

July 2001

Springfield Millrace

Sediment Sampling Evaluation

Abstract

The Clean Water Act (CWA) of 1977, as amended regulates dredging activities and requires sediment quality evaluation, including testing, prior to dredging. Guidelines to implement 40 CFR Part 230-Section 404(b)(1) regulations of the CWA, the national Inland Testing Manual (ITM) and the regional Dredge Material Evaluation Framework for the Lower Columbia River Management Area (DMEF) have adopted a tiered testing approach for the evaluation of dredge material. Tier IIa (physical testing) and Tier IIb (chemical testing) have been completed for this evaluation, using screening levels (SL) adopted in the DMEF.

Six (6) hand-core sediment samples with one (1) QC sample were collected from the Springfield Millpond (and Millrace) on February 23-24, 2000 (see Figures 1 & 2). All samples were sent to Sound Analytical Services, Inc. laboratory of Tacoma, WA, for physical and chemical analyses, to include: total petroleum hydrocarbon (TPH) scan with follow-up identification, volatile organic carbon (VOC), metals (10), total organic carbon (TOC), pesticides/polychlorinated biphenyls (PCBs), phenols, phthalates, miscellaneous extractables, polynuclear aromatic hydrocarbons (PAHs).

Material represented by samples SM-SG-01 and SM-HC-02 did not meet screening level guidelines of the DMEF. The material represented by these samples is not suitable for inwater placement and must be managed as contaminated or further characterized (Tier III, biological testing) for open inwater disposal consideration.

Sediment represented by samples SM-HC-03 through SM-HC-06 are suitable for open unconfined inwater placement without further characterization.

Follow-up sampling was conducted on May 22, 2001 to determine extent of contamination associated with sample SM-HC-02 (collected Feb. 23-24,2000) in the millpond. Nine (9) hand core samples were collected in the area around this sample (SM-HC-02) and the nearest "clean" sample (SM-HC-03). All samples were submitted for hydrocarbon identification (HCID) screen for petroleum. The analyses for all of these samples, except one indicated petroleum products present at levels at or above levels of concern. The contamination of motor oil in the millpond is limited to the western end of the pond. The material west of samples SM-HC-03 and SM-G-01 (see Figure 2) will need to be managed to avoid either contact with the water or availability to benthic organisms by removal or adequately capping material to prevent all potential avenues of exposure.

The site where sample SM-SG-01 was collected, as a potential reconnection location to the Willamette River, is no longer being considered as an option due to a gravel bar that develops in the river at that location. A sample (SM-HC-10) was collected at the newly proposed connecting site to the Willamette River. This sample showed benzyl alcohol, DDT

and motor oil in excess of concern levels for inwater placement. The material represented by this sample must be managed to avoid inwater exposure.

Introduction

The purpose of this report is to characterize the sediment in the Springfield Millpond and the connection site of the Millrace to the Willamette River, for the purpose of habitat improvement. The sampling and analysis objectives are listed in the Sampling and analysis plan , as well as below. This report will outline the procedures used to accomplish these goals.

SAMPLING AND ANALYSIS OBJECTIVES

The sediment characterization program objectives and constraints are summarized below:

- To characterize sediments in accordance with the regional dredge material testing manual, the Dredge Material Evaluation Framework for the Lower Columbia River Management Area (DMEF).
- Collect, handle and analyze representative sediment, of the purposed dredging prism, in accordance with protocols and Quality Assurance/Quality Control (QA/QC) requirements.
- Characterize sediments to be dredged for evaluation of disposal options and evaluate the newly exposed surface.
- Conduct physical and chemical characterization to determine management options for the disposal of the material represented by these samples.

Previous Studies

Limited sediment data is available from the Springfield millrace pond. EMCON collected 3 sediment samples on February 5, 1997. One sample each from the inlet, the interior of the Millpond and the outlet was selected for analyses of total petroleum hydrocarbons (TPH), total nitrogen and phosphorous and total arsenic, chromium, cadmium, lead, nickel, copper and selenium. None of the metals analyzed exceeded screening levels of the DMEF. Hydrocarbons were detected, but not identified in the TPH analyses. There was insufficient data collected to characterize sediment without additional sampling and analyses.

Current Sampling Events

Two sampling events were conducted. The first as an over all evaluation and the second as a follow up to confirm and isolate contamination detected in the first event.

The Corps of Engineers, Portland District personnel, with the City of Springfield maintenance providing a boat and operator, collected one (1) surface soil sample and five

(5)-hand core sediment samples on February 23-24, 2000. Two (2) sediment cores were collected at each sampling station to provide sufficient sample volume, with each core penetrating approximately 1-foot. Replicate cores were composited prior to submission to the lab. All samples were sent to Sound Analytical Services, Inc. laboratory of Tacoma, WA, for physical and chemical analyses, to include: total petroleum hydrocarbon (TPH) scan with follow-up identification, volatile organic carbon (VOC), metals (10), total organic carbon (TOC), pesticides/polychlorinated biphenyls (PCBs), phenols, phthalates, miscellaneous extractables, polynuclear aromatic hydrocarbons (PAHs).

On May 22, 2001 nine (9) hand core samples were collected from the millpond in an attempt to isolate contamination (petroleum) previously detected (SM-HC-02). Hydrocarbon identification (HCID) analysis was conducted on these samples. One (1) surface grab sample was collected at the newly proposed Willamette River connection site. All of the analyses listed for the previous sampling event (above) were conducted on this single sample.

Results/Discussion

Physical and Volatile Solids: Data for these analyses are presented in Table 1. All 6 samples submitted for analysis during the February 2000 sampling event exceeded 20% fines and 5% volatile solids. Three (3) samples submitted were classified as “elastic silt with sand”, 2 as “sandy elastic silt” and 1 as silty sand. Median grain size for all samples is 0.03 mm, with 33.85% sand and 65.22% fines. All samples were brown to gray in color. Volatile solids ranged from 12.91% to 20.72%. The one (1) soil sample (SM-G-10) submitted for physical analysis from the May, 2001 sampling event was 22.7% gravel, 67.48% sand and 9.82% fines with 23.18% volatile solids and was classified as well graded sand with silt.

Metals, Total Organic Carbon (TOC): Data for these analyses are presented in Table 2. Low levels of some metals were found in most of the samples collected, but do not approach the SL. The highest level detected was for cadmium, which is 47% of the SL. TOC ranged from 3200 to 110,000 mg/kg. Sample (SM-G-10), the only sample submitted for chemical analysis, from the May 2001 sampling event did not exceed SL for any of the metals analyzed. TOC for this sample was 41,000 mg/kg.

Pesticide/PCBs, Phenols, Phthalates and Misc. Extractables: Data for these analyses are presented in Table 3. No PCBs were found at the method detection limits. Four (4) phenols were detected at levels < 86.6% of the SL. Three (3) phthalates were detected at levels <30% of SL. Benzoic Acid was detected at 63.1% of the SL. Benzylalcohol exceeded the SL of 57 ug/kg with a 100-ug/kg level in 1 sample (SM-SG-01). Total DDT and its breakdown products, DDD and DDE were not detected above the 6.9 ug/kg SL. The one (1) soil sample (SM-G-10) submitted for chemical analysis from the May 2001 sampling event contained total DDT at 11.0 ug/kg (SL 6.9 ug/kg). Analyses also exceeded SL for Benzoic acid 4400 ug/kg (650 ug/kg SL) and Benzyl Alcohol 1700 ug/kg (57 ug/kg SL). Sample (SM-G-10) submitted for chemical analysis from the May 2001 sampling event exceeded the 6.9 ug/kg screening level of the DMEF at 11.0 ug/kg for total DDT (DDE 3.6 ug/kg and DDT 7.4 ug/kg). Benzoic acid and benzyl alcohol exceeded SLs for this sample, also. On the first run the concentration of the two (2) compounds exceeded the method equipment calibration, were diluted and reanalyzed. Benzoic acid analyses detected 4400

& 5500 ug/kg concentration in the respective runs (SL = 650 ug/kg). Benzyl alcohol was also analyzed twice with results of 1700 & 1500 ug/kg (SL = 57ug/kg).

Polynuclear Aromatic Hydrocarbons (PAHs): Data for these analyses are presented in Tables 4 & 5. Low levels of some individual “low molecular weight” PAHs were found in all samples at levels <2.8% of SL. Three (3) “high molecular weight” PAHs were found in some samples at levels <1.0% of the SL. The one (1) soil sample (SM-G-10) submitted for chemical analysis from the May 2001 sampling event did not exceed SL for any low or high density PAHs.

Total Petroleum Hydrocarbons – Hydrocarbon Identification (TPH-HCID): Data for these analyses are presented in Table 6. Petroleum hydrocarbons were detected in the >nC24-nC32 range at >390 mg/kg in 1 sample (SM-HC-02). The follow-up analysis of this sample indicated #2 diesel to be present at 180 mg/kg and motor oil to be present 870 mg/kg. TPH-HCID analysis was completed on all ten (10) samples collected in May 2001. The analyses for all samples except SM-G-01 exceeded method detection limits.

Volatile Organic Carbon (VOC): Data for these analyses are presented in Table 7. VOC analysis was not on the original chain of custody; therefore the samples were not stored in an appropriate VOC storage area at the laboratory. Methylene chloride is considered by the lab as a contamination as a result of the storage outside of the volatiles storage area. Three other volatiles were detected at low levels. SLs for sediment have not been established for these analytes. Toluene was detected at 0.57 ug/kg in 1 sample. The Water Quality Standard for Toluene is 17,500 ug/kg and the Soil Cleanup Standard is 80,000 ug/kg. The one (1) soil sample submitted for chemical analysis from the May, 2001 sampling event did not exceed DMEF screening levels.

Conclusion

Collection and evaluation of the sediment data was completed using guidelines from the Dredge Material Evaluation Framework for the Lower Columbia River Management Area (DMEF). The DMEF is a regional manual developed jointly with regional EPA, Corps, Oregon Dept. of Environmental Quality and Washington Depts. of Ecology and Natural Resources. This document is a guideline for implementing the Clean Water Act, 40 CFR 230 sec 404 (b)(1). The screening levels used are those adopted for use in the DMEF, final November 1998. The DMEF Tiered testing approach requires that material in excess of 20% fines and greater than 5% volatile solids, as well as any material with prior history or is suspected (“reason to believe”) of being contaminated, be subjected to chemical as well as physical analyses to determine method of disposal and determine suitability of the newly exposed surface (NES). Under the Tiered approach, if the chemical analytical results do not exceed the established screening levels (SL), the material is considered suitable for unconfined in-water disposal. Any sediment represented by sample analyses that exceed the SLs can not be determined to be acceptable for unconfined inwater placement. Two (2) management options can be considered when SLs are exceeded, further characterization (Tier III biological testing) for open inwater placement consideration or managed as contaminated material and place inwater with an appropriately designed cap or disposed of upland in a suitable confined disposal facility.

Sediment represented by samples SM-HC-03 through SM-HC-06 (see Figure 1 & 2) are suitable for unconfined inwater placement without further characterization.

The areas identified as potential sites to reconnect the millrace to the Willamette River were evaluated under the Clean Water Act using the DMEF screening levels to determine if this material would be suitable for placement as inwater fill. The soil represented by sample SM-SG-01, which contained benzyl alcohol, (see Figure 1), is no longer being considered as an option site. The new option for connecting the millrace to the Willamette River (at the east-end of the parking lot) contained total DDT at 11.0 ug/kg (DMEF screening level = 6.9 ug/kg), benzoic acid as high as 5500 ug/kg (DMEF screening level = 650 ug/kg) and benzyl alcohol as high as 1700 ug/kg (DMEF screening level = 57 ug/kg). Without further Tier III biological testing, this material will need to be excavated without release to water during removal and handled appropriately. It is recommended that the newly exposed surface be tested to ensure contamination is not present prior to being exposed to the water or that the water be directed through a culvert, which would eliminate potential exposure to contamination (culvert may be a fish passage issue).

The sediment represented by sample SM-HC-02 (see Figure 1 & 2) was determined to be unsuitable for open inwater disposal due to diesel and motor oil detected in that sample. Further characterization was conducted (May 2001) to evaluate the extent of the contamination in this area. As a result of this sampling event, it was determined that the material associated with samples SM-G-02 through SM-G-09 (see figure 2) is not suitable for open water placement. This material must either be removed and placed in a new location and suitably capped or removed for upland disposal in a suitable confined disposal facility. The newly exposed surface (NES), where contaminated sediment is removed, should be tested for similar contamination, after dredging (or excavation if area is dried up before construction). If contamination is present in NES, the contaminated area should be over dredged and a suitably designed cap placed over areas of concern.

References

1. U.S. Army Corps of Engineers, Portland District, Seattle District; U.S. Environmental Protection Agency, Region 10; Oregon Department of Environmental Quality; Washington State Department of Natural Resources and Department of Ecology. 1998 Final. Dredge Material Evaluation Framework for the Lower Columbia River Management Area.
2. U. S. Environmental Protection Agency and U. S. Army Corps of Engineers. February 1998. Evaluation of Dredged Material Proposed for Discharge in Inland and Near Coastal Waters – Testing Manual, dated (referred to as the “Inland Testing Manual”).
3. The Clean Water Act, 40 CFR 230 (b) (1).
4. EMCON. April 1997. Preliminary Site Characterization, Springfield Millpond, Springfield, Oregon.

Table 1, Springfield Millrace

Sampled February 23-24, 2000 & May 22, 2001

Physical Analysis

Sampled February 23-24, 2000									
	Grain Size (mm)				%				
Sample I.D.	Median		Mean		Gravel	Sand	Silt/Clay	Volatile solids	
SM-SG-01	0.02		0.45		3.23	56.51	40.26		13.48
SM-HC-02	0.03		0.10		0.00	35.73	64.27		20.72
SM-HC-03	0.02		0.30		1.40	36.18	62.42		13.20
SM-HC-04	0.03		0.08		0.00	26.57	73.43		14.78
SM-HC-05	0.03		0.07		0.24	21.22	78.54		15.10
SM-HC-06	0.03		0.15		0.71	26.89	72.40		12.91
Mean	0.03		0.19		0.93	33.85	65.22		15.03
Minimum	0.02		0.07		0.00	21.22	40.26		12.91
Maximum	0.03		0.45		3.23	56.51	78.54		20.72
Sampled May 22, 2001									
SM-G-10	1.2		1.58		22.7	67.48	9.82		23.18

Table 2, Springfield Millrace

Sampled February 23-24, 2000 & May 22, 2001

Inorganic Metals and TOC

Sampled February 23-24, 2000											
Sample I.D.	As	Sb	Cd	Cr	Cu	Pb	Hg	Ni	Ag	Zn	TOC
	mg/kg (ppm)										
SM-SG-01	3.1	1.2	0.96	47	40	12	<0.06	36	0.15	78	43000
SM-HC-02	3.6	4.5	1.2	51	74	14	0.15	35	0.23	110	110000
SM-HC-03	3.5	2.4	1.5	45	58	13	<0.083	34	0.25	100	34000
SM-HC-04	3.6	2.8	1.7	55	71	13	<0.056	36	0.45	100	55000
SM-HC-05	5.1	2.0	2.1	59	71	15	<0.11	40	0.33	120	32000
SM-HC-06	5.2	1.9	2.4	44	66	18	<0.092	30	0.35	120	41000
SM-HC-D	6.7	1.3	2.3	74	90	14	<0.078	54	0.36	140	38000
Screening level (SL)	57	150	5.1	*	390	450	0.41	140	6.1	410	
Mean	4.4	2.2	1.7	53.6	67.1	14.1	0.037	37.9	0.30	109.7	
Maximum	6.7	4.5	2.4	74	90	18	0.15	54	0.45	140	
SM-HC-D is a blind duplicate of SM-HC-04											
Symbol (<) = Non-detect (ND) at the value listed (Method Detection Limit)											
* Screening Level not established for Cr											
Sampled May 22, 2001											
Sample I.D.	As	Sb	Cd	Cr	Cu	Pb	Hg	Ni	Ag	Zn	TOC
SM-G-10	2.7	0.26	0.89	-	44	32	0.31	28	0.14	88	41000

Polynuclear Aromatic Hydrocarbons (PAHs)
Low Molecular Weight Analytes
ug/kg (ppb)

Sample I.D.	Pesticides					Phenols				Phthalates			Extractables	
	ug/kg (ppb)													
	4,4'-DDD	4,4'-DDE	4,4'-DDT	Total DDT	Delta-BHC	Phenol	2-Methyl phenol	3-&4-Methyl phenol	Penta chloro phenol	Diethyl phthalate	bis(2-Ethyl) hexzyl phthalate	Butyl Benzyl phthalate	Benzoic Acid	Benzyl Alcohol
SM-SG-01	<0.34	<0.72	<2.5	ND	<0.29	<10	<2.6	<8.2	<4.2	<3.7	33	11	410	100
SM-HC-02	<0.63	<1.3	<4.6	ND	2.5	<10	6.2	460	8.1	360	55	20	68	20
SM-HC-03	<0.45	<0.95	<3.3	ND	<0.21	<10	<3.6	210	<3.3	<4.9	46	11	32	8.2
SM-HC-04	<0.49	<1.0	<3.6	ND	<0.22	<10	4.4	300	6.3	<5.2	46	<4.1	27	22
SM-HC-05	<0.58	<1.2	<4.2	ND	2.1	46	4.9	580	<3.7	<5.8	39	<4.1	42	21
SM-HC-06	<0.57	<1.2	<4.1	ND	<2.6	30	<3.8	260	<3.7	<6	51	19	42	11
SM-HC-D	<0.51	<1.1	<3.7	ND	<0.23	68	6.6	480	<3.7	9.7	48	23	38	37
Screen level (SL)	DDD + DDE + DDT = 6.9				*	420	63	670	400	1200	8300	970	650	57
Mean					0.7	20.6	3.2	327.1	2.1	52.8	45.4	12.0	94.1	31.3
Maximum					2.5	68	6.6	580	8.1	360	55	23	410	100

* SL not established

PCBs = Non-detect (ND) <18.0 ppb (SL = 130 ppb).

SM-HC-D is a blind duplicate of SM-HC-04.

E = Estimate, diluted and rerun (second value).

Symbol (<) = Non-detect (ND) at the value listed (Method Detection Limit)

J= Estimate, value is between MDL and PQL.

Sampled May 22, 2001

Sample I.D.	Pesticides					Phthalates			Extractables	
	4,4'-DDD	4,4'-DDE	4,4'-DDT	Total DDT	Delta-BHC	Endrin	Di-n-butyl phthalate	bis(2-Ethyl) hexzyl phthalate	Benzoic Acid	Benzyl Alcohol
SM-HC-D	<0.67	3.6	7.4	11.0	<1.3	4.3	42 J	23 J	4400 E (5500)	1700 E (1500)

Polynuclear Aromatic Hydrocarbons (PAHs)
High Molecular Weight Analytes
ug/kg (ppb)

Sample I.D.	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	2-Methyl naphthalene	Naphthalene	Phenanthrene	Total Low PAHs
SM-SG-01	<1.9	<2.5	<3	<2.5	<4.5	<6.1	1.7	1.7
SM-HC-02	<1.9	15	4.3	4.3	5.6	58	24	111.2
SM-HC-03	<1.9	2.7	<3	<1.6	<4	9.6	3.7	16.0
SM-HC-04	<1.9	<2.2	<3	<1.6	<4	7.3	5.8	13.1
SM-HC-05	<1.9	8.2	<3	<1.6	<4	25	8.8	42.0
SM-HC-06	<1.9	6.2	<3	<1.6	4.5	22	10	42.7
SM-HC-D	<1.9	7.6	<3	8.1	4.1	35	11	65.8
Screen level (SL)	500	560	960	540	670	2100	1500	5200
Mean	ND	5.7	0.6	1.8	2.0	22	9.3	
Maximum	ND	15	4.3	8.1	5.6	58	24	
SM-HC-D is a blind duplicate of SM-HC-04 Symbol (<) = Non-detect (ND) at the value listed (Method Detection Limit)								
Sampled May 22, 2001								
Sample I.D.	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	2-Methyl naphthalene	Naphthalene	Phenanthrene	Total Low PAHs
SM-G-10	<1.0	<0.9	12	<3.5	5.8	13	<0.44	30.8

Northwest Total Petroleum Hydrocarbon mg/kg (ppm)

Sample I.D.	Benzo(a) anthracene	Benzo(b) fluoroanthene	Benzo(k) fluoroanthene	Benzo(g,h,i) perylene	Chrysene	Pyrene	Benzo(a) pyrene	Dibenz(a,h) anthracene	Indeno (1,2,3-cd) pyrene	Fluoranthene	Total High PAHs
SM-SG-01	<1.8	<1.9	<1.9	<0.84	<2.3	2.4	<2.3	<1.3	<2.1	2.4	4.8
SM-HC-02	<1.8	<1.9	<1.9	<0.84	<2.3	24	<2.3	<1.3	<2.1	17	41
SM-HC-03	<1.8	<1.9	<1.9	<0.84	<2.3	<1.4	<2.3	<1.3	<2.1	2.7	2.7
SM-HC-04	<1.8	<1.9	<1.9	<0.84	<2.3	7.7	<2.3	<1.3	<2.1	7.7	15.4
SM-HC-05	<1.8	<1.9	<1.9	<0.84	<2.3	8.8	<2.3	<1.3	<2.1	6.6	15.4
SM-HC-06	<1.8	<1.9	<1.9	<0.84	<2.3	12	<2.3	<1.3	<2.1	8.4	20.4
SM-HC-D	<1.8	<1.9	<1.9	<0.84	2.5	<1.4	<2.3	<1.3	<2.1	8.1	10.6
Screen level (SL)	1300	3200	3200	670	1400	2600	1600	230	600	1700	12000
Mean	ND	ND	ND	ND	0.4	54.9	ND	ND	ND	7.6	
Maximum	ND	ND	ND	ND	2.5	24	ND	ND	ND	17	
SM-HC-D is a blind duplicate of SM-HC-04											
Symbol (<) = Non-detect (ND) at the value listed (Method Detection Limit).											
Sample I.D.	Benzo(a) anthracene	Benzo(b) fluoroanthene	Benzo(k) fluoroanthene	Benzo(g,h,i) perylene	Chrysene	Pyrene	Benzo(a) pyrene	Dibenz(a,h) anthracene	Indeno (1,2,3-cd) pyrene	Fluoranthene	Total High PAHs
SM-G-10	<1.3	<0.9	<0.9	<0.34	<1.2	<0.68	<1.2	<0.48	<0.48	16	16

Northwest Total Petroleum Hydrocarbon mg/kg (ppm)

Sample I.D.	Gasoline (Toluene-nC12)	Diesel (>nC12-nC24)	Motor Oil (>nC24-nC32)
SM-SG-01	<38	<95	<190
SM-HC-02	<77	<190	>390*
SM-HC-03	<54	<130	<270
SM-HC-04	<59	<150	<290
SM-HC-05	<65	<160	<330
SM-HC-06	<65	<160	<320
SM-HC-D	<60	<150	<300
SM-G-01	<69	<170	<340
SM-G-02	<85	<210	>420
SM-G-03	<82	<210	>410
SM-G-04	<55	<140	>280
SM-G-05	<72	>180	>360
SM-G-06	<75	>190	>370
SM-G-07	<87	<220	>440
SM-G-08	<78	<200	>390
SM-G-09	<86	<220	>430
SM-G-10	<31	<77	>150

* Follow-up analysis on sample SM-HC-02 indicated #2 diesel to be present at 180 mg/kg and motor oil to be present at 870 mg/kg.

SM-HC-D is a blind duplicate of SM-HC-04

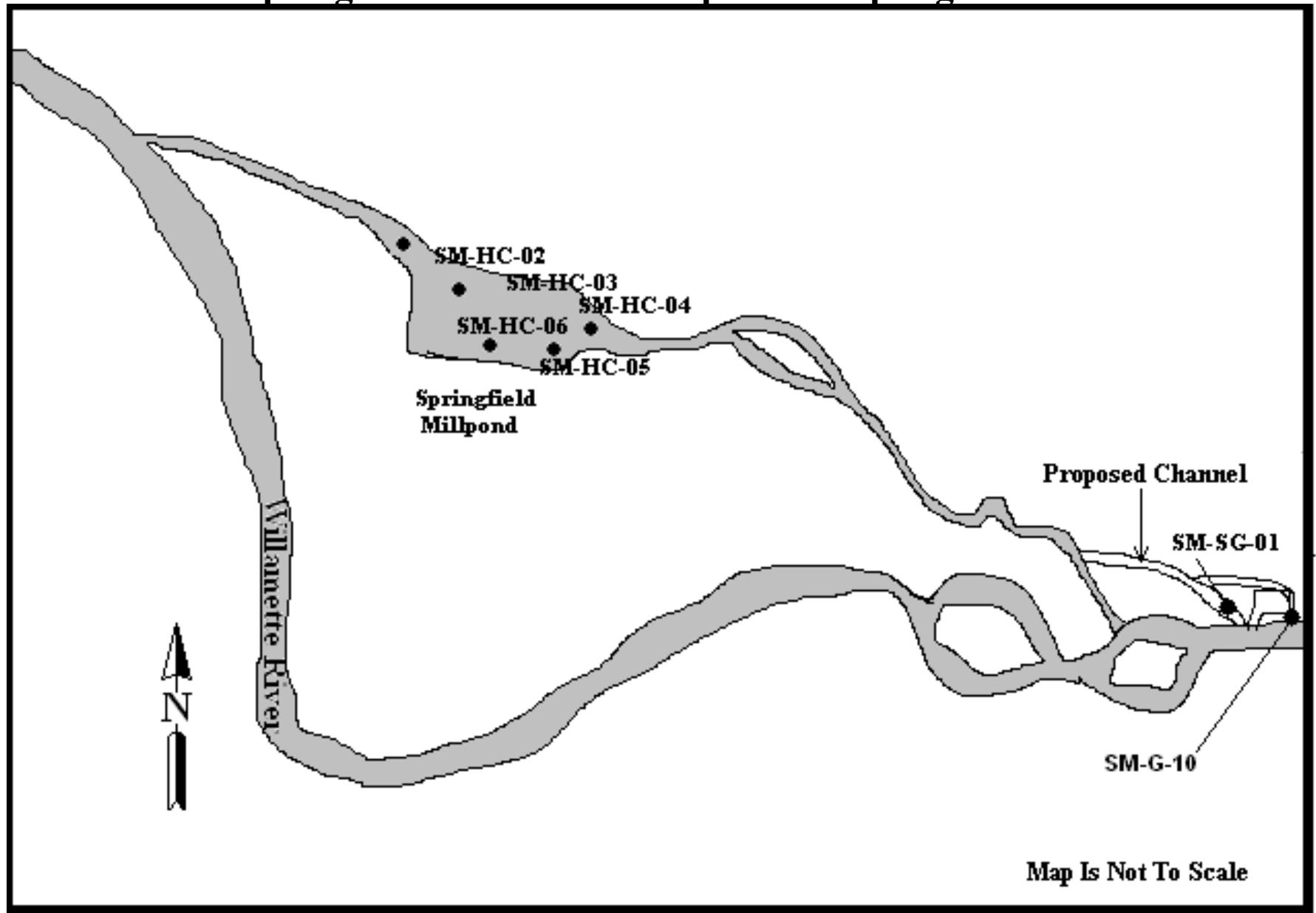
Symbol (<) = Non-detect (ND) at the value listed (Method Detection Limit). Symbol (>) = indicates greater than MDL.

Volatile Organic Carbon (VOCs)

ug/kg (ppb)

Sample I.D.	Methylene chloride*	2-Butanone	Toluene	Acetone	
SM-SG-01	29	<1.8	0.57	<1.8	
SM-HC-02	8	<3.5	<0.7	28	
SM-HC-03	12	4.7	<0.44	71	
SM-HC-04	11	<2.7	<.53	31	
SM-HC-05	9.1	<2.7	<0.54	51	
SM-HC-06	5.2	5	<0.58	91	
SM-HC-D	7.1	2.6	<0.51	41	
DMEF (SL)	N/A	N/A	N/A	N/A	
Water Quality Criteria	N/A	N/A	17,500	N/A	
Soil Cleanup STD	100	N/A	80,000	N/A	
<p>* VOC analysis was not on the original chain of custody, therefore the samples were not stored in volatile storage area. Methylene chloride is considered by the lab as a contamination as a result of the storage outside of the Volatiles storage area.</p> <p>Tentatively Identified Volatile Organics were identified in all samples at low levels.</p> <p>SM-HC-D is a blind duplicate of SM-HC-04.</p> <p>Symbol (<) = Non-detect (ND) at the value listed MDL (Method Detection Limit).</p> <p>Screen Levels have not been established in the DMEF for these VOCs. N/A = Not on Published List.</p> <p>J = Considered estimate, value between MDL and reporting value (PQL).</p>					
Sampled May 22, 2001					
Sample I.D.	Trichloroethene	Tetrachloroethene	Styrene	Acetone	Napthalene
SM-G-10	3.6 J	3.8 J	13	440	5.8 J

Springfield Millrace & Millpond Sampling Sites



Springfield Millpond Samplings Sites

