrene	500.00	2000.00
Benzo[b]fluoranthene	17000.00	5000.00
Benzo[g,h,i]perylene	###########	30000000.00

Benzo[k]fluoranthene	45000.00	170000.00
Bis(2-chloroethoxy)methane	---	---
Bis(2-chloroethyl)ether	400.00	2000.00
Bis(2-ethylhexyl) phthalate	35000.00	140000.00
Butyl benzyl phthalate	1200000.00	14000000.00
Caprolactam	###########	###########
Carbazole	24000.00	96000.00
Chrysene	450000.00	1700000.00
Dibenz(a,h)anthracene	500.00	2000.00
Dibenzofuran	---	---
Diethyl phthalate	###########	###########
Dimethyl phthalate	---	---
Di-n-butyl phthalate	---	---
Di-n-octyl phthalate	2400000.00	27000000.00
Fluoranthene	2300000.00	24000000.00
Fluorene	2300000.00	24000000.00
Hexachlorobenzene	300.00	1000.00
Hexachlorobutadiene	6000.00	25000.00
Hexachlorocyclopentadiene	45000.00	110000.00
Hexachloroethane	12000.00	48000.00
Indeno[1,2,3-cd]pyrene	12000.00	17000.00
Isophorone	510000.00	2000000.00
Methylphenol, 3 & 4	31000.00	340000.00
Naphthalene	6000.00	17000.00
Nitrobenzene	5000.00	14000.00
N-Nitrosodi-n-propylamine	200.00	300.00
N-Nitrosodiphenylamine	99000.00	390000.00
Pentachlorophenol	900.00	3000.00
Phenanthrene	---	###########
Phenol	###########	###########
Pyrene	1700000.00	18000000.00
VOLATILES	**ug/kg**	**ug/kg**
1,1,1-Trichloroethane	###########	**---**
1,1,2,2-Tetrachloroethane	1000.00	3000.00
1,1,2-Trichloro-1,2,2-trifluoroethane	**---**	**---**

1,1,2-Trichloroethane	2000.00	6000.00
1,1-Dichloroethane	8000.00	24000.00
1,1-Dichloroethene	11000.00	150000.00
1,2,4-Trichlorobenzene	73000.00	820000.00
1,2-Dibromo-3-Chloropropane	80.00	200.00
1,2-Dibromoethane	8.00	40.00
1,2-Dichlorobenzene	5300000.00	59000000.00
1,2-Dichloroethane	900.00	3000.00
1,2-Dichloroethene, Total	2000.00	5000.00
1,2-Dichloropropane	5300000.00	59000000.00
1,3-Dichlorobenzene	5000.00	13000.00
1,4-Dichlorobenzene	3100000.00	44000000.00
2-Butanone (MEK)	---	---
2-Hexanone	---	---
4-Methyl-2-pentanone (MIBK)	###########	---
Acetone	2000.00	5000.00
Benzene	1000.00	3000.00
Bromoform	81000.00	280000.00
Bromomethane	25000.00	59000.00
Carbon disulfide	7800000.00	###########
Carbon tetrachloride	2000.00	4000.00
Chlorobenzene	510000.00	7400000.00
Chlorodibromomethane	3000.00	8000.00
Chloroethane	220000.00	1100000.00
Chloroform	600.00	2000.00
Chloromethane	4000.00	12000.00
cis-1,2-Dichloroethene	230000.00	560000.00
cis-1,3-Dichloropropene	---	---
Cyclohexane	---	---
Dichlorobromomethane	1000.00	3000.00
Dichlorodifluoromethane	490000.00	###########
Ethylbenzene	7800000.00	###########
Isopropylbenzene	---	---
Methyl acetate	###########	---
Methyl tert-butyl ether	110000.00	320000.00
Methylcyclohexane	---	---
Methylene Chloride	46000.00	230000.00

m-Xylene & p-Xylene	---	---
o-Xylene	---	---
Styrene	90000.00	260000.00
Tetrachloroethene	43000.00	1500000.00
Toluene	6300000.00	91000000.00
trans-1,2-Dichloroethene	300000.00	720000.00
trans-1,3-Dichloropropene	---	---
Trichloroethene	3000.00	10000.00
Trichlorofluoromethane	###########	###########
Vinyl chloride	700.00	2000.00
Xylenes, Total	###########	###########
PESTICIDES	**ug/kg**	**ug/kg**
4,4'-DDD	3000.00	13000.00
4,4'-DDE	2000.00	9000.00
4,4'-DDT	2000.00	8000.00
Aldrin	40.00	200.00
alpha-BHC	100.00	500.00
beta-BHC	400.00	2000.00
cis-Chlordane	---	---
delta-BHC	---	---
Dieldrin	40.00	200.00
Endosulfan I	---	---
Endosulfan II	---	---
Endosulfan sulfate	470000.00	6800000.00
Endrin	23000.00	340000.00
Endrin aldehyde	---	---
Endrin ketone	---	---
gamma-BHC (Lindane)	400.00	2000.00
Heptachlor	100.00	700.00
Heptachlor epoxide	70.00	300.00
Methoxychlor	70.00	390000.00
Toxaphene	600.00	3000.00
trans-Chlordane	---	---
PCB Aroclors	**ug/Kg**	**ug/Kg**
PCB-1016	200	1000

PCB-1221	200	1000
PCB-1232	200	1000
PCB-1242	200	1000
PCB-1248	200	1000
PCB-1254	200	1000
PCB-1260	200	1000

APPENDIX C

CORRESPONDENCE

APPENDIX D

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

U.S. ARMY CORPS OF ENGINEERS

FINDING OF NO SIGNIFICANT IMPACT

MAURICE RIVER FEDERAL NAVIGATION CHANNEL AND BENEFICIAL USE OF DREDGED MATERIAL CUMBERLAND COUNTY, NEW JERSEY ENVIRONMENTAL ASSESSMENT

The U.S. Army Corps of Engineers, Philadelphia District (USACE) has conducted an environmental analysis in accordance with the National Environmental Policy Act of 1969, as amended. Based on when NEPA was initiated, this Environmental Assessment (EA) was developed in accordance with the applicable regulations, policies, and procedures, including the Corp's NEPA regulations in Engineers Regulation (ER) 200-2-2 and the previous CEQ NEPA regulations at 40 CFR Part 1500 (NEPA Implementing Regulations). The draft Environmental Assessment (EA) addresses maintenance dredging and beneficial use of dredged material for ecosystem restoration opportunities in the lower Maurice River, Cumberland County, New Jersey.

The Maurice River Federal Navigation Channel, adopted as HD 59-644 in 1910 and modified as HD 73-275 in 1935, provides for a channel 7 feet deep and 150 feet wide in Delaware Bay across Maurice Cove to the mouth; thence a channel 7 feet deep, 100 feet wide to the fixed bridge at Millville, 21.5 miles above the mouth, and then 60 feet wide to the mill dam, a further distance of one-half mile, including a turning basin 7 feet deep at Millville. The total length of the Federal navigation project is about 24 miles. The lower section of the Federal channel requires periodic maintenance dredging to authorized depth. This section was last dredged in 1996. USACE conducts regional sediment management and engineering with nature practices to beneficially use the dredged material to keep the dredged sediments within the natural system.

In addition to a "no action" plan, 2 other dredged material placement alternative plans were evaluated and described in Section 3.0 of the EA. The recommended plan is to conduct maintenance dredging of a portion of the lower Maurice River federal navigation channel to authorized depth of 7 ft MLLW with 2 ft allowable overdepth. Dredging will remove critical shoaling to maintain a safe and reliable navigation channel for commercial and recreational vessels. The dredged material will be hydraulically pumped into an area approximately 20 acres for the first-year placement (approximately 35 acres total for two potential placement areas) of flooded (former) marsh in the northwest region of the Heislerville Wildlife Management Area (WMA) to raise the substrate elevation to re-establish intertidal mudflats and vegetated wetlands that had been lost due to inundation and erosion.

For all alternatives, the potential effects were evaluated, as appropriate. A summary assessment of the potential effects of the recommended plan are listed in Table 1:

Table 1: Summary of Potential Effects of the Recommended Plan

	Insignificant effects	Insignificant effects as a result of mitigation*	Resource unaffected by action
Aesthetics	☒	☐	☐
Air quality	☒	☐	☐
Aquatic resources/wetlands	☒	☐	☐
Invasive species	☐	☐	☒
Fish and wildlife habitat	☒	☐	☐
Threatened/Endangered species/critical habitat	☒	☐	☐
Historic properties	☐	☐	☒
Other cultural resources	☐	☐	☒
Floodplains	☐	☐	☒
Hazardous, toxic & radioactive waste	☐	☐	☒
Hydrology	☐	☐	☒
Land use	☒	☐	☐
Navigation	☒	☐	☐
Noise levels	☐	☐	☒
Public infrastructure	☐	☐	☒
Socio-economics	☐	☐	☒
Environmental justice	☐	☐	☒
Soils	☒	☐	☐
Tribal trust resources	☐	☐	☒
Water quality	☒	☐	☐

	Insignificant effects	Insignificant effects as a result of mitigation*	Resource unaffected by action
Climate change	☐	☐	☒

All practicable and appropriate means to avoid or minimize adverse environmental effects were analyzed and incorporated into the recommended plan. Best management practices (BMPs) as detailed in the EA will be implemented, if appropriate, to minimize impacts. Avoidance and minimization measures will include scheduling dredging and placement operations during the cooler months of the year. During construction, stabilization of the area may include a combination of a turbidity curtain, earthen berms, hay bales and/or coir logs to contain the fluidized sediments. The placement site will be monitored before, during, and after operations to assess intertidal mudflat and wetland development. Since this is an ecosystem restoration project, no compensatory mitigation is required as part of the recommended plan.

Public review of the draft EA and FONSI will be completed, and all comments submitted during the public review period will be responded to in the final report.

Pursuant to Section 7 of the Endangered Species Act of 1973, as amended, the U.S. Army Corps of Engineers determined that the recommended plan may affect but is not likely to adversely affect the following federally listed species or their designated critical habitat: piping plover, red knot, Atlantic sturgeon and roseate tern.

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, the U.S. Army Corps of Engineers determined that the recommended plan has no effect on historic properties.

Pursuant to the Clean Water Act of 1972, as amended, the discharge of dredged or fill material associated with the recommended plan has been found to be compliant with section 404(b)(1) Guidelines (40 CFR 230). The Clean Water Act Section 404(b)(1) Guidelines evaluation is found in Appendix A of the EA.

A water quality certification pursuant to section 401 of the Clean Water Act will be obtained from the NJDEP prior to construction. All conditions of the water quality certification shall be implemented in order to minimize adverse impacts to water quality.

A determination of consistency with the New Jersey Coastal Zone Management program pursuant to the Coastal Zone Management Act of 1972 will be obtained from the NJDEP prior to construction. All conditions of the consistency determination shall be implemented in order to minimize adverse impacts to the coastal zone.

All applicable environmental laws have been considered and coordination with appropriate agencies and officials is ongoing with the public review of this EA. An Essential Fish Habitat (EFH) assessment was completed) and is being coordinated with NOAA Fisheries/National Marine Fisheries Service.

Technical, environmental, and cost effectiveness criteria used in the formulation of alternative plans were those specified in the Water Resources Council's 1983 Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies. All applicable laws, executive orders, regulations, and local government plans were considered in evaluation of alternatives. Based on this report, the reviews by other Federal, State and local agencies, Tribes, input of the public, and the review by my staff, it is my determination that the recommended plan would not cause significant adverse effects on the quality of the human environment; therefore, preparation of an Environmental Impact Statement is not required.

_____ _____

Date

Ramon Brigantti
Lieutenant Colonel, Corps of Engineers
District Engineer