

**TOWN PIER DREDGING PROJECT
GREEN HARBOR - MARSHFIELD, MA**

**SUMMARY OF SEDIMENT TESTING
May/June 2004**

Grain Size Distribution	SAMPLE NO.			
	S1	S2	S3	S4
% Coarse	4.8	0.2	17	1.6
% Sand	59.9	66.8	38.1	56.8
% Silt	32.1	29.9	21.2	41.1
% Clay	3.1	3.1	18.4	0.5

Metals	Composite	
Contaminant	A (mg/kg)	B (mg/kg)
Arsenic	3.6	2.5
Cadmium	0.15	0.21
Chromium	18	17
Copper	12	13
Lead	14	13
Mercury	0.037	0.04
Nickel	8.6	7.4
Zinc	36	37
Percent Moisture	28	28
TOC (%) - Run 1	0.56	0.95
TOC (%) - Run 2	0.51	0.80
Conductivity (umhos/cm)	3600	8600

NOTES:

All samples collected were advanced to proposed dredging depth including an assumed 1-ft. overdredge depth.

Composite A = S1 + S2; Composite B = S3+S4

Volatile Organics
Marshfield Town Pier Dredging

Parameter	S-1 (mg/kg)	S-2 (mg/kg)	S-3 (mg/kg)	S-4 (mg/kg)
Dichlorodifluoromethane	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Chloromethane	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Vinyl Chloride	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Bromomethane	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Chloroethane	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Trichlorofluoromethane	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Acetone	0.030	0.065	0.100	0.083
1,1-Dichloroethene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Carbon disulfide	0.005	0.012	0.017	0.017
Methylene chloride	0.0012 JB	0.0038 JB	0.0018 JB	0.0014 JB
Methyl tert-butyl ether (MTBE)	0.0011 U	0.0017 U	0.0017 U	0.0019 U
trans-1,2-Dichloroethene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
1,1-Dichloroethene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Vinyl acetate	0.0011 U	0.0017 U	0.0017 U	0.0019 U
2-Butanone (MEK)	0.008	0.018	0.030	0.024
cis-1,2-Dichloroethene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
2,2-Dichloropropane	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Chloroform	0.0011 U	0.0017 U	0.0017 U	0.0019 U
1,1,1-Trichloroethane	0.0011 U	0.0017 U	0.0017 U	0.0019 U
1,1-Dichloropropene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Carbon tetrachloride	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Benzene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
1,2-Dichloroethane	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Trichloroethene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
1,2-Dichloropropane	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Dibromomethane	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Bromodichloromethane	0.0011 U	0.0017 U	0.0017 U	0.0019 U
2-Chloroethylvinyl ether	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Methyl isobutyl ketone (MIBK)	0.0011 U	0.0017 U	0.0017 U	0.0019 U
cis-1,3-Dichloropropene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Toluene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
trans-1,3-Dichloropropene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
1,1,2-Trichloroethane	0.0011 U	0.0017 U	0.0017 U	0.0019 U
2-Hexanone	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Tetrachloroethene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
1,3-Dichloropropane	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Dibromochloromethane	0.0011 U	0.0017 U	0.0017 U	0.0019 U
1,2-Dibromoethane	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Chlorobenzene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
1,1,1,2-Tetrachloroethane	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Ethylbenzene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
p/m-Xylene	0.0023 U	0.0034 U	0.0034 U	0.0038
o-Xylene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Styrene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Bromoform	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Isopropylbenzene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
1,1,2,2-Tetrachloroethane	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Bromobenzene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
1,2,3-Trichloropropane	0.0011 U	0.0017 U	0.0017 U	0.0019 U
n-Propylbenzene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
2-Chlorotoluene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
1,3,5-Trimethylbenzene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
4-Chlorotoluene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
tert-Butylbenzene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
1,2,4-Trimethylbenzene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
sec-Butylbenzene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
1,3-Dichlorobenzene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
p-Isopropyltoluene	0.0006 J	0.0017 U	0.0017 U	0.0019 U
1,4-Dichlorobenzene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
n-Butylbenzene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
1,2-Dichlorobenzene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
1,2-Dibromo-3-chloropropane	0.0011 U	0.0017 U	0.0017 U	0.0019 U
1,2,4-Trichlorobenzene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Hexachlorobutadiene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
Napthalene	0.0011 U	0.0017 U	0.0017 U	0.0019 U
1,2,3-Trichlorobenzene	0.0011 U	0.0017 U	0.0017 U	0.0019 U

Surrogate	Acceptance Range (%)	% Recovery			
		S-1	S-2	S-3	S-4
Dibromofluoromethane	80-118	107	106	107	107
1,2-Dichloroethane-d4	70-130	111	105	108	109
Toluene-d8	81-114	95	94	92	95
4-Bromofluorobenzene	70-130	96	96	88	93

B = Found in associated blank

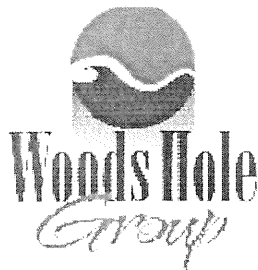
J = Estimated value, below quantitation limit

U = The analyte was analyzed for but not detected at the sample specific level reported

Reactive Sulfides
Marshfield Town Pier Dredging

Reactive Sulfides
Marshfield Town Pier Dredging

Depth (ft)		S-1 (mg/kg)	S-2 (mg/kg)	S-3 (mg/kg)	S-4 (mg/kg)
0	1	150	92	950	590
1	2	11		1	11
2	2.5	0	0	0	1
2	3	25	49	1	0
Wgt. Average		62	78	317	241



Extractable Petroleum Hydrocarbons by GC/FID

Client: **Vine Associates, Inc.**
Project: **Marshfield Town Pier**
Client ID: **Comp A=S-1 & S-2 (0'-3')**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **0405038**
Lab ID: **0405038-01**
Associated Blank: **ES051804B11**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Sample Amount (g)	Fraction	Date Analyzed	Final Volume (ml)	Dilution Factor	Analyst
04/30/04	04/30/04	05/19/04	72.0	10.33	Aromatic	05/25/04	1	1	TLB
					Aliphatic	05/25/04	1	1	TLB

Extractable Petroleum Hydrocarbons (EPH)

Result

C ₉ -C ₁₈ Aliphatics ¹	4000 U
C ₁₉ -C ₃₆ Aliphatics ¹	5400 U
C ₁₁ -C ₂₂ Aromatics ^{1,2}	11000 U
Unadjusted C ₁₁ -C ₂₂ Aromatics ¹	11000 U

Target PAH Analytes

Result

Naphthalene	670 U
2-Methylnaphthalene	670 U
Acenaphthylene	670 U
Acenaphthene	670 U
Fluorene	670 U
Phenanthrene	670 U
Anthracene	670 U
Fluoranthene	670 U
Pyrene	670 U
Benzo(a)anthracene	670 U
Chrysene	670 U
Benzo(b)fluoranthene	670 U
Benzo(k)fluoranthene	670 U
Benzo(a)pyrene	670 U
Indeno(1,2,3-cd)pyrene ³	670 U
Dibenzo(a,h)anthracene ³	670 U
Benzo(g,h,i)perylene	670 U

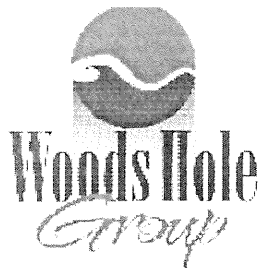
¹ = Range concentration excludes the concentration of any surrogate(s) and/or internal standards eluting in that range.

² = C11-C22 Aromatic Hydrocarbons exclude the concentration of Target PAH Analytes.

³ = Values reported reflect their sum.

Extraction Surrogate	% Recovery	Acceptance Range (%)
5-alpha Androstane	58	40-140
ortho-Terphenyl	71	40-140
Fractionation Surrogate		
Biphenyl	75	40-140
2-Fluorobiphenyl	77	40-140

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable



Extractable Petroleum Hydrocarbons by GC/FID

Client: **Vine Associates, Inc.**
Project: **Marshfield Town Pier**
Client ID: **Comp B=S-3 & S4 (0'-3')**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **0405038**
Lab ID: **0405038-02**
Associated Blank: **ES051804B11**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Sample Amount (g)	Fraction	Date Analyzed	Final Volume (ml)	Dilution Factor	Analyst
04/29/04	04/29/04	05/19/04	71.6	10.40	Aromatic	05/25/04	1	1	TLB
					Aliphatic	05/25/04	1	1	TLB

Extractable Petroleum Hydrocarbons (EPH)

Result

C ₉ -C ₁₈ Aliphatics ¹	4000 U
C ₁₉ -C ₃₆ Aliphatics ¹	5400 U
C ₁₁ -C ₂₂ Aromatics ^{1,2}	11000 U
Unadjusted C ₁₁ -C ₂₂ Aromatics ¹	11000 U

Target PAH Analytes

Result

Naphthalene	670 U
2-Methylnaphthalene	670 U
Acenaphthylene	670 U
Acenaphthene	670 U
Fluorene	670 U
Phenanthrene	670 U
Anthracene	670 U
Fluoranthene	670 U
Pyrene	670 U
Benzo(a)anthracene	670 U
Chrysene	670 U
Benzo(b)fluoranthene	670 U
Benzo(k)fluoranthene	670 U
Benzo(a)pyrene	670 U
Indeno(1,2,3-cd)pyrene ³	670 U
Dibenzo(a,h)anthracene ³	670 U
Benzo(g,h,i)perylene	670 U

¹ = Range concentration excludes the concentration of any surrogate(s) and/or internal standards eluting in that range.

² = C11-C22 Aromatic Hydrocarbons exclude the concentration of Target PAH Analytes.

³ = Values reported reflect their sum.

Extraction Surrogate	% Recovery	Acceptance Range (%)
5-alpha Androstane	59	40-140
ortho-Terphenyl	74	40-140
Fractionation Surrogate		
Biphenyl	74	40-140
2-Fluorobiphenyl	76	40-140

U - The analyte was analyzed for but not detected at the sample specific level reported.

N/A - Not Applicable



Polychlorinated Biphenyls by 8082

Client: **Vine Associates, Inc.**
Project: **Marshfield Town Pier**
Client ID: **Comp A=S-1 & S-2 (0'-3')**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

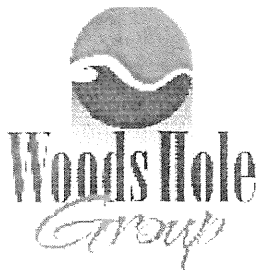
Lab Code: **MA00030**
ETR: **0405038**
Lab ID: **0405038-01**
Associated Blank: **PS051804B15**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
04/30/04	04/30/04	05/19/04	05/23/04	72.0	5.56	10	1	CMF

Parameter	Result
Aroclor 1016	50 U
Aroclor 1221	50 U
Aroclor 1232	50 U
Aroclor 1242	50 U
Aroclor 1248	50 U
Aroclor 1254	50 U
Aroclor 1260	50 U

Surrogate	% Recovery	Acceptance Range (%)
Tetrachloro-meta-xylene	82	30-150
Decachlorobiphenyl	75	30-150

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable



Polychlorinated Biphenyls by 8082

Client: **Vine Associates, Inc.**
Project: **Marshfield Town Pier**
Client ID: **Comp B=S-3 & S4 (0'-3')**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **0405038**
Lab ID: **0405038-02**
Associated Blank: **PS051804B15**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
04/29/04	04/29/04	05/19/04	05/23/04	71.6	5.46	10	1	CMF

Parameter	Result
Aroclor 1016	51 U
Aroclor 1221	51 U
Aroclor 1232	51 U
Aroclor 1242	51 U
Aroclor 1248	51 U
Aroclor 1254	51 U
Aroclor 1260	51 U

Surrogate	% Recovery	Acceptance Range (%)
Tetrachloro-meta-xylene	86	30-150
Decachlorobiphenyl	80	30-150

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

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