Appendices from the Biological and Water Quality Study of Mill Creek And Tributaries

Butler and Hamilton Counties, Ohio

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prepared by

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Appendix Table 1. Butler County Upper Mill Creek Regional WWTP NPDES Violations 1988-1992.

DATE	PARAMETER	PERMIT LIMITATION	VALUE REPORTED
Jan. 88	Ammonia	2.50 mg/l *	2.52 mg/l
Aug. 88	Ammonia	1.00 mg/l *	4.30 mg/l
Aug. 88	Ammonia	1.50 mg/l **	1.80 mg/l
Aug. 88	Ammonia	1.50 mg/l **	4.65 mg/l
Aug. 88	Ammonia	1.50 mg/l **	5.35 mg/l
Aug. 88	Ammonia	1.50 mg/l **	5.23 mg/l
Sept. 88	Ammonia	1.00 mg/l *	5.92 mg/l
Sept. 88	Ammonia	1.50 mg/l **	6.35 mg/l
Sept. 88	Ammonia	1.50 mg/l **	7.03 mg/l
Sept. 88	Ammonia	1.50 mg/l **	6.50 mg/l
Sept. 88	Ammonia	1.50 mg/l **	4.86 mg/l
Oct. 88	Ammonia	1.00 mg/l *	4.63 mg/l
Oct. 88	Ammonia	1.50 mg/l **	3.90 mg/l
Oct. 88	Ammonia	1.50 mg/l **	3.86 mg/l
Oct. 88	Ammonia	1.50 mg/l **	5.16 mg/l
Oct. 88	Ammonia	1.50 mg/l **	5.26 mg/l
Oct. 88	Residual Chlorine	0.5 mg/l (Max)	Exceeded 2 days
Nov. 88	Ammonia	2.50 mg/l *	4.83 mg/l
Nov. 88	Ammonia	5.00 mg/l **	5.83 mg/l
Nov. 88	Ammonia	5.00 mg/l **	5.60 mg/l
Dec. 88	Ammonia	2.50 mg/l *	5.72 mg/l
Dec. 88	Ammonia	5.00 mg/l **	5.15 mg/l
Dec. 88	Ammonia	5.00 mg/l **	7.90 mg/l
Dec. 88	Ammonia	5.00 mg/l **	6.06 mg/l
June 89	Ammonia	1.00 mg/l *	2.96 mg/l
June 89	Ammonia	1.50 mg/l **	1.63 mg/l
June 89	Ammonia	1.50 mg/l **	4.45 mg/l
June 89	Ammonia	1.50 mg/l **	4.55 mg/l
June 89	Oil & Grease	10 mg/l (Max)	27.6 mg/l
June 89	Oil & Grease	10 mg/l (Max)	11.4 mg/l
Aug. 89	Ammonia	1.00 mg/l *	1.33 mg/l
Aug. 89	Ammonia	1.50 mg/l **	1.60 mg/l
Aug. 89	Ammonia	1.50 mg/l **	1.70 mg/l
Sept. 89	Fecal coliforms	2000/100ml **	2527/100ml
Oct. 89	Ammonia	1.00 mg/l *	3.79 mg/l
Oct. 89	Ammonia	1.50 mg/l **	3.95 mg/l
Oct. 89	Ammonia	1.50 mg/l **	2.96 mg/l
Oct. 89	$CBOD_5$	10 mg/l *	12 mg/l
Oct. 89	$CBOD_5$	15 mg/l **	17 mg/l
May 90	Ammonia	1.00 mg/l *	2.15 mg/l

Appendix Table 1 (cont.).

DATE	PARAMETER	PERMIT LIMITATION	VALUE REPORTED
May 90	Ammonia	1.50 mg/l **	2.29 mg/l
May 90	Ammonia	1.50 mg/l **	3.87 mg/l
May 90	Fecal coliforms	1000/100ml *	1064/100ml
May 90	Fecal coliforms	2000/100ml **	3335/100ml
May 90	pH	6.5 SU (Min)	Not attained 8 days
June 90	Fecal coliforms	2000/100ml **	3563/100ml
June 90	Residual Chlorine	0.5 mg/l (Max)	Exceeded 1 day
July 90	Ammonia	1.00 mg/l *	1.35 mg/l
July 90	Ammonia	1.50 mg/l **	1.88 mg/l
July 90	Residual Chlorine	0.5 mg/l (Max)	Exceeded 3 days
Aug. 90	Ammonia	1.00 mg/l *	1.98 mg/l
Aug. 90	Ammonia	1.50 mg/l **	2.24 mg/l
Aug. 90	Ammonia	1.50 mg/l **	1.59 mg/l
Aug. 90	Ammonia	1.50 mg/l **	2.41 mg/l
Sept. 90	Ammonia	1.00 mg/l *	2.19 mg/l
Sept. 90	Ammonia	1.50 mg/l **	2.20 mg/l
Sept. 90	Ammonia	1.50 mg/l **	1.52 mg/l
Sept. 90	Ammonia	1.50 mg/l **	3.14 mg/l
Sept. 90	Ammonia	1.50 mg/l **	2.14 mg/l
Sept. 90	Fecal coliforms	2000/100ml **	AK/100ml
Oct. 90	Ammonia	1.00 mg/l *	1.15 mg/l
Oct. 90	Ammonia	1.50 mg/l **	2.09 mg/l
Oct. 90	Fecal coliforms	2000/100ml **	10870/100ml
Jan.91	Ammonia	2.50 mg/l *	3.17 mg/l
Jan. 91	Ammonia	75.7 kg/day **	81.9 kg/day
Feb. 91	Ammonia	2.50 mg/l *	3.07 mg/l
Feb. 91	Ammonia	37.9 kg/day *	58.7 kg/day
Feb. 91	Ammonia	75.7 kg/day **	84.8 kg/day
April 91	TSS	151 kg/day *	225 kg/day
April 91	TSS	227 kg/day **	311 kg/day
April 91	TSS	227 kg/day **	245 kg/day
May 91	Ammonia	1.00 mg/l *	4.00 mg/l
May 91	Ammonia	15.1 kg/day *	71.6 kg/day
May 91	Ammonia	1.50 mg/l **	1.89 mg/l
May 91	Ammonia	1.50 mg/l **	2.80 mg/l
May 91	Ammonia	1.50 mg/l **	8.51 mg/l
May 91	Ammonia	1.50 mg/l **	5.44 mg/l
May 91	Ammonia	22.7 kg/day **	27.3 kg/day
May 91	Ammonia	22.7 kg/day **	48.0 kg/day
May 91	Ammonia	22.7 kg/day **	148.2 kg/day

Appendix Table 1 (cont.).

DATE	PARAMETER	PERMIT LIMITATION	VALUE REPORTED
May 91	Ammonia	22.7 kg/day **	102.7 kg/day
May 91	Fecal coliforms	2000/100ml **	2900/100ml
May 91	Fecal coliforms	2000/100ml **	3700/100ml
June 91	Ammonia	1.00 mg/l *	6.88 mg/l
June 91	Ammonia	1.50 mg/l **	5.83 mg/l
June 91	Ammonia	1.50 mg/l **	8.52 mg/l
June 91	Ammonia	1.50 mg/l **	6.93 mg/l
June 91	Ammonia	1.50 mg/l **	6.25 mg/l
June 91	Ammonia	15.1 kg/day *	123.3 kg/day
June 91	Ammonia	22.7 kg/day **	121.9 kg/day
June 91	Ammonia	22.7 kg/day **	148.8 kg/day
June 91	Ammonia	22.7 kg/day **	117.0 kg/day
June 91	Ammonia	22.7 kg/day **	96.9 kg/day
July 91	Ammonia	1.00 mg/l *	5.30 mg/l
July 91	Ammonia	1.50 mg/l **	4.97 mg/l
July 91	Ammonia	1.50 mg/l **	3.25 mg/l
July 91	Ammonia	1.50 mg/l **	5.66 mg/l
July 91	Ammonia	1.50 mg/l **	6.58 mg/l
July 91	Ammonia	15.1 kg/day *	84.7 kg/day
July 91	Ammonia	22.7 kg/day **	71.7 kg/day
July 91	Ammonia	22.7 kg/day **	72.0 kg/day
July 91	Ammonia	22.7 kg/day **	103.4 kg/day
July 91	Ammonia	22.7 kg/day **	89.8 kg/day
Aug. 91	Ammonia	1.00 mg/l *	6.88 mg/l
Aug. 91	Ammonia	1.50 mg/l **	7.12 mg/l
Aug. 91	Ammonia	1.50 mg/l **	5.58 mg/l
Aug. 91	Ammonia	1.50 mg/l **	9.27 mg/l
Aug. 91	Ammonia	1.50 mg/l **	7.13 mg/l
Aug. 91	Ammonia	1.51 kg/day *	111.3 kg/day
Aug. 91	Ammonia	22.7 kg/day **	139.4 kg/day
Aug. 91	Ammonia	22.7 kg/day **	81.2 kg/day
Aug. 91	Ammonia	22.7 kg/day **	150.3 kg/day
Aug. 91	Ammonia	22.7 kg/day **	103.3 kg/day
Sept. 91	Ammonia	1.00 mg/l *	6.35 mg/l
Sept. 91	Ammonia	1.50 mg/l **	3.67 mg/l
Sept. 91	Ammonia	1.50 mg/l **	8.41 mg/l
Sept. 91	Ammonia	1.50 mg/l **	6.19 mg/l
Sept. 91	Ammonia	1.50 mg/l **	5.76 mg/l
Oct. 91	Ammonia	1.00 mg/l *	8.39 mg/l
Oct. 91	Ammonia	15.1 kg/day *	116.4 kg/day

Appendix Table 1 (cont.).

DATE	PARAMETER	PERMIT LIMITATION	VALUE REPORTED
Oct. 91	Ammonia	1.50 mg/l **	8.26 mg/l
Oct. 91	Ammonia	1.50 mg/l **	9.72 mg/l
Oct. 91	Ammonia	1.50 mg/l **	8.20 mg/l
Oct. 91	Ammonia	1.50 mg/l **	7.29 mg/l
Oct. 91	Ammonia	22.7 kg/day **	114.2 kg/day
Oct. 91	Ammonia	22.7 kg/day **	143.7 kg/day
Oct. 91	Ammonia	22.7 kg/day **	115.8 kg/day
Oct. 91	Ammonia	22.7 kg/day **	95.5 kg/day
Nov. 91	Ammonia	4.0 mg/l *	11.75 mg/l
Nov. 91	Ammonia	60.6 kg/day *	157.5 kg/day
Nov. 91	Ammonia	6.0 mg/l **	13.25 mg/l
Nov. 91	Ammonia	6.0 mg/l **	11.42 mg/l
Nov. 91	Ammonia	6.0 mg/l **	10.49 mg/l
Nov. 91	Ammonia	6.0 mg/l **	10.99 mg/l
Nov. 91	Ammonia	90.0 kg/day **	175.4 kg/day
Nov. 91	Ammonia	90.0 kg/day **	160.6 kg/day
Nov. 91	Ammonia	90.0 kg/day **	135.4 kg/day
Nov. 91	Ammonia	90.0 kg/day **	143.8 kg/day
Dec. 91	Ammonia	4.0 mg/l *	13.02 mg/l
Dec. 91	Ammonia	60.6 kg/day *	200.6 kg/day
Dec. 91	Ammonia	6.0 mg/l **	11.33 mg/l
Dec. 91	Ammonia	6.0 mg/l **	19.82 mg/l
Dec. 91	Ammonia	6.0 mg/l **	9.00 mg/l
Dec. 91	Ammonia	6.0 mg/l **	9.59 mg/l
Dec. 91	Ammonia	90.9 kg/day **	195.2 kg/day
Dec. 91	Ammonia	90.9 kg/day **	540.0 kg/day
Dec. 91	Ammonia	90.9 kg/day **	137.5 kg/day
Dec. 91	Ammonia	90.9 kg/day **	168.6 kg/day
Dec. 91	TSS	151kg/day *	187 kg/day
Dec. 91	TSS	18 mg/l **	19 mg/l
Dec. 91	TSS	227 kg/day **	330 kg/day
Jan. 92	Ammonia	4.0 mg/l *	7.61 mg/l
Jan. 92	Ammonia	60.6 kg/day *	136.4 kg/day
Jan. 92	Ammonia	6.0 mg/l **	7.68 mg/l
Jan. 92	Ammonia	6.0 mg/l **	9.56 mg/l
Jan. 92	Ammonia	6.0 mg/l **	9.31 mg/l
Jan. 92	Ammonia	90.9 kg/day **	144.2 kg/day
Jan. 92	Ammonia	90.9 kg/day **	179.0 kg/day
Feb. 92	Ammonia	4.0 mg/l *	8.62 mg/l
Feb. 92	Ammonia	6.0 mg/l **	12.49 mg/l

Appendix Table 1 (cont.).

DATE	PARAMETER	PERMIT LIMITATION	VALUE REPORTED
Feb. 92	Ammonia	6.0 mg/l **	8.26 mg/l
Feb. 92	Ammonia	6.0 mg/l **	6.79 mg/l
Feb. 92	Ammonia	6.0 mg/l **	6.94 mg/l
Feb. 92	Ammonia	90.9 kg/day **	139.8 kg/day
Feb. 92	TSS	12 mg/l *	15 mg/l
Feb. 92	TSS	151 kg/day *	182.5 kg/day
Feb. 92	TSS	18 mg/l **	21 mg/l
March 92	Ammonia	4.0 mg/l *	5.11 mg/l
March 92	Ammonia	60.6 kg/day *	108.2 kg/day
March 92	Ammonia	6.0 mg/l **	6.84 mg/l
March 92	Ammonia	90.9 kg/day **	121.5 kg/day
March 92	Ammonia	90.9 kg/day **	125.2 kg/day
March 92	Ammonia	90.9 kg/day **	107.2 kg/day
March 92	TSS	151 kg/day *	206.2 kg/day
March 92	TSS	227 kg/day **	334.7 kg/day
March 92	TSS	227 kg/day **	257.7 kg/day
April 92	Ammonia	4.0 mg/l *	4.25 mg/l
April 92	Ammonia	60.6 kg/day *	95.5 kg/day
April 92	Ammonia	90.9 kg/day **	97.5 kg/day
April 92	Ammonia	90.9 kg/day **	103.0 kg/day
April 92	Ammonia	90.9 kg/day **	96.7 kg/day
April 92	TSS	151 kg/day *	192.6 kg/day
April 92	$CBOD_5$	151 kg/day *	153.9 kg/day
May 92	Ammonia	4.0 mg/l *	4.48 mg/l
May 92	Ammonia	60.6 kg/day *	73.8 kg/day
May 92	Ammonia	90.9 kg/day **	100.5 kg/day
May 92	TSS	151 kg/day *	179.0 kg/day
June 92	Ammonia	4.0 mg/l *	6.15 mg/l
June 92	Ammonia	60.6 kg/day *	102.5 kg/day
June 92	Ammonia	6.0 mg/l **	6.65 mg/l
June 92	Ammonia	6.0 mg/l **	5.69 mg/l
June 92	Ammonia	6.0 mg/l **	6.00 mg/l
June 92	Ammonia	6.0 mg/l **	6.27 mg/l
June 92	Ammonia	90.9 kg/day **	111.6 kg/day
June 92	Ammonia	90.9 kg/day **	93.7 kg/day
June 92	Ammonia	90.9 kg/day **	104.8 kg/day
June 92	Ammonia	90.9 kg/day **	103.0 kg/day

* Monthly Average ** Weekly Average AK - Too numerous to count.

Appendix Table 2. Summary of diurnal D.O.(mg/l) data recorded with Datasonde continuous monitors at nine locations in the Mill Creek study area, 1992. June 23-25; July 6-9; July 6-10.

River Mile	Total Hours	Mean (mg/l)	Median (mg/l)	Minimum (mg/l)	Maximum (mg/l)	25th %ile (mg/l)	75th %ile (mg/l)
Mill Creek							
17.96	115	6.64	6.69	5.08	8.12	6.24	7.14
16.57	115	6.51	6.27	***4.35‡***	9.49	5.46	7.62
14.74	147	5.79	5.62	***4.83‡***	8.04	5.25	6.24
14.06	67	5.95	5.76	***4.74‡***	8.25	5.33	6.56
13.25	71	7.05	6.67	5.56	9.64	6.15	7.92
0.51	41	***2.48‡‡***	***2.03‡‡***	***0.56‡‡‡***	5.33	***0.98‡‡‡***	***4.08‡***
East Fork Mill Creek							
1.85	113	8.10	7.48	5.46	12.25	6.74	9.34
0.77	66	6.29	6.17	4.35‡	9.06	5.22	7.29
0.01	114	5.58	5.50	4.46‡	7.60	5.20	5.83

NOTE: At the time of the 1992 survey, Mill Creek from I-275 to the confluence with the Ohio River was designated Limited Warmwater Habitat. Numbers in ***bold italicized*** print represent exceedences of Warmwater Habitat criteria where Limited Warmwater Habitat criteria are being met.

‡ violation of the average dissolved oxygen (D.O.) criterion.
‡‡ violation of the minimum dissolved oxygen (D.O.) criterion.
‡‡‡ violation of the "nuisance prevention" minimum dissolved oxygen (D.O.) criterion (2.0mg/l).

Appendix Table 3. Concentration (µg/l) of organic compounds detected in water samples collected in the Mill Creek study area, 1992. See end of Table 3 for explanation of notations.

Stream/Location River Mile	Date Sample Collected 7/16/92	 8/13/92	 9/17/92
Mill Creek			
Sharon Rd. 16.57			
Parameter*			
alpha-Hexachlorocyclohexane	0.009	ND	ND
gamma-Hexachlorocyclohexane	0.017	0.011	0.020
Heptachlor	0.003	ND	ND
Heptachlor Epoxide	ND	ND	0.004
4,4'- DDE	0.009	ND	0.010
4,4'-DDT	0.027	ND	ND
Dieldrin	0.003	ND	ND
Endrin Aldehyde	ND	0.024	ND
Chloroform	ND	1.5	0.7
West Columbia 13.35			
Parameter*			
alpha-Hexachlorocyclohexane	0.009	ND	ND
gamma-Hexachlorocyclohexane	0.018	0.004	ND
4,4'- DDE	0.007	0.004	0.013
4,4'-DDT	0.017	ND	0.033
Dieldrin	ND	ND	0.014
Endosulfan II	0.002	ND	ND
Methoxychlor	0.015	ND	ND
North Bend Rd. 8.92			
Parameter*			
alpha-Hexachlorocyclohexane	0.017	ND	0.009
gamma-Hexachlorocyclohexane	ND	0.008	0.002
4,4'- DDE	0.009	0.004	0.006
4,4'-DDT	0.013	ND	ND
Dieldrin	0.003	0.003	ND
Endosulfan II	ND	ND	0.005

Appendix Table 3 (cont.) .

Stream/Location River Mile	Date Sample Collected 7/16/92	 8/13/92	 9/17/92
Mill Creek			
Center Hill Rd. 7.85			
Parameter*			
alpha-Hexachlorocyclohexane	ND	ND	0.010
gamma-Hexachlorocyclohexane	ND	ND	0.003
4,4'-DDE	0.011	ND	0.006
4,4'-DDT	0.026	ND	ND
Dieldrin	0.004	0.004	ND
Endosulfan II	0.003	ND	0.007
Heptachlor Epoxide	ND	0.002	ND
Mitchell Ave. 5.85			
Parameter*			
alpha-Hexachlorocyclohexane	ND	ND	0.013
gamma-Hexachlorocyclohexane	0.014	ND	0.004
4,4'-DDD	0.013	ND	0.010
4,4'-DDE	0.018	0.009	0.008
4,4'-DDT	0.026	ND	ND
Dieldrin	0.015	0.005	ND
Endrin	ND	0.010	ND
Endosulfan II	ND	ND	0.004
Heptachlor Epoxide	ND	ND	0.004
Heptachlor	0.004	ND	ND
1,2,4-Trichlorobenzene	ND	ND	0.6

Appendix Table 3 (cont.).

Stream/Location River Mile	Date Sample Collected 7/16/92	 8/13/92	 9/17/92
Mill Creek			
Ust. Hopple St. 2.90			
Parameter*			
alpha-Hexachlorocyclohexane	0.017	0.014	0.006
gamma-Hexachlorocyclohexane	0.016	ND	ND
4,4'-DDD	0.011	ND	ND
4,4'-DDE	0.009	ND	ND
4,4'-DDT	0.031	ND	0.007
Dieldrin	0.011	0.002	ND
Endrin	ND	ND	0.002
Endosulfan I	0.009	ND	ND
Endosulfan II	ND	0.006	0.004
Heptachlor	0.004	ND	ND
Chloroform	1.2	ND	ND
1,2-Dichlorobenzene	0.6	ND	ND
1,4-Dichlorobenzene	0.7	ND	0.8
1,2,4-Trichlorobenzene	1.7	0.6	0.7
Gest St. 0.51			
Parameter*			
alpha-Hexachlorocyclohexane	ND	ND	0.011
gamma-Hexachlorocyclohexane	ND	0.009	ND
4,4'-DDD	0.023	0.008	0.020
4,4'-DDE	0.020	0.007	0.012
4,4'-DDT	0.050	ND	0.051
Dieldrin	0.011	0.007	ND
Endrin	ND	ND	0.006
Endrin Aldehyde	ND	0.094	ND
Aldrin	0.002	ND	ND
Endosulfan II	ND	ND	0.005
Heptachlor Epoxide	0.005	0.051	ND
Toluene	ND	0.5	ND
1,2-Dichlorobenzene	5.9	ND	ND
1,3-Dichlorobenzene	0.6	ND	ND
1,4-Dichlorobenzene	1.6	1.2	1.3
1,2,3-Trichlorobenzene	0.8	ND	ND
1,2,4-Trichlorobenzene	2.8	0.6	0.6
1,2-Dicholrobenzene	4.1	ND	ND
1,2,4-Dichlorobenzene	2.1	ND	ND

Appendix Table 3 (cont.).

Stream/Location River Mile	Date Sample Collected 7/16/92	 8/13/92	 9/17/92
East Fork Mill Creek			
Barrett Rd. 4.69			
Parameter*			
alpha-Hexachlorocyclohexane	0.003	ND	0.002
Heptachlor Epoxide	0.004	0.003	0.003
4,4'- DDE	0.002	ND	ND
Dieldrin	0.002	0.003	ND
Station Rd. 3.78			
Parameter*			
alpha-Hexachlorocyclohexane	0.003	ND	ND
Heptachlor Epoxide	0.003	ND	ND
Dieldrin	ND	0.002	ND
Chloromethane	ND	ND	0.7
Allen Rd. 1.85			
Parameter*			
alpha-Hexachlorocyclohexane	0.005	0.003	ND
delta-Hexachlorocyclohexane	ND	ND	0.002
gamma-Hexachlorocyclohexane	0.007	0.004	0.003
Heptachlor Epoxide	0.006	ND	ND
Dieldrin	ND	0.002	ND
Endosulfan II	0.002	ND	0.003
Crescentville Rd. 0.77			
Parameter*			
gamma-Hexachlorocyclohexane	ND	0.018	0.040
Heptachlor Epoxide	ND	ND	0.019
Endrin	0.004	ND	0.006
Heptachlor	0.030	0.014	0.007
4,4'-DDE	0.019	ND	0.012
Endrin Aldehyde	ND	0.057	0.041
Chloroform	1.1	4.4	1.8
Bromodichloromethane	ND	2.6	ND
Dibromochloromethane	ND	1.0	ND

Appendix Table 3 (cont.).

Stream/Location River Mile	Date Sample Collected 7/16/92	 8/13/92	 9/17/92
West Fork Mill Creek			
Mouth (Dexter Ave.) 0.19			
Parameters*			
alpha-Hexachlorocyclohexane	ND	0.008	0.004
4,4'-DDE	0.006	ND	0.003
4,4'-DDT	ND	ND	0.007
Dieldrin	0.006	0.005	0.005
Endosulfan II	0.003	0.004	0.002
Endosulfan Sulfate	0.022	ND	ND
Aldrin	ND	0.005	0.003
Heptachlor Epoxide	ND	0.003	ND
Heptachlor	ND	ND	0.003
Methoxychlor	ND	ND	0.025
Bloody Run			
Vine St. 0.31			
Parameter*			
alpha-Hexachlorocyclohexane	ND	0.022	ND
delta-Hexachlorocyclohexane	ND	ND	0.003
4,4'-DDD	0.012	0.014	ND
4,4'-DDE	0.012	ND	ND
Dieldrin	0.011	ND	0.006
Endrin Aldehyde	ND	0.050	ND
Endosulfan Sulfate	ND	0.028	ND
Aldrin	0.055	ND	ND
Heptachlor Epoxide	ND	0.014	ND
Methoxychlor	ND	0.032	ND
Napthalene	ND	2.5	ND
Tetrachloroethene	ND	0.6	ND
M-Xylene &/or P-Xylene	ND	1.7	ND
Methylene Chloride	8.1	ND	ND

Appendix Table 3 (cont.).

Stream/Location River Mile	Date Sample Collected 7/16/92	 8/13/92	 9/17/92
Ross Run Mouth 0.01			
Parameter*			
delta-Hexachlorocyclohexane	**	0.034	0.033
4,4'-DDD	**	0.040	ND
4,4'-DDE	**	ND	0.008
4,4'-DDT	**	0.076	0.031
Dieldrin	**	0.019	ND
Endrin	**	0.020	0.003
Endosulfan II	**	0.012	ND
Methoxychlor	**	0.068	ND
Chloroform	**	2.6	0.7
Napthalene	**	ND	2.7
Chlorobenzene	**	1.8	ND
Sec-Butylbenzene	**	1.0	ND
Methylene Chloride	**	12.6	ND
1,4-Dichlorobenzene	**	ND	0.6
1,2,4-Dichlorobenzene	**	0.7	ND
4-isopropyltoluene	**	1.5	ND
Diethyl Phthalate	**	10.2	ND

* Parameters in plain type are organochlorine pesticides; parameters in *italic type* are volatile organic compounds; and parameters in **bold type** are semivolatile organic compounds. Some organic compounds may be detected by both analyses for semivolatile and volatile compounds, therefore they may appear in the table indicated in both catagories.

** No samples taken.

ND Compound not detected. Detection limits varied for compounds therefore none appear in this table.

Appendix Table 4. Water Chemistry Data from the 1992 Mill Creek Survey.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 001 East Fork Mill
River Mile 4.69 Barrett Rd.

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/16/92	23.3	9.3	8.27	< 1.0	< 5.0	16	28	504	< 5
08/13/92	20.9	10.2	8.10	< 1.0	< 5.0	13	35	656	
09/17/92	18.0	8.1	7.95	< 1.0	< 5.0	< 10	45	701	< 5
Average	20.73	9.19	8.106	< 1.00	< 5.00	13.0	36.0	620.3	< 5
Maximum	23.3	10.2	8.27	< 1.0	< 5.0	16	45	701	< 5
Minimum	18.0	8.1	7.95	< 1.0	< 5.0	< 10	28	504	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/16/92	0.17	0.02	< 0.05	0.40			< 10	0.16	332	13
08/13/92	0.39	< 0.02	< 0.05	0.40			< 10	0.12	414	9
09/17/92	0.24	0.02	< 0.05	< 0.20			< 10	0.17	442	< 5
Average	0.266	0.020	< 0.050	0.333			< 10	0.150	396.0	9.0
Maximum	0.39	0.02	< 0.05	0.40			< 10	0.17	442	13
Minimum	0.17	< 0.02	< 0.05	< 0.20			< 10	0.12	332	< 5

Date	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/16/92	2	< 0.20	64	< 30	< 10	780	17	< 2	< 40	< 2	< 10	230
08/13/92	< 2	< 0.20	85	< 30	< 10	324	23	< 2	< 40	< 2	< 10	307
09/17/92	< 2	< 0.20	84	< 30	< 10	231	24	< 2	< 40	< 2	< 10	309
Average	2.0	< 0.200	77.6	< 30.0	< 10.0	445.0	21.3	< 2.0	< 40	< 2.0	< 10.0	282.0
Maximum	2	< 0.20	85	< 30	< 10	780	24	< 2	< 40	< 2	< 10	309
Minimum	< 2	< 0.20	64	< 30	< 10	231	17	< 2	< 40	< 2	< 10	230

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 002 East Fork Mill
River Mile 3.78 Station Rd.

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/16/92	22.1	9.1	8.14	< 1.0	< 5.0	13	33	547	< 5
08/13/92	20.4	9.3	8.04	< 1.0	< 5.0	22	45	738	
09/17/92	16.7	7.8	7.95	< 1.0	< 5.0	11	51	862	< 5
Average	19.73	8.73	8.043	< 1.00	< 5.00	15.3	43.0	715.6	< 5
Maximum	22.1	9.3	8.14	< 1.0	< 5.0	22	51	862	< 5
Minimum	16.7	7.8	7.95	< 1.0	< 5.0	11	33	547	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/16/92	0.31	0.02	0.06	0.40			< 10	0.15	382	7
08/13/92	0.74	< 0.02	< 0.05	0.40			< 10	0.12	484	< 5
09/17/92	0.34	< 0.02	< 0.05	< 0.20			< 10	0.08	570	< 5
Average	0.463	0.020	0.053	0.333			< 10	0.116	478.6	5.6
Maximum	0.74	0.02	0.06	0.40			< 10	0.15	570	7
Minimum	0.31	< 0.02	< 0.05	< 0.20			< 10	0.08	382	< 5

Date	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/16/92	< 2	< 0.20	71	< 30	< 10	499	18	< 2	< 40	< 2	< 10	251
08/13/92	< 2	< 0.20	97	< 30	< 10	< 50	23	< 2	< 40	< 2	< 10	337
09/17/92	< 2	< 0.20	114	< 30	< 10	< 50	28	< 2	< 40	< 2	< 10	400
Average	< 2.0	< 0.200	94.0	< 30.0	< 10.0	199.6	23.0	< 2.0	< 40.0	< 2.0	< 10.0	329.3
Maximum	< 2	< 0.20	114	< 30	< 10	499	28	< 2	< 40	< 2	< 10	400
Minimum	< 2	< 0.20	71	< 30	< 10	< 50	18	< 2	< 40	< 2	< 10	251

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 01 East Fork Mill
River Mile 1.85 Allen Rd.

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92	26.1	12.3	8.22	< 1.0	< 5.0	13	39	719	< 5
07/16/92	20.1	8.3	7.97	< 1.0		33	32	573	< 5
07/23/92	21.0	17.0	7.99	< 1.0	< 5.0	13	38	695	< 5
07/30/92	21.3	8.7	8.10	1.1	< 5.0	19	29	547	< 5
08/06/92	18.9	9.7	7.81	< 1.0	< 5.0	11	45	723	< 5
08/13/92	19.7	8.6	7.95	< 1.0	< 5.0	< 10	42	708	
08/20/92	16.2	8.4	7.81	< 1.0	< 5.0	< 10	44	795	
08/27/92	20.4	8.4	7.82	1.3	< 5.0	34	20	452	< 5
09/03/92	19.2	8.1	8.00	< 1.0	< 5.0	18	40	790	5
09/10/92	20.2	7.3	7.92	< 1.0	< 5.0	17	36	702	< 5
09/17/92	17.7	7.8	7.87	1.0	< 5.0	10	44	770	< 5
09/24/92	11.9	9.1	8.14	1.0	< 5.0	20	34	685	< 5
Average	19.39	9.48	7.966	1.03	< 5.00	17.3	36.9	679.9	< 5.0
Maximum	26.1	17.0	8.22	1.3	< 5.0	34	45	795	5
Minimum	11.9	7.3	7.81	< 1.0	< 5.0	< 10	20	452	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	< 0.10	< 0.02	< 0.05	0.30			< 10	< 0.05	448	6
07/16/92	0.36	0.03	< 0.05	0.30			< 10	0.16	388	12
07/23/92	0.21	< 0.02	< 0.05	< 0.20			< 10	0.10	458	6
07/30/92	0.40	< 0.02	< 0.05	< 0.20			< 10	0.18	376	48
08/06/92	0.67	0.02	< 0.05	0.30			< 10	< 0.05	458	6
08/13/92	0.66	0.02	< 0.05	0.40			< 10	0.16	460	< 5
08/20/92	0.40	0.02	< 0.05	0.30			< 10	0.15	528	< 5
08/27/92	1.52	0.06	< 0.05	0.60			< 10	0.40	322	88
09/03/92	0.56	< 0.02	< 0.05	0.20			< 10	0.10	504	20
09/10/92	0.27	< 0.02	< 0.05	0.40			11	0.05	412	< 5
09/17/92	0.25	0.02	< 0.05	< 0.20			< 10	0.67	466	9
09/24/92	0.25	0.02	< 0.05	< 0.20			< 10	0.07	416	< 5
Average	0.470	0.024	< 0.050	0.300			10.0	0.178	436.3	17.9
Maximum	1.52	0.06	< 0.05	0.60			11	0.67	528	88
Minimum	< 0.10	< 0.02	< 0.05	< 0.20			< 10	< 0.05	322	< 5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 01 East Fork Mill
River Mile 1.85 Allen Rd.

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92	1200	350	< 2	< 0.20	56	< 30	< 10	2250	15	< 2	< 40	< 2	< 10	202
07/16/92	1400	1830	< 2	< 0.20	78	< 30	< 10	896	18	< 2	< 40	< 2	< 10	269
07/23/92	560	810	< 2	< 0.20	92	< 30	< 10	224	21	< 2	< 40	< 2	< 10	316
07/30/92	> 20000	> 2000	< 2	< 0.20	73	< 30	< 10	2640	17	2	< 40	< 2	< 10	252
08/06/92	685	400	< 2	< 0.20	98	< 30	< 10	178	23	< 2	< 40	< 2	< 10	339
08/13/92	1100	250	2	< 0.20	101	< 30	< 10	170	21	< 2	< 40	< 2	< 10	339
08/20/92	462	< 7	< 2	< 0.20	111	< 30	< 10	495	25	< 2	< 40	< 2	< 10	380
08/27/92	> 20000	> 20000	2	< 0.20	66	< 30	< 10	4800	13	3	< 40	< 2	19	218
09/03/92	430	320	< 2	< 0.20	106	< 30	< 10	177	23	< 2	< 40	< 2	< 10	359
09/10/92	1500	210	< 2	< 0.20	94	< 30	< 10	160	21	< 2	< 40	< 2	11	321
09/17/92	230	140	< 2	< 0.20	107	< 30	< 10	211	24	< 2	< 40	< 2	< 10	366
09/24/92	440	46	< 2	< 0.20	90	< 30	< 10	345	20	< 2	< 40	< 2	13	307
Average	4000.5	2196.9	< 2.0	< 0.200	89.3	< 30.0	< 10.0	1045.5	20.0	2.0	< 40.0	< 2.0	11.0	305.6
Maximum	> 20000	> 20000	< 2	< 0.20	111	< 30	< 10	4800	25	3	< 40	< 2.0	19	380
Minimum	230	< 7	< 2	< 0.20	56	< 30	< 10	160	13	< 2	< 40	< 2.0	< 10	202

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 02 East Fork Mill
River Mile 0.77 Crescentville Rd.

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92	22.1	4.0	7.20	4.0	5.4	45	133	1120	7
07/16/92	20.4	7.2	7.38	8.3		64	106	964	6
07/23/92	21.2	11.1	7.35	2.1	6.5	36	169	1370	< 5
07/30/92	21.3	7.7	7.67	3.4	< 5.0	30	62	635	< 5
08/06/92	20.1	6.2	7.20	3.0	8.2	42	145	1300	< 5
08/13/92	20.5	7.9	7.49	2.1	5.0	43	120	1080	
08/20/92	19.9	6.3	7.20	3.8	9.7	44	184	1740	
08/27/92	21.4	7.5	7.75	2.0	5.4	39	37	491	< 5
09/03/92	20.2	6.4	7.54	2.4	< 5.0	26	81	996	6
09/10/92	21.2	7.3	7.41	2.5	7.9	41	117	1210	< 5
09/17/92	21.6	6.4	7.33	7.1	10.0	43	209	1540	12
09/24/92	18.0	7.7	7.72	< 1.0	7.6	46	116	1100	< 5
Average	20.65	7.14	7.436	3.47	6.87	41.5	123.2	1128.8	6.1
Maximum	22.1	11.1	7.75	8.3	10.0	64	209	1740	12
Minimum	18.0	4.0	7.20	< 1.0	< 5.0	26	37	491	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	10.90	> 1.00	1.29	3.10	< 1.0		< 10	3.73	694	6
07/16/92	4.69	0.45	3.08	4.40			< 10	2.09	616	8
07/23/92	7.43	0.65	1.68	3.50			< 10	3.08	872	6
07/30/92	3.01	0.08	0.10	0.50			< 10	0.78	420	69
08/06/92	12.40	0.19	0.18	2.00			< 10	4.59	824	< 5
08/13/92	8.11	0.05	< 0.05	1.60			< 10	2.89	640	< 5
08/20/92	7.26	0.37	0.61	2.30			< 10	3.58	1070	< 5
08/27/92	1.99	0.14	0.53	1.00			< 10	0.78	310	100
09/03/92	4.55	0.16	0.41	1.20			< 10	1.93	606	< 5
09/10/92	10.10	0.32	1.82	3.20			< 10	2.82	750	5
09/17/92	9.17	0.36	1.41	3.50			< 10	4.12	928	< 5
09/24/92	8.88	0.29	0.72	2.40			< 10	3.52	688	5
Average	7.374	0.338	0.990	2.391	< 1.00		< 10.0	2.825	701.5	18.6
Maximum	12.40	> 1.00	3.08	4.40	< 1.0		< 10	4.59	1070	100
Minimum	1.99	0.05	< 0.05	0.50	< 1.0		< 10	0.78	310	< 5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 02 East Fork Mill
River Mile 0.77 Crescentville Rd.

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92	3930	380	< 2	< 0.20	61	< 30	< 10	264	19	< 2	< 40	< 2	29	231
07/16/92	1170	2070	< 2	< 0.20	72	< 30	< 10	457	21	< 2	< 40	< 2	19	266
07/23/92	260	540	< 2	< 0.20	70	< 30	< 10	241	20	< 2	< 40	< 2	20	257
07/30/92	> 20000	> 20000	< 2	< 0.20	58	< 30	< 10	3070	14	3	< 40	< 2	12	202
08/06/92	450	160	< 2	< 0.20	65	< 30	< 10	215	19	< 2	< 40	< 2	29	241
08/13/92	2700	2400	< 2	< 0.20	76	< 30	< 10	92	19	< 2	< 40	< 2	15	268
08/20/92	200	< 7	< 2	< 0.20	69	< 30	< 10	51	19	< 2	< 40	< 2	41	251
08/27/92	> 20000	7700	2	< 0.20	56	< 30	< 10	5670	12	4	< 40	< 2	49	189
09/03/92	1770	1000	< 2	< 0.20	90	< 30	< 10	115	22	< 2	< 40	< 2	15	315
09/10/92	280	10	< 2	< 0.20	74	< 30	< 10	121	19	< 2	47	< 2	30	263
09/17/92	260	21	< 2	< 0.20	70	< 30	< 10	119	17	< 2	< 40	7	28	245
09/24/92	100	23	< 2	< 0.20	70	< 30	< 10	150	19	< 2	< 40	< 2	32	253
Average	4260.0	2859.2	< 2.0	< 0.200	69.2	< 30.0	< 10.0	880.4	18.3	2.2	40.5	2.4	26.5	248.4
Maximum	> 20000	> 20000	2	< 0.20	90	< 30	< 10	5670	22	4	47	7	49	315
Minimum	100	< 7	< 2	< 0.20	56	< 30	< 10	51	12	< 2	< 40	< 2	12	189

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 03 East Fork Mill
River Mile 0.01 Mouth

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92	22.7	7.1	7.33	5.8	10.0	52	136	1080	7
07/16/92	20.7	13.7	7.42	10.0		60	110	995	6
07/23/92	21.5	6.8	7.34	1.8	4.4	35	150	1310	< 5
07/30/92	21.3	8.4	8.67	2.6	5.2	23	80	744	< 5
08/06/92	19.8	7.6	7.45	4.8	11.0	46	146	1324	< 5
08/13/92	20.5	7.9	7.34	5.6	9.0	39	131	1080	
08/20/92	19.7	9.2	7.29	4.9	10.7	49	193	1820	
08/27/92	21.4	7.3	7.69	2.5	< 5.0	39	36	495	5
09/03/92	21.0	6.8	7.66	4.5	< 5.0	29	98	1060	7
09/10/92	21.3	6.8	7.45	5.7	7.6	40	113	1150	< 5
09/17/92	21.0	6.5	7.35	9.6	10.8	45	205	1540	< 5
09/24/92	17.1	7.7	7.77	3.8	7.6	42	110	1030	5
Average	20.66	7.98	7.563	5.13	7.84	41.5	125.6	1135.6	5.5
Maximum	22.7	13.7	8.67	10.0	11.0	60	205	1820	7
Minimum	17.1	6.5	7.29	1.8	< 5.0	23	36	495	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	7.92	1.00	1.33	3.30			< 10	3.80	680	< 5
07/16/92	2.97	0.46	3.95	5.40			< 10	2.13	604	16
07/23/92	7.34	0.71	1.26	2.90			< 10	2.92	832	7
07/30/92	4.40	0.08	0.08	0.70			12	1.42	488	83
08/06/92	12.30	0.35	0.40	2.30			13	4.71	842	< 5
08/13/92	7.64	0.10	0.52	2.20			< 10	2.83	662	12
08/20/92	7.25	0.58	0.94	2.70			< 10	3.62	1110	8
08/27/92	1.89	0.14	0.50	1.00			< 10	0.95	304	125
09/03/92	5.90	0.22	0.55	1.60				2.50	642	6
09/10/92	9.37	0.45	1.88	3.20			42	2.49	708	6
09/17/92	0.65	0.39	2.01	3.80			15	3.92	928	6
09/24/92	9.10	0.30	0.84	2.30			< 10	3.07	682	5
Average	6.394	0.398	1.188	2.616			13.8	2.863	706.8	23.6
Maximum	12.30	1.00	3.9	5.40			42	4.71	1110	125
Minimum	0.65	0.08	0.08	0.70			< 10	0.95	304	< 5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 03 East Fork Mill
River Mile 0.01 Mouth

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92	> 6700	1230	< 2	< 0.20	55	< 30	< 10	214	18	< 2	< 40	< 2	52	211
07/16/92	867	700	2	< 0.20	70	< 30	< 10	754	20	< 2	< 40	< 2	23	257
07/23/92	1270	767	< 2	< 0.20	69	< 30	< 10	298	20	< 2	< 40	< 2	21	255
07/30/92	> 20000	> 6700	< 2	< 0.20	61	< 30	< 10	3940	16	2	< 40	< 2	16	218
08/06/92	> 20000	> 20000	< 2	< 0.20	62	< 30	< 10	185	18	3	< 40	< 2	25	229
08/13/92	> 20000	> 20000	2	< 0.20	74	< 30	< 10	246	18	< 2	< 40	< 2	23	259
08/20/92	> 20000	> 20000	< 2	< 0.20	71	< 30	< 10	178	19	< 2	< 40	< 2	36	256
08/27/92	> 20000	10300	3	< 0.20	58	< 30	< 10	6440	12	5	< 40	< 2	32	194
09/03/92	1100	640	< 2	< 0.20	80	< 30	< 10	268	20	< 2	< 40	< 2	25	282
09/10/92	3000	1270	< 2	< 0.20	74	< 30	< 10	207	19	< 2	< 40	< 2	23	263
09/17/92	> 20000	> 20000	< 2	< 0.20	66	< 30	< 10	214	17	< 2	< 40	< 2	38	235
09/24/92	> 6700	3000	< 2	< 0.20	68	< 30	< 10	401	18	< 2	< 40	< 2	24	244
Average	11636.4	8717.2	2.0	< 0.200	67.3	< 30.0	< 10.0	1112.0	17.9	2.3	< 40.0	< 2.0	28.1	241.9
Maximum	> 20000	> 20000	3	< 0.20	80	< 30	< 10	6440	20	5	< 40	< 2	52	282
Minimum	867	640	< 2	< 0.20	55	< 30	< 10	178	12	< 2	< 40	< 2	16	194

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 04 Mill Creek
River Mile 26.35 Dst. Liberty-Fairfield Rd.

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92	25.8	9.1	8.02	< 1.0	< 5.0	16	35	847	< 5
07/16/92	22.6	9.3	8.20	< 1.0	< 5.0	12	28	732	< 5
07/23/92	21.0	19.2	8.05	< 1.0	< 5.0	10	26	747	< 5
07/30/92	21.3	9.6	8.20	1.2	< 5.0	26	20	618	< 5
08/06/92	19.1	10.8	7.94	< 1.0	< 5.0	< 10	28	788	< 5
08/13/92	21.1	11.0	8.00	< 1.0	< 5.0	< 10	27	775	
08/20/92	15.5	7.8	7.51	1.0	< 5.0	< 10	30	939	
08/27/92	20.7	7.8	7.76	< 1.0	< 5.0	33	13	407	< 5
09/03/92	18.8	8.0	7.93	< 1.0	< 5.0	54	24	807	< 5
09/10/92	19.9	6.3	7.77	< 1.0	< 5.0	15	25	801	< 5
09/17/92	17.0	5.8	7.70	< 1.0	< 5.0	10	30	884	< 5
09/24/92	11.5	8.6	8.02	< 1.0	< 5.0	21	24	705	< 5
Average	19.52	9.44	7.924	1.01	< 5.00	18.9	25.8	754.1	< 5.0
Maximum	25.8	19.2	8.20	1.2	< 5.0	54	35	939	< 5
Minimum	11.5	5.8	7.51	< 1.0	< 5.0	< 10	13	407	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	< 0.10	0.02	< 0.05	0.20			< 10	< 0.05	578	< 5
07/16/92	0.85	0.03	< 0.05	0.50			< 5	0.12	514	14
07/23/92	0.24	< 0.02	< 0.05	< 0.20			< 10	< 0.05	466	6
07/30/92	0.21	0.03	< 0.05	0.20			< 10	0.15	426	40
08/06/92	0.74	0.02	< 0.05	0.30			< 10	< 0.05	484	< 5
08/13/92	0.10	< 0.02	< 0.05	0.30			< 10	0.06	494	< 5
08/20/92	0.12	< 0.02	< 0.05	0.20			< 10	0.06	614	8
08/27/92	0.78	0.16	< 0.05	0.50			< 10	0.84	310	455
09/03/92	0.38	< 0.02	< 0.05	0.20			< 10	< 0.05	512	< 5
09/10/92	0.14	< 0.02	< 0.05	0.30			< 10	< 0.05	486	< 5
09/17/92	0.16	< 0.02	< 0.05	< 0.20			< 10	0.06	544	< 5
09/24/92	0.24	< 0.02	< 0.05	< 0.20			< 10	< 0.05	464	< 5
Average	0.338	0.033	< 0.050	0.275			9.5	0.132	491.0	46.5
Maximum	0.85	0.16	< 0.05	0.50			10	0.84	614	455
Minimum	< 0.10	< 0.02	< 0.05	< 0.20			< 5	< 0.05	310	< 5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 04 Mill Creek
River Mile 26.35 Dst. Liberty-Fairfield Rd.

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92	1000	390	< 2	< 0.20	113	< 30	< 10	336	32	< 2	< 40	< 2	30	414
07/16/92	531	500	< 2	< 0.20	104	< 30	< 10	797	28	< 2	< 40	< 2	< 10	375
07/23/92	767	75	< 2	< 0.20	98	< 30	< 10	326	27	< 2	< 40	< 2	< 10	356
07/30/92	8000	< 7	2	< 0.20	89	< 30	< 10	2270	23	< 2	< 40	< 2	< 10	317
08/06/92	608	220	< 2	< 0.20	110	< 30	< 10	70	29	< 2	< 40	< 2	< 10	394
08/13/92	620	490	< 2	< 0.20	111	< 30	< 10	110	27	< 2	< 40	< 2	< 10	388
08/20/92	17600	400	< 2	< 0.20	139	< 30	< 10	105	35	< 2	< 40	< 2	26	491
08/27/92	> 20000	> 20000	4	< 0.20	65	< 30	22	29400	18	7	< 40	< 2	76	236
09/03/92	15900	7500	< 2	< 0.20	118	< 30	< 10	52	28	< 2	< 40	< 2	32	410
09/10/92	590	< 7	< 2	< 0.20	117	< 30	< 10	168	28	< 2	< 40	< 2	49	407
09/17/92	100	40	< 2	< 0.20	130	< 30	< 10	84	31	< 2	< 40	< 2	37	452
09/24/92	480	69	< 2	< 0.20	103	< 30	< 10	268	24	< 2	< 40	< 2	34	356
Average	5516.3	2474.8	2.1	< 0.200	108.0	< 30.0	11.0	2832.1	27.5	2.4	< 40.0	< 2.0	27.8	383.0
Maximum	> 20000	> 20000	4	< 0.20	139	< 30	22	29400	35	7	< 40	< 2	76	491
Minimum	100	< 7	< 2	< 0.20	65	< 30	< 10	52	18	< 2	< 40	< 2	< 10	236

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 05 Mill Creek
River Mile 19.05 Windisch Rd.

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92	25.7	6.1	7.86	1.4	< 5.0	25	25	475	< 5
07/16/92	20.7	14.9	7.71	1.5		24	22	568	< 5
07/23/92	21.6	13.2	7.81	< 1.0	< 5.0	11	25	641	< 5
07/30/92	21.6	7.5	7.61	2.1	< 5.0	21	14	393	< 5
08/06/92	20.6	8.1	7.89	< 1.0	< 5.0	12	29	646	< 5
08/13/92	19.5	7.7	7.64	< 1.0	< 5.0	14	28	712	
08/20/92	18.6	8.0	7.56	1.1	< 5.0	< 10	30	667	
08/27/92	21.3	6.1	7.57	1.8	6.4	43	10	285	5
09/03/92	19.0	7.2	7.68	< 1.0	< 5.0	18	25	710	5
09/10/92	20.3	6.6	7.70	< 1.0	< 5.0	18	24	686	< 5
09/17/92	19.2	7.8	7.75	< 1.0	< 5.0	< 10	23	692	< 5
09/24/92	13.1	8.6	7.87	< 1.0	< 5.0	21	20	566	< 5
Average	20.10	8.48	7.720	1.24	5.13	18.9	22.9	586.7	< 5.0
Maximum	25.7	14.9	7.89	2.1	6.4	43	30	712	5
Minimum	13.1	6.1	7.56	< 1.0	< 5.0	< 10	10	285	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	0.13	0.02	0.05	0.50			< 10	0.06	308	47
07/16/92	1.66	0.07	0.08	0.60			10	0.23	396	70
07/23/92	1.04	0.03	< 0.05	0.40			< 10	0.17	442	48
07/30/92	1.06	0.19	0.06	0.40			< 10	0.45	280	237
08/06/92	0.37	0.04	< 0.05	0.60			< 10	0.22	392	52
08/13/92	1.56	0.04	< 0.05	0.40			< 10	0.16	436	32
08/20/92	0.16	0.02	< 0.05	0.40			< 10	0.14	444	18
08/27/92	1.25	0.24	< 0.05	0.40			< 10	1.02	228	604
09/03/92	1.55	0.02	0.14	0.30			10	0.15	466	16
09/10/92	0.66	0.02	< 0.05	0.40			< 10	0.05	410	22
09/17/92	0.16	0.02	< 0.05	< 0.20			< 10	0.10	444	< 5
09/24/92	0.52	0.02	< 0.05	0.30			< 10	0.10	370	23
Average	0.843	0.060	0.060	0.408			10.0	0.237	384.6	97.8
Maximum	1.66	0.24	0.14	0.60			10	1.02	466	604
Minimum	0.13	0.02	< 0.05	< 0.20			< 10	0.05	228	< 5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 05 Mill Creek
River Mile 19.05 Windisch Rd.

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92			2	< 0.20	56	< 30	< 10	2260	15	< 2	< 40	< 2	< 10	202
07/16/92			2	< 0.20	84	< 30	< 10	3530	20	< 2	< 40	< 2	13	292
07/23/92			< 2	< 0.20	91	< 30	< 10	2120	22	< 2	< 40	< 2	10	318
07/30/92			3	< 0.20	58	< 30	< 10	10800	14	5	< 40	< 2	34	202
08/06/92			2	< 0.20	84	< 30	< 10	2700	25	< 2	< 40	< 2	< 10	313
08/13/92			2	< 0.20	99	< 30	< 10	1610	23	< 2	< 40	< 2	< 10	342
08/20/92			< 2	< 0.20	91	< 30	< 10	1100	25	< 2	< 40	< 2	< 10	330
08/27/92			4	< 0.20	56	< 30	15	31500	15	12	< 40	< 2	101	202
09/03/92			< 2	< 0.20	104	< 30	< 10	177	23	< 2	< 40	< 2	< 10	354
09/10/92			< 2	< 0.20	100	< 30	< 10	1490	24	< 2	< 40	< 2	< 10	349
09/17/92			3	< 0.20	98	< 30	< 10	669	25	< 2	< 40	< 2	< 10	348
09/24/92			2	< 0.20	81	< 30	< 10	1630	19	< 2	< 40	< 2	< 10	280
Average			2.3	< 0.200	83.5	< 30.0	10.4	4965.5	20.8	3.0	< 40.0	< 2.0	19.8	294.3
Maximum			4	< 0.20	104	< 30	15	31500	25	12	< 40	< 2	101	354
Minimum			< 2	< 0.20	56	< 30	< 10	177	14	< 2	< 40	< 2	< 10	202

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 07 Mill Creek
River Mile 16.57 Sharon Rd.

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92			< 2	< 0.20	51	< 30	< 10	805	14	14	< 40	< 2	47	185
07/16/92			3	< 0.20	69	< 30	< 10	2200	17	< 2	< 40	< 2	27	242
07/23/92			< 2	< 0.20	81	< 30	< 10	879	21	< 2	< 40	< 2	20	289
07/30/92			2	0.20	55	< 30	< 10	16400	13	10	44	< 2	75	191
08/06/92			< 2	< 0.20	77	< 30	< 10	1930	21	< 2	< 40	< 2	37	279
08/13/92			2	< 0.20	92	< 30	< 10	1200	23	< 2	< 40	< 2	31	324
08/20/92			< 2	< 0.20	82	< 30	< 10	756	22	< 2	< 40	< 2	41	295
08/27/92			4	< 0.20	55	< 30	< 10	20800	13	10	< 40	< 2	81	191
09/03/92			2	< 0.20	94	< 30	< 10	746	23	< 2	< 40	< 2	36	329
09/10/92			2	< 0.20	86	< 30	< 10	785	21	< 2	< 40	< 2	37	301
09/17/92			< 2	< 0.20	75	< 30	< 10	311	20	2	< 40	6	31	270
09/24/92			< 2	< 0.20	76	< 30	< 10	764	19	< 2	< 40	< 2	19	268
Average			2.2	< 0.200	74.4	< 30.0	< 10.0	3964.6	18.9	4.3	40.3	2.3	40.1	263.6
Maximum			4	< 0.20	94	< 30	< 10	20800	23	14	44	6	81	329
Minimum			< 2	< 0.20	51	< 30	< 10	311	13	< 2	< 40	< 2	19	185

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 07 Mill Creek
River Mile 16.57 Sharon Rd.

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92	22.9	5.9	7.33	4.0	8.3	32	64	600	< 5
07/16/92	20.6	10.2	7.60	6.0	< 5.0	34	56	660	5
07/23/92	21.1	9.0	7.62	2.2	5.9	22	101	1040	< 5
07/30/92	21.5	7.6	7.85	2.8	< 5.0	25	23	376	< 5
08/06/92	18.3	6.3	7.69	2.1	< 5.0	30	126	1247	< 5
08/13/92	20.0	6.8	7.74	1.3	< 5.0	27	95	953	
08/20/92	18.3	7.6	7.56	3.1	5.5	29	135	1320	
08/27/92	21.8	7.1	7.77	2.1	< 5.0	39	19	354	6
09/03/92	21.0	7.2	7.72	1.4	< 5.0	24	72	907	7
09/10/92	20.9	6.3	7.88	3.6	< 5.0	42	80	931	< 5
09/17/92	20.0	6.0	7.48	5.0	5.7	30	139	1260	
09/24/92	16.0	8.3	7.90	2.7	< 5.0	31	80	911	< 5
Average	20.19	7.37	7.678	3.02	5.44	30.4	82.5	879.9	5.3
Maximum	22.9	10.2	7.90	6.0	8.3	42	139	1320	7
Minimum	16.0	5.9	7.33	1.3	< 5.0	22	19	354	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	2.18	0.25	0.29	1.20	< 1.0		< 10	0.87	330	29
07/16/92	1.04	0.18	1.55	1.90			< 10	0.81	406	46
07/23/92	3.48	0.32	0.75	1.80			< 10	1.84	650	20
07/30/92	1.34	0.11	0.11	0.60			< 10	0.84	274	319
08/06/92	10.00	0.11	0.10	1.50			< 10	2.76	794	41
08/13/92	4.62	0.09	0.10	0.90			< 10	1.22	576	23
08/20/92	7.09	0.38	0.36	1.60			< 10	2.54	800	9
08/27/92	1.32	0.17	0.14	0.60			< 10	0.84	246	359
09/03/92	3.22	0.15	0.32	0.90			< 10	1.03	556	16
09/10/92	4.46	0.30	0.78	1.50			< 10	1.33	590	14
09/17/92	7.45	0.33	0.85	2.10			< 10	2.55	760	< 5
09/24/92	5.61	0.25	0.42	1.20			< 10	1.71	552	9
Average	4.317	0.220	0.480	1.316	<1.00		< 10.0	1.528	544.5	74.1
Maximum	10.00	0.38	1.55	2.10	< 1.0		< 10	2.76	800	359
Minimum	1.04	0.09	0.10	0.60	< 1.0		< 10	0.81	246	< 5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 08 Mill Creek
River Mile 14.75 Formica entrance

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92			7.44	3.7	< 5.0	35	108	864	< 5
07/16/92	21.0	9.0	7.45	3.1	< 5.0	39	53	587	< 5
07/23/92	21.0	5.4	7.79	1.1	< 5.0	22	90	891	< 5
07/30/92	21.0	7.0	7.02	2.5	5.3	18	20	324	< 5
08/06/92	19.5	6.4	7.94	2.0	< 5.0	22	105	986	< 5
08/13/92	20.0	7.4	7.94	1.1	< 5.0	19	72	800	
08/20/92	18.0	7.6	8.20	2.1	< 5.0	27	101	690	
08/27/92	21.0	7.0	7.47	2.5	< 5.0	29	13	265	6
09/03/92	19.0	6.9	7.80	1.0	< 5.0	20	68	870	6
09/10/92	19.5	6.0	7.30	1.5	< 5.0	26	81	883	< 5
09/17/92	21.0	7.4	7.83	2.8	< 5.0	18	136	1190	10
09/24/92	13.0	7.8	7.87	2.0	< 5.0	28	94	888	< 5
Average	19.45	7.08	7.670	2.11	5.02	25.2	78.4	769.8	5.7
Maximum	21.0	9.0	8.20	3.7	5.3	39	136	1190	10
Minimum	13.0	5.4	7.02	1.0	< 5.0	18	13	265	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	5.01	0.47	0.25	1.10			< 10	2.14	510	24
07/16/92	1.24	0.20	0.97	1.90			< 10	0.89	388	47
07/23/92	3.29	0.18	0.41	1.30		7.87	< 10	1.18	578	24
07/30/92	0.99	0.15	0.07	0.40			< 10	3.95	228	840
08/06/92	5.86	0.18	0.06	1.00			< 10	1.67	610	31
08/13/92	3.49	0.11	0.09	0.70			< 10	0.80	492	20
08/20/92	< 0.10	0.16	0.07	1.10			< 10	1.68	570	6
08/27/92	0.92	0.19	0.13	0.70			< 10	0.30	202	343
09/03/92	4.34	0.15	0.21	0.70			< 10	0.92	568	6
09/10/92	3.75	0.32	1.20	1.90			< 10	1.22	548	8
09/17/92	4.55	0.20	0.23	1.10			< 10	1.80	708	< 5
09/24/92		0.14	0.16	0.80			< 10	1.35	536	11
Average	3.049	0.204	0.320	1.058		7.870	< 10.0	1.491	494.8	113.7
Maximum	5.86	0.47	1.20	1.90		7.870	< 10	3.95	708	840
Minimum	< 0.10	0.11	0.06	0.40		7.870	< 10	0.30	202	< 5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 08 Mill Creek
River Mile 14.75 Formica entrance

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92	> 6700	> 6700	< 2	< 0.20	59	< 30	< 10	867	17	3	< 40	< 2	114	217
07/16/92	> 6700	> 6700	2	< 0.20	60	< 30	< 10	1960	14	< 2	< 40	< 2	22	207
07/23/92	> 20000	> 20000	< 2	< 0.20	80	< 30	< 10	1020	20	4	< 40	< 2	148	282
07/30/92	7100	> 2000	8	0.40	59	< 30	< 10	26800	16	16	50	< 2	164	213
08/06/92	11500	2330	< 2	< 0.20	80	< 30	< 10	1460	22	< 2	< 40	< 2	43	290
08/13/92	1580	730	2	< 0.20	93	< 30	< 10	1050	22	< 2	< 40	< 2	40	323
08/20/92	2500	< 7	2	< 0.20	79	< 30	< 10	284	21	3	< 40	< 2	85	284
08/27/92	> 20000	> 20000	5	< 0.20	42	< 30	< 10	18600	10	11	< 40	< 2	79	146
09/03/92	730	490	2	< 0.20	91	< 30	< 10	615	22	< 2	< 40	< 2	18	318
09/10/92	1970	400	< 2	< 0.20	83	< 30	< 10	591	20	< 2	< 40	< 2	21	290
09/17/92	7800	8200	< 2	< 0.20	79	< 30	< 10	321	21	< 2	< 40	< 2	127	284
09/24/92	2600	1250	2	< 0.20	77	< 30	< 10	743	18	< 2	< 40	< 2	19	266
Average	7431.6	5733.9	2.7	0.216	73.5	< 30.0	< 10.0	4525.9	18.5	4.2	40.8	< 2.0	73.3	260.0
Maximum	> 20000	> 20000	8	0.40	93	< 30	< 10	26800	22	16	50	< 2	164	323
Minimum	730	< 7	< 2	< 0.20	42	< 30	< 10	284	10	< 2	< 40	< 2	18	146

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 09 Mill Creek
River Mile 13.35 West Columbia Rd.

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92			7.67	2.2	< 5.0	24	71	699	< 5
07/16/92	22.0	6.9	7.80	2.0	< 5.0	34	49	570	< 5
07/23/92	24.0	5.2	7.75	< 1.0	< 5.0	67	63	764	< 5
07/30/92	20.5	7.2	7.62	6.2	< 5.0	25	24	360	< 5
08/06/92	19.5	8.0	7.87	8.9	< 5.0	17	90	933	< 5
08/13/92	20.0	7.2	7.95	1.2	< 5.0	21	61	766	
08/20/92	20.0	8.2	8.16	2.2	< 5.0	18	102	923	
08/27/92	21.0	7.2	7.52	2.9	< 5.0	33	16	294	9
09/03/92	20.5	7.6	8.10	< 1.0	< 5.0	26	63	795	6
09/10/92	22.5	7.0	7.89	1.2	< 5.0	26	63	736	< 5
09/17/92	21.0	9.8	7.97	4.1	< 5.0	20	113	953	< 5
09/24/92	17.0	8.8	7.94	1.7	< 5.0	24	59	706	< 5
Average	20.73	7.55	7.853	2.88	< 5.00	27.9	64.5	708.2	5.5
Maximum	24.0	9.8	8.16	8.9	< 5.0	67	113	953	9
Minimum	17.0	5.2	7.52	< 1.0	< 5.0	17	16	294	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	2.96	0.21	0.05	0.80	< 1.0		< 10	0.76	382	25
07/16/92	1.76	0.21	0.41	0.80			< 10	0.58	364	34
07/23/92	2.33	0.12	0.14	1.10			< 10	0.78	513	8
07/30/92	1.15	0.13	0.30	0.90			< 10	1.13	256	477
08/06/92	6.12	0.18	< 0.05	1.00			13	1.39	584	5
08/13/92	2.81	0.08	0.05	0.60			< 10	0.55	464	10
08/20/92	6.28	0.16	0.06	0.90			< 10	1.30	556	< 5
08/27/92	0.98	0.18	0.25	0.80			< 10	0.78	196	366
09/03/92	3.19	0.06	0.08	0.50			< 10	0.61	534	< 5
09/10/92	4.17	0.16	0.28	0.70			< 10	0.66	450	5
09/17/92	2.97	0.14	0.25				< 10		554	< 5
09/24/92	2.72	0.06	0.07	0.60			< 10	0.66	422	< 5
Average	3.120	0.140	0.165	0.791	< 1.00		10.2	0.836	439.5	79.1
Maximum	6.28	0.21	0.41	1.10	< 1.0		13	1.39	584	477
Minimum	0.98	0.06	< 0.05	0.50	< 1.0		< 10	0.55	196	< 5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 09 Mill Creek
River Mile 13.35 West Columbia Rd.

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92	> 6700	2870	< 2	< 0.20	56	< 30	< 10	1020	17	< 2	< 40	< 2	52	210
07/16/92	> 6700	> 6700	3	< 0.20	58	< 30	< 10	1580	15	< 2	< 40	< 2	21	207
07/23/92	> 20000	5100	< 2	< 0.20	74	< 30	< 10	418	20	< 2	< 40	< 2	18	267
07/30/92	> 20000	> 20000	5	0.30	56	< 30	14	19700	14	13	43	< 2	129	197
08/06/92	2000	390	< 2	< 0.20	75	< 30	< 10	471	22	< 2	< 40	< 2	12	278
08/13/92	1000	250	< 2	< 0.20	86	< 30	< 10	446	21	< 2	< 40	< 2	10	301
08/20/92	1070	708	< 2	< 0.20	74	< 30	< 10	196	20	< 2	< 40	< 2	21	267
08/27/92	> 20000	> 20000	5	0.30	46	< 30	12	18100	11	11	< 40	< 2	80	160
09/03/92	800	340	< 2	< 0.20	83	< 30	< 10	414	21	< 2	< 40	< 2	27	294
09/10/92	16100	3580	< 2	< 0.20	74	< 30	< 10	317	20	< 2	< 40	< 2	20	267
09/17/92	530	140	< 2	< 0.20	72	< 30	< 10	201	20	< 2	< 40	< 2	< 10	262
09/24/92	8600		< 2	< 0.20	68	< 30	< 10	471	19	< 2	< 40	< 2	13	248
Average	8625.0	5461.6	2.5	0.216	68.5	< 30.0	10.5	3611.1	18.3	3.6	40.2	< 2.0	34.4	246.5
Maximum	> 20000	> 20000	5	0.30	86	< 30	14	19700	22	13	43	< 2	129	301
Minimum	530	140	< 2	< 0.20	46	< 30	< 10	196	11	< 2	< 40	< 2	< 10	160

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 10 Mill Creek
River Mile 11.73 Galbraith Rd.

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92			7.68	1.8	< 5.0	24	61	668	< 5
07/16/92	21.0	7.5	7.76	2.0	< 5.0	46	45	525	5
07/23/92	22.0	7.0	7.77	< 1.0	< 5.0	67	60	760	< 5
07/30/92	21.0	7.6	7.89	5.1	< 5.0	22	27	388	< 5
08/06/92	20.0	7.7	7.85	1.5	< 5.0	34	86	850	< 5
08/13/92	21.5	8.3	7.90	1.3	< 5.0	15	57	708	
08/20/92	20.5	8.2	8.01	1.4	< 5.0	12	75	813	
08/27/92	21.5	7.7	7.51	3.5	< 5.0	35	17	298	9
09/03/92	20.5	8.0	8.26	< 1.0	< 5.0	21	62	802	18
09/10/92	20.0	7.2	7.90	1.3	< 5.0	23	59	722	< 5
09/17/92	20.0	7.2	8.02	2.0	< 5.0	14	68	748	< 5
09/24/92	14.5	8.5	7.78	1.5	< 5.0	23	59	700	< 5
Average	20.23	7.71	7.860	1.94	< 5.00	28.0	56.3	665.1	6.7
Maximum	22.0	8.5	8.26	5.1	< 5.0	67	86	850	18
Minimum	14.5	7.0	7.51	< 1.0	< 5.0	12	17	298	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	2.55	0.09	< 0.05	0.60			< 10	0.43	422	36
07/16/92	1.77	0.21	0.29	1.20			< 10	0.77	344	112
07/23/92	2.14	0.19	0.34	1.30			< 10	0.67	508	10
07/30/92	1.29	0.11	0.22	0.60			< 10	0.65	260	326
08/06/92	5.51	0.14	< 0.05	0.60			< 10	0.97	520	16
08/13/92	2.41	0.10	0.09	0.60			< 10	0.46	430	10
08/20/92	4.04	0.10	< 0.05	0.60			< 10	0.89	472	8
08/27/92	0.98	0.15	0.20	0.80			< 10	0.76	206	176
09/03/92	2.72	0.05	0.07	0.40	1.05		< 10	0.49	502	< 5
09/10/92	3.62	0.13	0.22	0.80			< 10	0.66	448	8
09/17/92	2.70	0.06	< 0.05	0.40			< 10	0.64	462	< 5
09/24/92	2.72	0.07	0.08	0.50			< 10	0.59	444	12
Average	2.704	0.116	0.142	0.700	1.05		< 10.0	0.665	418.1	60.3
Maximum	5.51	0.21	0.34	1.30	1.05		< 10	0.97	520	326
Minimum	0.98	0.05	< 0.05	0.40	1.05		< 10	0.43	206	< 5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 10 Mill Creek
River Mile 11.73 Galbraith Rd.

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92	> 6700	2870	< 2	< 0.20	60	< 30	< 10	1350	18	3	< 40	< 2	27	224
07/16/92	> 6700	> 6700	3	< 0.20	57	< 30	< 10	5380	14	14	< 40	< 2	57	200
07/23/92	7900	600	< 2	< 0.20	74	< 30	< 10	604	20	< 2	< 40	< 2	27	267
07/30/92	> 20000	> 20000	3	0.30	53	31	< 10	14600	13	13	41	< 2	93	186
08/06/92	933	510	< 2	< 0.20	79	< 30	< 10	908	23	< 2	< 40	< 2	13	292
08/13/92	3700	190	2	< 0.20	85	< 30	< 10	420	21	< 2	< 40	< 2	15	299
08/20/92	1800	754	< 2	< 0.20	74	< 30	< 10	218	21	< 2	< 40	< 2	14	271
08/27/92	> 20000	> 20000	4	0.30	51	< 30	12	18700	12	14	< 40	< 2	87	177
09/03/92	870	590	< 2	< 0.20	88	< 30	< 10	379	22	< 2	< 40	< 2	21	310
09/10/92	4800	380	< 2	< 0.20	73	< 30	< 10	696	20	< 2	< 40	< 2	34	264
09/17/92	1300	2	< 2	< 0.20	72	< 30	< 10	331	20	< 2	< 40	< 2	< 10	262
09/24/92	4100	2280	< 2	< 0.20	66	< 30	< 10	763	18	< 2	< 40	< 2	12	239
Average	6566.9	4573.0	2.3	0.216	69.3	30.0	10.1	3695.7	18.5	5.0	40.0	< 2.0	34.1	249.2
Maximum	> 20000	> 20000	4	0.30	88	31	12	18700	23	14	41	< 2	93	310
Minimum	870	2	< 2	< 0.20	51	< 30	< 10	218	12	< 2	< 40	< 2	< 10	177

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 11 Mill Creek
River Mile 9.97 Vine St.

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92			7.87	4.2	< 5.0	23	61	638	< 5
07/16/92	22.0	7.8	7.60	19.0	8.4	35	40	479	< 5
07/23/92	23.0	7.2	7.97	1.0	< 5.0	43	35	499	< 5
07/30/92	22.5	7.0	7.93	4.1	< 5.0	50	27	381	< 5
08/06/92	19.9	6.4	8.27	1.2	< 5.0	22	73	784	< 5
08/13/92	22.0	8.4	8.04	3.6	< 5.0	23	34	478	
08/20/92	20.0	8.4	8.14	4.2	< 5.0	20	76	837	
08/27/92	21.5	7.2	7.65	2.9	5.5	33	17	291	6
09/03/92	21.0	7.5	7.98	3.2	< 5.0	22	62	819	< 5
09/10/92	22.0	6.0	7.85	7.8	< 5.0	28	55	639	< 5
09/17/92	21.0	6.5	7.98	1.5	< 5.0	15	81	868	< 5
09/24/92	14.2	7.5	7.33	5.4	< 5.0	30	47	610	< 5
Average	20.83	7.25	7.884	4.84	5.32	28.6	50.6	610.2	5.1
Maximum	23.0	8.4	8.27	19.0	8.4	50	81	868	6
Minimum	14.2	6.0	7.33	1.0	< 5.0	15	17	291	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	2.55	0.11	< 0.05	0.60			< 10	0.37	400	13
07/16/92	1.51	0.16	0.61	1.20			< 10	0.45	312	35
07/23/92	0.34	0.13	0.16	0.90			< 10	0.34	330	20
07/30/92	1.30	0.12	0.16	0.60			< 10	0.58	262	223
08/06/92	3.70	0.16	< 0.05	0.70			< 10	0.64	478	26
08/13/92	1.19	0.08	0.09	0.70			< 10	0.23	294	44
08/20/92	3.99	0.12	0.05	0.60			< 10	0.76	488	13
08/27/92	0.96	0.16	0.18	0.70			< 10	0.73	216	343
09/03/92	2.97	0.08	0.15	0.70			< 10	0.66	538	41
09/10/92	2.87	0.14	0.33	1.00			10	0.57	404	109
09/17/92	2.97	0.12	0.25	0.70			< 10	1.01	522	38
09/24/92	1.99	0.09	0.37	0.70			< 10	0.66	408	298
Average	2.194	0.122	0.204	0.758			10.0	0.583	387.6	100.2
Maximum	3.99	0.16	0.61	1.20			10	1.01	538	343
Minimum	0.34	0.08	< 0.05	0.60			< 10	0.23	216	13

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 11 Mill Creek
River Mile 9.97 Vine St.

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92			2	< 0.20	54	< 30	< 10	511	16	< 2	< 40	< 2	60	201
07/16/92			3	< 0.20	51	< 30	< 10	1760	12	< 2	< 40	< 2	29	177
07/23/92			< 2	< 0.20	54	< 30	< 10	774	12	2	< 40	< 2	18	184
07/30/92			3	0.20	50	< 30	< 10	10400	11	10	44	< 2	122	170
08/06/92			< 2	< 0.20	77	< 30	< 10	1140	22	2	< 40	< 2	17	283
08/13/92			3	< 0.20	59	< 30	< 10	1750	13	2	< 40	< 2	13	201
08/20/92			< 2	< 0.20	73	< 30	< 10	529	20	3	< 40	< 2	10	265
08/27/92			6	0.20	48	< 30	10	17200	11	12	< 40	< 2	74	165
09/03/92			< 2	< 0.20	87	< 30	< 10	2540	22	3	< 40	< 2	24	308
09/10/92			3	< 0.20	71	< 30	< 10	4440	19	8	< 40	< 2	27	256
09/17/92			< 2	< 0.20	78	< 30	< 10	2090	21	3	< 40	< 2	12	281
09/24/92			4	< 0.20	80	< 30	11	12900	22	13	< 40	< 2	48	290
Average			2.8	0.200	65.1	< 30.0	10.0	4669.5	16.7	5.1	40.3	< 2.0	37.8	231.7
Maximum			6	0.20	87	< 30	11	17200	22	13	44	< 2	122	308
Minimum			< 2	< 0.20	48	< 30	< 10	511	11	< 2	< 40	< 2	10	165

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 12 Mill Creek
River Mile 8.92 North Bend Rd.

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92	25.0	7.7		2.1	< 1.0	25	58	581	< 5
07/16/92	24.0	6.7	7.92	19.0	9.6	38	41	479	5
07/23/92	23.5	7.4		1.2	< 5.0	22	36	513	< 5
07/30/92	23.0	7.0		3.7	6.3	22	27	389	< 5
08/06/92	21.5	7.9		1.4	< 5.0	20	70	784	< 5
08/13/92	23.0	7.7		2.4		26	44	470	
08/20/92	21.0	8.7		1.5	< 5.0	22	79	870	
08/27/92	22.0	7.2		2.8	< 5.0	70	16	292	7
09/03/92	21.0	7.9	8.13	1.1	< 5.0	21	63	823	< 5
09/10/92	23.0	6.3		2.8	< 5.0	22	56	646	< 5
09/17/92	22.5	8.1		2.0	< 5.0	16	80	856	< 5
09/24/92	15.5	7.7		1.6	< 5.0	22	47	614	< 5
Average	22.08	7.52	8.025	3.46	5.17	27.1	51.4	609.7	5.2
Maximum	25.0	8.7	8.13	19.0	9.6	70	80	870	7
Minimum	15.5	6.3	7.92	1.1	< 5.0	16	16	292	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	2.15	0.07	< 0.05	0.60		8.12	< 10	0.31	374	13
07/16/92	1.40	0.16	0.31	0.80			14	0.37	320	41
07/23/92	1.42	0.14	0.15	0.70		7.84	< 10	0.29	309	26
07/30/92	1.28	0.11	0.16	0.50			< 10	0.61	252	299
08/06/92	3.51	0.14	< 0.05	0.80		8.41	< 10	0.64	478	13
08/13/92	1.20	0.09	0.10	0.70		8.01	< 10	0.22	306	61
08/20/92	4.42	0.13	< 0.05	0.80		8.34	< 10	0.78	508	7
08/27/92	0.95	0.18	0.17	0.60		7.75	< 10	0.76	214	359
09/03/92	3.39	0.08	0.10	0.50			< 10	0.60	502	28
09/10/92	3.12	0.12	0.20	0.90		8.00	< 10	0.45	402	11
09/17/92	2.84	0.10	0.13	0.30		8.05	< 10	2.55	520	5
09/24/92	2.01	0.08	0.31	0.60		8.05	< 10	0.48	396	14
Average	2.307	0.116	0.148	0.650		8.063	10.3	0.671	381.7	73.0
Maximum	4.42	0.18	0.31	0.90		8.41	14	2.55	520	359
Minimum	0.95	0.07	< 0.05	0.30		7.75	< 10	0.22	214	5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 12 Mill Creek
River Mile 8.92 North Bend Rd.

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92			< 2	< 0.20	53	< 30	< 10	494	15	< 2	< 40	< 2	11	194
07/16/92			2	< 1.00	56	< 30	< 10	1730	14	< 2	< 40	< 2	< 10	197
07/23/92			< 2	< 0.20	52	< 30	< 10	859	12	2	< 40	< 2	< 10	179
07/30/92			4	< 0.20	52	< 30	< 10	10900	12	13	51	< 2	70	179
08/06/92			2	< 0.20	80	< 30	< 10	767	22	2	< 40	< 2	29	290
08/13/92			2	< 0.20	61	< 30	< 10	2560	13	4	< 40	< 2	< 10	206
08/20/92			< 2	< 0.20	73	< 30	< 10	239	21	< 2	< 40	< 2	< 10	269
08/27/92			4	0.30	49	< 30	< 10	18300	12	14	< 40	< 2	81	172
09/03/92			2	< 0.20	83	< 30	< 10	1460	21	3	< 40	< 2	12	294
09/10/92			< 2	< 0.20	65	< 30	< 10	622	16	< 2	< 40	< 2	< 10	228
09/17/92			< 2	< 0.20	77	< 30	< 10	418	21	< 2	< 40	< 2	< 10	279
09/24/92			3	< 0.20	68	< 30	< 10	5800	18	7	< 40	< 2	52	244
Average	———	———	2.4	0.275	64.0	< 30.0	< 10.0	3679.0	16.4	4.5	40.9	< 2.0	26.2	227.5
Maximum			4	< 1.00	83	< 30	< 10	18300	22	14	51	< 2	81	294
Minimum			< 2	< 0.20	49	< 30	< 10	239	12	< 2	< 40	< 2	< 10	172

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 13 Mill Creek
River Mile 7.85 Center Hill Rd.

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92	24.5	7.2		1.7	< 5.0	26	59	590	< 5
07/16/92	24.0	6.9	7.86	2.0	< 5.0	28	41	475	5
07/23/92	23.0	7.3		< 1.0	< 5.0	18	38	510	< 5
07/30/92	23.0	6.9	8.05	4.2	7.0	24	29	409	< 5
08/06/92	22.0	7.8		1.1	< 5.0	17	74	819	< 5
08/13/92		7.5		1.6		17	34	487	
08/20/92	20.5	7.1		1.6	< 5.0	10	73	834	
08/27/92	22.0	7.0		3.2	< 5.0	42	16	281	6
09/03/92	21.0	8.0	8.15	< 1.0	< 5.0	14	66	812	< 5
09/10/92	22.5	7.1		1.2	< 5.0	19	57	640	< 5
09/17/92	22.0	7.4		1.5	< 5.0	21	76	883	< 5
09/24/92	15.5	7.9		1.4	< 5.0	30	44	603	< 5
Average	21.82	7.34	8.020	1.79	5.18	22.1	50.5	611.9	5.1
Maximum	24.5	8.0	8.15	4.2	7.0	42	76	883	6
Minimum	15.5	6.9	7.86	< 1.0	< 5.0	10	16	281	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	2.40	0.15	0.30	0.80	< 1.0	8.06	< 10	1.06	376	10
07/16/92	1.41	0.18	0.98	1.60			< 10	0.50	308	47
07/23/92	1.48	0.13	0.11	0.90		7.99	< 10	0.34	340	23
07/30/92	1.26	0.10	0.24	0.70			< 10	0.49	264	216
08/06/92	4.44	0.15	< 0.05	0.80		8.67	< 10	0.66	520	12
08/13/92	1.25	0.11	0.25	0.90		8.06	< 10	0.19	314	33
08/20/92	3.21	0.07	< 0.05	0.60		8.77	< 10	0.49	494	< 5
08/27/92	0.92	0.20	0.21	0.70		7.58	< 10	0.86	206	412
09/03/92	3.28	0.07	0.10	0.60			< 10	0.57	552	< 5
09/10/92	2.85	0.08	0.17	0.70		8.12	< 10	0.38	410	10
09/17/92	3.35	0.10	0.06	0.70		8.25	< 10	0.97	510	< 5
09/24/92	1.87	0.08	0.45	0.80		8.07	< 10	0.37	374	19
Average	2.310	0.118	0.247	0.816	< 1.00	8.174	< 10.0	0.573	389.0	66.4
Maximum	4.44	0.20	0.98	1.60	< 1.0	8.77	< 10	1.06	552	412
Minimum	0.92	0.07	< 0.05	0.60	< 1.0	7.99	< 10	0.19	206	< 5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 13 Mill Creek
River Mile 7.85 Center Hill Rd.

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92	> 6700	1200	< 2	< 0.20	54	< 30	< 10	416	14	2	< 40	< 2	< 10	192
07/16/92	> 6700	> 6700	2	< 0.20	50	< 30	< 10	2820	12	3	41	< 2	21	174
07/23/92	4300	1430	< 2	< 0.20	53	< 30	< 10	1080	12	< 2	< 40	< 2	< 10	182
07/30/92	> 20000	> 2000	3	< 0.20	50	< 30	< 10	7760	11	9	< 40	< 2	48	170
08/06/92	6400	400	< 2	< 0.20	83	< 30	< 10	740	23	< 2	< 40	< 2	< 10	302
08/13/92	4600	4100	< 2	< 0.20	59	< 30	< 10	1550	13	< 2	< 40	< 2	< 10	201
08/20/92	1400	< 7	< 2	< 0.20	77	< 30	< 10	287	22	< 2	< 40	< 2	< 10	283
08/27/92	> 20000	> 20000	4	< 0.20	48	< 30	< 10	21100	11	16	< 40	< 2	81	165
09/03/92	3900	3500	< 2	< 0.20	83	< 30	< 10	404	21	< 2	< 40	< 2	59	294
09/10/92		1200	< 2	< 0.20	66	< 30	< 10	613	16	< 2	< 40	< 2	< 10	231
09/17/92	5400	120	< 2	< 0.20	73	< 30	< 10	335	21	< 2	< 40	< 2	< 10	269
09/24/92	7200	6200	2	< 0.20	59	< 30	< 10	1090	15	< 2	< 40	< 2	10	209
Average	7872.7	3904.7	2.2	< 0.200	62.9	< 30.0	< 10.0	3182.9	15.9	3.8	40.0	< 2.0	24.0	222.6
Maximum	> 20000	> 20000	4	< 0.20	83	< 30	< 10	21100	23	16	41	< 2	81	302
Minimum	1400	< 7	< 2	< 0.20	48	< 30	< 10	287	11	< 2	< 40	< 2	< 10	165

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 14 Mill Creek
River Mile 6.53 Spring Grove

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92	26.5	14.6		2.2	< 5.0	33	63	621	< 5
07/16/92	25.0	8.9	8.15	6.0	< 5.0	41	49	529	5
07/23/92	24.0	9.8		2.0	< 5.0	17	39	512	< 5
07/30/92	23.0	7.0	7.96	8.2	7.1	22	37	431	< 5
08/06/92	23.0	17.8		1.9	< 5.0	20	76	810	< 5
08/13/92	23.5	9.0		2.2		21	34	506	
08/20/92	21.0	18.7		2.2	< 5.0	24	65	865	
08/27/92	22.0	6.7		3.0	< 5.0	35	14	241	7
09/03/92	21.5	10.6	8.37	< 1.0	< 5.0	18	66	810	< 5
09/10/92	23.0	11.2		1.3	< 5.0	21	55	631	< 5
09/17/92	23.0	18.8		2.5	< 5.0	12	76	852	< 5
09/24/92	16.0	12.4		2.3	< 5.0	28	41	584	< 5
Average	22.62	12.12	8.160	2.89	5.19	24.3	51.2	616.0	5.2
Maximum	26.5	18.8	8.37	8.2	7.1	41	76	865	7
Minimum	16.0	6.7	7.96	< 1.0	< 5.0	12	14	241	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	2.52	0.15	< 0.05	0.60		8.75	< 10	1.12	400	5
07/16/92	1.24	0.18	2.80	3.70			< 10	0.47	342	44
07/23/92	1.51	0.14	0.09	0.80		8.35	< 10	0.29	336	22
07/30/92	1.20	0.11	2.69	2.80				0.57	280	190
08/06/92	3.67	0.12	< 0.05	0.80			< 10	0.42	518	5
08/13/92	1.28	0.12	0.50	1.00		8.09	< 10	0.37	330	23
08/20/92	2.16	0.07	0.06	0.70		8.86	< 10	0.40	514	< 5
08/27/92	0.89	0.22	0.19	0.70		7.78	< 10	0.84	194	458
09/03/92	2.93	0.07	< 0.05	0.60			< 10	0.52	492	< 5
09/10/92	1.97	0.06	< 0.05	0.60		8.47	11	0.32	392	6
09/17/92	2.87	0.10	< 0.05	0.50		8.70	10	0.72	534	< 5
09/24/92	1.63	0.07	0.27	0.70		8.41	< 10	0.34	370	15
Average	1.989	0.117	0.570	1.125		8.426	9.8	0.531	391.8	65.2
Maximum	3.67	0.22	2.80	3.70		8.86	11	1.12	534	458
Minimum	0.89	0.06	< 0.05	0.50		7.78	< 10	0.29	194	< 5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 14 Mill Creek
River Mile 6.53 Spring Grove

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92			2	< 0.20	57	< 30	< 10	236	15	4	< 40	< 2	12	204
07/16/92			4	< 0.20	55	< 30	< 10	2280	13	3	< 40	< 2	31	191
07/23/92			< 2	< 0.20	52	< 30	< 10	877	12	4	< 40	< 2	11	179
07/30/92			4	< 0.20	50	< 30	< 10	6660	11	32	< 40	< 2	47	170
08/06/92			3	< 0.20	91	< 30	< 10	210	25	< 2	< 40	< 2	< 10	330
08/13/92			4	< 0.20	60	< 30	< 10	1080	12	< 2	< 40	< 2	< 10	199
08/20/92			3	< 0.20	88	< 30	< 10	192	24	< 2	< 40	< 2	< 10	319
08/27/92			4	0.20	49	< 30	14	23200	13	18	< 40	< 2	100	176
09/03/92	1000	580	< 2	< 0.20	89	< 30	< 10	229	23	< 2	< 40	< 2	< 10	317
09/10/92			2	< 0.20	64	< 30	< 10	365	16	< 2	< 40	< 2	< 10	226
09/17/92			< 2	< 0.20	82	< 30	< 10	181	23	< 2	< 40	2	< 10	299
09/24/92			< 2	< 0.20	61	< 30	< 10	859	16	< 2	< 40	< 2	13	218
Average	1000.0	580.0	2.8	0.200	66.5	< 30.0	10.3	3030.7	16.9	6.2	< 40.0	2.0	22.8	235.6
Maximum	1000	580	4	0.20	91	< 30	14	23200	25	32	< 40	2	100	330
Minimum	1000	580	< 2	< 0.20	49	< 30	< 10	181	11	< 2	< 40	< 2	< 10	170

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 15 Mill Creek
River Mile 5.85 Mitchell Ave.

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92	26.5	14.5		3.4	< 5.0	27	64	631	< 5
07/16/92	24.0	7.4	8.15	6.7	6.8	31	47	521	6
07/23/92	23.0	10.8		2.0	< 5.0	18	38	513	< 5
07/30/92	23.0	7.2	7.87	11.0	12.0	32	46	459	< 5
08/06/92	22.0	15.6		2.2	< 5.0	22	74	831	< 5
08/13/92	23.0	9.4		2.4	< 5.0	25	34	504	
08/20/92	20.0	15.8		1.7	< 5.0	16	68	840	
08/27/92	22.0	7.2		2.6	6.0	< 10	13	248	6
09/03/92	21.5	11.6	8.42	1.5	< 5.0	14	64	808	< 5
09/10/92	23.0	10.6		1.9	< 5.0	19	52	618	< 5
09/17/92	22.0	16.8		2.4	< 5.0	15	76	843	< 5
09/24/92	16.0	15.2		2.2	< 5.0	26	42	577	< 5
Average	22.16	11.84	8.144	3.33	5.81	21.2	51.5	616.0	5.2
Maximum	26.5	16.8	8.42	11.0	12.0	32	76	843	6
Minimum	16.0	7.2	7.87	1.5	< 5.0	< 10	13	248	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	2.61	0.15	0.11	0.80		8.95	< 10	0.44	416	5
07/16/92	1.22	0.17	2.75	3.50			10	0.41	330	52
07/23/92	1.46	0.14	0.10	0.80		8.36	< 10	0.22	344	20
07/30/92	1.14	0.11	5.18	5.20			< 10	0.51	282	188
08/06/92	3.72	0.13	0.07	0.80			< 10	0.43	518	8
08/13/92	1.27	0.11	0.34	1.10		8.05	< 10		494	21
08/20/92	2.20	0.08	0.13	0.70		8.77	< 10	0.36	516	< 5
08/27/92	0.90	0.16	0.14	1.00		7.77	11	1.08	198	452
09/03/92	2.85	0.06	< 0.05	0.60			10	0.46	498	< 5
09/10/92	1.71	0.05	< 0.05	0.70		8.40	10	0.22	398	5
09/17/92	2.75	0.10	< 0.05	0.60		8.82	< 10	0.76	536	< 5
09/24/92	1.55	0.06	0.16	0.50		8.35	< 10	0.32	480	13
Average	1.948	0.110	0.760	1.358		8.433	10.0	0.473	417.5	64.9
Maximum	3.72	0.17	5.18	5.20		8.95	11	1.08	536	452
Minimum	0.90	0.05	< 0.05	0.50		7.77	< 10	0.22	198	< 5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 15 Mill Creek
River Mile 5.85 Mitchell Ave.

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92	> 6700	733	3	< 0.20	56	< 30	< 10	225	15	< 2	< 40	< 2	< 10	202
07/16/92	> 6700	> 6700	3	< 0.20	57	< 30	< 10	2100	14	3	< 40	< 2	21	200
07/23/92	8100	4300	< 2	< 0.20	55	< 30	< 10	874	13	2	< 40	< 2	< 10	191
07/30/92	> 20000	> 2000	4	< 0.20	49	< 30	< 10	7490	10	11	< 40	< 2	48	164
08/06/92	4200	180	3	< 0.20	92	< 30	< 10	363	25	3	< 40	< 2	< 10	333
08/13/92	13000	3000	4	< 0.20	59	< 30	< 10	1010	13	< 2	< 40	< 2	< 10	201
08/20/92	1750	< 7	3	< 0.20	87	< 30	< 10	187	24	< 2	< 40	< 2	< 10	316
08/27/92	> 20000	> 20000	5	0.20	53	< 30	12	24500	14	21	< 40	< 2	112	190
09/03/92	770	500	2	< 0.20	89	< 30	< 10	208	23	< 2	< 40	< 2	< 10	317
09/10/92	3500	900	2	< 0.20	65	< 30	< 10	339	16	< 2	< 40	< 2	< 10	228
09/17/92	6300	< 7	< 2	< 0.20	80	< 30	< 10	161	22	< 2	< 40	4	< 10	290
09/24/92	9400	1450	2	< 0.20	61	< 30	< 10	794	15	< 2	< 40	< 2	< 10	214
Average	8368.3	3314.7	2.9	0.200	66.9	< 30.0	10.1	3187.5	17.0	4.5	< 40.0	2.1	22.5	237.1
Maximum	> 20000	> 20000	5	0.20	92	< 30	12	24500	25	21	< 40	4	112	333
Minimum	770	< 7	< 2	< 0.20	49	< 30	< 10	161	10	< 2	< 40	< 2	< 10	164

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 16 Mill Creek
River Mile 4.90 Salway Park

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92	25.0	8.2		2.2	< 5.0	30	68	700	< 5
07/16/92	23.0	6.6	8.03	4.9	5.4	48		499	7
07/23/92	23.0	8.3		2.4	< 5.0	19	39	518	< 5
07/30/92	23.0	6.2	7.89	8.5	9.3	32	39	415	< 5
08/06/92	20.0	8.4		1.4	< 5.0	17	74	810	< 5
08/13/92	22.5	8.7		3.0	< 5.0	24	36	527	
08/20/92	18.5	7.5		1.6	< 5.0	23	68	851	
08/27/92	22.0	7.3		2.4	< 5.0	50	14	240	6
09/03/92	21.0	8.9	8.32	1.5	< 5.0	29	72	784	< 5
09/10/92	22.0	6.7		2.0	< 5.0	60	48	616	< 5
09/17/92	21.0	7.3		2.4	< 5.0	12	71	804	< 5
09/24/92	14.0	8.4		1.9	< 5.0	28	41	600	< 5
Average	21.25	7.70	8.080	2.85	5.39	31.0	51.8	613.6	5.3
Maximum	25.0	8.9	8.32	8.5	9.3	60	74	851	7
Minimum	14.0	6.2	7.89	1.4	< 5.0	12	14	240	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	2.55	0.18	0.12	0.80		8.15	< 10	0.62	412	7
07/16/92	1.27	0.16	2.38	2.90			< 10	0.67	318	39
07/23/92	1.57	0.15	0.20	0.70		8.08	< 10	0.38	342	16
07/30/92	1.11	0.10	3.06	3.50			< 10	0.48	266	184
08/06/92	3.95	0.18	0.10	0.80		8.20	< 10	0.42	502	< 5
08/13/92	1.39	0.12	0.22	0.90		8.01	< 10	0.38	338	14
08/20/92	2.72	0.16	0.13	0.70		8.01	< 10	0.37	506	< 5
08/27/92	0.90	0.21	0.14	0.60		7.85	< 10	0.99	185	598
09/03/92	2.74	0.05	0.08	0.60			< 10	0.44	530	< 5
09/10/92	1.38	0.07	0.15	0.80		8.02	< 10	0.21	380	< 5
09/17/92	2.39	0.18	0.07	0.50		8.08	< 10	0.60	478	< 5
09/24/92	1.35	0.04	0.15	0.70		8.01	< 10	0.26	372	17
Average	1.943	0.133	0.566	1.125		8.045	< 10.0	0.485	385.7	75.0
Maximum	3.95	0.21	3.06	3.50		8.20	< 10	0.99	530	598
Minimum	0.90	0.04	0.07	0.50		7.85	< 10	0.21	185	< 5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 16 Mill Creek
River Mile 4.90 Salway Park

Date	Fecal coli, (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92			3	< 0.20	59	< 30	< 10	370	16	< 2	< 40	< 2	35	213
07/16/92			3	< 0.20	49	< 30	< 10	2160	12	< 2	< 40	< 2	23	172
07/23/92			< 2	< 0.20	55	< 30	< 10	795	13	2	< 40	< 2	< 10	191
07/30/92			2	0.20	47	< 30	< 10	7980	10	11	< 40	< 2	51	159
08/06/92			3	< 0.20	84	< 30	< 10	365	24	< 2	< 40	< 2	< 10	309
08/13/92			3	< 0.20	61	< 30	< 10	850	13	< 2	< 40	< 2	< 10	206
08/20/92			2	< 0.20	87	< 30	< 10	150	24	< 2	< 40	< 2	< 10	316
08/27/92			4	0.30	53	< 30	22	28100	14	23	< 40		122	190
09/03/92			2	< 0.20	85	< 30	< 10	198	21	< 2	< 40	< 2		
09/10/92			2	< 0.20	65	< 30	< 10	290	16	< 2	< 40	< 2	12	228
09/17/92			< 2	< 0.20	75	< 30	< 10	157	22	< 2	< 40	< 2	< 10	278
09/24/92			3	< 0.20	69	< 30	< 10	1020	17	< 2	< 40	< 2	< 10	242
Average			2.5	0.208	65.7	< 30.0	11.0	3536.2	16.8	4.5	< 40.0	< 2.0	27.5	227.6
Maximum			4	0.30	87	< 30	22	28100	24	23	< 40	< 2.0	122	316
Minimum			< 2	< 0.20	47	< 30	< 10	150	10	< 2	< 40	< 2.0	< 10	159

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 17 Mill Creek
River Mile 2.90 Hopple St.

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92	25.0	5.8	7.86	2.0	< 5.0	25	64	668	< 5
07/16/92	22.0	6.3	7.82	4.5	5.8		37	454	5
07/23/92	23.0	6.8		2.1	< 5.0	20	38	528	< 5
07/30/92	22.5	6.2	7.87	3.6	9.7	19	21	348	< 5
08/06/92	20.0	6.5		1.2	< 5.0	17	66	805	
08/13/92	22.0	6.9		2.0	< 5.0	22	39	547	
08/20/92	19.0	7.3		1.0	< 5.0	34	69	856	
08/27/92	22.0	7.4		2.8	5.1	29	13	227	6
09/03/92	21.0	8.3	8.18	< 1.0	< 5.0	22	56	770	< 5
09/10/92	22.0	5.5		1.2	< 5.0	23	48	629	< 5
09/17/92	20.0	4.4		2.4	< 5.0	17	76	825	< 5
09/24/92	13.5	6.2		3.7	< 5.0	32	37	585	< 5
Average	21.00	6.46	7.933	2.29	5.46	23.6	47.0	603.5	5.1
Maximum	25.0	8.3	8.18	4.5	9.7	34	76	856	6
Minimum	13.5	4.4	7.82	< 1.0	< 5.0	17	13	227	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	2.70	0.22	0.20	0.90	< 1.00		< 10	0.43	414	11
07/16/92	1.19	0.12	0.37	0.90			< 10	0.61	294	72
07/23/92	1.64	0.17	0.28	0.80		7.78	< 10	0.29	348	28
07/30/92	1.06	0.12	0.21	1.40			< 10	0.76	237	304
08/06/92	2.93	0.13	0.07	0.80		8.20	< 10	0.30	480	6
08/13/92	1.42	0.10	0.16	1.00		7.99	< 10	0.24	356	25
08/20/92	2.88	0.16	0.10	0.60		8.31	< 10	0.35	504	8
08/27/92	0.86	0.25	0.22	0.70		7.82	< 10	1.56	196	828
09/03/92	2.30	0.03	0.07	0.60			< 10	0.38	533	< 5
09/10/92	1.57	0.10	0.15	0.80		7.90	< 10	0.20	396	5
09/17/92	2.04	0.29	0.08	0.50		8.14	< 10	0.63	488	< 5
09/24/92	0.99	0.05	< 0.05	0.30		7.79	< 10	0.18	366	26
Average	1.798	0.145	0.163	0.775	< 1.000	7.991	< 10.0	0.494	384.3	110.2
Maximum	2.93	0.29	0.37	1.40	< 1.00	8.31	< 10	1.56	533	828
Minimum	0.86	0.03	< 0.05	0.30	< 1.00	7.78	< 10	0.18	196	< 5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 17 Mill Creek
River Mile 2.90 Hopple St.

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92	> 6700	> 6700	3	< 0.20	59	< 30	< 10	597	16	2	< 40	< 2	12	213
07/16/92	> 6700	> 6700	3	< 0.20	50	< 30	< 10	3040	12	6	< 40	< 2	30	174
07/23/92	> 20000	5900	< 2	< 0.20	58	< 30	< 10	1180	13	2	< 40	< 2	< 10	198
07/30/92	> 20000	> 20000	4	0.40	50	< 30	< 10	13600	10	18	< 40	< 2	99	166
08/06/92	6600	200	4	< 0.20	89	< 30	< 10	430	26	< 2	< 40	< 2	< 10	
08/13/92	9500	2000	3	< 0.20	63	< 30	< 10	1190	14	< 2	< 40	< 2	< 10	215
08/20/92	1380	533	2	< 0.20	89	< 30	< 10	453	24	< 2	< 40	< 2	< 10	321
08/27/92	> 20000	> 20000	4	0.60	74	36	35	42700	20	42	< 40	< 2	184	267
09/03/92	900	620	3	< 0.20	85	< 30	< 10	377	21	< 2	< 40	< 2	11	299
09/10/92	1390	933	2	< 0.20	65	< 30	< 10	316	16	< 2	< 40	< 2	< 10	228
09/17/92	2000	21	2	< 0.20	80	< 30	< 10	152	23	< 2	< 40	< 2	< 10	294
09/24/92	> 20000	5300	2	< 0.20	67	< 30	< 10	1420	16	< 2	< 40	< 2	16	233
Average	9597.5	5742.2	2.8	0.250	69.0	30.5	12.0	5454.5	17.5	7.0	<40.0	< 2.0	34.3	237.1
Maximum	> 20000	> 20000	4	0.60	89	36	35	42700	26	42	< 40	< 2	184	321
Minimum	900	21	< 2	< 0.20	50	< 30	< 10	152	10	< 2	< 40	< 2	< 10	166

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 18 Mill Creek
River Mile 0.51 Gest St.

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92	26.0	3.80	7.95	2.0	< 5.0	22	52	621	< 5
07/16/92	22.0	3.30	7.40	2.8	< 5.0	36	32	411	6
07/23/92	24.0	2.20	7.94	2.8	< 5.0	23	34	526	< 5
07/30/92	23.0	4.70	7.77	3.0	5.3	21	24	360	< 5
08/06/92	22.5	0.00		5.2	< 5.0	18	69	830	< 5
08/13/92	23.0	4.70		1.8	< 5.0	22	42	568	
08/20/92	21.5	4.70	8.23	1.0	< 5.0	16	75	920	
08/27/92	22.0	5.50		2.5	< 5.0	47	15	232	6
09/03/92	22.5	7.30	8.04	< 1.0	< 5.0	21	54	781	< 5
09/10/92	25.0	3.00		1.1	< 5.0	15	48	620	< 5
09/17/92	23.0	8.20		2.8	< 5.0	17	78	860	< 5
09/24/92	17.5	4.00		3.3	< 5.0	29	43	576	< 5
Average	22.66	4.28	7.888	2.44	5.02	23.9	47.1	608.7	5.2
Maximum	26.0	8.2	8.23	5.2	5.3	47	78	920	6
Minimum	17.5	0.0	7.40	< 1.0	< 5.0	15	15	232	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	1.45	0.07	0.46	1.00			< 10	0.30	386	36
07/16/92	0.85	0.12	0.45	1.20			< 10	0.46	270	88
07/23/92	1.43	0.12	0.38	1.20			< 10	0.27	336	46
07/30/92	1.50	0.14	0.21	0.80			< 10	0.52	252	170
08/06/92	1.39	0.49	0.22	1.40		7.74	< 10	0.28	504	12
08/13/92	1.21	0.12	0.52	1.10		7.85	< 10	0.36	370	81
08/20/92	1.57	0.13	0.62	1.00			< 10	0.31	528	29
08/27/92	0.74	0.22	0.40	0.80		7.86	< 10	1.62	178	999
09/03/92	2.55	0.07	0.29	0.70			< 10	0.36	518	20
09/10/92	1.48	0.08	0.43	0.90		7.97	< 10	0.30	396	37
09/17/92	1.62	0.21	0.37			8.41	< 10		504	25
09/24/92	1.11	0.10	1.71	2.00		7.75	< 10	0.24	352	34
Average	1.408	0.155	0.505	1.100		7.930	< 10.0	0.456	382.8	131.4
Maximum	2.55	0.49	1.71	2.00		8.41	< 10	1.62	528	999
Minimum	0.74	0.07	0.21	0.70		7.74	< 10	0.24	178	12

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 18 Mill Creek
River Mile 0.51 Gest St.

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92	> 6700	> 6700	3	< 0.20	61	< 30	< 10	1820	17	6	< 40	< 2	< 10	222
07/16/92	> 6700	> 6700	4	< 0.20	46	< 30	< 10	5210	10	9	44	< 2	70	156
07/23/92	8900	4400	2	0.20	59	< 30	< 10	2640	14	12	< 40	< 2	28	205
07/30/92	> 20000	> 20000	3	0.30	42	< 30	< 10	7600	9	11	< 40	< 2	42	142
08/06/92	> 20000	> 20000	4	< 0.20	88	< 30	< 10	784	24	3	< 40	< 2	< 10	319
08/13/92	7700	4800	4	< 0.20	70	< 30	< 10	4560	15	11	< 40	< 2	18	237
08/20/92	1070	480	3	< 0.20	88	< 30	< 10	1850	25	6	< 40	< 2	18	323
08/27/92	> 20000	> 20000	6	0.90	76	53	51	44900	21	70	50	< 2	238	276
09/03/92	1600	510	3	< 0.20	87	< 30	< 10	1430	21	7	< 40	< 2	22	304
09/10/92	15300	6300	4	< 0.20	69	< 30	12	2440	17	8	< 40	< 2	17	242
09/17/92	1300	350	3	< 0.20	84	< 30	< 10	1740	24	7	< 40	< 2	13	309
09/24/92	> 20000	9500	2	< 0.20	64	< 30	< 10	2730	15	8	< 40	< 2	24	222
Average	10772.5	8311.6	3.4	0.266	69.5	31.9	13.5	6475.3	17.6	13.1	41.1	< 2.0	42.5	246.4
Maximum	> 20000	> 20000	6	0.90	88	53	51	44900	25	70	50	< 2	238	323
Minimum	1070	350	2	< 0.20	42	< 30	< 10	784	9	3	< 40	< 2	< 10	142

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 19 Town Run
River Mile 0.70 Chester Rd.

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92	21.9	4.6	7.47	7.2	7.5	41	79	646	< 5
07/16/92	20.0	4.7	7.52	8.0	6.7	45	77	739	5
07/23/92	20.0	4.7	7.55	5.7	8.4	30	90	897	< 5
07/30/92	20.5	7.3	7.56	3.8	< 5.0	30	52	657	< 5
08/06/92	18.0	4.2	7.55	7.5	8.8	43	114	927	< 5
08/13/92	19.2	5.9	7.68	5.7	< 5.0	40	97	907	
08/20/92	18.4	4.4	7.38	7.5	8.7	42	118	962	
08/27/92	22.3	7.1	7.68	2.0	< 5.0	31	48	563	6
09/03/92	20.2	5.1	7.56	5.6	5.9	35	119	1010	6
09/10/92	20.9	5.0	7.49	5.1	6.4	45	92	883	< 5
09/17/92	20.0	3.4	7.36	6.2	10.4	43	108	902	< 5
09/24/92	16.7	6.3	7.91	6.5	5.0	39	92	869	< 5
Average	19.84	5.23	7.559	5.89	6.90	38.6	90.5	830.1	5.2
Maximum	22.3	7.3	7.91	8.0	10.4	45	119	1010	6
Minimum	16.7	3.4	7.36	2.0	< 5.0	30	48	563	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	2.34	0.57	1.06	2.20	< 1.0		< 10	1.53	384	7
07/16/92	2.50	0.57	1.48	2.40			< 10	1.32	450	5
07/23/92	4.55	0.68	3.10	5.00			< 5	1.82	582	< 5
07/30/92	2.29	0.24	0.63	1.20			< 10	0.56	422	5
08/06/92	3.93	0.92	2.20	3.80			< 10	1.95	572	< 5
08/13/92	2.79	0.53	0.86	2.20			< 10	1.25	532	< 5
08/20/92	4.19	1.04	2.30	3.80			< 10	2.49	608	< 5
08/27/92	2.43	0.23	0.64	1.40			< 10	0.44	364	8
09/03/92	4.15	0.70	1.21	2.50			< 10	1.78	606	< 5
09/10/92	4.42	0.75	0.90	2.20			10	1.82	526	< 5
09/17/92	6.84	> 1.00	3.03	4.90			< 10	2.81	542	< 5
09/24/92	5.74	0.88	1.45	2.50			< 10	1.65	548	5
Average	3.847	0.675	1.571	2.841	< 1.00		8.8	1.618	511.3	5.4
Maximum	6.84	1.04	3.10	5.00	< 1.0		10	2.81	608	8
Minimum	2.29	0.23	0.63	1.20	< 1.0		< 5	0.44	364	< 5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 19 Town Run
River Mile 0.70 Chester Rd.

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92	> 6700	3833	3	< 0.20	39	< 30	< 10	395	16	2	< 40	< 2	< 10	163
07/16/92	1730	1000	3	< 0.20	63	< 30	< 10	220	21	< 2	< 40	< 2	< 10	244
07/23/92	> 20000	> 20000	< 2	< 0.20	75	< 30	< 10	198	26	< 2	< 40	< 2	< 10	294
07/30/92	> 20000	> 6700	< 2	< 0.20	72	< 30	< 10	269	18	< 2	< 40	< 2	< 10	254
08/06/92	377	230	< 2	< 0.20	66	< 30	< 10	191	31	< 2	< 40	< 2	< 10	292
08/13/92	4700	5700	< 2	< 0.20	82	< 30	38	110	26	< 2	< 40	< 2	< 10	312
08/20/92	150	20	< 2	< 0.20	68	< 30	< 10	147	30	< 2	< 40	< 2	17	293
08/27/92	12500	6300	3	< 0.20	57	< 30	< 10	539	14	< 2	< 40	< 2	11	200
09/03/92	1750	300	< 2	< 0.20	76	< 30	< 10	128	28	< 2	< 40	< 2	12	305
09/10/92	867	< 7	2	< 0.20	69	< 30	< 10	227	27	< 2	< 40	< 2	15	283
09/17/92	2800	130	< 2	< 0.20	52	< 30	< 10	185	27	< 2	< 40	< 2	< 10	241
09/24/92	> 20000	10400	< 2	< 0.20	74	< 30	< 10	175	27	< 2	< 40	< 2	19	296
Average	7631.1	4551.6	2.2	< 0.200	66.0	< 30.0	12.3	232.0	24.2	2.0	<40.0	< 2.0	12.0	264.7
Maximum	> 20000	> 20000	3	< 0.20	82	< 30	38	539	31	2	< 40	< 2	19	312
Minimum	150	< 7	< 2	< 0.20	39	< 30	< 10	110	14	< 2	< 40	< 2	< 10	163

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 20 Sharon Creek
River Mile 0.01 Mouth

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92	21.8	7.4	7.73	1.5	< 5.0	24	54	500	< 5
07/16/92	21.0	8.0	7.83	2.0	< 5.0	33	45	419	< 5
07/23/92	21.5	7.8	8.04	< 1.0	< 5.0	14	54	582	< 5
07/30/92	22.5	8.3	8.13	3.3	< 5.0	18	37	373	< 5
08/06/92	18.3	8.0	7.76	< 1.0	< 5.0	16	78	692	< 5
08/13/92	20.0	8.0	7.99	< 1.0	< 5.0	13	67	639	
08/20/92	18.3	8.9	8.02	< 1.0	< 5.0	12	71	745	
08/27/92	22.9	7.5	7.85	< 1.0	< 5.0	36	29	331	5
09/03/92	21.0	7.7	8.06	< 1.0	< 5.0	19	79	719	17
09/10/92	20.9	7.7	8.00	< 1.0	< 5.0	20	60	629	< 5
09/17/92	19.5	7.3	7.95	1.9	< 5.0	15	58	620	< 5
09/24/92	13.9	9.6	8.37	1.9	< 5.0	31	38	481	< 5
Average	20.13	8.01	7.977	1.46	< 5.0	20.9	55.8	560.8	6.2
Maximum	22.9	9.6	8.37	3.3	< 5.0	36	79	745	17
Minimum	13.9	7.3	7.73	< 1.0	< 5.0	12	29	331	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	0.79	0.02	< 0.05	0.40	< 1.0		< 10	< 0.05	310	30
07/16/92	0.21	0.03	< 0.05	0.60	< 1.0		< 10	0.26	262	14
07/23/92	0.43	< 0.02	< 0.05	0.50	< 1.0		< 10	0.19	384	5
07/30/92	0.32	0.03	< 0.05	0.20	< 10.0		< 10	0.16	238	50
08/06/92	0.44	0.03	< 0.05	0.30	1.1		< 10	0.13	406	< 5
08/13/92	0.76	0.03	< 0.05	0.50	< 1.0		< 10	0.13	380	11
08/20/92	0.18	< 0.02	< 0.05	0.30	1.4		< 10	0.13	470	< 5
08/27/92		0.05		0.40	1.1		< 10	0.31	218	113
09/03/92	0.05	< 0.02	< 0.05	0.30	< 1.0		< 10	0.14	462	< 5
09/10/92	0.33	0.02	< 0.05	0.30	< 1.0		< 10	0.94	352	< 5
09/17/92	0.44	0.03	1.29	1.60	< 1.0		< 10	0.23	362	< 5
09/24/92	0.52	0.02	< 0.05	0.30	< 1.0		< 10	0.09	291	< 5
Average	0.406	0.026	0.163	0.475	1.81		< 10.0	0.230	344.5	21.0
Maximum	0.79	0.05	1.29	1.60	< 10.0		< 10	0.94	470	113
Minimum	0.05	< 0.02	< 0.05	0.20	< 1.0		< 10	< 0.05	218	< 5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 20 Sharon Creek
River Mile 0.01 Mouth

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92	> 6700	> 6700	< 2	< 0.20	51	< 30	< 10	869	10	3	< 40	< 2	50	169
07/16/92	2070	2470	3	< 0.20	41	< 30	< 10	493	10	< 2	< 40	< 2	25	144
07/23/92	1130	1380	2	< 0.20	64	< 30	< 10	220	14	< 2	< 40	< 2	22	217
07/30/92	7800	10900	< 2	< 0.20	37	< 30	< 10	2010	9	2	< 40	< 2	16	129
08/06/92	1930	1300	< 2	< 0.20	72	< 30	< 10	85	15	< 2	< 40	< 2	57	242
08/13/92	1270	1100	4	< 0.20	70	< 30	< 10	692	15	< 2	< 40	< 2	20	237
08/20/92	531	830	< 2	< 0.20	88	< 30	< 10	61	18	< 2	< 40	< 2	< 10	294
08/27/92	12200	> 20000	4	< 0.20	41	< 30	< 10	5730	8	5	< 40	< 2	26	135
09/03/92	415	220	< 2	< 0.20	79	< 30	< 10	468	15	< 2	< 40	< 2	< 10	259
09/10/92	2800	300	< 2	< 0.20	66	< 30	< 10	443	12	< 2	< 40	< 2	92	214
09/17/92	2200	2200	3	< 0.20	70	< 30	< 10	425	14	< 2	< 40	< 2	< 10	232
09/24/92	2100	250	3	< 0.20	58	< 30	< 10	364	11	< 2	< 40	< 2	< 10	190
Average	3428.8	3970.8	2.5	< 0.200	61.4	< 30.0	< 10.0	988.3	12.5	2.3	< 40.0	< 2.0	29.0	205.1
Maximum	12200	> 20000	4	< 0.20	88	< 30	< 10	5730	18	5	< 40	< 2.0	92	294
Minimum	415	220	< 2	< 0.20	37	< 30	< 10	61	8	< 2	< 40	< 2.0	< 10	129

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 21 Cooper Creek
River Mile 3.64 Plainfield Rd.

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92			7.74	< 1.0	< 5.0	20	34	430	< 5
07/16/92	24.0	6.5	7.89	< 1.0	< 5.0	44	32	469	< 5
07/23/92	27.0	7.0	7.91	< 1.0	< 5.0	49	36	493	< 5
07/30/92	19.0	7.3	8.10	1.1	< 5.0	16	26	512	< 5
08/06/92	21.8	6.8	7.73	1.0	< 5.0	17	32	432	< 5
08/13/92	23.0	7.2	7.93	< 1.0	< 5.0	44	28	425	
08/20/92	23.0	7.6	8.17	1.3	< 5.0	< 10	26	407	
08/27/92	22.5	7.4	7.61	< 1.0	< 5.0	38	29	495	7
09/03/92	24.0	6.8	7.99	1.0	< 5.0	22	32	429	7
09/10/92	23.5	6.4	7.96	1.4	< 5.0	18	33	414	< 5
09/17/92	23.5	6.4	7.93	1.8	< 5.0	10	33	435	< 5
09/24/92	19.0	8.0	7.85	< 1.0	< 5.0	11	32	482	< 5
Average	22.75	7.03	7.900	1.13	< 5.0	24.9	31.0	451.9	5.4
Maximum	27.0	8.0	8.17	1.8	< 5.0	49	36	512	7
Minimum	19.0	6.4	7.61	< 1.0	< 5.0	10	26	407	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	1.24	< 0.02	< 0.05	0.40			< 10	< 0.05	284	< 5
07/16/92	0.99	0.02	< 0.05	0.30			< 10	0.08	312	< 5
07/23/92	2.33	< 0.02	0.15	0.40			< 10	0.08	332	< 5
07/30/92	1.41	0.02	0.05	0.20			< 10	0.25	348	5
08/06/92	1.22	0.02	< 0.05	0.30			< 10	0.11	278	< 5
08/13/92	1.12	< 0.02	< 0.05	0.20			< 10	0.07	288	< 5
08/20/92	1.05	< 0.02	< 0.05	0.30			< 10	0.07	242	< 5
08/27/92	1.68	0.02	< 0.05	0.40			< 10	0.14	302	< 5
09/03/92	0.87	< 0.02	< 0.05	0.20	2.4		< 10	< 0.05	310	< 5
09/10/92	0.85	< 0.02	< 0.05	0.30	< 1.0		< 10	< 0.05	258	< 5
09/17/92	0.85	0.02	< 0.05				< 10		266	< 5
09/24/92	0.98	< 0.02	< 0.05	< 0.20			< 10	< 0.05	326	< 5
Average	1.215	0.020	0.058	0.291	1.70		< 10.0	0.091	295.5	5.0
Maximum	2.33	0.02	0.15	0.40	2.4		< 10	0.25	348	5
Minimum	0.85	< 0.02	< 0.05	< 0.20	< 1.0		< 10	< 0.05	242	< 5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 21 Cooper Creek
River Mile 3.64 Plainfield Rd.

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92			< 2	< 0.20	43	< 30	< 10	< 50	11	< 2	< 40	< 2	< 10	153
07/16/92			< 2	< 0.20	51	< 30	< 10	71	12	< 2	< 40	< 2	< 10	177
07/23/92			< 2	< 0.20	49	< 30	< 10	99	12	< 2	< 40	< 2	59	172
07/30/92			< 2	< 0.20	63	< 30	< 10	328	13	7	< 40	< 2	18	211
08/06/92			< 2	< 0.20	47	< 30	< 10	< 50	10	< 2	< 40	< 2	< 10	159
08/13/92			< 2	< 0.20	49	< 30	< 10	104	10	< 2	< 40	< 2	16	164
08/20/92			< 2	< 0.20	42	< 30	< 10	< 50	8	< 2	< 40	< 2	< 10	138
08/27/92														
09/03/92			< 2	< 0.20	44	< 30	< 10	54	10	< 2	< 40	< 2	11	151
09/10/92			< 2	< 0.20	40	< 30	< 10	111	9	< 2	< 40	< 2	14	137
09/17/92			< 2	< 0.20	45	< 30	< 10	< 50	10	< 2	< 40	< 2	< 10	154
09/24/92			< 2	< 0.20	52	< 30	< 10	108	13	< 2	< 40	< 2	< 10	183
Average			< 2.0	< 0.200	47.7	< 30.0	< 10.0	97.7	10.7	2.5	< 40.0	< 2.0	16.2	163.5
Maximum			< 2	< 0.20	63	< 30	< 10	328	13	7	< 40	< 2	59	211
Minimum			< 2	< 0.20	40	< 30	< 10	< 50	8	< 2	< 40	< 2	< 10	137

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 22 Cooper Creek
River Mile 0.20 Mouth

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92			7.71	< 1.0	< 5.0	29	129	872	< 5
07/16/92	19.0	9.3	7.75	< 1.0	< 5.0	46	60	569	< 5
07/23/92	27.0	7.0	7.91	< 1.0	< 5.0	34	110	870	< 5
07/30/92	20.5	9.2	8.10	1.7	5.1	30	32	458	< 5
08/06/92	16.5	8.1	7.63	< 1.0	< 5.0	15	225	1245	< 5
08/13/92	19.0	8.5	7.73	< 1.0	< 5.0	13	126	965	
08/20/92	16.0	9.0	8.10	< 1.0	< 5.0	< 10	306	1630	
08/27/92	20.5	8.4	7.77	< 1.0	< 5.0	31	33	448	17
09/03/92	19.0	7.1	8.05	< 1.0	< 5.0	14	174	1170	7
09/10/92	21.0	9.6	8.10	< 1.0	< 5.0	59	100	838	< 5
09/17/92	22.5	12.5	7.97	1.6	< 5.0	12	627	2640	< 5
09/24/92	14.0	12.0	7.97	1.1	< 5.0	28	117	882	< 5
Average	19.54	9.15	7.899	1.11	5.00	26.7	169.9	1048.9	6.4
Maximum	27.0	12.5	8.10	1.7	5.1	59	627	2640	17
Minimum	14.0	7.0	7.63	< 1.0	< 5.0	< 10	32	448	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	< 0.10	< 0.02	< 0.05	0.30	< 1.00		< 10	< 0.05	510	6
07/16/92	0.43	0.03	< 0.05	0.50			< 10	0.16	360	< 5
07/23/92	0.14	< 0.02	< 0.05	0.40			< 10	0.12	530	< 5
07/30/92	1.23	0.04	0.07	0.60			< 10	0.21	304	14
08/06/92	< 0.10	0.02	< 0.05	0.20			< 10	< 0.05	699	< 5
08/13/92	0.40	< 0.02	< 0.05	0.30			< 10	0.07	598	< 5
08/20/92	< 0.10	< 0.02	0.11	0.30			< 10	0.09	886	8
08/27/92	2.12	0.06	0.14	0.70			< 10	0.22	282	10
09/03/92	0.20	< 0.02	< 0.05	0.20			< 10	0.07	726	< 5
09/10/92	0.41	0.02	< 0.05	0.40			< 10	0.06	488	< 5
09/17/92	< 0.10	0.02	< 0.05	< 0.20	4.68		< 10	0.11	1450	5
09/24/92		< 0.02		0.40			< 10	0.09	530	< 5
Average	0.484	0.025	0.065	0.375	2.84		< 10.0	0.108	613.5	6.5
Maximum	2.12	0.06	0.14	0.70	4.68		< 10	0.22	1450	14
Minimum	< 0.10	< 0.02	< 0.05	< 0.20	< 1.00		< 10	< 0.05	282	< 5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 22 Cooper Creek
River Mile 0.20 Mouth

Date	Fecal coli, (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92			< 2	< 0.20	74	< 30	< 10	85	15	< 2	< 40	< 2	27	246
07/16/92			< 2	< 0.20	62	< 30	< 10	483	11	< 2	< 40	< 2	< 10	200
07/23/92			< 2	< 0.20	89	< 30	< 10	60	18	< 2	< 40	< 2	17	296
07/30/92			< 2	< 0.20	55	< 30	< 10	748	9	< 2	< 40	< 2	< 10	174
08/06/92			< 2	< 0.20	92	< 30	< 10	76	22	< 2	< 40	< 2	< 10	320
08/13/92			< 2	< 0.20	102	< 30	< 10	< 50	20	< 2	< 40	< 2	< 10	337
08/20/92			< 2	< 0.20	108	< 30	< 10	< 50	24	< 2	< 40	< 2	19	368
08/27/92			< 2	< 0.20	52	< 30	< 10	954	9	< 2	< 40	< 2	< 10	167
09/03/92			< 2	< 0.20	102	< 30	< 10	81	21	< 2	< 40	< 2	< 10	341
09/10/92			< 2	< 0.20	87	< 30	< 10	68	17	< 2	< 40	< 2	< 10	287
09/17/92			< 2	< 0.20	131	< 30	< 10	227	30	< 2	< 40	< 2	< 10	451
09/24/92			< 2	< 0.20	90	< 30	< 10	70	17	< 2	< 40	< 2	< 10	295
Average			< 2.0	< 0.200	87.0	< 30.0	< 10.0	246.0	17.7	< 2.0	< 40.0	< 2.0	12.7	290.1
Maximum			< 2	< 0.20	131	< 30	< 10	954	30	< 2	< 40	< 2	27	451
Minimum			< 2	< 0.20	52	< 30	< 10	< 50	9	< 2	< 40	< 2	< 10	167

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 23 West Fork Mill
River Mile 4.44 Riddle Rd.

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92			7.95	1.5	< 5.0	23	28	340	< 5
07/16/92	23.0	7.2	7.97	< 1.0	< 5.0	48	27	419	5
07/23/92	24.0	8.0	7.92	< 1.0	< 5.0	43	17	295	< 5
07/30/92	25.0	7.2	7.91	2.9	< 5.0	19	16	262	< 5
08/06/92	20.0	8.5	8.00	1.1	< 5.0	16	64	589	< 5
08/13/92	24.5	9.0	8.06	2.9	5.4	27	19	283	
08/20/92	20.0	13.2	8.49		< 5.0	26			
08/27/92	24.5	8.2	7.67	< 1.0	< 5.0	25	16	258	< 5
09/03/92	20.2	8.4	8.01	1.8	< 5.0	33	30	464	8
09/10/92	21.2	7.5	7.39	< 1.0	< 5.0	25	17	291	< 5
09/17/92	16.0	7.2	7.89	1.7	< 5.0	22	54	571	< 5
09/24/92	14.0	8.6	7.30	2.0	< 5.0	34	20	327	< 5
Average	21.12	8.45	7.879	1.63	5.03	28.4	27.9	372.5	5.3
Maximum	25.0	13.2	8.49	2.9	5.4	48	64	589	8
Minimum	14.0	7.2	7.30	< 1.0	< 5.0	16	16	258	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	0.42	0.03	< 0.05	0.60			< 10	0.06	204	11
07/16/92	0.62	0.09	0.07	0.50			< 10	0.42	280	41
07/23/92	0.49	0.09	0.07	0.60			< 10	0.13	190	40
07/30/92	0.27	0.07	0.20	0.40			< 10	0.21	162	81
08/06/92	0.55	0.03	< 0.05	0.60			< 10	0.38	348	< 5
08/13/92	0.18	0.04	< 0.05	0.80			< 10	0.14	180	33
08/20/92	0.21		< 0.05	0.50			< 10	0.54		
08/27/92	0.29	0.06	0.29	1.00			< 10	0.39	164	135
09/03/92	0.67	0.02	< 0.05	0.40			12	0.36	328	12
09/10/92	0.58	0.04	0.07	0.50			13	0.14	192	31
09/17/92	0.26	< 0.02	< 0.05	0.50			< 10	0.62	330	< 5
09/24/92	0.15	0.02	< 0.05	0.40			< 10	0.07	200	13
Average	0.390	0.046	0.087	0.566			10.4	0.288	234.3	37.0
Maximum	0.67	0.09	0.29	1.00			13	0.62	348	135
Minimum	0.15	< 0.02	< 0.05	0.40			< 10	0.06	162	< 5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 23 West Fork Mill
River Mile 4.44 Riddle Rd.

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92			4	< 0.20	37	< 30	< 10	614	8	< 2	< 40	< 2	< 10	125
07/16/92			4	< 0.20	53	35	< 10	4790	11	< 2	46	< 2	39	178
07/23/92			< 2	< 0.20	37	< 30	11	2000	6	3	< 40			
07/30/92			< 2	< 0.20	39	< 30	< 10	3040	6	4	< 40	< 2	< 10	110
08/06/92			< 2	< 0.20	64	< 30	< 10	330	12	< 2	49	< 2	16	209
08/13/92			3	< 0.20	37	< 30	< 10	1750	6	< 2	< 40	< 2	< 10	117
08/20/92			< 2	< 0.20	69	< 30	< 10	310	13	< 2	< 40	< 2	< 10	226
08/27/92			4	< 0.20	36	< 30	< 10	7390	7	7	< 40	< 2	22	119
09/03/92			< 2	< 0.20	53	< 30	< 10	1360	10	< 2	< 40	< 2	42	174
09/10/92			3	< 0.20	39	< 30	< 10	2160	6	< 2	< 40	< 2	< 10	122
09/17/92			< 2	< 0.20	61	< 30	< 10	468	11	< 2	< 40	< 2	52	198
09/24/92			< 2	< 0.20	39	< 30	< 10	656	6	< 2	< 40	< 2	19	122
Average			2.6	< 0.200	47.0	30.4	10.0	2072.3	8.5	2.6	41.2	< 2.0	21.8	154.5
Maximum			4	< 0.20	69	35	11	7390	13	7	49	< 2	52	226
Minimum			< 2	< 0.20	36	< 30	< 10	310	6	< 2	< 40	< 2	< 10	110

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 24 West Fork Mill
River Mile 2.00 Gardner Park

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92			8.01	1.1	< 5.0	21	29	372	< 5
07/16/92	23.0	7.2	8.47	1.0	< 5.0	36	27	359	< 5
07/23/92	23.0	7.2	7.93	< 1.0	< 5.0	52	18	303	< 5
07/30/92	22.0	7.2	7.85	1.8	< 5.0	32	17	291	< 5
08/06/92	18.5	8.2	8.01	< 1.0	< 5.0	14	46	576	< 5
08/13/92	23.0	9.0	8.03	2.2	< 5.0	19	20	292	
08/20/92	17.5	7.0	8.22	1.0	< 5.0	15	52	613	
08/27/92	24.0	7.5	7.67	1.0	< 5.0	28	18	300	< 5
09/03/92	20.0	7.4	8.14	< 1.0	< 5.0	19	28	439	< 5
09/10/92	21.5	7.4	7.82	1.0	< 5.0	19	19	325	< 5
09/17/92	17.5	6.8	8.00	< 1.0	< 5.0	13	44	566	< 5
09/24/92	13.5	9.6	7.38	2.3	< 5.0	23	21	335	< 5
Average	20.31	7.68	7.958	1.28	< 5.00	24.2	28.2	397.5	< 5.0
Maximum	24.0	9.6	8.47	2.3	< 5.0	52	52	613	< 5
Minimum	13.5	6.8	7.38	< 1.0	< 5.0	13	17	291	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	0.42	0.03	< 0.05	0.60			< 10	< 0.05	230	4
07/16/92	0.44	0.05	0.08	0.50			< 10	0.22	240	8
07/23/92	0.52	0.09	0.05	0.60			< 10	0.17	204	36
07/30/92	0.69	0.11	0.07	0.40			< 10	0.60	194	404
08/06/92	0.41	0.03	< 0.05	0.40			< 10	0.06	356	< 5
08/13/92	0.29	0.04	< 0.05	0.52			< 10	0.12	178	32
08/20/92	0.12	0.02	< 0.05	0.30			< 10	0.08	364	6
08/27/92	0.10	0.03	0.23	0.60			< 10	0.47	184	270
09/03/92	0.63	< 0.02	< 0.05	0.30			< 10	0.12	310	28
09/10/92	0.40	0.02	< 0.05	0.70			< 10	0.14	204	19
09/17/92	0.13	0.02	< 0.05	0.20			11	0.09	360	5
09/24/92	0.10	0.02	< 0.05	0.50			10	0.07	214	8
Average	0.354	0.040	0.069	0.468			10.0	0.182	253.1	68.7
Maximum	0.69	0.11	0.23	0.70			11	0.60	364	404
Minimum	0.10	< 0.02	< 0.05	0.20			< 10	< 0.05	178	4

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 24 West Fork Mill
River Mile 2.00 Gardner Park

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92			4	< 0.20	39	< 30	< 10	250	8	< 2	< 40	< 2	10	130
07/16/92			3	< 0.20	43	< 30	< 10	960	9	< 2	< 40	< 2	25	144
07/23/92			< 2	< 0.20	38	< 30	< 10	1710	7	3	< 40	< 2	10	124
07/30/92			3	0.20	62	< 30	< 10	13800	11	19	41	< 2	69	200
08/06/92			< 2	< 0.20	68	< 30	< 10	154	16	< 2	43	< 2	< 10	236
08/13/92			3	< 0.20	38	< 30	< 10	1510	6	< 2	< 40	< 2	< 10	120
08/20/92			< 2	< 0.20	65	< 30	< 10	115	14	< 2	< 40	< 2	< 10	220
08/27/92			4	< 0.20	57	< 30	< 10	10900	11	18	< 40	< 2	63	188
09/03/92			< 2	< 0.20	55	< 30	< 10	1320	10	< 2	< 40	< 2	16	178
09/10/92			3	0.20	40	< 30	< 10	1230	6	2	< 40	< 2	109	125
09/17/92			< 2	< 0.20	67	< 30	< 10	403	16	< 2	< 40	< 2	< 10	233
09/24/92			< 2	< 0.20	42	< 30	< 10	473	7	< 2	< 40	< 2	< 10	134
Average			2.6	0.200	51.1	< 30.0	< 10.0	2735.4	10.0	4.8	40.3	< 2.0	29.3	169.3
Maximum			4	0.20	68	< 30	< 10	13800	16	19	43	< 2	109	236
Minimum			< 2	< 0.20	38	< 30	< 10	115	6	< 2	< 40	< 2	< 10	120

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 25 West Fork Mill
River Mile 0.19 Mouth

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92			7.86	1.1	< 5.0	28	30	408	< 5
07/16/92	20.0	5.0	7.76	2.9	< 5.0	31	20	387	< 5
07/23/92	23.0	7.6	7.90	< 1.0	< 5.0	66	18	310	< 5
07/30/92	22.0	7.7	7.99	2.1	< 5.0	18	17	315	< 5
08/06/92	19.0	5.5	7.57	3.8	< 5.0	24	36	640	< 5
08/13/92	20.0	7.8	8.14	1.8	< 5.0	21	19	287	
08/20/92	18.0	4.2	7.69	2.1	< 5.0	20	35	648	
08/27/92	22.0	6.4	7.61	1.8	< 5.0	32	19	329	5
09/03/92	18.5	3.1	7.85	2.4	< 5.0	24	20	446	6
09/10/92	22.0	6.7	7.92	< 1.0	< 5.0		20	383	< 5
09/17/92	19.0	2.4	7.66	1.6	< 5.0	15	30	602	< 5
09/24/92	13.0	8.5	7.74	2.4	< 5.0	31	23	371	< 5
Average	19.68	5.90	7.807	1.99	< 5.00	28.15	23.9	427.1	5.1
Maximum	23.0	8.5	8.14	3.8	< 5.0	66	36	648	6
Minimum	13.0	2.4	7.57	< 1.0	< 5.0	15	17	287	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	0.57	0.06	0.54	1.10			< 10	< 0.05	234	< 5
07/16/92	1.03	0.23	6.24	7.60			< 10	0.21	230	14
07/23/92	0.62	0.08	0.10	0.60			< 10	0.14	204	30
07/30/92	0.86	0.12	0.86	0.70			< 10	0.51	228	140
08/06/92	1.53	0.21	21.4	18.7			< 10	0.10	324	< 5
08/13/92	0.35	0.05	0.05	0.60			< 10	0.13	172	26
08/20/92	2.35	0.33	13.3	13.3			< 10	0.10	342	8
08/27/92	0.86	0.07	0.58	0.90			< 10	0.17	200	26
09/03/92	1.47	0.24		7.90			< 10	0.09	290	14
09/10/92	0.71	0.14	4.45	4.10			16	0.11	214	16
09/17/92	1.15	0.29	16.1	16.8			< 10	0.18	324	< 5
09/24/92	0.31	0.06	1.60	2.00			< 10	0.08	227	7
Average	0.984	0.156	5.928	6.191			10.5	0.155	249.0	24.6
Maximum	2.35	0.33	21.40	18.70			16	0.51	342	140
Minimum	0.31	0.05	0.05	0.60			< 10	< 0.05	172	< 5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 25 West Fork Mill
River Mile 0.19 Mouth

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92	> 6700	> 6700	3	< 0.20	91	< 30	< 10	202	22	< 2	< 40	< 2	10	318
07/16/92	> 6700	> 6700	4	< 0.20	41	< 30	< 10	1590	7	3	< 40	< 2	31	131
07/23/92	1350	2030	< 2	< 0.20	40	< 30	< 10	1530	7	4	< 40	< 2	16	129
07/30/92	> 20000	> 20000	3	< 0.20	44	< 30	< 10	8610	8	9	< 40	< 2	41	143
08/06/92	> 20000	> 20000	< 2	< 0.20	58	< 30	< 10	250	11	< 2	< 40	< 2	< 10	190
08/13/92	8600	1900	4	< 0.20	40	< 30	< 10	1380	7	2	< 40	< 2	12	129
08/20/92	> 20000	> 20000	< 2	< 0.20	60	< 30	< 10	216	12	< 2	< 40	< 2	< 10	199
08/27/92	> 20000	> 20000	< 2	< 0.20	40	< 30	< 10	1870	7	17	< 40	< 2	18	129
09/03/92	> 20000	> 20000	2	< 0.20	48	< 30	< 10	1290	8	2	< 40	< 2	16	153
09/10/92	> 20000	4230	3	< 0.20	43	< 30	< 10	1190	7	< 2	< 40	< 2	11	136
09/17/92	> 20000	< 7	< 2	< 0.20	55	< 30	< 10	167	11	< 2	< 40	< 2	< 10	183
09/24/92	14000		< 2	< 0.20	45	< 30	< 10	404	8	< 2	< 40	< 2	< 10	145
Average	14779.1	11051.5	2.5	< 0.200	50.4	< 30.0	< 10.0	1558.2	9.5	4.0	< 40.0	< 2.0	16.2	165.4
Maximum	> 20000	> 20000	4	< 0.20	91	< 30	< 10	8610	22	17	< 40	< 2	41	318
Minimum	1350	< 7	< 2	< 0.20	40	< 30	< 10	167	7	< 2	< 40	< 2	< 10	129

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 26 Bloody Run
River Mile 0.31 Vine St.

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/09/92	21.5	6.3		< 1.0	< 5.0	14	34	921	< 5
07/16/92	22.0	1.3	7.70	6.2	< 5.0	31	29	676	5
07/23/92	20.5	4.9		1.3	< 5.0	11	37	1020	< 5
07/30/92	21.0	2.8	7.50	29.0	20.0	67	40	713	< 5
08/06/92	19.0	5.4		< 1.0	< 5.0	15	36	963	< 5
08/13/92	21.0	.6		7.6		34	24	649	
08/20/92	18.5	5.4		< 1.0	< 5.0	< 10	40	1060	
08/27/92	22.0	2.2		5.6	39.7	174	130	990	10
09/03/92	21.0	4.9	8.10	< 1.0	< 5.0	16	43	1050	< 5
09/10/92	21.5	.4		16.8	15.2	60	18	510	< 5
09/17/92	19.0	7.0		< 1.0	< 5.0	< 10	45	1010	< 5
09/24/92	15.0	6.2		1.2	< 5.0	21	41	1010	8
Average	20.16	3.94	7.766	6.05	10.44	38.5	43.0	881.0	5.8
Maximum	22.0	7.0	8.10	29.0	39.7	174	130	1060	10
Minimum	15.0	0.4	7.50	< 1.0	< 5.0	< 10	18	510	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt. Res. (mg/l)	TSS (mg/l)
07/09/92	0.31	0.04	0.14	0.30	< 1.00	8.13	< 10	1.50	666	8
07/16/92	0.19	0.08	0.35	1.10			10	0.29	448	6
07/23/92	0.28	0.05	0.37	0.90		7.93	< 10	0.14	700	6
07/30/92	< 0.10	0.12	0.09	2.00			< 10	0.84	468	16
08/06/92	0.34	0.07	0.17	0.60		8.05	< 10	0.10	630	< 5
08/13/92	< 0.10	0.04	0.72	1.60		7.57	< 10	0.45	426	10
08/20/92	0.34	0.06	0.13	0.30		8.09	< 10	0.10	670	< 5
08/27/92			0.53	3.20		7.40		1.77	614	24
09/03/92	0.53	0.04	0.15	0.30			11	0.12	734	< 5
09/10/92	< 0.10	0.02	1.03	2.60		7.41	< 10	0.40	334	11
09/17/92	0.54	0.06	0.09	< 0.20		7.99	12	0.07	726	< 5
09/24/92	0.52	0.06	0.17	0.30		8.06	< 10	0.08	684	< 5
Average	0.304	0.058	0.328	1.116	< 1.000	7.847	10.3	0.488	591.6	8.8
Maximum	0.54	0.12	1.03	3.20	< 1.00	8.13	< 12	1.77	734	24
Minimum	< 0.10	0.02	0.09	< 0.20	< 1.00	7.40	< 10	0.07	334	< 5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 26 Bloody Run
River Mile 0.31 Vine St.

Date	Fecal coli. (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/09/92	> 6700	> 6700	< 2	< 0.20	134	< 30	< 10	301	43	2	< 40	< 2	60	512
07/16/92	> 6700	> 6700	2	< 0.20	83	< 30	< 10	377	28	< 2	< 40	< 2	66	323
07/23/92	3600	667	< 2	< 0.20	133	< 30	< 10	315	43	< 2	< 40	< 2	37	509
07/30/92	> 20000	> 20000	< 2	< 0.20	44	< 30	< 10	623	27	10	< 40	< 2	80	221
08/06/92	2700	1600	< 2	< 0.20	134	< 30	< 10	395	43	< 2	< 40	< 2	< 10	512
08/13/92	19400	20700	< 2	< 0.20	72	< 30	< 10	803	28	< 2	< 40	< 2	21	295
08/20/92	1030	400	< 2	< 0.20	142	< 30	< 10	136	45	< 2	< 40	< 2	31	540
08/27/92	> 20000	> 20000	< 2	< 0.20	28	43	35	839	17	10	< 40	< 2	68	140
09/03/92	4200	1600	< 2	< 0.20	139	< 30	< 10	218	44	< 2	< 40	< 2	37	528
09/10/92	> 20000	> 20000	< 2	< 0.20	32	< 30	< 10	660	21	4	< 40	< 2	38	166
09/17/92	430	240	< 2	< 0.20	143	< 30	< 10	90	45	< 2	< 40	< 2	< 10	542
09/24/92	1000	69	< 2	< 0.20	138	< 30	< 10	120	43	< 2	< 40	< 2	25	522
Average	8813.3	8223.0	2.0	< 0.200	101.8	31.0	12.0	406.4	35.5	3.5	< 40.0	< 2.0	40.2	400.8
Maximum	> 20000	20700	2	< 0.20	143	43	35	839	45	10	< 40	< 2	80	542
Minimum	430	69	< 2	< 0.20	28	< 30	< 10	90	17	< 2	< 40	< 2	< 10	140

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 27 Ross Run
River Mile 0.01 Mouth

Date	Temp (C)	D.O (mg/l)	pH (fld) (SU)	CBOD5 (mg/l)	TOC (mg/l)	COD (mg/l)	Cl (mg/l)	Conductivity (umhos/cm)	CN (ug/l)
07/16/92			8.05	5.4	< 5.0	44	58	915	8
07/23/92				1.7	< 5.0	24	69	1080	< 5
07/30/92			7.80	49.0	29.0	66	64	1160	< 5
08/06/92				1.6	< 5.0	28	64	982	< 5
08/13/92	23.5	9.0		7.0		50	52	793	
08/20/92				1.3	< 5.0	16	55	786	
09/03/92			8.23	3.3	< 5.0	24	49	729	10
09/10/92				15.0	5.8	34	48	714	5
09/17/92				3.4	< 5.0	13	74	962	6
09/24/92				37.0	18.7	89	68	1030	< 5
Average	23.50	9.00	8.027	12.47	9.28	38.7	60.0	915.0	6.1
Maximum	23.5	9.0	8.23	49.0	29.0	89	74	1160	10
Minimum	23.5	9.0	7.80	1.3	< 5.0	13	48	714	< 5

Date	NO3-NO2-N (mg/l)	NO2-N (mg/l)	NH3-N (mg/l)	TKN (mg/l)	Oil & Grease (mg/l)	pH (lab) (SU)	Phenolics (mg/l)	P-T (mg/l)	Flt.Res. (mg/l)	TSS (mg/l)
07/16/92	1.97	0.49	2.07	3.20			14	0.40	584	10
07/23/92	2.69	0.56	1.91	2.40	1.27	8.27	23	0.29	698	10
07/30/92	2.09	0.22	3.07	7.50				1.37	756	97
08/06/92	2.16	0.51	2.12	3.30			< 10	0.32	616	8
08/13/92	0.87	0.25	1.50	2.20		8.14	< 10	< 0.05	484	10
08/20/92	1.61	0.24	1.93	2.14		8.30	< 10	0.20	480	< 5
09/03/92	1.05	0.09	1.11	1.90			< 10	0.22	428	< 5
09/10/92	1.34	0.23	1.08	1.40		8.17	10	0.66	438	6
09/17/92	1.71	0.34	1.92	2.50		8.12	13	0.23	572	< 5
09/24/92	1.47	0.23	1.25	2.20		8.14	13	0.72	666	8
Average	1.695	0.316	1.795	2.873	1.270	8.188	12.6	0.446	572.2	16.3
Maximum	2.69	0.56	3.07	7.50	1.27	8.30	23	1.37	756	97
Minimum	0.87	0.09	1.08	1.40	1.27	8.12	< 10	< 0.05	428	< 5

Appendix Table 4. continued.

MILL CREEK SURVEY
CHEMICAL/PHYSICAL SAMPLING RESULTS
1992

Site/Location 27 Ross Run
River Mile 0.01 Mouth

Date	Fecal coli, (#/100ml)	E. coli (#/100ml)	As (ug/l)	Cd (ug/l)	Ca (mg/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Mg (mg/l)	Pb (ug/l)	Ni (ug/l)	Se (ug/l)	Zn (ug/l)	Hardness (mg/l)
07/16/92			6	< 0.20	91	34	< 10	2750	21	< 2	< 40	< 2	101	314
07/23/92			3	< 0.20	110	< 30	< 10	3020	25	< 2	68	< 2	37	378
07/30/92			< 2	2.70	81	53	21	2090	18	15	< 40	< 10	107	276
08/06/92			5	< 0.20	107	< 30	< 10	2270	25	< 2	< 40	< 2	20	370
08/13/92			5	< 0.20	86	< 30	< 10	758	17	< 2	< 40	< 2	50	285
08/20/92			3	< 0.20	81	< 30	< 10	614	17	< 2	< 40	< 2	13	272
09/03/92			4	< 0.20	73	< 30	< 10	385	16	< 2	< 40	< 2	100	248
09/10/92			4	< 0.20	70	< 30	< 10	1040	15	< 2	< 40	< 2	49	237
09/17/92			3	< 0.20	99	< 30	< 10	894	23	< 2	< 40	< 2	88	342
09/24/92			8	0.20	112	< 30	< 10	1860	24	6	< 40	< 2	115	378
Average			4.3	0.450	91.0	32.7	11.1	1568.0	20.1	3.7	42.7	2.7	68.0	310.0
Maximum			8	2.70	112	53	21	3020	25	15	68	< 10	115	378
Minimum			< 2	< 0.20	70	< 30	< 10	385	15	< 2	< 40	< 2	13	237

Appendix Table 5. Organic compounds detected in the Mill Creek basin sediments, 1992. See end of Table 5 for explanation of notations.

Site (RM)	*Compound	Concentration (mg/kg)
Mill Creek		
26.40	< DL	
24.64	< DL	
16.57	< DL	
14.80	*Benzo [B&K] Fluoranthene*	*1.3*
	Bis (2-Ethylhexyl) Phthalate	*0.6*
	Chrysene	*0.7*
	Fluoranthene	*1.4*
	Indeno [1,2,3-CD] Pyrene	*0.9*
	Phenanthrene	*0.7*
	Pyrene	*1.0*
	Hexadecanoic Acid	*5.5*
	Octacosane	*1.9*
	2,6,10,14,18,22-Tetracosahexane	*3.3*
	Nonacosane	*13.3*
	Hexadecanal	*2.5*
	Triacontane	*7.2*
	Cholestane, 2,3-Epoxy (2.Alpha)	*1.6*
	Octadecanal	*2.1*
13.89	*Benzo [B&K] Fluoranthene*	*2.6*
	Benzo [A] Pyrene	*1.3*
	Benzo [GHI] Perylene	*0.7*
	Benz [A] Anthracene	*1.0*
	Bis (2-Ethylhexyl) Phthalate	*1.0*
	Chrysene	*1.3*
	DI-N-Butyl Phthalate	*0.8*
	Fluoranthene	*2.6*
	Indeno [1,2,3-CD] Pyrene	*1.3*
	Phenanthrene	*1.2*
	Pyrene	*1.9*

Appendix Table 5 (cont.).

Site (RM)	*Compound	Concentration (mg/kg)
Mill Creek		
	Nonacosane	1.7
	Triacontane	1.5
13.72	**Chlorobenzene**	**.13**
	Benzo [B&K] Fluoranthene	*1.6*
	Benzo [A] Pyrene	*0.9*
	Benzo [GHI] Perylene	*0.6*
	Benz [A]Anthracene	*0.7*
	Chrysene	*1.0*
	Fluoranthene	*2.4*
	Indeno [1,2,3-CD] Pyrene	*0.9*
	Phenanthrene	*1.4*
	Pyrene	*1.9*
	4-Undecene, 3-methyl	0.7
	Toluene, 3-(2-Cyano-2-Phenylethenyl)	0.6
13.13	**Chlorobenzene**	**0.05**
	Octane, 2,6-dimethyl	0.06
	Heptane, 4-propyl	0.05
	Decane	0.08
	Decane, 4-methyl	0.05
	Dodecane	0.06
	Benzo [B&K] Fluoranthene	*2.3*
	Benzo [A] Pyrene	*1.1*
	Benzo [GHI] Perylene	*0.8*
	Benz [A] Anthracene	*0.8*
	Bis (2-ethylhexyl) Phthalate	*1.5*
	Chrysene	*1.2*
	Fluoranthene	*2.3*
	Indeno-[1,2,3-CD] Pyrene	*1.1*
	Phenanthrene	*1.2*
	Pyrene	*1.7*
	Heptadecane, 2,6-dimethyl	3.6
	Iron, Tricarbonyl	2.4
	Hexacosane	1.1

Appendix Table 5 (cont.).

Site (RM)	*Compound	Concentration (mg/kg)
Mill Creek		
13.13	Heptacosane	2.0
	1,2-Benzenedicarboxylic Acid, Ditridecyc	1.6
	Octacosane	1.1
	Nonacosane	3.1
	Triacontane	2.5
9.02	*Benzo [B&K] Fluoranthene*	*3.2*
	Benzo [A] Pyrene	*1.6*
	Benzo [A] Anthracene	*1.4*
	Bis (2-ethylhexyl) Phthalate	*0.9*
	Chrysene	*1.7*
	Fluoranthene	*3.8*
	Indeno [1,2,3-CD] Pyrene	*1.6*
	Phenanthrene	*1.7*
	Pyrene	*2.8*
	Heptadecane	2.4
	Octadecane	2.5
	Nonacosane	3.8
	Triacontane	3.7
8.38	*Benzo [B&K] Fluoranthene*	*2.0*
	Benzo [A] Pyrene	*0.9*
	Benz[A] Anthracene	*0.9*
	Chrysene	*1.1*
	Fluoranthene	*2.5*
	Indeno [1,2,3-CD] Pyrene	*0.9*
	Phenanthrene	*1.5*
	Pyrene	*1.9*
	Heptadecane	1.7
	Octadecane	1.6
	Octacosane	1.5
	Nonacosane	5.3
	Triacontane	4.8

Appendix Table 5 (cont.).

Site (RM)	*Compound	Concentration (mg/kg)
Mill Creek		
7.86	*Benzo [B&K] Fluoranthene*	*2.4*
	Benzo [A] Pyrene	*1.1*
	Benzo [GHI] Perylene	*0.8*
	Benz [A] Anthracene	*0.9*
	Bis (2-ehtylhexyl) Phthalate	*1.2*
	Chrysene	*1.2*
	Fluoranthene	*2.3*
	Indeno [1,2 3-CD]Pyrene	*1.2*
	Phenanthrene	*1.1*
	Pyrene	*1.8*
	Heptadecane, 2, 6-Dimethyl	2.7
	Iron,Tricarbonyl[N-(Phenyl-2-Pyridinyln)	3.3
	Heptacosane	2.2
	Octacosane	2.7
	Nonacosane	3.3
	Triacontane	2.4
5.2	**Chlorobenzene**	**1.72**
	1,3-Dichlorobenzene	**0.15**
	1,4-Dichlorobenzene	**0.28**
	1,2,4-Trimethylbenzene	**0.10**
	0-Xylene	**0.09**
	Anthracene	*0.9*
	Benzo [B&K] Fluoranthene	*6.2*
	Benzo [A] Pyrene	*2.9*
	Benzo[GHI] Perylene	*1.7*
	Benz [A] Anthracene	*3.3*
	Bis (2-ethylhexyl0 Phthalate	*11.4*
	Chrysene	*3.7*
	DI-N-Butyl Phthalate	*1.4*
	Fluoranthene	*12.1*
	Indeno [1,2,3-CD] Pyrene	*3.0*
	Phenanthrene	*5.6*
	Pyrene	*8.7*

Appendix Table 5 (cont.).

Site (RM)	*Compound	Concentration (mg/kg)
Mill Creek		
2.90	*Benzo [B&K] Fluoranthene*	*3.6*
	Benzo [A} Pyrene	*1.8*
	Benzo [GHI] Perylene	*1.1*
	Benz [A] Anthracene	*1.4*
	Bis (2-ethylhexyl Phthalate)	*1.3*
	Chrysene	*1.9*
	DI-N-Butyl Phthalate	*1.0*
	Fluoranthene	*3.6*
	Indeno [1,2,3 -CD] Pyrene	*2.2*
	Phenanthrene	*1.7*
	Pyrene	*2.9*
	Nonacosane	2.0
0.50	**1,4-Dichlorobenzene**	**0.17**
	Toluene	**0.94**
	Heptane, 2-methyl	0.08
	Cyclohexane, 1,3-dimethy-,cis	0.12
	Cyclohexane,1,4-dimethyl-,trans	0.14
	Cyclopentane, ethyl	0.10
	Cyclohexane, ethyl	0.20
	Cyclohexane, 1,1,3-trimethyl	0.22
	Cyclohexane,1-ethyl-4-methyl-, tra	0.14
	Pentalene, octahydro-2-methyl	0.10
	Cyclohexane, (1-methylethyl)	0.18
	Benzene, 1-ethyl-3, 5-dimethyl	0.10
	3,7,7-Trimethyl-Cyclohepta-1,3,5	0.12
	Dodecane	0.16
	Benzene,2-ethyl-1, 3-dimethyl	0.10
	Benzo [B&K] Fluoranthene	*1.8*
	Bis (2-ethylhexyl Phthalate	*2.2*
	Chrysene	*0.9*
	Fluoranthene	*1.7*
	Indeno [1,2,3-CD] Pyrene	*1.0*
	Phenanthrene	*1.0*
	Pyrene	*1.4*
	Undecane	5.5

Appendix Table 5 (cont.).

Site (RM)	*Compound	Concentration (mg/kg)
Mill Creek		
0.50	Dodecane	7.8
	Tridecane	6.9
	Tetradecane	10.0
	Pentadecane	13.9
	Hexadecane	11.5
	Dodecane, 2-methyl-8-propyl	8.3
	Heptadecane	17.9
	Pentadecane, 2,6,10,14-Tetramethyl	11.3
	Octadecane	13.7
	Hexadecane, 2,6,10,14-Tetramethyl	10.4
	Nonadecane	13.2
	Eicosane	7.9
	Heneicosane	5.6
	Pentacosane	5.9
	2,6,10,14,18,22-Tetracosahexene, 2,6,	1010.3
	Nonacosane	10.2
	Cholestan-3-OL (3. alpha)	15.6
	Triacontane	5.5
	Cholestane, 2,3-Epoxy	19.2
West Fork Mill Creek		
11.6; 4.45	*Anthracene*	*0.7*
	Benzo [B&K] Fluoranthene	*4.1*
	Benzo [A] Pyrene	*1.5*
	Benzo [GHI] Perylene	*0.9*
	Benz [A] Anthracene	*2.7*
	Bis (2-ethylhexyl) Phthalate	*1.1*
	Chrysene	*3.2*
	Fluoranthene	*7.7*
	Indeno [1,2,3-CD] Pyrene	*1.0*
	Phenanthrene	*3.5*
	Pyrene	*6.2*
	Hexadecane	0.7

Appendix Table 5 (cont.).

Site (RM)	*Compound	Concentration (mg/kg)
West Fork Mill Creek		
11.6; 2.0	*Acenaphthene*	*0.9*
	Anthracene	*4.1*
	Benzo [B&K] Fluoranthene	*11.8*
	Benzo [A] Pyrene	*5.8*
	Benzo [GHI] Perylene	*2.2*
	Benz [A] Anthracene	*8.0*
	Bis (2-ethylhexyl) Phthalate	*1.7*
	Chrysene	*8.4*
	Dibenzofuran	*0.7*
	Dibenz [A,H] Anthracene	*1.4*
	Fluoranthene	*37.9*
	Fluorene	*1.7*
	Indeno[1,2,3-CD] Pyrene	*4.3*
	Phenanthrene	*15.0*
	Pyrene	*25.1*
	11H-Benzo[A]Fluorene	7.6
	Nonacosane	12.6
11.6; 0.1	*Anthracene*	*0.7*
	Benzo [B&K] Fluoranthene	*4.1*
	Benzo [A] Pyrene	*1.5*
	Benzo [GHI] Perylene	*0.9*
	Benz[A] Anthracene	*2.7*
	Bis (2-Ethylhexyl) Phthalate	*1.1*
	Chyrsene	*3.2*
	Fluoranthene	*7.7*
	Indeno [1,2,3-CD] Pyrene	*1.0*
	Phenanthrene	*3.5*
	Pyrene	*6.2*
	Benzene, (1,1,4,6,6-Pentamethykheptyl)	3.5
	9H-Fluorene, 9-Butyl-9-methyl	4.4
	1,1':2,1-Terphenyl	14.6
	4A,8A-Ethenonaphthalene1,2,3,4,5,8-hex	13.1
	Bicyclohexyl, 4-Phenyl	76.0
	Benzene 1,1'-[4-(3-Phenylpropyl)-3-hept	34.1
	1(2H)-Naphthalenone, 3,4-Dihydro-2	18.3
	Bicyclohexyl, 4-Phenyl	47.8

Appendix Table 5 (cont.).

Site (RM)	*Compound	Concentration (mg/kg)
West Fork Mill Creek		
11.6; 0.1	9,10-Anthracenedione, 2,3-Dimethyl	65.1
	Benzene, 1,1'-Cyclohexylidenebis	52.1
	Naphthalene, 1,2,3,4,4A, 5,6,8A-Octahydro	17.3
	Androstan-3-ol, 9-methyl-,acetate	8.3
	Benzene, 1,3,5-Tris (2,2-Dimethylpropyl)	9.5
	Nonacosane	7.6
	Triacontane	3.5
	Hexadecane, 1-(Ethenyloxy)	4.1
East Fork Mill Creek		
17.95; 0.1	*Cyclohexane, 1,3,5-trimethyl*	*0.16*
	Nonane	*0.16*
	Dimethyl-3,5 Heptene	*0.51*
	Octane, 3,6-dimethyl	*0.90*
	Heptane, 4-propyl	*0.54*
	Cyclohexane,1-ethyl-2, 3-dimethyl	*0.22*
	2-Pyrazoline, 1-isobutyl-3-methyl	*0.67*
	Decane	*1.15*
	Pentane, 2,3,4-trimethyl	*0.74*
	Bis (2-Ethylhexyl) Phthalate	*4.2*
	Undecane	23.7
	Dodecane 2-Cyclohexyl,2-Cyclohexyl	12.5
	Nonane, 3,7-Dimethyl	9.5
	Tridecane, 6-Methyl	6.8
	Nonane, 3-Methyl-5-Propyl	9.2
	Tetradecane	3.1
	Pentadecane	3.9
	Phenol, 4-(2,2,3,3-Tetramethylbutyl)	7.8
	Phenol,2-Chloro-4-(1,1-Dimethylpropyl)	3.4
	Heptadecane	5.3
	Nonadecane	2.6
	2,6,10,14,18,22-Tetracosahexaene	6.4

Appendix Table 5 (cont.).

Site (RM)	*Compound	Concentration (mg/kg)
East Fork Mill Creek		
17.95; 0.1	Nonacosane	16.0
	Triacontane	8.8
	Stigmast-5-EN-3-OL,	4.1
	URS-12-EN-3-OL	4.9
Winton Ridge Tributary		
6.85; 1.81	*Benzo [B&K] Fluoranthene*	*0.8*
	DI-N-Butyl Phthalate	*0.7*
	Fluoranthene	0.6
	A-Friedooleanan-3-ONE	1.1

* Volatile organic compounds (priority) **bold** print, semivolatile organic compounds (priority) *italicized*. Compounds in plain text are non-priority organic compounds.

DL-Detection limit taking into account Method Detection Limit and sample dilution

Appendix Table 6. Spills to tributaries of Mill Creek, 1988-1992.

Date	Entity	Location	Stream	Material	Quantity
06-12-88	Procter & Gamble	Cin.	Mill Ck trib.	chemicals/suds	unknown
07-27-88	Borden Chemical	Cin.	"	Toluene	500 gallon
11-05-88	Chemicals Inc.	Loclland	"	sulfuric acid	400 gallon
12-08-88	G.E /Aircraft	Evendale	"	PCB oil	unknown
08-14-89	G.E	Evendale	"	sewage	"
12-06-89	G.E	Evendale	*E.Fork Mill Ck	oil	5000 gallon
02-08-90	Chemicals Inc.	Lockland	W.F.Mill Ck	emulsifier	600 gallon
07-18-90	G.E	Evendale	*E.F. Mill Ck	lime sludge	unknown
11-08-90	MSD	Cin.	Bloody Run	sewage	"
12-12-90	MSD	Wyoming	Mill Ck trib.	sewage	"
08-01-91	MSD	Elmwood	Bloody Run	blue/grn dye	"
04-02-91	MSD	Colerain	W. Wood trib.	fluorescene dye	"
04-06-91	MSD	Reading	Mill Ck trib.	sewage	"
06-26-91	MSD	Evendale	"	oil	"
08-13-91	G.E	Evendale	"	oil	"
11-21-91	MSD	Gest St.	"	sewage	"
11-30-91	MSD	Kellogg Ave.	"	sewage	"
12-03-91	Henkle-Emery Ind.	Este Ave.	"	wastewater	"
01-17-92	MSD	Gest St.	"	sewage	"
02-11-92	Henkle-Emery Ind.	Este Ave.	"	stearic acid	10 lbs.
03-10-92	G.E	Arlngtn Ave.	*E.F.Mill Ck	waste material	unknown
04-23-92	Borden Packaging	Woodlawn	W.F.Mill Ck	wastewater	"
05-08-92	Phthalchem	St. Bernard	Mill Ck trib.	green material	"
08-05-92	Borden Packaging	Woodlawn	"	wastewater	"
08-06-92	*Procter & Gamble*	*Spring Grove*	"	*wastewater*	*200 gallon*
08-10-92	G.E	Evendale	"	coolant	300 gallon
08-13-92	*MSD*	*Gest St.*	"	*foam*	*unknown*
08-24-92	MSD	Gest St.	"	sewage	unknown
09-03-92	*Xtec Inc.*	*Elmwood*	*Bloody Run*	*coolant*	*25 gallon*
09-11-92	G.E	Evendale	"	Trimsol	200 gallon
09-30-92	MSD	Garden Hills	"	sewage	unknown

italicized/underlined spills occurred on Ohio EPA survey days.
* due to misnaming of county maps confusion regarding stream names occurred. These sites are actually Mill Creek.

Appendix Table 6 (cont.) Spills to Mill Creek mainstem, 1988-1992.

Date	Entity	Location	Material	Quantity
02-10-88	MSD	Reading	sewage	unknown
02-19-88	Borden Packaging	Glendale/Milford	oil/carbon black	"
03-06-88	G.E/Aircraft	Evendale	sewage	50 gallon
04-12-88	Chemicals Inc.	Lockland	caustic soda	unknown
07-20-88	Henkle-Emery Ind.	Este Ave.	green material	"
08-06-88	Phthalchem	St. Bernard	blue material	"
10-03-88	Chemicals Inc.	Lockland	aqua ammonia	300 gallon
11-02-88	Henkle-Emery Ind.	Este Ave.	hydrocarbon	"
01-23-89	MSD	Cin.	sewage	"
02-21-89	G.E	Evendale	oil/grease	"
05-04-89	MSD	Cin.	sewage	"
07-07-89	Phthalchem	St. Bernard	ammonia	"
08-29-89	MSD	St. Bernard	sewage	"
11-22-89	G.E	Evendale	jet fuel	100 gallon
12-29-89	MSD	Cin.	sewage	2 mil. gallon
01-30-90	MSD	Cin.	sewage	unknown
01-30-90	MSD	Cin.	sewage	"
02-02-90	MSD	Cin.	sewage	"
02-19-90	Procter & Gamble	Cin.	unknown	"
04-10-90	MSD	Cin.	sewage	"
06-13-90	MSD	Galbraith	sewage	"
07-10-90	Procter & Gamble	"	sewage	"
08-29-90	MSD	Cin.	sewage	"
09-27-90	Chemicals Inc.	Shepherd Dr.	Benzene	"
11-10-90	MSD	Gest St.	sewage	"
11-17-90	MSD	Gest St.	foam	1000 gallon
11-19-90	MSD	Gest St.	foam	unknown
11-30-90	MSD	Gest St.	Iron Chloride	25 gallon
12-01-90	Procter & Gamble	Spring Grove	discolored water	unknown
12-04-90	Procter & Gamble	Spring Grove	acidic material	"
12-14-90	MSD	Gest St.	sewage	"
12-20-90	MSD	Cin.	sewage	"
01-01-91	Henkle-Emery Ind.	Este Ave.	sewage	"
01-28-91	MSD	Gest St	fuel oil	300 gallon
03-22-91	MSD	Este Ave.	sewage	unknown
04-13-91	MSD	Gest St.	sewage	"
04-19-91	MSD	Cin.	sewage	"
04-23-91	Borden Packaging	Glendale/Milford	carbon black	"
06-14-91	G.E	Evendale	oil	"
07-12-91	Henkle-Emery Ind.	Este Ave.	sewage	5000 gallon
07-16-91	"	Este Ave.	sewage	500 gallon
07-16-91	G.E	Cin.	oil	onknown
07-26-91	Procter & Gamble	Spring Grove	surfactant paste	25 gallon

Appendix Table 6 (cont.). Spills to Mill Creek mainstem, 1988-1992.

Date	Entity	Location	Material	Quantity
08-14-91	MSD	Gest St.	foam	unknown
08-14-91	MSD	Gest St.	chlorine	"
08-19-91	MSD	St. Bernard	sewage	"
09-04-91	MSD	"	sewage	"
11-27-91	MSD	Gest St.	sewage	"
11-28-91	MSD	Gest St.	chlorine	"
12-07-91	Procter & Gamble	Spring Grove	grease	"
12-11-91	MSD	Gest St.	treated effluent	"
12-23-91	MSD	Gest St.	chlorine	"
01-01-92	Henkle-Emery Ind.	Este Ave.	coating/solvent	"
03-13-92	G.E	Evendale	red dye	"

Appendix Table 7. Catch Summary for fish collected at each location (by RM) sampled during the 1992 Mill Creek biological and water quality survey.

Species	Stream Code:	23001	23001	23001	23001	23001
	Year:	92	92	92	92	92
	River Mile:	.3	3.1	5.1	7.8	8.7
SILVER LAMPREY		1.1	-	-	-	-
GIZZARD SHAD		275.6	-	-	0.8	-
BLACK BUFFALO		8.5	-	-	-	-
SMALLMOUTH BUFFALO		4.3	-	-	-	-
QUILLBACK CARPSUCKER		2.1	-	-	-	-
RIVER CARPSUCKER		10.6	-	-	-	-
WHITE SUCKER		-	-	1.5	6.8	2.1
COMMON CARP		11.7	2.3	-	6.0	0.7
GOLDFISH		-	-	0.8	3.8	-
GOLDEN SHINER		-	-	-	-	-
BLACKNOSE DACE		-	-	-	3.0	0.7
CREEK CHUB		-	0.8	2.3	0.8	3.6
SOUTH. REDBELLY DACE		-	-	-	-	-
EMERALD SHINER		-	1.5	-	-	-
STRIPED SHINER		-	-	-	19.5	2.1
SPOTFIN SHINER		-	1.5	63.0	93.8	213.5
SILVERJAW MINNOW		-	-	-	-	-
FATHEAD MINNOW		-	-	0.8	-	-
BLUNTNOSE MINNOW		-	8.3	69.0	102.0	114.2
CENTRAL STONEROLLER		-	-	1.5	101.3	27.9
CHANNEL CATFISH		1.1	1.5	-	2.3	-
YELLOW BULLHEAD		-	11.3	9.8	87.8	6.4
STR. BASS X WH. BASS		4.3	1.5	-	-	-
WHITE CRAPPIE		-	-	-	-	-
LARGEMOUTH BASS		-	-	-	-	-
GREEN SUNFISH		-	3.0	27.8	140.3	44.3
BLUEGILL SUNFISH		2.1	-	-	0.8	-
LONGEAR SUNFISH		-	-	-	3.0	1.4
GREEN SF X BLUEGILL		-	-	-	-	-
GREEN SF X LONGEAR		-	-	-	-	-
GREEN SF X HYBRID		-	-	-	0.8	-
HYBRID X SUNFISH		-	-	-	-	-
WALLEYE		1.1	-	-	-	-
JOHNNY DARTER		-	-	-	-	-
ORANGETHROAT DARTER		-	-	-	-	1.4
FRESHWATER DRUM		4.3	-	-	-	-
Total Relative Number		326.6	31.5	176.2	572.2	418.4
Total Number of Species		11	8	9	15	12
Total Number of Hybrids		1	1		1	
Distance Sampled		.94	.40	.40	.40	.42
Number of Passes		2	2	2	2	2

Appendix Table 7. continued

Species	Stream Code:	23001	23001	23001	23001	23001
	Year:	92	92	92	92	92
	River Mile:	13.2	14.8	16.5	17.6	19.1
SILVER LAMPREY		-	-	-	-	-
GIZZARD SHAD		-	-	-	-	-
BLACK BUFFALO		-	-	-	-	-
SMALLMOUTH BUFFALO		-	-	-	-	-
QUILLBACK CARPSUCKER		-	-	-	-	-
RIVER CARPSUCKER		-	-	-	-	-
WHITE SUCKER		-	5.3	35.3	103.5	129.4
COMMON CARP		-	4.5	14.3	4.5	5.6
GOLDFISH		-	-	-	-	-
GOLDEN SHINER		-	-	-	-	-
BLACKNOSE DACE		1.4	-	0.8	9.0	45.0
CREEK CHUB		1.4	15.8	8.3	121.5	427.7
SOUTH. REDBELLY DACE		-	-	-	-	-
EMERALD SHINER		-	-	-	-	-
STRIPED SHINER		0.7	2.3	24.8	12.0	125.7
SPOTFIN SHINER		27.3	24.8	29.3	-	-
SILVERJAW MINNOW		-	-	2.3	3.0	15.0
FATHEAD MINNOW		2.7	0.8	0.8	60.0	9.4
BLUNTNOSE MINNOW		15.7	9.8	28.5	6.0	37.5
CENTRAL STONEROLLER		28.0	6.0	13.5	238.5	339.6
CHANNEL CATFISH		-	-	-	-	-
YELLOW BULLHEAD		49.8	38.3	47.3	7.5	18.8
STR. BASS X WH. BASS		-	-	-	-	-
WHITE CRAPPIE		-	-	1.5	-	-
LARGEMOUTH BASS		-	-	1.5	4.5	3.8
GREEN SUNFISH		57.3	87.0	27.0	27.0	76.9
BLUEGILL SUNFISH		2.7	6.0	12.0	3.0	15.0
LONGEAR SUNFISH		-	-	-	-	-
GREEN SF X BLUEGILL		-	1.5	0.8	-	5.6
GREEN SF X LONGEAR		-	-	-	-	-
GREEN SF X HYBRID		-	-	1.5	-	-
HYBRID X SUNFISH		-	-	-	-	-
WALLEYE		-	-	-	-	-
JOHNNY DARTER		-	-	-	-	13.1
ORANGETHROAT DARTER		-	0.8	0.8	33.0	3.8
FRESHWATER DRUM		-	-	-	-	-
Total Relative Number		186.8	202.5	249.7	633.0	1271.9
Total Number of Species		10	12	16	14	15
Total Number of Hybrids		0	1	2		1
Distance Sampled		.44	.40	.40	.40	.32
Number of Passes		2	2	2	2	2

Appendix Table 7. continued

Species	Stream Code:	23001	23004	23004	23004	23004
	Year:	92	92	92	92	92
	River Mile:	26.4	.2	1.1	2.0	4.5
SILVER LAMPREY		-	-	-	-	-
GIZZARD SHAD		-	-	-	-	10.0
BLACK BUFFALO		-	-	-	-	-
SMALLMOUTH BUFFALO		-	-	-	-	-
QUILLBACK CARPSUCKER		-	-	-	-	-
RIVER CARPSUCKER		-	-	-	-	-
WHITE SUCKER		37.5	213.0	32.0	434.0	20.0
COMMON CARP		-	-	-	-	28.0
GOLDFISH		-	-	-	-	-
GOLDEN SHINER		-	9.0	28.0	34.0	2.0
BLACKNOSE DACE		270.0	-	32.0	62.0	-
CREEK CHUB		682.5	48.0	166.0	504.0	136.0
SOUTH. REDBELLY DACE		60.0	-	-	-	-
EMERALD SHINER		-	-	-	-	-
STRIPED SHINER		5.0	6.0	4.0	54.0	14.0
SPOTFIN SHINER		-	180.0	14.0	2.0	2.0
SILVERJAW MINNOW		45.0	-	-	8.0	4.0
FATHEAD MINNOW		-	-	-	-	-
BLUNTNOSE MINNOW		40.0	660.0	342.0	876.0	478.0
CENTRAL STONEROLLER		427.5	411.0	300.0	11.4	262.0
CHANNEL CATFISH		-	-	-	-	2.0
YELLOW BULLHEAD		10.0	-	-	4.0	4.0
STR. BASS X WH. BASS		-	-	-	-	-
WHITE CRAPPIE		-	-	-	-	-
LARGEMOUTH BASS		-	-	-	-	4.0
GREEN SUNFISH		7.5	3.0	78.0	76.0	220.0
BLUEGILL SUNFISH		2.5	-	-	-	14.0
LONGEAR SUNFISH		-	-	16.0	32.0	302.0
GREEN SF X BLUEGILL		-	-	-	-	-
GREEN SF X LONGEAR		-	-	-	-	2.0
GREEN SF X HYBRID		-	-	-	2.0	4.0
HYBRID X SUNFISH		-	-	-	-	6.0
WALLEYE		-	-	-	-	-
JOHNNY DARTER		22.5	-	-	-	-
ORANGETHROAT DARTER		142.5	-	-	-	-
FRESHWATER DRUM		-	-	-	-	-
Total Relative Number		1752.5	1530.0	1012.0	3252.0	1514.0
Total Number of Species		13	8	10	12	16
Total Number of Hybrids		0			1	3
Distance Sampled		.24	.20	.30	.30	.30
Number of Passes		2	2	2	2	2

Appendix Table 7. continued

Species	Stream Code:	23005	23006	23006	23006	23006
	Year:	92	92	92	92	92
	River Mile:	.2	.3	.8	1.9	3.8
SILVER LAMPREY		-	-	-	-	-
GIZZARD SHAD		-	-	-	-	-
BLACK BUFFALO		-	-	-	-	-
SMALLMOUTH BUFFALO		-	-	-	-	-
QUILLBACK CARPSUCKER		-	-	-	-	-
RIVER CARPSUCKER		-	-	-	-	-
WHITE SUCKER		2.0	40.0	21.0	102.0	-
COMMON CARP		-	-	-	-	-
GOLDFISH		-	-	-	-	-
GOLDEN SHINER		-	-	-	-	-
BLACKNOSE DACE		170.0	16.0	7.5	120.0	60.0
CREEK CHUB		312.0	228.0	16.5	332.0	72.0
SOUTH. REDBELLY DACE		-	-	-	-	2.0
EMERALD SHINER		-	-	-	-	-
STRIPED SHINER		22.0	8.0	-	180.0	6.0
SPOTFIN SHINER		2.0	-	-	-	-
SILVERJAW MINNOW		10.0	-	-	14.0	-
FATHEAD MINNOW		-	80.0	4.5	-	-
BLUNTNOSE MINNOW		100.0	-	-	154.0	-
CENTRAL STONEROLLER		270.0	252.0	82.5	26.2	262.0
CHANNEL CATFISH		-	-	-	-	-
YELLOW BULLHEAD		10.0	-	3.0	-	-
STR. BASS X WH. BASS		-	-	-	-	-
WHITE CRAPPIE		-	-	-	-	-
LARGEMOUTH BASS		8.0	-	-	28.0	1.0
GREEN SUNFISH		4.0	12.0	42.0	82.0	9.0
BLUEGILL SUNFISH		6.0	32.0	3.0	-	1.0
LONGEAR SUNFISH		-	-	-	-	-
GREEN SF X BLUEGILL		-	-	-	-	-
GREEN SF X LONGEAR		-	-	-	-	-
GREEN SF X HYBRID		2.0	-	-	-	-
HYBRID X SUNFISH		-	-	-	4.0	-
WALLEYE		-	-	-	-	-
JOHNNY DARTER		-	-	-	20.0	-
ORANGETHROAT DARTER		4.0	8.0	31.5	432.0	169.0
FRESHWATER DRUM		-	-	-	-	-
Total Relative Number		922.0	676.0	211.5	4090.0	582.0
Total Number of Species		13	9	9	11	9
Total Number of Hybrids		1			1	
Distance Sampled		.30	.15	.40	.30	.30
Number of Passes		2	1	2	2	2

Appendix Table 7. continued

Species	Stream Code: / Year: / River Mile:	23006 / 92 / 4.7				
SILVER LAMPREY		-	-	-	-	-
GIZZARD SHAD		-	-	-	-	-
BLACK BUFFALO		-	-	-	-	-
SMALLMOUTH BUFFALO		-	-	-	-	-
QUILLBACK CARPSUCKER		-	-	-	-	-
RIVER CARPSUCKER		-	-	-	-	-
WHITE SUCKER		7.0	-	-	-	-
COMMON CARP		-	-	-	-	-
GOLDFISH		-	-	-	-	-
GOLDEN SHINER		-	-	-	-	-
BLACKNOSE DACE		100.0	-	-	-	-
CREEK CHUB		47.0	-	-	-	-
SOUTH. REDBELLY DACE		-	-	-	-	-
EMERALD SHINER		-	-	-	-	-
STRIPED SHINER		3.0	-	-	-	-
SPOTFIN SHINER		-	-	-	-	-
SILVERJAW MINNOW		-	-	-	-	-
FATHEAD MINNOW		1.0	-	-	-	-
BLUNTNOSE MINNOW		-	-	-	-	-
CENTRAL STONEROLLER		379.0	-	-	-	-
CHANNEL CATFISH		-	-	-	-	-
YELLOW BULLHEAD		-	-	-	-	-
STR. BASS X WH. BASS		-	-	-	-	-
WHITE CRAPPIE		-	-	-	-	-
LARGEMOUTH BASS		3.0	-	-	-	-
GREEN SUNFISH		41.0	-	-	-	-
BLUEGILL SUNFISH		-	-	-	-	-
LONGEAR SUNFISH		-	-	-	-	-
GREEN SF X BLUEGILL		-	-	-	-	-
GREEN SF X LONGEAR		-	-	-	-	-
GREEN SF X HYBRID		-	-	-	-	-
HYBRID X SUNFISH		-	-	-	-	-
WALLEYE		-	-	-	-	-
JOHNNY DARTER		-	-	-	-	-
ORANGETHROAT DARTER		89.0	-	-	-	-
FRESHWATER DRUM		-	-	-	-	-
Total Relative Number		670.0				
Total Number of Species		9				
Total Number of Hybrids		0				
Distance Sampled		.30				
Number of Passes		2				

Appendix Table 8. Ohio EPA Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 09/08/92 River Code: 23-001 River: Mill Creek RM: .30

Taxa Code	Taxa	Quan/Qual
03600	*Oligochaeta*	0 +
04964	*Mooreobdella microstoma*	0 +
22001	*Coenagrionidae*	0 +
83051	*Dicrotendipes simpsoni*	0 +
84470	*Polypedilum (P.) illinoense*	0 +

Taxa Code	Taxa	Quan/Qual

No. Quantitative Taxa: 0 Total Taxa: 5
No. Qualitative Taxa: 5 ICI:

Appendix Table 8. Ohio EPA Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 09/04/92 River Code: 23-001 River: Mill Creek RM: 3.10

Taxa Code	Taxa	Quan/Qual	Taxa Code	Taxa	Quan/Qual
03600	*Oligochaeta*	0 +			
04964	*Mooreobdella microstoma*	0 +			
08250	*Orconectes (Procericambarus) rusticus*	0 +			
84470	*Polypedilum (P.) illinoense*	0 +			

No. Quantitative Taxa: 0 Total Taxa: 4
No. Qualitative Taxa: 4 ICI:

Appendix Table 8.

Ohio EPA Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 09/04/92 River Code: 23-001 River: Mill Creek RM: 5.10

Taxa Code	Taxa	Quan/Qual
03600	*Oligochaeta*	0 +
04962	*Mooreobdella fervida*	0 +
22001	*Coenagrionidae*	0 +
28955	*Plathemis lydia*	0 +
60300	*Dineutus sp*	0 +
60910	*Peltodytes edentulus*	0 +
69930	*Lampyridae*	0 +
77500	*Conchapelopia sp*	0 +
78650	*Procladius sp*	0 +
80420	*Cricotopus (C.) bicinctus*	0 +
82820	*Cryptochironomus sp*	0 +
84470	*Polypedilum (P.) illinoense*	0 +
94400	*Fossaria sp*	0 +
95100	*Physella sp*	0 +

Taxa Code	Taxa	Quan/Qual

No. Quantitative Taxa: 0 Total Taxa: 14
No. Qualitative Taxa: 14 ICI:

Appendix Table 8. Ohio EPA Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 09/04/92 River Code: 23-001 River: Mill Creek RM: 7.80

Taxa Code	Taxa	Quan/Qual
01801	*Turbellaria*	0 +
03600	*Oligochaeta*	0 +
04901	*Erpobdellidae*	0 +
08250	*Orconectes (Procericambarus) rusticus*	0 +
08601	*Hydracarina*	0 +
11120	*Baetis flavistriga*	0 +
11130	*Baetis intercalaris*	0 +
22001	*Coenagrionidae*	0 +
22300	*Argia sp*	0 +
77750	*Hayesomyia senata or Thienemannimyia norena*	0 +
80420	*Cricotopus (C.) bicinctus*	0 +
80430	*Cricotopus (C.) tremulus group*	0 +
82820	*Cryptochironomus sp*	0 +
83040	*Dicrotendipes neomodestus*	0 +
84470	*Polypedilum (P.) illinoense*	0 +

Taxa Code	Taxa	Quan/Qual

No. Quantitative Taxa: 0 Total Taxa: 15
No. Qualitative Taxa: 15 ICI:

Appendix Table 8. Ohio EPA Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 09/08/92 River Code: 23-001 River: Mill Creek RM: 8.70

Taxa Code	Taxa	Quan/Qual
03360	*Plumatella sp*	0 +
03600	*Oligochaeta*	0 +
04964	*Mooreobdella microstoma*	0 +
05900	*Lirceus sp*	0 +
08601	*Hydracarina*	0 +
22001	*Coenagrionidae*	0 +
22300	*Argia sp*	0 +
52540	*Hydropsyche (H.) dicantha*	0 +
53800	*Hydroptila sp*	0 +
65800	*Berosus sp*	0 +
69400	*Stenelmis sp*	0 +
71300	*Limonia sp*	0 +
71900	*Tipula sp*	0 +
74501	*Ceratopogonidae*	0 +
77500	*Conchapelopia sp*	0 +
80420	*Cricotopus (C.) bicinctus*	0 +
80430	*Cricotopus (C.) tremulus group*	0 +
84470	*Polypedilum (P.) illinoense*	0 +
87501	*Empididae*	0 +
96900	*Ferrissia sp*	0 +

Taxa Code	Taxa	Quan/Qual

No. Quantitative Taxa: 0 Total Taxa: 20
No. Qualitative Taxa: 20 ICI:

Appendix Table 8. Ohio EPA Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 09/03/92 River Code: 23-001 River: Mill Creek RM: 13.30

Taxa Code	Taxa	Quan/Qual
01801	*Turbellaria*	0 +
03600	*Oligochaeta*	0 +
04962	*Mooreobdella fervida*	0 +
04964	*Mooreobdella microstoma*	0 +
22001	*Coenagrionidae*	0 +
22300	*Argia sp*	0 +
28955	*Plathemis lydia*	0 +
71900	*Tipula sp*	0 +
77500	*Conchapelopia sp*	0 +
78401	*Natarsia species A (sensu Roback, 1978)*	0 +
80420	*Cricotopus (C.) bicinctus*	0 +
84470	*Polypedilum (P.) illinoense*	0 +

Taxa Code	Taxa	Quan/Qual

No. Quantitative Taxa: 0 Total Taxa: 12
No. Qualitative Taxa: 12 ICI:

Appendix Table 8. Ohio EPA Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 09/03/92 River Code: 23-001 River: Mill Creek RM: 14.80

Taxa Code	Taxa	Quan/Qual	Taxa Code	Taxa	Quan/Qual
03600	*Oligochaeta*	0 +			
04962	*Mooreobdella fervida*	0 +			
04964	*Mooreobdella microstoma*	0 +			
05900	*Lirceus sp*	0 +			
06730	*Crangonyx setodactylus*	0 +			
11120	*Baetis flavistriga*	0 +			
17200	*Caenis sp*	0 +			
65800	*Berosus sp*	0 +			
69400	*Stenelmis sp*	0 +			
71900	*Tipula sp*	0 +			
74100	*Simulium sp*	0 +			
77500	*Conchapelopia sp*	0 +			
80420	*Cricotopus (C.) bicinctus*	0 +			
81240	*Nanocladius (N.) distinctus*	0 +			
82820	*Cryptochironomus sp*	0 +			
84315	*Phaenopsectra flavipes*	0 +			
84470	*Polypedilum (P.) illinoense*	0 +			
96900	*Ferrissia sp*	0 +			

No. Quantitative Taxa: 0 Total Taxa: 18
No. Qualitative Taxa: 18 ICI:

Appendix Table 8. Ohio EPA Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 08/02/92 River Code: 23-001 River: Mill Creek RM: 16.60

Taxa Code	Taxa	Quan/Qual
01801	*Turbellaria*	0 +
03600	*Oligochaeta*	0 +
04664	*Helobdella stagnalis*	0 +
04666	*Helobdella triserialis*	0 +
04687	*Placobdella parasitica*	0 +
04962	*Mooreobdella fervida*	0 +
04964	*Mooreobdella microstoma*	0 +
11120	*Baetis flavistriga*	0 +
11200	*Callibaetis sp*	0 +
13521	*Stenonema femoratum*	0 +
22001	*Coenagrionidae*	0 +
66500	*Enochrus sp*	0 +
74100	*Simulium sp*	0 +
77500	*Conchapelopia sp*	0 +
80420	*Cricotopus (C.) bicinctus*	0 +
80430	*Cricotopus (C.) tremulus group*	0 +
83040	*Dicrotendipes neomodestus*	0 +
83300	*Glyptotendipes (Phytotendipes) sp*	0 +
315	*Phaenopsectra flavipes*	0 +
84470	*Polypedilum (P.) illinoense*	0 +
95100	*Physella sp*	0 +

Taxa Code	Taxa	Quan/Qual

No. Quantitative Taxa: 0 Total Taxa: 21
No. Qualitative Taxa: 21 ICI:

Appendix Table 8. Ohio EPA Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 09/14/92 River Code: 23-001 River: Mill Creek RM: 17.60

Taxa Code	Taxa	Quan/Qual
03600	*Oligochaeta*	0 +
04664	*Helobdella stagnalis*	0 +
04964	*Mooreobdella microstoma*	0 +
08250	*Orconectes (Procericambarus) rusticus*	0 +
11120	*Baetis flavistriga*	0 +
13400	*Stenacron sp*	0 +
13520	*Stenonema femoratum group*	0 +
17200	*Caenis sp*	0 +
22001	*Coenagrionidae*	0 +
22300	*Argia sp*	0 +
47600	*Sialis sp*	0 +
52200	*Cheumatopsyche sp*	0 +
60900	*Peltodytes sp*	0 +
65800	*Berosus sp*	0 +
67700	*Paracymus sp*	0 +
69400	*Stenelmis sp*	0 +
74100	*Simulium sp*	0 +
77120	*Ablabesmyia mallochi*	0 +
77500	*Conchapelopia sp*	0 +
78350	*Meropelopia sp*	0 +
80410	*Cricotopus (C.) sp*	0 +
80420	*Cricotopus (C.) bicinctus*	0 +
80430	*Cricotopus (C.) tremulus group*	0 +
82730	*Chironomus (C.) decorus group*	0 +
82820	*Cryptochironomus sp*	0 +
84210	*Paratendipes albimanus*	0 +
84470	*Polypedilum (P.) illinoense*	0 +
84540	*Polypedilum (Tripodura) scalaenum group*	0 +
95100	*Physella sp*	0 +

Taxa Code	Taxa	Quan/Qual

No. Quantitative Taxa: 0 Total Taxa: 29
No. Qualitative Taxa: 29 ICI:

Appendix Table 8. Ohio EPA Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 08/26/92 River Code: 23-001 River: Mill Creek RM: 19.10

Taxa Code	Taxa	Quan/Qual	Taxa Code	Taxa	Quan/Qual
02600	*Nematomorpha*	0 +			
04685	*Placobdella ornata*	0 +			
04962	*Mooreobdella fervida*	0 +			
05900	*Lirceus sp*	0 +			
06700	*Crangonyx sp*	0 +			
08250	*Orconectes (Procericambarus) rusticus*	0 +			
11120	*Baetis flavistriga*	0 +			
11130	*Baetis intercalaris*	0 +			
11200	*Callibaetis sp*	0 +			
13000	*Leucrocuta sp*	0 +			
13520	*Stenonema femoratum group*	0 +			
22001	*Coenagrionidae*	0 +			
22300	*Argia sp*	0 +			
47600	*Sialis sp*	0 +			
52200	*Cheumatopsyche sp*	0 +			
52530	*Hydropsyche (H.) depravata group*	0 +			
60900	*Peltodytes sp*	0 +			
68130	*Helichus sp*	0 +			
708	*Dubiraphia vittata group*	0 +			
69400	*Stenelmis sp*	0 +			
74100	*Simulium sp*	0 +			
77500	*Conchapelopia sp*	0 +			
77750	*Hayesomyia senata or Thienemannimyia norena*	0 +			
77800	*Helopelopia sp*	0 +			
80420	*Cricotopus (C.) bicinctus*	0 +			
80430	*Cricotopus (C.) tremulus group*	0 +			
82820	*Cryptochironomus sp*	0 +			
84210	*Paratendipes albimanus*	0 +			
84450	*Polypedilum (P.) convictum*	0 +			
84470	*Polypedilum (P.) illinoense*	0 +			
84540	*Polypedilum (Tripodura) scalaenum group*	0 +			
84612	*Saetheria tylus*	0 +			
85230	*Cladotanytarsus mancus group*	0 +			
95100	*Physella sp*	0 +			
98600	*Sphaerium sp*	0 +			

No. Quantitative Taxa: 0 Total Taxa: 35
No. Qualitative Taxa: 35 ICI:

Appendix Table 8. Ohio EPA Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 09/04/92 River Code: 23-001 River: Mill Creek RM: 26.40

Taxa Code	Taxa	Quan/Qual
03600	*Oligochaeta*	0 +
04964	*Mooreobdella microstoma*	0 +
05900	*Lirceus sp*	0 +
06700	*Crangonyx sp*	0 +
06904	*Synurella dentata*	0 +
08250	*Orconectes (Procericambarus) rusticus*	0 +
11120	*Baetis flavistriga*	0 +
11200	*Callibaetis sp*	0 +
13521	*Stenonema femoratum*	0 +
17200	*Caenis sp*	0 +
21200	*Calopteryx sp*	0 +
22300	*Argia sp*	0 +
52200	*Cheumatopsyche sp*	0 +
52530	*Hydropsyche (H.) depravata group*	0 +
60900	*Peltodytes sp*	0 +
63300	*Hydroporus sp*	0 +
67700	*Paracymus sp*	0 +
67800	*Tropisternus sp*	0 +
68025	*Ectopria nervosa*	0 +
68708	*Dubiraphia vittata group*	0 +
71900	*Tipula sp*	0 +
72700	*Anopheles sp*	0 +
74100	*Simulium sp*	0 +
77120	*Ablabesmyia mallochi*	0 +
77500	*Conchapelopia sp*	0 +
80351	*Corynoneura n.sp 1*	0 +
80370	*Corynoneura lobata*	0 +
80420	*Cricotopus (C.) bicinctus*	0 +
80430	*Cricotopus (C.) tremulus group*	0 +
81460	*Orthocladius (O.) sp*	0 +
81650	*Parametriocnemus sp*	0 +
81825	*Rheocricotopus (Psilocricotopus) robacki*	0 +
82141	*Thienemanniella xena*	0 +
82730	*Chironomus (C.) decorus group*	0 +
82820	*Cryptochironomus sp*	0 +
83003	*Dicrotendipes fumidus*	0 +
84210	*Paratendipes albimanus*	0 +
84450	*Polypedilum (P.) convictum*	0 +
84470	*Polypedilum (P.) illinoense*	0 +
84540	*Polypedilum (Tripodura) scalaenum group*	0 +
85800	*Tanytarsus sp*	0 +
85814	*Tanytarsus glabrescens group*	0 +
85840	*Tanytarsus guerlus group*	0 +
89700	*Limnophora sp*	0 +
95100	*Physella sp*	0 +

No. Quantitative Taxa: 0 Total Taxa: 45
No. Qualitative Taxa: 45 ICI:

Appendix Table 8. Ohio EPA Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 09/15/92 River Code: 23-004 River: West Fork Mill Creek (Upstream) RM: .20

Taxa Code	Taxa	Quan/Qual
01801	*Turbellaria*	0 +
03600	*Oligochaeta*	0 +
04962	*Mooreobdella fervida*	0 +
04964	*Mooreobdella microstoma*	0 +
06700	*Crangonyx sp*	0 +
08250	*Orconectes (Procericambarus) rusticus*	0 +
11120	*Baetis flavistriga*	0 +
13400	*Stenacron sp*	0 +
13521	*Stenonema femoratum*	0 +
17200	*Caenis sp*	0 +
22001	*Coenagrionidae*	0 +
22300	*Argia sp*	0 +
66500	*Enochrus sp*	0 +
68075	*Psephenus herricki*	0 +
69400	*Stenelmis sp*	0 +
77120	*Ablabesmyia mallochi*	0 +
77500	*Conchapelopia sp*	0 +
80410	*Cricotopus (C.) sp*	0 +
420	*Cricotopus (C.) bicinctus*	0 +
80430	*Cricotopus (C.) tremulus group*	0 +
82141	*Thienemanniella xena*	0 +
82820	*Cryptochironomus sp*	0 +
83040	*Dicrotendipes neomodestus*	0 +
84470	*Polypedilum (P.) illinoense*	0 +
84540	*Polypedilum (Tripodura) scalaenum group*	0 +

Taxa Code	Taxa	Quan/Qual

No. Quantitative Taxa: 0 Total Taxa: 25
No. Qualitative Taxa: 25 ICI:

Appendix Table 8. Ohio EPA Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 09/15/92 River Code: 23-004 River: West Fork Mill Creek (Upstream) RM: 1.00

Taxa Code	Taxa	Quan/Qual
01801	*Turbellaria*	0 +
03600	*Oligochaeta*	0 +
04962	*Mooreobdella fervida*	0 +
04964	*Mooreobdella microstoma*	0 +
08250	*Orconectes (Procericambarus) rusticus*	0 +
11120	*Baetis flavistriga*	0 +
13400	*Stenacron sp*	0 +
13521	*Stenonema femoratum*	0 +
17200	*Caenis sp*	0 +
69400	*Stenelmis sp*	0 +
74100	*Simulium sp*	0 +
77120	*Ablabesmyia mallochi*	0 +
77500	*Conchapelopia sp*	0 +
77750	*Hayesomyia senata or Thienemannimyia norena*	0 +
80420	*Cricotopus (C.) bicinctus*	0 +
81240	*Nanocladius (N.) distinctus*	0 +
81270	*Nanocladius (N.) spiniplenus*	0 +
82141	*Thienemanniella xena*	0 +
82820	*Cryptochironomus sp*	0 +
84470	*Polypedilum (P.) illinoense*	0 +
84540	*Polypedilum (Tripodura) scalaenum group*	0 +
85814	*Tanytarsus glabrescens group*	0 +
98600	*Sphaerium sp*	0 +

Taxa Code	Taxa	Quan/Qual

No. Quantitative Taxa: 0 Total Taxa: 23
No. Qualitative Taxa: 23 ICI:

Appendix Table 8. Ohio EPA Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 09/15/92 River Code: 23-004 River: West Fork Mill Creek (Upstream) RM: 2.00

Taxa Code	Taxa	Quan/Qual	Taxa Code	Taxa	Quan/Qual
01801	*Turbellaria*	0 +			
03600	*Oligochaeta*	0 +			
04962	*Mooreobdella fervida*	0 +			
04964	*Mooreobdella microstoma*	0 +			
08250	*Orconectes (Procericambarus) rusticus*	0 +			
11120	*Baetis flavistriga*	0 +			
13400	*Stenacron sp*	0 +			
13520	*Stenonema femoratum group*	0 +			
22001	*Coenagrionidae*	0 +			
22300	*Argia sp*	0 +			
69400	*Stenelmis sp*	0 +			
77120	*Ablabesmyia mallochi*	0 +			
80420	*Cricotopus (C.) bicinctus*	0 +			
82141	*Thienemanniella xena*	0 +			
83040	*Dicrotendipes neomodestus*	0 +			
84540	*Polypedilum (Tripodura) scalaenum group*	0 +			
98600	*Sphaerium sp*	0 +			

No. Quantitative Taxa: 0 Total Taxa: 17
No. Qualitative Taxa: 17 ICI:

Appendix Table 8. Ohio EPA Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 09/15/92 River Code: 23-004 River: West Fork Mill Creek (Upstream) RM: 4.40

Taxa Code	Taxa	Quan/Qual
01801	*Turbellaria*	0 +
03600	*Oligochaeta*	0 +
04964	*Mooreobdella microstoma*	0 +
05900	*Lirceus sp*	0 +
06700	*Crangonyx sp*	0 +
08250	*Orconectes (Procericambarus) rusticus*	0 +
11120	*Baetis flavistriga*	0 +
13400	*Stenacron sp*	0 +
13521	*Stenonema femoratum*	0 +
17200	*Caenis sp*	0 +
22001	*Coenagrionidae*	0 +
22300	*Argia sp*	0 +
64800	*Uvarus sp*	0 +
68075	*Psephenus herricki*	0 +
69400	*Stenelmis sp*	0 +
71900	*Tipula sp*	0 +
74100	*Simulium sp*	0 +
77120	*Ablabesmyia mallochi*	0 +
79400	*Zavrelimyia sp*	0 +
80410	*Cricotopus (C.) sp*	0 +
80420	*Cricotopus (C.) bicinctus*	0 +
82141	*Thienemanniella xena*	0 +
82820	*Cryptochironomus sp*	0 +
83003	*Dicrotendipes fumidus*	0 +
83040	*Dicrotendipes neomodestus*	0 +
83300	*Glyptotendipes (Phytotendipes) sp*	0 +
84210	*Paratendipes albimanus*	0 +
84450	*Polypedilum (P.) convictum*	0 +
84470	*Polypedilum (P.) illinoense*	0 +
84540	*Polypedilum (Tripodura) scalaenum group*	0 +
85625	*Rheotanytarsus exiguus group*	0 +

Taxa Code	Taxa	Quan/Qual

No. Quantitative Taxa: 0 Total Taxa: 31
No. Qualitative Taxa: 31 ICI:

Appendix Table 8. Ohio EPA Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 09/15/92 River Code: 23-005 River: Sharon Creek RM: .30

Taxa Code	Taxa	Quan/Qual
01801	*Turbellaria*	0 +
05900	*Lirceus sp*	0 +
06700	*Crangonyx sp*	0 +
08250	*Orconectes (Procericambarus) rusticus*	0 +
11120	*Baetis flavistriga*	0 +
13400	*Stenacron sp*	0 +
13521	*Stenonema femoratum*	0 +
17200	*Caenis sp*	0 +
21200	*Calopteryx sp*	0 +
22001	*Coenagrionidae*	0 +
22300	*Argia sp*	0 +
47600	*Sialis sp*	0 +
52200	*Cheumatopsyche sp*	0 +
52315	*Diplectrona modesta*	0 +
52530	*Hydropsyche (H.) depravata group*	0 +
68025	*Ectopria nervosa*	0 +
68075	*Psephenus herricki*	0 +
69400	*Stenelmis sp*	0 +
900	*Tipula sp*	0 +
74100	*Simulium sp*	0 +
77120	*Ablabesmyia mallochi*	0 +
77500	*Conchapelopia sp*	0 +
78350	*Meropelopia sp*	0 +
80420	*Cricotopus (C.) bicinctus*	0 +
84470	*Polypedilum (P.) illinoense*	0 +
85814	*Tanytarsus glabrescens group*	0 +
85840	*Tanytarsus guerlus group*	0 +
95100	*Physella sp*	0 +
98200	*Pisidium sp*	0 +

Taxa Code	Taxa	Quan/Qual

No. Quantitative Taxa: 0 Total Taxa: 29
No. Qualitative Taxa: 29 ICI:

Appendix Table 8. Ohio EPA Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 09/14/92 River Code: 23-006 River: East Fork Mill Creek RM: .10

Taxa Code	Taxa	Quan/Qual
03600	*Oligochaeta*	0 +
04666	*Helobdella triserialis*	0 +
04935	*Erpobdella punctata punctata*	0 +
04964	*Mooreobdella microstoma*	0 +
06700	*Crangonyx sp*	0 +
13400	*Stenacron sp*	0 +
13521	*Stenonema femoratum*	0 +
17200	*Caenis sp*	0 +
21200	*Calopteryx sp*	0 +
22001	*Coenagrionidae*	0 +
22300	*Argia sp*	0 +
28208	*Erythemis simplicicollis*	0 +
28955	*Plathemis lydia*	0 +
47600	*Sialis sp*	0 +
52200	*Cheumatopsyche sp*	0 +
60900	*Peltodytes sp*	0 +
65800	*Berosus sp*	0 +
68075	*Psephenus herricki*	0 +
69400	*Stenelmis sp*	0 +
69930	*Lampyridae*	0 +
71900	*Tipula sp*	0 +
72700	*Anopheles sp*	0 +
74100	*Simulium sp*	0 +
77120	*Ablabesmyia mallochi*	0 +
77500	*Conchapelopia sp*	0 +
77800	*Helopelopia sp*	0 +
80204	*Brillia flavifrons group*	0 +
80420	*Cricotopus (C.) bicinctus*	0 +
82141	*Thienemanniella xena*	0 +
82730	*Chironomus (C.) decorus group*	0 +
82770	*Chironomus (C.) riparius group*	0 +
82820	*Cryptochironomus sp*	0 +
83003	*Dicrotendipes fumidus*	0 +
84210	*Paratendipes albimanus*	0 +
84450	*Polypedilum (P.) convictum*	0 +
84470	*Polypedilum (P.) illinoense*	0 +
85500	*Paratanytarsus sp*	0 +
95100	*Physella sp*	0 +

Taxa Code	Taxa	Quan/Qual

No. Quantitative Taxa: 0 Total Taxa: 38
No. Qualitative Taxa: 38 ICI:

Appendix Table 8. Ohio EPA Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 09/14/92 River Code: 23-006 River: East Fork Mill Creek RM: .80

Taxa Code	Taxa	Quan/Qual
03600	*Oligochaeta*	0 +
04666	*Helobdella triserialis*	0 +
04964	*Mooreobdella microstoma*	0 +
05900	*Lirceus sp*	0 +
06700	*Crangonyx sp*	0 +
07800	*Cambarus sp*	0 +
13400	*Stenacron sp*	0 +
13521	*Stenonema femoratum*	0 +
17200	*Caenis sp*	0 +
21200	*Calopteryx sp*	0 +
22001	*Coenagrionidae*	0 +
22300	*Argia sp*	0 +
28208	*Erythemis simplicicollis*	0 +
47600	*Sialis sp*	0 +
52200	*Cheumatopsyche sp*	0 +
52530	*Hydropsyche (H.) depravata group*	0 +
60900	*Peltodytes sp*	0 +
61400	*Agabus sp*	0 +
075	*Psephenus herricki*	0 +
69400	*Stenelmis sp*	0 +
71900	*Tipula sp*	0 +
74100	*Simulium sp*	0 +
74501	*Ceratopogonidae*	0 +
77500	*Conchapelopia sp*	0 +
77800	*Helopelopia sp*	0 +
78401	*Natarsia species A (sensu Roback, 1978)*	0 +
78702	*Psectrotanypus dyari*	0 +
79020	*Tanypus neopunctipennis*	0 +
80420	*Cricotopus (C.) bicinctus*	0 +
80430	*Cricotopus (C.) tremulus group*	0 +
81231	*Nanocladius (N.) crassicornus or N. (N.) rectinervus*	0 +
82770	*Chironomus (C.) riparius group*	0 +
82820	*Cryptochironomus sp*	0 +
84450	*Polypedilum (P.) convictum*	0 +
84470	*Polypedilum (P.) illinoense*	0 +
85800	*Tanytarsus sp*	0 +
95100	*Physella sp*	0 +

Taxa Code	Taxa	Quan/Qual

No. Quantitative Taxa: 0 Total Taxa: 37
No. Qualitative Taxa: 37 ICI:

Appendix Table 8. Ohio EPA Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 08/26/92 River Code: 23-006 River: East Fork Mill Creek RM: 1.90

Taxa Code	Taxa	Quan/Qual
01801	*Turbellaria*	0 +
03600	*Oligochaeta*	0 +
04964	*Mooreobdella microstoma*	0 +
06700	*Crangonyx sp*	0 +
08250	*Orconectes (Procericambarus) rusticus*	0 +
11120	*Baetis flavistriga*	0 +
11130	*Baetis intercalaris*	0 +
13400	*Stenacron sp*	0 +
13520	*Stenonema femoratum group*	0 +
17200	*Caenis sp*	0 +
21200	*Calopteryx sp*	0 +
22001	*Coenagrionidae*	0 +
23600	*Aeshna sp*	0 +
47600	*Sialis sp*	0 +
52200	*Cheumatopsyche sp*	0 +
60900	*Peltodytes sp*	0 +
67700	*Paracymus sp*	0 +
68075	*Psephenus herricki*	0 +
68708	*Dubiraphia vittata group*	0 +
69400	*Stenelmis sp*	0 +
72700	*Anopheles sp*	0 +
74100	*Simulium sp*	0 +
74501	*Ceratopogonidae*	0 +
77500	*Conchapelopia sp*	0 +
77800	*Helopelopia sp*	0 +
78401	*Natarsia species A (sensu Roback, 1978)*	0 +
80001	*Orthocladiinae*	0 +
81650	*Parametriocnemus sp*	0 +
82141	*Thienemanniella xena*	0 +
84210	*Paratendipes albimanus*	0 +
84450	*Polypedilum (P.) convictum*	0 +
84470	*Polypedilum (P.) illinoense*	0 +
84540	*Polypedilum (Tripodura) scalaenum group*	0 +
84750	*Stictochironomus sp*	0 +
85230	*Cladotanytarsus mancus group*	0 +
87400	*Stratiomys sp*	0 +
95100	*Physella sp*	0 +

Taxa Code	Taxa	Quan/Qual

No. Quantitative Taxa: 0 Total Taxa: 37
No. Qualitative Taxa: 37 ICI:

Appendix Table 8. Ohio EPA Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 08/21/92 River Code: 23-006 River: East Fork Mill Creek RM: 3.90

Taxa Code	Taxa	Quan/Qual
01801	*Turbellaria*	0 +
03600	*Oligochaeta*	0 +
05900	*Lirceus sp*	0 +
06904	*Synurella dentata*	0 +
08250	*Orconectes (Procericambarus) rusticus*	0 +
11120	*Baetis flavistriga*	0 +
13400	*Stenacron sp*	0 +
13521	*Stenonema femoratum*	0 +
17200	*Caenis sp*	0 +
47600	*Sialis sp*	0 +
52200	*Cheumatopsyche sp*	0 +
60910	*Peltodytes edentulus*	0 +
67500	*Laccobius sp*	0 +
67703	*Paracymus subcupreus*	0 +
67800	*Tropisternus sp*	0 +
68025	*Ectopria nervosa*	0 +
68075	*Psephenus herricki*	0 +
69400	*Stenelmis sp*	0 +
)410	*Cricotopus (C.) sp*	0 +
83820	*Microtendipes "caelum" (sensu Simpson & Bode, 1980)*	0 +
84210	*Paratendipes albimanus*	0 +
84470	*Polypedilum (P.) illinoense*	0 +
84700	*Stenochironomus sp*	0 +
87400	*Stratiomys sp*	0 +
94400	*Fossaria sp*	0 +
95100	*Physella sp*	0 +

Taxa Code	Taxa	Quan/Qual

No. Quantitative Taxa: 0 Total Taxa: 26
No. Qualitative Taxa: 26 ICI:

Appendix Table 8. Ohio EPA Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 08/21/92 River Code: 23-006 River: East Fork Mill Creek RM: 4.70

Taxa Code	Taxa	Quan/Qual
05800	*Caecidotea sp*	0 +
05900	*Lirceus sp*	0 +
06800	*Gammarus sp*	0 +
08250	*Orconectes (Procericambarus) rusticus*	0 +
11120	*Baetis flavistriga*	0 +
13400	*Stenacron sp*	0 +
13521	*Stenonema femoratum*	0 +
17200	*Caenis sp*	0 +
22001	*Coenagrionidae*	0 +
23704	*Anax junius*	0 +
42700	*Belostoma sp*	0 +
47600	*Sialis sp*	0 +
52200	*Cheumatopsyche sp*	0 +
60900	*Peltodytes sp*	0 +
64000	*Laccornis sp*	0 +
67703	*Paracymus subcupreus*	0 +
68075	*Psephenus herricki*	0 +
68708	*Dubiraphia vittata group*	0 +
69400	*Stenelmis sp*	0 +
71900	*Tipula sp*	0 +
77750	*Hayesomyia senata or Thienemannimyia norena*	0 +
84210	*Paratendipes albimanus*	0 +
84315	*Phaenopsectra flavipes*	0 +
84470	*Polypedilum (P.) illinoense*	0 +
85500	*Paratanytarsus sp*	0 +
87400	*Stratiomys sp*	0 +
95100	*Physella sp*	0 +

Taxa Code	Taxa	Quan/Qual

No. Quantitative Taxa: 0 Total Taxa: 27
No. Qualitative Taxa: 27 ICI:

Appendix 9. Preliminary Assessment information regarding potential hazardous waste facilities in the Mill Creek Basin from the Division of Emergency and Remedial Response, Ohio EPA.

1. B&O Dump
2. Borden Chemical-Galbraith Plant
3. Brighton Corporation/Trinity Industries
4. Brighton Yard
5. Canal Ridge Road Dump
6. Carthage Avenue Landfill
7. Carstab
8. Celotex
9. City of Cincinnati Mill Creek Dump
10. CSX
11. Elda Inc.
12. Emery Chemicals
13. Este Avenue Dump
14. General Electric (Evendale)
15. Highland Green WWTP
16. Laidlaw City Dump
17. Lockland Works*
18. Mainville Forest Products
19. MSD
20. North Bend Dump
21. Old Galbraith Road Landfill
22. Phthalchem, Inc.*
23. Premium Finishes, Inc.*
24. Pristine*
25. Ridgewood Arsenal
26. Saint Bernard Dump
27. Sherwin Williams Co./PMC Inc.
28. Skinner Landfill*
29. Techno-Adhesives
30. Vine Street Dump
31. Winton Ridge Dump

* Indicates Active Sites

Potential Hazardous Waste Site
Preliminary Assessment

B & O Dump
I.D. # OHD000607606, OHD980509731
August 31, 1984

Baltimore and Ohio Railroad Dump was a landfill designed to dispose of incinerator waste from the West Fork Incinerator. The landfill, located between the incinerator facility and the railroad tracks, was about 8 acres in size. The B & O dump was used for the disposal of demolition debris, household waste, non-hazardous material and non-combustible waste. There is a possibility that this site may have received some unknown quantities of industrial waste. This may have been the source of the chemical and organic waste that was observed leaching from the site in the the Mill Creek.

The B & O dump also had a few problems with management control of the landfill. Large heaps of poorly burned incinerator residue was being dumped at the landfill without providing the proper cover. There was little control to prevent public access causing open dumping and scavenging on site. More restrictions were instituted by the City Health Dept. to render the landfill free of violations of the solid waste disposal regulations. Because of the mismanagement of many landfills throughout Cincinnati, the Cincinnati Health Solid Waste Disposal Program was in jeopardy. The disposal of the incinerator residue on the landfill became a problem also. Eventually the site was closed. It was economically feasible to use the privately owned sanitary landfill.

This is a low priority site for State and Federal response. F.I.T. activities are not necessary at this time.

PRELIMINARY ASSESSMENT NARRATIVE

Date: June 26, 1986
Company: Borden Chemical-Galbraith Plant
I.D.#: OHD980509608
E & E Competed PA (1983)

Borden Chemical-Galbraith Plant was a printing ink manufacturing company located on the corner of I-75 and Galbraith Road. The site is located east of the Penn Central railroad, west of Mill Creek, and south of Galbraith Road. The Galbraith Plant operated from 1961 - 1980. The building is now occupied by an office furniture rental company.

This site was put on the Comprehensive Environmental Response Compensation Liability Information System (CERCLIS) because Borden Chemical was required to submit a hazardous waste site notification to U.S. EPA under Section 103(c) of CERCLA (Comprehensive Environmental Response Compensation Liability Act of 1980). Ohio EPA has completed a Preliminary Assessment (part 1 and 2 only) to serve as an update to the assessment prepared by Ecology and Environment (EPA Form 2070-12(7-81).

We have no reason to believe hazardous wastes were disposed of on-site. According to a former employee at the plant, a hot caustic tank was used to wash dirty tubs. All wastes and sludges from the tank were reportedly drummed and disposed of off-site. No large spills or potential hazards are noted in OEPA files.

This site is a low priority for State and FIT investigation.

1812S/5

SEP 26 1990

PRELIMINARY ASSESSMENT NARRATIVE

Brighton Corp.
11861 Mosteller Rd.
Sharonville, OH 45241
OHD004237475

Brighton Corp. is located one half mile north of the I-275 Mosteller Rd. exit in Sharonville, Hamilton County, Ohio. This chemical processing and special equipment production plant was established in 1914 and is presently operating. The plant produces kettles, reactors, tankheads, and pressure vessels. It is classified as a small quantity generator under RCRA. The areas to the north, south, and east of Brighton Corp. are primarily occupied by industrial facilities. To the west is an agricultural/rural area. Residences exist approximately one mile away in all directions.

In January of 1988, the Ohio EPA was contacted by Brighton Corp. regarding problems with their drinking water. The Ohio EPA Division of Ground Water then investigated the site on January 12, 1988, sampling both of their production wells for VOCs and metals. Water sampled from production well #2, which supplies drinking water to the plant, revealed that the supply was contaminated with trichloroethylene (41.70 ug/L), 1,2-dichloroethane (2.10 ug/L), 1,1,1-trichloroethane (20.90 ug/L), cis-1,2-dichloroethylene (19.90 ug/L), trans-1,1-dichloroethylene (1.04 ug/L), 1,1-dichloroethene (8.48 ug/L), and toluene (0.75 ug/L). Production well #1 was contaminated with the same chemicals at lesser concentrations. Brighton Corp. apparently has never used or stored any of the contaminants found in the ground-water. Therefore, Brighton is not likely to be the source of this contamination.

A more likely source of this contamination is the Techno-Adhesive Co. located at 12113 Mosteller Road. OEPA has received several complaints concerning their alleged mishandling of chlorinated and non-chlorinated solvents. These allegations have not yet been confirmed by OEPA.

Working with the Culligan Water Co., Brighton Corp. is continuing its use of the production wells as a source of potable water. Culligan filters the contaminants from the water before it is used. Although more recent monitoring of the ground-water by Brighton Corp. indicates that the types of contaminants have not changed, the level of contamination has increased.

No further remedial action is recommended for both state and FIT for the Brighton Corp. site since it seems to be a receptor of contamination from off-site. However, further investigation of the Techno-Adhesive Co. should be pursued by adding the site to the CERCLIS and the Ohio EPA Master Sites List, and also completing a preliminary assessment for that site.

Submitted by:
Ali Moazed
Ali Moazed
College Co-Op, DERR, SWDO
Date: 9-11-90

Reviewed by:
Michael Starkey
Michael Starkey
Group Leader, DERR, SWDO
Date: 9/11/90

PRELIMINARY ASSESSMENT NARRATIVE

Brighton Yard/Chesapeake & Ohio Railroad
State Street
Cincinnati, Ohio 45204

OHD98061176

The Brighton Yard site is located just east of Ernst Street near State Avenue and south of Fairmount in Cincinnati, Ohio. The Ohio EPA became aware of this site in 1981 when the Chesapeake and Ohio Railway Company filed a notification of hazardous waste form for the site.

On March 22, 1978 a train derailed, spilling 20 tons of ammonia nitrate fertilizer in granular form on the tracks and the immediate surrounding area. The spill area covered approximately 2500 square feet. Response was immediate and the OEPA Spill Response Team reported that approximately 20 tons of the fertilizer was recovered.

Routes of concern regarding contaminant migration from the site include groundwater, surface water and direct contact although none are regarded as a serious threat due to the low quantity of fertilizer lost. Heavy rains and overland runoff could provide a pathway for migration of any residual fertilizer to Mill Creek which is located about 500 feet east of the site.

It is recommended that this site be given a no further action priority for both FIT and State activities as the potential for population exposure and environmental contamination is minimal due to the relatively thorough clean-up.

Narrative completed by Ecology & Environment, Inc. 8/25/86

Narrative updated by Claudine F. Jones, 12/3/87, OEPA/SWDO/DSHWM

PRELIMINARY ASSESSMENT NARRATIVE

CANAL RIDGE ROAD DUMP
4100 CANAL RIDGE ROAD
CINCINNATI, OHIO 45223
HAMILTON COUNTY

ID #: OHD980509665

CANAL RIDGE ROAD DUMP (OHD980509665) IS LOCATED IN SECTIONS 21 AND 22, MILLCREEK TOWNSHIP, CINCINNATI. THE SITE IS JUST SOUTH OF MITCHELL AVENUE, AND IT IS DIRECTLY ADJACENT TO MILL CREEK AND I-75.

THE PROPERTY WAS ORIGINALLY OWNED BY SARA HIRSCHBERG AND BEVERLY HIRSCHBERG OF CINCINNATI. IN THE EARLY 1960'S, THE HIRSCHBERGS USED THE SITE FOR OPEN DUMPING UNDER THE NAME OF CARTHAGE AUTO PARTS CO. THEY ACQUIRED A FILL PERMIT IN 1970 ALLOWING THEM TO DISPOSE OF JUNK AUTOS AND BILLBOARDS. IN THE LATE 60'S OR EARLY 70'S, THE HIRSCHBERGS LEASED THE PROPERTY TO GLENN MULLINS (NOW AT 4265 SPRING GROVE AVENUE, CINCINNATI, OHIO).

THE SITE WAS USED BY MULLINS FOR OPEN DUMPING AND INDUSTRIAL PROCESSING OF WASTES BETWEEN 1967 AND 1984. THIS SITE WAS NEVER PERMITTED OR LICENSED TO RECEIVE AND/OR TREAT SOLID WASTES. THE SITE WAS CLAIMED TO HAVE BEEN ONLY USED AS A TRANSFER STATION. A SAMPLE (LEACHATE) TAKEN BY OEPA ON 11/14/84 SHOWED PRESENCE OF LEAD (<500 UG/L), CADMIUM (<50 UG/L), AND CHROMIUM (<250 UG/L). VOLATILE ORGANIC CHEMICALS WERE NOT DETECTED. (ON 5/14/87, TWO MEMBERS FROM OEPA OBSERVED SEVERAL LEACHATE SEEPS AT THE SITE DURING A DRIVE-BY. VEGETATION WAS NOT GROWING AROUND THOSE SEEPS. NO SAMPLES WERE TAKEN AT THAT TIME.)

THE INDUSTRIAL PROCESSING OF WASTE AT THE SITE CONSISTED OF MIXING THE WASTE (LIQUID OR SLUDGE) WITH FOUNDRY SAND, SAW DUST, OR OTHER DRY MATERIALS. THIS PROCEDURE WAS CONDUCTED IN UNLINED PITS OVER POROUS FOUNDRY SAND FILL AND SOILS CONSISTING OF SAND AND GRAVEL.

SOME OF THE COMPANIES THAT HAVE USED MULLINS SERVICES INCLUDE: H. B. FULLER COMPANY, CINCINNATI ENQUIRER, STEELCRAFT MANUFACTURING COMPANY, HEEKIN CAN (DIVISION OF DIAMOND INTERNATIONAL CORPORATION), EMERY INDUSTRIES, INC., CARTHAGE MILLS, MELBEN PRODUCTS COMPANY, INC., BITUCOTE PRODUCTS CO., DELCO PRODUCTS, SUPERIOR LABEL CO., SCHAUER MFG. CORP., MULLEN INDUSTRIES, ASHLAND CHEMICAL, DUBOIS CHEMICALS, AND OTHERS.

BECAUSE OF THE MILL CREEK EXPANSION PROJECT, THE CITY OF CINCINNATI ACQUIRED THE PROPERTY ON MARCH, 1984 BY APPROPRIATION, CASE NO. A-8305743, HAMILTON COUNTY COURT OF COMMON PLEAS. THE ADJOINING PROPERTY, 4300 CANAL RIDGE ROAD -- OWNED BY GLENN MULLINS, WAS ALSO ACQUIRED BY THE CITY BY APPROPRIATION. A SURFACE CLEANUP WAS PERFORMED AT THE SITE IN 1985. THE CLEANUP EFFORT INCLUDED THE REMOVAL OF THE VISIBLE DRUMS AND THE COVERING OF THE AREA WITH EARTH AND SEED. SOME

RUMS (CONTAINING INDUSTRIAL HAZARDOUS WASTES) MAYBE BURIED AT THE ITE. THE UNDERLYING GEOLOGY IS COMPOSED MOSTLY OF SAND AND GRAVEL. HE SITE OVERLIES AN UNCONSOLIDATED AQUIFER YIELDING 100 ALLONS/MINUTE.

MEDIUM PRIORITY FOR THE STATE, AND A MEDIUM PRIORITY FOR F.I.T. CTIVITY IS RECOMMENDED. THE PRIMARY SURFACE WATER THAT IS POTENTIALLY FFECTED IS MILL CREEK, WHICH IS A TRIBUTARY OF THE OHIO RIVER. F.I.T. CTIVITY SHOULD INCLUDE SOIL AND LEACHATE SAMPLING. BECAUSE THE URROUNDING AREA IS HEAVLY INDUSTRIALIZED, OFF-SITE GROUNDWATER AMPLING WOULD NOT REFLECT POTENTIAL GROUNDWATER CONTAMINATION BENEATH HIS SITE. ADDITIONAL ACTIVITY SHOULD INCLUDE LEACHATE AND MONITORING ELL INSTALLATION AND SAMPLING.

REPARED BY:
Ruth Kim-McGuire
HUL KIM-MCGUIRE
ISTRICT CERCLIS COORDINATOR
EPA - SOUTHWEST DISTRICT
ARCH 13, 1987

REVIEWED BY:
Michael Starkey
MICHAEL STARKEY
DISTRICT UNREGULATED SITES
GROUP LEADER
DIVISION OF SOLID AND HAZARDOUS
WASTE MANAGEMENT

Preliminary Assessment Narrative

Date: June 26, 1986
Company: Carstab
I.D.#: OHD000724138

Carstab Corporation, owned by Morton-Thiokol Inc., is located on 1560 West Street in Reading, Ohio-Hamilton County. It is south of Pristine (an NPL site) and Cincinnati Drum, east of Mill Creek, and west of the Conrail railroad and Koenig Park. Carstab manufactures chemical additives for the plastics and petroleum industry. The plastic additives are used in making PVC pipes.

Several ponds were dug in 1950 for the disposal of different products. A letter from Carstab's Plant Engineer to a former Ohio EPA employee listed the types of materials discharged to the lagoons. These included various acids, organic compounds, and oils (Nov. 20, 1979). The last of these ponds were dredged and filled in 1980.

In 1980 Bill Barrown, a former OEPA employee, inspected the site and discovered leachate coming out of the bank of Mill Creek. Samples were taken and different organic compounds were detected. This leachate was flowing into and contaminating Mill Creek. Monitoring wells were sampled on 6/10/80 and heavy metals such as chromium (550 ug/l) and arsenic (270 ug/l) were detected above Drinking Water Standards. Organic compounds were also detected in the wells. The wells were drilled into a sand and gravel layer between two clay layers. Contaminates attributable to Carstab were found in this upper aquifer. There are two water-bearing formations in the Mill Creek valley separated by impermeable gray clay. Only the upper aquifer has been contaminated by Carstab. The City of Reading's wells are screened in the lower aquifer.

Carstab has installed a ground water collection and treatment system consisting of a slurry wall along the northern site boundary and a french drain collection system along the western boundary. This system intercepts contaminated groundwater from the lagoon before it enters Mill Creek. The water is treated before discharge to MSD.

Since Carstab has installed and maintained a groundwater recovery system which is functioning satisfactorily, we recommend a low FIT priority. The site will remain a medium State priority as long as remediation continues.

1812S/4

PRELIMINARY ASSESSMENT NARRATIVE

CARTHAGE AVENUE LANDFILL
CARTHAGE AVENUE
ARLINGTON HEIGHTS, OHIO 45215
HAMILTON COUNTY

ID #: OHD980615827

THE SITE IS LOCATED ABOUT 1/4 MILES NORTH OF GALBRAITH ROAD, DIRECTLY EAST OF I-75, ADJACENT TO MILL CREEK ON CARTHAGE AVENUE, IN ARLINGTON HEIGHTS. IT IS ABOUT 5 ACRES IN SIZE AND WAS OWNED AND OPERATED BY THE CITY. THE LANDFILL CLOSED IN JUNE OF 1969 WHEN OHIO'S SOLID WASTE LAWS BECAME EFFECTIVE. THE STARTING DATE IS UNKNOWN. PARTS OF THE LANDFILL ARE NOW COVERED WITH PAVEMENT AND ARE BEING LEASED AND USED FOR PARKING SPACE.

THE LANDFILL WAS LISTED ON THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY INFORMATION SYSTEM (CERCLIS) BECAUSE OF A CERCLA 103(C) FORM SUBMITTED BY BORDEN CHEMICALS, INC. ACCORDING TO THE FORM, THE TYPES OF WASTES DISPOSED AT THE LANDFILL INCLUDE BASES AND PAINTS AND PIGMENTS. THE TOTAL AMOUNT OF THESE WASTES IS REPORTED TO BE 100 TONS. ACCORDING TO A JUNE 1, 1987 LETTER FROM BORDEN, THE TOTAL AMOUNT OF THE WASTES INCLUDED CARDBOARD, PAPER, "ETC". THE TYPES OF PIGMENTS INCLUDED COMPOUNDS OF LEAD CHROMATE, CADMIUM, BARIUM LITHOLS, ZINC, ZINC OXIDE, BENZIDINE YELLOW, CALCIUM LITHOLS, AND TITANIUM DIOXIDE. ONE TO TWO PERCENT OF EACH BATCH (INK) WAS CONSIDERED UNUSEABLE AND WAS DISCARDED. (NO INFORMATION IS AVAILABLE AS TO HOW MANY BATCHES THE COMPANY PRODUCED THAT WERE EVENTUALLY DISPOSED AT THE LANDFILL.) OTHER TYPES OF WASTES INCLUDED ALCOHOLS, SOME KETONES, AND ALIPHATIC AND AROMATIC HYDROCARBON SOLVENTS FROM THE FLUID INKS PRODUCTION. ABOUT ONE-HALF TO ONE PERCENT OF A BATCH IS REPORTED TO BE DISCARDED.

OTHER THAN BORDEN CHEMICAL'S NOTIFICATION, THERE IS NO OTHER AVAILABLE INFORMATION AS TO THE NATURE AND THE TYPES OF WASTES THAT WERE DISPOSED AT THE LANDFILL. (OTHER INDUSTRIAL WASTES ARE SUSPECTED AT THIS SITE.)

THE SITE OVERLIES A PORTION OF THE MILL CREEK BURIED VALLEY AQUIFER. THEREFORE, DEPENDING ON THE EXACT QUANTITIES OF WASTES CONTAINING HAZARDOUS SUBSTANCES DISPOSED AT THE SITE, THERE IS THE POTENTIAL FOR GROUNDWATER CONTAMINATION. THE CITY OF WYOMING, 1.5 MILES NORTHWEST OF THE LANDFILL, HAS FIVE (5) WELLS. THE CITY OF READING, 1.5 MILES TO THE NORTHEAST, ALSO HAS A PUBLIC WATER SUPPLY SYSTEM NEARBY. THERE IS THE POTENTIAL FOR SURFACE WATER CONTAMINATION, BECAUSE THE SITE IS DIRECTLY ADJACENT TO MILL CREEK.

ANOTHER CERCLIS SITE, THE OLD GALBRAITH ROAD LANDFILL (OHD980994412) OR WHICH INFORMATION IS VERY LIMITED AND A P.A. IS IN PROGRESS, MAY BE HE SAME SITE AS THE CARTHAGE AVENUE LANDFILL.

A MEDIUM PRIORITY FOR THE STATE, AND A MEDIUM PRIORITY FOR F.I.T. ACTIVITY IS RECOMMENDED FOR THE SITE BECAUSE OF SOME OF THE CONSTITUENT WASTES THAT HAVE GONE INTO THE LANDFILL. F.I.T. ACTIVITIES SHOULD INCLUDE SOIL AND GROUNDWATER SAMPLING.

PREPARED BY:

Chul Kim-McGuire

CHUL KIM-MCGUIRE
DISTRICT CERCLIS COORDINATOR
OEPA - SOUTHWEST DISTRICT
JUNE 18, 1987

REVIEWED BY:

Michael Starkey

MICHAEL STARKEY
DISTRICT UNREGULATED SITES
GROUP LEADER
DIVISION OF SOLID AND HAZARDOUS
WASTE MANAGEMENT

Preliminary Assessment Narrative

Date: June 8, 1984
Company: Celotex Corporation
I.D. #: OHD059100446

Celotex Corporation is a facility which produces roofing material. The waste material generated at the plant is disposed of on-site. The previous owner, The Phillip Carey Corp., produced the same type of product and used the same on-site disposal area as Celotex Corp. According to Lecil Colburn, Celotex Corp., the bulk of the waste buried there is waste roofing materials. Various other solvents, organics and inorganic waste were also buried on-site by Phillip Carey Corp. but the amounts of those waste materials placed there is unknown.

Celotex Corp. had housekeeping problems. Asbestos insulation was exposed in various areas throughout the landfill. The lack of cover material over the asbestos waste posed a serious risk to human health. The Ohio EPA, Office of Solid Waste Management, responded to this problem and under their supervision Celotex Corp. provided an adequate cover over the asbestos waste eliminating the exposure to the surrounding community.

This facility is a low priority site for additional site inspection activities.. The proper disposal method eliminated any harmful exposure to the asbestos insulation. There is very little information available about the other waste buried on-site to remark upon.

Considering unknown quantities of solvents and organics at the site could present a potential hazard to the environment, Ohio EPA considers this to be a medium priority for additional S.I. activities. FIT assistance is requested at the site.

1.0 INTRODUCTION

This document has been prepared for CSXT to describe the findings of the Phase II site investigation at the Spring Grove Avenue, Cincinnati, Ohio property. The report also provides a summary of background information and data generated in the preliminary site assessment. Finally, the Phase II investigation, findings and conclusions and recommendations are detailed in this report.

1.1 AUTHORIZATION

The Phase II site investigation of the former CSXT locomotive repair facility, located on Spring Grove Avenue in Cincinnati, Ohio was authorized by Richard Barry (CSXT) in a verbal communication to John Dwyer (WAPORA) on 15 June 1989. WAPORA, Inc. has completed all Phase II operations.

1.2 PURPOSE OF PHASE II OPERATIONS

Phase II was designed and implemented in response to the meeting of 16 March 1989 between the OEPA and CSXT and its representatives, and incorporates modifications specifically requested in the 1 May 1989 letter to Richard Barry (CSXT) from Bob Princic (OEPA). The specific modifications are as follows:

- Further delineation of groundwater contamination with the installation of five additional monitoring wells constructed of stainless steel;
- Groundwater sampling of MW2, MW4, and MW7 for Hazardous Substance List analysis; and
- Further delineation of soil contamination with the requested placement and sampling of six Hazardous Substance List test zones.

1.3 BACKGROUND INFORMATION

The Spring Grove Avenue site was formerly used as a maintenance yard for equipment cleaning, fueling, and repairs. Figure 1 shows the location of the site on a cut-out of the Cincinnati West USGS 7.5 minute topographic map. Maintenance yard operations

ceased in 1981, following a fire which destroyed a large portion of the repair shop. The site was subsequently abandoned. A portion of the property along Spring Grove Avenue was leased to Garden Street Iron & Metal, Inc. after the site was abandoned. Garden Street used the property to store miscellaneous debris, abandoned vehicles, tanks, scrap metal, and shavings. The lease was terminated on 15 July 1989.

The CSXT property was included in a site assessment program commissioned by Hamilton County, Ohio in 1988. The purpose of the assessment was to choose a site for the construction of a minimum security correctional facility. A geotechnical and environmental investigation was performed at the site. The environmental investigation report noted potential environmental impairment at the site.

The information contained in the report was submitted to the OEPA. OEPA, upon review of the report, requested that CSXT initiate a site assessment to address environmental concerns raised during the Hamilton County site assessment.

WAPORA conducted a preliminary site assessment from 19 September to 2 October 1988. The investigation addressed environmental concerns set forth in the above-mentioned report. Eight monitoring wells were installed on the property to determine groundwater levels, flow directions, and environmental impairment within the uppermost aquifer. A series of 33 soil borings were drilled at various locations on a grid system. The soil borings were installed to determine the presence and relative concentrations of suspected contamination.

Strong petroleum hydrocarbon (PHC) odor and free-phase oil were detected in many of the monitoring wells and soil borings. Laboratory testing of samples revealed variable concentrations of PHC. The PHC concentrations of composite samples retrieved during Phase I from soil borings ranged from 12 to 14,000 ppm. Groundwater samples were found to have PHC concentrations ranging from 2 to 200 ppm.

Soil and water samples were also tested for volatile organics, PCBs, EP Toxicity, total metals, and flash point. The information contained in the Preliminary Contamination Assessment Report was submitted to OEPA (Mr. Mark Hill). OEPA requested that CSXT expand the site investigation prior to implementation of remedial activities.

Preliminary Assessment Narrative

Date: 4/8/86
Company: ELDA Incorporated
I.D. #: OHD080927171

The ELDA Landfill is located at 5701 Este Avenue in Cincinnati, Ohio - Hamilton County. The 125 acre site is west of Proctor & Gamble, Mill Creek, B & O. Railroad, east of USEPA's research lab and approximately 5.5 miles north of downtown Cincinnati. ELDA Landfill is owned by Ohio Waste Systems Management and Waste Management Incorporated.

The landfill, which started operations in 1973, currently accepts general solid wastes and approved special wastes such as asbestos and zinc cyanide. Permits to Install (PTI) were approved by the Ohio EPA for disposal of these other special wastes. (Asbestos is a special solid waste approved for disposal in the landfill but does not require a PTI.)

Soil borings showed that the site lies on top of a thick shelf of relatively impervious silty clay underlain by interspersed discontinuous layers of sand and clay. A leachate collection system, completed in 1983, prevents any possible leachate from percolating off-site. The leachate is analyzed regularly and piped to Metropolitan Sewer District (MSD). Analyses from samples taken by Environmental Testing Certifiation on 11/20/84 detected organic chemicals such as 1,1 di-chloroethane (77 ug/l), ethylbenzene (25 ug/l), methylene chloride (142 ug/l), toluene (~~3252~~ 322 ug/l), and vinyl chloride (23 ug/l).

Five monitoring wells were installed on-site in 1980. Sample analyses from Environmental Enterprises Incorporated date back to September 1981. Annual sampling of the wells has continued since then. Split samples taken by Rich Bendula, OEPA-Geologist, on 3/11/86 indicated that all five wells were within the National Interim Primary Drinking Water Standards (DWS) for heavy metals. Community drinking water is supplied by the City of Cincinnati.

This is a low priority site for State and FIT activties. Continued sampling of the monitoring wells and leachate system is recommended. All results are to be sent to Rich Bendula at the OEPA office. The site is adequately addressed by existing solid waste regulations. No FIT activities are required at this time.

SS:pam
M87

THE WINTON HILLS REGION OF CINCINNATI

SUMMARY OF ENVIRONMENTAL ADVISORY COUNCIL'S CONCERNS

ELDA Landfill

In February 1986, the EAC formally brought to the city's attention the fact that the ELDA landfill was on the U.S.EPA's Comprehensive Environmental Response, Compensation and Liability Act Inventory System (CERCLIS — formerly called ERRIS) list of reported potential hazardous waste sites. The EAC recommended that the city request the Ohio EPA to conduct a Preliminary Assessment of the site as soon as possible to determine if the landfill posed any environmental risks.

There is a strong possibility that hazardous materials were disposed of in the ELDA landfill during the 1970 decade, prior to RCRA and Superfund legislation, because of the following information, obtained from both the U.S.EPA and the Ohio EPA:

--Mobil Chemical Company reported that it used ELDA for hazardous waste disposal from 1973 to 1979. Forms that Mobil submitted to the U.S.EPA indicate Mobil contracted with two hazardous waste haulers to transport wastes from Mobil to the ELDA landfill: Browning-Ferris International Inc. from 1973-79 and Liquid Waste Inc. from 1978-79.

— Borden Inc. (Pigments Division of the Printing Ink Division of the Chemical Graphics Division of Borden) reported that the company hauled wastes to ELDA in 1977. The type of wastes listed in the reporting form were "organics; inorganics; heavy metals; and other - paints and pigments."

— Hilton Davis, according to an April 1986 memorandum from Health Commissioner Stanley Broadnax, received approval from the then state Public Health Engineer's Office of Land Pollution Control to dispose of "wastewater sludge cake" on 10/29/76. Broadnax does not specify for what time period the state's permission to Hilton Davis extended.

The Ohio EPA's Preliminary Assessment on the ELDA landfill was completed in April 1986. The Preliminary Assessment indicates that interviews were conducted with ELDA management personnel and Ohio EPA records were checked, but does not mention any review of records belonging to Borden Inc., Mobil Chemical Company, Hilton Davis, or the two hazardous waste haulers. According to the Preliminary Assessment report, no new tests were conducted, except for split samples of water from five monitoring wells. These samples showed "that all five wells were within the National Interim Primary Drinking Water Standards for heavy metals. Community drinking water is supplied by the City of Cincinnati." However, according to neighborhood representatives, there are a number of families living in the Dutch Hollow area who rely on groundwater for their drinking water supplies.

According to the April 1986 report, analyses of leachate samples taken in November 1984 detected organic chemicals such as 1,1 di-chloroethane (77 ug/l), ethylbenzene (25 ug/l), methylene chloride (142 ug/l), toluene (3222 ug/l) and vinyl chloride (23 ug/l).

Among the hazardous conditions and incidents the Ohio EPA report did not evaluate for the ELDA landfill (the letters "N/A" —"not applicable" — are written in the relevant blocks on the assessment form) are the following: "Contamination of Air; Fire/Explosive Conditions; Contamination of Soil; Population Exposure/Injury; Unstable Containment of Wastes; Contamination of Sewers, Storm Drains."

The Ohio EPA's report concludes that "This is a low priority site for State and FIT activities. Continued sampling of the monitoring wells and leachate system is recommended....The site is adequately addressed by existing solid waste regulations. No FIT activities are required at this time."

In July 1986, migrating gases alternatively referred to as "methane gas" and "landfill gas" were discovered in the surface soil and below the ground in the vicinity of the Elda Landfill and the Varsity Circle residential area of Winton Hills. From all reports, it appears that the Ohio EPA, Elda Management, and relevant city agencies acted responsibly in monitoring the levels of "methane gas" and in installing a "methane" extraction system.

According to an August 23, 1986 report prepared by Timothy Burke, of Manley, Burke and Fischer, a methane recovery plant is being constructed on the southeast portion of the property. A subsequent report by Mr. Burke dated 8/26/86 states that the methane migration is "restricted to the utility backfill trenches underneath and adjacent to the pavement of the parking lot in the area of 5349-5411 Varsity Circle. Gas is still found in the ground around the complex. This gas is not moving and has not spread since our initial readings, though its concentration in the ground has diminished slightly."

At the public meeting held in Winton Hills on September 25, 1986, Mr. Joseph Moore, Ohio EPA, stated that "all but three or four locations now have no gas...there is lingering gas which is still trapped in the soil...the present extraction system is withdrawing gas from the upper elevations, but in the deeper strata, the gas is migrating laterally and will require deeper probes."

At the same public meeting, public health and Ohio EPA officials offered repeated assurances to the residents of the Winton Hills region that there were no harmful health effects associated with exposures to the low level

of "methane gas" found in the Varsity Circle vicinity. However, the EAC learned from these same officials that no one -- the Ohio EPA, the ELDA management, or any city agency -- had tested the gases to determine their actual composition.

With the suspected history of this landfill, it is possible that exposures to other constituents of the gaseous mixture (e.g., carcinogenic volatile organic compounds) even at very low levels over time may cause harmful health effects. The actual composition of the gases is also important to know in evaluating the effect of uncontrolled emissions from the flare, which is part of the extraction system, and from the future resource recovery plant.

Old Center Hill Landfill

On July 8, 1986, three employees of a city contractor who were working on a stormsewer line for the Recreation Commission's Crosley Field Sports Center were injured when "landfill gas" exploded after one of the workers lit a cigarette.

According to a city administration report dated 9/10/86, the Recreation Commission has known about the landfill gas problem since at least September 1984. It should be noted that the old Center Hill landfill is also a CERCLIS site;* to the EAC's knowledge, the Ohio EPA has not conducted a Preliminary Assessment of this location to date.

To the northwest of the landfill site, a new industrial/warehouse complex is located. Directly on top of at least a portion of the old Center Hill landfill is the Recreation Commission's new baseball field and nearby, along Center Hill Road, is the newly constructed recreation complex building. To the southeast of the landfill (and possibily on part of the CERCLIS site) is the proposed location for the ENCOA incinerator.

According to the 9/10/86 city administration report:

"...Preliminary investigations are being made by Waste Management and the Sanitation Division of Public Works to estimate the gas generation rate in the Center Hill Landfill. These investigations will consist of an historical review of the landfill's operation, including such items as waste composition, depth and area, and computer calculations on expected generation based on that information. The feasibility and economics of active recovery or venting of the gas can then be better known.... Various

* The CERCLIS site is listed as "Este Avenue Dump, Este and Township Avenue, #OHD980509988.

Preliminary Assessment Narrative

Date: December 31, 1986
Company: Emery Chemicals, INC..
I.D.#: OHD093903235

Emery Industries, Inc. had changed its name to Emery Chemicals, Inc. Emery is a Division of National Distillers and Chemical Corporation located in New York. The operating plant is located on 4900 Este Avenue in Cincinnati, Ohio - Hamilton County. It is just south of the E.L.D.A. landfill, northwest of the city of Saint Bernard, and it lies along Mill Creek.

The company started its operations at the site in 1885. They manufacture specialty chemicals primarily from fats and oils under vacuum and very high temperatures. Records indicate that Emery used three surface impoundments for organic sludge disposal from 1970-77. In 1978, excavation of the 8,500 cubic yards from the ponds commenced. The filter cakes from these impounds were transported to the ELDA, and the Rumpke landfills in Hamilton County. Cleanup finished in 1980 and a closure certificate was issued in 1982.

Studies on the waste composition from the impounds showed organic components to be reasonably biodegradable. The waste contained metallic ions in insoluble forms - Chromium, nickel, aluminum, iron, calcium, manganese, and magnesium. Heavy metals were in low concentration and they included hexavalent chromium, mercury, cadmium, and lead. Results from leachate samples indicated minimal effects. Toxic effects from the wastewater residual was found to be non-existent.

HWFAB issued Emery with a Hazardous Waste Facility Installation and Operation permit on December 28, 1981. Emery withdrew its part B of RCRA-TSDF permit in 1982. In April of 1985, the company was assigned as a "generator only" with 90 day storage.

Files show that Emery has voluntarily reported to OEPA several spills into Mill Creek and to the sewer drains in its operations. Most of the spills were different forms of alcohols and acids at low volumes. These spills were either contained or recovered.

The only potential hazardous situation that remains at Emery is fire/explosive conditions. (The extreme temperatures that the company uses warrants this comment.) Concerned hazardous substances at this time are cleaning solvents. However, these solvents are in small amounts on the site to be of a major concern. Emery's Contingency plan for safety indicates a well reorganized approach to responding to any emergencies that may arise.

A low priority for the state and a low F.I.T. activity is recommended. Emery should be inspected under the appropriated guidelines to maintain a "generator only" status.

PRELIMINARY ASSESSMENT NARRATIVE

ESTE AVENUE DUMP
5700 CENTER HILL ROAD
CINCINNATI, OHIO 45232
HAMILTON COUNTY

ID #: OHD980509988

ESTE AVENUE DUMP IS LOCATED WEST OF THE TOWN OF ELMWOOD PLACE, NORTH OF THE TOWN OF SAINT BERNARD, AND IT IS SEVERAL HUNDRED YARDS FROM THE E.L.D.A. LANDFILL (CERCLIS SITE). AN INOPERATIVE INCINERATOR PLANT IS LOCATED ON SITE, AND MILL CREEK IS ABOUT 75 YARDS TO THE EAST. THE THE CITY LANDFILL STOPPED TAKING WASTES IN 1977. SINCE THAT TIME, IT HAS BEEN TURNED INTO RECREATIONAL BALLFIELDS. THE NORTH END OF THE LANDFILL IS CURRENTLY BEING FILLED WITH DEMOLITION WASTES. SIZE OF THE LANDFILL IS APPROXIMATELY 30 ACRES.

FROM 1955 TO 1977, THE SITE WAS USED TO DISPOSE OF ALL TYPES OF WASTE MATERIALS. IT PROVIDED THE CITY OF CINCINNATI A NEW SITE FOR DISPOSAL OF INCINERATOR RESIDUE AND NON-COMBUSTIBLES. IN 1972, THE CITY STOPPED DISPOSING OF MUNICIPAL WASTES BUT CONTINUED WITH THE DISPOSAL OF RESIDUE WASTES. SAMPLE RESULTS OF RESIDUE QUENCH WATER AND RESIDUE LEACHATE INDICATED INCOMPLETE COMBUSTION OF WASTES THAT DID NOT RENDER THE WASTES INERT. DAILY COVERING OF THE WASTES WAS NOT PRACTICED AT THE SITE. THIS METHOD OF LANDFILLING, ALONG WITH THE UNDESIRABLE CHEMICAL QUALITY OF THE RESIDUE, COULD HAVE RESULTED IN GROUNDWATER AND/OR SURFACE WATER CONTAMINATION.

THE OHIO EPA AND THE CINCINNNATI HEALTH DEPT. WORKED WITH THE LANDFILL OPERATORS TO STOP THE OPEN DUMPING OF THE UNINCINERATED WASTES. EVENTUALLY, THE LANDFILL STOPPED TAKING RESIDUE WASTES IN 1977. THERE MAY HAVE BEEN HEAVY METALS AND TRACE METALS DISPOSED AT THE SITE. UNITED STATES PLAYING CARD COMPANY (OHD004234217) LISTS CENTER HILL LANDFILL IN ITS CERCLA 103(C) FORM AS HAVING BEEN USED FOR THE DISPOSAL OF "OLD COATING IN 55 GALLON DRUMS." THE COATINGS WERE PIGMENTED AND WERE COMPOSED OF 20% ORGANICS AND 80% INORGANICS. THIS SITE MAY HAVE RECEIVED OTHER INDUSTRIAL WASTES TOO.

BECAUSE OF PAST OPERATIONAL AND DISPOSAL PROBLEMS, METHANE GAS WAS GENERATED AND RELEASED TO THE SURFACE AND SURROUNDING ATMOSPHERE FROM THE RESIDUE WASTES DISPOSED AT THE SITE. ON 7/8/86, THREE WORKERS IN A BUILDING AT THE SITE WERE INJURED FROM A METHANE FLASH FIRE. THEY WERE TREATED AND RELEASED AT A HOSPITAL.

AT A CITY OF CINCINNATI COUNCIL MEETING, A CITIZEN REPRESENTING THE COMMUNITY NEAR THE SITE, ALONG WITH AN ENVIRONMENTAL ADVISORY COUNCIL (EAC) REPRESENTATIVE, DISCUSSED MANY OF THE REPORTED HEALTH COMPLAINTS IN THE AREA. EAC RECOMMENDED THAT A STUDY BE INITIATED FOR THE POTENTIAL HEALTH EFFECTS FROM THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, LIABILITY, AND INFORMATION SYSTEM (CERCLIS) SITES, AND FROM THE INDUSTRIAL PLANTS IN THE AREA. OTHER CERCLIS SITES IN THE AREA

INCLUDE: WINTON RIDGE LANDFILL, GRAY ROAD LANDFILL, CANAL RIDGE ROAD DUMP, E.L.D.A. LANDFILL, AND EMERY CHEMICALS COMPANY.

THE SITE OVERLIES A GENERAL AREA OF UNCONSOLIDATED AQUIFER. THE SOIL IN THE AREA IS COMPOSED OF CLAY, SAND AND GRAVEL. THE CITY OF WYOMING WATER SUPPLY WELLS ARE ABOUT 3 MILES FROM THE SITE. THERE ARE ALSO SEVERAL PRIVATE AND/OR INDUSTRIAL WELLS IN THE AREA. THESE WELLS AND OTHERS MAY OR MAY NOT BE IN USE. METHANE GAS THAT HAS BEEN DETECTED AT THE SITE HAS BEEN AS HIGH AS 80% CONCENTRATION. (MONITORING CONDUCTED BY NORHTWEST DISTRICT, CITY OF CINCINNATI HEALTH DEPT. OFFICIAL.)

A MEDIUM PRIORITY FOR THE STATE AND A MEDIUM PRIORITY FOR F.I.T. ACTIVITY IS RECOMMENDED FOR THIS SITE. THERE IS THE POTENTIAL FOR GROUNDWATER AND SURFACE WATER CONTAMINATION SHOULD THERE BE ANY HEAVY METALS AND/OR OTHER HAZARDOUS SUBSTANCES PRESENT AT THE SITE. F.I.T. ACTIVITY SHOULD INCLUDE GROUNDWATER, SOIL, AND LEACHATE SAMPLING IF ANY SEEPS ARE FOUND TO EXIST.

PREPARED BY:

Chul Kim-McGuire

CHUL KIM-MCGUIRE
DISTRICT CERCLIS COORDINATOR
OEPA - SOUTHWEST DISTRICT
JUNE 2, 1987

REVIEWED BY:

Michael Starkey

MICHAEL STARKEY
DISTRICT UNREGULATED SITES
GROUP LEADER
DIVISION OF SOLID AND HAZARDOUS
WASTE MANAGEMENT

Preliminary Assessment Narrative

Date: March 14, 1984
Company: General Electric/Evendale - Aircraft Engine Group
I.D.#: OHD000817312

General Electric basic site activities include manufacturing and testing of jet aircraft engines. The facility is partially owned by General Electric Co. and partially owned by U. S. Air Force. General Electric is controlled by RCRA management as a TSD facility.

G.E.'s main concern is the abandoned sludge basins located near building 508, Scrap and Salvage area. The east basin is approximately 8,000 cubic yards in size and the west basin is approximately 2,000 cubic yards. Historically, these basins were constructed by Wright Aeronautical in 1944. They were used to store water treatment sludge, which is basically lime sludge. The Auto lite Co. began operations after the shutdown of Wright. Auto lite used the basins to store water treatment sludge and electro plating waste. The treatment included the destruction of cyanide and the reduction of hexavalent chromium to trivalent chromium. This operation ceased in 1958.

It was common practice to fill one basin while using the other basin for dewatering and drying. Afterwards, the dewatered basin was excavated and the sludge hauled to a landfill.

These basins were used by the past and present owners as impoundments for water treatment sludge and electroplating waste. At present, the basins are inactive. General Electric is concerned about the present condition of the basins. Both basins were tested in 1980. The test results exceed the allowed limits on E.P. Toxicity Test for cadmium and chromium. In 1981, core samples were taken around the north side of the basins for determining migration of pollution. Those results indicate minimal migration of metals. Upon the development of further geological information, it was discovered that the upper aquifer flows in a southerly direction and the lower confined aquifer flows in a south-southwest direction. General Electric decided to install 3 monitor wells along the southern edge of the basin to watch for movement of contaminants. Sample analysis was taken in April, 1982, and September, 1982, and each sample was analyzed by two different labs, DuBois Testing and Pedco Environmental. All results had somewhat lower concentrations. Although these values are below drinking water standard, the presence of any of these contaminants indicate groundwater pollution. The presence of chromium and cadmium is a very good reason for further monitoring.

E & E proposed groundwater monitoring. My recommendations are the same proposed by E & E. A site inspection is necessary to obtain further information. The well field (unit)

Assessment Prepared by: Darryl Fowler, ECHOS Coordinator, SWDO

Review by: David R. Duell OEMMM/SWDO

for the City of Reading is within a mile south of General Electric. These fields are well within the limits as a target area. The tributary to the Mill Creek, which flows around the northeastern edge of the basins should also be monitored. I would like to be on this site inspection upon scheduling.

General Electric is north of Pristine and Cincinnati Steel Drum. These facilities may not influence the findings locally around G.E. but they may affect the results of the well field.

DPD:bjg

Preliminary Assessment Narrative

Date: May 29, 1984
Company: Highland Greens WWTP
I.D.#: OHD980898613

Highland Greens facility was a sewage treatment plant for the Highland Greens Apartment complex. This plant was abolished in 1981 on account of a merger with the Upper Mill Creek Regional Waste Project.

The plant had problems typical to sewer treatment operations. Many of these problems were solved by the merger and with the elimination of the lagoons and the plant. This facility had never received any waste chemicals for disposal.

The site seems in stable conditions. It is a marshy area with plenty of wildlife. I observed about 10 ducks in the temporary marsh. I see no need for F.I.T. activity or state response. This site should be eliminated from the Erris List.

Assessment Prepared by: Darryl Fowler, Erris Coordinator

Review by: D.D. Stiger, Supv. SIA/RMU

Preliminary Assessment Narrative

Date: 7/1/86
Company: Laidlaw City Dump
I.D.#: OHD000810176

The City Dump on 735 Laidlaw Avenue Cincinnati, Ohio started operations prior to 1960. It is located on the northeast corner of Mill Creek Expressway and the Norwood Lateral (St. Rt. 562). The B & O Railroad runs south of the site and Laidlaw is north of it. Solid and industrial wastes were disposed of on-site prior to the takeover of Proctor and Gamble Co. in 1960.

Proctor & Gamble disposed of plastics, glass, and metal containers, wood, paper, garbage and manufactured waste products. The waste was dumped at the five acre site in a mismanaged fashion. The landfill contained a shallow lagoon about 7 feet by 300 feet which received approximately 120 tons per month of liquid residue from the distillation of glycerine. This site was not in compliance with the solid waste regulations because there was no daily cover and material other than solid wastes were dumped in the landfill.

The Cincinnati Health Department notified Proctor & Gamble of their violations and restricted their activities to hardfill such as concrete, bricks and sand. The files do not indicate any hazardous wastes disposed of on-site. Proctor & Gamble was commended for their cooperation and improved solid waste practices. (The site has a dense grass cover now). This site is a medium priority site for State and Federal activities.

A FIT (Field Investigation Team) inspection is recommended because the site is located in a sand and gravel buried valley aquifer. This creates the potential for glycerine to leach through the lagoon into the groundwater. Groundwater samples should be taken so installation of monitoring wells are required. Soil samples should also be taken in the area where the lagoon was located.

1812S/6

PRELIMINARY ASSESSMENT NARRATIVE

Lockland Works (E.I. DuPont de Nemours & Company, Inc.)
606 Shepard Drive
Lockland, Ohio 45215

→ Pilot Chemicals' address!

OHD980704704

The Lockland Works facility is located in the Village of Lockland in a mixed industrial and residential area. Former property boundaries of the facility are unknown, but it is believed that the site was bounded by Anthony Wayne Road to the east, the West Fork of Mill Creek to the west and south and the southern city limits of Lincoln Heights to the north. E.I. Dupont de Nemours & Company, Inc. owned and operated a sulfuric acid manufacturing plant at this site between 1929 and 1951. DuPont sold the 137 acre landholding in three separate parcels during the 1950's. The land has since been parcelled further and is currently occupied by Pilot Chemical, truck terminals and Lockland's municipal landfill. The area of concern at this site is reported to have covered approximately 1600 square feet within the 137 acre landholding. The exact location of the facility operations is not known, but the Lockland Building Commissioner believes the location to have been at 606 Shepard Drive, which is currently occupied by Pilot Chemical Company. The site was brought to the attention of the Ohio EPA by a Notification of Hazardous Waste form.

Sulfuric acid manufactured by the lead chamber process generated a lead sulfate sludge which was disposed of on-site in shallow pits as well as directly onto the ground surface. Contamination concerns include groundwater, surface water and direct contact. The site lies above the Mill Creek buried valley aquifer - fill deposits which supply 25,700 residents of Reading, Glendale and Wyoming with drinking water. The nearest well to the site is for the community of Wyoming and is located at 4500 feet to the south; Reading's well is located 6500 feet east of the site and the Glendale community well is located 2.5 miles northeast of the site. All wells pump from the sand and gravel valley fill deposits at depths ranging from 130 to 220 feet. Detailed site geology is unknown, although area well logs indicate the presence of a thick till deposit which may separate the aquifer of concern from site contamination.

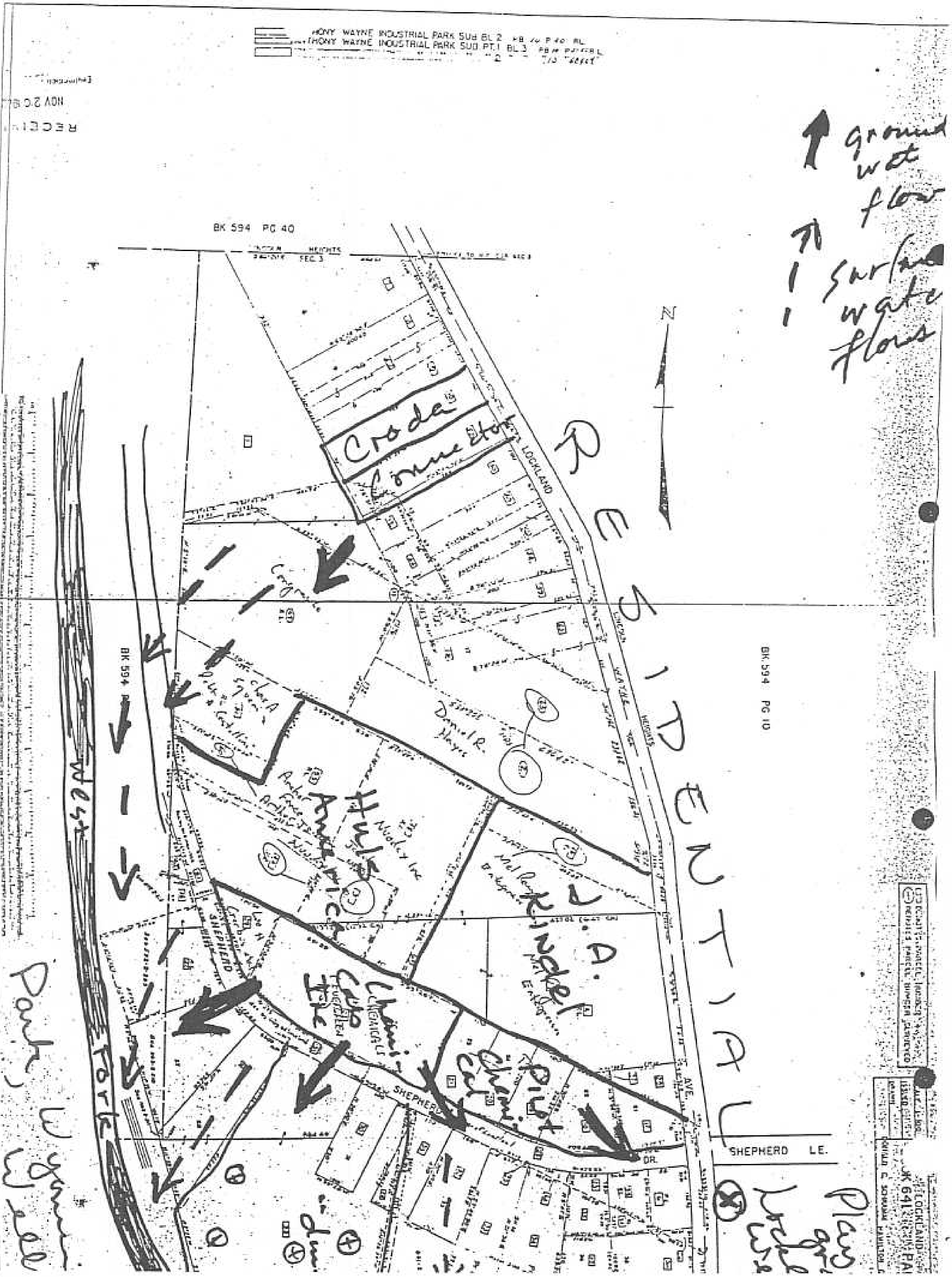
The West Fork of Mill Creek is located about 500 feet west of the site. Runoff, overland flow and subsurface seeps may have accelerated contaminant migration toward the creek. The West Fork of Mill Creek is not generally used for recreational or drinking water purposes. Direct contact is of concern as former site security is unknown and the nearest home is located less than 800 feet away.

It is recommended that this site be given a medium priority for additional investigation activities by the state and FIT. Investigations should include sampling of the West Fork of Mill Creek sediments, on-site soils and residential wells in the area.

Narrative completed by Ecology & Environment, Inc. 9/3/86

Narrative updated 12/7/87 by Claudine F. Jones, OEPA/SWDO/DSHWM

lmr



THONY WAYNE INDUSTRIAL PARK SUB PT.1 BL.3
BK 594 PG 40
ground water flow
surface water flows
Croda
RESIDENTIAL
LOCKLAND
Daniel R. Hayes
BK 594 PG 10
Huls America
Chemicals
Pilot Chemical
J.D. Kindel
SHEPHERD
SHEPHERD LE.
AVE.
DR.
West Fork
Park, Wayne Well

PRELIMINARY ASSESSMENT NARRATIVE

TENNECO CHEMICAL, INC.
620 SHEPHERD DRIVE
LOCKLAND, OH 45215
HAMILTON COUNTY

ID #: OHD041604729

THE FACILITY IS LOCATED ABOUT 3/4 MILES WEST OF I-75, SOUTH OF LINCOLN HEIGHTS, NORTH OF THE CITIES OF WYOMING AND LOCKLAND, AND ABOUT 1/8 MILE EAST OF THE BALTIMORE AND OHIO RAILROAD. THIS FACILITY IS IN OPERATION. ON DECEMBER 22, 1982, NUODEX INC. PURCHASED THE FACILITY FROM TENNECO INC. IT IS CURRENTLY UNDER THE RCRA - GENERATOR STATUS.

ACCORDING TO THE ECKHARDT - WASTE DISPOSAL SURVEY (1979), TENNECO DISPOSED SOME OF THEIR WASTES AT METROPOLITAN SEWER DISTRICT, MILL CREEK, 1600 GEST STREET, CINCINNATI, OH. THE TYPES OF WASTES DISPOSED THERE INCLUDED WASTES CONTAINING HEAVY METALS AND TRACE METALS, ORGANICS AND MISCELLANEOUS WASTE MATERIAL(S). THE AMOUNT OF WASTES DISPOSED IS SAID TO BE 2.6 MILLION GALLONS. A 1981 INDUSTRIAL SURVEY CONDUCTED BY OHIO EPA - SOUTHWEST DISTRICT, INDICATED NO ON-SITE WASTE DISPOSAL. THE COMPANY REPORTED THE DISPOSAL OF WASTE SOLVENTS AT GENERAL PORTLAND, INC., ROUTE 127 N, PAULDING, OHIO, LICENSE #OHD005048-947, AND THE DISPOSAL OF PAINT COLORANT SLUDGE AT CECOS/CER CO., 5092 ABER ROAD, WILLIAMSBURG, OH.

OTHER THAN THE TWO SURVEYS, THERE IS NO OTHER INFORMATION INDICATING THAT TENNECO HAD DISPOSED ANY WASTES ON-SITE. THE TWO ABOVE-MENTIONED DISPOSAL SITES ARE RCRA FACILITIES.

IF ANY WASTES CONTAINING HAZARDOUS SUBSTANCES WERE DISPOSED ON-SITE, THERE CAN BE A POTENTIAL GROUNDWATER CONTAMINATION. THE CITY OF WYOMING AND READING HAVE PUBLIC WATER SUPPLY SYSTEMS NEARBY THAT CAN BE AFFECTED.

A LOW STATE PRIORITY AND NO F.I.T. ACTIVITY IS RECOMMENDED FOR THIS SITE. THE DIVISION OF SOLID AND HAZARDOUS WASTE MANAGEMENT, RCRA GROUP, SHOULD INSPECT THE FACILITY TO INSURE THAT THE COMPANY MEETS RCRA - GENERATOR REGULATIONS.

PREPARED BY:
Chul Kim-McGuire
CHUL KIM-MCGUIRE
DISTRICT CERCLIS COORDINATOR
OEPA - SOUTHWEST DISTRICT
JUNE 19, 1987

REVIEWED BY:
Michael Starkey
MICHAEL STARKEY
DISTRICT UNREGULATED SITES
GROUP LEADER
DIVISION OF SOLID AND HAZARDOUS
WASTE MANAGEMENT

CHEMICALS INC.
LOCKLAND
HAMILTON COUNTY

SITE DESCRIPTION

This chemical repackaging and distribution facility, which is located in the Anthony Wayne Industrial Park, repackaged inorganic and organic chemicals, metal finishing products, lawn care products and agricultural products. The site has been used for industrial purposes by various owners since 1927.

ENVIRONMENTAL CONCERN

On-site and off-site ground water contamination with volatile organic chemicals has been discovered. Contaminants of concern include chlorinated solvents. The municipalities of Wyoming and Lockland have public drinking water supply wells located within 1/2 mile and 1/8 mile, respectively, of the facility.

CURRENT STATUS

In June 1990 an invitation to negotiate was extended to the potentially responsible party. Administrative negotiations for an interim action at the site were completed in July 1991.

ACTIVITY	ACTION DATE	STATUS	FUNDING SOURCE	COMMENTS
CONSENT ORDER	7/91	C	PRP	
IA	12/91	Current	PRP	finishing investigation stage
RI				
FS				
RD				
RA				
O & M				

PRELIMINARY ASSESSMENT NARRATIVE

Manville Forest Products Corporation
10600 Evendale Drive
Sharonville, OH 45241
USEPA #OHD037493707

Manville Forest Products Corporation Plant (MFP) is located in an industrial area of Hamilton County. The site is east of Evendale Drive, west of the CSX railroad lines, north of the Maxwell Tank Lines, Inc. and one half mile south of Sharon Road. The facility produces printed cartons and utilizes various solvents. These solvents are stored in eight underground storage tanks (USTs). Because the process produces spent solvents and ink, the facility is a RCRA generator.

There have been several spills at the facility over the past few years. On May 21, 1986, a RCRA inspection revealed spillage from a slop drain. This spillage, outside the solvent room, appeared to have taken place over a long period of time. On January 28, 1988, MFP discovered a leak in a fitting to an underground tank used for storage of house blend solvent. This house blend solvent contains toluene, normal propyl acetate, and isopropyl acetate. While personnel from Ohio EPA's Division of Ground Water were investigating this spill, they became aware of four other spills:

1. A spill similar to the January 28, 1988 toluene spill occurred in July 1986. OEPA did not become aware of this until a meeting held on July 25, 1988. Manville said that the spill did not involve any chlorinated solvents. They removed some contaminated soil.

2. OEPA noted a paint-like substance splattered on the ground. It appeared that this release occurred on several occasions. Manville later identified this material as varnish and that it was a one time release due to pipeline pressure testing.

3. A 500 gallon spill in the tank farm on October 12, 1988. A toluene tank overflowed in the same cavity as the January 28, 1988 spill.

4. A tanker truck spilled a white liquid on November 7, 1988. Mark Bange, Division of Groundwater, witnessed the substance being rinsed off into a drainage ditch. Manville and the distributor claim it is a glue consisting of water, clay, and polyvinylalcohol. OEPA sampling of the run-off wash water showed it to contain concentrations of 1,1,1-Trichloroethane and 1,1-Dichloroethane.

Upon discovery of the January 28, 1988 spill, MFP shut down the solvent pump and notified the USEPA National Response Center. The initial estimate was 3500 gallons of the solvent were spilled. Soil removal began the following day; by the first week in February, 80 cubic yards of contaminated soil had been removed. S&ME (now known as Westinghouse

Environmental Engineering) was retained by MFP to conduct the initial investigation. Monitoring wells were put into place to determine if groundwater contamination was present. Results from monitoring well sampling (concentrations given in µg/L) were: Toluene (1,280,000); Normal Propyl Acetate (1,100,000); Isopropyl Acetate (1,160,000); Benzene (680); 1,1-Dichloroethane (88); Ethylbenzene (680); 1,1,1-Trichloroethene (3,910); Methylene Chloride (13,130); Choroethane (8); 1,2-Dichloroethane (190); Acetone (187,000); Total Xylenes (169); and Methyl Isobutyl Ketone (8,620). In addition, samples from the 11/7/88 spill runoff showed 1,1-Dichloroethane (790) and 1,1,1-Trichloroethane (16,850).

Several remedial actions have taken place since the initial spill. Manville's consultant, Westinghouse, collected soil samples from three bore holes and performed a soil gas survey using an organic vapor analyzer; however, the results were never received by the OEPA. By October 1988, 20 wells were in place (monitoring and recovery). A soil vapor extraction system was implemented in October of 1989. MFP reported on August 28, 1990, that the system had removed approximately 5,200 gallons of spilled toluene. In their report they also stated that toluene is being recovered in low volumes from the shallow aquifer beneath the plant site. They stated that no detectable toluene is leaving the site in groundwater, whereas significant concentrations in low volumes are still being recovered from groundwater in the immediate area of the spill.

There are four major well fields within the three mile target area which serve 29,300 people and draw from the Mill Creek buried valley aquifer. The well fields are: Village of Glendale (serves 2,500), Lockland (4,300), the City of Reading (12,800), and the City of Wyoming (9,700). There are also several surface water routes in the target area: Mill Creek, West Fork Mill Creek, Sharon Creek, and Sharon Lake. Sharon Lake is part of Sharon Woods, a Hamilton County Park.

Due to the nature of the contaminants (highly toxic and persistent) and the large population potentially affected, a high priority for both FIT and state activity is recommended.

Prepared by:

Rick J. Riess

Rick J. Riess
College Co-Op, DERR, SWDO
Date: 11/23/90

Reviewed by:

Michael Starkey

Michael Starkey
Group Leader, DERR, SWDO
Date: 11/23/90

PRELIMINARY ASSESSMENT NARRATIVE

Date: July 31, 1984
Company: MSD
I.D.#: OHD000720250
OHD980898621

Metropolitan Sewer District of Cincinnati (MSD) is a RCRA regulated TSD facility operated by the Hamilton County Board of Commissioners. The MSD site is located in a commercial-industrial-residential area. The facility is responsible for the treatment, storage and disposal of sewage and liquid hazardous waste.

MSD is divided into 2 facilities. The primary facility is the STP. It is managed under the NPDES permit system. The second facility is the hazardous waste incinerator and waste storage area. Behind that are the 2 lagoons used for the storage of ash and water generated from the 2 waste processes. Although Liquid/Fluid Incinerator (L/FI) is located on the same property as the WWTP, each facility is operated independently.

The concern is directed toward the L/FI facility and the two ash lagoons. The L/FI is comprised of a rotary kiln, cyclone furnace, final combustion chamber and auxiliaries for solvent waste disposal, WWTP grit and skimming disposal.

The L/FI is regulated by RCRA and Air Pollution guidelines. The LFI is a integrated facility for storing and incinerating liquid organic wastes with high BTU values. The wastes include a wide variety of substances such as printing ink waste, paint manufacturing sludges, methacrylate wastes, hydrocarbon solvents and chlorinated solvents. MSD also has the privilege of excluding specific waste such as peroxide, metal hydrides and waste containing mercury, arsenic, beryllium, cadmium, lead and selenium.

The attached portion of the Part A describes the various waste that are incinerated at MSD. Ash generated from both the hazardous waste facility and the WWTP is discharged to the two lagoons. By definition, the ash from the L/FI is hazardous. By the mixture rule, it defines the entire contents of the lagoons as hazardous. MSD is petitioning the USEPA to rule on delisting the ash from the L/FI thereby exempting these lagoons from regulations. As it currently stands, MSD is in violation of RCRA regulations for not implementing the ground water monitoring program mandated under RCRA for ground water monitoring of hazardous waste lagoons.

The L/FI has not been operating for the past two years. They were shut down for violating the ambient air quality standards for particulates. The permit was denied on the basis of the stack test. This test confirms under normal operating conditions, the LFI unit would exceed Ohio EPA particulate

emission standards. The 1st stack test on the L/FI was in late 1981. By February, 1982, MSD was notified of the violation in emission standards. Additional stack tests were performed in November, 1982 and July, 1983. These tests continued to demonstrate L/FI violation of the particulate emission standards during normal operations.

Analysis also exhibits a small percentage of lead in the particulate matter. The L/FI will remain closed until all violations are resolved.

The tank farm for the storage of the waste before incineration consist of 21 tanks with a total capacity of 300,000 gallons. One large tank contains 30,450 gallons of fuel oil. Nine tanks, along with the 4 holding tanks and 4 batch tanks are used for storage of liquid organic waste. A fire and explosion hazard may exist due to the nature of the waste stored in the tank farm. RCRA requires a facility to introduce inspection plans and emergency guidelines for accidental spills released to the environment. On the site visit, the daily inspection of the tank farms was reviewed. They were inspecting the valves, general fittings and the spill prevention system on a daily basis. The Cincinnati Fire Department also assured me that no major problems exist at MSD for a fire and explosion hazard. The contents of the tank is organic liquid waste. PCB and lead had been mixed with the waste but the concentration was minimal. The highest PCB concentration in one tank was valued at 25 ppm. All other tanks values were less than detectable limits. These concentrations are below the established levels set forth by 40 CFR 761 of the Toxic Substance Control Act (less than 50 ppm).

MSD major problems are the compliance status for particulate emission standards and the RCRA status of the L/FI Ash. Although, MSD has discontinued disposing of the ash from the L/FI into the lagoons, the lagoons are within RCRA guidelines for past disposal practices. Until the USEPA finalizes the status of the L/FI ash, the lagoons are hazardous by definition. A ground water monitoring program should be implemented.

Technically, MSD is violating RCRA guidelines for not installing a ground water monitoring system around the lagoons. The Ohio EPA and the USEPA has deferred action against MSD in expectation of a final delisting ruling on the two lagoons. Since all areas and activities at this facility are regulated by RCRA or the NPDES regulations, this is considered a low priority site. No FIT or State activity is warranted at this time. (Low priority FIT, low priority State)

PRELIMINARY ASSESSMENT NARRATIVE

North Bend Dump
200 W. North Bend Road
Cincinnati, Ohio 45216
Hamilton County

I.D. #OHD980510317

The North Bend Dump is located on West North Bend Road in Cincinnati, Ohio. The site lies adjacent to the Mill Creek and Congress Run Creek. The North Bend Dump operated from 1960 until 1974. There are no available records to indicate exactly what types and amounts of waste were disposed here. Frederick Steel Corporation is now located adjacent to, or very close to where the original location of the North Bend Dump is supposed to exist.

The dump is listed on the Comprehensive Environmental Response Compensation, and Liability Information System (CERCLIS) as being a potential hazardous waste site. The types of waste allegedly disposed at the site were foundry sand, demolition waste, heavy metals, organics and inorganics, but no known documentation is presently available as to the nature or quantity of this or other waste which may have been disposed of at the site.

The site overlies a portion of the Mill Creek Buried Valley Aquifer. Therefore, the quanitities of hazardous waste, if any was disposed of at the site, create a potential for groundwater and surface water contamination.

The city of Wyoming, 2.1 miles to the northeast of the dump, has 6 wells. The city of Lockland, 2.3 miles to the northeast of the dump, has 4 wells. The city of Reading, 2.7 miles to the northeast also utilizes groundwater in the area for its water supply, and has 7 wells.. There is potential for surface water contamination because the Mill Creek and Congress Run Creek flow adjacent to the site and onward through Lockland, Wyoming and Reading.

A low priority for the state, and a low priority for F.I.T. activity is recommended for the site.

Prepared by: _____
Marc S. Hill
District CERCLIS Coordinator
OEPA - Southwest District Office
September 30, 1987

Reviewed by: _____
Michael Starkey
District Unregulated Sites, Group Leader
Division of Solid and Hazardous Waste Management

bjb

PRELIMINARY ASSESSMENT NARRATIVE

Old Galbraith Road Landfill
Galbraith Road
Arlington Heights, Ohio 45215
Hamilton County

I.D.#: OHD980994412

The old Galbraith Road Landfill is located at Galbraith Road, east of Mill Creek in Arlington Heights. The site extends 200 yards on both the north and south side of Galbraith Road. The landfill operated from 1958 until 1965. There are no available records to indicate who operated the site. The site is now covered by buildings which have existed at the location for the last three years.

The landfill is listed on the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) as being a potential hazardous waste site. The type(s) of waste disposed at the site was demolition waste, but no known documentation is presently available as to the nature or quantity of this or other waste which may have been disposed of at the site. The City of Arlington Heights stipulates that this site was once an old sand pit, which is now covered with 70 feet of soil.

The site overlies a portion of the Mill Creek Buried Valley Aquifer. Therefore, depending on the exact location, and quantities of hazardous waste, if any was disposed of at the site, there is a potential for groundwater and surface water contamination. The City of Lockland, 1.3 miles due north of the landfill, has 4 wells. The City of Reading, 1.0 miles to the northeast also utilizes groundwater in the area for its water supply, and has 7 wells. There is potential for surface water contamination because the Mill Creek flows directly adjacent to the site and onward through Lockland and Reading.

A low priority for the State, and a low priority for F.I.T. activity is recommended for the site because of the nature of the waste disposed here which apparently is limited to demolition materials but could possibly include some hazardous wastes.

Prepared by: Marc S. Hill
Marc S. Hill
District CERCLIS Coordinator
OEPA - Southwest District
September 9, 1987

Reviewed by: Michael Starkey
Michael Starkey
District Unregulated Sites, Group Leader
Division of Solid and Hazardous Waste Management

PHTHALCHEM, INC.
CINCINNATI
HAMILTON COUNTY

TE DESCRIPTION

This company is the only manufacturer in the western hemisphere of crude copper phthalocyanine blue, a pigment intermediary which is the basis of blue dye for all types of products.

The site borders Mill Creek, which was channelized with concrete by the U.S. Army Corps of Engineers in 1983.

ENVIRONMENTAL CONCERN

Releases of trichlorobenzene (TCB), dichlorobenzene (DCB), ammonia, copper, napthalene, chlorobenzene and other chemicals to the environment have occurred at this facility. These releases have been to the air, surface water, ground water, and Cincinnati's combined storm/ sanitary sewer. Other problems include spills in the company's process building and warehouse, a former unlined lagoon, contaminated ground water seepage into Mill Creek, and scrubber system discharges. These problems have been occurring since before 1980.

CURRENT STATUS

In August 1985 the company cleaned up TCB-contaminated sediment from the floor of Mill Creek, cleaned up downstream pools of TCB in Mill Creek and installed a pump in the Mill Creek sub-base to recover TCB from under the floor of Mill Creek. Reportedly, 4,400 gallons of TCB were recovered in 1985.

An order for a remedial investigation and feasibility study was issued by Ohio EPA in February 1987. The Attorney General's Office entered into a preliminary injunction in December 1989 to correct air emission violations, industrial discharge permitting violations, nonpermitted surface and ground water discharges and hazardous waste violations. As a result of this injunction the company is required to install monitor and recovery wells, surface water controls, and air emission controls as temporary measures.

Phthalchem was referred to the Attorney General's Office for negotiation of interim actions in 1991.

ACTIVITY	ACTION DATE	STATUS	FUNDING SOURCE	COMMENTS
CONSENT ORDER	2/87	C		
PHASE I RI	5/87	C	PRP	
PHASE II RI	5/88	U	PRP	
FS				
RD				
RA				
O & M				

PREMIUM FINISHES

The first task of the RI/FS is to prepare a description of the current situation at the site, to be presented in report form. This Project Status Summary Report presents the results of ERM-Midwest's RI/FS Task 1 activities. The report describes the background of the site, summarizes all relevant previous investigations, and will serve as a baseline for the remaining RI/FS tasks.

2.0 SUBTASK 1.1: SITE BACKGROUND REVIEW

2.1 Introduction

The purpose of this subtask is to compile, examine, and present in summary form existing information and data pertinent to the site. This information includes reports from the literature covering the regional area, pertinent site and boundary features, general area physiography, hydrology, and geology. Information concerning site history, facility operations, and other general information regarding the site and surrounding areas was obtained via discussions with the current facility technical director, Dr. Donald R. Montgomery.

2.2 Facility Description/History

Hunting owns and operates a specialty coating manufacturing facility located at 10448 Chester Road, Woodlawn, Ohio. Land usage in the vicinity of the site is predominantly commercial (industrial and manufacturing). The facility is located in an industrial subdivision which extends along the southeast side of Chester Road from Glendale-Milford Road to Oak Road (Figure 1). Plate 1, which is a map prepared based on U.S.G.S. maps, site observations, and discussions with Hunting, depicts the facility and its relationship to neighboring facilities.

The plant was built in 1961 and was first occupied by the Black Diamond Paint and Varnish Works (Black Diamond). Gloria and Dr. Ronald Savin purchased the facility in 1968 and it was renamed "Premium Finishes, Inc." (PFI). The Savins operated PFI as a specialty coatings manufacturing facility up until March of 1991, when it was purchased by Hunting. Based upon existing information, the basic nature, operations, and production process at the facility has remained constant from the purchase by PFI up until the present. Little information is available concerning the nature of the Black Diamond operations; it is presumed, however, that the basic nature of the facility operations was similar to PFI's.

The Black Diamond facility reportedly utilized an 11-tank underground storage tank (UST) farm for storage of raw materials. The USTs were of steel construction and had no cathodic protection. The presumed configuration of the Black Diamond facility and underground storage tank farm is shown in Figure 2. The Black Diamond underground storage tanks reportedly were used for storage of the following raw materials:

Tank 1 (6,000 gallon capacity)	Mineral Spirits
Tank 2 (1,000 gallon capacity)	VM & P Naptha
Tank 3 (1,000 gallon capacity)	Apco 467
Tank 4 (1,000 gallon capacity)	Kerosene
Tank 5 (1,000 gallon capacity)	Xylol
Tank 6 (2,000 gallon capacity)	60% Alkyd
Tank 7 (2,000 gallon capacity)	Quick Dry Alkyd
Tank 8 (2,000 gallon capacity)	70% Alkyd
Tank 9 (2,000 gallon capacity)	Z-2 Oil
Tank 10 (1,500 gallon capacity)	Aged Linseed Oil
Tank 11 (4,000 gallon capacity)	Latex

In July of 1989, toluene was discovered in a surface drainage located east of the facility. The product was subsequently traced to a leak in Tank #4 (Figure 3) at PFI. An environmental emergency response contractor (Environmental Enterprises Inc. of Cincinnati, Ohio) was retained initially by Ohio EPA Emergency Response and subsequently by PFI to contain the product and remove the tank. According to a February 1988 report by Environmental Assessment Services, Inc. (EAS), a consulting firm later retained by PFI, tank removal included removal of approximately three cubic yards of soil and the installation of two groundwater collection sumps. One sump was installed in the tank excavation pit. The second sump was installed in an excavation pit approximately fifty feet east of the tank excavation in the direction of the groundwater flow toward the storm sewer leading to the creek.

According to EAS (February 1989), a small hole was observed in the toluene tank cylinder following its removal. The cumulative period during which the product release (the volume of which is unknown but has been estimated by Hunting at 600 gallons) occurred was not known. From 1988 to 1990, PFI retained several consulting firms to assist with the assessment of the integrity of the tank farm, characterize conditions at the site, and to implement interim remedial actions. The following section of this report summarizes those studies.

2.3 Previous Studies

During the past three years, the following firms have been retained by PFI to characterize the extent of soil and groundwater contamination and perform remedial actions at the site:

August 15, 1990 Report (Appendix C), the direction of groundwater flow at the site is toward the southeast.

PET calculated the average hydraulic gradient at the site to be 0.06. PET noted that following periods of rainfall, a groundwater mounding effect occurs in the vicinity of the former tank pit. This is presumably because, with the exception of the backyard area of the site, most of the immediately vicinity is either paved or covered by structures, both of which essentially eliminate recharge by rainfall. Further, since the former tank pit is presumably filled mostly with permeable granular materials, it acts as an effective infiltration point for recharge.

Based upon slug tests performed on selected monitoring wells at the site, PET calculated the hydraulic conductivity of the glacial till water bearing zone to be 7.8×10^{-6} cm/sec.

3.0 CONTAMINANT NATURE AND EXTENT

3.1 Contaminant Nature

A significant amount of information has been collected to date concerning the nature of contaminant presence at the site. This includes analyses of soil samples collected from the tank pit by PET in April 1990 (Appendix B), analyses of groundwater samples collected from monitoring wells at the site by PET in June 1990 (Appendix C), as well as analyses of a number of water samples collected by PFI and Hunting from monitoring well #2, the tank pit sump, the interceptor trench sump, and the catch basin at the site (Appendix E). A summary of the maximum levels of constituents identified by media is presented in Table 1.

Table 1

Organic Constituents Identified in the Groundwater or Soil

CONSTITUENT	PHASE	MAXIMUM CONCENTRATION Water(ug/l)	Soil(ug/kg)
1,1,1-Trichloroethane	Water and Soil	9.12	144
1,1,2,2-Tetrachloroethane	Soil	-	466
1,1,2-Trichloroethane	Water	1.55	-
1,1-Dichloroethane	Soil	-	484
Tetrachloroethylene	Water and Soil	3.56	2,490
2-Hexanone	Soil	-	5,928
Benzene	Water and Soil	3.6	81
Ethylbenzene	Soil	-	282,430
Toluene	Water and Soil	40,000	887,200
Total Xylene	Water and Soil	25,767	1,211,640
MEK	Water	67,000	-
MIBK	Water and Soil	58,000	375,975
Total Purged Hydrocarbons	Soil	-	2,370

kar\adm\table1

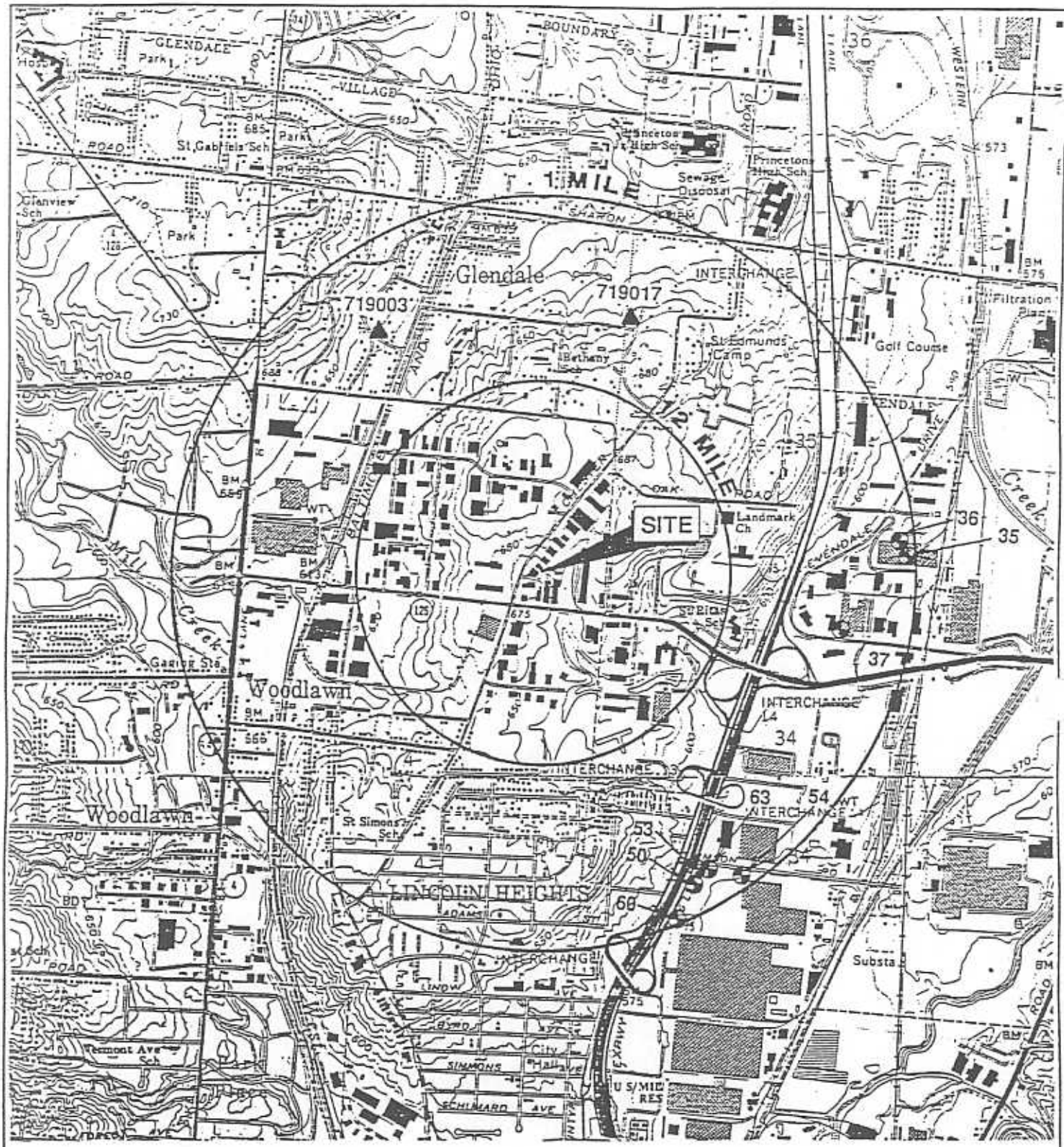
3.2 Contaminant Extent

3.2.1 Contaminant Extent in Soil

There is limited information available concerning the extent of contaminant presence in soil at the site. The PET analytical results from soil samples collected at the base of the tank pit excavation (Appendix B) in April 1990 indicate that the presence of organic constituents is probably ubiquitous in the former tank pit.

3.2.2 Contaminant Extent in Groundwater

The existing groundwater data presented herein indicates the presence of volatile organic constituents (VOCs) in groundwater at the site. The monitoring well located near the site property boundary and directly downgradient (southeast) of the former tank pit (MW-1) has historically exhibited the presence of significantly elevated levels of VOCs. As illustrated by Figure 9 of the August 15, 1990 PET report (Appendix C), MW-1 is the only well which indicated the presence of significant levels of VOCs during the June 26, 1990 sampling round. The proximity of well MW-1 to the site's southwestern property boundary indicates that a plume of VOC contaminants may have moved off-site towards the southeast.



*BASED UPON CONR RECORDS

BASEMAP SOURCE: USGS GLENDALE AND CINCINNATI EAST QUADS

WATER WELLS WITHIN 1 MILE RADIUS*
HUNTING SPECIALTY PRODUCTS, INC.
PFI-CINCINNATI, OHIO

FIGURE 4

ERM-Midwest, inc.
Environmental Resources Management

water, ground water and soil samples to characterize background levels and to help determine off-site risk to human health and the environment.

The Skinner property is comprised of approximately 78 acres of hilly terrain, bordered on the immediate south by the East Fork of Mill Creek. The landfill is bordered to the north by wooded land, to the east by a Consolidated Rail Corporation (Conrail) right-of-way, to the south across the East Fork of Mill Creek by agricultural and wooded land and to the west by Cincinnati-Dayton Road. A site topographic map is included as Figure 1.2. The principal residential area is west of the landfill; however, numerous residences are located within 2,000 feet of the landfill to the east, south and west.

1.2.2 Site History and Chronology

The Skinner property, originally a sand and gravel operation, first became involved in landfill operations in 1934 with the disposal of general municipal refuse in abandoned sand and gravel pits. The precise location of these early fill areas is not known. It is unknown exactly what materials were deposited in the landfill from 1934 until the present.

In 1959, the landfill was used for the disposal of scrap metal and general trash from a paper manufacturing plant. In the spring of 1963, the Butler County Board of Health (BCBH) approved the use of the site as a sanitary landfill. In 1963, during the permitting procedure, local residents opposed the landfill, stating that chemical wastes were being dumped there.

It was revealed during a phone conversation on April 26, 1976 between Mr. Bill Kovacs of Chem-Dyne and Mr. Elmer Rehme, Chief of the Industrial Waste Section, Ohio EPA, SWDO, that Mr. Albert Skinner built and repaired tanks for C.D.C. (Chem-Dyne Company). This information was taken from a report to Mr. Ned Williams, Director, Ohio EPA, by Mr. Joe Moore, Ohio EPA.

Also in April of 1976, numerous citizen complaints and a fireman's observation, while fighting a fire at the Skinner Landfill, of a black, oily liquid in a waste lagoon on the site prompted the Ohio Environmental Protection Agency (OEPA) to investigate the Skinner Landfill. Representatives of BCBH, OEPA, the Southwestern Ohio Air Pollution Control Agency (SOAPCA) and the Butler County Sheriff's Department (BCSD), after being denied access on April 22, 1976, entered the Skinner Landfill with a search warrant on April 26, 1976. Bill Kovacs, owner/operator of Chem-Dyne, a Superfund site in

Hamilton, Ohio was also on-site at this time. According to the U.S. EPA's Regional Project Manager (RPM) responsible for this site investigation, Mr. Kovacs' role was as a consultant and advisor to the Skinners. During this site visit the waste lagoon area showed evidence of recent grading. Over one hundred 55-gallon drums marked "Chemical Waste" were observed. In verification of these observations, OEPA inspection of aerial photos taken in January and February of 1976 revealed a lagoon in the regraded area and several hundred drums scattered throughout the site.

The OEPA returned to the Skinner Landfill with a search warrant on May 4, 1976. The road leading to the waste lagoon was blocked by a bulldozer, claimed to be inoperable by Mr. Albert Skinner. When told that the OEPA would return with equipment to remove the bulldozer, Mr. Albert Skinner stated that the following materials were buried at the landfill: nerve gas, mustard gas, incendiary bombs, phosphorus, flame throwers, cyanide ash and explosive devices. At this time the OEPA withdrew from the site.

On May 11, 1976, representatives of the OEPA, the Army Special Unit and the BCSD entered the landfill to inspect and sample the waste lagoon area. Analysis of samples taken from a trench excavated at the lagoon site revealed pesticides, including chlordane intermediates, some volatile organic compounds and elevated concentrations of several heavy metals, as shown in Table 1.1. Appendix B contains the raw data as reported by the U.S. EPA.

In response to these discoveries, the Skinners retained H.C. Nutting Company in July 1976 to conduct a shallow geologic investigation. Records of five soil borings, drilled 9 to 16.5 feet deep in the area of the lagoon, show mixed soils consisting of sand, silt, clay and gravel with an occasional mention of "organics" and "odor detected." Copies of the boring logs are provided in Appendix A of this report.

The OEPA made a subsequent site inspection in July 1977. WESTON's Phase I Work Plan states that the OEPA found leachate seeping from near the buried lagoon and a faint chemical odor near the buried lagoon. From August 1977 until January 1979, OEPA attempted without success to obtain a court order to force the Skinners to remove the chemical waste. Subsequent appeals by the OEPA were unsuccessful. The court did, however, prohibit future disposal of industrial waste at this site except under legal permit. It was confirmed at this time that the Skinners had an agreement with Bill Kovacs to clean and maintain Chem-Dyne vehicles and tanks.

In early 1980, a Field Investigation Team (FIT) from CH2M Hill tried to enter the landfill to install monitoring wells and to take samples but was refused entry by Mrs. Elsa Skinner.

In July 1982, a Field Investigation Team (FIT) from CH2M Hill installed four ground water monitoring wells to characterize water quality beneath the buried lagoon area. Volatile organic compounds were detected in ground water collected from a monitoring well located southeast of the buried lagoon. In December 1982, as a result of the FIT investigation, the Skinner Landfill was placed on the National Priority List (NPL) with a ranking of 659. This action prompted the initiation of a RI/FS with Phase I activities commenced by Roy F. Weston, Inc. (WESTON) in September 1984.

In the Spring of 1986, WESTON initiated the field investigation for Phase I of the RI. This initial investigation included a geophysical survey, the installation of eighteen ground water monitoring wells, and the sampling of ground water, surface water, and soils. Additionally, a biological survey of the diversity of both fish and macroinvertibrate fauna collected from the East Fork of Mill Creek and Skinner Creek was performed.

A second round of ground water, surface water, and soil sampling was taken in the summer of 1986. Based upon the results of sampling during rounds I and II, an additional round of sampling was performed in July 1987 in accordance with the recommendations outlined in the Phase I Tech Memo, submitted by WWES in October, 1990. A soil gas survey was also performed in the vicinity of the buried lagoon in an attempt to define specific areas needing further exploration.

Since the time WWES began planning Phase II of the RI investigation and apparently also throughout Phase I activities, site access problems have occurred. Although eventually resolved, these situations served to delay the start-up of the Phase II activities. Ultimately an administrative order to permit access to the U.S. EPA and it's subcontractors was issued in October 1987 to prevent future disruption in the work schedule. Additionally, the OEPA sought and achieved site closure to all landfilling activities.

associated with the breakdown of the waste lagoon pesticides. This well is screened just below the bedrock contact on the floor of the buried valley to the southeast of the lagoon.

6.4.3 Surface Water, Sediment, and Leachate

The leachate seeps entering the East Fork of Mill Creek contained volatile organics, semi-volatile organics and pesticide compounds in the leachate water and sediment. The only significant organic compound detected in the leachate water from the Skinner Creek seep (LW-03) was the pesticide hexachlorobutadiene. This pesticide compound was also detected in a water sample from Trilobite Pond which suggests that the pond and the seep are in hydraulic communication. This suggestion is supported by pH and specific conductivity values. Petroleum odors, however, seem to link this seep to Diving Pond.

The set of compounds detected in LW-01 were also found in the ground water sample obtained from GW-20, located upgradient of the leachate seep and below the waste lagoon. This pattern suggests that the seep is a direct discharge point for ground water originating in, and impacted by, the waste lagoon. Discharge at LW-01 may be induced or aided by the drainage pipe while discharge at LW-02 appears to be controlled by lithology, as discussed in Section 4.4.4, and supported by the soil vapor screening, specific conductivity and pH measurements. The leachate sample LW-01 did not contain any of the contaminants seen in LW-02 but the corresponding sediment sample, LS-01, contained many of the same compounds as LS-02. The majority of detections in the sediments were semi-volatile compounds.

The laboratory analyses of surface water and sediment samples form the Skinner site showed the presence of volatile organic compounds, semi-volatile organic compounds, pesticides, PCB's and metals at low concentrations.

No significant surface water contamination of East Fork of Mill Creek was observed. A variety of semi-volatile organic compounds, pesticides, and PCB's were detected in sediment samples from the creek, however. Similar observations were made of Skinner Creek as no significant surface water contamination was observed, but volatile organic, semi-volatile organic and pesticide compounds were detected in Skinner Creek sediment samples in the vicinity of SM-20 and SM-21, near the buried pit and the main site access road.

Water samples from Duck Pond and Dump Creek did not reveal significant amounts of contamination. The sediments of Duck Pond were shown to be impacted by pesticides

while Dump Creek sediments contained detectable levels of volatile organics, semi-volatile organics and a single low level detection of a pesticide compound.

Water samples from Trilobite and Diving Ponds both contained low concentrations of pesticides. Semi-volatile organics were detected in water collected near the base of Trilobite Pond. Sediments from Diving Pond contained detectable levels of volatile organics, semi-volatile organics, PCB's and pesticides. The sediment samples from Trilobite Pond were relatively unimpacted, but have been recently disturbed and altered through dredging and excavating activities by the landfill operator.

The draft risk assessment submitted in December 1990 compared the results of the on-site surface water and sediment sampling on the Skinner site to background sample locations. This process of comparison will determine if the contamination encountered is attributable to the historic disposal process or attributable to off-site sources. The risk assessment will evaluate which, if any, of the compounds pose a threat to human health or the environment.

6.5 POTENTIAL OFF-SITE MIGRATION

The results of the Phase II Remedial Investigation indicate that there is limited potential for significant off-site migration of contaminants from the Skinner site. The only evidence of contaminants potentially leaving the site through ground water migration was a detection of ethylbenzene at 5 ug/l from the bedrock well GW-24 located across the East Fork of Mill Creek from the buried waste lagoon. This low concentration and the fact that only a single organic parameter was detected may indicate that the ethylbenzene detection was invalid.

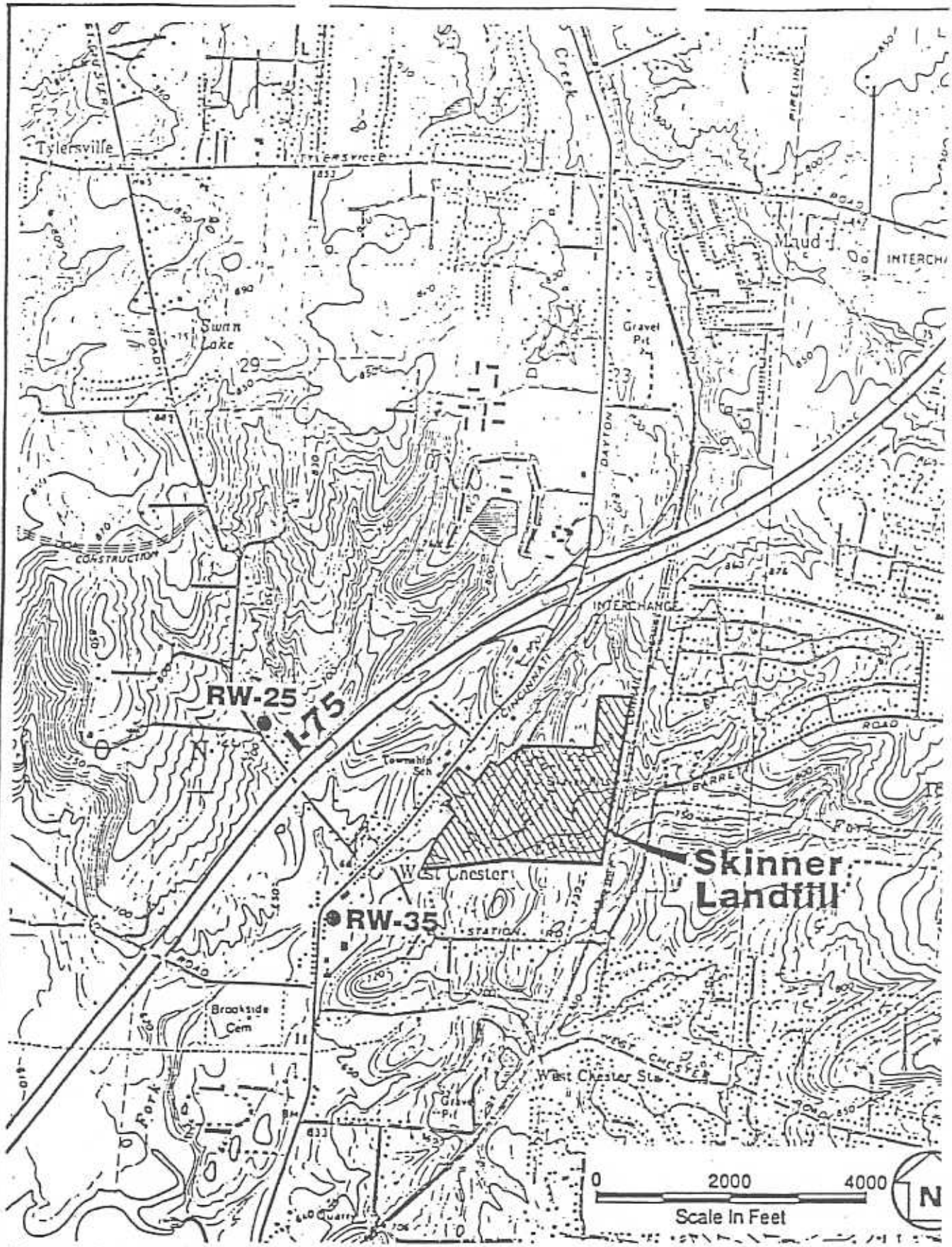
The only other potential off-site migration route is through the East Fork of Mill Creek and Skinner Creek. The leachate seeps discharging into the East Fork of Mill Creek appear to originate within the buried waste lagoon. A variety of contaminants were detected in surface waters and sediments from the creeks at low concentrations. The Risk Assessment will evaluate the potential effects of the surface water and sediment contamination on human health and the aquatic environment.

TABLE 1.1

SUMMARY OF CONCENTRATION RANGES OF CHEMICALS OF CONCERN

Chemical	Sediments					
	Mill Creek (mg/Kg)	Skinner Creek (mg/Kg)	Dump Creek (mg/Kg)	Duck Pond (mg/Kg)	Diving Pond (mg/Kg)	Trilobite Pond (mg/Kg)
Aluminum	- - -	8860 - 15900	- - -	18600 - 24900	13300 - 15300	32300 - 42700
Antimony	- - -	- - -	- - -	- - -	- - -	- - -
Arsenic	- - -	- - -	- - -	- - -	- - -	- - -
Barium	- - -	- - -	- - -	136 - 209	- - -	- - -
Beryllium	- - -	- - -	- - -	- - -	- - -	1.6 - 2.3
Cadmium	- - -	- - -	- - -	- - -	- - -	- - -
Chromium	- - -	- - -	- - -	21.3 - 29.7	17.8 - 26.8	37.8 - 46.4
Cobalt	- - -	- - -	- - -	15.7 - 18.7	- - -	19.4 - 21.6
Copper	- - -	- - -	- - -	21.1 - 29.3	- - -	18.6 - 22.7
Lead	10 - 43	21 - 139	- - -	- - -	196 - 511	- - -
Manganese	- - -	- - -	- - -	- - -	- - -	- - -
Mercury	0.12 - 0.13	- - -	- - -	- - -	- - -	- - -
Nickel	- - -	- - -	- - -	19.9 - 24	- - -	34.1 - 39.3
Silver	- - -	- - -	- - -	- - -	- - -	- - -
Thallium	- - -	- - -	- - -	0.42 - 0.61	- - -	- - -
Tin	- - -	40 - 52	37 - 37	- - -	47 - 47	- - -
Vanadium	- - -	18 - 32.3	- - -	38.7 - 54.6	- - -	56.1 - 73.3
Zinc	- - -	- - -	- - -	- - -	80.7 - 131	- - -
Cyanide	- - -	- - -	- - -	- - -	- - -	- - -
Vinyl Chloride	- - -	- - -	- - -	- - -	- - -	- - -
Chloroethane	- - -	- - -	- - -	- - -	- - -	- - -
Methylene Chloride	- - -	- - -	0.968 - 0.968	- - -	- - -	- - -
Acetone	0.007 - 0.016	0.023 - 0.062	0.074 - 0.31	- - -	- - -	- - -
Carbon Disulfide	0.0009 - 0.0014	- - -	- - -	- - -	- - -	- - -
1,1-Dichloroethene	- - -	- - -	- - -	- - -	0.0299 - 0.0299	- - -
1,1-Dichloroethane	- - -	- - -	- - -	- - -	- - -	- - -
1,2-Dichloroethene	- - -	0.083 - 0.083	- - -	- - -	- - -	- - -
Chloroform	- - -	- - -	- - -	- - -	- - -	- - -
1,2-Dichloroethane	- - -	- - -	- - -	- - -	- - -	- - -
2-Butanone	- - -	- - -	- - -	- - -	0.005 - 0.011	- - -
1,1,1-Trichloroethane	- - -	- - -	- - -	- - -	- - -	- - -
Carbon Tetrachloride	- - -	- - -	- - -	- - -	- - -	- - -
1,2-Dichloropropane	- - -	- - -	- - -	- - -	- - -	- - -
Trichloroethene	- - -	0.02 - 0.02	- - -	- - -	0.0016 - 0.0016	- - -
Dibromochloromethane	- - -	- - -	- - -	- - -	- - -	- - -
1,1,2-Trichloroethane	- - -	- - -	- - -	- - -	- - -	- - -

Chemical	Mill Creek (mg/Kg)	Skinner Creek (mg/Kg)	Dump Creek (mg/Kg)	Duck Pond (mg/Kg)	Diving Pond (mg/Kg)	Trilobite Pond (mg/Kg)
4-Methyl-2-Pentanone	0.0013 - 0.0016	0.0049 - 0.0049	- - -	- - -	- - -	- - -
2-Hexanone	- - -	0.0051 - 0.0051	- - -	- - -	- - -	- - -
Tetrachloroethene	- - -	- - -	- - -	- - -	- - -	- - -
1,1,2,2-Tetrachloroethane	- - -	0.002 - 0.002	- - -	- - -	- - -	- - -
Toluene	- - -	- - -	- - -	- - -	- - -	- - -
Chlorobenzene	- - -	- - -	- - -	- - -	- - -	- - -
Ethylbenzene	- - -	- - -	- - -	- - -	0.074 - 0.074	- - -
Xylene (total)	- - -	- - -	- - -	- - -	0.008 - 0.261	- - -
Phenol	0.055 - 0.1397	- - -	- - -	- - -	- - -	- - -
bis(2-Chloroethyl)Ether	- - -	- - -	- - -	- - -	- - -	- - -
1,3-Dichlorobenzene	- - -	- - -	- - -	- - -	- - -	- - -
1,4-Dichlorobenzene	- - -	- - -	- - -	- - -	- - -	- - -
Benzyl Alcohol	- - -	- - -	- - -	- - -	- - -	- - -
1,2-Dichlorobenzene	- - -	- - -	- - -	- - -	- - -	- - -
2-Methylphenol	- - -	- - -	- - -	- - -	- - -	- - -
bis(2-Chloroisopropyl)Ether	- - -	- - -	- - -	- - -	- - -	- - -
4-Methylphenol	0.0165 - 1.5542	0.0105 - 0.0191	- - -	- - -	- - -	- - -
Hexachloroethane	- - -	- - -	- - -	- - -	- - -	- - -
Nitrobenzene	- - -	0.0042 - 0.0042	- - -	- - -	- - -	- - -
Benzoic Acid	- - -	- - -	- - -	- - -	- - -	- - -
Naphthalene	0.022 - 0,38	0.0166 - 0.0648	0.18 - 0.18	- - -	0.1341 - 0.14	- - -
2-Methylnaphthalene	0.002 - 0.045	0.0235 - 0.1007	0.12 - 0.16	- - -	0.18 - 0.49	- - -
Dimethyl Phthalate	- - -	- - -	- - -	- - -	- - -	- - -
Acenaphthylene	0.0184 - 0.12	- - -	- - -	- - -	- - -	- - -
Acenaphthene	0.4 - 0.4	0.14 - 0.14	- - -	- - -	0.13 - 0.16	- - -
Dibenzofuran	0.042 - 0.28	0.0073 - 0.13	0.15 - 0.15	- - -	- - -	- - -
Diethylphthalate	0.0335 - 0.0517	0.021 - 0.0283	- - -	- - -	- - -	- - -
Fluorene	0.0271 - 0.39	0.008 - 0.22	0.22 - 0.22	- - -	0.1 - 0.14	- - -
Pentachlorophenol	- - -	- - -	- - -	- - -	- - -	- - -
Phenanthrene	0.0905 - 2.9	0.0151 - 1.8	0.152 - 2	- - -	0.12 - 0.59	- - -
Anthracene	0.047 - 0.58	0.014 - 0.31	0.51 - 0.51	- - -	- - -	- - -
Di-n-Butylphthalate	- - -	0.073 - 0.16	0.071 - 0.071	- - -	- - -	- - -
Fluoranthene	0.11 - 3.3	0.0313 - 2.5	0.13 - 1.9	- - -	0.12 - 0.14	- - -
Pyrene	0.089 - 3.2	0.0217 - 1.5	0.134 - 1.9	- - -	0.18 - 0.6907	- - -
Butylbenzylphthalate	- - -	- - -	- - -	- - -	- - -	- - -
Benzo(a)Anthracene	0.0476 - 1.6	0.0876 - 0.68	0.124 - 0.83	- - -	0.099 - 0.1	- - -
Chrysene	0.0602 - 1.9	0.056 - 0.69	0.12 - 0.88	- - -	0.11 - 0.14	- - -
bis(2-Ethylhexyl)Phthalate	0.043 - 0.18	- - -	0.033 - 0.57	0.08 - 0.08	0.1341 - 0.1341	0.26 - 0.26
Di-n-Octyl Phthalate	- - -	- - -	- - -	- - -	- - -	- - -



Map copied in part from USGS Glendale Quadrangle (7.5 minute)

● Residential Well

Figure 2.5

Off Site Monitor Well Location Map

Skinner Landfill

West Chester, Ohio

February, 1991

040

Chemical	Mill Creek (mg/Kg)	Skinner Creek (mg/Kg)	Dump Creek (mg/Kg)	Duck Pond (mg/Kg)	Diving Pond (mg/Kg)	Trilobite Pond (mg/Kg)
Benzo(b)Fluoranthene	0.0366 - 1.7	0.0116 - 0.51	0.103 - 1.1	- - -	0.1341 - 0.16	- - -
Benzo(k)Fluoranthene	0.0375 - 1.2	0.0146 - 0.51	0.079 - 0.16	- - -	- - -	- - -
Benzo(a)Pyrene	0.069 - 1.4	0.0084 - 0.33	0.125 - 0.74	- - -	- - -	- - -
Indeno(1,2,3-cd)Pyrene	0.099 - 0.61	0.0394 - 0.26	0.059 - 0.059	- - -	- - -	- - -
Dibenzo(a,h)Anthracene	0.055 - 0.13	- - -	- - -	- - -	- - -	- - -
Benzo(g,h,i)Perylene	0.078 - 0.51	0.048 - 0.21	0.055 - 0.055	- - -	- - -	- - -
beta-BHC	0.028 - 0.028	- - -	- - -	- - -	- - -	- - -
Heptachlor	- - -	- - -	- - -	- - -	- - -	- - -
Aldrin	- - -	- - -	- - -	- - -	- - -	- - -
Dieldrin	- - -	- - -	- - -	- - -	- - -	- - -
4,4'-DDE	- - -	- - -	- - -	- - -	- - -	- - -
Endrin	- - -	- - -	- - -	- - -	- - -	- - -
4,4'-DDD	0.0038 - 0.0038	- - -	- - -	- - -	- - -	- - -
4,4'-DDT	- - -	- - -	- - -	- - -	- - -	- - -
Endrin ketone	- - -	- - -	- - -	- - -	- - -	- - -
alpha-Chlordane	0.0042 - 0.0042	- - -	- - -	- - -	- - -	- - -
gamma-Chlordane	- - -	- - -	- - -	- - -	- - -	- - -
Aroclor-1248	- - -	- - -	- - -	- - -	- - -	- - -
Aroclor-1254	0.16 - 0.16	- - -	- - -	- - -	0.2 - 0.29	- - -
Aroclor-1260	- - -	0.01143 - 0.02985	- - -	- - -	0.25 - 0.44219	- - -
Hexachlorobenzene	0.0029 - 0.016	0.003 - 0.003	- - -	0.0032 - 0.0032	0.0049 - 0.0072	- - -
Hexachlorocylopentadiene	- - -	0.052 - 0.067	- - -	- - -	- - -	- - -
Hexachlorobutadiene	0.0019 - 0.0019	0.0021 - 0.027	0.0025 - 0.0025	- - -	0.0023 - 0.0034	- - -
Octachlorocyclopentene	0.012 - 0.012	- - -	- - -	- - -	- - -	- - -
Heptachloronorborene	- - -	0.0012 - 0.029	- - -	0.0017 - 0.0025	0.0027 - 0.0037	0.0017 - 0.0017
Chlordene	0.0013 - 0.0034	0.0013 - 0.0049	- - -	0.00161 - 0.00161	- - -	- - -
2,3,7,8-TCDD	- - -	- - -	- - -	- - -	- - -	- - -
Total TETRA CDD	- - -	- - -	- - -	- - -	- - -	- - -
Total PENTA CDD	- - -	- - -	- - -	- - -	- - -	- - -
Total HEXA CDD	- - -	- - -	- - -	- - -	- - -	- - -
Total HEPTA CDD	- - -	- - -	- - -	- - -	- - -	- - -
Total OCTA CDD	- - -	- - -	- - -	- - -	- - -	- - -
2,3,7,8-TCDF	- - -	- - -	- - -	- - -	- - -	- - -
Total TETRA CDF	- - -	- - -	- - -	- - -	- - -	- - -
Total PENTA CDF	- - -	- - -	- - -	- - -	- - -	- - -
Total HEXA CDF	- - -	- - -	- - -	- - -	- - -	- - -
Total HEPTA CDF	- - -	- - -	- - -	- - -	- - -	- - -
Total OCTA CDF	- - -	- - -	- - -	- - -	- - -	- - -

--- Not Detected

PRELIMINARY ASSESSMENT NARRATIVE

Techno-Adhesives Co.
12113 Mosteller Rd.
Sharonville, OH 45241
No USEPA ID#

The Techno-Adhesives Co. is located 0.75 miles north of the I-275 Mosteller Rd. exit in Sharonville, Hamilton County, Ohio. This adhesive production plant was established in 1965 and is presently operating. The areas to the north, south, and east of Techno-Adhesives are primarily occupied by industrial facilities. To the west is an agricultural/rural area. Residences exist approximately one mile away in all directions.

In January 1988, the Ohio EPA was contacted by the Brighton Corp., a special equipment production plant also located on Mosteller Rd., regarding problems with their drinking water. The Ohio EPA Division of Ground Water investigated the site on January 12, 1988, sampling their production wells, which supply drinking water to the plant, for VOCs and metals. Water sampled revealed that the supply was contaminated with trichloroethylene (41.70 ug/L), 1,2-dichloroethane (2.10 ug/L), 1,1,1-trichloroethane (20.90 ug/L), cis-1,2-dichloroethylene (19.90 ug/L), trans-1,1-dichloroethylene (1.04 ug/L), 1,1-dichloroethene (8.48 ug/L) and toluene (.75 ug/L). The Brighton Corp. claims to have never used or stored any of these compounds on this site. Therefore, the OEPA Division of Ground Water, as well as the RCRA Group, began investigations of possible sources of contamination in the surrounding area.

Several complaints have been received by OEPA concerning the Techno-Adhesives Co.'s allegedly unsafe and possibly illegal handling of chlorinated and non-chlorinated solvents. These complaints allege that Techno-Adhesives may be contaminating all three migration routes: ground-water, surface water, and air.

After being denied access to the site several times, OEPA, RCRA Group finally received permission, on June 11, 1990, to perform on-site sampling of a trail of discharge from an unauthorized drainage system at the Techno-Adhesives Co., as well as the soil near the accumulated discharge. The results showed high concentrations of toluene in the discharge (up to 10.1 mg/L), and in soil samples (up to 1163 ug/g). A five-gallon bucket found near the point of discharge outside of the plant, contained a liquid with very high levels of toluene (2600 mg/L). Another bucket found outside of the plant contained a hazardous waste consisting of toluene (71.7% w/v) and xylenes (5.4% w/v), with a flashpoint of less than 70° F. It was also found that Techno-Adhesives has at least four 3000 gallon underground storage tanks on-site holding acetone, hexane, toluene, 1,1,1-trichloroethane, and methylene chloride. A large quantity of 1,1,1-trichloroethane is also stored in drums.

The East Fork of the Mill Creek, which runs behind both the Techno-Adhesives Co., may be receiving contamination form the unauthorized discharge at the Techno-Adhesives plant. Although no intakes for either industrial or drinking-water purposes are known to exist within 3 miles downstream of the site, the East Fork of the Mill Creek is presently used for fishing and other recreational purposes.

The city of Sharonville receives its drinking water from the city of Cincinnati. However, there are two municipal well fields and at least one non-community drinking water well in the surrounding area. Brighton Corp. (300 employees) is the only known industry in the area which relies on ground-water as a source of potable water. Also located within a three-mile radius of the site are the Lockland (0.75 miles south) and Glendale (1.75 miles south) municipal well fields serving 4300 and 2422 people, respectively. The city of Reading's municipal drinking water wells, serving 12,800 people, lie just beyond the range of a three-mile radius from the Techno-Adhesives Co.

Although some of the allegations against the Techno-Adhesives Co. have not yet been confirmed, there is a large number of ground-water targets within a three mile radius of the site. Given this and the fact that wells which supply drinking water for workers at nearby Brighton Corp. have been contaminated by some of the same chemicals which are present at the Techno-Adhesives site, a high priority for both state and FIT action is recommended. Further investigation of the Techno-Adhesives Co. should be pursued along with the installation of monitoring wells around the site, more extensive soil sampling, and surface water sampling.

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Date: 8/13/90

Preliminary Assessment Narrative

Date: June 30, 1986
Company: Vine Street Dump
I.D.#: OHD980510531

The Vine Street Dump was once owned by the Philip Carey Corporation. The landfill is located between Vine Street and Mill Creek, opposite the Carthage Fairgrounds. The site lies over the buried preglacial valley occupying the Mill Creek flood plain. It operated from 1968 - 1970.

The twenty acre site is comprised of the landfill and two abandoned gravel pits, (the gravel pits have been covered.) The Philip Carey Corp. disposed of cuttings, defective shingles, asbestos, asphalt waste, sludges of asphalt, cement, fly ash, and sludge from the production of transit pipe in the landfill. The asbestos products and the fly ash were intended to be used as a sealant for the landfill.

Ohio EPA files mentioned that waste had been dumped along the Mill Creek with little protection to the creek. This creates a potential for surface water contamination. Most of the compounds disposed of at the landfill were not volatile or reactive. However, records did show that the sludge from the production of transit pipe had volatile properties. The City Health Department determined through investigations that incinerator waste and solid wastes were not suitable for the landfill because the pit is located in gravel; it is filled with groundwater which fluctuates with the level of Mill Creek, leachate may be produced from incinerator residue, and there is not a good enough material to form a reliable seal. The Health Department recommended that only inert wastes such as concrete and demolition debris be disposed of on-site.

Lack of information regarding the characterization of incinerator residue, fly ash and the volatiles from the transit pipe create a concern for potential contamination. These unknowns warrant a medium priority for FIT (Field Investigation Team) and State activities. A FIT inspection is recommended. Samples of the incinerator residue, fly ash and transit pipe are recommended to determine if these materials contain hazardous constituents. If tests are positive, groundwater and surface water samples should be taken. Monitoring wells will have to be installed for groundwater sampling.

1812S/9

TABLE 1

ANALYTICAL RESULTS OF OEPA SAMPLING*
WINTON RIDGE DUMP SITE
CINCINNATI, OHIO

	SAMPLE NUMBER[1]			
rameter	1	2	3	RCRA EP Tox Standards
cation scription PA Number	Hillside Foundry Sand EEI 2518	Between Drums 2 & 3 Hillside Soil EEI 2519	End of Path Sludge OEPA #1	
its	mg/l	mg/kg	ug/l	mg/l
dmium	ND	0.48	ND	1.0
rcmium	0.49	9.73	ND	5.0
ad	ND	39.8	ND	5.0
ash Point	NA	NA	>230°F	<140°F
itial pH	NA	NA	7.7	<2, >12.5
nal pH	NA	NA	5.0	<2, >12.5
mments	None	None	Resembles lubricating oil	None

. = Not Analyzed
) = Not Detected
Metal concentrations determined by Extraction Procedure Toxicity Test except
. Sample No. 2, which represents total hazardous metals.
Samples analyzed by Environmental Enterprises Inc., Cincinnati, Ohio

TABLE 1 (Continued)

	SAMPLE NUMBER[1]			
Parameter	4	5	6	RCRA EP Tox Standards
Location Description OEPA Number	Hillside Sand and Sludge OEPA #2	Creek Composite Water and Scum OEPA #3	Creek Composite Stream Sediment OEPA #4	
Units	ug/l	ug/l	ug/l	mg/l
Barium	ND	NA	2090	100.0
Lead	ND	NA	20,900	5.0
Flash Point	>230°F	NA	>230°F	ND
Initial pH	7.3	NA	5.7	<2, >12.5
Final pH	5.2	NA	5.1	<2, >12.5
Comments	Resembles lubricating oil	None	Resembles lubricating oil	None

NA = Not Analyzed
ND = Not Detected

1.0 Site Description

The Winston Ridge Dump (WRD) site, formerly an unrestricted dump for drums and foundry sands, is located in Hamilton County, Cincinnati, Ohio at latitude 39°11'28.0° N and longitude 84°31'20.5" W (Figure 1).

The WRD site encompasses 1 to 2 acres and is located in a ravine between Winton Ridge Lane and Winton Road (Figure 2). Dense vegetation covers the steep slopes, and an unnamed tributary flows through the ravine into Mill Creek.

The surround area, which is predominantly residential, includes an apartment complex to the north of the site, and the Cincinnati Academy of Physical Education (CAPE) to the south. Dutch Colony Drive forms the southern border and Winston Ridge Lane the eastern border of the site (Figure 3).

At least two water wells are located within 1 mile of the WRD site. The average well depth is 110-ft. according to the Ohio Environmental Protection Agency (OEPA). The wells are developed in a lower sand layer that lies stratigraphically above a shale layer. These wells are reportedly used to irrigate a local plant nursery and cemetery, and are not used as a drinking water source.

2.0 Site Background

Representatives of the OEPA inspected the WRD site in 1969, at the request of the Cincinnati Health Department (CHD), and determined it was not suitable for use as a sanitary landfill. In a letter to the CHD, the OEPA recommended that the 20 barrels of paint-like material previously dumped at the site should be removed. Information concerning WRD for the period between 1969 and 1985 is unavailable.

On April 11, 1985, the site was reported to the Cincinnati Fire Department (CFD) by David Rosenburg, a local resident. The CFD investigated the site and discovered leaking drums. After contacting the OEPA, the CFD wrapped the drums in plastic to prevent the release of paint sludge into the creek.

The OEPA Division of Solid and Hazardous Waste Management (DSHWM) contracted Environmental Enterprises, Inc. (EEI), to mitigate the immediate hazards posed by the site. On April 11, 1985, EEI overpacked three leaking drums, constructed a straw dam in the creek to stop the flow of contaminants, and collected samples of the soils and foundry sands. The overpacked drums along with three others containing contaminated creek sediment were disposed of on April 19, 1985. Numerous extensively corroded drums were scattered over the hillside along with assorted garbage such as

furniture springs and bales of plastic. Several additional drum were suspected to be buried on site. OEPA observed several dead trees along the edge of the creek, that were in the direct path of any leachate mitigation from the leaking drums.

Analytical results of sample collected by the OEPA indicated levels of lead in the stream sediment were as high as 20.9 milligrams per liter (mg/l) using the Extraction Procedure Toxicity Test (EP Tox). Materials with lead levels above 5.0 mg/l, as determined with the EP Tox test, are considered listed hazardous wastes according to the Resource Conservation and Recovery Act (RCRA) regulations. These results are summarized i Table 1.

In April, 1985, the OEPA contacted the current owners, Wilbur Hodde and Henry Coors in an attempt to procure a responsible party cleanup; both owners, however, denied any knowledge of dumping activities. According to a former resident of the area, Mullins Brothers Hauling had dumped drums at the site approximately 15 years ago.

On July 24, 1985, the OEPA requested a U.S. Environmental Protection Agency (U.S. EPA) Field Investigation Team (FIT) inspection. The FIT conducted an investigation on March 19, 1986, and observed partially buried drums, in addition to, the other material cited by the OEPA investigation. Although no Hazardous Ranking System (HRS) score was determined, the FIT tea indicated the site would potentially receive a high score becaus of the direct contact threat.

In January 1987, the Environmental Advisory Council (EAC) to the Cincinnati City Council considered the site a high priority and recommended both federal and state action, because of the elevated lead levels detected in the stream and the potential fo buried drums containing hazardous waste. In addition, the unrestricted access to the site was a concern.

After unsuccessful attempts by the OEPA to persuade the potentially responsible parties to mitigate the hazards present at WRD, the U.S. EPA Region V Emergency Response Section was requested to investigate the site.

3.0 Site Inspections

On October 22, 1987, TAT members Larry Mencin and William Scoville investigated the Winton Ridge site, accompanied by Scot Shane of the OEPA. The TAT confirmed OEPA and FIT findings.

A second site assessment was conducted on March 10, 1988, by TAT members Ellen Stanifer and Scoville to confirm the initial site assessment observations and to delineate sampling locations.

The site was located in a deep ravine covered with dense vegetation, and stressed or dead trees bordered Cape Creek, which flowed through the site. The 45 degree slopes of the ravine made access difficult.

The TAT observed approximately 100 drums, mounds of foundry sands, bundles of shredded cellophane, hardened polyresin blocks, and other assorted debris scattered in the ravine. Almost all of the drums observed were extensively corroded and empty. However, one drum, labeled "Cincinnati Varnish Company", was approximately 80 percent full of liquid. Another drum was observed in a horizontal position protruding from the hillside and was full of what appeared to be foundry sands. Other drums were suspected to be buried by foundry sands on the slopes.

3.1 Air Monitoring

Air monitoring was conducted by the TAT with a Combustible Gas Indicator (CGI), an Organic Vapor Analyzer (OVA), and a Radiation Meter. Readings were taken at the top of the slope, on the side slopes, in the bottom of the ravine, and in and around the drums. Only one reading above background as recorded -- inside a drum marked "Cincinnati Varnish Company". The drum contained approximately 45 gallons of liquid and deflected 25 units above the 0 to 3 unit background level on the OVA.

32. Sampling

A sampling plan was prepared by the TAT and approved by U.S. EPA On-Scene Coordinator (OSC) P.C. Lall. On May 31, 1988, sampling was performed by the TAT, who were accompanied by Marc Hill of the OEPA. The purpose of the sampling was to confirm the presence of the suspected contaminants; i.e., metals and volatile organic compounds (VOCs). A total of nine samples were collected: two drum samples, three water samples, two sediment samples, and two soil samples.

Drum Samples

The two drum samples were grab samples. Sample 1 was a liquid sample collected with a drum thief from the drum labeled "Cincinnati Varnish Company." Sample 2 was a solid sample collected with a garden trowel from a rusted drum containing foundry sands. Both samples were analyzed for RCRA characteristics (i.e., EP toxicity test, flash point, and ph).

Two drums partially buried in the hillside containing material were not sampled, due to their inaccessibility.

Water Samples

Three water samples were collected for analysis. Sample 3, distilled water, was submitted as a quality control blank. Sample 4 was collected upstream of the drum site (as a backgroun sample), and Sample 5 was collected in approximately the middle of the site. These grab samples were analyzed for metals, to determine if metals were being washed onto the site through the storm sewer located in the parking lot north of the site.

Sediment Samples

The two samples of stream bed sediment were analyzed for metals, extractable organic compounds, and VOCs because of the possibility that any organics remaining on site potentially may have collected in the stream sediment. Sample 6, a grab sample collected upstream of the site, was used as a background sample, and Sample 7 was a composite sample of sediments collected along the stream bed throughout the site.

Soil Samples

During the site assessment on March 10, 1988, evidence of soil erosion on one hillside and a large growth of moss was observed. Thus, any contaminants present in the drums buried on the hillside could be present in the soils of the eroded areas. Sample 8, which was a composite sample of this hillside, was analyzed for metals, extractable organic compounds, and VOCs. Sample 9 was the background soil sample.

All samples were submitted to Gulf Coast Laboratories in Park Forest, Illinois, under TAT Analytical Services TDD# 5-8805-L6.

4.0 Analytical Results

4.1 Drum Sample Analyses

Analyses of the liquid drum sample confirmed that the drum labeled "Cincinnati Varnish Company" contained no EP Tox metals. The pH was 6.9, which is very near neutral, and the flash point (>200°F) was above the RCRA ignitability level of 140°. The values of total cyanides and total sulfides were below detection limits, and thus, may be considered nonhazardous. Because the bung on this drum was missing during site investigations and sampling, the contents of the drum were probably diluted by rain water.

4.2 Volatile Sample Analyses

The results of soil and sediment analyses for VOCs revealed that off-site samples contained more contaminants than on-site samples.

EXECUTIVE SUMMARY

Overview of the RI Process and Objectives

This report presents the results of the Phase 2 Remedial Investigation (RI2) conducted by U.S. EPA at the Pristine, Incorporated site in the City of Reading, Ohio. The addendum to the Remedial Investigation Report has been developed to evaluate data collected during the RI2 field program. This document is intended to be used as a companion document to the Final Remedial Investigation Report, Document No. 115-RI1-RT-CMKQ-1. The RI has several major objectives. The principal objective of a RI is to accurately characterize the site to determine the need for, and extent of any corrective action. In order to determine the need for remedial action, RI activities examine the nature of the site with respect to the types of contamination present, quantities of contamination present, and potential pathways by which contamination may affect public health or environment. Based upon the results of detailed sampling and analysis, a comprehensive evaluation of the actual and potential threat to public health and the environment is conducted. This phase of the RI, referred to as the Public Health Evaluation, examines all available data and assesses the concentration of contaminants and the effect of public exposure via all routes.

Site Description

The Pristine, Inc., site is located in southwestern Ohio in the City of Reading (Population 12,843), a suburb of Cincinnati. The site occupies approximately two acres in the northeast quarter of Section 33, Township 4, Range 1 in Hamilton County Ohio (Figure 1). The site is bordered by residential and industrial areas (Figure 2). Industrial operations owned by Cincinnati Drum Service and Carstab Corporation are located to the west and south of the facility. Cincinnati Drum Service cleans, reclaims, and recycles steel drums. Carstab Corporation manufactures synthetic stabilizers and plasticizers. The immediate eastern limit of the site is bordered by Conrail Railroad right-of-way. On the other side of the tracks, further to the east and southeast, is a grain elevator. Northeast of the site, beyond the railroad is a residential trailer park. The land to the north is owned by the City of Reading. Eight municipal water supply wells, serving the citizens of Reading are approximately 400 feet northwest of the site.

The buildings and facilities which were used during past operations at the Pristine, Inc., site still exist (Figure 2). A concrete pad is present in the area north of the buildings that was used as a mixing area. The site is partially revegetated and shows little evidence of past soil removal activities (May through July, 1984). A lack of vegetation is noted in the southeastern section of the site at the location of the soil trench sampling conducted in June 1985 as part of the RI1 field

program. The site is situation on a low terrace that is about ten feet higher than the Mill Creek flood plain immediately to the west of the site. The Pristine, Inc. site does not lie within the 100 year flood plain or a designated wetlands. Site surface water runoff generally flows off site toward the Mill Creek.

Site geology consists of five distinct soil units (Figure 3). The upper most unit consists of zero to ten feet of brown and gray fill. underlying the fill unit is a sequence of upper lake sediment and outwash deposits. This unit ranges from zero to 46 feet in thickness and consists of three separate outwash lenses within a large lake sediment deposit. The third unit, underlying the lake sediment and outwash sequence, is a glacial till layer ranging from 10 to 45 feet in thickness. Beneath the glacial till is the lower lake sediment unit which is distinctly different from the upper lake sediment unit. The lower lake sediment is absent in the southeastern corner of the site and also southeast of the site. Underlying the lower lake sediments is a lower aquifer. The lower outwash deposit is directly underlain by the lower aquifer at the southeast corner of the site. The thickness of the unit cannot be determined from on-site data. The lower aquifer is the principal regional water supply aquifer. Most notably, the nearby Reading municipal wells, northwest of the site, are completed in the lower aquifer. Results of the field investigation indicate groundwater flow direction in the lower aquifer is toward the northwest.

Current Site Status

Results of the Remedial Investigation

Data collected during the Phase 1 Remedial Investigation was reviewed and evaluated. During the evaluation process and during the development of the Feasibility Study several data gaps were identified. Based on review of results of the RI and the identification of data gaps, the RI2 focused on:

- Sampling and analysis of surface soils to determine whether dioxin/furans are present on-site;
- Sampling and analysis of subsurface soils to determine whether an area, referred to as the "magic pit" is a source of contamination for groundwater;
- Sampling and analysis of groundwater to continue the characterization of groundwater contamination both on site and in immediately adjacent, off-site areas;

- A hydrogeological study to determine the extent of the upper outwash lens of the upper aquifer system and to continue the characterization of the lower aquifer.

Results of the RI2 are presented in detail in Sections 1 through 5. Section 1 through 4 present results corresponding to the pathways listed above and should be consulted for detailed review. Section 5 presents the results of the Public Health Evaluation conducted to determine the risk posed by polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans. A brief summary of significant results in each of the media sampled is presented in the following paragraphs.

TABLE 6
SUMMARY OF SURFACE WATER ANALYTICAL DATA
PRISTINE, INC.

Inorganics (ug/l)	SF0401	SF0501	SF0601	SF0701	SF07DP	SF078K	SFDT01
1. Aluminum	238	1600	968	184000	191000	--	14400
2. Antimony	--	--	--	149	214	--	--
3. Arsenic	5.2(XR)	--	--	418	447	--	--
4. Barium	33(X)	38(X)	51(X)	--	--	--	2(X)
5. Beryllium	--	--	--	24	25	--	25100
6. Cadmium (IC)	--	4.8(X)	--	136	136	--	7.7
7. Calcium	573000	412000	219000	478000	513000	--	251000
8. Chromium	--	124	73	6140	6480	--	42
9. Cobalt	--	12(X)	4.6(X)	286	288	--	22(X)
10. Copper	16(X)	41	29	2460	2560	--	95
11. Iron	362	8830	6620	567000	599000	--	268000
12. Lead (IC)	--	65	132	371	383	6.1	71
13. Magnesium	152000	472000	217000	966000	952000	--	74300
14. Manganese	2260	6520	2570	19800	19600	--	2420
15. Mercury	0.12(X)	0.16	1.1	0.19(X)	0.72	--	0.52
16. Nickel	12(X)	40(X)	12(X)	680	684	--	59

Table 6
Summary of Surface Water Analytical Data
Pristine, Inc.
Page 2

17. Potassium	12600	2300	13900	18000	13900	--	17600
18. Selenium	--	--	--	--	--	--	--
19. Silver	--	3.300	6.300	55	60	--	4.6(X)
20. Sodium	242000	760000	505000	37100	38400	3700(X)	193000
21. Thalliue	--	--	--	--	--	--	--
22. Tin	--	--	--	--	--	--	--
23. Vanadium	4(X)	8.4(X)	7.5(X)	4430	4640	--	25(X)
24. Zinc	8.8(X)	99	182	16100	16000	2(X)	251
25. Cyanide	--	--	11	12	--	--	43
26. Fluoride (IC)	3400	1500	2400	--	--	--	1800

-- = Compound Analyzed For, But Not Detected Within Detection Limits
(X) Concentration Less Than The Required Detection Limits
(R) = Spike Samples Recovery Not Within Control Limits
(IC) = Indicator Compound

TABLE 6
SUMMARY OF SURFACE WATER ANALYTICAL DATA
PRISTINE, INC.

Volatiles (ug/l)	SF0401	SF0501	SF0601	SF0701	SF07DP	SF078K	SFDT01
1. Chloromethane	---	---	---	---	---	---	---
2. Bromomethane	---	---	---	---	---	---	---
3. Vinyl chloride	---	---	---	---	---	---	---
4. Chloroethane	---	---	---	---	---	---	---
5. Methylene Chloride	15.3 B,J	9.2 B,J	18 B,J	5.6 B,J	12.1 B,J	34.2 B,J	16000B
6. Acetone	---	2.6 B,J	---	60 B	46.1 B,J	---	9.1 B
7. Carbon Disulfide	85.8 J	28.8 J	11.2 J	---	---	13.9	---
8. 1,1-Dichloroethene	---	9	---	---	---	---	3.1 J
9. 1,1-Dichloroethane	---	50.2	---	---	---	---	13
10. trans-1,2-Dichloroethene	---	87.6 J	---	5.8	9.5 J	---	110
11. Chloroform	---	---	---	---	---	---	100
12. 1,2-Dichloroethane	---	6200	149 J	---	---	---	220
13. 2-Butanone	---	---	---	---	---	---	---
14. 1,1,1-Trichloroethane	---	49.5 J	---	7.2	---	---	685 J
15. Carbon Tetrachloride	---	---	---	---	---	---	---
16. Vinyl Acetate	---	---	---	---	---	---	87
17. Bromodichloromethane	---	---	---	---	---	---	---
18. 1,1,2,2-Tetrachloroethane	---	---	---	---	---	---	9
19. 1,2-Dichloropropane	---	92.3	---	---	---	---	---
20. trans-1,3-Dichloropropene	---	---	---	---	---	---	---
21. Trichloroethene	---	10.8	---	1.2 J	---	---	10
22. Dibromochloromethane	---	---	---	---	---	---	---
23. 1,1,2-Trichloroethane	---	---	---	---	---	---	12
24. Benzene	---	9.3	---	---	---	---	2 J
25. cis-1,3-Dichloropropene	---	---	---	---	---	---	---
26. 2-Chloroethyl Vinyl Ether	---	---	---	---	---	---	---
27. Bromoform	---	---	---	---	---	---	---
28. 2-Hexanone	---	---	---	---	---	---	---
29. 4-Methyl-2-pentanone	---	---	---	---	---	---	---
30. Tetrachloroethene	1.9 J	---	---	---	---	---	250
31. Toluene	1.3 J	6	---	---	3.3 J	---	3.8 J
32. Chlorobenzene	---	---	---	---	---	---	---
33. Ethyl Benzene	---	---	---	---	---	---	---
34. Styrene	3.9 BJ	1.5 BJ	---	---	---	---	---
35. Total Xylenes	---	2.2	---	2.1 J	---	---	14

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PRISTINE, INC.

Semi-Volatiles (ug/l)	SF0401	SF0501	SF0601	SF0701	SF07DP	SF07BK	SFDT01
36. N-Nitrosodiaethylamine	---	---	---	---	---	---	---
37. Phenol	---	---	---	7.6 J	8.0 J	---	230
38. Aniline	---	---	---	4 J	5.8 J	---	---
39. bis(2-Chloroethyl) ether	---	---	---	---	---	---	---
40. 2-Chlorophenol	---	---	---	---	---	---	---
41. 1,3-Dichlorobenzene	---	---	---	---	---	---	---
42. 1,4-Dichlorobenzene	---	---	---	---	---	---	---
43. Benzyl Alcohol	---	---	---	---	---	---	---
44. 1,2-Dichlorobenzene	---	---	---	---	---	---	14
45. 2-Methylphenol	---	---	---	17 J	---	---	19
46. bis(2-Chloroisopropyl) ether	---	---	---	---	---	---	---
47. 4-Methylphenol	---	---	---	---	13.2	---	15
48. n-Nitroso-Dipropylamine	---	---	---	---	---	---	---
49. Hexachloroethane	---	---	---	---	---	---	---
50. Nitrobenzene	---	---	---	---	---	---	---
51. Isophorone	---	---	---	---	---	---	---
52. 2-Nitrophenol	---	---	---	---	---	---	9 J
53. 2,4-Dimethylphenol	---	---	---	---	---	---	---
54. Benzoic Acid	11 J	---	---	21.6 J	34 J	---	---
55. bis(2-Chloroethoxy) methane	---	---	---	---	---	---	---
56. 2,4-Dichlorophenol	---	---	---	---	---	---	---
57. 1,2,4-Trichlorobenzene	---	---	---	---	---	---	---
58. Naphthalene	---	---	---	---	---	---	---
59. 4-Chloroaniline	---	---	---	---	---	---	---
60. Hexachlorobutadiene	---	---	---	---	---	---	---
61. 4-Chloro-3-methylphenol (para-chloro-meta-cresol)	---	---	---	---	---	---	13
62. 2-Methylnaphthalene	---	---	---	---	---	---	---
63. Hexachlorocyclopentadiene	---	---	---	---	---	---	---
64. 2,4,6-Trichlorophenol	---	---	---	---	---	---	---
65. 2,4,5-Trichlorophenol	---	---	---	---	---	---	---
66. 2-Chloronaphthalene	---	---	---	---	---	---	---
67. 2-Nitroaniline	---	---	---	---	---	---	---
68. Dimethyl Phthalate	---	---	---	---	---	---	---
69. Acenaphthylene	---	---	---	---	---	---	---
70. 3-Nitroaniline	---	---	---	---	---	---	---

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PRISTINE, INC.

Semi-Volatiles (ug/l)	SF0401	SF0501	SF0601	SF0701	SF07DP	SF07BK	SFDT01
71. Acenaphthene	---	---	---	---	---	---	---
72. 2,4-Dinitrophenol	---	---	---	---	---	---	---
73. 4-Nitrophenol	---	---	---	---	---	---	---
74. Dibenzofuran	---	---	---	---	---	---	---
75. 2,4-Dinitrotoluene	---	---	---	---	---	---	---
76. 2,6-Dinitrotoluene	---	---	---	---	---	---	---
77. Diethylphthalate	---	---	---	---	---	---	---
78. 4-Chlorophenyl Phenyl ether	---	---	---	---	---	---	---
79. Fluorene	---	---	---	---	---	---	---
80. 4-Nitroaniline	---	---	---	---	---	---	---
81. 4,6-Dintiro-2-methylphenol	---	---	---	---	---	---	---
82. N-nitrosodiphenylamine	---	---	---	---	---	---	---
83. 4-Bromophenyl Phenyl ether	---	---	---	---	---	---	---
84. Hexachlorobenzene	---	---	---	---	---	---	---
85. Pentachlorophenol	---	---	---	---	13.2 J	---	---
86. Phenanthrene	---	---	---	---	---	---	---
87. Anthracene	---	---	---	---	---	---	---
88. Di-n-butylphthalate	---	---	---	---	2.2 J	---	---
89. Fluoranthene	---	---	---	---	---	---	---
90. Benzidine	---	---	---	---	---	---	---
91. Pyrene	---	---	---	---	---	---	---
92. Butyl Benzyl Phthalate	---	5 J	---	3 J	3.4 J	6.2 B,J	---
93. 3,3'-Dichlorobenzidine	---	---	---	---	---	---	---
94. Benzo(a)anthracene	---	---	---	---	---	---	---
95. bis(2-ethylhexyl)phthalate	11.2 J	27.4 J	104 J	23.4 J	10.6 J	990 B	12
96. Chrysene	---	---	---	---	---	---	---
97. Di-n-octyl Phthalate	---	---	---	---	---	---	---
98. Benzo(b)fluoranthene	---	---	---	---	---	---	---
99. Benzo(k)fluoranthene	---	---	---	---	---	---	---
100. Benzo(a)pyrene	---	---	---	---	---	---	---
101. Ideno(1,2,3-cd)pyrene	---	---	---	---	---	---	---
102. Dibenz(a,h)anthracene	---	---	---	---	---	---	---
103. Benzo(g,h,i)perylene	---	---	---	---	---	---	---

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PRISTINE, INC.

Pesticides (ug/l)	SF0401	SF0501	SF0601	SF0701	SF07DP	SF07BK	SFDT01
104. Alpha-BHC	0.19	---	---	---	---	---	---
105. beta BHC	---	---	---	---	---	---	---
106. delta-BHC	---	---	---	---	---	---	---
107. gaaaa-BHC (Lindane)	---	---	---	---	---	---	---
108. Heptachlor	---	---	---	---	---	---	---
109. Aldrin	---	---	---	---	---	---	---
110. Heptachlor Epoxide	---	---	---	---	---	---	---
111. Endosulfan I	---	---	---	---	---	---	---
112. Dieldrin	---	---	---	---	---	---	---
113. 4,4'-DDE	---	---	0.86	0.127	0.07 J	---	---
114. Endrin	---	---	---	---	---	---	---
115. Endosulfan II	---	---	---	---	---	---	---
116. 4,4'-DDD	0.07 J	0.1	0.78	0.15	0.09 J	---	---
117. Endrin Aldehyde	---	---	---	---	---	---	---
118. Endosulfan Sulfate	---	---	---	---	---	---	---
119. 4,4'-DDT	1.82	---	---	0.47	---	---	---
120. Endrin Ketone	---	---	---	---	---	---	---
121. Methoxychlor	---	---	---	---	---	---	---
122. Chlordane	---	---	---	---	---	---	---
123. Toxaphene	---	---	---	---	---	---	---
124. AROCLOR-1016	---	---	---	---	---	---	---
125. AROCLOR-1221	---	---	---	---	---	---	---
126. AROCLOR-1232	---	---	---	---	---	---	---
127. AROCLOR-1242	---	---	---	---	---	---	---
128. AROCLOR-1248	---	---	---	---	---	---	---
129. AROCLOR-1254	---	---	---	---	---	---	---
130. AROCLOR-1260	---	---	---	---	---	---	---

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TABLE 7

SUMMARY OF SEDIMENT ANALYTICAL DATA
PRISTINE, INC.

Inorganics (eg/kg)	SD0801	SD0901	SD1001	SD1101	SD11DP	SD1201	SD1301	SD1401	SD14MS
1. Aluminum	5100	7550	12400	10500	10000	7470	4710	1690	2210
2. Antimony	19(X)	59	--	--	22(X)	--	--	--	--
3. Arsenic	25	52	59	40	38	32	13	6.6	8.3
4. Barium	222	284	786	101(X)	105(X)	103(X)	60(X)	127	204
5. Beryllium	0.52(X)	0.69(X)	0.9(X)	0.8(X)	0.8(X)	0.58(X)	0.35(X)	--	0.52(X)
6. Cadmium (IC)	5.9(R)	5.9(R)	11(R)	45(R)	2.8(X,R)	4.8(R)	(R)	6.1(R)	7.4(R)
7. Calcium	64400*	31900*	14200*	7580*	7580(X)	2370(*X)	105000*	107000*	65500*
8. Chromium	343(R)	602*	1520(R)	82(R)	55(R)	136(R)	27(R)	92(R)	117(R)
9. Cobalt	9.2(X)	15(X)	33(X)	17(X)	19(X)	6.9(X)	8.2(X)	7.7(X)	10(X)
10. Copper	76	1020	302	46	46	57	34	74	101
11. Iron	30400	36500	38800	37600	38900	20600	18600	33600	32700
12. Lead (IC)	851(*R)	1040(*R)	2410(*R)	107(*R)	74(*R)	234(R)	90(*R)	466(R)	642(*R)
13. Magnesium	10900	8670	5900(X)	4360	4010	1850(X)	46600	24800	13200
14. Manganese	387*	464*	285*	765*	744*	138*	527*	460*	407I
15. Mercury	2.2(R)	4(R)	15(R)	5.7(R)	8.6(R)	4.5(R)	0.43(R)	2.4(R)	3.4(R)
16. Nickel	20(X)	135	60	34	37	21(X)	26	29	26

Table 7
Summary of Sediment Analytical Data
Pristine, Inc.
Page 2

17. Potassium	138(X)	1100(X)	1510(X)	1400(X)	1240(X)	710(X)	1290(X)	--	529(X)
18. Selenium	--	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)
19. Silver	7.2*	27*	97*	5(*,X)	4.6(*,X)	9.6(*,X)	2(*,X)	4.9(X)	13*
20. Sodium	1370(X)	2040(X)	4000(X)	963(X)	1130(X)	--	2530(X)	1840(X)	1910(X)
21. Thalliue	--	--	--	--	--	--	--	--	--
22. Tin	16(X)	47	92	--	--	--	--	20	30
23. Vanadium	73	38(X)	75	32	32	30(X)	19(X)	12(X)	14(X)
24. Zinc	429	806	1570	152	321	252	102	252	336
25. Cyanide	5.2	4.2	2.8	4.8	4.7	4.2	--	0.73	0.95

-- = Compound Analyzed For, But Not Detected Within Detection Limits
(X) Concentration Less Than The Required Detection Limits
(R) = Spike Samples Recovery Not Within Control Limits
(*) = Duplicate Analysis Not Within Control Limits

TABLE 7
SUMMARY OF SEDIMENT ANALYTICAL DATA
PRISTINE, INC.

Volatiles (ug/kg)	SD08O1	SD09O1	SD10O1	SD11O1	SD11DP	SD12O1	SD13O1	SD14O1	SD14MS
1. Chloroaethane	---	---	---	---	---	---	---	---	---
2. Bromomethane	---	---	---	---	---	---	---	---	---
3. Vinyl chloride	---	---	---	---	---	---	---	---	---
4. Chloroethane	---	---	---	---	---	---	---	---	---
5. Methylene Chloride	415.44B	346.30B	258.54B	233.54B	152.42B	59.66 B	29.90 B	149.95B	179.75B
6. Acetone	13.28	---	---	---	---	---	---	---	---
7. Carbon Disulfide	---	---	---	---	---	---	---	---	---
8. 1,1-Dichloroethene	---	---	---	---	---	---	---	---	---
9. 1,1-Dichloroethane	---	85.47	---	---	---	---	---	---	---
10. trans-1,2-Dichloroethene	---	87.68 J	---	---	---	---	---	---	---
11. Chloroform	---	---	---	---	---	---	---	---	---
12. 1,2-Dichloroethane.	---	2423.4 J	1148	---	---	---	---	---	---
13. 2-Butanone	---	---	---	---	---	---	---	---	---
14. 1,1,1-Trichloroethane	---	146.56 J	---	---	19.70	11.86	---	---	---
15. Carbon Tetrachloride	---	---	---	---	---	---	---	---	---
16. Vinyl Acetate	---	---	---	---	---	---	---	---	---
17. Bromodichloromethane	---	---	---	---	---	---	---	---	---
18. 1,1,2,2-Tetrachloroethane	---	---	---	---	---	---	---	---	---
19. 1,2-Dichloropropane	---	102.46	82.28	---	---	---	---	---	---
20. trans-1,3-Dichloropropene	---	---	---	---	---	---	---	---	---
21. Trichloroethene	50.8	173.8	89.76	---	7.68	---	---	---	---
22. Dibromochloromethane	---	---	---	---	---	---	---	---	---
23. 1,1,2-Trichloroethane	---	---	---	---	---	---	---	---	---
24. Benzene	---	11.67	---	---	---	---	---	---	---
25. cis-1,3-Dichloropropene	---	---	---	---	---	---	---	---	---
26. 2-Chloroethyl Vinyl Ether	---	---	---	---	---	---	---	---	---
27. Bromoform	---	---	---	---	---	---	---	---	---
28. 2-Hexanone	---	718.55J	---	---	---	---	---	---	---
29. 4-Methyl-2-pentanone	---	629.65	---	---	---	---	---	---	---
30. Tetrachloroethene	331.44	153.05	504.07	---	125.15	57.99	3.45 J	3.45 J	---
31. Toluene	51.42	10517	---	76.89	---	---	---	7.65	11.05
32. Chlorobenzene	---	---	---	---	---	---	---	---	---
33. Ethyl Benzene	---	600.52	186.99	---	---	---	---	---	---
34. Styrene	---	---	---	---	---	---	---	---	---
35. Total Xylenes	---	3359.3	447.15	---	---	---	---	---	---

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PRISTINE, INC.

Semi-Volatiles (ug/kg)	SD0801	SD0901	SD1001	SD1101	SD11DP	SD1201	SD1301	SD1401	SD14MS
36. N-Nitrosodiaethylaaine	---	---	---	---	---	---	---	---	---
37. Phenol	987.5IR	---	---	---	---	---	---	---	---
38. Aniline	---	---	---	---	---	---	---	837.64R	2376R
39. bis(2-Chloroethyl) ether	---	---	---	---	---	---	---	---	---
40. 2-Chlorophenol	---	---	---	---	---	---	---	---	---
41. 1,3-Dichlorobenzene	---	---	---	---	---	---	---	---	---
42. 1,4-Dichlorobenzene	---	---	---	---	---	---	---	---	---
43. Benzyl Alcohol	---	---	---	---	---	---	---	---	---
44. 1,2-Dichlorobenzene	---	---	---	---	---	---	---	---	---
45. 2-Methylphenol	---	---	---	---	---	---	---	---	---
46. bis(2-Chloroisopropyl) ether	---	---	---	---	---	---	---	---	---
47. 4-Methylphenol	---	---	---	---	---	---	---	---	---
48. n-Nitroso-Dipropylaaine	---	---	---	---	---	---	---	---	---
49. Hexachloroethane	---	---	---	---	---	---	---	---	---
50. Nitrobenzene	---	---	---	---	---	---	---	---	---
51. Isophorone	---	---	---	---	---	---	---	---	---
52. 2-Nitrophenol	---	---	---	---	---	---	---	---	---
53. 2,4-Dimethylphenol	---	---	---	---	---	---	---	---	---
54. Benzoic Acid	---	---	---	---	---	---	---	---	---
55. bis(2-Chloroethoxy) methane	---	---	---	---	---	---	---	---	---
56. 2,4-Dichlorophenol	---	---	---	---	---	---	---	---	---
57. 1,2,4-Trichlorobenzene	---	---	---	---	---	---	---	---	---
58. Naphthalene	---	---	---	---	---	---	---	---	---
59. 4-Chloroaniline	---	---	---	---	---	---	---	---	---
60. Hexachlorobutadiene	---	---	---	---	---	---	---	---	---
61. 4-Chloro-3-methylphenol (para-chloro-meta-cresol)	---	---	---	---	---	---	---	---	---
62. 2-Methylnaphthalene	---	---	---	---	---	---	---	---	---
63. Hexachlorocyclopentadiene	---	---	---	---	---	---	---	---	---
64. 2,4,6-Trichlorophenol	---	---	---	---	---	---	---	---	---
65. 2,4,5-Trichlorophenol	---	---	---	---	---	---	---	---	---
66. 2-Chloronaphthalene	---	---	---	---	---	---	---	---	---
67. 2-Nitroaniline	---	---	---	---	---	---	---	---	---
68. Diaethyl Phthalate	---	---	---	---	---	---	---	---	---
69. Acenaphthylene	---	---	---	---	---	---	---	---	---
70. 3-Nitroaniline	---	---	---	---	---	---	---	---	---

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Semi-Volatiles (ug/kg)	SD0801	SD0901	SD1001	SD1101	SD11DP	SD1201	SD1301	SD1401	SD14MS
71. Acenaphthene	---	---	---	---	---	---	---	---	---
72. 2,4-Dinitrophenol	---	---	---	---	---	---	---	---	---
73. 4-Nitrophenol	---	---	---	---	---	---	---	---	---
74. Dibenzofuran	---	---	---	---	---	---	---	---	---
75. 2,4-Dinitrotoluene	---	---	---	---	---	---	---	---	---
76. 2,6-Dinitrotoluene	---	---	---	---	---	---	---	---	---
77. Diethylphthalate	---	---	---	---	---	---	---	---	---
78. 4-Chlorophenyl Phenyl ether	---	---	---	---	---	---	---	---	---
79. Fluorene	---	---	---	---	---	---	---	---	---
80. 4-Nitroaniline	---	---	---	---	---	---	---	---	---
81. 4,6-Dintiro-2-methylphenol	---	---	---	---	---	---	---	---	---
82. N-nitrosodiphenylamine	227.01 J	---	---	---	---	---	---	---	---
83. 4-Bromophenyl Phenyl ether	---	---	---	---	---	---	---	---	---
84. Hexachlorobenzene	---	---	---	---	---	---	---	---	---
85. Pentachlorophenol	---	---	---	---	---	---	---	---	---
86. Phenanthrene	590.24R	---	---	---	---	---	---	486.04 J	268.60 J
87. Anthracene	---	---	---	---	---	---	---	---	---
88. Di-n-butylphthalate	1929.8R	---	---	---	---	---	1218.2J	1344.4J	805.79J
89. Fluoranthene	1021.6R	---	---	---	---	---	---	1241R	991.74R
90. Benzidine	---	---	---	---	---	---	---	---	---
91. Pyrene	998.86R	---	---	---	---	---	---	620.48 J	547.52 J
92. Butyl Benzyl Phthalate	4653.8B	6300B,J	---	---	---	---	155.04BJ	1964.8BJ	1343B,JB
93. 3,3'-Dichlorobenzidine	---	---	---	---	---	---	---	---	---
94. Benzo(a)anthracene	306.47J	---	---	---	---	---	---	413.65J	309.92J
95. bis(2-ethylhexyl)phthalate	21566B	63600B,J	143000BJ	---	8000B,J	12000BJ	841.64BJ	12410 JB	17562B
96. Chrysene	374.57R	---	---	---	---	---	---	610.13 J	420 J
97. Di-n-octyl Phthalate	---	---	---	---	---	---	---	---	---
98. Benzo(b)fluoranthene	---	---	---	---	---	---	---	---	---
99. Benzo(k)fluoranthene	522.13J	---	---	---	---	---	---	---	---
100. Benzo(a)pyrene	---	---	---	---	---	---	---	---	---
101. Ideno(1,2,3-cd)pyrene	---	---	---	---	---	---	---	---	---
102. Dibenz(a,h)anthracene	---	---	---	---	---	---	---	---	---
103. Benzo(g,h,i)perylene	---	---	---	---	---	---	---	---	---

--- = COMPOUND ANALYZED FOR, BUT NOT DETECTED WITHIN DETECTION LIMITS
B = ANALYTE WAS FOUND IN THE BLANK AS WELL AS THE SAMPLE
J = INDICATES AN ESTIMATED VALUE
R = RESTRICTED DATA-ESTIMATED, REVIEWER COMMENT

TABLE 7
SUMMARY OF SEDIMENT ANALYTICAL DATA
PRISTINE, INC.

Pesticides (ug/kg)	SD0801	SD0901	SD1001	SD1101	SD11DP	SD1201	SD1301	SD1401	SD14MS
104. Alpha-BHC	---	---	---	---	---	---	---	---	---
105. beta BHC	---	---	---	---	---	---	---	---	---
106. delta-BHC	---	---	---	---	---	---	---	---	---
107. gamma-BHC (Lindane)	148 J	---	---	---	---	---	---	---	---
108. Heptachlor	---	---	---	---	---	---	---	---	---
109. Aldrin	160 J	---	---	---	251	38 J	---	---	38.1
110. Heptachlor Epoxide	---	---	---	---	---	---	---	---	---
111. Endosulfan I	---	---	---	---	---	---	---	---	---
112. Dieldrin	---	---	---	---	75 J	45 J	4.8 J	46	35
113. 4,4'-DDE	1106	1098	2847	355	1800	791	---	245	179
114. Endrin	---	---	---	---	---	---	---	---	---
115. Endosulfan II	---	---	---	---	---	---	---	---	---
116. 4,4'-DDD	1745	1040	1731	185 J	980	381	3.3 J	69	55
117. Endrin Aldehyde	---	---	---	---	---	---	---	---	---
118. Endosulfan Sulfate	---	---	---	---	---	---	---	---	---
119. 4,4'-DDT	20734	---	---	712	4006	2438	16	444	347
120. Endrin Ketone	---	---	---	---	---	---	---	---	---
121. Methoxychlor	---	---	---	---	---	---	---	---	---
122. Chlordane	---	---	---	---	---	---	---	---	---
123. Toxaphene	---	---	---	---	---	---	---	---	---
124. AROCLOR-1016	---	---	---	---	---	---	---	---	---
125. AROCLOR-1221	---	---	---	---	---	---	---	---	---
126. AROCLOR-1232	---	---	---	---	---	---	---	---	---
127. AROCLOR-1242	---	---	---	---	---	---	---	---	---
128. AROCLOR-1248	---	---	---	---	---	---	---	---	---
129. AROCLOR-1254	---	---	---	---	---	---	---	---	---
130. AROCLOR-1260	---	---	---	---	---	---	---	---	---

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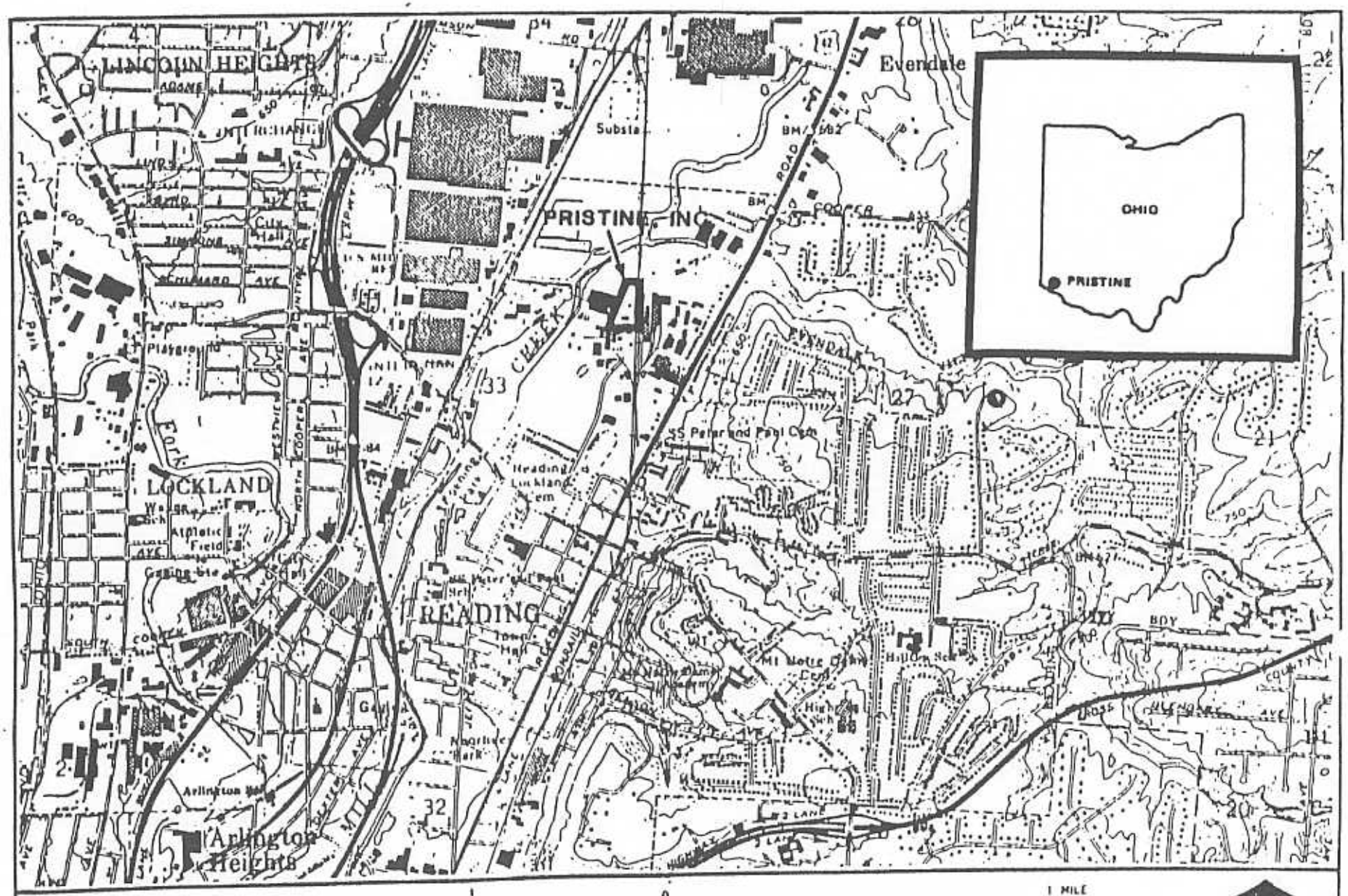

From: U.S.G.S. Topographic Map, 7½ Minute Series, Cincinnati-East Quadrangle

FIGUR

PRELIMINARY ASSESSMENT NARRATIVE

Ridgewood Arsenal
Seymour Avenue
Cincinnati, Ohio 45232
** Discovery Site **

The Ridgewood Arsenal site (RA) is approximately a 40 acre parcel of land. The site is bordered by the Este Avenue Dump (EAD) (OHD980509988) to the southwest, the Mill Creek on the east, and Seymour Avenue to the north. RA is located in a mixed industrial, commercial, and residential area. RA was formerly used for the manufacture of munitions by the US government. Some of the buildings on the east side of the property have been demolished.

The city of Cincinnati now owns this site and plans to develop the site for industrial use. The Cincinnati Department of Public Works also owns EAD and is overseeing work on both sites. The work includes environmental remediation, construction of access roads, installation of a water pre-treatment facility, and planing of future development. Although manufacturing has ceased, RA is still is accepting composting materials.

The city has contracted with Westinghouse Environmental and Geotechnical Services, Inc. (formerly S&ME) to conduct site investigations and remediation for both sites. Most of the environmental investigation have been aimed at EAD. Westinghouse believes that leachate from the dump has migrated toward RA. A "drainage swale" has been installed between the two sites. During the excavation of the drainage swale, leachate was observed along the slopes of the swale on both the EAD and RA sides.

There have been two soil borings done at RA. A sandy layer was encountered in borings 1 and 2 at 3.5 and 5.5 feet below the ground surface, respectively. A sample of this sandy layer from each boring was then sent to a laboratory for chemical analysis. Elevated concentrations of Arsenic (15 mg/kg), Di-n-butyl phthalate (3.8 mg/kg), and Cyanide (0.68 mg/kg) were found. Di-n-butyl phthalate is typically used in plasticizing vinyl acetate emulsion systems as well as cellulose esters. It is also used as an insect repellent. Sodium and potassium cyanides are primarily used in the extraction of ores, electroplating, metal treatment, and various manufacturing processes. The cyanide detected may be associated with past manufacturing activities at the former arsenal.

The city of Wyoming obtains drinking water from wells located 2.5 to 3 miles northeast of the site and serves about 9,700 people. Shallow groundwater at the site is believed to flow southeast. The Mill Creek bounds the eastern side of RA, flowing from northeast to

southwest. Because of relatively low levels of contamination, lack of nearby drinking water supplies, and current remedial work at these sites, a low priority for the Division of Emergency and Remedial Response is recommended. .

Prepared by:

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Date: 6/13/91

Reviewed by:

Michael Starkey
Group Leader, DERR, SWDO
Date:

DRAFT

Preliminary Assessment Narrative

Date: 7/19/84
Company: Saint Bernard Dump
I.D.#: OHD980510465

The City of St. Bernard disposal facility was comprised of a landfill about 8 acres in size and an incinerator with a capacity to burn 40 tons of waste per day.

The landfill was used to dispose of domestic waste, commercial waste, industrial waste and demolition waste. In 1975, records show a violation occurred with the disposal of liquids into the landfill. The Ohio EPA quickly advised the City of St. Bernard of the violation. Soon afterwards, the City of St. Bernard responded to alleviate the violations.

The incinerator was used to burn household, commercial and industrial waste. The incinerator was closed because of violations of air emission standards. The non-compliance status was due to inadequacies in the equipment not inefficient operations. After incineration, the residue was spread over the surface of the landfill. The incinerator was not licensed beyond 1976 and was finally closed in 1977. Soon after the landfill was closed all the waste for the City of St. Bernard was routed to Environmental Land Development Associates, (ELDA), a privately owned sanitary landfill. However, the incinerator was not at the same location as the landfill.

.e geology of the principle aquifer surrounding the landfill is coarse sand and gravel which overlap bedrock. The direction of groundwater movement is southwest across the landfill.

Possible surface water contamination from site runoff was mentioned in a letter from OEPA to the site operations. Standing water was contaminated with a black-colored industrial liquid of unknown origin. There is an industrial water user in the area. U.S. Playing Card Co. has a water well within two miles of St. Bernard Dump. The City of Norwood has 7 municipal wells within 2 miles of the site. However, these wells are no longer used to supply water to the City of Norwood. Moreover, the wells are upgradient of the landfill. In addition to the wells location, Mr. Burns, Community Development Director for St. Bernard, assures me that no hazardous waste was disposed of in the landfill. Although, Ohio EPA files indicate numerous industrial facilities had used the landfill, information about the nature of the material disposed of is unavailable. Contamination does not have to come from hazardous waste.

The landfill site has been converted in a soccer field referred to as the Ludlow Grove Park. According to Mr. Burns, City of St. Bernard, demolition debris is the major waste disposed of at the site. No. F.I.T. or State activity is necessary at this time.

PRELIMINARY ASSESSMENT NARRATIVE

Sherwin Williams Company
501 Murray Road
Cincinnati, Ohio 45217

OHD004261301

Sherwin-Williams Chemicals, a division of the Sherwin-Williams Company, owned and operated a chemical manufacturing facility at 501 Murray Road in Cincinnati, Ohio from 1966 to 1985 at which time, ownership was transferred to PMC Specialties Group, a division of PMC, Inc. The site was formerly occupied by the American Agricultural Chemical Company and production at the facility is documented to have occurred since the late 1800's. The site occupies approximately 33 acres in a mixed industrial and residential area within the Saint Bernard city limits, due west of I-75 and the Norwood Lateral Interchange. Currently, PMC Specialties Group handles the following materials, all of which are regulated by RCRA as hazardous wastes: dimethyl sulfate (U103), methyl alcohol (U154), toluene diamine (U221), phthalic anhydride (U190), dimethylamine (U092), methyl isobutyl ketone (U161), methylene chloride (U080), n-butyl alcohol (U031), chlorobenzene (U037), formaldehyde (U122), xylene (U239), toluene (220), saccharin and salts (U202) and 1,2-benzenedicarboxylic acid (U028). These materials are used in the manufacture of saccharin products, organic intermediates and triazole corrosion inhibitors, the same products formerly manufactured by Sherwin-Williams Chemicals.

Currently, hazardous wastes generated by the manufacturing process are stored in eight drums on-site which are disposed of quarterly in an approved hazardous waste facility. Sherwin-Williams has a record of violations regarding the on-site accumulation of hazardous wastes. A previous on-site inspection by Ohio EPA (3/30/84) revealed leaking pumps and tanks from which hazardous materials orthonitroaniline and orthotoluenediamene were exuding, resulting in several hundred square feet of soil contamination. The facility is situated over the Mill Creek buried valley aquifer in the upper northwestern reaches of the Norwood Trough, a sand and gravel unit with estimated yields of several hundred gallons per minute. Migration of contaminants could result in deterioration of groundwater quality in the underlying aquifer. Although surrounding communities within a 3-mile radius obtain municipal water from Cincinnati sources, the City of Norwood, located southeast of the facility does have one well which draws groundwater from the underlying sand and gravel aquifer. This well is available for use by that portion of the public sector which prefers to utilize non-municipal water sources for daily drinking water purposes.

In addition, dead earthworms and dead vegetation were observed near some chunks of triazole, loosely discarded on the ground surface, along several low-lying areas within the bounds of the facility. Ross Run, a small intermittent tributary to Mill Creek, formerly passed through the low-lying areas at the southern bounds of the facility property. Heavy rains could expedite the dissolution and migration of surface contaminants located along this old watercourse through the subsurface to the water table. Soil borings taken during three preliminary subsurface investigations in 1974 and 1975 as well as during two geotechnical investigations in 1980 for on-site construction proposal purposes, revealed the presence of buried chemical wastes at depths ranging from 2.5 to 14.0 feet. Surface drainage at the facility was noted to be very poor, with water ponding at several locations on-site.

Between 1966 and 1974, an on-site settling tank was utilized in an industrial wastewater treatment system which generated approximately 200,000 gallons of a wastewater treatment sludge within the tank. Analysis of the sludge in 1981 revealed the presence of dichlorobenzene, tetrachlorobenzene and pentachlorobenzene at unknown concentrations as well as the presence of arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver, although concentrations did not exceed EP Toxicity levels. This sludge remained in the tank between 1974 and 1980, during which time, industrial wastewater was pumped into the tank to balance pH swings before being discharged to the Metropolitan Sewer District (MSD). On March 7, 1980, a faulty pump switch on a storage tank resulted in the overflow of 1,017 gallons of trichlorobenzene (TCB) to the process sewer which drains to the MSD.

An on-site chemical spill of dimethyl sulfate was reported on 10/3/84, however, the spill was contained within the plant building with no reports of population injury or release into the environment. In June of 1978, six employees were exposed during processing of a chemical mixture of chlorothiaxanthones in powder form. All six employees experienced a burning sensation on their faces after exposure to sunlight. Although redness was noted to last about 2 hours, there were no observable, apparent long-term effects to anyone. On March 30, 1984, OEPA personnel conducted a PCB inspection to determine compliance with the PCB disposal and marketing regulations as stated in the 40 CFR Part 761. During the inspection, samples were taken from various locations on-site. Soil debris collected from around a surge tank near facility building #40 showed levels of PCB at 21 ppm. Materials scooped up from the floor near an old Therminol boiler in facility building #38 contained 20,000 ppm of PCB.

Currently, PMC Specialties Group is regulated under RCRA as a generator of hazardous waste. Based on information regarding location of the facility over potentially valuable groundwater resources as well as previous problems regarding leaking pumps, tanks and discarded hazardous materials on-site, a high priority for FIT and a medium priority for State activity is recommended. FIT activity should include the installation and sampling of groundwater monitoring wells and soil sampling.

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Unregulated Site's Group
November 27, 1987

Reviewed by: Michael J. Starkey

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