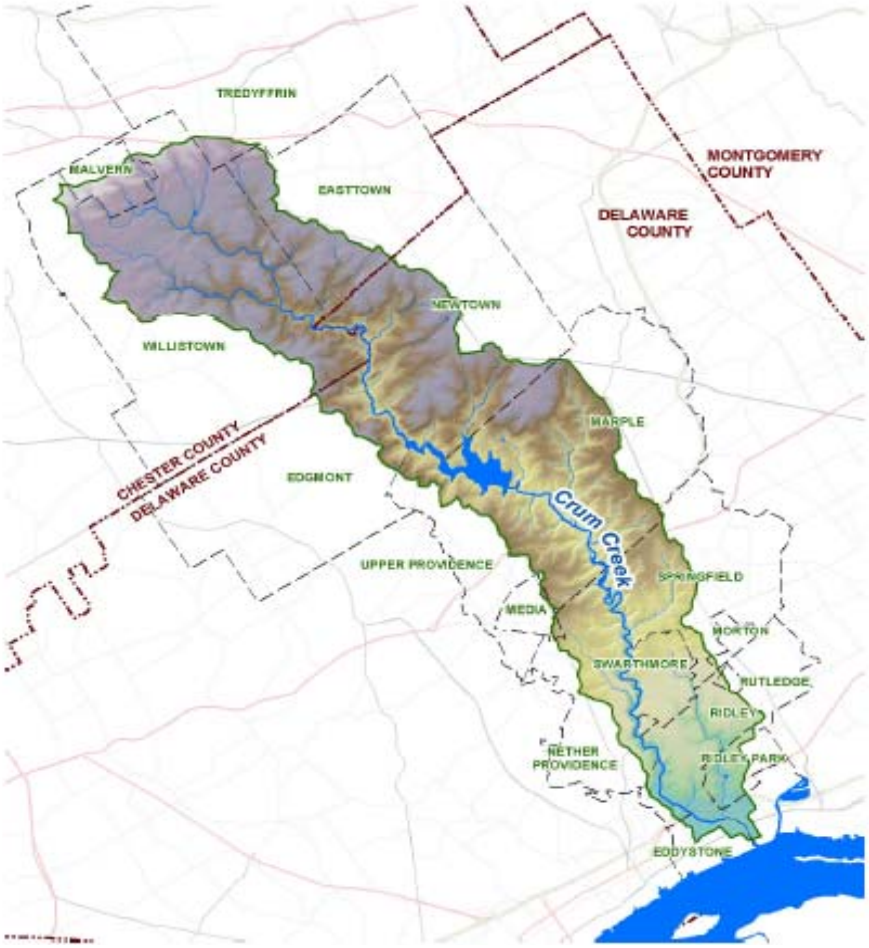
CRUM CREEK WATERSHED ACT 167 STORMWATER MANAGEMENT PLAN



VOLUME III
TECHNICAL APPENDIX

CHESTER AND DELAWARE COUNTIES, PENNSYLVANIA

DECEMBER 2011

CRUM CREEK WATERSHED ACT 167
STORMWATER MANAGEMENT PLAN

CHESTER AND DELAWARE COUNTIES, PENNSYLVANIA

VOLUME III
TECHNICAL APPENDIX

December 2011

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BLE PROJECT NO. 2004-1553-00

PREPARED BY:

DELAWARE COUNTY PLANNING DEPARTMENT
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and

CHESTER COUNTY PLANNING COMMISSION
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ENGINEERING CONSULTANT:

Borton-LAWSON ENGINEERING, INC.
3893 Adler Place, Suite 100
Bethlehem, PA 18017

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Borton-Lawson Engineering, Inc.

CRUM CREEK WATERSHED DESIGNATED WPAC MEMBERS
As of October 10, 2007

Delaware County

Delaware County Planning Department	Ms. Karen Holm Manager, Environmental Section
Delaware County Conservation District	Mr. Edward Magargee District Manager
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Marple Township	Mr. Anthony Hamaday Manager
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Media Borough	Mr. Jeffrey Smith Manager
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Springfield Township	Mr. Michael T. LeFevre Manager
Swarthmore Borough	Ms. Nancy Crickman EAC Member Alternate: Ms. Jane Billings
Upper Providence Township	Mr. Anthony Hamaday Manager (former)

Chester County

Chester County Planning Commission	Ms. Carrie Conwell Environmental/Open Space Planner
Chester County Conservation District	Mr. Dan Greig District Manager
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Malvern Borough	Ms. Sandra L Kelley Manager
Tredyffrin Township	Mr. Stephen Burgo, P.E. Municipal Engineer
Willistown Township	Mr. Hugh J. Murray, Sr. Manager

Others

Chester County Water Resources Authority	Ms. Janet Bowers Director
Chester Ridley Crum Watersheds Association	Mr. Gary Snyder President Alternate: Ms. Anne Murphy
Natural Resources Conservation Service (NRCS)	Mr. Sam High District Conservationist
Aqua Pennsylvania	Mr. Preston Luitweiler Alternate: Craig Marleton

VOLUME III – TECHNICAL APPENDIX

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A. WATERSHED PEAK FLOWS SUMMARY TABLES

CRUM CREEK

ACT 167 SUMMARY FLOW TABLES

Subbasin	HMS Element	Subarea DA	EXISTING CONDITIONS SUBAREA FLOWS					
			2- Yr	5- Yr	10- Yr	25- Yr	50- Yr	100- Yr
50	50	1.08	290.13	482.40	529.93	630.38	808.79	1010.07
51	51	1.97	375.03	609.91	667.95	820.99	1072.35	1357.39
52	52	1.59	293.29	474.27	505.57	608.35	799.58	1016.73
53	53	0.75	143.98	233.59	245.25	291.28	388.24	499.26
54	54	1.41	189.10	320.24	427.91	589.28	728.00	884.37
55	55	1.09	203.72	334.60	345.87	406.14	547.25	710.35
56	56	0.45	125.48	213.95	287.06	396.79	491.28	597.97
57	57	1.46	213.35	372.24	406.49	500.81	675.59	876.73
58	58	1.34	393.93	632.30	640.85	688.01	929.45	1205.40
59	59	0.69	166.54	271.39	284.93	340.78	454.43	583.90
60	60	2.04	173.71	675.30	763.37	976.84	1316.90	1708.25
61	61	1.95	664.66	1080.52	1238.13	1571.34	2018.72	2525.41
62	62	1.17	273.89	442.45	496.75	620.12	800.51	1004.43
63	63	1.61	377.92	600.19	680.03	851.03	1081.86	1339.64
64	64	0.75	98.80	196.78	249.19	343.19	453.70	579.23
65	65	2.96	968.21	1746.03	2558.34	3666.52	4464.07	5356.38
66	66	2.78	302.19	622.34	728.06	883.80	1174.64	1506.10
67	67	1.07	207.31	341.04	364.97	441.69	587.17	754.56
68	68	2.30	594.61	945.41	1129.81	1455.48	1817.09	2222.39
69	69	1.27	344.31	542.62	610.28	762.11	966.51	1193.28
70	70	1.39	482.85	784.94	859.05	1058.84	1384.43	1752.19
71	71	0.91	301.95	471.21	583.16	759.59	927.65	1114.67
72	72	0.87	183.28	291.30	315.60	383.91	497.59	625.12
73	73	0.84	214.66	338.97	374.89	463.44	593.16	737.67
74	74	0.32	90.55	137.91	165.24	210.99	258.22	310.72
75	75	1.27	242.80	376.73	551.29	811.25	969.17	1143.32
76	76	0.42	249.40	372.02	457.61	585.64	698.96	823.34
77	77	1.20	170.60	299.97	427.50	607.67	735.51	875.49
78	78	1.10	377.28	573.29	643.60	800.94	990.81	1194.32
79	79	0.25	124.11	174.73	196.79	241.84	289.19	339.33

CRUM CREEK
ACT 167 SUMMARY FLOW TABLES

Subbasin	HMS Element	Cumulative DA	EXISTING CONDITIONS CUMULATIVE FLOWS					
			2- Yr	5- Yr	10- Yr	25- Yr	50- Yr	100- Yr
62	1	16.98	1,423	2,372	2,687	3,312	4,303	5,451
78	101	34.65	1,336	2,440	3,014	4,035	5,248	6,599
77	102	3.37	591	960	1,364	1,962	2,367	2,815
55	103	6.47	897	1,450	1,591	1,933	2,501	3,145
US 60*	104	9.78	1,193	1,940	2,180	2,686	3,448	4,311
50	105	1.08	290	482	530	630	809	1,010
58	106	1.34	394	633	641	688	929	1,205
51	11	3.04	618	1,014	1,129	1,399	1,817	2,289
52	12	5.38	840	1,363	1,497	1,825	2,363	2,973
54&56	13	1.86	228	381	507	696	859	1,042
57	14	3.32	425	730	890	1,169	1,498	1,876
60	15	11.82	1,260	2,087	2,352	2,900	3,719	4,646
59	16	13.85	1,329	2,194	2,482	3,057	3,935	5,002
61	17	15.80	1,383	2,285	2,598	3,183	4,142	5,253
66	18	26.14	1,355	2,420	2,834	3,651	4,745	5,965
68	19	28.44	1,253	2,313	2,804	3,697	4,834	6,098
69&70	20	31.10	1,286	2,383	2,897	3,830	4,999	6,300
72&73	21	32.81	1,318	2,430	2,963	3,926	5,118	6,445
71	22	0.91	302	471	583	760	928	1,115
74	23	33.13	1,328	2,442	2,979	3,948	5,145	6,476
75	24	2.18	452	706	1,026	1,521	1,837	2,186
76	25	33.55	1,335	2,449	2,995	3,974	5,174	6,510
63	3	1.61	378	600	680	851	1,082	1,340
64&65	7	22.29	1,294	2,320	2,679	3,397	4,420	5,558
US 70*	9	38.02	1,678	2,592	3,525	5,100	6,338	7,767

*Note: The HMS Element is located upstream of the subbasin listed. All other HMS elements are directly downstream of the subasin(s) listed.

B. HEC-HMS MODEL OUTPUT TABLES

Project: Final_Crum_Creek Simulation Run: 1-yr

Start of Run: 15May2006, 00:00
End of Run: 17May2006, 00:05
Compute Time: 22Aug2007, 11:24:36

Basin Model: Crum 2-yr OK
Meteorologic Model: 1-YR
Control Specifications: Synthetic Storm

Volume Units: AC-FT

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
1	16.9760	792.95	15May2006, 17:20	873.67
10	38.2700	990.35	15May2006, 16:25	1867.92
101	34.6500	767.40	16May2006, 04:25	1604.03
102	3.3730	312.50	15May2006, 14:05	221.29
103	6.4660	485.61	15May2006, 15:35	352.05
104	9.7830	640.75	15May2006, 15:25	522.89
105	1.0750	147.34	15May2006, 13:00	62.88
106	1.3390	206.07	15May2006, 12:40	68.32
11	3.0410	325.74	15May2006, 13:15	155.62
12	5.3790	451.26	15May2006, 14:50	291.03
13	1.8550	116.89	15May2006, 14:10	107.89
14	3.3170	209.04	15May2006, 14:00	170.84
15	11.8230	687.98	15May2006, 15:35	594.47
16	13.8540	733.28	15May2006, 16:20	713.33
17	15.8030	766.98	15May2006, 16:50	805.43
18	26.1380	742.13	15May2006, 22:00	1170.70
19	28.4420	703.77	16May2006, 01:30	1195.37
20	31.0970	723.56	16May2006, 01:35	1346.00
21	32.8100	745.22	16May2006, 01:35	1461.58
22	0.9090	171.84	15May2006, 12:55	67.95
23	33.1290	753.90	16May2006, 01:45	1501.53
24	2.1760	255.10	15May2006, 13:25	155.28
25	33.5490	770.53	15May2006, 13:55	1551.24
27	26.1380	740.06	15May2006, 23:30	1154.65
28	28.4420	703.40	16May2006, 02:00	1189.25

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
29	31.0970	723.25	16May2006, 02:10	1337.81
3	1.6080	209.02	15May2006, 13:25	91.32
30	32.8100	745.10	16May2006, 01:50	1458.07
31	0.9090	167.97	15May2006, 13:15	67.95
32	33.1290	753.78	16May2006, 02:00	1498.15
33	2.1760	250.48	15May2006, 14:00	155.28
34	33.5490	759.65	16May2006, 04:25	1516.16
36	16.9760	789.39	15May2006, 18:20	873.67
37	1.6080	204.41	15May2006, 14:00	91.32
41	22.2940	697.99	15May2006, 22:05	1039.34
42	38.0230	972.55	15May2006, 16:25	1820.33
43	3.0410	299.70	15May2006, 15:05	155.62
44	9.7830	638.98	15May2006, 15:40	522.89
45	1.8550	116.32	15May2006, 14:35	107.89
46	5.3790	443.22	15May2006, 15:40	291.03
47	11.8230	681.78	15May2006, 16:20	594.47
48	13.8540	729.62	15May2006, 16:55	713.33
49	15.8030	764.67	15May2006, 17:25	805.43
50	1.0750	147.34	15May2006, 13:00	62.88
51	1.9660	201.46	15May2006, 13:35	92.74
52	1.5900	158.38	15May2006, 13:50	83.24
53	0.7480	78.29	15May2006, 13:30	52.17
54	1.4050	94.08	15May2006, 14:20	67.03
55	1.0870	108.39	15May2006, 13:25	61.02
56	0.4500	61.99	15May2006, 12:45	40.86
57	1.4620	100.64	15May2006, 13:45	62.95
58	1.3390	206.07	15May2006, 12:40	68.32
59	0.6920	90.01	15May2006, 13:05	50.54
60	2.0400	154.90	15May2006, 13:10	71.59
61	1.9490	358.10	15May2006, 12:35	92.10
62	1.1730	149.00	15May2006, 13:10	68.24
63	1.6080	209.02	15May2006, 13:25	91.32

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
64	0.7540	36.62	15May2006, 13:40	41.67
65	2.9560	406.91	15May2006, 12:30	99.69
66	2.7790	100.49	15May2006, 13:55	71.83
67	1.0650	110.54	15May2006, 13:20	59.53
68	2.3040	329.63	15May2006, 13:10	116.62
69	1.2660	191.94	15May2006, 13:15	80.97
7	22.2940	701.22	15May2006, 19:55	1060.82
70	1.3890	258.61	15May2006, 12:35	75.78
71	0.9090	171.84	15May2006, 12:55	67.95
72	0.8700	101.61	15May2006, 13:40	61.49
73	0.8430	119.87	15May2006, 13:20	62.28
74	0.3190	54.02	15May2006, 13:20	43.46
75	1.2670	137.13	15May2006, 14:35	87.33
76	0.4200	150.50	15May2006, 12:30	53.09
77	1.1970	74.99	15May2006, 15:00	66.00
78	1.1010	215.03	15May2006, 13:20	87.87
79	0.2470	80.44	15May2006, 13:05	47.59
9	38.0230	978.23	15May2006, 16:10	1825.32
Crum Dam 23-020	28.4420	703.77	16May2006, 01:30	1195.37
Geist 23-079	22.2940	701.22	15May2006, 19:55	1060.82

Project: Final_Crum_Creek Simulation Run: 2-yr

Start of Run: 15May2006, 00:00 Basin Model: Crum 2-yr
End of Run: 17May2006, 00:05 Meteorologic Model: 2-YR
Compute Time: 22Aug2007, 11:21:36 Control Specifications: Synthetic Storm

Volume Units: AC-FT

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
1	16.9760	1452.49	15May2006, 17:10	1324.40
10	38.2700	1690.81	15May2006, 16:25	2937.89
101	34.6500	1386.77	16May2006, 04:05	2548.96
102	3.3730	591.23	15May2006, 14:05	336.53
103	6.4660	897.09	15May2006, 15:35	530.88
104	9.7830	1193.08	15May2006, 15:20	785.97
105	1.0750	290.13	15May2006, 12:55	93.88
106	1.3390	393.93	15May2006, 12:40	102.99
11	3.0410	617.85	15May2006, 13:10	240.77
12	5.3790	839.82	15May2006, 14:45	441.75
13	1.8550	227.88	15May2006, 14:00	156.59
14	3.3170	425.18	15May2006, 13:50	255.10
15	11.8230	1282.81	15May2006, 15:30	907.08
16	13.8540	1354.28	15May2006, 16:10	1079.00
17	15.8030	1410.02	15May2006, 16:45	1223.58
18	26.1380	1412.35	15May2006, 21:35	1858.67
19	28.4420	1301.21	16May2006, 00:50	1946.44
20	31.0970	1336.95	16May2006, 00:50	2176.26
21	32.8100	1369.10	16May2006, 01:15	2343.58
22	0.9090	301.95	15May2006, 12:55	97.12
23	33.1290	1378.86	16May2006, 01:30	2393.46
24	2.1760	451.80	15May2006, 13:25	229.39
25	33.5490	1386.04	16May2006, 01:40	2458.42
27	26.1380	1405.25	15May2006, 23:05	1841.91
28	28.4420	1300.19	16May2006, 01:15	1939.65

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
29	31.0970	1335.46	16May2006, 01:25	2167.11
3	1.6080	377.92	15May2006, 13:25	140.93
30	32.8100	1368.43	16May2006, 01:30	2339.63
31	0.9090	294.96	15May2006, 13:10	97.12
32	33.1290	1378.24	16May2006, 01:45	2389.65
33	2.1760	442.91	15May2006, 14:00	229.39
34	33.5490	1378.69	16May2006, 04:05	2417.82
36	16.9760	1449.34	15May2006, 18:05	1324.40
37	1.6080	369.19	15May2006, 14:00	140.93
41	22.2940	1338.73	15May2006, 21:35	1635.51
42	38.0230	1667.79	15May2006, 16:25	2879.57
43	3.0410	566.23	15May2006, 15:00	240.77
44	9.7830	1189.84	15May2006, 15:35	785.97
45	1.8550	226.77	15May2006, 14:25	156.59
46	5.3790	823.45	15May2006, 15:35	441.75
47	11.8230	1272.58	15May2006, 16:15	907.08
48	13.8540	1349.03	15May2006, 16:45	1079.00
49	15.8030	1407.06	15May2006, 17:15	1223.58
50	1.0750	290.13	15May2006, 12:55	93.88
51	1.9660	375.03	15May2006, 13:35	146.89
52	1.5900	293.29	15May2006, 13:45	128.97
53	0.7480	143.98	15May2006, 13:30	72.01
54	1.4050	189.10	15May2006, 14:15	104.28
55	1.0870	203.72	15May2006, 13:25	89.13
56	0.4500	125.48	15May2006, 12:40	52.30
57	1.4620	213.35	15May2006, 13:40	98.51
58	1.3390	393.93	15May2006, 12:40	102.99
59	0.6920	166.54	15May2006, 13:00	68.93
60	2.0400	368.79	15May2006, 13:05	121.11
61	1.9490	664.66	15May2006, 12:35	144.58
62	1.1730	273.89	15May2006, 13:10	100.81
63	1.6080	377.92	15May2006, 13:25	140.93

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
64	0.7540	98.80	15May2006, 13:30	59.60
65	2.9560	968.21	15May2006, 12:30	179.31
66	2.7790	302.19	15May2006, 13:40	136.92
67	1.0650	207.31	15May2006, 13:15	86.24
68	2.3040	594.61	15May2006, 13:10	185.61
69	1.2660	344.31	15May2006, 13:15	121.64
7	22.2940	1349.82	15May2006, 19:30	1657.63
70	1.3890	482.85	15May2006, 12:35	114.97
71	0.9090	301.95	15May2006, 12:55	97.12
72	0.8700	183.28	15May2006, 13:40	87.85
73	0.8430	214.66	15May2006, 13:20	88.62
74	0.3190	90.55	15May2006, 13:20	53.83
75	1.2670	242.80	15May2006, 14:30	132.27
76	0.4200	249.40	15May2006, 12:30	68.78
77	1.1970	170.60	15May2006, 14:50	107.14
78	1.1010	377.28	15May2006, 13:20	131.13
79	0.2470	124.11	15May2006, 13:05	58.32
9	38.0230	1678.14	15May2006, 16:05	2885.49
Crum Dam 23-02	28.4420	1301.21	16May2006, 00:50	1946.44
Geist 23-079	22.2940	1349.82	15May2006, 19:30	1657.63

Project: Final_Crum_Creek Simulation Run: 5-yr

Start of Run:	15May2006, 00:00	Basin Model:	Crum 2-yr
End of Run:	17May2006, 00:05	Meteorologic Model:	5-YR
Compute Time:	17Aug2007, 09:07:37	Control Specifications:	Synthetic Storm

Volume Units: AC-FT

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
1	16.9760	2371.61	15May2006, 16:00	1935.44
10	38.2700	2604.14	15May2006, 16:25	4376.45
101	34.6500	2440.47	16May2006, 03:30	3827.63
102	3.3730	959.58	15May2006, 14:05	484.56
103	6.4660	1450.10	15May2006, 15:30	770.40
104	9.7830	1940.01	15May2006, 15:20	1141.64
105	1.0750	482.40	15May2006, 12:55	135.32
106	1.3390	651.89	15May2006, 12:40	150.02
11	3.0410	1014.17	15May2006, 13:10	354.65
12	5.3790	1362.99	15May2006, 14:45	643.13
13	1.8550	381.30	15May2006, 13:55	223.19
14	3.3170	729.58	15May2006, 13:45	371.24
15	11.8230	2086.53	15May2006, 15:30	1332.46
16	13.8540	2194.17	15May2006, 16:05	1576.22
17	15.8030	2284.90	15May2006, 15:35	1791.15
18	26.1380	2419.86	15May2006, 21:05	2799.59
19	28.4420	2313.38	16May2006, 00:00	2972.64
20	31.0970	2383.28	16May2006, 00:20	3306.67
21	32.8100	2429.98	16May2006, 00:50	3542.02
22	0.9090	471.21	15May2006, 12:55	134.77
23	33.1290	2441.75	16May2006, 01:05	3604.85
24	2.1760	706.37	15May2006, 13:25	323.87
25	33.5490	2449.36	16May2006, 01:15	3688.88
27	26.1380	2410.44	15May2006, 22:35	2782.15
28	28.4420	2310.92	16May2006, 00:25	2965.26

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
29	31.0970	2378.73	16May2006, 00:55	3296.66
3	1.6080	600.19	15May2006, 13:25	205.66
30	32.8100	2428.29	16May2006, 01:05	3537.68
31	0.9090	460.43	15May2006, 13:10	134.77
32	33.1290	2440.38	16May2006, 01:15	3600.65
33	2.1760	692.06	15May2006, 13:55	323.87
34	33.5490	2431.32	16May2006, 03:30	3643.33
36	16.9760	2363.29	15May2006, 17:10	1935.44
37	1.6080	585.92	15May2006, 14:00	205.66
41	22.2940	2305.57	15May2006, 21:10	2445.22
42	38.0230	2575.17	15May2006, 16:25	4305.42
43	3.0410	926.69	15May2006, 15:00	354.65
44	9.7830	1934.16	15May2006, 15:35	1141.64
45	1.8550	379.37	15May2006, 14:25	223.19
46	5.3790	1336.02	15May2006, 15:35	643.13
47	11.8230	2072.46	15May2006, 16:10	1332.46
48	13.8540	2188.23	15May2006, 16:40	1576.22
49	15.8030	2281.20	15May2006, 16:10	1791.15
50	1.0750	482.40	15May2006, 12:55	135.32
51	1.9660	609.91	15May2006, 13:30	219.32
52	1.5900	474.27	15May2006, 13:45	189.69
53	0.7480	233.59	15May2006, 13:30	98.79
54	1.4050	320.24	15May2006, 14:15	155.11
55	1.0870	334.60	15May2006, 13:25	127.27
56	0.4500	213.95	15May2006, 12:40	68.08
57	1.4620	372.24	15May2006, 13:35	148.05
58	1.3390	651.89	15May2006, 12:40	150.02
59	0.6920	271.39	15May2006, 13:00	93.74
60	2.0400	675.30	15May2006, 13:00	190.82
61	1.9490	1080.52	15May2006, 12:35	214.93
62	1.1730	442.45	15May2006, 13:10	144.29
63	1.6080	600.19	15May2006, 13:25	205.66

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
64	0.7540	196.78	15May2006, 13:25	85.58
65	2.9560	1746.03	15May2006, 12:25	288.92
66	2.7790	622.34	15May2006, 13:40	231.73
67	1.0650	341.04	15May2006, 13:15	122.64
68	2.3040	945.41	15May2006, 13:10	276.03
69	1.2660	542.62	15May2006, 13:15	174.26
7	22.2940	2320.31	15May2006, 19:10	2467.96
70	1.3890	784.94	15May2006, 12:35	167.16
71	0.9090	471.21	15May2006, 12:55	134.77
72	0.8700	291.30	15May2006, 13:40	122.44
73	0.8430	338.97	15May2006, 13:20	122.91
74	0.3190	137.91	15May2006, 13:20	67.17
75	1.2670	376.73	15May2006, 14:30	189.09
76	0.4200	372.02	15May2006, 12:30	88.23
77	1.1970	299.97	15May2006, 14:45	160.69
78	1.1010	573.29	15May2006, 13:20	184.30
79	0.2470	174.73	15May2006, 13:05	71.04
9	38.0230	2592.43	15May2006, 16:05	4312.19
Crum Dam 23-02	028.4420	2313.38	16May2006, 00:00	2972.64
Geist 23-079	22.2940	2320.31	15May2006, 19:10	2467.96

Project: Final_Crum_Creek Simulation Run: 10-yr

Start of Run: 15May2006, 00:00 Basin Model: Crum 2-yr
End of Run: 17May2006, 00:05 Meteorologic Model: 10-YR
Compute Time: 17Aug2007, 09:06:27 Control Specifications: Synthetic Storm

Volume Units: AC-FT

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
1	16.9760	3141.24	15May2006, 15:55	2434.42
10	38.2700	3389.21	16May2006, 03:20	5542.51
101	34.6500	3314.84	16May2006, 03:05	4868.20
102	3.3730	1251.60	15May2006, 14:05	601.01
103	6.4660	1899.50	15May2006, 15:30	964.70
104	9.7830	2547.03	15May2006, 15:15	1431.56
105	1.0750	637.96	15May2006, 12:55	168.81
106	1.3390	864.38	15May2006, 12:40	188.51
11	3.0410	1336.57	15May2006, 13:10	446.90
12	5.3790	1787.43	15May2006, 14:45	806.21
13	1.8550	507.43	15May2006, 13:55	277.77
14	3.3170	982.49	15May2006, 13:45	466.86
15	11.8230	2741.01	15May2006, 15:25	1680.29
16	13.8540	2888.27	15May2006, 14:50	1982.77
17	15.8030	3029.02	15May2006, 15:25	2254.91
18	26.1380	3211.20	15May2006, 20:55	3570.13
19	28.4420	3150.88	15May2006, 23:30	3812.39
20	31.0970	3239.42	15May2006, 23:55	4229.99
21	32.8100	3299.60	16May2006, 00:30	4519.82
22	0.9090	605.75	15May2006, 12:55	164.63
23	33.1290	3314.24	16May2006, 00:40	4592.97
24	2.1760	907.82	15May2006, 13:25	398.14
25	33.5490	3324.49	16May2006, 00:55	4691.81
27	26.1380	3199.93	15May2006, 22:25	3552.24
28	28.4420	3147.66	16May2006, 00:00	3804.63

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
29	31.0970	3235.26	16May2006, 00:30	4219.44
3	1.6080	778.12	15May2006, 13:25	257.33
30	32.8100	3297.85	16May2006, 00:45	4515.23
31	0.9090	592.01	15May2006, 13:10	164.63
32	33.1290	3312.81	16May2006, 00:55	4588.52
33	2.1760	889.51	15May2006, 13:55	398.14
34	33.5490	3304.34	16May2006, 03:10	4643.07
36	16.9760	3127.08	15May2006, 17:00	2434.42
37	1.6080	759.34	15May2006, 14:00	257.33
41	22.2940	3065.15	15May2006, 21:00	3106.27
42	38.0230	3381.42	16May2006, 03:20	5461.89
43	3.0410	1219.73	15May2006, 15:00	446.90
44	9.7830	2540.76	15May2006, 15:30	1431.56
45	1.8550	504.96	15May2006, 14:20	277.77
46	5.3790	1751.92	15May2006, 15:35	806.21
47	11.8230	2723.78	15May2006, 16:10	1680.29
48	13.8540	2879.29	15May2006, 15:30	1982.77
49	15.8030	3022.11	15May2006, 16:00	2254.91
50	1.0750	637.96	15May2006, 12:55	168.81
51	1.9660	801.98	15May2006, 13:30	278.09
52	1.5900	620.91	15May2006, 13:45	238.66
53	0.7480	307.15	15May2006, 13:25	120.64
54	1.4050	427.91	15May2006, 14:15	196.70
55	1.0870	442.43	15May2006, 13:25	158.49
56	0.4500	287.06	15May2006, 12:40	81.07
57	1.4620	505.16	15May2006, 13:35	189.09
58	1.3390	864.38	15May2006, 12:40	188.51
59	0.6920	357.46	15May2006, 13:00	113.97
60	2.0400	932.43	15May2006, 13:00	248.74
61	1.9490	1420.77	15May2006, 12:35	272.14
62	1.1730	579.79	15May2006, 13:10	179.51
63	1.6080	778.12	15May2006, 13:25	257.33

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
64	0.7540	280.24	15May2006, 13:20	107.33
65	2.9560	2388.52	15May2006, 12:25	378.64
66	2.7790	898.26	15May2006, 13:35	311.32
67	1.0650	451.73	15May2006, 13:15	152.54
68	2.3040	1227.68	15May2006, 13:10	348.49
69	1.2660	700.11	15May2006, 13:15	216.00
7	22.2940	3083.02	15May2006, 19:00	3129.41
70	1.3890	1030.56	15May2006, 12:35	209.35
71	0.9090	605.75	15May2006, 12:55	164.63
72	0.8700	378.00	15May2006, 13:40	150.14
73	0.8430	438.20	15May2006, 13:20	150.24
74	0.3190	175.48	15May2006, 13:20	77.74
75	1.2670	481.02	15May2006, 14:30	233.50
76	0.4200	466.52	15May2006, 12:30	103.29
77	1.1970	401.80	15May2006, 14:40	202.88
78	1.1010	722.00	15May2006, 13:15	225.13
79	0.2470	212.27	15May2006, 13:05	80.62
9	38.0230	3383.86	16May2006, 03:00	5469.21
Crum Dam 23-028	28.4420	3150.88	15May2006, 23:30	3812.39
Geist 23-079	22.2940	3083.02	15May2006, 19:00	3129.41

Project: Final_Crum_Creek Simulation Run: 25-yr

Start of Run:	15May2006, 00:00	Basin Model:	Crum-100-yr
End of Run:	17May2006, 00:05	Meteorologic Model:	25-YR
Compute Time:	17Aug2007, 09:06:55	Control Specifications:	Synthetic Storm

Volume Units: AC-FT

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
1	16.9760	3312.08	15May2006, 16:00	2577.52
10	38.2700	5152.64	15May2006, 15:00	6364.45
101	34.6500	4034.68	15May2006, 21:20	5515.58
102	3.3730	1962.23	15May2006, 15:00	770.79
103	6.4660	1933.47	15May2006, 15:45	979.40
104	9.7830	2685.96	15May2006, 15:30	1534.09
105	1.0750	630.38	15May2006, 13:10	184.55
106	1.3390	688.01	15May2006, 12:55	182.18
11	3.0410	1398.63	15May2006, 13:20	469.92
12	5.3790	1824.67	15May2006, 15:00	826.46
13	1.8550	696.27	15May2006, 13:50	359.34
14	3.3170	1169.21	15May2006, 13:50	554.70
15	11.8230	2900.46	15May2006, 15:40	1802.62
16	13.8540	3057.04	15May2006, 16:15	2096.84
17	15.8030	3183.47	15May2006, 15:35	2388.78
18	26.1380	3650.75	15May2006, 19:15	4028.72
19	28.4420	3697.29	15May2006, 20:15	4342.21
20	31.0970	3830.05	15May2006, 20:25	4779.35
21	32.8100	3926.34	15May2006, 20:45	5081.54
22	0.9090	759.59	15May2006, 12:55	195.22
23	33.1290	3948.47	15May2006, 20:50	5165.28
24	2.1760	1521.27	15May2006, 13:40	498.51
25	33.5490	3974.11	15May2006, 21:00	5283.08
27	26.1380	3648.91	15May2006, 19:30	4025.89
28	28.4420	3695.32	15May2006, 20:30	4337.94

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
29	31.0970	3827.87	15May2006, 20:50	4773.65
3	1.6080	851.03	15May2006, 13:25	274.36
30	32.8100	3925.21	15May2006, 20:55	5079.10
31	0.9090	711.49	15May2006, 13:40	195.22
32	33.1290	3947.63	15May2006, 21:00	5162.93
33	2.1760	1415.38	15May2006, 15:05	498.51
34	33.5490	3971.81	15May2006, 21:25	5276.67
36	16.9760	3299.13	15May2006, 17:10	2577.52
37	1.6080	831.29	15May2006, 14:00	274.36
41	22.2940	3394.17	15May2006, 19:25	3497.13
42	38.0230	5082.68	15May2006, 15:00	6281.26
43	3.0410	1285.73	15May2006, 15:10	469.92
44	9.7830	2678.23	15May2006, 15:45	1534.09
45	1.8550	692.79	15May2006, 14:20	359.34
46	5.3790	1788.49	15May2006, 15:50	826.46
47	11.8230	2879.47	15May2006, 16:20	1802.62
48	13.8540	3047.41	15May2006, 16:50	2096.84
49	15.8030	3178.28	15May2006, 17:15	2388.78
50	1.0750	630.38	15May2006, 13:10	184.55
51	1.9660	820.99	15May2006, 13:35	285.37
52	1.5900	608.35	15May2006, 13:50	237.99
53	0.7480	291.28	15May2006, 13:35	118.55
54	1.4050	589.28	15May2006, 14:10	258.79
55	1.0870	406.14	15May2006, 13:30	152.93
56	0.4500	396.79	15May2006, 12:40	100.55
57	1.4620	500.81	15May2006, 13:40	195.35
58	1.3390	688.01	15May2006, 12:55	182.18
59	0.6920	340.78	15May2006, 13:05	112.03
60	2.0400	976.84	15May2006, 13:05	268.53
61	1.9490	1571.34	15May2006, 12:35	291.94
62	1.1730	620.12	15May2006, 13:10	188.74
63	1.6080	851.03	15May2006, 13:25	274.36

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
64	0.7540	343.19	15May2006, 13:25	126.13
65	2.9560	3666.52	15May2006, 12:25	571.92
66	2.7790	883.80	15May2006, 14:15	379.05
67	1.0650	441.69	15May2006, 13:20	152.54
68	2.3040	1455.48	15May2006, 13:10	397.64
69	1.2660	762.11	15May2006, 13:15	228.00
7	22.2940	3396.99	15May2006, 19:05	3500.96
70	1.3890	1058.84	15May2006, 12:40	213.41
71	0.9090	759.59	15May2006, 12:55	195.22
72	0.8700	383.91	15May2006, 13:40	152.41
73	0.8430	463.44	15May2006, 13:20	155.48
74	0.3190	210.99	15May2006, 13:20	86.18
75	1.2670	811.25	15May2006, 13:45	303.29
76	0.4200	585.64	15May2006, 12:30	120.15
77	1.1970	607.67	15May2006, 14:20	272.28
78	1.1010	800.94	15May2006, 13:20	238.91
79	0.2470	241.84	15May2006, 13:05	83.19
9	38.0230	5100.14	15May2006, 14:45	6286.37
Crum Dam 23-078	28.4420	3697.29	15May2006, 20:15	4342.21
Geist 23-079	22.2940	3396.99	15May2006, 19:05	3500.96

Project: Final_Crum_Creek Simulation Run: 50-yr

Start of Run: 15May2006, 00:00 Basin Model: Crum-100-yr
End of Run: 17May2006, 00:05 Meteorologic Model: 50-YR
Compute Time: 17Aug2007, 09:07:24 Control Specifications: Synthetic Storm

Volume Units: AC-FT

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
1	16.9760	4303.23	15May2006, 15:55	3191.05
10	38.2700	6400.66	15May2006, 15:00	7808.58
101	34.6500	5247.95	15May2006, 20:55	6806.93
102	3.3730	2367.27	15May2006, 15:00	912.66
103	6.4660	2501.31	15May2006, 15:45	1215.25
104	9.7830	3447.60	15May2006, 15:25	1890.83
105	1.0750	808.79	15May2006, 13:10	225.62
106	1.3390	929.45	15May2006, 12:55	228.72
11	3.0410	1816.86	15May2006, 13:20	582.56
12	5.3790	2363.21	15May2006, 14:55	1024.60
13	1.8550	858.67	15May2006, 13:50	429.50
14	3.3170	1498.41	15May2006, 13:45	675.58
15	11.8230	3719.15	15May2006, 15:35	2231.61
16	13.8540	3934.71	15May2006, 14:55	2596.85
17	15.8030	4141.92	15May2006, 15:25	2959.24
18	26.1380	4744.62	15May2006, 18:55	4986.88
19	28.4420	4834.27	15May2006, 19:55	5387.81
20	31.0970	4999.40	15May2006, 20:00	5926.25
21	32.8100	5118.53	15May2006, 20:20	6294.50
22	0.9090	927.65	15May2006, 12:55	231.81
23	33.1290	5144.67	15May2006, 20:25	6391.02
24	2.1760	1836.70	15May2006, 13:40	589.00
25	33.5490	5174.41	15May2006, 20:35	6526.74
27	26.1380	4743.10	15May2006, 19:10	4984.01
28	28.4420	4832.34	15May2006, 20:10	5383.42

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
29	31.0970	4997.32	15May2006, 20:25	5920.38
3	1.6080	1081.86	15May2006, 13:25	336.91
30	32.8100	5117.36	15May2006, 20:30	6291.99
31	0.9090	868.77	15May2006, 13:40	231.81
32	33.1290	5143.77	15May2006, 20:35	6388.60
33	2.1760	1707.91	15May2006, 15:05	589.00
34	33.5490	5171.94	15May2006, 21:00	6520.13
36	16.9760	4281.52	15May2006, 17:00	3191.05
37	1.6080	1056.15	15May2006, 14:00	336.91
41	22.2940	4416.71	15May2006, 19:10	4316.87
42	38.0230	6319.87	15May2006, 15:00	7714.31
43	3.0410	1667.25	15May2006, 15:10	582.56
44	9.7830	3439.13	15May2006, 15:40	1890.83
45	1.8550	854.34	15May2006, 14:15	429.50
46	5.3790	2316.63	15May2006, 15:45	1024.60
47	11.8230	3694.67	15May2006, 16:20	2231.61
48	13.8540	3921.50	15May2006, 15:30	2596.85
49	15.8030	4131.53	15May2006, 16:00	2959.24
50	1.0750	808.79	15May2006, 13:10	225.62
51	1.9660	1072.35	15May2006, 13:35	356.93
52	1.5900	799.58	15May2006, 13:50	297.05
53	0.7480	388.24	15May2006, 13:30	144.99
54	1.4050	728.00	15May2006, 14:10	312.15
55	1.0870	547.25	15May2006, 13:30	190.65
56	0.4500	491.28	15May2006, 12:40	117.35
57	1.4620	675.59	15May2006, 13:40	246.08
58	1.3390	929.45	15May2006, 12:55	228.72
59	0.6920	454.43	15May2006, 13:05	136.52
60	2.0400	1316.90	15May2006, 13:05	340.78
61	1.9490	2018.72	15May2006, 12:35	362.39
62	1.1730	800.51	15May2006, 13:10	231.82
63	1.6080	1081.86	15May2006, 13:25	336.91

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
64	0.7540	453.70	15May2006, 13:20	153.92
65	2.9560	4464.07	15May2006, 12:25	688.49
66	2.7790	1174.64	15May2006, 14:10	480.92
67	1.0650	587.17	15May2006, 13:20	189.09
68	2.3040	1817.09	15May2006, 13:10	486.61
69	1.2660	966.51	15May2006, 13:15	278.22
7	22.2940	4419.55	15May2006, 18:50	4320.76
70	1.3890	1384.43	15May2006, 12:35	264.61
71	0.9090	927.65	15May2006, 12:55	231.81
72	0.8700	497.59	15May2006, 13:40	185.75
73	0.8430	593.16	15May2006, 13:20	188.38
74	0.3190	258.22	15May2006, 13:20	99.03
75	1.2670	969.17	15May2006, 13:45	357.19
76	0.4200	698.96	15May2006, 12:30	138.15
77	1.1970	735.51	15May2006, 14:20	323.66
78	1.1010	990.81	15May2006, 13:20	286.80
79	0.2470	289.19	15May2006, 13:05	94.28
9	38.0230	6338.25	15May2006, 14:45	7719.59
Crum Dam 23-028	28.4420	4834.27	15May2006, 19:55	5387.81
Geist 23-079	22.2940	4419.55	15May2006, 18:50	4320.76

Project: Final_Crum_Creek Simulation Run: 100-yr

Start of Run: 15May2006, 00:00 Basin Model: Crum-100-yr
End of Run: 17May2006, 00:05 Meteorologic Model: 100-YR
Compute Time: 22Aug2007, 09:52:43 Control Specifications: Synthetic Storm

Volume Units: AC-FT

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
1	16.9760	5450.65	15May2006, 15:50	3891.84
10	38.2700	7838.47	15May2006, 15:05	9445.09
101	34.6500	6598.96	15May2006, 20:30	8273.74
102	3.3730	2814.51	15May2006, 15:00	1070.34
103	6.4660	3144.56	15May2006, 15:40	1484.41
104	9.7830	4311.04	15May2006, 15:25	2297.65
105	1.0750	1010.07	15May2006, 13:05	272.12
106	1.3390	1205.40	15May2006, 12:55	282.27
11	3.0410	2289.32	15May2006, 13:20	710.70
12	5.3790	2973.27	15May2006, 14:55	1250.32
13	1.8550	1041.76	15May2006, 13:50	508.77
14	3.3170	1876.35	15May2006, 13:45	813.25
15	11.8230	4645.50	15May2006, 15:30	2721.36
16	13.8540	5001.99	15May2006, 14:45	3168.25
17	15.8030	5253.02	15May2006, 15:20	3610.97
18	26.1380	5965.12	15May2006, 18:40	6078.40
19	28.4420	6098.34	15May2006, 19:35	6578.23
20	31.0970	6299.76	15May2006, 19:45	7231.36
21	32.8100	6445.03	15May2006, 20:00	7674.34
22	0.9090	1114.67	15May2006, 12:55	272.78
23	33.1290	6475.91	15May2006, 20:05	7785.17
24	2.1760	2186.21	15May2006, 13:40	689.73
25	33.5490	6510.51	15May2006, 20:15	7940.77
27	26.1380	5963.75	15May2006, 18:55	6075.49
28	28.4420	6096.27	15May2006, 19:50	6573.72

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
29	31.0970	6297.61	15May2006, 20:05	7225.33
3	1.6080	1339.64	15May2006, 13:25	407.50
30	32.8100	6443.98	15May2006, 20:05	7671.75
31	0.9090	1043.81	15May2006, 13:40	272.78
32	33.1290	6474.89	15May2006, 20:15	7782.68
33	2.1760	2032.01	15May2006, 15:05	689.73
34	33.5490	6508.17	15May2006, 20:35	7933.95
36	16.9760	5418.23	15May2006, 16:55	3891.84
37	1.6080	1307.20	15May2006, 14:00	407.50
41	22.2940	5555.20	15May2006, 19:00	5250.03
42	38.0230	7751.44	15May2006, 15:10	9338.63
43	3.0410	2098.72	15May2006, 15:05	710.70
44	9.7830	4299.80	15May2006, 15:40	2297.65
45	1.8550	1036.74	15May2006, 14:15	508.77
46	5.3790	2915.43	15May2006, 15:45	1250.32
47	11.8230	4620.73	15May2006, 16:15	2721.36
48	13.8540	4983.09	15May2006, 15:25	3168.25
49	15.8030	5237.32	15May2006, 15:55	3610.97
50	1.0750	1010.07	15May2006, 13:05	272.12
51	1.9660	1357.39	15May2006, 13:35	438.58
52	1.5900	1016.73	15May2006, 13:45	364.29
53	0.7480	499.26	15May2006, 13:30	175.34
54	1.4050	884.37	15May2006, 14:10	372.40
55	1.0870	710.35	15May2006, 13:25	234.08
56	0.4500	597.97	15May2006, 12:40	136.37
57	1.4620	876.73	15May2006, 13:40	304.48
58	1.3390	1205.40	15May2006, 12:55	282.27
59	0.6920	583.90	15May2006, 13:05	164.62
60	2.0400	1708.25	15May2006, 13:00	423.71
61	1.9490	2525.41	15May2006, 12:35	442.72
62	1.1730	1004.43	15May2006, 13:10	280.86
63	1.6080	1339.64	15May2006, 13:25	407.50

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
64	0.7540	579.23	15May2006, 13:20	185.62
65	2.9560	5356.38	15May2006, 12:25	819.28
66	2.7790	1506.10	15May2006, 14:10	597.20
67	1.0650	754.56	15May2006, 13:15	231.16
68	2.3040	2222.39	15May2006, 13:10	586.97
69	1.2660	1193.28	15May2006, 13:15	334.72
7	22.2940	5558.13	15May2006, 18:40	5253.97
70	1.3890	1752.19	15May2006, 12:35	322.92
71	0.9090	1114.67	15May2006, 12:55	272.78
72	0.8700	625.12	15May2006, 13:40	223.50
73	0.8430	737.67	15May2006, 13:20	225.51
74	0.3190	310.72	15May2006, 13:20	113.43
75	1.2670	1143.32	15May2006, 13:45	416.95
76	0.4200	823.34	15May2006, 12:30	158.08
77	1.1970	875.49	15May2006, 14:20	380.60
78	1.1010	1194.32	15May2006, 13:20	339.79
79	0.2470	339.33	15May2006, 13:05	106.46
9	38.0230	7766.51	15May2006, 14:50	9344.08
Crum Dam 23-028	28.4420	6098.34	15May2006, 19:35	6578.23
Geist 23-079	22.2940	5558.13	15May2006, 18:40	5253.97

Project: Final_Crum_Creek Simulation Run: 100-Future

Start of Run: 15May2006, 00:00 Basin Model: Crum-100-yr FLU
End of Run: 17May2006, 00:05 Meteorologic Model: 100-YR
Compute Time: 22Aug2007, 09:48:30 Control Specifications: Synthetic Storm

Volume Units: AC-FT

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
1	16.9760	5488.07	15May2006, 15:50	3971.74
10	38.2700	7862.63	15May2006, 15:05	9550.67
101	34.6500	6696.59	15May2006, 20:30	8378.87
102	3.3730	2817.17	15May2006, 15:00	1071.10
103	6.4660	3248.46	15May2006, 15:45	1516.20
104	9.7830	4403.48	15May2006, 15:25	2331.00
105	1.0750	1019.25	15May2006, 13:05	273.99
106	1.3390	1215.44	15May2006, 12:55	284.05
11	3.0410	2409.53	15May2006, 13:20	741.13
12	5.3790	3082.24	15May2006, 14:55	1281.53
13	1.8550	1040.97	15May2006, 13:50	508.61
14	3.3170	1882.40	15May2006, 13:45	814.80
15	11.8230	4731.68	15May2006, 15:35	2753.89
16	13.8540	5016.46	15May2006, 14:45	3201.80
17	15.8030	5281.70	15May2006, 15:20	3677.48
18	26.1380	6049.29	15May2006, 18:40	6177.40
19	28.4420	6192.33	15May2006, 19:35	6684.19
20	31.0970	6394.98	15May2006, 19:40	7338.38
21	32.8100	6541.24	15May2006, 19:55	7780.81
22	0.9090	1116.61	15May2006, 12:55	273.18
23	33.1290	6572.11	15May2006, 20:05	7891.26
24	2.1760	2188.99	15May2006, 13:40	690.45
25	33.5490	6607.28	15May2006, 20:10	8046.66
27	26.1380	6048.12	15May2006, 18:55	6174.48
28	28.4420	6190.51	15May2006, 19:50	6679.67

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
29	31.0970	6392.84	15May2006, 20:00	7332.33
3	1.6080	1377.38	15May2006, 13:25	416.68
30	32.8100	6540.23	15May2006, 20:05	7778.22
31	0.9090	1045.63	15May2006, 13:40	273.18
32	33.1290	6571.29	15May2006, 20:10	7888.76
33	2.1760	2034.55	15May2006, 15:05	690.45
34	33.5490	6605.03	15May2006, 20:35	8039.83
36	16.9760	5456.91	15May2006, 16:55	3971.74
37	1.6080	1343.86	15May2006, 14:00	416.68
41	22.2940	5640.74	15May2006, 19:05	5346.25
42	38.0230	7778.57	15May2006, 15:10	9444.50
43	3.0410	2209.43	15May2006, 15:05	741.13
44	9.7830	4392.47	15May2006, 15:40	2331.00
45	1.8550	1036.00	15May2006, 14:15	508.61
46	5.3790	3020.92	15May2006, 15:45	1281.53
47	11.8230	4699.74	15May2006, 16:20	2753.89
48	13.8540	4998.46	15May2006, 15:25	3201.80
49	15.8030	5266.69	15May2006, 15:55	3677.48
50	1.0750	1019.25	15May2006, 13:05	273.99
51	1.9660	1468.27	15May2006, 13:35	467.14
52	1.5900	1020.14	15May2006, 13:45	365.24
53	0.7480	498.56	15May2006, 13:30	175.16
54	1.4050	883.22	15May2006, 14:10	371.99
55	1.0870	712.78	15May2006, 13:25	234.67
56	0.4500	599.51	15May2006, 12:40	136.62
57	1.4620	883.10	15May2006, 13:40	306.19
58	1.3390	1215.44	15May2006, 12:55	284.05
59	0.6920	580.10	15May2006, 13:05	163.87
60	2.0400	1703.97	15May2006, 13:00	422.89
61	1.9490	2759.45	15May2006, 12:35	475.68
62	1.1730	1066.91	15May2006, 13:10	294.26
63	1.6080	1377.38	15May2006, 13:25	416.68

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
64	0.7540	603.00	15May2006, 13:20	191.00
65	2.9560	5369.18	15May2006, 12:25	821.08
66	2.7790	1514.40	15May2006, 14:10	599.88
67	1.0650	755.02	15May2006, 13:15	231.27
68	2.3040	2253.98	15May2006, 13:10	594.05
69	1.2660	1195.78	15May2006, 13:15	335.27
7	22.2940	5643.57	15May2006, 18:45	5350.19
70	1.3890	1755.85	15May2006, 12:35	323.43
71	0.9090	1116.61	15May2006, 12:55	273.18
72	0.8700	622.08	15May2006, 13:40	222.69
73	0.8430	738.93	15May2006, 13:20	225.80
74	0.3190	309.18	15May2006, 13:20	113.04
75	1.2670	1144.28	15May2006, 13:45	417.28
76	0.4200	822.18	15May2006, 12:30	157.90
77	1.1970	875.60	15May2006, 14:20	380.65
78	1.1010	1190.98	15May2006, 13:20	339.04
79	0.2470	338.00	15May2006, 13:05	106.17
9	38.0230	7792.28	15May2006, 14:50	9449.97
Crum Dam 23-028	28.4420	6192.33	15May2006, 19:35	6684.19
Geist 23-079	22.2940	5643.57	15May2006, 18:45	5350.19

C. OBSTRUCTION CAPACITY SUMMARY FORMS (FORM B)

Box Culvert / Box Bridge Capacity Calculation Sheet

Watershed: **Crum Creek**

Box Culverts Calculation Sheet

Completed by: sdb
Checked by:
Date(s): 3/22/2006

T= Amount of fill
D= Diameter
HT = Height
W = Width
PW = Pier Width (if applicable)

msry = Stone Masonry Structure
CMP = Corrugated Metal Pipe
CPP = Corrugated Polyethylene Pipe
BCCMP = Bituminous Coated Corrugated Metal Pipe

Map ID. #	Owner or Address of Obstruction	Capacity (CFS)	Area (SQ. FT)	Nos. of?	Opening Type: Part of Bridge?	Opening Type: Culvert Purpose	Shape (✓): Culvert □	Culvert ○	Culvert ⬭	Bridge ⌒	Bridge ⊓	T (ft)	D (ft)	HT (ft)	W (ft)	PW (ft)	skew angle	material	NOTES
TRE001	Poplar Lane Int	98	14	1			X					1.5		3.0	4.5		90.0	MSRY/HW,WW	
RID010	Fairview AV	453	52	1			X					2.0		5.2	10.0	1.2	90.0	Concrete/HW,WW	1 pier
WIL003	Devon RD/Warren av	211	24	1			X					2.5		3.3	7.3		90.0	MSRY/HW	
WIL009	Abby RD	85	18	1			X					0.3		3.0	6.0		90.0	MSRY/HW,WW	
WIL017	Warren av	245	40	1			X					0.7		4.0	10.0		90.0	MSRY/HW,WW	
WIL024	Remington RD	285	30	1			X					3.0		3.0	10.0		90.0	MSRY/HW,WW	
WIL048	Hillview RD	18	3	1			X					1.3		1.4	2.0		90.0	MSRY	Water deeper than top of culvert
WIL065	6-8-10 Barr RD Culvert	133	17	1			X					2.0		3.0	5.5		90.0	MSRY	Very Clogged
EAS010	White Horse RD	364	24	2			X					1.5		4.0	6.0		90.0	Concrete/HW,WW	2 Culverts, See Diagram
EAS019	Fox Creek Farm Field culvert	10	3	1			X					0.1		1.3	2.5		90.0	MSRY/SW	
NPR003	Rose Valley RD/Dicks Run	513	73	1			X					1.0		5.0	14.5		90.0	Concrete/HW,WW	
NPR008	Avondale	433	50	1			X					2.0		5.0	10.0		90.0	Concrete	
RID021	646 Michigan St	368	44	1			X					2.0		4.0	11.0		90.0	Concrete	
SWA009	Harvard Lane / Little Crum	607	80	1			X					1.5		4.0	20.0		45.0	Concrete/ HW, WW	
NPR033	Pine Ridge RD RR culvert	842	45	1			X					13.0		5.0	9.0		80.0	Concrete / HW,WW	
NPR034	Plush Mill RD	189	23	1			X					2.0		3.8	6.0		90.0	Concrete / HW,WW	
SPR004	RT 420 Culvert	195	16	1			X					2.0		4.0	4.0		90.0	Concrete/ HW, WW	See Diagram
SPR008	RT420 Culvert / Funeral Home	186	24	1			X					2.0		2.0	12.0		90.0	Concrete / WW	
SPR010	RT 420 Culvert	645	70	1			X					2.0		7.0	10.0		90.0	Concrete/HW,SW	
SPR012	RT 420 S Culvert	175	16	1			X					4.0		4.0	4.0		90.0	Concrete/HW,WW	
MAR004	Rose Tree Woods Swim Club	1,192	140	1			X					1.5		7.0	20.0		70.0	Concrete	
MAR009	Comm. College Drive	411	48	1			X					2.0		5.0	9.5		90.0	Concrete/SW	Channel is pond
MAR012	Comm. College Walkway 2	299	26	1			X					4.5		4.3	6.0		90.0	Concrete/ HW,SW	
MAR022	GAP International/ Old Maple RD	356	24	1			X					8.0		4.0	6.0		90.0	Concrete/HW	Picture
NEW033	Troop Farm Rd off 252	1,095	80	1			X					6.5		5.0	16.0		70.0	Concrete/HW,WW	
S2	PennDOT	4,146	125	2	X						X	10.0	-	5.0	25.0	2.0	20.0	Concrete	See Sketch A1
RID001	RR Bridge (Mouth)	33,654	2,264	1	X						X	6.2		13.2	171.5	5.0	90.0	Concrete	2 Piers, Diagram
RID002	RR Bridge 2 (Mouth)	23,365	1,792	1	X						X	4.0		14.0	128.0	5.0	90.0	Concrete	2 piers
RID003	RT 291 (Mouth)	19,348	1,413	1	X						X	4.5		15.0	94.2	3.0	90.0	Concrete	1 pier
RID004	Lifecycle Engineering	3,692	304	1	X						X	4.0		9.5	32.0		90.0	MSRY	Building on Bridge
WIL010	Grubb RD S	303	40	1	X						X	1.5		4.0	10.0		90.0	MSRY/HW	
WIL011	Grubb RD N	199	32	1	X						X	0.8		4.0	8.0		90.0	MSRY/HW,1/2WW	
WIL013	30 ft upstream fromWIL13	66	13	1	X						X	0.3		3.8	3.5		90.0	MSRY/HW	Small footbridge
WIL014	Paoli pk	155	18	1	X						X	2.3		3.5	5.1		90.0	MSRY/HW	
WIL034	Driveway 100' down from WIL34	384	50	1	X						X	1.8		3.3	15.0		90.0	MSRY/WW	
WIL041	Warren Ave South	1,200	127	1	X						X	2.5		5.5	23.0		90.0	Concrete	
WIL047	Hillview RD	1,638	259	1	X						X	0.2		7.0	37.0	2.0	90.0	MSRY	1 pier
WIL053	Davis RD	1,964	285	1	X						X	0.0		9.5	30.0		90.0	Concrete/WW	
WIL058	Duffryn Run Farm	215	32	1	X						X	1.0		4.0	8.0		90.0	Wood	
WIL060	Whitehorse RD	1,323	140	1	X						X	2.7		4.5	31.0	2.0	90.0	Concrete/HW,WW	1 pier
WIL062	Grubb Mill RD	520	60	1	X						X	1.5		7.5	8.0		90.0	MSRY/SW	
WIL063	Grubb Mill/Whitehorse	2,828	400	1	X						X	0.0		10.0	40.0		90.0	Concrete/ HW, WW	
WIL066	6-8-10 Barr RD Bridge	900	138	1	X						X	0.5		6.0	23.0		90.0	Concrete	
WIL067	Twin Creek Bridge	4,099	400	1	X						X	2.2		10.0	40.0		90.0	Metal/Concrete/WW	

Watershed: Crum Creek

Box Culverts Calculation Sheet

Completed by: sdb
Checked by:
Date(s): 3/22/2006

T= Amount of fill
D= Diameter
HT = Height
W = Width
PW = Pier Width (if applicable)

msry = Stone Masonry Structure
CMP = Corrugated Metal Pipe
CPP = Corrugated Polyethylene Pipe
BCCMP = Bituminous Coated Corrugated Metal Pipe

Map ID. #	Owner or Address of Obstruction	Capacity (CFS)	Area (SQ. FT)	Nos. of?	Opening: Type: Part of Bridge?	Opening: Type: Culvert Purpose	Opening: Shape (✓): Culvert □	Culvert ○	Culvert ⬭	Bridge ⌒	Bridge ⊓	Measurements: T (ft)	D (ft)	HT (ft)	W (ft)	PW (ft)	skew angle	material	NOTES
EAS009	7 Farm, White Horse RD	310	40	1	X						X	1.6		4.0	10.0		90.0	MSRY/HW	
EAS020	Fox Creek Farm Bridge	205	36	1	X						X	0.5		4.0	9.0		90.0	MSRY,Wood/HW	
WIL073	Goshen RD County Line	6,026	488	1	X						X	4.5		8.0	61.0		90.0	Concrete/WW	
WIL074	Goshen RD covered bridge	6,026	488	1	X						X	4.5		8.0	61.0		90.0	Wood	
NEW005	Crum Creek RD	704	95	1	X						X	1.0		6.1	15.5		90.0	Concrete/WW	
NEW006	Crum Creek RD Private Bridge	294	48	1	X						X	0.7		4.0	12.0		90.0	Wood	
NEW012	Echo Valley Ln/Private Bridge	66	12	1	X						X	0.8		2.0	6.0		90.0	Wood	Estimate, could only get close to bridge
NEW026	Gradyville/Hunter Run	807	88	1							X	2.0		7.0	12.5		90.0	Concrete/WW	
NEW027	Giest Res/Gradyville RD	21,087	1,540	1	X						X	3.5		20.0	77.0		90.0	Concrete	*HT estimated (Water depth unkown)
NEW028	Giest Res/Biship Hollow RD	17,986	1,350	1	X						X	3.5		18.0	75.0		90.0	Concrete/WW	
NPR001	Rose Valley RD	21,706	1,716	1	X						X	4.0		12.0	143.0	4.0	90.0	concrete	See Diagram
NPR002	Rose Valley RD/Dicks Run	904	108	1	X						X	1.0		9.0	12.0		90.0	Concrete	
NPR005	Dicks Run under turnpike	2,180	294	1	X						X	0.8		7.0	42.0		90.0	Wood/Metal	
NPR007	Dicks Run under turnpike	285	50	1	X						X	0.8		2.5	20.0		90.0	Wood/Metal	
NPR009	Avondale & Copples	590	65	1	X						X	2.0		6.5	10.0		90.0	Concrete/WW	
NPR010	Avondale	650	130	1	X						X	0.2		4.0	32.5		90.0	Wood	
NPR011	Avondale	322	48	1	X						X	1.0		4.0	12.0		90.0	Concrete	
NPR012	217 Avondale	257	34	1	X						X	1.5		3.8	9.0		90.0	Concrete	
NPR013	213 Avondale	645	80	1	X						X	1.0		8.0	10.0		90.0	Concrete	
NPR014	Acondale & Oak Knob	576	76	1	X						X	1.5		4.0	19.0		45.0	Concrete	
RPA001	Ridley Park Pond	14,946	986	1	X						X	6.5		13.5	73.0		90.0	Concrete	
RID012	Bullens Ln	4,605	561	1	X						X	0.8		9.5	59.0		90.0	Concrete/WW	
RID013	Crum Creek Dr. Park	17,974	1,369	1	X						X	3.5		17.0	80.5		90.0	Concrete	
RID015	Haverford & MacDade	1,863	184	1	X						X	2.5		8.0	23.0		70.0	Concrete	
RID016	MacDade	906	135	1	X						X	0.0		9.0	15.0		90.0	Concrete	
RID017	Michigan St	984	99	1	X						X	2.5		7.1	14.0		90.0	Concrete	
RID018	Michigan St	582	95	1	X						X	0.5		5.0	19.0		90.0	Wood	
RID019	Michigan St	169	31	1	X						X	0.5		3.3	9.5		90.0	Wood	
RID020	307 Michigan St	182	33	1	X						X	0.5		3.5	9.5		90.0	Wood	
RID022	Near 646 Michigan St	94	18	1	X						X	0.5		3.0	6.0		90.0	Wood	
RID023	Near 646 Michigan St	186	32	1	X						X	0.7		3.5	9.0		90.0	Wood	
SWA004	College Ave	196	27	1	X						X	1.5		3.0	9.0		90.0	MSRY	
SWA005	Benjamine West rd	268	32	1	X						X	2.0		4.0	8.0		90.0	MSRY	
SWA007	Dartmouth Ave	256	27	1	X						X	3.0		3.0	9.0		90.0	MSRY/HW	
SWA008	Amhert Ave / Little Crum	330	38	1	X						X	2.2		4.2	9.0		90.0	MSRY	
SWA010	Yale Lane / Little Crum	809	95	1	X						X	1.0		9.5	10.0		90.0	Concrete/ SW, HW	
SWA011	Yale Lane Park / Little Crum	666	113	1	X						X	0.5		4.5	25.0		90.0	Steel, Wood	
NPR037	Dicks Run private bridge	236	45	1	X						X	0.5		3.0	15.0		90.0	Wood	
NPR038	Circle off Avondale Near RR Tracks	671	100	1	X						X	1.0		4.0	25.0		90.0	Wood	
NPR041	Plush Mill Rd over crum	6,941	603	1	X						X	3.5		9.0	67.0		90.0	Concrete	
NPR015	Crum Creek Rd / Oak Valley Rd	261	36	1	X						X	1.5		3.0	12.0		90.0	Concrete / HW,WW	
NPR022	Beatty Rd over Crum	12,021	850	1	X						X	6.0		10.0	85.0		90.0	Concrete/HW	
NPR029	Beechwood RD / Pine Ridge	254	49	1	X						X	0.3		3.8	13.0		90.0	Wood	
NPR031	606 Pine Ridge RD	182	24	1	X						X	1.5		4.0	8.0		90.0	Concrete	Sounds like sewage discharge

Watershed: Crum Creek

Completed by: sdb
Checked by:
Date(s): 3/22/2006

Box Culverts Calculation Sheet

T= Amount of fill
D= Diameter
HT = Height
W = Width
PW = Pier Width (if applicable)

msry = Stone Masonry Structure
CMP = Corrugated Metal Pipe
CPP = Corrugated Polyethylene Pipe
BCCMP = Bituminous Coated Corrugated Metal Pipe

Map ID. #	Owner or Address of Obstruction	Capacity (CFS)	Area (SQ. FT)	Nos. of?	Opening: Type: Part of Bridge?	Opening: Type: Culvert Purpose	Opening: Shape (✓): Culvert □	Culvert ○	Culvert ⬭	Bridge ⌒	Bridge Π	Measurements: T (ft)	D (ft)	HT (ft)	W (ft)	PW (ft)	skew angle	material	NOTES
NPR032	606 Pine Ridge RD yard bridge	71	12	1	X						X	0.8		3.0	4.0		90.0	Wood	
NPR035	Dicks Run South of Plush Mill	100	12	1	X						X	2.0		4.0	3.0		90.0	MSRY / HW	
SPR003	Sidewalk 525 RT 420	1,084	143	1	X						X	1.0		6.5	22.0		90.0	Concrete	
SPR006	433 Kerr RD Yard Bridge	63	12	1	X						X	0.5		3.0	4.0		90.0	Wood	
SPR007	RT420 sidewalk / Funeral Home	523	78	1	X						X	1.0		4.0	19.5		90.0	Concrete	
SPR009	RT420 Sidewalk	1,030	133	1	X						X	1.0		7.0	19.0		90.0	Concrete	
SPR011	RT 420 S Sidewalk	2,323	252	1	X						X	1.0		12.0	21.0		90.0	Concrete	
SPR013	RT 420 / Dairy Cottage	110	18	1	X						X	0.6		4.5	4.0		90.0	Wood	Estimate, could only get close to bridge
SPR014	Thompson Rd	829	50	1	X						X	10.0		5.0	10.0		90.0	Concrete	
SPR015	2 Thompson Rd	355	44	1	X						X	1.5		5.5	8.0		90.0	Concrete	
SPR016	RR Bridge off Thompson	995	55	1	X						X	12.0		5.5	10.0		90.0	MSRY/HW,WW	
SPR018	RR Tracks off 320	1,640	113	1	X						X	7.0		7.5	15.0		45.0	MSRY/HW,WW	
SPR019	Park Near Turnpike	667	88	1	X						X	1.5		4.0	22.0		90.0	Concrete/HW,WW	
UPR008	Crum Creek Rd / Rose Tree Rd	355	36	1	X						X	3.0		4.5	8.0		90.0	Concrete/HW,SW	
UPR010	State Rd over Crum	72,471	4,886	1	X						X	6.0		14.0	349.0	3.0	90.0	Concrete	
UPR011	Paxon Hollow over Crum	7,826	700	1	X						X	3.0		10.0	70.0		90.0	MSRY	Water Depth Estimated
UPR017	Backyard Bridge off Farnum	100	23	1	X						X	0.3		2.3	10.0		90.0	Wood	
MAR013	Palmer Mill RD	380	53	1	X						X	1.0		5.3	10.0		70.0	Concrete/HW,WW	
MAR015	Paxon Hollow / Trout Run	1,122	120	1	X						X	2.3		6.0	20.0		90.0	Concrete/HW,WW	
MAR020	Crum Creek Rd/Spring Valley	44,726	2,520	1	X						X	7.0		28.0	90.0		90.0	Concrete/HW,WW	
MAR021	Crum Creek Rd over Crum Creek	1,837	150	1	X						X	5.0		5.0	30.0		90.0	Concrete	
NEW034	Troop Farm Rd/Hunter Run	2,835	198	1	X						X	7.0		6.0	33.0		45.0	Concrete/HW,WW	
NEW036	Gradyville Rd / Bishop Hollow Rd	155	23	1	X						X	1.0		4.5	5.0		90.0	MSRY	

Circular Culvert Capacity Calculation Sheet

Watershed: **Crum Creek**

Completed by: sdb
Checked by:
Date(s): 3/22/2006

NOTE: Different parameters assigned to CMP and RCP culverts in capacity

Circular Culverts Calculation Sheet

T= Amount of fill
D= Diameter
HT = Height
W = Width
PW = Pier Width (if applicable)

msry = Stone Masonry Structure
CMP = Corrugated Metal Pipe
CPP = Corrugated Polyethylene Pipe
BCCMP = Bituminous Coated Corrugated Metal Pipe

Map ID. #	Owner or Address of Obstruction	Capacity (CFS)	Area (SQ. FT)	Nos. of?	Opening Type: Part of Bridge?	Opening Type: Culvert Purpose	Shape (✓): Culvert □	Shape (✓): Culvert ○	Shape (✓): Culvert ⬭	Shape (✓): Bridge ⌒	Shape (✓): Bridge ⌐	Measurements: T (ft)	D (ft)	HT (ft)	W (ft)	PW (ft)	skew angle	material	NOTES
SPR004	RT 420 Culvert	61	7.07	1				X				2.0	3.0				90.0	Concrete/ HW, WW	See Diagram
EAS008	Toad Hall	8	0.50	2				X				2.0	0.8				90.0	RCP/HW,WW	2 Pipes, see diagram
EAS011	2490 White Horse RD	147	7.07	2				X				3.3	3.0				90.0	RCP/HW	See Diagram
NEW023	491 Bishop Hollow	90	4.91	2				X				2.5	2.5				90.0	SP/HW	See Diagram
NPR028	701 Beechwood RD	75	3.14	2				X				5.0	2.0				90.0	RCP/HW,SW	See Diagram
UPR014	Dog Kennel RD	50	4.91	2				X				0.2	2.5				70.0	RCP	See Diagram for UPP013
MAR006	Cedar Grove Rd	376	19.63	2				X				2.0	5.0				45.0	RCP/HW	
SWA006	racks downstream from SW	1179	17.35	3				X				18.0	4.7				90.0	BCCMP/SP/RCP	See Diagram
UPR021	Crum Creek Rd near RT 1	61	3.14	3				X				1.0	2.0				90.0	Concrete/HW	See Diagram
S3	Unkown	38	3.14	1				X				5.0	2.0	-	-	-	0.0	CMP	Bottom corroded
EAS004	Sugartown RD	3	0.35	1				X				2.0	0.7				90.0	MSRY	Small inlet/large outlet
TRE002	RT 30	187	8.55	1				X				18.0	3.3				90.0	SP/HW	
RID011	Walter st	199	28.27	1				X				0.0	6.0				90.0	RCP/HW,SW	
WIL004	Eisenhower DR/Vernon ln	272	19.63	1				X				6.0	5.0				90.0	RCP/HW,WW	Clogged
WIL005	Eisenhower DR	96	12.57	1				X				1.0	4.0				90.0	RCP/HW, 1/2 WW	
WIL007	Devon RD near Paoji	97	12.57	1				X				1.0	4.0				90.0	CMP	
WIL008	Devon RD Wayne School	188	19.63	1				X				2.0	5.0				90.0	RCP/HW,WW	
WIL018	Eisenhower RD #2	126	19.63	1				X				0.0	5.0				90.0	RCP	
WIL019	EisenhowerRD #4	126	19.63	1				X				0.0	5.0				90.0	RCP	
WIL022	Stonehenge Lane South	192	15.90	1				X				4.3	4.5				90.0	RCP/HW,WW	
WIL023	6 Salisbury Lane	92	9.62	1				X				2.5	3.5				90.0	RCP/HW,WW	
WIL028	Spring RD	70	7.07	1				X				2.8	3.0				90.0	CMP	
WIL030	Laurel Cirlce (small pipe)	57	7.07	1				X				1.5	3.0				90.0	CMP	overflow pipe
WIL031	aurel Circle upper (small pip	50	7.07	1				X				1.0	3.0				90.0	CMP	overflow pipe
WIL038	Pond across from Potters	13	3.14	1				X				0.0	2.0				90.0	RCP	Overflow waiting to happen
WIL044	9 Hunt Club Ln	23	3.14	1				X				1.5	2.0				100.0	BCCMP	
WIL050	730 Hillview RD	23	3.14	1				X				1.5	2.0				90.0	SP	
WIL054	Davis RD	21	3.14	1				X				1.0	2.0				90.0	CMP	
WIL056	13 Brooke Ln	33	4.91	1				X				1.0	2.5				90.0	RCP	
WIL059	Grubb Mill	50	7.07	1				X				1.0	3.0				90.0	CMP	
WIL061	790 Grubb Mill RD	30	3.14	1				X				2.8	2.0				80.0	CMP	
WIL068	White Horse RD	12	1.77	1				X				1.4	1.5				90.0	CPP	
EAS014	Buttonwood RD	1	0.20	1				X				1.0	0.5				90.0	CMP/HW,WW	
EAS015	Fox RD	96	12.57	1				X				1.0	4.0				85.0	RCP/HW,WW	
EAS016	Private drive off White Horse	29	4.91	1				X				0.6	2.5				90.0	RCP/SW	Pond spills into pipe
EAS018	2430 White Horse	17	3.14	1				X				0.5	2.0				90.0	BCCMP	Vertical inlet in small pond
WIL069	White Horse RD	21	3.14	1				X				1.0	2.0				90.0	CMP/HW	

Watershed: Crum Creek

Circular Culverts Calculation Sheet

Completed by: sdb
Checked by:
Date(s): 3/22/2006

NOTE: Different parameters assigned to CMP and RCP culverts in capacity

T= Amount of fill
D= Diameter
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Map ID. #	Owner or Address of Obstruction	Capacity (CFS)	Area (SQ. FT)	Nos. of?	Opening Type: Part of Bridge?	Opening Type: Culvert Purpose	Shape (✓): Culvert ▭	Shape (✓): Culvert ○	Shape (✓): Culvert ⬭	Shape (✓): Bridge ⌒	Shape (✓): Bridge ⊓	Measurements: T (ft)	Measurements: D (ft)	Measurements: HT (ft)	Measurements: W (ft)	Measurements: PW (ft)	skew angle	material	NOTES
WIL070	6075 White Horse RD	4	1.13	1				X				0.0	1.2				90.0	CPP	No Channel
WIL071	Marlborough RD	22	3.14	1				X				1.2	2.0				90.0	BCCMP/SW	
WIL072	Goshen RD	115	12.57	1				X				2.0	4.0				90.0	RCP/HW,WW	
WIL075	Goshen RD	52	5.31	1				X				2.8	2.6				90.0	CMP	work being done on inlet side
NEW001	Horse Farm off Goshen	9	1.77	1				X				0.6	1.5				90.0	CMP/WW,HW	
NEW002	Boot RD N Bridge	160	19.63	1				X				1.0	5.0				90.0	MSRY	Lewis Run
NEW003	Boot RD S	347	28.27	1				X				4.0	6.0				90.0	RCP/HW	
NEW004	Goshen RD/Lewis Run	128	15.90	1				X				1.1	4.5				90.0	RCP/HW,1/2WW	
NEW007	Pheasant Lane	37	4.91	1				X				1.4	2.5				90.0	RCP/HW	
NEW011	Echo Valley Ln/Meadow Ln	28	3.14	1				X				2.5	2.0				90.0	RCP/HW,WW	No Channel, Underground water source
NEW013	331 Echo Valley Ln	17	1.77	1				X				3.0	1.5				90.0	CMP	
NEW014	Goshen RD	21	3.14	1				X				1.0	2.0				90.0	BCCMP/HW	
NEW015	Pine St	28	3.14	1				X				2.5	2.0				90.0	RCP/HW	
NEW016	Main St/Summit	108	8.55	1				X				5.3	3.3				90.0	RCP/HW	
NEW017	Summit Ln	32	3.14	1				X				3.2	2.0				90.0	BCCMP/HW	
NEW018	Summit/Chestnut	122	8.55	1				X				7.0	3.3				80.0	RCP/HW	
NEW019	Hickory Ln	20	3.14	1				X				1.0	2.0				90.0	RCP/HW	
NEW020	Private RD off Bishop Hollow	14	1.77	1				X				2.0	1.5				90.0	CMP/HW	
NEW021	Williamson House off Bishop	20	1.77	1				X				4.5	1.5				90.0	RCP/HW	
NEW022	481 Bishop Hollow	87	12.57	1				X				0.6	4.0				90.0	RCP/HW	
NEW024	541 Bishop Hollow	38	4.91	1				X				1.5	2.5				90.0	CMP/HW	
NEW025	Gradyville/Bishop Hollow	97	12.57	1				X				1.0	4.0				60.0	BCCMP/HW,1/2WW	
UPR001	Providence RD/Pineville Dr	43	4.91	1				X				2.3	2.5				90.0	RCP/HW	GPS NEW27
UPR002	Wilton Wooods RD	106	12.57	1				X				1.5	4.0				90.0	RCP/HW,WW	GPS NEW28
UPR003	115 Wilton Woods	125	12.57	1				X				2.5	4.0				90.0	CMP	GPS NEW29, Driveway
UPR004	111 Wilton Woods	125	12.57	1				X				2.5	4.0				90.0	CMP	GPS NEW30, Driveway
UPR005	Providence/Bishop Hollow	17	1.77	1				X				3.0	1.5				90.0	SP/HW	GPS NEW31
UPR006	Horseshoe Ln	122	9.62	1				X				5.0	3.5				90.0	CMP	GPS NEW32, Inlet severly clogged
SWA003	Chester rd	10	2.54	1				X				0.0	1.8				90.0	RCP	
NPR016	423 Oak Valley RD	164	23.76	1				X				0.1	5.5				90.0	BCCMP/HW	Driveway Bridge
NPR017	421 Oak Valley RD	164	23.76	1				X				0.1	5.5				90.0	BCCMP/HW	Driveway Bridge
NPR018	419 Oak Valley RD	164	23.76	1				X				0.1	5.5				90.0	BCCMP/HW	Driveway Bridge
NPR019	417 Oak Valley RD	164	23.76	1				X				0.1	5.5				90.0	BCCMP/HW	Driveway Bridge
NPR020	415 Oak Valley RD	201	23.76	1				X				1.0	5.5				90.0	BCCMP/HW	Driveway Bridge
NPR021	413 Oak Valley RD	193	23.76	1				X				0.8	5.5				90.0	BCCMP/HW	Driveway Bridge
NPR023	501 Beatty RD	41	4.91	1				X				2.0	2.5				90.0	RCP/HW,WW	No Channel
NPR024	505 Beatty RD	33	4.91	1				X				1.0	2.5				90.0	RCP/HW,WW	
NPR025	Sprinlawn Dr / Meredith Dr	61	7.07	1				X				2.0	3.0				90.0	RCP/ HW,SW	

Watershed: Crum Creek

Completed by: sdb
Checked by:
Date(s): 3/22/2006

NOTE: Different parameters assigned to CMP and RCP culverts in capacity

Circular Culverts Calculation Sheet

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D= Diameter
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Map ID #	Owner or Address of Obstruction	Capacity (CFS)	Area (SQ. FT)	Nos. of?	Opening Type: Part of Bridge?	Opening Type: Culvert Purpose	Shape (✓): Culvert ▭	Shape (✓): Culvert O	Shape (✓): Culvert ⬭	Shape (✓): Bridge ⌒	Shape (✓): Bridge ⊓	Measurements: T (ft)	Measurements: D (ft)	Measurements: HT (ft)	Measurements: W (ft)	Measurements: PW (ft)	Measurements: skew angle	material	NOTES
NPR026	708 Beechwood RD	106	12.57	1				X				1.5	4.0				90.0	RCP/HW	
NPR027	704 Beechwood RD	169	19.63	1				X				1.3	5.0				90.0	RCP/HW,SW	
NPR036	Dicks Run Near RR Tracks	59	7.07	1				X				1.8	3.0				90.0	Concrete / HW,WW	
SPR001	Country Club RD	190	15.90	1				X				4.0	4.5				90.0	CMP / HW	
SPR002	Lewis RD	298	19.63	1				X				7.5	5.0				90.0	RCP/HW	
SPR005	433 Kerr RD	174	15.90	1				X				3.3	4.5				90.0	RCP/HW,SW	
SPR021	Paper Mill RD Culvert	75	7.07	1				X				3.5	3.0				90.0	RCP	
MAR026	Paxon Hollow	133	12.57	1				X				3.0	4.0				90.0	BCCMP/HW,WW	
UPR012	ite Hollow Rd / Dog Kennel	61	7.07	1				X				2.0	3.0				90.0	RCP/HW	
UPR013	Dog Kennel RD	54	7.07	1				X				1.3	3.0				70.0	RCP/HW	
UPR015	Dog Kennel RD	66	7.07	1				X				2.5	3.0				90.0	RCP/HW	
UPR016	Famum RD	67	7.07	1				X				2.5	3.0				90.0	BCCMP/HW,SW	
UPR018	Meetinghouse Ln	85	7.07	1				X				4.5	3.0				90.0	CMP/HW,WW	
UPR020	Crum Creek Rd duck pond	12	1.77	1				X				1.2	1.5				90.0	CPP/HW	
MAR003	Parkview Dr	485	38.48	1				X				4.0	7.0				90.0	RCP/HW,WW	
MAR007	Cedar Grove Rd W	79	7.07	1				X				4.0	3.0				90.0	RCP/HW	
MAR008	r Grove Rd / Old Cedar Gro	42	4.91	1				X				2.0	2.5				90.0	CMP / HW	Very Corroded
MAR010	Comm. College Top	51	4.91	1				X				3.5	2.5				90.0	RCP/HW,WW	
MAR011	Comm. College Walkway	34	3.14	1				X				4.0	2.0				90.0	RCP	
MAR014	1024 Palmer Mill RD	161	12.57	1				X				5.0	4.0				90.0	CMP/HW,SW	Very Corroded
MAR016	Paxon Hollow Rd	62	7.07	1				X				2.0	3.0				90.0	CMP/HW	
MAR017	inchester Rd near Paxon Hi	106	7.07	1				X				8.0	3.0				90.0	RCP/HW	
MAR018	pring Valley Rd off Crum Cr	185	12.57	1				X				7.0	4.0				90.0	CMP/HW,WW	
MAR019	pring Valley Rd off Crum Cr	164	12.57	1				X				5.2	4.0				90.0	CMP/HW,WW	
MAR024	Old Maple Rd near quarry	126	19.63	1				X				0.0	5.0				90.0	RCP/HW,WW	
MAR025	Old Maple Rd	306	19.63	1				X				8.0	5.0				90.0	RCP/HW,WW	
NEW030	Off Rt 252	47	6.16	1				X				1.4	2.8				90.0	SP/HW,1/2 WW	
NEW032	Rt 252 / Hunter Run	62	7.07	1				X				2.0	3.0				90.0	CMP/HW	
NEW035	Camelot Ln off 252	21	1.77	1				X				4.8	1.5				90.0	CMP/HW,WW	
NEW037	Sunrise Assisted Living	11	0.79	1				X				8.0	1.0				90.0	RCP/HW	
WIL027	Driveway off Sugartown RD	3	0.44	1				X				1.5	0.8				90.0	RCP	Man-Made channel through lawn
MAR027	1180 Paxon Hollow	134	7.07	2				X				2.5	3.0				90.0	SP/HW	See Diagram

Elliptical Capacity Calculation Sheet

Watershed: **Crum Creek**

Completed by: sdb
Checked by:
Date(s): 3/22/2006

NOTE: Different parameters assigned to CMP and RCP culverts in capacity column

Elliptical Culverts Calculation Sheet

T= Amount of fill
D= Diameter
HT = Height
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msry = Stone Masonry Structure
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Map ID. #	Owner or Address of Obstruction	Capacity (CFS)	Area (SQ. FT)	Nos. of Opening	Type: Part of Bridge?	Type: Culvert Purpose	Shape (✓): Culvert □	Shape (✓): Culvert ○	Shape (✓): Culvert ⬭	Shape (✓): Bridge	Measurements: T (ft)	D (ft)	HT (ft)	W (ft)	PW (ft)	skew angle	material	NOTES
EAS012	2470 White Horse RD	174	18.85	1					X		2.0		4.0	6.0		90.0	BCCMP/HW	
WIL036	Devon RD West of Sugartown RD	122	5.74	3			1		2		1.2		2.3	3.3		90.0	MSRY/HW	See Diagram
WIL049	Hillview RD 150' from WIL49	150	10.60	2					X		0.5		4.5	3.0		80.0	CMPs	2 Pipes, see diagram
EAS013	White Horse RD 100' from EAS12	290	15.12	2					X		2.5		3.5	5.5		90.0	RCP/HW,WW	See Diagram
EAS017	2430 White Horse	68	6.28	2					X		0.5		2.0	4.0		90.0	RCP/HW,WW	See Diagram
NEW031	Rt 252 North	167	11.78	2					X		1.0		3.0	5.0		90.0	RCP	Pipes Touching OO
WIL037	Potters Nursery	85	6.50	3					X		0.0		2.3	3.6		90.0	BCCMP	See Diagram
EAS001	Darby Rd/252 int	544	51.05	1					X		2.8		5.0	13.0		45.0	CMP/HW	Pipe cut on angle
EAS003	Waynesborough RD Golf	109	13.74	1					X		1.3		3.5	5.0		90.0	BCCMP/HW,WW	Golf Course
EAS005	Waynesborough RD East	31	3.89	1					X		2.0		1.5	3.3		45.0	CMP/HW,WW	Wingwalls have outfalls
MAR001	Cedar Grove RD	89	13.74	1					X		0.5		3.5	5.0		90.0	CMP/HW	Martins Run/arch pipe
MAR002	Martins Run RD	124	10.01	1					X		4.5		4.3	3.0		90.0	CMP/HW/WW	arch pipe
WIL001	Devon RD near blind school	187	18.85	1					X		2.5		4.0	6.0		90.0	BCCMP/HW,WW	Erosion around outlet end of pipe
WIL006	Marlin DR	101	13.74	1					X		1.0		3.5	5.0		90.0	RCP/HW,WW	
WIL015	Malvern Prep School	201	21.21	1					X		2.0		4.5	6.0		90.0	BCCMP/HW,WW	
WIL020	Long Lane	77	11.78	1					X		0.7		3.0	5.0		90.0	RCP/HW	
WIL021	Forest Lane	110	7.23	2					X		1.5		2.3	4.0		90.0	CMP/HW	2 pipes,See Diagram
WIL025	Brampton Chase RD	98	13.99	1					X		0.7		3.8	4.8		90.0	CMP/HW,WW	
WIL026	Sugartown RD	84	10.60	1					X		1.5		3.0	4.5		90.0	CMP	Bank eroding around pipe inlet
WIL029	Spring RD	348	13.74	2					X		5.0		3.5	5.0		90.0	CMP	2 pipes, lots of debris
WIL030	Laurel Circle (big pipe)	312	18.85	2					X		0.5		4.0	6.0		90.0	CMP	1 main pipe, 1 overflow pipe, See Diagram
WIL031	Laurel Cirlce upper (big pipe)	306	18.85	2					X		0.5		4.0	6.0		90.0	CMP	same as WIL31
WIL033	Andrews RD	118	18.85	1					X		0.3		4.0	6.0		100.0	MSRY/HW	
WIL035	Andrews RD/Harvey Ln	114	14.57	1					X		1.3		3.5	5.3		90.0	BCCMP/WW	
WIL039	637 Warren Ave	26	4.71	1					X		0.5		2.0	3.0		90.0	SP	Corroded
WIL040	Wildwood RD off Warren	108	18.85	1					X		0.0		4.0	6.0		90.0	SP	
WIL043	10 Hunt Club Ln	145	18.85	1					X		1.0		4.0	6.0		90.0	CMP	
WIL045	Barr RD West	57	7.85	1					X		1.2		2.5	4.0		90.0	CMP	
WIL055	5 Brooke Ln	260	32.99	1					X		0.5		6.0	7.0		90.0	CMP/HW,WW	
WIL064	Barr RD	76	8.84	1					X		2.0		2.5	4.5		90.0	CMP	
NEW008	Battles Ln/Lewis Run	421	34.56	1					X		4.1		5.5	8.0		90.0	RCP/HW,WW	
NEW009	Echo Valley Ln/Lewis Run	338	34.56	1					X		2.0		5.5	8.0		90.0	RCP/HW,WW	
NEW010	Echo Valley Ln	177	18.85	1					X		2.2		4.0	6.0		90.0	RCP/HW,WW	
UPR007	Bridle Way	217	25.53	1					X		1.2		5.0	6.5		90.0	CMP/HW,WW	GPS New33
NPR030	Pine Ridge RD	145	18.85	1					X		1.0		4.0	6.0		90.0	BCCMP/HW,WW	
UPR009	Crum Creek Rd/ State Rd	127	10.80	1					X		4.5		2.5	5.5		90.0	CMP/ HW	
UPR019	310 Crum Creek Rd	574	27.49	1					X		15.0		5.0	7.0		90.0	BCCMP/HW,WW	
MAR023	Old Maple Rd/Construction	234	24.74	1					X		2.0		4.5	7.0		90.0	CMP/HW	

Watershed: Crum Creek

Elliptical Culverts Calculation Sheet

Completed by: sdb
Checked by:
Date(s): 3/22/2006

NOTE: Different parameters assigned to CMP and RCP culverts in capacity column

T= Amount of fill	msry = Stone Masonry Structure
D= Diameter	CMP = Corrugated Metal Pipe
HT = Height	CPP = Corrugated Polyethylene Pipe
W = Width	BCCMP = Bituminous Coated Corrugated Metal Pipe
PW = Pier Width (if applicable)	

Map ID. #	Owner or Address of Obstruction	Capacity (CFS)	Area (SQ. FT)	Nos. of	Opening Type: Part of Bridge?	Opening Type: Culvert Purpose	Shape (✓): Culvert □	Shape (✓): Culvert ◇	Shape (✓): Culvert ⬭	Shape (✓): Bridge	Measurements: T (ft)	D (ft)	HT (ft)	W (ft)	PW (ft)	skew angle	material	NOTES
NEW029	RT 252 / Dudie Dr	59	8.17	1					X		1.2		2.6	4.0		90.0	CMP/WW	
WIL012	Colonial Way	93	10.60	1					X		2.0		3.0	4.5		90.0	CMP/HW,WW	

Arch Culvert / Arch Bridge Capacity Calculation Sheet

Watershed: **Crum Creek**

Completed by: sdb
Checked by:
Date(s):

Arch Culverts Calculation Sheet

3/22/2006

T= Amount of fill
D= Diameter
HT = Height
W = Width
PW = Pier Width (if applicable)

msry = Stone Masonry Structure
CMP = Corrugated Metal Pipe
CPP = Corrugated Polyethylene Pipe
BCCMP = Bituminous Coated Corrugated Metal Pipe

Map ID #	Owner or Address of Obstruction	Capacity (CFS)	Area (SQ. FT)	Nos. of?	Opening: Type: Part of Bridge?	Opening: Type: Culvert Purpose	Opening: Shape (✓): Culvert			Opening: Shape (✓): Bridge		Measurements: T (ft)	Measurements: D (ft)	Measurements: HT (ft)	Measurements: W (ft)	Measurements: PW (ft)	skew angle	material	NOTES
SWA001	Swathmore Ave / Wellesey rd	168	3.60	2	X					X		3.0		1.8	3.0	*	90.0	MSRY/HW	See Diagram
SWA001	Swathmore Ave / Wellesey rd	99	10.13	1						X		3.0		1.9	8.0		90.0	MSRY/HW	See Diagram
S1	Strausstown Boro	1042	53.33	1						X		12.0	-	8.0	10.0	-	0.0	Concrete	Wing Wall
RID005	RT 13	1261	65.88	2	X					X		1.8		5.4	18.3	5.0	90.0	MSRY	See Diagram
WIL002	100 ft upstream from WIL01	108	11.67	1	X					X		2.5		2.5	7.0		90.0	MSRY	See Back
WIL032	Jaffery RD	666	66.00	1	X					X		2.0		6.0	16.5		90.0	MSRY	diagram on back
WIL046	Stll Meadow Farm	130	13.94	1	X					X		2.0		4.1	5.1		90.0	MSRY	See Diagram
WIL052	Whitehorse (Grubb) RD	2145	208.00	1	X					X		0.0		13.0	24.0		90.0	MSRY/WW	See Diagram
WIL057	Duffryn Run/ South Valley RD	344	44.80	1	X					X		0.5		5.6	12.0		90.0	MSRY/HW,WW	See Diagram
EAS006	Twinbrook RD	313	33.33	1	X					X		1.8		5.0	10.0		90.0	Concrete	See Diagram
SWA002	Ogden rd	120	10.00	1	X					X		4.5		3.0	5.0		90.0	MSRY/HW	See Diagram
MAR005	Cedar Grove Rd / Trout Run	5709	400.00	1	X					X		4.0		12.0	50.0		90.0	Concrete	
NPR004	Dicks Run under turnpike	693	66.67	1	X					X		1.0		10.0	10.0		90.0	MSRY	See Diagram
NPR039	RR Bridge over Dicks	2207	90.00	1	X					X		20.0		9.0	15.0		90.0	MSRY/HW,SW	See Diagram
NPR040	Rogers Ln / Dicks Run	836	46.67	1	X					X		10.0		7.0	10.0		90.0	Concrete/HW	See Diagram

No Data Capacity Calculation Sheet

Watershed: Crum Creek

Completed by: sdb
Checked by:
Date(s): 3/22/2006

No Data Culverts Calculation Sheet

T= Amount of fill
D= Diameter
HT = Height
W = Width
PW = Pier Width (if applicable)

msry = Stone Masonry Structure
CMP = Corrugated Metal Pipe
CPP = Corrugated Polyethylene Pipe
BCCMP = Bituminous Coated Corrugated Metal Pipe

Map ID. #	Owner or Address of Obstruction	Capacity (CFS)	Area	Nos. of?	Opening: Type: Bridge?	Opening: Type: Purpose	Opening: Shape (✓): □	Shape: ō	Shape: ◇	Shape: ⌒	Shape: ⊓	Measurements: T (ft)	D (ft)	HT (ft)	W (ft)	PW (ft)	angle	material	
EAS002	Top of Darby RD	#DIV/0!	0	1	X						X								NO OBSTRUCTION
WIL042	Little Valley Farm	#DIV/0!	0	1	X						X								NO OBSTRUCTION
B - 0	I-95																		NO OBSTRUCTION
RID007	Bridge above 95																		NO ACCESS
RID008	Baldwin Creek Bridge																		NO ACCESS
RID009	Baldwin Creek Bridge																		NO ACCESS
WIL051	732 Hillview RD																		Can't see pipe, Completely covered with leaves
EAS007	Twinbrook Rd Private			1	X														NO ACCESS, Fenced
NPR006	Turnpike			1	X														NO OBSTRUCTION
RID014	Rt 320 over Crum																		NO OBSTRUCTION
SWA012	RR Tracks over Crum																		No Access
SPR020	Park Bridge over Crum			1	X														NO OBSTRUCTION
SPR022	Turnpike over Crum			1	X														NO OBSTRUCTION
SPR023	Paper Mill Rd over Crum																		Bridge gone / New one currently being constructed
SPR024	Turnpike over Crum																		NO OBSTRUCTION
SPR017	Rt 320 Bridge			1	X														NO OBSTRUCTION
UPR022	Rt 1 over Crum Creek			1	X														NO OBSTRUCTION
WIL016	Prep School Footbridge			1	X														NO OBSTRUCTION

D. DATA COLLECTION FORMS (FORMS A, C – J, O)

Outfall Data Summary Forms

(Form O)

Outfall Data / Master List																	
Municipality	Map_ID	Pipe_Swale_No	Photo_No	Storm_Drain	Time	Pipe_Diam_inch	Depth_of_flow_inch	Channel_Depth_feet	Channel_Bottom_feet	Channel_Side_Slopes	Flow_Observed	Color_Odor	Upstream land use	Rating	Headwall	Borton-Lawson Notes
MARPLE	MAR001	C-1	CMP	Yes		42	2	Directly	into	Stream	Yes	Clean	Neighborhood	0		
MARPLE	MAR002	C-2	CMP	Yes		42	1	Flat	3 1/2 "	1:1	Yes	Clean	Neighborhood	0		
MARPLE	MAR003	C-3	DBL CIP	Not Sure		2-6		Directly	into	Stream	No	Sed. Build-up	Houses	1		
MARPLE	MAR004	C-4	CIP	Not Sure		8		Directly	into	Stream	No	Old Pipes	Houses	0		
MARPLE	MAR005	C-5	PVC	Yes		8		6"	1	3:4	No	Erosion/ Sediment	Neighborhood	0		
MARPLE	MAR006	C-6	RCP	Yes		24		2	4	2:1	No	Clean	Neighborhood	0		
MARPLE	MAR007	C-7	RCP	Yes		24		15	8	1:5	No	Sed/cracks/trash/plants	Neighborhood	2		
MARPLE	MAR008	C-8	PLASTIC	Yes		24	1	Directly	into	Stream	No	Good	Neighborhood	0		
MARPLE	MAR009	C-9	DBL CIP	Yes		2-12		Directly	into	Stream	No	Trash/Deterorating	Neighborhood	2		
MARPLE	MAR010	C-10	CIP	Yes		10		Directly	into	Stream	No	Clean (old)	Park	1		
MARPLE	MAR011	C-11	RCP	Yes		36	4	6	6	1:2	Yes	Sediment/ Trash	Neighborhood	1		
MARPLE	MAR012	C-12	RCP	Yes		24	3	6	4	1:6	Yes	Big Rocks/ Wood	Neighborhood	2		
MARPLE	MAR013	C-13	CLAY	Yes		8	2	1	1	1:1	No	Old/Rocks/Pebbles	Neighborhood	0		
MARPLE	MAR014	C-14	RCP/BRICK	Yes		INLET		Directly	into	Stream	Yes	Clean	Neighborhood	0		
MARPLE	MAR015	C-15	RCP	Yes		24		1	1	1:2	No	Bamboo	Neighborhood	0		
MARPLE	MAR016	C-16	RCP	Yes		8(BOX)	36	9	18	1:2	Yes	Erosion (bottom)	Neighborhood	0		
MARPLE	MAR017	C-17	RCP	Yes		30	4	5	4	1:4	Yes	Wood Debris	Neighborhood	0		
MARPLE	MAR018	C-18	CMP	Yes		36	3	2-5	12	1:5	Yes	Rocks/ Trash	Neighborhood	1		
MARPLE	MAR019	C-19	RCP	Yes		48	2	4	6	Box	Yes	Erosion/ Sediment	Neighborhood	1		
MARPLE	MAR020	C-20	RCP	Yes		10		1	3	2:1	No	Erosion of outlet	Basin	0		
MARPLE	MAR021	C-21	CMP	Yes		36	4	6"	4	3:1	Yes	Clean/ Plants(ferns)	Roadside Brook	0		
MARPLE	MAR022	C-22	?	Yes		Couldn't	get a good	look at it		3:1	Yes	Bamboo forest	Neighborhood	0		
MARPLE	MAR023	C-23	CMP	Yes		12	2	6"	2	3:1	Yes	Bamboo forest	Neighborhood	0		
MARPLE	MAR024	C-24	CMP	Yes		30	3	2	15	5:1	Yes	Erosion (bottom)	Neighborhood/stream	0		
MARPLE	MAR025	C-25	CREEK	Not Sure			6	1-2	3	1:3	Yes	Sediment/ Debris	Neighborhood	0		
MARPLE	MAR026	C-26	CMP	Yes		4	1	1	6	1:2	Yes	Sediment	Neighborhood	1		
MARPLE	MAR027	C-27	RCP	Yes		24			3	Flat	No	Sediment (lots)	New Neighborhood	1		
MARPLE	MAR028	C-28	CREEK	?		18	3	1	4	1:1	Yes	Good	Woods	0		
MARPLE	MAR029	C-29	RC CHANNEL	Yes				2	4	Box	No	Algae	Woods	1		
MARPLE	MAR030	C-30	CMP	Yes		18		Directly	into	Creek	No	Good	Road	0		
RIDLEY PARK	RP001	LCC-1	N/A	Yes	2:30 PM	8	0	12	8	1:4	No	N/A	residential	0		
RIDLEY PARK	RP002	LCC-11	N/A	Yes	2:24 PM	48	2	1	8	1:8	Yes	oil sheen/ rust color	residential	1		
RIDLEY PARK	RP003	LCC-21	N/A	Yes	1:55 PM	18	0	1	4	2:1	No	N/A	residential	0		
RIDLEY PARK	RP004	LCC-31	N/A	Yes	1:55 PM	18	0	1	4	2:1	No	debris	residential	0		
RIDLEY PARK	RP005	LCC-41	N/A	Yes	2:00 PM	18	0	1	6	2:1	No	N/A	residential	1		
RIDLEY PARK	RP006	LCC-51	N/A	Yes	2:05 PM	24	0	1	4	2:1	No	N/A	residential	0		
RIDLEY PARK	RP007	LCC-61	N/A	Yes	2:05 PM	18	0	2	4	2:1	No	N/A	residential	0		
RIDLEY PARK	RP008	LCC-71	N/A	Yes	2:06 PM	18	0	2	4	2:1	No	N/A	residential	0		
RIDLEY PARK	RP009	LCC-81	N/A	Yes	1:32 PM	18	0.5	1	2	2:1	Yes	oil sheen/ rust color	residential	1		
RIDLEY PARK	RP010	LCC-91	N/A	Yes	1:34 PM	36	2	1	4	2:1	Yes	rust color	residential	1		
RIDLEY PARK	RP011	LCC-101	N/A	Yes	1:35 PM	24	0	1	4	2:1	No	N/A	residential	0		
RIDLEY PARK	RP012	LCC-111	N/A	Yes	1:16 PM	18	0	3	2	1:3	No	N/A	residential	0		
RIDLEY PARK	RP013	LCC-121	N/A	Yes	1:18 PM	18	0	2	4	1:3	No	N/A	residential	0		
RIDLEY PARK	RP014	LCC-131	N/A	Yes	1:20 PM	18	0	1	4	1:5	No	N/A	residential	0		
RIDLEY PARK	RP015	LCC-141	N/A	Yes	1:22 PM	18	0	1.5	3	1:5	No	N/A	residential	0		
RIDLEY PARK	RP016	LCC-151	N/A	No Ditch	10:57 AM	NONE	0	0	0	1:2	No	N/A	residential	0		
RIDLEY PARK	RP017	LCC-161	N/A	Yes	11:00 AM	24	0	6	6	1:2	No	N/A	residential	0		
RIDLEY PARK	RP018	LCC-171	N/A	Flat Ditch	11:05 AM	NONE	0	0	0	1:2	No	N/A	residential	0		
RIDLEY PARK	RP019	LCC-181	N/A	Flat Ditch	11:06 AM	0	0	0	0	1:2	No	N/A	railroad	0		
RIDLEY PARK	RP020	LCC-191	N/A	Yes	1:07 PM	16	0	3	6	1:2	No	algae, rust color	residential	1		
RIDLEY PARK	RP021	LCC-201	N/A	Yes	1:07 PM	36	0	4	6	1:2	No	sediment	railroad / res.	0		
RIDLEY TWP	RID001	CC-2	N/A	Yes	4:35 PM	26	0	8	40	15:7	No	N/A	highways	0		
RIDLEY TWP	RID002	CC-3	N/A	No	4:15 PM	36	0	5	35	3:3	No	N/A	highways	1*		
RIDLEY TWP	RID003	CC-4	N/A	Yes	4:25 PM	12	0	6	35	7:8	No	N/A	highways	0		
RIDLEY TWP	RID004	CC-5	N/A	Yes	4:30 PM	18	0	6	30	6:5	No	orange/ rust colored	highways	1*		
RIDLEY TWP	RID005	CC-7	N/A	Yes	3:15 PM	18	0	10	30	4:8	No	N/A	residential	0		
RIDLEY TWP	RID006	CC-7A	N/A	Yes	3:15 PM	18	0	10	30	4:8	No	N/A	residential	0		
RIDLEY TWP	RID007	CC-8	N/A	No	3:00 PM	36	1	4.5	3.7	5:3	Yes	orange/ rust colored	residential	1		
RIDLEY TWP	RID008	CC-9	N/A	Yes	2:50 PM	18	0	5	5	5:4.75	No	N/A	residential	0		
RIDLEY TWP	RID009	CC-10	N/A	Yes	2:45 PM	18	0	3.3	3	2.6:3.4	No	N/A	residential	0		
RIDLEY TWP	RID010	CC-11	N/A	Yes	2:30 PM	18	0	7	5	1:1	No	N/A	residential	0		
RIDLEY TWP	RID011	CC-12	N/A	inaccessable	due to	growth										
RIDLEY TWP	RID012	CC-13	N/A	Yes	3:05 PM	24	0	10	30	1:1	No	sediment in pipe	residential	0		
RIDLEY TWP	RID013	LCC-1	N/A	Yes	8:30 AM	18	0	8	6	4:6	No	N/A	res./ comm.	1*		
RIDLEY TWP	RID014	LCC-1A	N/A	Yes	9:00 AM	10	0	8	6	1:1	No	N/A	commercial	0		
RIDLEY TWP	RID015	LCC-2	N/A	Yes	9:30 AM	2 X 24	25	8	10	2:8	No	N/A	residential	0		
RIDLEY TWP	RID016	LCC-3	N/A	Yes	10:00 AM	30	0	4	2	8:4	No	N/A	residential	0		
RIDLEY TWP	RID017	LCC-4	N/A	Yes	10:30 AM	52	2	3	4	10:20	Yes	N/A	residential	0		
RIDLEY TWP	RID018	LCC-5	N/A	Yes	11:00 AM	18	0	4	20	1:1	No	N/A	residential	2*		
RIDLEY TWP	RID019	LCC-5A	N/A	No	11:30 AM	15	0	6	20	4:4	No	N/A	residential	0*		
RIDLEY TWP	RID020	LCC-6	N/A	Yes	12:00 PM	18	0	5	9	1:1	No	N/A	residential	0		
RIDLEY TWP	RID021	LCC-6A	N/A	Yes	12:30 PM	24	1	5	9	1:1	Yes	N/A	residential	0		
RIDLEY TWP	RID022	LCC-7	N/A	No	8:30 AM	18	25	5	2	5:4	Yes	N/A	commercial	0		
RIDLEY TWP	RID023	LCC-8	N/A	Yes	9:00 AM	18	0	9	18	1:1	No	N/A	residential	0		
RIDLEY TWP	RID024	LCC-8A	N/A	Yes	9:30 AM	10	0	7.75	18	10.6	No	N/A	residential	0		

Municipality	Map_ID	Pipe_Swale_No	Photo_No	Storm_Drain	Time	Pipe_Diam_inch	Depth_of_flow_inch	Channel_Depth_feet	Channel_Bottom_feet	Channel_Side_Slopes	Flow_Observed	Color_Odor	Upstream_land_use	Rating	Headwall	Borton-Lawson Notes
RIDLEY TWP	RID025	LCC-8B	N/A	Yes	10:00 AM	15	0	9	18	1:1	No	N/A	residential	0		
RIDLEY TWP	RID026	LCC-8C	N/A	No	10:30 AM	24	0	9	18	1:1	No	N/A	commercial	1*		
RIDLEY TWP	RID027	LCC-8D	N/A	No	11:00 AM	18	0	9	18	1:1	No	N/A	commercial	2*		
RIDLEY TWP	RID028	LCC-8E	N/A	Yes	11:30 AM	18	0	9	18	1:1	No	N/A	residential	0		
RIDLEY TWP	RID029	LCC-8F	N/A	Yes	12:00 PM	15	0	9	18	1:1	No	N/A	residential	0		
RIDLEY TWP	RID030	LCC-9	N/A	Yes	12:30 PM	18	0	3	8	12:3	No	N/A	residential	1*		
RIDLEY TWP	RID031	LCC-10	N/A	No	1:00 PM	15	1	2	20	10:5	Yes	N/A	residential	0		
RIDLEY TWP	RID032	LCC-10A	N/A	No	1:30 PM	24	.25	3	20	8:6	Yes	N/A	residential	0		
RIDLEY TWP	RID033	LCC-11	N/A	Yes	2:00 PM	24	.25	2	20	3:8	Yes	N/A	residential	1*		
RIDLEY TWP	RID034	LCC-11A	N/A	Yes	2:30 PM	54	2	12	18	5:7	Yes	N/A	residential	0		
RIDLEY TWP	RID035	LCC-12	N/A	Yes	3:00 PM	54	2	14	10	10:20	Yes	N/A	residential	0		
RIDLEY TWP	RID036	LCC-13	N/A	Yes	3:30 PM	2-42	1	8	6	1:1	Yes	N/A	residential	0		
RIDLEY TWP	RID037	LCC-14	N/A	Yes	4:00 PM	18	0	5	15	1:5	No	N/A	residential	2*		
RIDLEY TWP	RID038	LCC-15	N/A	Yes	4:30 PM	24	0	6	22	15:10	No	N/A	residential	0		
RIDLEY TWP	RID039	LCC-15A	N/A	Yes	5:00 PM	48	0	16	5	10:15	No	N/A	school	0		
RIDLEY TWP	RID040	LCC-15B	N/A	No	8:30 AM	26	.25	14	10	1:1	Yes	N/A	commercial	2*		
RIDLEY TWP	RID041	LCC-16	N/A	No	9:00 AM	72	2	16	10	10:15	Yes	algae	commercial	1		
RIDLEY TWP	RID042	LCC-17	N/A	Yes	9:30 AM	48	0	16	5	10:15	No	N/A	school	0		
RIDLEY TWP	RID043	LCC-18	N/A	Yes	10:00 AM	18	0	2.75	8	2:1	No	N/A	residential	0		
RIDLEY TWP	RID044	LCC-19	N/A	Yes	10:30 AM	2-18	0-1	5.75	7.75	1:1	No-Yes	orange/ rust colored	residential	1		
RIDLEY TWP	RID045	LCC-19A	N/A	Yes	11:00 AM	36	0	6.75	12	1:1	No	N/A	residential	0		
RIDLEY TWP	RID046	LCC-20	N/A	Yes	11:30 AM	4-15	0	4.25	10.75	1:1	No	N/A	residential	0		
RIDLEY TWP	RID047	LCC-21	N/A	Yes	12:00 PM	18	.25	3	6	5: 2.5	Yes	N/A	residential	0		
RIDLEY TWP	RID048	LCC-22	N/A	Yes	12:30 PM	24	0	5	11	5:4	No	N/A	residential	0		
RIDLEY TWP	RID049	LCC-23	N/A	Yes	1:00 PM	1:00 PM	4-15	0	9.5	12.5	No	N/A	residential	0		
RIDLEY TWP	RID050	LCC-24	N/A	Yes	1:30 PM	1:30 PM	36	0	5	18	No	N/A	residential	2*		
RIDLEY TWP	RID051	LCC-25	N/A	Yes	2:00 PM	2:00 PM	24	0	7	6	No	N/A	residential	0		
RIDLEY TWP	RID052	LCC-26	N/A	Yes	2:30 PM	2:30 PM	3-28	0	7	6	No	N/A	residential	0		
SPRINGFIELD	SPR001	M1	1	Yes		44	8	16	25	2:1	Yes	Good	Inx	0		
SPRINGFIELD	SPR002	M2	2	Yes		8	0	12	15	Vertical	Yes	Good	Inx	0		
SPRINGFIELD	SPR003	a	3	Yes		8	0	N/A	35	2:1	Yes	Good	Rec	0		
SPRINGFIELD	SPR004	b	4	Yes		swale	0	1	35	4:1	Yes	Good	Rec	0		
SPRINGFIELD	SPR005	M3	5	Yes		24	0	N/A	35	1:2	Yes	Good	Rec	0		
SPRINGFIELD	SPR006	C1	6	Yes		swale	0	5	15	7:1	No	Good	aqua	0		
SPRINGFIELD	SPR007	c	7	Yes		swale	0	1	10	1:3	No	Good	aqua	0		On spreadsheet this swale was incorrectly identified as "d" rather than "c"
SPRINGFIELD	SPR008	C2	8	Yes		24	0	5	5	2:1	No	Good	R	0		
SPRINGFIELD	SPR009	B2	10	Yes		18 (at inlet)	0	3	10	2:2	Yes	Collapsed	R	2		
SPRINGFIELD	SPR010	B5	11/12	Yes		18	trickle	4	5	1:1	Yes	Orange in Color	R	2		
SPRINGFIELD	SPR011	B8	13	Yes		24	0	2	5	1:1	Yes	Good	R	0		
SPRINGFIELD	SPR012	B9	14	Yes		24	1	7	5-10	2:1	Yes	Good	R	0		
SPRINGFIELD	SPR013	B6	17	Yes		30	0	4	10	1:1	Yes	Good	R	0		
SPRINGFIELD	SPR014	B3	18	Yes		30	1	3	8	1:5	Yes	Some algae	Rec	1		
SPRINGFIELD	SPR015	B1	19	Yes		24	0	4	8	2:1	Yes	Good	R	0		
SPRINGFIELD	SPR016	B4	21/22/23/24	Yes		18	0	N/A	15	1:1	Yes	Detached	R	2		
SPRINGFIELD	SPR017	A23	25	Yes		30	trickle	5	7	Vertical	Yes	Brownish	R	1		
SPRINGFIELD	SPR018	A22	26	Yes		24	trickle	10	10	1:4	Yes	Brownish	R	1		
SPRINGFIELD	SPR019	A21	27	Yes		18	0	5	6	Vertical	Yes	Good	R	0		
SPRINGFIELD	SPR020	A20	28	Yes		60	2	6	10	1:3	Yes	Good	Funeral Home	0		
SPRINGFIELD	SPR021	A19	29	stone channel		48" wide15	1	4	4	Vertical	Yes	Good	R	0		
SPRINGFIELD	SPR022	d	30	Yes		15	0	3	6	1:3	Yes	Good	R	0		
SPRINGFIELD	SPR023	A18	31	Yes		N/A	N/A	2	N/A	N/A	N/A	N/A	N/A	N/A		
SPRINGFIELD	SPR024	A17	N/A	Yes		24	0	N/A	10	Vertical	Yes	Good	R	0		
SPRINGFIELD	SPR025	A14	32	Yes		24	0	10	10-20	1:10	Yes	Good	R	0		
SPRINGFIELD	SPR026	A15	33	Yes		48	0	12	15	1:3	No	Good	Rec	0		
SPRINGFIELD	SPR027	A7	34	Yes		N/A	N/A	5	N/A	N/A	N/A	N/A	N/A	N/A		
SPRINGFIELD	SPR028	A16	35	Yes		15	0	N/A	N/A	N/A	No	Good	School	0		
SPRINGFIELD	SPR029	A10	36	Yes	8/23	24	1	10	10	1:1	No	Debris	R	0		
SPRINGFIELD	SPR030	A6	37	Yes	8/23	24	trickle	15	25	1:1	No	Algae present	R	0		
SPRINGFIELD	SPR031	A13	38	Yes	8/23	48	1	5	15	stone wall	Yes	Good	R	0		
SPRINGFIELD	SPR032	A12	39/40	Yes	8/23	24	1	3	2	stone wall	Yes	Orange on Rip-Rap	R	1		
SPRINGFIELD	SPR033	A11	41	Yes	8/23	18	0	4	10	2:1	No	3/4 blocked w/ rocks	R	1		
SPRINGFIELD	SPR034	A9	42	Yes	8/23	swale	0	5	10	0	No	Good	R	0		
SWARTHMORE	SWA001	13	1,2,3*	Yes	8:40 AM	15	3	5	1	flat	minimal	clear	residential	1	no	
SWARTHMORE	SWA002	14	4	Yes	8:40 AM	30	3	1	8	1:2	Yes	clear	residential	0	yes	
SWARTHMORE	SWA003	15	6	Yes	8:40 AM	15,15	0	5.1	8	11:2	0	N/A	residential	0	yes	
SWARTHMORE	SWA004	16	7	Yes	8:40 AM	18	0	2	8	1:2	0	N/A	residential	0	yes	
SWARTHMORE	SWA005	17	9	Yes	9:00 AM	18	0	3	6	1:2	0	N/A	residential	0	no	
SWARTHMORE	SWA006	18	10	Yes	9:20 AM	15,18**	0	6	8	1:1.5	0	N/A	residential	0	yes	
SWARTHMORE	SWA007	19	(dive 2) 1	Yes	9:30 AM	48	0	1	6	1:1.5	minimal	clear	residential	0	yes	
SWARTHMORE	SWA008	20	2	Yes	9:40 AM	12	0	1	4	11:5	minimal	clear	residential	1	no	
SWARTHMORE	SWA009	21	3	Yes	9:50 AM	15	0	6	8	1:2	0	N/A	residential	0	no	
SWARTHMORE	SWA010	22	4	Yes	10:00 AM	30	1	6	12	1:2	Yes	clear	residential	0	yes	
SWARTHMORE	SWA011	23	5	Yes	10:00 AM	8	0	0	N/A	N/A	No	0	residential	1	no	
SWARTHMORE	SWA012	24	6	Yes	10:04 AM	48	3	3	8	1:2	Yes	clear	residential	0	yes	

Municipality	Map_ID	Pipe_Swale_No	Photo_No	Storm_Drain	Time	Pipe_Diam_inch	Depth_of_flow_inch	Channel_Depth_feet	Channel_Bottom_feet	Channel_Side_Slopes	Flow_Observed	Color_Odor	Upstream_land_use	Rating	Headwall	Borton-Lawson Notes
SWARTHMORE	SWA013	25	7,8	Yes	10:11 AM	4'x10'	2	3	10	1:2	No	clear	residential	0	yes	
SWARTHMORE	SWA014	26	9	Yes	10:20 AM	18	1	2	10	1:2	Yes	clear	residential	0	no	
SWARTHMORE	SWA015	27	10	Yes	10:30 AM	4'x10'	N/A	3	8	1:2	No	clear	residential	0	Yes	
SWARTHMORE	SWA016	28	(disc 3) 1	Yes	10:40 AM	15'	0	1	5	5	No	N/A	residential	1	Yes	
SWARTHMORE	SWA017	29	2	Yes	10:45 AM	18	0	2	10	10	No	N/A	residential	0	Yes	
SWARTHMORE	SWA018	30	3	street overpass	11:00 AM	***	N/A	1	8	8	No	clear	residential	0	Yes	
SWARTHMORE	SWA019	31	(disc 3) 4	runs under st.	10:55 AM	3'x6'	N/A	4	4	1:2	No	N/A	residential	0	Yes	
SWARTHMORE	SWA020	32	5	Yes	11:00 AM	15,18	0	1	8	1:2	No	N/A	residential	0	Yes	
SWARTHMORE	SWA021	33	6	Yes	11:05 AM	15	0	3	8	1:1.5	No	N/A	residential	0	Yes	
SWARTHMORE	SWA022	34	7	Yes	11:20 AM	18	0	2	1	into stream	No	N/A	residential	0	Yes	
SWARTHMORE	SWA023	35	8	Yes	11:20 AM	12	0	6	6	into stream	No	N/A	residential	0	Yes	
SWARTHMORE	SWA024	36	9	Yes	11:25 AM	18	0	8	8	1:2	No	N/A	residential	0	Yes	
SWARTHMORE	SWA025	37	10	Yes	11:30 AM	15	0	3	5	1:1.5	No	N/A	residential	0	Yes	
SWARTHMORE	SWA026	38	(disc 4) 1	Yes	11:35 AM	5'x5'	2	3	20	1:2	Yes	clear	residential	0	Yes	
SWARTHMORE	SWA027	39	2,3	Yes	11:40 AM	10'x10'	0	1	10	1:2	No	N/A	residential	0	Yes	
SWARTHMORE	SWA028	40	(disc 4) 4	Yes	11:50 AM	24	0	5	8	1:1.5	No	N/A	residential	1	Yes	
SWARTHMORE	SWA029	41	5	Yes	12:00 PM	18	0	1	8	1:1.5	No	N/A	residential	0	Yes	
SWARTHMORE	SWA030	42	6	Yes	12:20 PM	24	trickle	.5	6	1:1.5	trickle	clear	residential	0	No	
SWARTHMORE	SWA031	43	7	Yes	12:30 PM	24	12	1	6	1:1.5	Yes	clear	residential	1	No	
SWARTHMORE	SWA032	44	8	Yes	12:40 PM	18	0	5	6	1:1.5	No	N/A	residential	0	No	
SWARTHMORE	SWA033	45	9	Yes	12:45 PM	15	0	.5	6	1:1.5	No	N/A	residential	2	pipe broken off from headwall	
SWARTHMORE	SWA034	46	10	Yes	12:47 PM	30	trickle	0.5	7	1:1.5	trickle	trickle	residential	0	Yes	
SWARTHMORE	SWA035	47	(disc 5) 1	Yes	12:50 PM	30	no	1	7	1:1.5	No	N/A	residential	0	No	
SWARTHMORE	SWA036	48	2	Yes	1:00 PM	15,15(2 pipes)	no	5 into stream	15	1:1.5	No	N/A	residential	0	Yes	
WILLISTOWN	WIL001	1	1	Yes	9:45 AM	18	0	32	65		No	No	Residential	0		
WILLISTOWN	WIL002	2	2	Yes	10:00 AM	61	7.5	40	72		Yes	No	Residential	0		
WILLISTOWN	WIL003	3	3	Yes	10:15 AM	18	0	31	36		Yes	No	Residential	0		
WILLISTOWN	WIL004	4	4	Yes	10:30 AM	18	0	24	42		No	No	Residential	0		
WILLISTOWN	WIL005	S5	5	Yes	10:30 AM	swale	0	48	84		No	No	Residential	0		
WILLISTOWN	WIL006	S6	6	Yes	10:30 AM	swale	0	36	30		No	No	Residential	0		
WILLISTOWN	WIL007	7	7	Yes	10:35 AM	12	0	20	48		No	No	Residential	0		
WILLISTOWN	WIL008	8	8	Yes	10:45 AM	14x24	0	72	84		No	No	Residential	0		
WILLISTOWN	WIL009	9	9	Yes	10:50 AM	18	0	36	48		No	No	Residential	0		
WILLISTOWN	WIL010	10	10	Yes	11:00 AM	38x21	0	72	108		No	0	Residential	0		
WILLISTOWN	WIL011	10	11	Yes	11:00 AM	38x21	0	72	108		No	0	Residential	0		
WILLISTOWN	WIL012	11	12	Yes	11:15 AM	swale	0	6	36		No	0	Residential	1		
WILLISTOWN	WIL013	11	13	Yes	11:15 AM	swale	0	6	36		No	0	Residential	1		
WILLISTOWN	WIL014	12	14	Yes	11:20 AM	swale	0	6	36		No	0	Residential	0		
WILLISTOWN	WIL015	12	15	Yes	11:20 AM	swale	0	6	36		No	0	Residential	0		
WILLISTOWN	WIL016	13	16	Yes	11:30 AM	20x15					No	0	Residential	0		
WILLISTOWN	WIL017		17	Yes	11:30 AM	swale		10	36		No	0	Residential	0		
WILLISTOWN	WIL018		18	Yes	11:30 AM	swale		10	36		No	0	Residential	0		
WILLISTOWN	WIL019	13	19	Yes	11:30 AM	18x21	0				No	0	Residential	0		
WILLISTOWN	WIL020	14	20	Yes	11:40 AM	19x20	0				No	0	Residential	0		
WILLISTOWN	WIL021		21	Yes	11:40 AM	19x20	0				No	0	Residential	0		
WILLISTOWN	WIL022					swale	0		24x6		No	0	Residential	0		
WILLISTOWN	WIL023					swale	0		24x6		No	0	Residential	0		
WILLISTOWN	WIL024	15	22		11:45 AM	10x24										
WILLISTOWN	WIL025		23		11:45 AM	swale			24x6							
WILLISTOWN	WIL026		24		11:45 AM	10x24										
WILLISTOWN	WIL027		25		11:45 AM	swale			24x6							
WILLISTOWN	WIL028	16	26	Yes	1:10 PM	9X24	0	-	120		No	0	Residential	0		
WILLISTOWN	WIL029			Yes	1:10 PM	12X24	0	-	120		No	0	Residential	0		
WILLISTOWN	WIL030	17	27	Yes	1:15 PM	10	2	12	48		Yes	0	Residential	0		
WILLISTOWN	WIL031	18	28	Yes	1:30 PM	2X15	6	72	84		Yes	0	Residential	0		
WILLISTOWN	WIL032	19	29	Yes	1:35 PM	15	9	32	66		Yes	0	Residential	0		
WILLISTOWN	WIL033	20	30	Yes	1:45 PM	24X34	2	48	84		Yes	0	Farm	0		
WILLISTOWN	WIL034	21	31	Yes	1:50 PM		20	48	84		Yes	0	Residential	2		
WILLISTOWN	WIL035	22	33	Yes	2:00 PM	15	0	39	-		No	0	Residential	0		
WILLISTOWN	WIL036	23	34	Yes	2:05 PM	15	0	30	50		No	0	Residential	0		
WILLISTOWN	WIL037	24	35	Yes	2:10 PM	swale	0	8	48		No	0	Farm	0		
WILLISTOWN	WIL038	25	36	Yes	2:15 PM	swale	0				No	0	Farm	0		
WILLISTOWN	WIL039	26	37	Yes	2:25 PM	15x19	0	44			No	0	Farm	0		
WILLISTOWN	WIL040	27	38	Yes	2:30 PM	16	0	28	64		No	0	Residential	0		
WILLISTOWN	WIL041		39	Yes	2:30 PM	swale	0	30	72		No	0	Residential	0		
WILLISTOWN	WIL042	28	40	Yes	2:50 PM	19x36	1	50	108		Yes	0	Residential	0		

EASTTOWN TOWNSHIP

Easttown Township

566 Beaumont Road, PO Box 79, Devon PA 19333
Telephone: 610-687-3000 / Fax: 610-687-9666

July 20, 2005

Karen Holm
Delaware County Planning Commission
Government Center Building
201 West Front Street
Media, PA 19063-2751

Re: Crum Creek Watershed

Dear Ms. Holm:

Enclosed herewith please find the survey forms completed by Easttown Township for the Crum Creek Watershed for your review and use.

If you have any questions, please contact the undersigned or Surender Kohli.

Sincerely,

Gene R. Williams,
Township Manager

Cc: Surender Kohli P.E.

CRUM CREEK WATERSHED
ACT 167 STORMWATER MANAGEMENT PLAN

MUNICIPALITY QUESTIONNAIRE

Please fill out the following questionnaire and return it to Karen Holm at the Delaware County Planning Department, Court House and Government Center Building, 201 West Front St. Media, PA 19063 as soon as possible. If you have any questions or comments, or if you would like these forms in digital format, please call Karen at 610-891-5213 or e-mail her at holmk@co.delaware.pa.us.

PART I - GENERAL INFORMATION

Municipality: EASTTown Township

Contact Person: Gene R. Williams

WPAC Designee: Surender S. Kohli

Title: Township Engineer

Address: 566 Beaumont Road

P. O. Box 79 Devon PA 19333

Phone: 610-687-3000

Fax: 610-687-9666

Person Completing form (if different from Contact Person):

Name: _____

Address: _____

_____

Phone: _____

Fax: _____

E-mail: _____

PART II - REGULATORY ACTIVITIES

A. Please indicate the regulations you currently use to manage development.

REGULATION	MUNICIPAL ORDINANCE	COUNTY ORDINANCE
Zoning Ordinance	✓	
Subdivision/Land Development Ordinance	✓	
Separate Stormwater Ordinance		
Separate Floodplain Ordinance		

B. Please indicate the agencies/individuals who review and approve land development plans and zoning variance/waiver requests.

ENTITY	LAND DEVELOPMENT PLANS		ZONING VARIANCE/WAIVER REQUESTS	
	REVIEW	APPROVE	REVIEW	APPROVE
Supervisors				
Municipal Engineering Department				
Municipal Planning Department	✓		✓	
County Planning Department	✓			
County Conservation District	✓			
Zoning Hearing Board				✓
Consulting Engineer	✓		✓	
Others (List Below				

C. Please provide **copies** of your zoning, subdivision/land development, and separate stormwater management and floodplain ordinances and your current zoning map when you return this questionnaire. Please list these documents below.

Zoning ordinance
Subdivision / Land development ordinance
Zoning MAP

PART III - MUNICIPAL AND LOCAL PLANNING ACTIVITIES

Please indicate below whether your community has approved the following plans and maps and the date of the most recent update.

ITEM	APPROVED/DATE	IN PROGRESS	PLANNED WITHIN NEXT YEAR
PA Act 537 Sewage Facilities Plan	1999		
Comprehensive Land Use Plan	2001		
Existing Land Use Maps		2005	
Proposed Land Use Maps		2005	
Zoning Maps		2005	

PART IV - FLOOD INSURANCE PROGRAM AND COMPREHENSIVE LAND USE PLAN

Please indicate below whether your community participates in the National Flood Insurance Program:

ITEM	PARTICIPATES (Y/N)
Flood Hazard Boundary Map (FHBM)	Y
Participates in FEMA Emergency Program	Y
Participates in FEMA Regular Program	Y

PART V - EXISTING STORMWATER RELATED PROBLEMS AND STRUCTURES

Please complete the matrices on the following pages (Forms A and C-J) to describe any significant stormwater-related problems (Form A), Existing or Proposed Flood Control Projects (Forms C & D), Existing or Proposed Storm Water Control Facilities (Forms E and F), Existing or Proposed Stormwater Collection Systems (Forms G & H), Present and Projected Development in the Flood Hazard Area (Form I), and Water Quality Problem Areas (Form J) that you are aware of in your municipality.

What we would like to ask of you is that you complete as much of the attached data collection forms as possible. There is a different form for each item of information as summarized in the attached "FORM DESCRIPTION SUMMARY. The process would be as follows starting with the problem areas (Form A):

- Place the location of the problem area on the map as shown in the attached example map.
- Draw a box on the map with the problem area identifier starting with A-1 with an arrow leading from the problem area identifier to the problem area.
- Place an A-1 in the first column of FORM A.
- Put a check in each box in the A-1 column that represents the problems associated with that particular problem area.
- Repeat with the next problem area (A-2) and so on.

Form A

STORM WATER PROBLEM AREAS FORM A. SHEET_____ OF _____

WATERSHED	Crum Creek		FORM COMPLETED BY						Before Filling Out Form, See Instructions On Back					
Name:	Crum Creek		Name:	Surender Ghai										
Municipality:	Ridley Township		Telephone:	610-687-3600					For County Use:					
County:	Chester		Date:	5/31/05										
MAP NO. *		A-1	A-2	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-
Types of Storm Water Problems														
Flooding		X	X											
Accelerated Erosion		X	X											
Sedimentation														
Landslide														
Groundwater														
Water Pollution														
Other (Explain)														
Explanation Line No. (On Back)		1	2											
Cause (s)														
Storm Water Volume		X	X											
Storm Water Velocity														
Storm Water Direction														
Water Obstruction														
Other (Explain)														
Explanation Line No. (On Back)														
Frequency														
Year Most Recent Occurred		04	04											
Year First Known Occurred														
Regularity														
More Than 1 Year		X	X											
Less Than 1 Year														
Only During Agnes														
Duration (If Applicable)														
Less Than 1 Day		X	X											
1 Day + (Enter Days)														
Property Damage														
Loss of Life/Vital Services														
Private														
More Than One Owner														
Types of Properties														
Number of Properties														
Public (List Types)														
Explanation Line No. (On Back)														
Solutions														
Suggested														
Explanation Line No. (On Back)														
Formally Proposed														
Explanation Line No. (On Back)														

* Include Map ID No. if found on any other form listing proposed facilities.

INSTRUCTIONS

Begin with A.1 as the first map number to identify the first' storm water problem area. Illustrate the defined problem on the watershed map provided, and identify it with its map number.

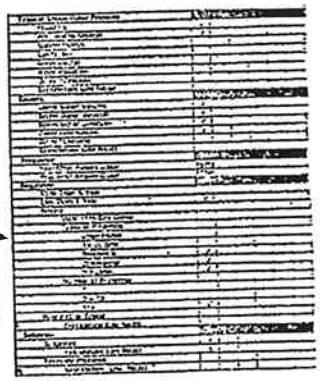
For each storm water problem area within your municipality, enter the map identification number at the head of the column. Describe the problem by placing a check (4 in the appropriate blocks of the column under this map identification number.

When an additional explanation is required, write the line number(s) used in the column marked "Explanation Line No. (s)".Example 1, 2-3, etc.

If storm water problem occurred during and after Agnes, describe the frequency of the problem after Agnes.

Use the explanation lines to list the types of public property damages ,e.g.roadways, hospitals, etc.

Enter the line no. (s) used to list the map ID no. (s) for the proposed facilities.



Definitions

Storm Water Problem Area
An area that defines the farthest extent of a storm water problem, including any area that experiences property damage, inundation, accelerated erosion, surface water pollution, groundwater pollution, landslides, or any other problem as a result of storm water runoff.

Groundwater
Water in the ground below the water table.

Accelerated Erosion
The removal of the surface of the land through the combined action of man's activities and the natural processes at a rate greater than would occur because of the natural process alone.

Sedimentation
The process by which soil or other surface materials, transported by surface water, is deposited on stream bottoms.

Water Obstruction
Any dike, bridge, culvert, wall, wingwall, fill, pier, wharf, embankment, abutment, or other structure located in, along, across, or projecting into any watercourse, floodway, or body of water.

EXPLANATION LINES (continued)

A-1	culvert size restriction
A-2	culvert size restriction

Eastown (Eas)

FORM B - OBSTRUCTION DATA COLLECTION

SHEET 6 OF 15

Municipal Stream Obstruction Data

Watershed: Crum Creek

Municipality/County: Eastown / Delaware

Records completed by: Brian Bruno

Field work personnel:

Date(s): 12/1 - 12/20/04

T = Amount of fill
D = Diameter
HT = Height
W = Width
PW = Pier Width

Material
msry = Stone Masonry Structure
CMP = Corrugated Metal Pipe
CPP = Corrugated Polyethylene Pipe
BCCMP = Bituminous Coated CMP
RCP = Reinforced Concrete Pipe
SP = Steel Pipe

Inlet Conditions
HW = Headwall
WW = Wingwall
SW = Sidewall

Map ID.	Owner or Address Of Obstruction	Capacity (CFS)	Nos. of?	Opening Type: Part of Bridge?	Opening Type: Culvert Purpose	Shape (✓) Culvert □	Culvert ○	Culvert ⬭	Bridge ∩	Bridge ⊓	T (ft)	D (ft)	HT (ft)	W (ft)	PW (ft)	skew angle	MATERIAL / INLET CONDITION	NOTES
Eas - 1	Darby Rd / 252 int		1					X			2.75	—	5	13	—	45	CMP / HW	Pipe cut on angle
Eas - 2	Top of Darby Rd		1	✓						✓								No Obstruction
Eas - 3	Waynesborough rd off		1					X			1.3	—	3.5	5	—	90	BCCMP / HW, WW	Golf course
Eas - 4	Sugartown rd		1				✓				2	2/3				90	msry /	Small in - large out
Eas - 5	Waynesborough rd East		1					✓			2	—	1.5	3.3	—	45	CMP / HW, WW	WW's have outfalls
Eas 6	Twinbrook Rd		1	✓					✓		1.8	—	*	10	—	90	Concrete	
Eas 7	" Private		1														No Access (Private)	
Eas 8	Town Hall		2				2				2	.58	—	—	—	90	RCP / HW, WW	2 Pipes
FAS 9	7 Farm White Horse Rd		1	✓						✓	1.6	—	4	10	—	90	msry / HW	
FAS 10	White Horse Rd		2			2					1.5	—	4	6	—	90	Concrete / HW, WW	2 Culverts
FAS 11	2470 " "		2				2				3.3	3	—	—	—	90	RCP / HW	See Diagram
FA 12	2470 White Horse Rd		1					✓			2	—	4	6	—	90	BCCMP / HW	
FA 13	White Horse [illegible]		1					✓			2.5	—	3.5	5.5	—	90	RCP / HW, WW	See diagram
EAS 14	Buttonwood Rd		1				✓				.5	1.5	—	—	—	90	CMP / HW, SW	
EAS 15	Fox Rd		1				✓				2.5	4	—	—	—	95	RCP / HW, WW	
EAS 16	Behind [illegible] off White Horse		1				✓				1.3	2.5	—	—	—	90	RCP / SW	Pond spills into pipe
EAS 17	2430 White Horse		2					2										
											1.5	—	2	4	—	90	RCP / HW, WW	Diagram
Tre - Z	Rt 30		1				✓				18	3.3				90	SP / HW	
Tre	Poplar lane int		1			✓					1.5	—	3	4.5	—	90	msry / HW, WW	

Tredyffrin (TRE)

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EAS

FORM B - OBSTRUCTION DATA COLLECTION	SHEET 4 OF 15

Municipal Stream Obstruction Data

Watershed: Crum Creek

Municipality/County: Easttown / Chester

Records completed by: [illegible]

Field work personnel: ____________

Date(s): 12/1 - 12/20/04

T= Amount of fill
D= Diameter
HT = Height
W = Width
PW = Pier Width

Material
msry = Stone Masonry Structure
CMP = Corrugated Metal Pipe
CPP = Corrugated Polyethylene Pipe
BCCMP = Bituminous Coated CMP
RCP = Reinforced Concrete Pipe
SP = Steel Pipe

Inlet Conditions
HW = Headwall
WW = Wingwall
SW = Sidewall

Map ID.	Owner or Address Of Obstruction	Capacity (CFS)	Nos. of?	Opening Type: Part of Bridge?	Opening Type: Culvert Purpose	Shape (✓) Culvert □	Shape (✓) Culvert ○	Shape (✓) Culvert ⬭	Shape (✓) Bridge ∩	Shape (✓) Bridge ⊓	Measurements T (ft)	D (ft)	HT (ft)	W (ft)	PW (ft)	skew angle	MATERIAL / INLET CONDITION	NOTES
[illegible]	Buttonwood Rd		1				✓				1	.5				90	(MP) / HW, SW	
[illegible]	Fox Rd		1				✓				1	4				92	RCP / HW, SW	
[illegible]	Private drive off White Horse		1				✓				1	2.5				90	RCP / SW	[illegible]
[illegible]	2420 White Horse		2					2			.5	–	2	4	-	90	RCP / HW, WW	Diagram
[illegible]	2430 White Horse		1				✓				.5	2	–	–	–	90	BCCMP	Vertical invert [illegible]
[illegible]	Fox Creek Farm Field		1			✓					1	–	1.3	2.5	–	90	MSRY / SW	
[illegible]	" " [illegible]		1	✓						✓	.5	–	4	0	–	90	MSRY abandoned / H	
EAS 21																		

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FORM C

EXISTING FLOOD CONTROL PROJECT FORM C. NONE SHEET ____ OF ____

WATERSHED	FORM COMPLETED BY	TYPICAL TYPES OF FLOOD CONTROL PROJECTS		
Name: Crum Creek	Name: Surendra Kohli	Channel Excavation / Widening	Levee	Dams
Municipality: Ridley Twp	Telephone: 610-687-3000	Channel Realignment	Gabions	Floodwall
County: Chester	Date: 5/31/05	Rock Riprap	Pipe Channel	Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Year Constr Built	Expected Life Yrs.	Design Flood Frequency Yrs.	Design Flood Discharge C.F.S. (if known)	Owner Name, Address, and Phone
C-						
C-						
C-						
C-						
C-						

FORM D

Non Proposed

PROPOSED FLOOD CONTROL PROJECT FORM D. SHEET ____ OF ____

WATERSHED	FORM COMPLETED BY	TYPICAL TYPES OF FLOOD CONTROL PROJECTS
Name: Crum Municipality: Ridley Twp County: Chester	Name: Surendra Kolli Telephone: 610-687-3000 Date: 5/31/05	Channel Excavation / Widening, Channel Realignment, Rock Riprap, Levee, Gabions, Pipe Channel, Dams, Floodwall, Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Study Phase Begun			Year Constr. Planned	Projected Compltn. Date	Expected Life Yrs.	Design Flood		Map ID No. Form A*	Owner Name, Address, and Phone
		YES		N0				Frequency Yrs.	Discharge C.F.S.		
		Prelim.	Final								
D-											
D-											
D-											
D-											
D-											

* Enter the storm water problem area's Map ID No., if the proposed project will solve or reduce any / all of an identified drainage problem.

FORM E

EXISTING STORM WATER CONTROL FACILITIES FORM E. SHEET _____ OF _____

WATERSHED	FORM COMPLETED BY	DEFINITION
Name: Crum Municipality: Goshen Twp County: Chester	Name: Surender Kohli Telephone: 610-687-3000 Date: 5/31/05	Storm Water Control Facility A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.
For County Use:		

Map ID No.	Type of Storm Water Control Facility	Year Built	Contact Person Name, Address and Phone	Comments
E- 1	Storm water Detention facility.	1995	greens@waynesbrough —	
E- 2	"	1995	"	
E- 3	"	1980	Paxtown Run	
E- 4	"	1996	Berwyn estate	
E-				
E-				
E-				
E-				

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

(Detention) / Retention Basin

Natural Pond or Wetland

Parking Lot Pondling

Roof-Top Storage

Semi-Pervious Paving

Infiltration Device (Seepage / Recharge Basin or Underground Tank)

FORM F

PROPOSED FLOOD CONTROL PROJECT FORM F. SHEET OF

WATERSHED	FORM COMPLETED BY
Name: Crum	Name: Surendra Kohl
Municipality: East Vincent Twp	Telephone: 610-687-3000
County: Chester	Date: 5/31/05

DEFINITION

Storm Water Control Facility

A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.

For County Use:

Map ID No.	Type of Storm Water Control Facility	Proposed Constr. Dates Start	Proposed Constr. Dates End	Map No. Form A*	Contact Person Name, Address and Phone	Comments
F-		ASAP	Proposed			
F-						
F-						
F-						
F-						
F-						
F-						
F-						

* Enter the storm water problem area's Map ID No., if the proposed project will solve or reduce any / all of an identified drainage problem.

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

- Detention / Retention Basin
- Natural Pond or Wetland
- Parking Lot Pondling
- Roof-Top Storage
- Semi-Pervious Paving
- Infiltration Device (Seepage / Recharge Basin or Underground Tank)

FORM G (Front)

EXISTING FLOOD CONTROL PROJECT FORM G. SHEET ____ OF ____

WATERSHED Name: Crum Creek
Municipality: Upper Darby Township
County: Chester

FORM COMPLETED BY
Name: Surendra Kohli
Telephone: 610-449-5591
Date:

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1,G-2,G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map I.D. No.		System's Elements (x)			Measurements *				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-	G-				None	available							
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												

* See measurement key on reverse side.

FORM I

PRESENT & PROJECTED DEVELOPMENT IN THE FLOOD HAZARD AREA (FORM 1)

SHEET _____ OF _____

WATERSHED

Name: Crum Creek

Municipality: Aston

County: Chester

FORM COMPLETED BY

Name: Sverde Kohl

Telephone: 610 644-5591

Date: -

For County Use:

DEFINITION

FLOOD HAZARD AREA:

A NORMALLY DRY LAND AREA THAT HAS BEEN OR IS SUSCEPTABLE TO BEING INUNDATED BY THE 100-YEAR FLOOD.

no detail information available

Flooding occurs generally along the stream Banks.

Map ID No.	TYPE OF DEVELOPMENT	Year Built	Contact Person Name, Address and Phone	Comments
1-				
1-				
1-				
1-				
1-				
1-				
1-				

Form J

WATER QUALITY PROBLEM AREAS FORM J. SHEET_____ OF _____

WATERSHED					FORM COMPLETED BY								
Name:	Crum Creek				Name:		Surendra Konka						
Municipality:	Aston Twp				Telephone:		610-687-8000						
County:	Chester				Date:		5/31/05						
SITE		J-	J-	J-	J-	J-	J-	J-	J-	J-	J-	J-	J-
Types of Water Quality Problems													
High Community Tolerence													
High Temperature													
High Turbidity													
Hydrocarbon Pollution													
Low Community Diversity													
Low Dissolved Oxygen													
Low pH													
Nutrient Enrichment													
Poor Habitat													
Other/Explanation Line No.													
Potential Cause(s)													
Agriculture													
Construction Site													
Erosion													
Lake Discharge													
STP Outfall													
Other/Explanation Line No.													
Frequency													
Year Most Recent Occurence													
Year First Known Occurence													
Source of Information													
County Water Quality Study													
Driveby													
Other/Explanation Line No.													
		EXPLANATION LINES											
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													

No information available for water quality problem.

Form O - Outfall Data

Person: Surender Kohli Date: _____ Time Since Last Rain was ≥ 72 Hours: Yes_____

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain _____

Municipality: Upper Townsend Name of receiving water: Crum Creek.

No field work has been conducted to date. This is formation will be obtained during 2005 - 2006 year.

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if float algae or sediment present)	Describe land u upstream drain area.	Rating (0-2)

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Easttown Township

Easttown Township

566 Beaumont Road, PO Box 79, Devon, PA 19333
Telephone: 610.687.3000
Fax: 610.687.9666

FAX TRANSMITTAL

DATE: 12/6/04

SEND TO: Bill Brokaw FAX #: 610-837-5918

FROM: Surender Kohli. FAX#: 610.687.9666
EASTTOWN TOWNSHIP PHONE #: 610.687.3000

PAGES: 2 (including cover)

ORIGINAL: [ ] WILL BE MAILED [X] WILL NOT BE MAILED

COMMENTS:

If you do not receive the complete number of pages indicated or there is a problem with the transmission of this fax, please call 610.687.3000. Thank you.

Easttown Township

566 Beaumont Road, PO Box 79, Devon, PA 19333
Telephone: 610.687.3000
Fax: 610.687.9666

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PHONE #: 610.687.3000

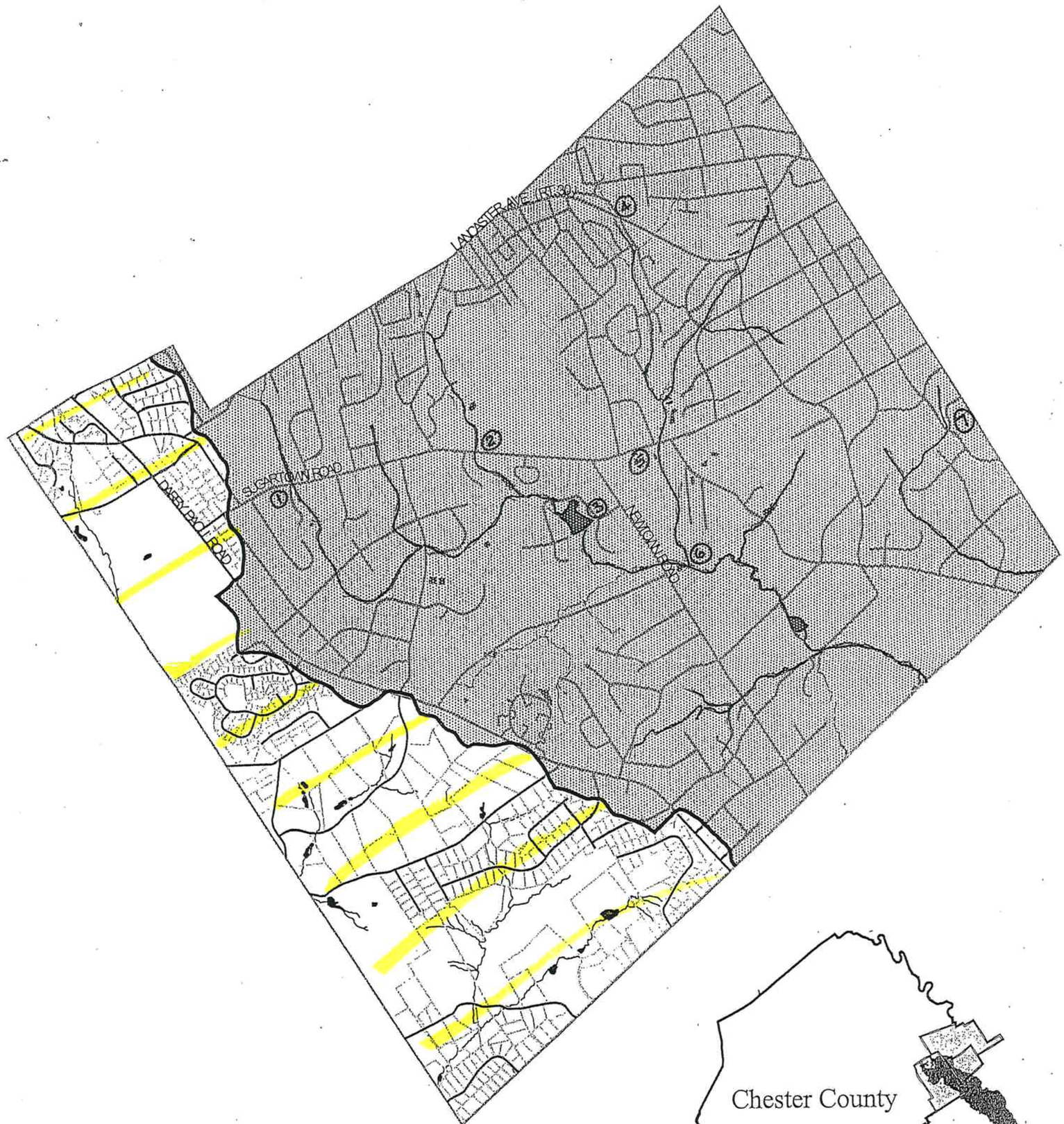
PAGES: 2 (including cover)

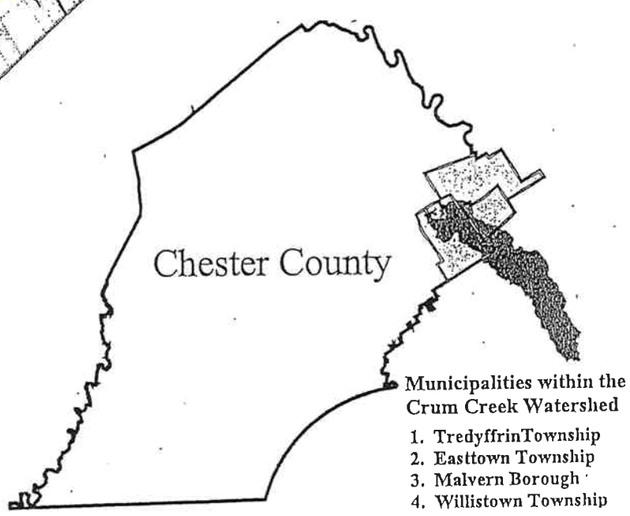
ORIGINAL: [ ] WILL BE MAILED [X] WILL NOT BE MAILED

COMMENTS:

If you do not receive the complete number of pages indicated or there is a problem with the transmission of this fax, please call 610.687.3000. Thank you.

Crum Creek Watershed
Easttown Township





- Crum Creek Watershed
- Municipal Boundary
- Roads
- Land Parcels
- Municipal Area Outside the Crum Creek Watershed
- Rivers and Streams
- Ponds and Lakes

N

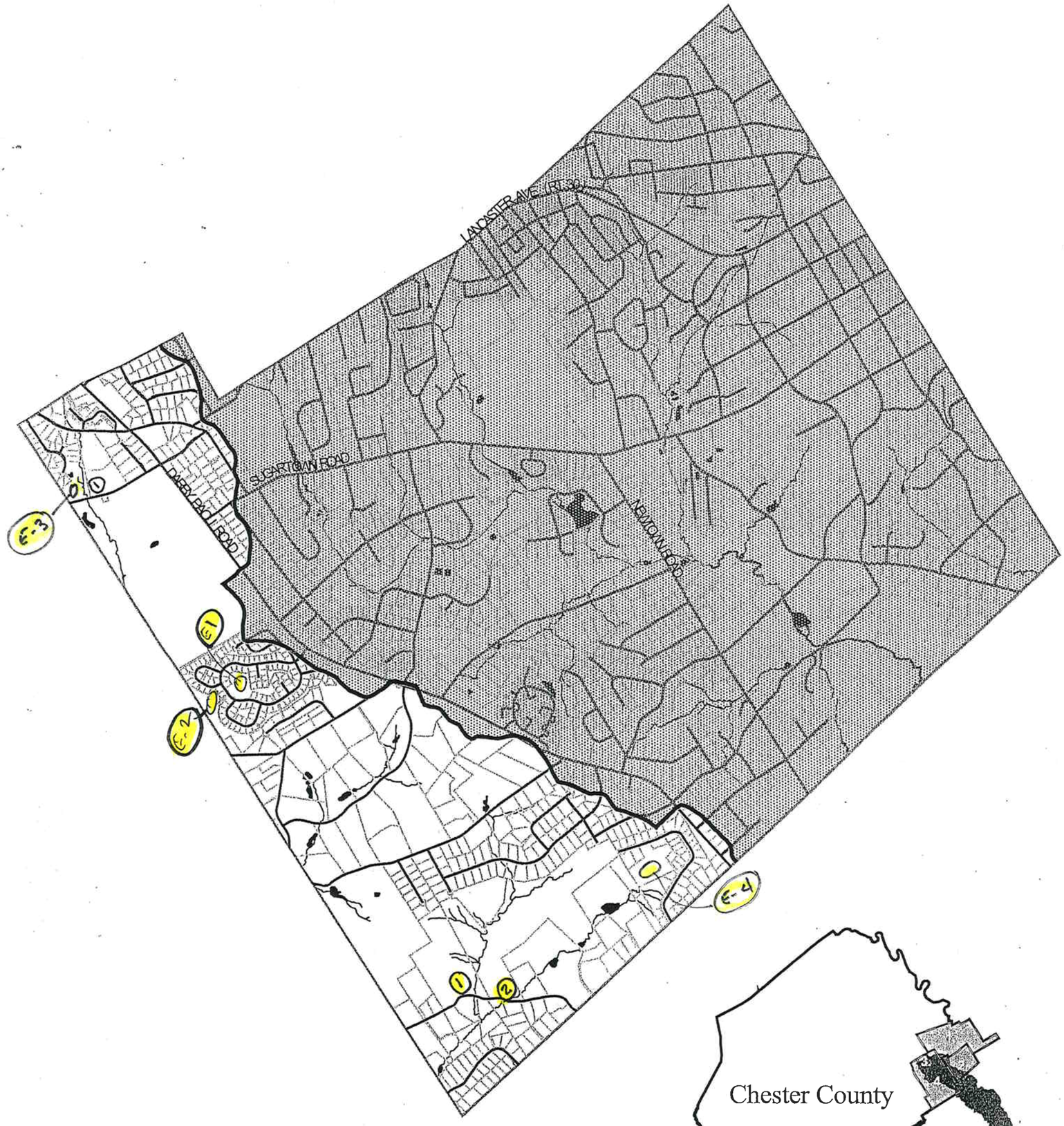
0.4 0 0.4 0.8 Miles

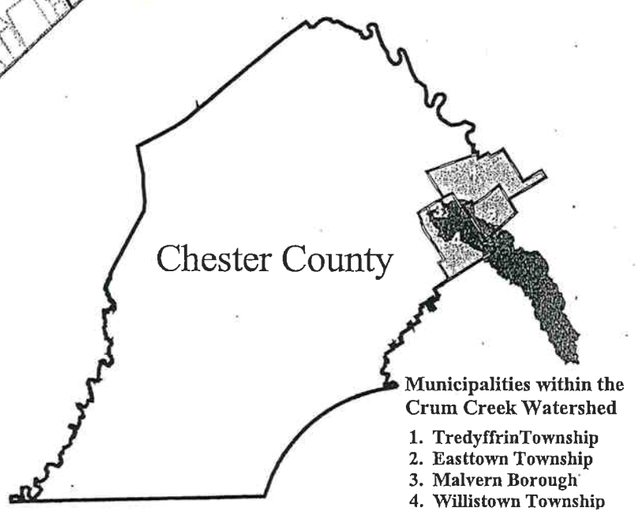
1:25344

1 inch = 0.4 mile

CCPC, 2003

Crum Creek Watershed
Easttown Township





- Crum Creek Watershed
- Municipal Boundary
- Roads
- Land Parcels
- Municipal Area Outside the Crum Creek Watershed
- Rivers and Streams
- Ponds and Lakes

N

0.4 0 0.4 0.8 Miles

1:25344

1 inch = 0.4 mile

CCPC, 2003

EDDYSTONE TOWNSHIP

Borough of Eddystone

August 25, 2005

Ms. Karen Holm
Delaware County Planning Department
Government Center Building
201 W. Front Street
Media, PA 19063

RE: Crum Creek Watershed
Act 167 Stormwater Management Plan

Dear Ms. Holm:

Enclosed please find the completed questionnaire on the subject project.

Very truly yours,

Brian Lauer

Brian Lauer
Borough Secretary

BL/pm
Enclosure (1)
cc: CEA File No. 82800-115-CCW

1300 East Twelfth Street • Eddystone, Pennsylvania 19022 • (610) 874-1100 • Fax (610) 874-1605

CRUM CREEK WATERSHED
ACT 167 STORMWATER MANAGEMENT PLAN

MUNICIPALITY QUESTIONNAIRE

Please fill out the following questionnaire and return it to Karen Holm at the Delaware County Planning Department, Court House and Government Center Building, 201 West Front St. Media, PA 19063 as soon as possible. If you have any questions or comments, or if you would like these forms in digital format, please call Karen at 610-891-5213 or e-mail her at holmk@co.delaware.pa.us.

PART I - GENERAL INFORMATION

Municipality: Eddystone Borough

Contact Person: Brian Lauer, Borough Secretary

WPAC Designee: Charles J. Catania

Title: Borough Engineer

Address: 520 W. MacDade Boulevard

Milmont Park, PA 19033-3311

Phone: 610-532-2884

Fax: 610-532-2923

Person Completing form (if different from Contact Person):

Name: Jamie H. Bricker

Address: 520 W. MacDade Boulevard

Milmont Park, PA 19033-3311

Phone: 610-532-2884

Fax: 610-532-2923

E-mail: jamie@cataniaengineering.com

PART II - REGULATORY ACTIVITIES

A. Please indicate the regulations you currently use to manage development.

REGULATION	MUNICIPAL ORDINANCE	COUNTY ORDINANCE
Zoning Ordinance	Chapter 295	
Subdivision/Land Development Ordinance	N/A	
Separate Stormwater Ordinance	No. 609	
Separate Floodplain Ordinance	N/A	

B. Please indicate the agencies/individuals who review and approve land development plans and zoning variance/waiver requests.

ENTITY	LAND DEVELOPMENT PLANS		ZONING VARIANCE/WAIVER REQUESTS	
	REVIEW	APPROVE	REVIEW	APPROVE
Supervisors	X	X		
Municipal Engineering Department				
Municipal Planning Department	X		X	
County Planning Department	X		X	
County Conservation District	X	X		
Zoning Hearing Board			X	X
Consulting Engineer	X		X	
Others (List Below				

C. Please provide **copies** of your zoning, subdivision/land development, and separate stormwater management and floodplain ordinances and your current zoning map when you return this questionnaire. Please list these documents below.

Zoning Chapter 295
Stormwater Management Ordinance No. 609 (Crum Creek Act 167 Ordinance – not included)
Zoning Map – Borough of Eddystone (4/19/04)

PART III – MUNICIPAL AND LOCAL PLANNING ACTIVITIES

Please indicate below whether your community has approved the following plans and maps and the date of the most recent update.

ITEM	APPROVED/DATE	IN PROGRESS	PLANNED WITHIN NEXT YEAR
PA Act 537 Sewage Facilities Plan	May 2003		
Comprehensive Land Use Plan	April 2004		
Existing Land Use Maps	April 2004		
Proposed Land Use Maps	April 2004		
Zoning Maps	April 2004		

PART IV – FLOOD INSURANCE PROGRAM AND COMPREHENSIVE LAND USE PLAN

Please indicate below whether your community participates in the National Flood Insurance Program:

ITEM	PARTICIPATES (Y/N)
Flood Hazard Boundary Map (FHBM)	Y
Participates in FEMA Emergency Program	N
Participates in FEMA Regular Program	Y

PART V - EXISTING STORMWATER RELATED PROBLEMS AND STRUCTURES

Please complete the matrices on the following pages (Forms A and C-J) to describe any significant stormwater-related problems (Form A), Existing or Proposed Flood Control Projects (Forms C & D), Existing or Proposed Storm Water Control Facilities (Forms E and F), Existing or Proposed Stormwater Collection Systems (Forms G & H), Present and Projected Development in the Flood Hazard Area (Form I), and Water Quality Problem Areas (Form J) that you are aware of in your municipality.

What we would like to ask of you is that you complete as much of the attached data collection forms as possible. There is a different form for each item of information as summarized in the attached "FORM DESCRIPTION SUMMARY. The process would be as follows starting with the problem areas (Form A):

- Place the location of the problem area on the map as shown in the attached example map.
- Draw a box on the map with the problem area identifier starting with A-1 with an arrow leading from the problem area identifier to the problem area.
- Place an A-1 in the first column of FORM A.
- Put a check in each box in the A-1 column that represents the problems associated with that particular problem area.
- Repeat with the next problem area (A-2) and so on.

- Repeat for existing flood control projects (FORM C) placing a triangle on the maps and starting the labeling with C-1.
- Repeat for all forms.

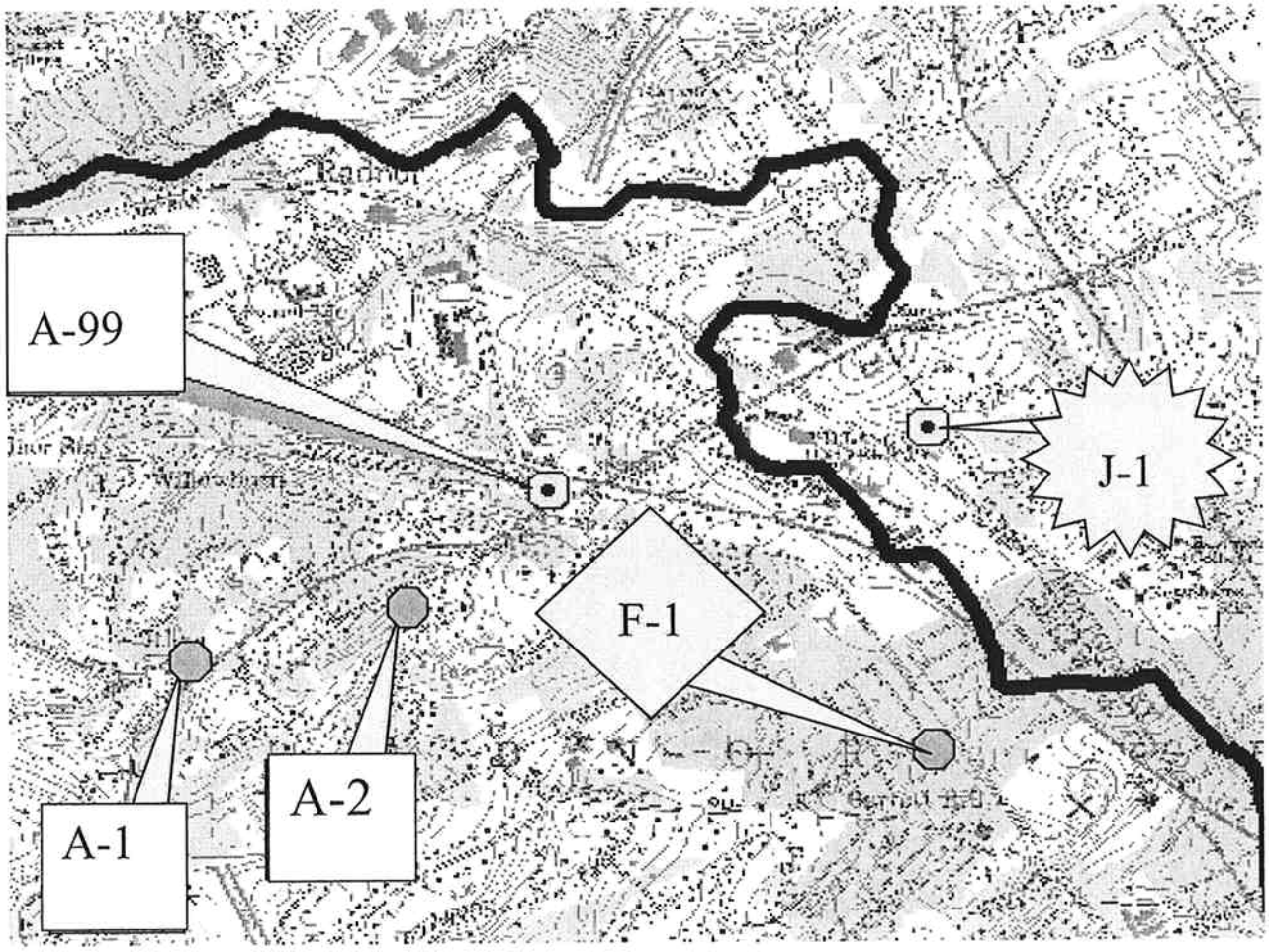
The sample map attached shows three problem areas (A99- A1 and A-2), one proposed flood control project (F-1) and one water quality problem (J1).

Use additional paper to provide detailed descriptions of your most serious problems and attach a map to show the location of the problem. Attach photographs, if available.

If you have any storm or combined sewers, please provide maps showing the collection system and overflow discharge locations and an estimate of the average annual discharge at each overflow point.

The more detail you provide, the better we will be able to evaluate the situation for your municipality. We appreciate your help.

Sample Location of Information from Data Collection Forms on the Municipal Map



	FORM A - STORM WATER PROBLEM AREAS	SHEET 2 OF 2
	EXPLANATION LINES	
1	CC flooding at Chester Pike bridge	
2	CC flooding on Boeing's site, formally proposed floodwall to alleviate	

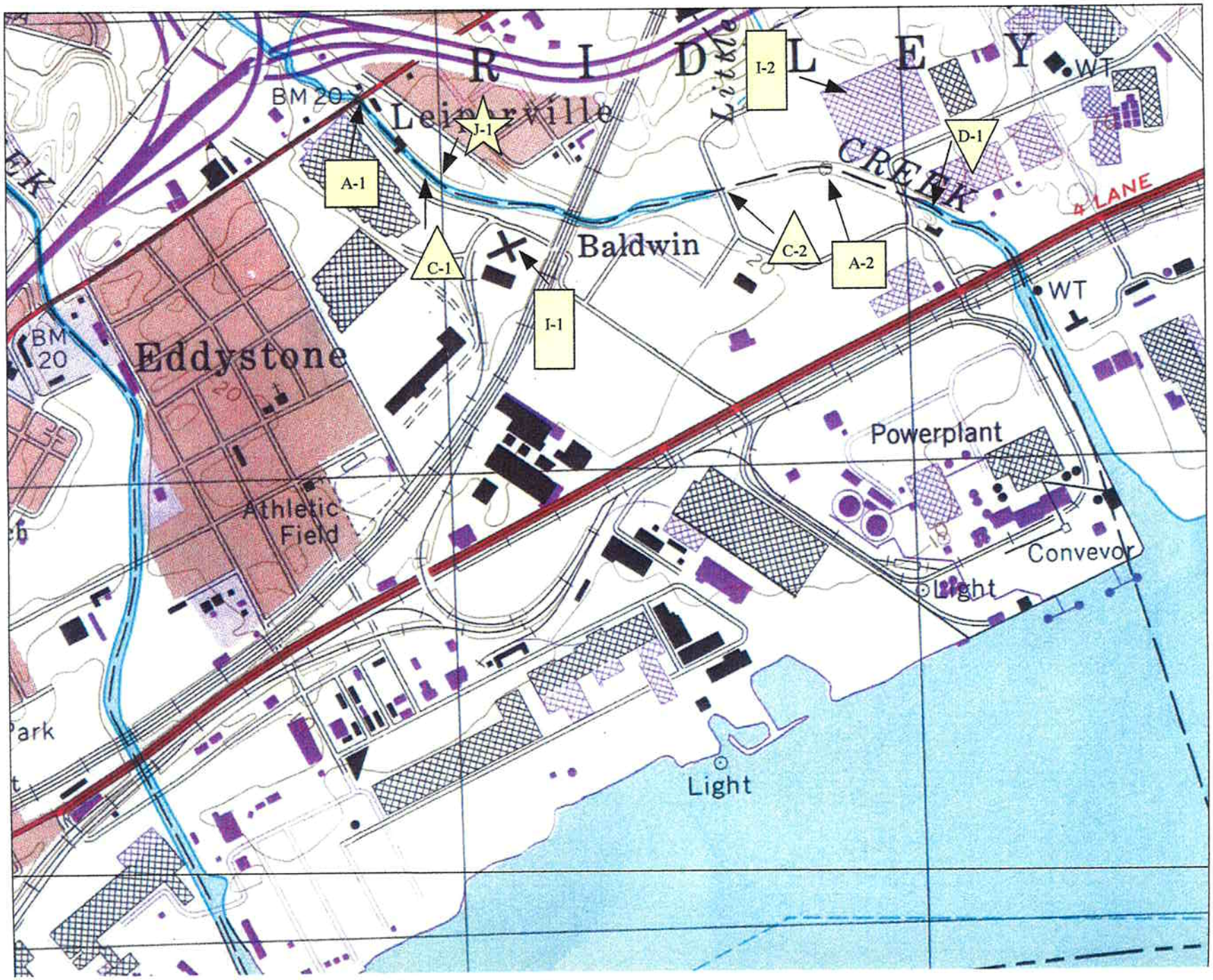
FORM A - STORM WATER PROBLEM AREAS SHEET 1 OF 2

WATERSHED		FORM COMPLETED BY		Before Filling Out Form, See Instructions on Back
Name:	Crum Creek	Name:	Jamie H. Bricker	
Municipality:	Eddystone Borough	Telephone:	610-532-2884	For County Use:
County:	Delaware	Date:	8/24/2005	

MAP NO. *	A-1	A-2	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-
Types of Storm Water Problems												
Flooding	X	X										
Accelerated Erosion												
Sedimentation												
Landslide												
Groundwater												
Water Pollution												
Other (Explain)												
Explanation Line No. (On Back)	1	2										
Cause (s)												
Storm Water Volume	X	X										
Storm Water Velocity												
Storm Water Direction												
Water Obstruction	X											
Other (Explain)												
Explanation Line No. (On Back)												
Frequency												
Year Most Recent Occurred	2003	2002										
Year First Known Occurred	?	?										
Regularity												
More Than 1 Year												
Less Than 1 Year	X	X										
Only During Agnes												
Duration (If Applicable)												
Less Than 1 Day	X											
1 Day + (Enter Days)												
Property Damage												
Loss of Life/Vital Services												
Private		X										
More Than One Owner												
Types of Properties		Ind										
Number of Properties		1										
Public (List Types)	X											
Explanation Line No. (On Back)	1											
Solutions												
Suggested												
Explanation Line No. (On Back)												
Formally Proposed		X										
Explanation Line No. (On Back)		2										

* Include Map ID No. if found on any other form listing proposed facilities.

Eddystone Borough – Crum Creek Act 167 Map



FORM C

EXISTING FLOOD CONTROL PROJECT FORM C. SHEET 1 OF 1

WATERSHED		FORM COMPLETED BY		TYPICAL TYPES OF FLOOD CONTROL PROJECTS		
Name:	Crum Creek	Name:	Jamie H. Bricker	Channel Excavation / Widening	Levee	Dams
Municipality:	Eddystone Borough	Telephone:	610-532-2884	Channel Realignment	Gabions	Floodwall
County:	Delaware	Date:	8/24/2005	Rock Riprap	Pipe Channel	Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Year Constr Built	Expected Life Yrs.	Design Flood Frequency Yrs.	Design Flood Discharge C.F.S. (if known)	Owner Name, Address, and Phone
C-1	Stone Channel Walls	?	?	?	?	?
C-2	Concrete Box Culvert	?	?	?	?	The Boeing Company (Dale Davis) (610) 591-2006 P.O. Box 16858 P25-75 Philadelphia, PA 19142-0858
C-						
C-						
C-						

FORM D

PROPOSED FLOOD CONTROL PROJECT FORM D. SHEET 1 OF 1

WATERSHED		FORM COMPLETED BY		TYPICAL TYPES OF FLOOD CONTROL PROJECTS		
Name:	Crum Creek	Name:	Jamie H. Bricker	Channel Excavation / Widening	Levee	Dams
Municipality:	Eddystone Borough	Telephone:	610-532-2884	Channel Realignment	Gabions	Floodwall
County:	Delaware	Date:	8/24/2005	Rock Riprap	Pipe Channel	Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Study Phase Begun			Year Constr. Planned	Projected Compltn. Date	Expected Life Yrs.	Design Flood		Map ID No. Form A*	Owner Name, Address, and Phone
		YES		N0				Frequency Yrs.	Discharge C.F.S.		
		Prelim.	Final								
D-1	floodwall		X		2004/ 2005	2005	100	100-yr.	10335	A-2	The Boeing Company (Dale Davis) P.O. Box 16858 P25-75 Philadelphia, PA 19142-0858 (610) 591-2006
D-											
D-											
D-											
D-											

* Enter the storm water problem area's Map ID No., if the proposed project will solve or reduce any / all of an identified drainage problem.

FORM E

EXISTING STORM WATER CONTROL FACILITIES FORM E. SHEET 1 OF 1

WATERSHED		FORM COMPLETED BY		DEFINITION
Name:	Crum Creek	Name:	Jamie H. Bricker	Storm Water Control Facility A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.
Municipality:	Eddystone Borough	Telephone:	610-532-2884	
County:	Delaware	Date:	8/24/2005	
For County Use:				

Map ID No.	Type of Storm Water Control Facility	Year Built	Contact Person Name, Address and Phone	Comments
E-	No stormwater control facilities exist in the Crum Creek Watershed boundaries of Eddystone Borough.			
E-				
E-				
E-				
E-				
E-				
E-				
E-				

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

Detention / Retention Basin

Natural Pond or Wetland

Parking Lot Ponding

Roof-Top Storage

Semi-Pervious Paving

Infiltration Device (Seepage / Recharge Basin or Underground Tank)

FORM F

PROPOSED STORM WATER CONTROL FACILITIES FORM F. SHEET 1 OF 1

WATERSHED		FORM COMPLETED BY	
Name:	Crum Creek	Name:	Jamie H. Bricker
Municipality:	Eddystone Borough	Telephone:	610-532-2884
County:	Delaware	Date:	8/24/2005

DEFINITION

Storm Water Control Facility
A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.

For County Use:

Map ID No.	Type of Storm Water Control Facility	Proposed Constr. Date Start	Proposed Constr. Date End	Map No. Form A*	Contact Person Name, Address and Phone	Comments
F-	No stormwater control facilities are proposed within Eddystone Borough.					
F-						
F-						
F-						
F-						
F-						
F-						
F-						

* Enter the stormwater problem area's Map ID No., if the proposed project will solve or reduce and / all of an identified drainage problem.

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

Detention / Retention Basin
Natural Pond or Wetland
Parking Lot Ponding
Roof-Top Storage
Semi-Pervious Paving
Infiltration Device (Seepage / Recharge Basin or Underground Tank)

FORM G

EXISTING FLOOD CONTROL PROJECT FORM G. SHEET 1 OF 1

WATERSHED		FORM COMPLETED BY	
Name:	Crum Creek	Name:	Jamie H. Bricker
Municipalit	Eddystone Borough	Telephone:	610-532-2884
County:	Delaware	Date:	8/24/2005

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-	G-	NONE											
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												

*See measurement key on reverse side

FORM H

PROPOSED FLOOD CONTROL PROJECT FORM H.

SHEET 1 OF 1

WATERSHED

Name: Crum Creek
Municipalit Eddystone Borough
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone 610-532-2884
Date: 8/24/2005

INSTRUCTIONS

On the map for proposed stormwater collection systems, diagram each proposed system. Indicate a map point to show changes in system elements, pipe size, pipe direction and connections to existing system. For proposed additions to existing systems, diagram only the additions and their connection point into the existing system. Complete a separate form for each proposed, new system and one for each existing system having one or more proposed additions. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher (if H-3 ends one system, begin the next with H-23). Be sure to show the point where proposed additions connect into existing systems, using the map point number from he existing system form and map. See Sample Diagrams and Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Map I.D Nos.**	Proposed Constr. Dates		Design Data	Contact Person	Name of Final Ownership and
					Pipe	Channel / Swale									
From	To	Pipe	Open Channe	Swale	D	TW	B	Depth		Form A	Start	End	Available	Name and Phone	Maintenance Responsibility
H-	H-	NONE													
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														

*See measurement key on reverse side. **Enter the stormwater problem areas' Map I.D. Nos., if proposed project will solve or reduce any / all of the drainage problems.

FORM I

PRESENT & PROJECTED DEVELOPMENT IN THE FLOOD HAZARD AREA FORM I. SHEET 1 OF 1

WATERSHED		FORM COMPLETED BY		DEFINITION
Name:	Crum Creek	Name:	Jamie H. Bricker	FLOOD HAZARD AREA A normally dry land area that has been or is susceptible to being inundated by the 100-year flood.
Municipality:	Eddystone Borough	Telephone:	610-532-2884	
County:	Delaware	Date:	8/24/2005	

For County Use:

Map ID No.	TYPE OF DEVELOPMENT	Year Built	Contact Person Name, Address and Phone	Comments
I - 1	Baldwin Towers		Baldwin Office Associates 1001 E Hector St Ste 100 Conshohocken , PA 19428	
I - 2	Boeing		Boeing Company P.O. Box 16858 P25-75 Philadelphia, PA 19142-0858	
I -				
I -				
I -				
I -				
I -				

Form J

WATER QUALITY PROBLEM AREAS FORM J.										SHEET 1 OF 1
WATERSHED				FORM COMPLETED BY						
Name:	Crum Creek			Name:	Jamie H. Bricker					
Municipality:	Eddystone Borough			Telephone:	610-532-2884					
County:	Delaware			Date:	8/24/2005					
SITE	J-1	J-	J-	J-	J-	J-	J-	J-	J-	J-
Types of Water Quality Problems										
High Community Tolerance	X									
High Temperature										
High Turbidity										
Hydrocarbon Pollution										
Low Community Diversity										
Low Dissolved Oxygen										
Low pH										
Nutrient Enrichment										
Poor Habitat	X									
Other/Explanation Line No.										
Potential Cause(s)										
Agriculture										
Construction Site										
Erosion										
Lake Discharge										
STP Outfall										
Other/Explanation Line No.	1									
Frequency										
Year Most Recent Occurrence	2004									
Year First Known Occurrence	?									
Source of Information										
County Water Quality Study										
Driveby	X									
Other/Explanation Line No.										

EXPLANATION LINES
1 below Chester pike, lined channel, rubbish in stream, heavy silt
2
3
4
5
6
7
8
9

Form O - Outfall Data

Person: Jamie H. Bricker Date: 8/24/05 Time Since Last Rain was > 72 Hours: Yes_____

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain: Five (8/19/05)

Municipality: Eddystone Borough Name of receiving water: Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
None												

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment deposition, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

***1:1** = Vertical - rectangular channel

NOTES:

Eddystone Borough does not have any storm sewers or outfalls in the Crum Creek watershed

J – 1 Crum Creek, below Chester Pike

MALVERN BOROUGH

EDWARD B. WALSH & ASSOCIATES, INC.
Complete Civil Engineering Design / Consultation Services

March 23, 2004

Mr. Justin D. Kauffman, Environmental Planner
Delaware County Planning Department
Government Center Building
201 West Front Street
Media, PA 19063-2751

Re: Crum Creek Act 167 Stormwater Management Plan
Outfall Map
Malvern Borough

Dear Mr. Kauffman:

Enclosed please find two (2) copies of the outfall map for Malvern Borough in accordance with your request (letter dated February 19, 2004). As discussed with Karen Holm from your office, we have not completed the Form O – Outfall Data worksheet to date. It is our intention to gather that information during the screening process of the outfall locations.

Also as discussed with Ms. Holm, please copy myself on future request for information associated with Malvern Borough involvement in the Act 167 Plan.

If you should have any questions or require any additional information, please do not hesitate to contact me.

Very truly yours,
EDWARD B. WALSH & ASSOCIATES, INC.
Malvern Borough Engineers

Daniel H. Daley, P.E.

encl.

cc: Sandra L. Kelley, Borough Manager, w/o encl.

REGISTERED PROFESSIONAL ENGINEERS - PA, NJ, DE & MD
55 Country Club Drive, Suite 100 Downingtown, PA 19335
610-518-1360 FAX 610-518-1255

EDWARD B. WALSH & ASSOCIATES, INC.
Complete Civil Engineering Design / Consultation Services

September 16, 2004

Delaware County Planning Department
Attn. Ms. Karen Holm
Government Center Building
201 West Front Street
Media, PA 19063-2751
Phone (610) 891.5200

RE: Crum Creek Watershed Act 167 Plan
Malvern Borough, Chester County

Dear Ms. Holm:

On behalf of Malvern Borough, enclosed please find one (1) copy of the completed survey forms provided by your office. If you should have any questions or require any additional information, please do not hesitate to contact me.

Very truly yours,
EDWARD B. WALSH & ASSOCIATES, INC.
Malvern Borough Engineers

Daniel H. Daley, P.E.

cc: Sandra L. Kelley, Malvern Borough

REGISTERED PROFESSIONAL ENGINEERS – PA, NJ, DE & MD
55 Country Club Drive, Suite 100, Downingtown, PA 19335
610-518-1360 FAX 610-518-1255

CRUM CREEK WATERSHED
ACT 167 STORMWATER MANAGEMENT PLAN

MUNICIPALITY QUESTIONNAIRE

Please fill out the following questionnaire and return it to Karen Holm at the Delaware County Planning Department, Court House and Government Center Building, 201 West Front St. Media, PA 19063 as soon as possible. If you have any questions or comments, or if you would like these forms in digital format, please call Karen at 610-891-5213 or e-mail her at holmk@co.delaware.pa.us.

PART I - GENERAL INFORMATION

Municipality: MALVERN BOROUGH

Contact Person: SANDRA L. KELLEY

WPAC Designee: SANDRA L. KELLEY

Title: BOROUGH MANAGER

Address: ONE EAST FIRST AVENUE - SUITE 3
PO BOX 437 MALVERN PA 19355

Phone: 610. 644. 2602

Fax: 610. 644. 4504

Person Completing form (if different from Contact Person):

Name: DANIEL DALEY, PE - BOROUGH ENGINEER

Address: E.B. WALSH & ASSOC., INC., 55 COUNTRY CLUB DR. - SUITE 100, DOWNINGTOWN PA 19335

Phone: 610. 518. 1360

Fax: 610. 518. 1255

E-mail: ddaley@ebwalshinc.com

PART II - REGULATORY ACTIVITIES

A. Please indicate the regulations you currently use to manage development.

REGULATION	MUNICIPAL ORDINANCE	COUNTY ORDINANCE
Zoning Ordinance	X	
Subdivision/Land Development Ordinance	X	
Separate Stormwater Ordinance		
Separate Floodplain Ordinance		

B. Please indicate the agencies/individuals who review and approve land development plans and zoning variance/waiver requests.

BOROUGH COUNCIL

ENTITY	LAND DEVELOPMENT PLANS		ZONING VARIANCE/WAIVER REQUESTS	
	REVIEW	APPROVE	REVIEW	APPROVE
~~Supervisors~~		X		X
Municipal Engineering Department				
Municipal Planning Department				
County Planning Department	X			
County Conservation District	X			
Zoning Hearing Board			X	X
Consulting Engineer	X		X	
Others (List Below				

C. Please provide **copies** of your zoning, subdivision/land development, and separate stormwater management and floodplain ordinances and your current zoning map when you return this questionnaire. Please list these documents below.

ZONING ORDINANCE (TABLE OF CONTENTS ONLY) - 2003*
ZONING MAP
SLDO (SELECT SECTIONS) - 1973*
[NOTE MALVERN BOROUGH IN PROCESS OF SLDO REWRITE]
* IF COMPLETE COPY NEEDED - PLEASE CONTACT S. KELLEY @ BOROUGH

PART III - MUNICIPAL AND LOCAL PLANNING ACTIVITIES

Please indicate below whether your community has approved the following plans and maps and the date of the most recent update.

ITEM	APPROVED/DATE	IN PROGRESS	PLANNED WITHIN NEXT YEAR
PA Act 537 Sewage Facilities Plan	1993		
Comprehensive Land Use Plan	1999		
Existing Land Use Maps	1999		
Proposed Land Use Maps	1999		
Zoning Maps	2003		

PART IV - FLOOD INSURANCE PROGRAM AND COMPREHENSIVE LAND USE PLAN

Please indicate below whether your community participates in the National Flood Insurance Program:

ITEM	PARTICIPATES (Y/N)
Flood Hazard Boundary Map (FHBM)	?
Participates in FEMA Emergency Program	?
Participates in FEMA Regular Program	?

PART V - EXISTING STORMWATER RELATED PROBLEMS AND STRUCTURES

Please complete the matrices on the following pages (Forms A and C-J) to describe any significant stormwater-related problems (Form A), Existing or Proposed Flood Control Projects (Forms C & D), Existing or Proposed Storm Water Control Facilities (Forms E and F), Existing or Proposed Stormwater Collection Systems (Forms G & H), Present and Projected Development in the Flood Hazard Area (Form I), and Water Quality Problem Areas (Form J) that you are aware of in your municipality.

What we would like to ask of you is that you complete as much of the attached data collection forms as possible. There is a different form for each item of information as summarized in the attached "FORM DESCRIPTION SUMMARY. The process would be as follows starting with the problem areas (Form A):

- Place the location of the problem area on the map as shown in the attached example map.
- Draw a box on the map with the problem area identifier starting with A-1 with an arrow leading from the problem area identifier to the problem area.
- Place an A-1 in the first column of FORM A.
- Put a check in each box in the A-1 column that represents the problems associated with that particular problem area.
- Repeat with the next problem area (A-2) and so on.

- Repeat for existing flood control projects (FORM C) placing a triangle on the maps and starting the labeling with C-1.
- Repeat for all forms.

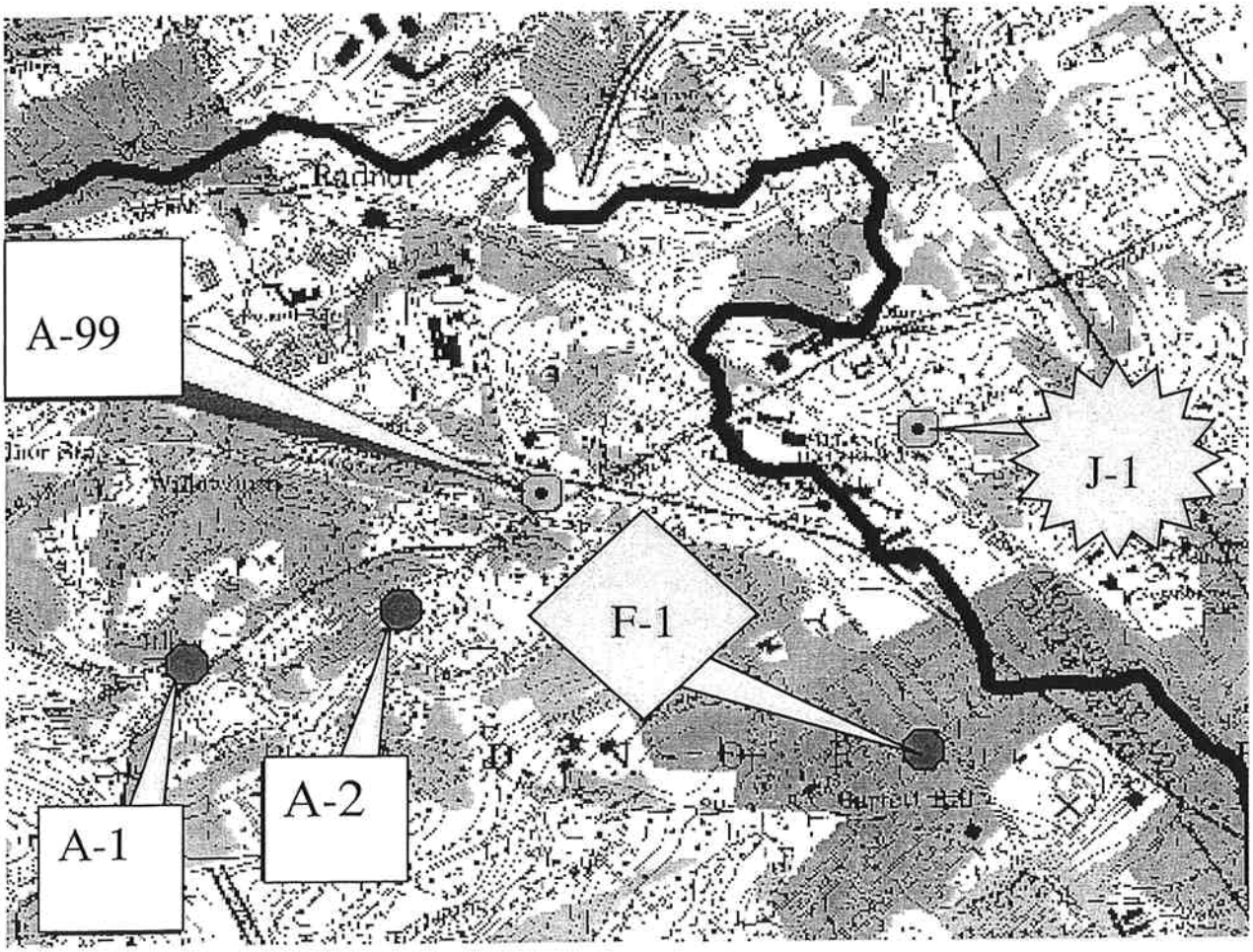
The sample map attached shows three problem areas (A99- A1 and A-2), one proposed flood control project (F-1) and one water quality problem (J1).

Use additional paper to provide <u>detailed</u> descriptions of your most serious problems and attach a map to show the location of the problem. Attach photographs, if available.

If you have any storm or combined sewers, please provide maps showing the collection system and overflow discharge locations and an estimate of the average annual discharge at each overflow point.

The more detail you provide, the better we will be able to evaluate the situation for your municipality. We appreciate your help.

Sample Location of Information from Data Collection Forms on the Municipal Map



STORM WATER PROBLEM AREAS - FORM A sheet __ of __

WATERSHED
Name: CRUM CREEK
Municipality: MALVERN
County: CHESTER

FORM COMPLETED BY
Name: DANIEL H. DALEY, P.E - BOROUGH EGR
Telephone: 610.518.1360
Date: 09-15-04

MAP NO.	sample A-99	A-1	A-2	A-3	A-4	A-5	A-	A-	A-	A-	A-	A-	A-
Types of Storm Water Problems													
Flooding	x	X	X	X	X								
Accelerated Erosion	x			X		X							
Sedimentation													
Landslide													
Groundwater		X											
Water Pollution	x												
Other (Explain)													
Explanation Line No.(s)													
Cause(s)													
Storm Water Volume	x	X	X	X	X	X							
Storm Water Velocity	x		X	X	X	X							
Storm Water Direction	x		X	X	X								
Water Obstruction	x	X											
Other (Explain)													
Explanation Line No.(s)													
Frequency													
Year Most Recent Occurred													
Year First Known to Occur													
Regularity													
More Than 1/Year	x	X	X	X	X	X							
Less Than 1/Year													
Only During Agnes or Floyd													
Duration (If Applicable)													
Less Than One Day	x	X	X	X	X	X							
One Day + (Enter Days)													
Property Damages													
Loss of Life / Vital Services													
Private													
More Than One Owner													
Types of Properties													
Undeveloped													
Agricultural													
Residential			X	X									
Commercial	x												
Industrial													
Number of Properties													
1													
2-10	x												
11+													
Public (List Types)					X	X							
Explanation Line No.(s)					STREET	PARK							
Solutions													
Suggested													
Explanation Line No.(s)	1	1	2	3	4	5							
Formally Proposed													
Explanation Line No.(s)													

EXPLANATION LINES

1 A-1 FLOOD OF ROADWAY - UNDERSIZED CULVERT (LOCATED IN WILLISTOWN TWP.)
2 A-2 BOROUGH HAS RECEIVED COMPLAINT RE. STORMWATER DISCHARGE - CONCENTRATED FLOW
3 A-3 BORO. RECEIVED COMPLAINTS RE. STORMWATER FLOWS (NO STORMSEWER EXISTS IN ROAD)
4 A-4 CONCENTRATED POINT DISCHARGE OF PIPE ONTO WARREN AVE. - NO ROADSIDE SWALE OR STORM SEWER EXISTS

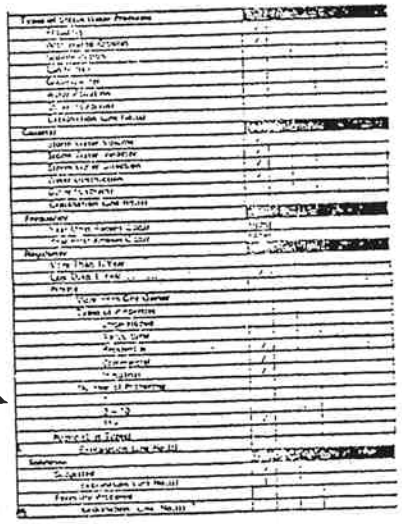
INSTRUCTIONS

Begin with A.1 as the first map number to identify the first' storm water problem area. Illustrate the defined problem on the watershed map provided, and identify it with its map number.

For each storm water problem area within your municipality, enter the map identification number at the head of the column. Describe the problem by placing a check (4 in the appropriate blocks of the column under this map identification number.

When an additional explanation is required, write the line number(s) used in the column marked "Explanation Line No. (s)".Example 1, 2-3, etc.

f storm water problem occurred during and after Agnes, describe the frequency of the problem after Agnes.



Use the explanation lines to list the types of public property damages e.g.roadways, hospitals, etc.

Enter the line no. (s) used to list the map ID no. (s) for the proposed facilities.

Definitions

Storm Water Problem Area
An area that defines the farthest extent of a storm water problem, including any area that experiences property damage, inundation, accelerated erosion, surface water pollution, groundwater pollution, landslides, or any other problem as a result of storm water runoff.

Groundwater
Water in the ground below the water table.

Accelerated Erosion
The removal of the surface of the land through the combined action of man's activities and the natural processes at a rate greater than would occur because of the natural process alone.

Sedimentation
The process by which soil or other surface materials, transported by surface water, is deposited on stream bottoms.

Water Obstruction
Any dike, bridge, culvert, wall, wingwall, fill, pier, wharf, embankment, abutment, or other structure located in, along, across, or projecting into any watercourse, floodway, or body of water.

EXPLANATION LINES (continued)

5	POTENTIAL STREAM CHANNEL EROSION (MINOR) IN TWP PARKLAND

EXISTING FLOOD CONTROL PROJECT FORM C. SHEET _____ OF _____

WATERSHED	FORM COMPLETED BY	TYPICAL TYPES OF FLOOD CONTROL PROJECTS
Name: CRUM CREEK Municipality: MALVERN County: CHESTER	Name: DAN DALEY Telephone: 610.518.1360 Date: 09-15-04	Channel Excavation / Widening, Channel Realignment, Rock Riprap; Levee, Gabions, Pipe Channel; Dams, Floodwall, Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Year Constr Built	Expected Life Yrs.	Design Flood Frequency Yrs.	Design Flood Discharge C.F.S. (if known)	Owner Name, Address, and Phone
C- 1	STORM SEWER OUTLET & RIP-RAP ENERGY DISSAPATOR	EARLY 2000?			?	MALVERN BOROUGH
C-						
C-						
C-						
C-						

FORM D

NO PROPOSED FLOOD CONTROL PROJECTS ANTICIPATED.

PROPOSED FLOOD CONTROL PROJECT FORM D. SHEET _____ OF _____

WATERSHED	FORM COMPLETED BY	TYPICAL TYPES OF FLOOD CONTROL PROJECTS		
Name: CRUM CREEK	Name: D. DALEY	Channel Excavation / Widening	Levee	Dams
Municipality: MALVERN	Telephone: 610.518.1360	Channel Realignment	Gabions	Floodwall
County: CHESTER	Date: 09-15-04	Rock Riprap	Pipe Channel	Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Study Phase Begun			Year Constr. Planned	Projected Compltn. Date	Expected Life Yrs.	Design Flood		Map ID No. Form A*	Owner Name, Address, and Phone
		YES		N0				Frequency Yrs.	Discharge C.F.S.		
		Prelim.	Final								
D-											
D-											
D-											
D-											
D-											

* Enter the storm water problem area's Map ID No., if the proposed project will solve or reduce any / all of an identified drainage problem.

FORM E

EXISTING STORM WATER CONTROL FACILITIES FORM E. SHEET _____ OF _____

WATERSHED	FORM COMPLETED BY	DEFINITION
Name: CRUM CREEK Municipality: MALVERN County: CHESTER	Name: D. DALEY Telephone: 610.518.1360 Date: 09-15-04	Storm Water Control Facility A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.
For County Use:		

Map ID No.	Type of Storm Water Control Facility	Year Built	Contact Person Name, Address and Phone	Comments
E- 1	DETENTION BASIN	MODIFIED 2003	MALVERN PREP SCHOOL (PRIVATE)	
E-				
E- 2	DETENTION BASIN	2002	VILLAGE OF PENNWYCK HOMEOWNERS ASSOC.	LOCATED IN WILLISTOWN (DEVELOPMENT
E- 3	DETENTION BASIN WITH INFILTRATION TRENCH	2002-03	MALVERN RETREAT HOUSE CHARLES BURGY 313 S. WARREN AVE. MALVERN PA 19355	W/I MALVERN BOROUGH)
E-				
E-				
E-				
E-				

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

Detention / Retention Basin

Natural Pond or Wetland

Parking Lot Pondling

Roof-Top Storage

Semi-Pervious Paving

Infiltration Device (Seepage /

PROPOSED FLOOD CONTROL PROJECT FORM F. SHEET _____ OF _____

WATERSHED

Name: CRUM CREEK
Municipality: MALVERN
County: CHESTER

FORM COMPLETED BY

Name: D. DALEY
Telephone: 610.518.1360
Date: 09-15-04

DEFINITION

Storm Water Control Facility

A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.

For County Use:

Map ID No.	Type of Storm Water Control Facility	Proposed Constr. Dates Start	Proposed Constr. Dates End	Map No. Form A*	Contact Person Name, Address and Phone	Comments
F- 1	BASIN - DETENTION	01-05	08-05		REMED RECOVERY CARE CENTER (PRIVATE OWNER)	(PROPOSED INSTITUTIONAL HOME & PARKING LOT)
F-						
F-						
F-						
F-						
F-						
F-						
F-						

* Enter the storm water problem area's Map ID No., if the proposed project will solve or reduce any / all of an identified drainage problem.

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

- Detention / Retention Basin
- Natural Pond or Wetland
- Parking Lot Pondling
- Roof-Top Storage
- Semi-Pervious Paving
- Infiltration Device (Seepage / Recharge Basin or Underground Tank)

COLLECTION FACILITIES HAVE NOT BEEN MAPPED BY BOROUGH TO DATE

FORM G

EXISTING STORM WATER COLLECTION FACILITIES FORM G.

SHEET ________ OF ________

WATERSHED		FORM COMPLETED BY		INSTRUCTIONS
Name:	CRUM CREEK	Name:	D. DALEY	Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1,G-2,G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.
Municipality:	MALVERN	Telephone:	610.518.1360	
County:	CHESTER	Date:	09-15-04	

Map I.D. No.		System's Elements (x)			Measurements *				Material	Year	Design Data	Contact Person	Name of Final Ownership and
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth		Constr.	Available	Name and Phone	Maintenance Responsibility
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												

* See measurement key on reverse side.

FORM H

(NO PROPOSED FACILITIES)

PROPOSED STORM WATER COLLECTION FACILITIES FORM H (10 YRS) SHEET ______ OF ______

WATERSHED	FORM COMPLETED BY	INSTRUCTIONS
Name: CRUM CREEK	Name: D. DALEY	On the map for proposed storm water collection systems, diagram each proposed system. Indicate a map point to show changes in system elements, pipe size, pipe direction and connections to existing systems. For proposed additions to existing systems, diagram only the additions and their connection point into the existing system. Complete a separate form for each proposed, new system and one for each existing system having one or more proposed additions. Identify the points within a system consecutively (ex. H-1, H-2, H-3). Start the first point in each additional system 20 numbers higher (if H-3 ends one system, begin the next with H-23). Be sure to show the point where proposed additions connect into existing systems, using the map point number from the existing system form and map. See Sample Diagrams and Form on Reverse.
Municipality: MALVERN	Telephone: 610.578.1360	
County: CHESTER	Date: 09-15-04	

Map I.D. No.		System's Elements (x)			Pipe	Measurements * Open Channel / Swale			Material	Map I.D. Nos.** Form A	Proposed Const. Dates		Design Data Avail.	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth			Start	End			
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														

* See measurement key on reverse side. ** Enter the storm water problem areas' Map I.D. Nos., if proposed project will solve or reduce any / all of the drainage problems.

NO KNOWN DEVELOPMENT (W/i MALVERN) IN FHA.
NO PROPOSED/PROJECT IN FHA

FORM I

PRESENT & PROJECTED DEVELOPMENT IN THE FLOOD HAZARD AREA (FORM 1)

SHEET _____ OF _____

WATERSHED	FORM COMPLETED BY	DEFINITION
		FLOOD HAZARD AREA:
Name: CRUM CREEK	Name: D. DALEY	A NORMALLY DRY LAND AREA THAT HAS BEEN OR IS
Municipality: MALVERN	Telephone: 610. 518. 1360	SUSCEPTABLE TO BEING INUNDATED BY THE
County: CHESTER	Date: 09-15-04	100-YEAR FLOOD.
For County Use:		

Map ID No.	TYPE OF DEVELOPMENT	Year Built	Contact Person Name, Address and Phone	Comments
1 -				
1 -				
1 -				
1 -				
1 -				
1 -				
1 -				

NO KNOWN WATER QUALITY PROBLEMS W/I MALVERN BOROUGH (NO TESTING OR OBSERVATION OCCURRED)

WATER QUALITY PROBLEM AREAS (FORM J)

Watershed

Name CRUM CREEK
Municipality MALVERN
County CHESTER

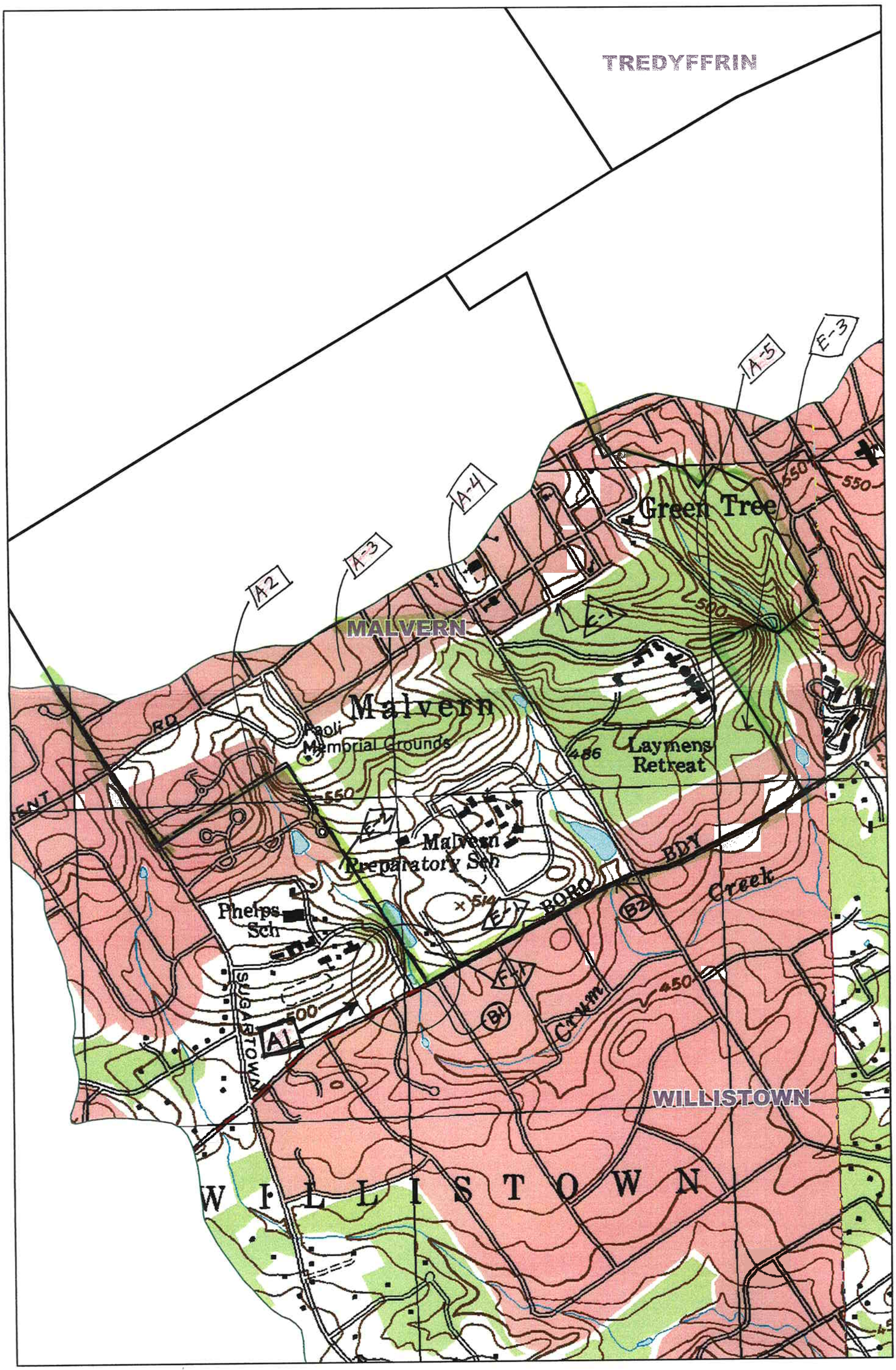
Form Completed By

Name DAN DALEY
Telephone 610.518.1360
Date 09-15-04

Site:	J-	J-	J-	J-	J-	J-	J-	J-
Types of Water Quality Problems								
High Community Tolerance								
High Temperature								
High Turbidity								
Hydrocarbon Pollution								
Low Community Diversity								
Low Dissolved Oxygen								
Low pH								
Nutrient Enrichment								
Poor Habitat								
Other / Explanation Line No.								
Potential Causes(s)								
Agriculture								
Construction Site								
Erosion								
Lake Discharge								
STP Outfall								
Other / Explanation Line No.								
Frequency								
Year Most Recent Occurrence								
Year First Known Occurrence								
Source of Information								
Streamwatch								
County Water Quality Study								
Driveby								
CCD Complaint Investigation								
Other / Explanation Line No.								

Explanation Lines

1. _____
2. _____
3. _____



CRUM CREEK WATERSHED - LOCATOR MAP

MARPLE TOWNSHIP

Marple Twsp (MAR)

FORM B - OBSTRUCTION DATA COLLECTION

SHEET 14 OF ____

Municipal Stream Obstruction Data

Watershed: Crum Creek

Municipality/County: Marple / Chester

Records completed by: Brian Bruno

Field work personnel: " "

Date(s): 12/1 - 12/20/04

T= Amount of fill
D= Diameter
HT = Height
W = Width
PW = Pier Width

Material
msry = Stone Masonry Structure
CMP = Corrugated Metal Pipe
CPP = Corrugated Polyethylene Pipe
BCCMP = Bituminous Coated CMP
RCP = Reinforced Concrete Pipe
SP = Steel Pipe

Inlet Conditions
HW = Headwall
WW = Wingwall
SW = Sidewall

Map ID.	Owner or Address Of Obstruction	Capacity (CFS)	Nos. of?	Opening: Type: Part of Bridge?	Culvert Purpose	Shape (✓): Culvert □	Culvert ○	Culvert ⬭	Bridge ⌒	Bridge ⊓	Measurements: T (ft)	D (ft)	HT (ft)	W (ft)	PW (ft)	skew angle	MATERIAL / INLET CONDITION	NOTES
MAR 1	Cedar Grove Rd		1					X			0.5	–	2.5	5	–	90	CMP / HW	No [illegible]
MAR 2	[illegible]		1					X			4.5	–	4.25	3	–	90	CMP / HW / WW	[illegible]
MAR-3	Parkview Dr		1				✓				4	7	–	–	–	90	RCP / HW, WW	
MAR 4	Rose tree woods Swim Dr		1			✓					1.5	–	7	20	–	70	Concrete /	
MAR 5	Cedar Grove Rd / [illegible]		1	✓					✓		4	–	4	50	–	90	Concrete	
MAR 6	Cedar Grove Rd		1				✓				2	5	–	–	–	45	RCP / HW	
MAR 7	Cedar Grove Rd W		1				✓				4	3	–	–	–	90	RCP / HW	
MAR 8	Cedar Grove Rd / old Cedar Grove		1				✓				2	2.5	–	–	–	90	CMP / HW	Very corroded
MAR 9	Comm. College Dr.		1			✓					2	–	5	9.5	–	90	Concrete / SW	channel is pond
MAR 10	Comm College Top		1				✓				3.5	2.5	–	–	–	90	RCP / HW, WW	
MAR 11	Comm College walkway		1				✓				4	2	–	–	–	90	RCP	
MAR 12	Comm College "		1			✓					4.5	–	4.3	6	–	90	Concrete / SW, HW	
MAR 13	Palmer Mill Rd		1	✓						✓	5	–	5.3	10	–	70	Concrete / HW, WW	
MAR 14	1024 " "		1				✓				5	4	–	–	–	90	CMP / HW, SW	Very corroded
MAR 15	Paxon Hollow / [illegible]		1	✓						✓	2.3	–	6	20	–	90	Concrete / HW, WW	
MAR 16	Paxon Hollow Rd		1				✓				2	3	–	–	–	90	CMP / HW	
MAR 17	Winchester Rd Near Paxon High		1				✓				8	3	–	–	–	90	RCP / HW	
MAR 18	1818 Spring Valley / Crum Ck Rd						✓				7	4	–	–	–	90	CMP / HW, WW	
MAR 19	1885 "						✓				5.2	4	–	–	–	90	CMP / HW, WW	
MAR 20	[illegible]		1	✓						✓	1	–	7	28	–	90	Concrete / HW, WW	
MAR 21	Crum creek Rd / Crum Ck		1	✓						✓	5	–	5	30	–	90	Concrete	
MAR 22	Gold International / Old Maple Rd		1			✓					8	–	4	6	–	90	Concrete / HW	picture
MAR 23	Old Maple Rd / [illegible]							✓			2	–	4.5	2	–	90	CMP / HW	
MAR 24	Old Maple Rd / New Ocean						✓				0	5	–	–	–	90	RCP / HW, WW	
MAR 25	Old Maple Rd		1				✓				8	5	–	–	–	90	RCP / HW, WW	
MAR 26	→ see UPP 12																	
MAR 27	see UPP 13																	

L:\GISData\Misc-stormwater\Act167DOCS\DataCollectionForms\obsforms.xls

Crum Creek Watershed

Form O - Outfall Data

Person: Adam McLaughlin, Remington, Vernick & Beach Date: 7/24/03 Time Since Last Rain was ≥ 72 Hours: Yes 24 hrs.

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 24 hrs.

Municipality: Marple Township Name of receiving water: Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
C-1	CMP	Y		42"	2"	Directly	into	stream	Y	Clean	Neighborhood	0
C-2	CMP	Y		42"	1"	Flat	3 ½'	1:1	Y	Clean	Neighborhood	0
C-3	DOUBLE CIP	?		2'-6"		Directly	into	stream	N	Sed. Build up (Old Pipe)	houses	1
C-4	CIP	?		8"		Directly	into	stream	N	Old pipes	houses	0
C-5	PVC	Y		8"		6"	1'	3:4	N	Brown/sediment	Neighborhood	0
C-6	RCP	Y		24"		2'	4'	2:1	N	Clean	Neighborhood	0
C-7	RCP	Y		24"		15'	8'	1:5	N	Sed./cracking/ trash/plant life	Neighborhood	2
C-8	Plastic	Y		24"	1"	Directly	into	stream	N	Good	Neighborhood	0
C-9	DOUBLE CIP	Y		2-12"		Directly	into	stream	N	Trash/Deteriorating	Bridge Inlet Road	2

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Crum Creek Watershed

Form O - Outfall Data

Person: Adam McMachlin, R.V. & B Engineers Date: 7/24/03 Time Since Last Rain was ≥ 72 Hours: Yes 24 hrs

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 24 hrs.

Municipality: Marple Township Name of receiving water: Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
C-10	CIP	Y		10"		Directly	into	stream	N	Clean (Old)	Park	1
C-11	RCP	Y		36"	4"	6"	6'	1:2	Y	Sediment/ Trash	Neighborhood	1
C-12	RCP	Y		24"	3"	6'	4'	1:6	Y	Bg Rocks/ weeds	Neighborhood	2
C-13	Clay	Y		8"	2"	1'	1'	1:1	N	Old / Rocks / Pebbles	Neighborhood	0
C-14	RCP/Brick	Y		INLET	Directly	into	stream		Y	Clean	Neighborhood	0
C-15	RCP	Y		24"		1'	1'	1:2	N	Bamboo Everywhere	Neighborhood	0
C-16	RCP	Y		8'(box)	3'	9'	18'	1:2	Y	Erosion (bottom)	Neighborhood	0
C-17	RCP	Y		30"	4"	3'	4'	1:4	Y	Wood Debris	Neighborhood	0
C-18	CMP	Y		36"	3"	2-5'	12'	1:5	Y	Pebbles / Rocks/ Trash	Neighborhood	1

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Crum Creek Watershed

Form O - Outfall Data

Person: Adam McLaughlin, R.V & B Engineer Date: 7/24/03 Time Since Last Rain was ≥ 72 Hours: Yes 24 hrs

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 24 hrs.

Municipality: Marple Township Name of receiving water: Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
C-19	RCP	Y		48"	2"	4'	6'	Box	Y	Erosion/Sediment	Neighborhood	1
C-20	RCP	Y		10"		1'	3'	2:1	N	Erosion at pipe outlet	Basin	0
C-21	CMP	Y		36"	4"	6"	4'	3:1	Y	Clear/Plants (ferns)	Roadside Brook	0
C-22	?	Y		Couldn't	get a	good look	at it	3:1	Y	Bamboo forrest	Neighborhood	0
C-23	CMP	Y		12"	2"	6"	2'	3:1	Y	Bamboo forest	Neighborhood	0
C-24	CMP	Y		30"	3"	2'	15'	5:1	Y	Erosion (Bottom)	Neighborhood/stream	0
C-25	Creek	?			6"	1'-2'	3'	1:3	Y	Sediment/Debris	Neighborhood	0
C-26	CMP	Y		4'	1"	1'	6'	1:2	Y	Sediment	Neighborhood	1
C-27	RCP	Y		24"			3'	Flat	N	Sediment (Mats)	New Neighborhood	1

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

CRUM CREEK WATERSHED

Form O - Outfall Data

Person: ADAM MCLAUGHLIN, RV & B. (Big Meers) Date: 7/24/03 Time Since Last Rain was ≥ 72 Hours: Yes 24 hrs

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 24 hrs.

Municipality: MARPLE TOWNSHIP Name of receiving water: Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
C-28	Creek	?		15"	3"	1'	4'	1:1	Y	Green	Weeds	0
C-29	RC Channel	Y				2'	4'	Box	N	Algae	Weeds	1
C-30	CMP	Y		18"	Directly	into	Creek		N	Green	Road	0

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

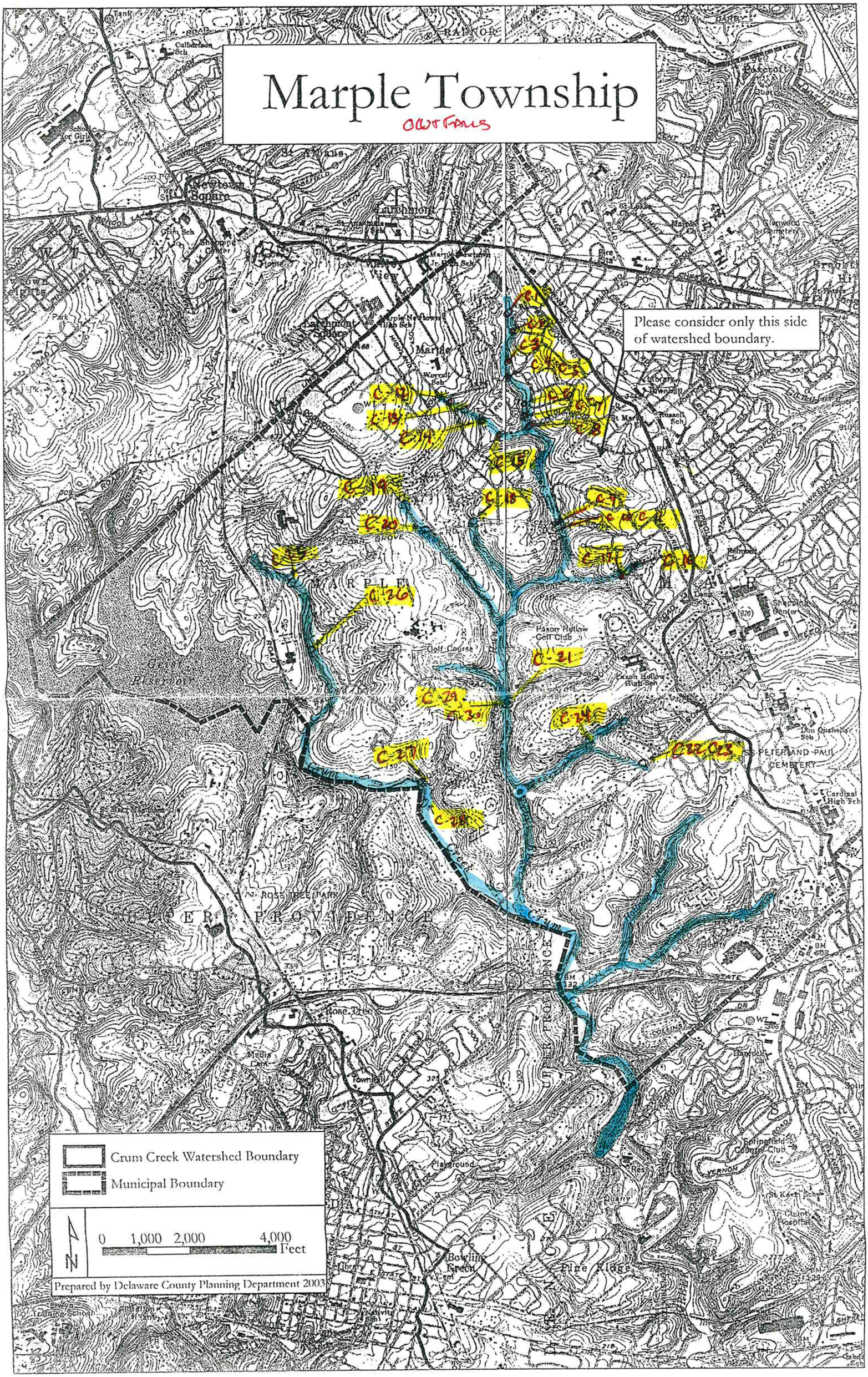
1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

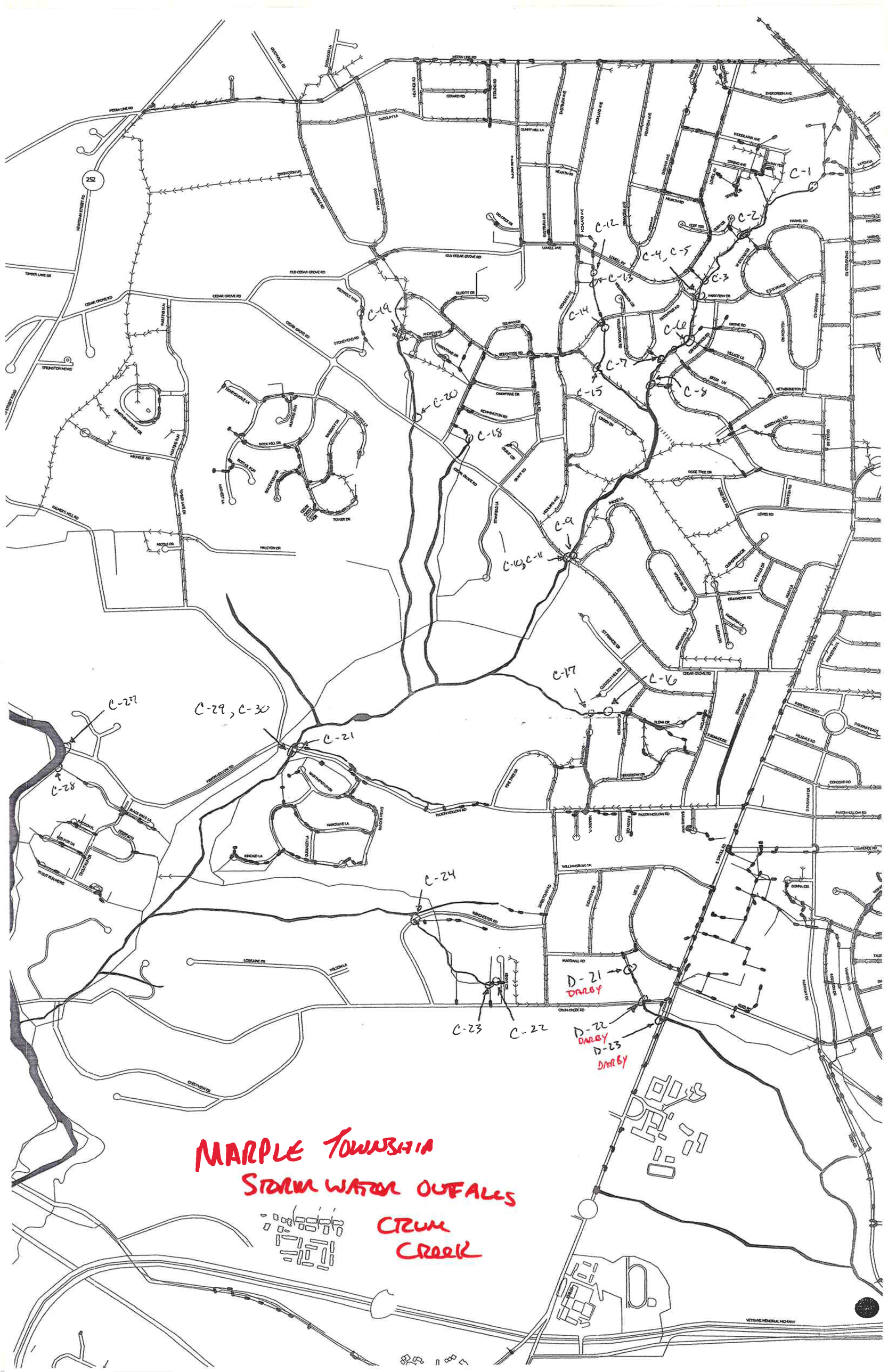
2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:


Marple Township
OWT Falls
Please consider only this side of watershed boundary.
C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
C-9
C-10
C-11
C-12
C-13
C-14
C-15
C-16
C-17
C-18
C-19
C-20
C-21
C-22,23
C-24
C-25
C-26
C-27
C-28
C-29
C-30
Crum Creek Watershed Boundary
Municipal Boundary
0 1,000 2,000 4,000 Feet
Prepared by Delaware County Planning Department 2003


C-1
C-2
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C-4, C-5
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C-10, C-11
C-17
C-16
C-27
C-29, C-30
C-21
C-28
C-24
C-23
C-22
D-21
DARBY
D-22
DARBY
D-23
DARBY
MARPLE TOWNSHIP
STORM WATER OUTFALLS
CRUM
CREEK

"Horsemint, *Mondara punctara*" Rendered photograph by William Brokaw, Brokaw Photography

DELAWARE COUNTY PLANNING DEPARTMENT

DCPD

Court House/ Government Center , 201 W. Front St., Media, PA 19063
Office Location: Toal Building, 2nd & Orange Sts., Media, PA 19063
Phone: (610) 891-5200 FAX: (610) 891-5203
E-mail: planning_department@co.delaware.pa.us

TO: Bill Brokaw

FROM: Christopher Gallagher

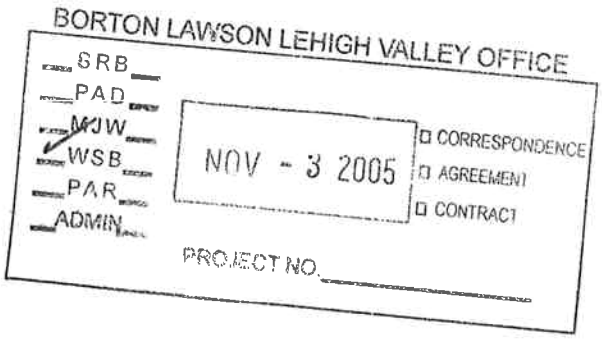
DATE: 11/1/05

RE: Crum Creek Stormwater Management Plan
Marple Township Forms

Bill,

Please find enclosed the completed Marple Township survey, forms, and maps.

If you require and further information, please do not hesitate to contact me at (610)-891-5130.



"Horsemint, *Mondara punctara*" Rendered photograph by William Brokaw, Brokaw Photography

Form O - Outfall Data

Person: ADAM MCLAUGHLIN Date: 7/25/03 Time Since Last Rain was ≥ 72 Hours: Yes 48 hrs.

Remington, Vernick & Beech Eng

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 48 hrs.

Municipality: MARPLE Township Name of receiving water: DARBY Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
D-19	CIP	Y		12"	Directly	into	stream		N	Good	Farmland	0
D-20	RCP/Brick	Y		INLET	Directly	into	stream		N	Green	Neighborhood	1
D-21	Plastic	Y		24"	6"	6"	4'	1:1	Y	Reeds/Plants	Neighborhood	0
D-22	RCP	Y		INLET	Directly	into	stream		Y	Debre	Neighborhood	0
D-23	RCP	Y		INLET	Directly	into	stream		Y	Plant life	Major Road	0

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Bid Evaluation

Location of Maple Outfalls:

Unnamed Run, starting at IHS, Main Rd, ending in Darby Creek N of Fountain Hill Rd.

1. IHS has outfalls from parking lot and apparently, roof.
2. Culvert from IHS contains a second pipe just above, perhaps from intervening ground. Both pipes feed headwaters of Run, beside Creek church
3. White PVC pipe S bank from parking (of)
3A. 12" pipe encased in concrete, downstream end of 150' Chapel Rd. culver
4. Approx. 12" drain pipe from Orchard Dr., at head of tributary.
5. Several hundred feet downstream from tributary is a ~16" aluminum pipe, just below 2748 S. Kent Road, causing considerable erosion of S bank
5A. N Bank, ~100' downstream of outfall 5, drains James Road
6. Just below Cherry Hill Rd, on Township property, this big outfall feeds a tributary to unnamed Run.

2

7. I am told there is an outfall where Unnamed Run meets Darby Creek.

8. Big one on SW corner, Darby Creek / Sproul.

Langford Run

1. Run starts in 3 adjacent outfalls below Malin Rd.

2. ~~30'~~ Twenty feet ds of New Ardmore Ave, E bank.

3. On S side of N A Ave Bridge, on either side of culvert are outfalls.

4. 150' downstream, ~~E~~ W bank.

Whetstone Run

1. Run starts here in Rockhill Dr. outfall. This short segment before it goes underground at Parkway, was bright orange this spring, poss. by iron oxide. I saw this same problem at Long Ford weep holes between Sprout and Norton Ave, and at Long Road outfall no. 2, and on Trout Run outfall 4.

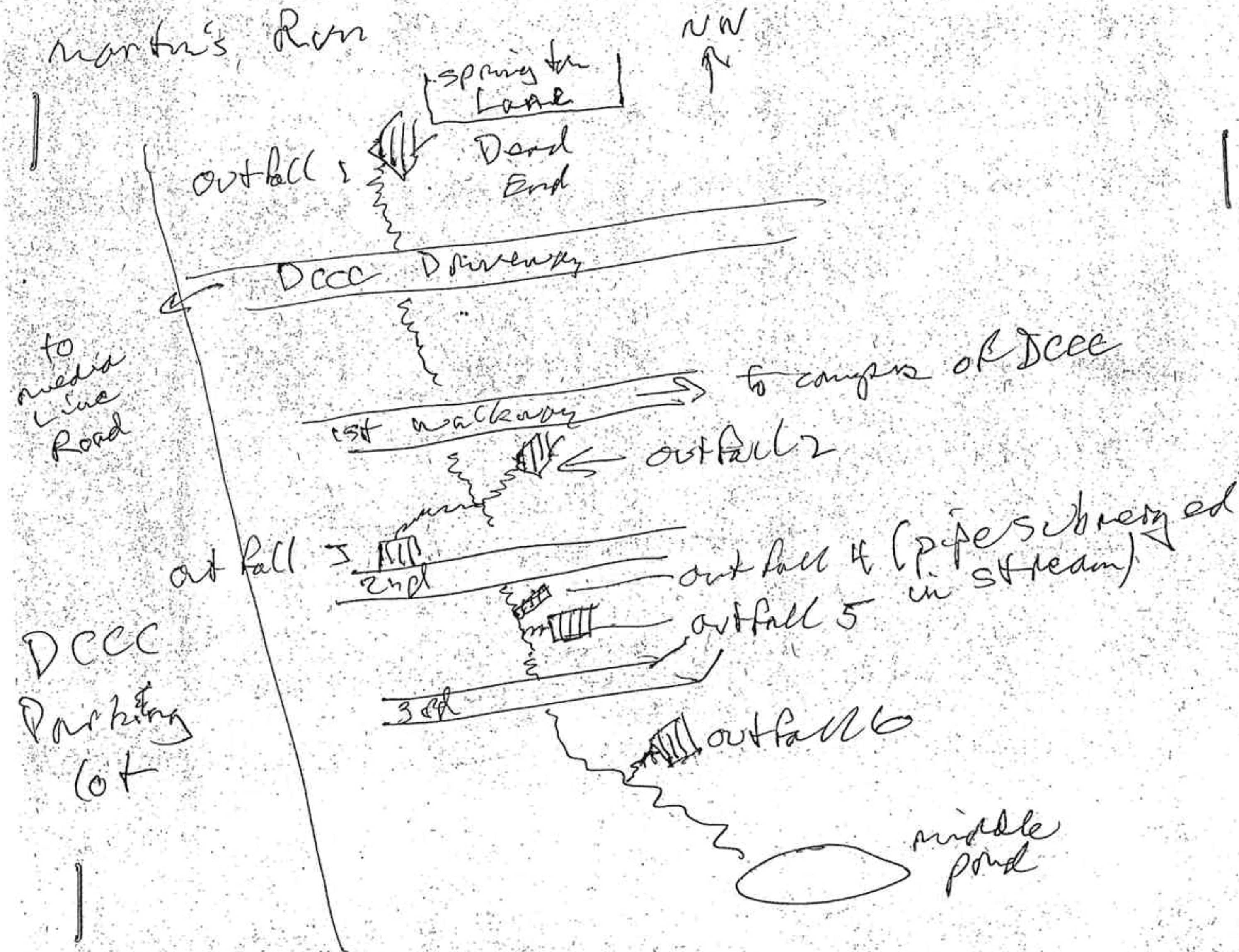
2. This pipe may be just a culvert or it may be the outfall for storm drains evident in the parking lots under which it passes.

3. This trib starts in an outfall

4

5 of Reed Rd; draining K mart Parking Lot

4. At end of Margit Rd, E bank.



outfall 7 is at michelle drive, on east bank, between Cedar Grove and Palmer's mill Rds.

Trout Run

1. Run ~~starts~~ in this big pipe under Giant / DE Parking Lots

2. About 400' downstream is a small dam next to an E bank pipe that may drain Down Terrace

3. 150' N of where Parkview Dr. crosses Trout Run, on W bank drains Cliff Terrace.

4. About 500' N of Cedar Grove Rd E bank, 6-8' inland from stream. Note red/orange effluent.

5. 50' N. of Cedar Grove, E bank

6. W bank, Paxon Hollow Golf Course.

7. S side, Paxon Hollow Rd. bridge, W bank.

→

8. This pipe was no longer functional. It's on S bank of a tributary, not shown on map, that starts below the middle School. Pipe is 30' downstream from entrance to Golf Course.

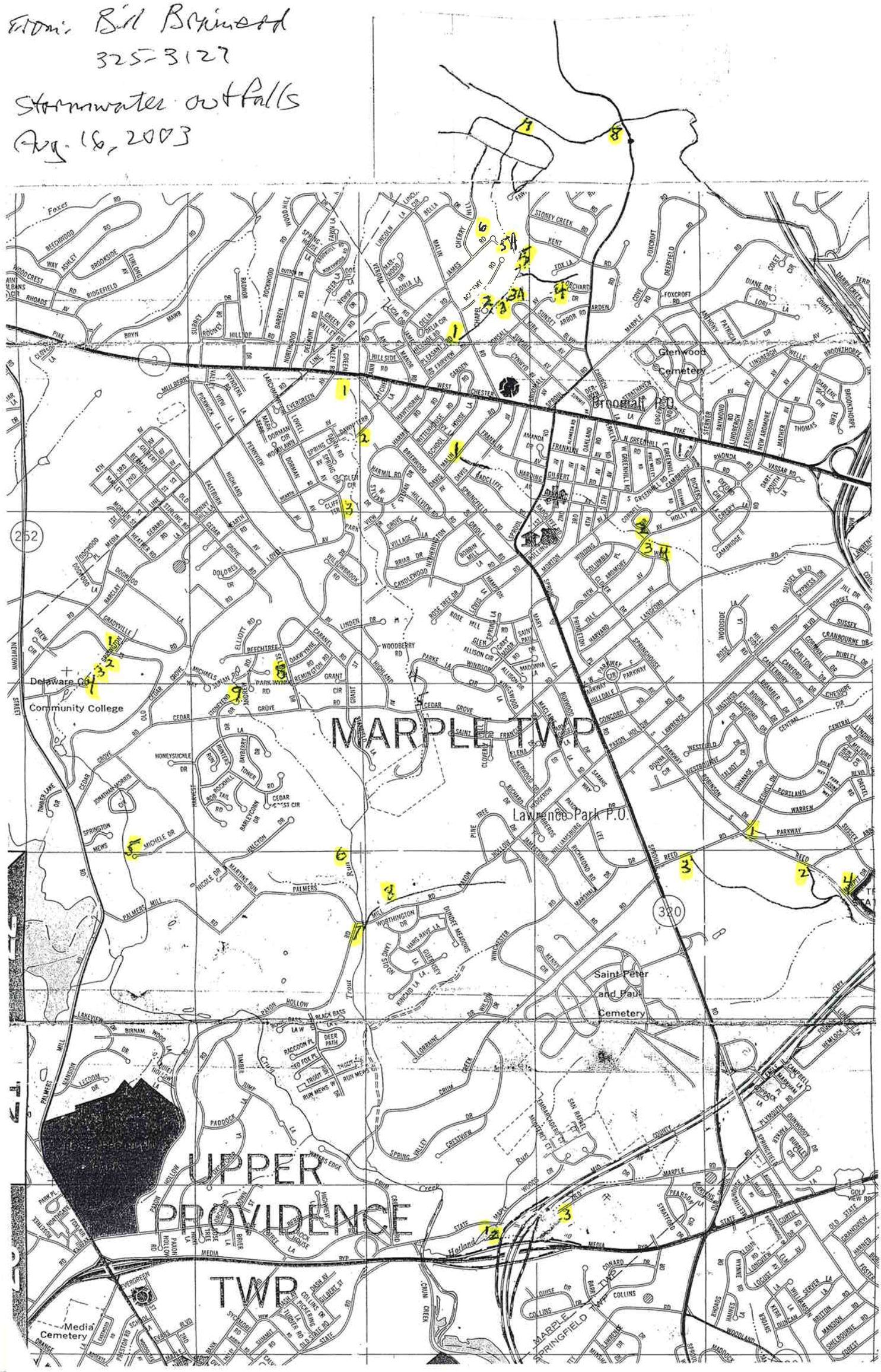
Mottard Run

1. W bank 10' downstream of State Road, and to west of Maple Woods Drive.
2. Follow this trib 150' downstream to where it joins effluent from Blue Route pond, coming out of a big concrete culvert.
3. A hard one to find. At State Rd, a stream enters a culvert (under Blue Route) that leads to a pond. Follow this stream 300' south to its origin in a pipe coming from under Blue Route, near intersection with by pass. Water is remarkably clear.

To: Chris Fogid / DCPD

From: Bill Brinsfield
325-3127

Stormwater outfalls
Aug. 16, 2003



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Remington, Vernick & Vena Engineers
Remington, Vernick & Beach Engineers
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Wildwood City, NJ 08260
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(609) 522-5313 (fax)

9550 Highland Street
2nd Level
Mauricetown, NJ 08329
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Conshohocken, PA 19428
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University Office Plaza
Commonwealth Building
260 Chapman Road, Ste. 104F
Newark, DE 19702
(302) 266-0212
(302) 266-6208 (fax)

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Established in 1901

July 28, 2003

Karen Holm
Delaware County Planning Department
Government Center Building
201 West Front Street
Media, PA 19063-2751

Re: Township of Marple
Act 167 Stormwater Management Plan for the Crum Creek and Darby Creek
Our File # PDMAT350

Dear Ms. Holm:

Enclosed please find one copy of the Crum Creek and Darby Creek outfall maps and outfall data sheets. The maps and sheets were completed as per the directions given at the July 8, 2003 Act 167 conference held at Marple Township. We understand that the County will use this information to develop an ordinance and produce electronic GIS mappings that can be used by the Township for their Year 1 NPDES submission.

Should you have any questions please feel free to contact me directly at (610) 940-1050, extension 513.

Very truly yours,
Remington, Vernick & Beach Engineers

Christopher J. Fazio, P.E., C.M.E.

Cc: Joseph Flicker, Town Manager (w/ enclosure)
Thomas F. Beach, P.E., C.M.E. (w/ enclosure)

Crum Creek Watershed

Form O - Outfall Data

Person: Adam McLaughlin, Remington, Vernick & Beach Date: 7/24/03 Time Since Last Rain was ≥ 72 Hours: Yes 24 hrs.

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 24 hrs.

Municipality: Marple Township Name of receiving water: Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
C-1	CMP	Y		42"	2"	Directly	into	stream	Y	Clean	Neighborhood	0
C-2	CMP	Y		42"	1"	Flat	3½'	1:1	Y	Clean	Neighborhood	0
C-3	Double CIP	?		2'-6"		Directly	into	stream	N	Sed. Build-up (old pipe)	houses	1
C-4	CIP	?		8"		Directly	into	stream	N	Old pipes	houses	0
C-5	PVC	Y		8"		6"	1'	3:4	N	Erosion/sediment	Neighborhood	0
C-6	RCP	Y		24"		2'	4'	2:1	N	Clean	Neighborhood	0
C-7	RCP	Y		24"		15'	8'	1:5'	N	Sed./cracking/ trash/plant life	Neighborhood	2
C-8	Plastic	Y		24"	1"	Directly	into	stream	N	Good	Neighborhood	0
C-9	Double CIP	Y		2-12"		Directly	into	stream	N	Trash/Deteriorating	Bridge Inlet(Road)	2

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Crum Creek Watershed

Form O - Outfall Data

Person: Adam McAuliffe, R.V. & B Engineers Date: 12/24/03 Time Since Last Rain was ≥ 72 Hours: Yes 24 hrs

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 24 hrs.

Municipality: Marple Township Name of receiving water: Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
C-10	CIP	Y		10"		Directly	into	stream	N	Clean (Clr)	Park	1
C-11	RCP	Y		36"	4"	6"	6'	1:2	Y	Sediment/ Trash	Neighborhood	1
C-12	RCP	Y		24"	3"	6'	4'	1:6	Y	Big Rocks/ weeds	Neighborhood	2
C-13	Clay	Y		8"	2"	1'	1'	1:1	N	Old / Rocks / Pebbles	Neighborhood	0
C-14	RCP/Brick	Y		INLET	Directly	into	stream		Y	Clean	Neighborhood	0
C-15	RCP	Y		24"		1'	1'	1:2	N	Bamboo Everywhere	Neighborhood	0
C-16	RCP	Y		8' (Brick)	3'	9'	18'	1:2	Y	Erosion (Bottom)	Neighborhood	0
C-17	RCP	Y		30"	4"	3'	4'	1:4	Y	Wood Debris	Neighborhood	0
C-18	CMP	Y		36"	3"	2-5'	12'	1:5	Y	Pennies / Rocks / Trash	Neighborhood	1

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Crum Creek Watershed

Form O - Outfall Data

Person: ADAM MCLAUGHLIN, B.V & B Engineer Date: 7/24/03 Time Since Last Rain was ≥ 72 Hours: Yes 24 hrs

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 24 hrs.

Municipality: MARPLE Township Name of receiving water: Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
C-19	RCP	Y		48"	2"	4'	6'	1:1	Y	Erosion/Sediment	Neighborhood	1
C-20	RCP	Y		10"		1'	3'	2:1	N	Erosion at pipe outlet	Basin	0
C-21	CMP	Y		36"	4"	6"	4'	3:1	Y	Clear/Plants (ferns)	Roadside Ditch	0
C-22	?	Y		Couldn't	get a	good look	at it	3:1	Y	Bamboo forest	Neighborhood	0
C-23	CMP	Y		12"	2"	6"	2'	3:1	Y	Bamboo forest	Neighborhood	0
C-24	CMP	Y		36"	3"	2'	15'	5:1	Y	Erosion (Bottom)	Neighborhood/stre	0
C-25	Creek	?			6"	1'-2'	3'	1:3	Y	Sediment/Debre	Neighborhood	0
C-26	CMP	Y		41	1"	1'	6'	1:2	Y	Sediment	Neighborhood	1
C-27	RCP	Y		24"			3'	Flat	N	Sediment (Oils)	New Neighborhood	1

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

CRUM CREEK WATERSHED

Form O - Outfall Data

Person: Adam McLaughlin, RV & B. (Bing Mears) Date: 7/24/03 Time Since Last Rain was ≥ 72 Hours: Yes 24 hrs

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 24 hrs.

Municipality: MARPLE TOWNSHIP Name of receiving water: Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
C-28	Creek	?		18"	3"	1'	4'	1:1	Y	Green	Woods	0
C-29	RC Channel	Y				2'	4'	1:1	N	Algae	Woods	1
C-30	CMP	Y		18"	Directly	into	Creek		N	Algae	Road	0

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

DARBY Creek WATERSHED

Form O - Outfall Data

Person: ADAM MCLAUGHLIN, Remington, Vernick & Beach Engineers Date: 7/25/03 Time Since Last Rain was ≥ 72 Hours: Yes 48 hrs.

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 48 hrs.

Municipality: MARBLE TOWNSHIP Name of receiving water: DARBY Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
D-1	RCP	Y		48"	6"	3'	12'	Box	Y	Metal Gate off	Basin (Road)	1
D-2	CMP	Y		12"	Couldn't	get good	look			Forest	Neighborhood	
D-3	Plastic	Y		18"	1"	3'	3'	1:1	N	Trash	Neighborhood	0
D-4	RCP	Y		24"	Couldn't	get a good	look			Forest	Neighborhood	
D-5	RCP	Y		12"		2'	3'	Destroyed	N	Trash/Leaves/Debris	Neighborhood	2
D-6	RCP	Y		36"		4½'	6'	1:6	N	Erosion/sediment	Neighborhood	1
D-7	RCP/CMP	Y		72"	6"	4'	7'	Box	Y	Clean	Neighborhood	0
D-8	RCP	Y		24"		2'	3'	1:3	N	Plant/sediment	Neighborhood	1
D-9	RCP/CMP	Y		45"	1"	2'	.5'	Stone walls	Y	Erosion of stone walls	stream Connecting	1

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

DARBY Creek Watershed

43

Form O - Outfall Data

Person: ADAM McLAUGHLIN Date: 7/25/03 Time Since Last Rain was ≥ 72 Hours: Yes 48 hrs.

Remington, Vernick & Beach Eng.

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 45 hrs.

Municipality: MARPLE Township Name of receiving water: DARBY Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
D-10	RCP/Brick	Y		INLET	Directly	into	stream		Y	Erosion	Neighborhood	1
D-11	RCP	Y		18"	5"	Directly	into	stream	Y	Bank Erosion	Neighborhood	1
D-12	RCP/Brick	Y		INLET	Directly	into	stream		N	Good/Brick Erosion	Major Road	1
D-13	RCP/Brick	Y		INLET	Directly	into	stream		Y	Erosion	Neighborhood	1
D-14	RCP/Brick	Y		INLET	Directly	into	stream		Y	Erosion	Neighborhood	1
D-15	RCP	Y		18"		Directly	into	stream	N	Grass/stone wall	Neighborhood	0
D-16	RCP/Comp	Y		36"		1'	5'	Bin	N	Cracking/plant life	Neighborhood	1
D-17	RCP	Y		36"	3"	Directly	into	stream	Y	Embankment Erosion	Neighborhood	0
D-18	CIP	Y		18"		1'-2'	5'	Headwall	N	Grass	Parking lot	0

Rating System:

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2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

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Remington, Vernick & Vena Engineers
Remington, Vernick & Beach Engineers
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Established in 1901

June 10, 2005

Delaware County Planning Department
Government Center Building
201 West Front Street
Media, PA 19063

Attn: Karen Holm

Re: Marple Township
Crum Creek Watershed Planning
Our File# PDMAT387

Dear Karen:

Attached, please find one (1) copy of the information you requested for the Crum Creek Watershed Planning Report.

Should you need any further assistance on this matter please feel free to contact our office at (610) 940-1050.

Very truly yours,
Remington, Vernick & Beach Engineers

Christopher J. Fazio, P.E., C.M.E

Enclosures
cc: Joseph Wm. Flicker, Township Manager
Thomas F. Beach, Executive Vice President
Chris Serpente, P.E.

CRUM CREEK WATERSHED
ACT 167 STORMWATER MANAGEMENT PLAN

MUNICIPALITY QUESTIONNAIRE

Please fill out the following questionnaire and return it to Karen Holm at the Delaware County Planning Department, Court House and Government Center Building, 201 West Front St. Media, PA 19063 as soon as possible. If you have any questions or comments, or if you would like these forms in digital format, please call Karen at 610-891-5213 or e-mail her at holmk@co.delaware.pa.us.

PART I - GENERAL INFORMATION

Municipality: MARPLE TOWNSHIP

Contact Person: JOE FLICKER

WPAC Designee: JOE FLICKER

Title: TOWNSHIP MANAGER

Address: 227 SOUTH SPROUL RD

BROOMALL PA 19008

Phone: 610.356.4040

Fax: 610.356.3587

Person Completing form (if different from Contact Person):

Name: C. SERPENTE

Address: REMINGTON, VERNICK + BEACH ENGINEERS

922 FAYETTE ST

Phone: CONSHOHOCKEN, PA 19428

Fax: 610.940.1050 x519, FAX: 610.940.1161

E-mail: X

PART II - REGULATORY ACTIVITIES

A. Please indicate the regulations you currently use to manage development.

REGULATION	MUNICIPAL ORDINANCE	COUNTY ORDINANCE
Zoning Ordinance	X	
Subdivision/Land Development Ordinance	X	
Separate Stormwater Ordinance	X	
Separate Floodplain Ordinance	X	

B. Please indicate the agencies/individuals who review and approve land development plans and zoning variance/waiver requests.

ENTITY	LAND DEVELOPMENT PLANS		ZONING VARIANCE/WAIVER REQUESTS	
	REVIEW	APPROVE	REVIEW	APPROVE
Supervisors		X		X
Municipal Engineering Department				
Municipal Planning Department	X			
County Planning Department	X			
County Conservation District	X			
Zoning Hearing Board	X		X	
Consulting Engineer	X		X	
Others (List Below				

C. Please provide **copies** of your zoning, subdivision/land development, and separate stormwater management and floodplain ordinances and your current zoning map when you return this questionnaire. Please list these documents below.

COMING VIA MAIL, PLS CALL CHRIS SERPENTE 610.940.1050 X519 IF NEEDED.

PART III - MUNICIPAL AND LOCAL PLANNING ACTIVITIES

Please indicate below whether your community has approved the following plans and maps and the date of the most recent update.

ITEM	APPROVED/DATE	IN PROGRESS	PLANNED WITHIN NEXT YEAR
PA Act 537 Sewage Facilities Plan	X		
Comprehensive Land Use Plan		X	PLANNED REVISION
Existing Land Use Maps		X	PLANNED REVISION
Proposed Land Use Maps			
Zoning Maps		X	EXPECT 6/05

PART IV - FLOOD INSURANCE PROGRAM AND COMPREHENSIVE LAND USE PLAN

Please indicate below whether your community participates in the National Flood Insurance Program:

ITEM	PARTICIPATES (Y/N)
Flood Hazard Boundary Map (FHBM)	
Participates in FEMA Emergency Program	Y
Participates in FEMA Regular Program	

PART V - EXISTING STORMWATER RELATED PROBLEMS AND STRUCTURES

Please complete the matrices on the following pages (Forms A and C-J) to describe any significant stormwater-related problems (Form A), Existing or Proposed Flood Control Projects (Forms C & D), Existing or Proposed Storm Water Control Facilities (Forms E and F), Existing or Proposed Stormwater Collection Systems (Forms G & H), Present and Projected Development in the Flood Hazard Area (Form I), and Water Quality Problem Areas (Form J) that you are aware of in your municipality.

What we would like to ask of you is that you complete as much of the attached data collection forms as possible. There is a different form for each item of information as summarized in the attached "FORM DESCRIPTION SUMMARY. The process would be as follows starting with the problem areas (Form A):

- Place the location of the problem area on the map as shown in the attached example map.
- Draw a box on the map with the problem area identifier starting with A-1 with an arrow leading from the problem area identifier to the problem area.
- Place an A-1 in the first column of FORM A.
- Put a check in each box in the A-1 column that represents the problems associated with that particular problem area.
- Repeat with the next problem area (A-2) and so on.

- Repeat for existing flood control projects (FORM C) placing a triangle on the maps and starting the labeling with C-1.
- Repeat for all forms.

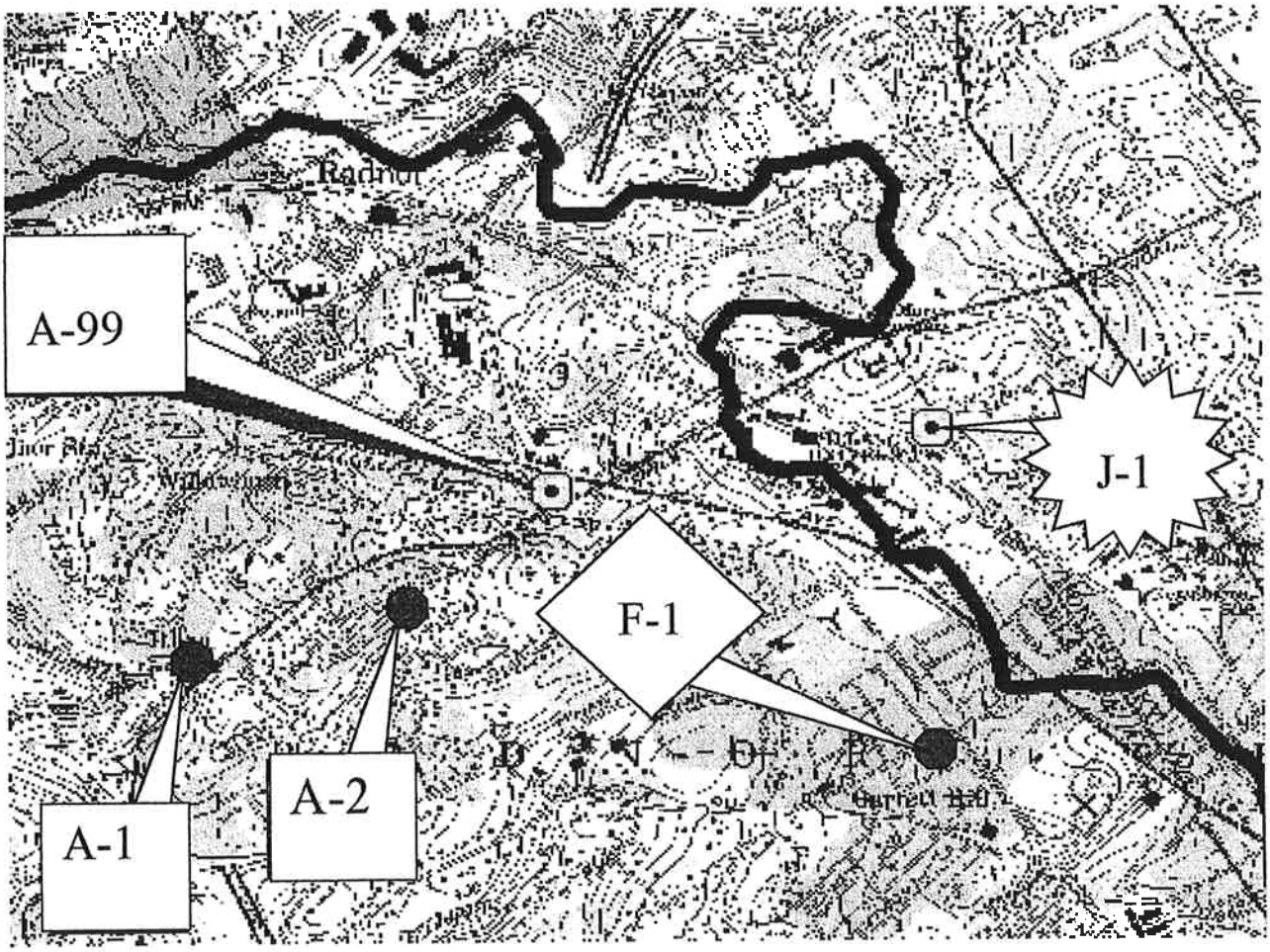
The sample map attached shows three problem areas (A99- A1 and A-2), one proposed flood control project (F-1) and one water quality problem (J1).

Use additional paper to provide <u>detailed</u> descriptions of your most serious problems and attach a map to show the location of the problem. Attach photographs, if available.

If you have any storm or combined sewers, please provide maps showing the collection system and overflow discharge locations and an estimate of the average annual discharge at each overflow point.

The more detail you provide, the better we will be able to evaluate the situation for your municipality. We appreciate your help.

Sample Location of Information from Data Collection Forms on the Municipal Map



Form A

STORM WATER PROBLEM AREAS FORM A. SHEET 1 OF 1

WATERSHED		FORM COMPLETED BY					Before Filling Out Form, See Instructions On Back						
Name:	CRUM/DARBY	Name:	C. SERVENTE										
Municipality:	MARPLE	Telephone:	610 940 1050				For County Use:						
County:	DELAWARE	Date:	6/6/05										
MAP NO. *		A- 1	A- 2	A- 3	A- 4	A- 5	A-	A-	A-	A-	A-	A-	A-
Types of Storm Water Problems													
Flooding		X	X			X							
Accelerated Erosion	NO												
Sedimentation	NO												
Landslide	NO												
Groundwater				X	X								
Water Pollution													
Other (Explain)													
Explanation Line No. (On Back)													
Cause (s)													
Storm Water Volume		X	X	X	X	X							
Storm Water Velocity													
Storm Water Direction													
Water Obstruction													
Other (Explain)													
Explanation Line No. (On Back)													
Frequency													
Year Most Recent Occurred		05	05	05	05	05							
Year First Known Occurred													
Regularity													
More Than 1 Year		Y	Y	Y	Y	Y							
Less Than 1 Year													
Only During Agnes													
Duration (If Applicable)													
Less Than 1 Day		Y		Y									
1 Day + (Enter Days)			≈3			≈2							
Property Damage													
Loss of Life/Vital Services		X											
Private		X	X										
More Than One Owner													
Types of Properties													
Number of Properties													
Public (List Types)													
Explanation Line No. (On Back)													
Solutions													
Suggested													
Explanation Line No. (On Back)													
Formally Proposed													
Explanation Line No. (On Back)													

* Include Map ID No. if found on any other form listing proposed facilities.

A-1: BRIDGE OUT. APARTMENT DAMAGE.

A-2: HOUSE DAMAGE

A-5: FLOODING ON WATER COMPANY PROPERTY

INSTRUCTIONS

Begin with A.1 as the first map number to identify the first' storm water problem area. Illustrate the defined problem on the watershed map provided, and identify it with its map number.

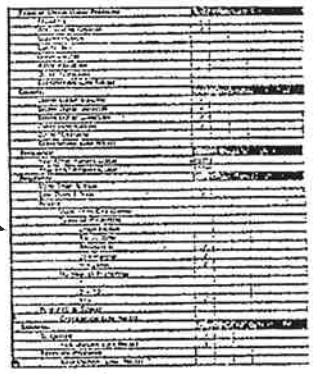
For each storm water problem area within your municipality, enter the map identification number at the head of the column. Describe the problem by placing a check (4 in the appropriate blocks of the column under this map identification number.

When an additional explanation is required, write the line number(s) used in the column marked "Explanation Line No. (s)".Example 1, 2-3, etc.

If storm water problem occurred during and after Agnes, describe the frequency of the problem after Agnes.

Use the explanation lines to list the types of public property damages ,e.g.roadways, hospitals, etc.

Enter the line no. (s) used to list the map ID no. (s) for the proposed facilities.



Definitions

Storm Water Problem Area
An area that defines the farthest extent of a storm water problem, including any area that experiences property damage, inundation, accelerated erosion, surface water pollution, groundwater pollution, landslides, or any other problem as a result of storm water runoff.

Groundwater
Water in the ground below the water table.

Accelerated Erosion
The removal of the surface of the land through the combined action of man's activities and the natural processes at a rate greater than would occur because of the natural process alone.

Sedimentation
The process by which soil or other surface materials, transported by surface water, is deposited on stream bottoms.

Water Obstruction
Any dike, bridge, culvert, wall, wingwall, fill, pier, wharf, embankment, abutment, or other structure located in, along, across, or projecting into any watercourse, floodway, or body of water.

EXPLANATION LINES (continued)

EXISTING FLOOD CONTROL PROJECT FORM C. SHEET ____ OF ____

WATERSHED
Name: CRUM/DARBY
Municipality: MARPLE
County: DELAWARE

FORM COMPLETED BY
Name: C. SERPENTE
Telephone: 610.940.1050
Date: 6/7/05

TYPICAL TYPES OF FLOOD CONTROL PROJECTS

Channel Excavation / Widening	Levee	Dams
Channel Realignment	Gabions	Floodwall
Rock Riprap	Pipe Channel	Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Year Constr Built	Expected Life Yrs.	Design Flood Frequency Yrs.	Design Flood Discharge C.F.S. (if known)	Owner Name, Address, and Phone
C- 1	1000 FOOT LONG ROCK + WIRE MESH SWALE	2003	25			LAWRENCE COURT APARTMENTS
C- 2	RECONSTRUCTED MANHOLE. INSTALLED BLACKTOP BERM IN DRIVEWAY	2005	25			ALLISON DRV.
C- 3	ADDED FRENCH DRAINS. RECONSTRUCTED MANHOLE	2005	25			GLENSPRING CIRCLE
C- 4	ADDED 5 STORM SEWERS INLETS	2005	25			LANGFORD ROAD
C-						

C-1 => FLOODING STILL A PROBLEM

C-2, C-3 => IMPROVEMENT IN FLOODING

PROPOSED FLOOD CONTROL PROJECT FORM D. SHEET OF

WATERSHED

Name: CRUM/DARBY
Municipality: MARPLE
County: DELAWARE

FORM COMPLETED BY

Name: C. SERPENTI
Telephone: 610.940.1050
Date: 6/7/05

TYPICAL TYPES OF FLOOD CONTROL PROJECTS

Channel Excavation / Widening	Levee	Dams
Channel Realignment	Gabions	Floodwall
Rock Riprap	Pipe Channel	Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Study Phase Begun			Year Constr. Planned	Projected Compltn. Date	Expected Life Yrs.	Design Flood		Map ID No. Form A*	Owner Name, Address, and Phone
		YES		N0				Frequency Yrs.	Discharge C.F.S.		
		Prelim.	Final								
D-											
D-											
D-											
D-											
D-											

* Enter the storm water problem area's Map ID No., if the proposed project will solve or reduce any / all of an identified drainage problem.

FORM E

EXISTING STORM WATER CONTROL FACILITIES FORM E. SHEET OF

WATERSHED	FORM COMPLETED BY	DEFINITION
Name: CRUM/DARBY Municipality: MARPLE County: DELAWARE	Name: C SERPENTE Telephone: 610.940.1050 Date: 6/8/05	Storm Water Control Facility A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.
For County Use:		

Map ID No.	Type of Storm Water Control Facility	Year Built	Contact Person Name, Address and Phone	Comments
E- 1	RETENTION BASIN	2004	PRIVATELY OWNED	NOT OWNED BY TOWNSHIP
E- 2	SWAMP/ WETLAND	X	Y	NATURAL SWAMP AREA
E- 3	RETENTION BASIN	1993	MARPLE TOWNSHIP	
E-				
E-				
E-				
E-				
E-				

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

Detention / Retention Basin

Natural Pond or Wetland

Parking Lot Pondling

Roof-Top Storage

Semi-Pervious Paving

Infiltration Device (Seepage / Recharge Basin or Underground Tank)

FORM F

STORMWATER FACILITIES

PROPOSED ~~FLOOD~~ CONTROL ~~PROJECT~~ FORM F. SHEET ____ OF ____

WATERSHED		FORM COMPLETED BY	
Name:	CRUM/DARBY	Name:	C. SERPENTE
Municipality:	MARPLE	Telephone:	
County:	DELAWARE	Date:	

DEFINITION

Storm Water Control Facility

A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.

For County Use:

Map ID No.	Type of Storm Water Control Facility	Proposed Constr. Dates Start	End	Map No. Form A*	Contact Person Name, Address and Phone	Comments
F- 1	5 ADDITIONAL STORM SEWERS/INLETS	2005	2005		MARPLE TOWNSHIP	MARPLE GARDENS
F- 2	5 ADDITIONAL SEWERS/INLETS	2005	2005		" "	LANGFORD ROAD
F-						
F-						
F-						
F-						
F-						
F-						

* Enter the storm water problem area's Map ID No., if the proposed project will solve or reduce any / all of an identified drainage problem.

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

- Detention / Retention Basin
- Natural Pond or Wetland
- Parking Lot Pondling
- Roof-Top Storage
- Semi-Pervious Paving
- Infiltration Device (Seepage / Recharge Basin or Underground Tank)

FORM G (Front)

→ SEE ENCLOSED MAP OF SYSTEM

Stormwater Collection

EXISTING ~~FLOOD CONTROL PROJECT~~ FORM G. SHEET ____ OF ____

WATERSHED

FORM COMPLETED BY

Name:

Municipality: MARPLE

County:

Name:

Telephone:

Date:

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1,G-2,G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map I.D. No.		System's Elements (x)			Measurements *				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												

* See measurement key on reverse side.

FORM H (Front)

Storm Water Collection

PROPOSED ~~FLOOD CONTROL PROJECT~~ FORM H.

SHEET 1 OF 1

WATERSHED	FORM COMPLETED BY
Name: CRUM/DARBY	Name: C. SERPENTE
Municipality: MARPLE	Telephone: 610. 940. 1050
County: DELAWARE	Date: 6/9/05

INSTRUCTIONS

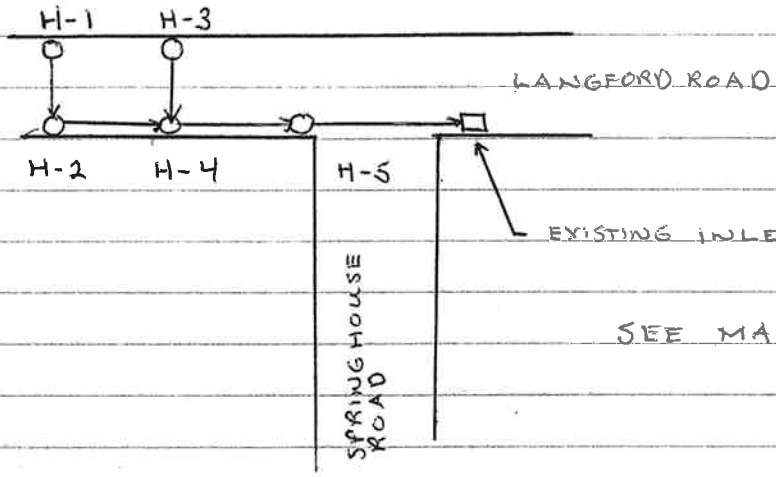
On the map for proposed storm water collection systems, diagram each proposed system. Indicate a map point to show changes in system elements, pipe size, pipe direction and connections to existing systems. For proposed additions to existing systems, diagram only the additions and their connection point into the existing system. Complete a separate form for each proposed, new system and one for each existing system having one or more proposed additions. Identify the points within a system consecutively (ex. H-1, H-2, H-3). Start the first point in each additional system 20 numbers higher (if H-3 ends one system, begin the next with H-23). Be sure to show the point where proposed additions connect into existing systems, using the map point number from the existing system form and map. See Sample Diagrams and Form on Reverse.

Map I.D. No.		System's Elements (x)			Measurements *					Map I.D.	Proposed		Design	Contact Person	Name of Final	
					Pipe	Open Channel / Swale			Material	Nos.**	Const. Dates		Data	Name and	Ownership and	
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth		Form A	Start	End	Avail.	Phone	Maintenance Responsibility	
H- 1	H- 5	X			18"Ø				SOLID ADS		2005	2005			MARPLE TOWNSHIP	SEE F-2
H- 25	H- 28	X			12"Ø				SOLID ADS		2005	2005			MARPLE TOWNSHIP	SEE F-1
H-	H-															
H-	H-															
H-	H-															
H-	H-															
H-	H-															
H-	H-															
H-	H-															
H-	H-															
H-	H-															
H-	H-															

* See measurement key on reverse side. ** Enter the storm water problem areas' Map I.D. Nos., if proposed project will solve or reduce any / all of the drainage problems.

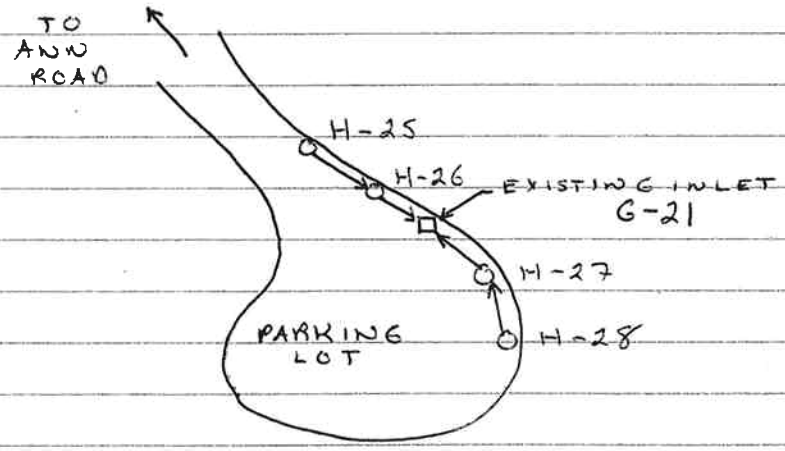
FORM H DATA

H-1 ⇒ H-5



SEE MAP F-2

H-25 ⇒ H-28 MARPLE GARDEN PARK



FORM I

NA

PRESENT & PROJECTED DEVELOPMENT IN THE FLOOD HAZARD AREA (FORM 1) SHEET ____ OF ____

WATERSHED

Name:

Municipality: MARPLE

County:

FORM COMPLETED BY

Name:

Telephone:

Date:

For County Use:

DEFINITION

FLOOD HAZARD AREA:

A NORMALLY DRY LAND AREA THAT HAS BEEN OR IS SUSCEPTABLE TO BEING INUNDATED BY THE 100-YEAR FLOOD.

Map ID No.	TYPE OF DEVELOPMENT	Year Built	Contact Person Name, Address and Phone	Comments
I -				
I -				
I -				
I -				
I -				
I -				
I -				

Form J

WATER QUALITY PROBLEM AREAS FORM J. SHEET_____ OF _____

WATERSHED					FORM COMPLETED BY								
Name:					Name:								
Municipality:	MARPLE				Telephone:								
County:					Date:								
SITE		J-	J-	J-	J-	J-	J-	J-	J-	J-	J-	J-	J-
Types of Water Quality Problems													
High Community Tolerence													
High Temperature													
High Turbidity													
Hydrocarbon Pollution													
Low Community Diversity													
Low Dissolved Oxygen													
Low pH													
Nutrient Enrichment													
Poor Habitat													
Other/Explanation Line No.													
Potential Cause(s)													
Agriculture													
Construction Site													
Erosion													
Lake Discharge													
STP Outfall													
Other/Explanation Line No.													
Frequency													
Year Most Recent Occurence													
Year First Known Occurence													
Source of Information													
County Water Quality Study													
Driveby													
Other/Explanation Line No.													
		EXPLANATION LINES											
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													

Form O - Outfall Data

Person: _____ Date: _____ Time Since Last Rain was ≥ 72 Ho

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Day

Municipality: MARPLE Name of receiving water: _____

Pipe Swale #	Photo #	Storm Drain? Yes/No Not Sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor c

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or de blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Remington & Vernick Engineers
Remington, Vernick & Vena Engineers
Remington, Vernick & Beach Engineers
Remington, Vernick & Walberg Engineers

EDWARD VERNICK, P.E., C.M.E., President
CRAIG F. REMINGTON, P.L.S., P.P., Vice President

EXECUTIVE VICE PRESIDENTS
Michael D. Vena, P.E., P.P., C.M.E.
Edward J. Walberg, P.E., P.P., C.M.E.
Thomas F. Beach, P.E., C.M.E.

DIRECTOR OF OPERATIONS
CORPORATE SECRETARY
Bradley A. Blubaugh, B.A., M.P.A.

SENIOR ASSOCIATES
John J. Cantwell, P.E., P.P., C.M.E.
Alan Dittenhofer, P.E., P.P., C.M.E.
Frank J. Seney, Jr., P.E., P.P., C.M.E.
Terence Vogt, P.E., P.P., C.M.E.
Dennis K. Yoder, P.E., P.P., C.M.E.

Remington & Vernick Engineers
232 Kings Highway East
Haddonfield, NJ 08033
(856) 795-9595
(856) 795-1882 (fax)

18 East Broad Street
Burlington City, NJ 08016
(609) 387-7053
(609) 387-5320 (fax)

Remington, Vernick & Vena Engineers
9 Allen Street
Toms River, NJ 08753
(732) 286-9220
(732) 505-8416 (fax)

Remington, Vernick & Walberg Engineers
845 North Main Street
Pleasantville, NJ 08232
(609) 645-7110
(609) 645-7076 (fax)

4907 New Jersey Avenue
Wildwood City, NJ 08260
(609) 522-5150
(609) 522-5313 (fax)

Remington, Vernick & Beach Engineers
922 Fayette Street
Conshohocken, PA 19428
(610) 940-1050
(610) 940-1161 (fax)

University Office Plaza
Commonwealth Building
260 Chapman Road Ste. 104F
Newark, DE 19702
(302) 266-0212
(302) 266-6208 (fax)

www.rve.com

Established in 1901

June 10, 2005

Delaware County Planning Department
Government Center Building
201 West Front Street
Media, PA 19063

Attn: Karen Holm

Re: Marple Township
Crum Creek Watershed Planning
Our File# PDMAT387

Dear Karen:

Attached, please find one (1) copy of the information you requested for the Crum Creek Watershed Planning Report.

Should you need any further assistance on this matter please feel free to contact our office at (610) 940-1050.

Very truly yours,
Remington, Vernick & Beach Engineers

Christopher J. Fazio, P.E., C.M.E

Enclosures
cc: Joseph Wm. Flicker, Township Manager
Thomas F. Beach, Executive Vice President
Chris Serpente, P.E.

CRUM CREEK WATERSHED
ACT 167 STORMWATER MANAGEMENT PLAN

MUNICIPALITY QUESTIONNAIRE

Please fill out the following questionnaire and return it to Karen Holm at the Delaware County Planning Department, Court House and Government Center Building, 201 West Front St. Media, PA 19063 as soon as possible. If you have any questions or comments, or if you would like these forms in digital format, please call Karen at 610-891-5213 or e-mail her at holmk@co.delaware.pa.us.

PART I - GENERAL INFORMATION

Municipality: MARPLE TOWNSHIP

Contact Person: JOE FLICKER

WPAC Designee: JOE FLICKER

Title: TOWNSHIP MANAGER

Address: 227 SOUTH SPROUL RD

BROOMALL PA 19008

Phone: 610.356.4040

Fax: 610.356.3587

Person Completing form (if different from Contact Person):

Name: C. SERPENTE

Address: REMINGTON, VERNICK + BEACH ENGINEERS

922 FAYETTE ST

CONSHOHOCKEN, PA 19428

Phone: 610.940.1050 x519, FAX: 610.940.1161

Fax:

E-mail: X

PART II - REGULATORY ACTIVITIES

A. Please indicate the regulations you currently use to manage development.

REGULATION	MUNICIPAL ORDINANCE	COUNTY ORDINANCE
Zoning Ordinance	X	
Subdivision/Land Development Ordinance	X	
Separate Stormwater Ordinance	X	
Separate Floodplain Ordinance	X	

B. Please indicate the agencies/individuals who review and approve land development plans and zoning variance/waiver requests.

ENTITY	LAND DEVELOPMENT PLANS		ZONING VARIANCE/WAIVER REQUESTS	
	REVIEW	APPROVE	REVIEW	APPROVE
Supervisors		X		X
Municipal Engineering Department				
Municipal Planning Department	X			
County Planning Department	X			
County Conservation District	X			
Zoning Hearing Board	X		X	
Consulting Engineer	X		X	
Others (List Below				

C. Please provide **copies** of your zoning, subdivision/land development, and separate stormwater management and floodplain ordinances and your current zoning map when you return this questionnaire. Please list these documents below.

COMING VIA MAIL. PLS CALL CHRIS SERPENTE 610.940.1050 X519 IF NEEDED.

PART III - MUNICIPAL AND LOCAL PLANNING ACTIVITIES

Please indicate below whether your community has approved the following plans and maps and the date of the most recent update.

ITEM	APPROVED/DATE	IN PROGRESS	PLANNED WITHIN NEXT YEAR
PA Act 537 Sewage Facilities Plan	X		
Comprehensive Land Use Plan		X	PLANNED REVISION
Existing Land Use Maps		X	PLANNED REVISION
Proposed Land Use Maps			
Zoning Maps		X	EXPECT 6/05

PART IV - FLOOD INSURANCE PROGRAM AND COMPREHENSIVE LAND USE PLAN

Please indicate below whether your community participates in the National Flood Insurance Program:

ITEM	PARTICIPATES (Y/N)
Flood Hazard Boundary Map (FHBM)	
Participates in FEMA Emergency Program	Y
Participates in FEMA Regular Program	

PART V - EXISTING STORMWATER RELATED PROBLEMS AND STRUCTURES

Please complete the matrices on the following pages (Forms A and C-J) to describe any significant stormwater-related problems (Form A), Existing or Proposed Flood Control Projects (Forms C & D), Existing or Proposed Storm Water Control Facilities (Forms E and F), Existing or Proposed Stormwater Collection Systems (Forms G & H), Present and Projected Development in the Flood Hazard Area (Form I), and Water Quality Problem Areas (Form J) that you are aware of in your municipality.

What we would like to ask of you is that you complete as much of the attached data collection forms as possible. There is a different form for each item of information as summarized in the attached "FORM DESCRIPTION SUMMARY. The process would be as follows starting with the problem areas (Form A):

- Place the location of the problem area on the map as shown in the attached example map.
- Draw a box on the map with the problem area identifier starting with A-1 with an arrow leading from the problem area identifier to the problem area.
- Place an A-1 in the first column of FORM A.
- Put a check in each box in the A-1 column that represents the problems associated with that particular problem area.
- Repeat with the next problem area (A-2) and so on.

- Repeat for existing flood control projects (FORM C) placing a triangle on the maps and starting the labeling with C-1.
- Repeat for all forms.

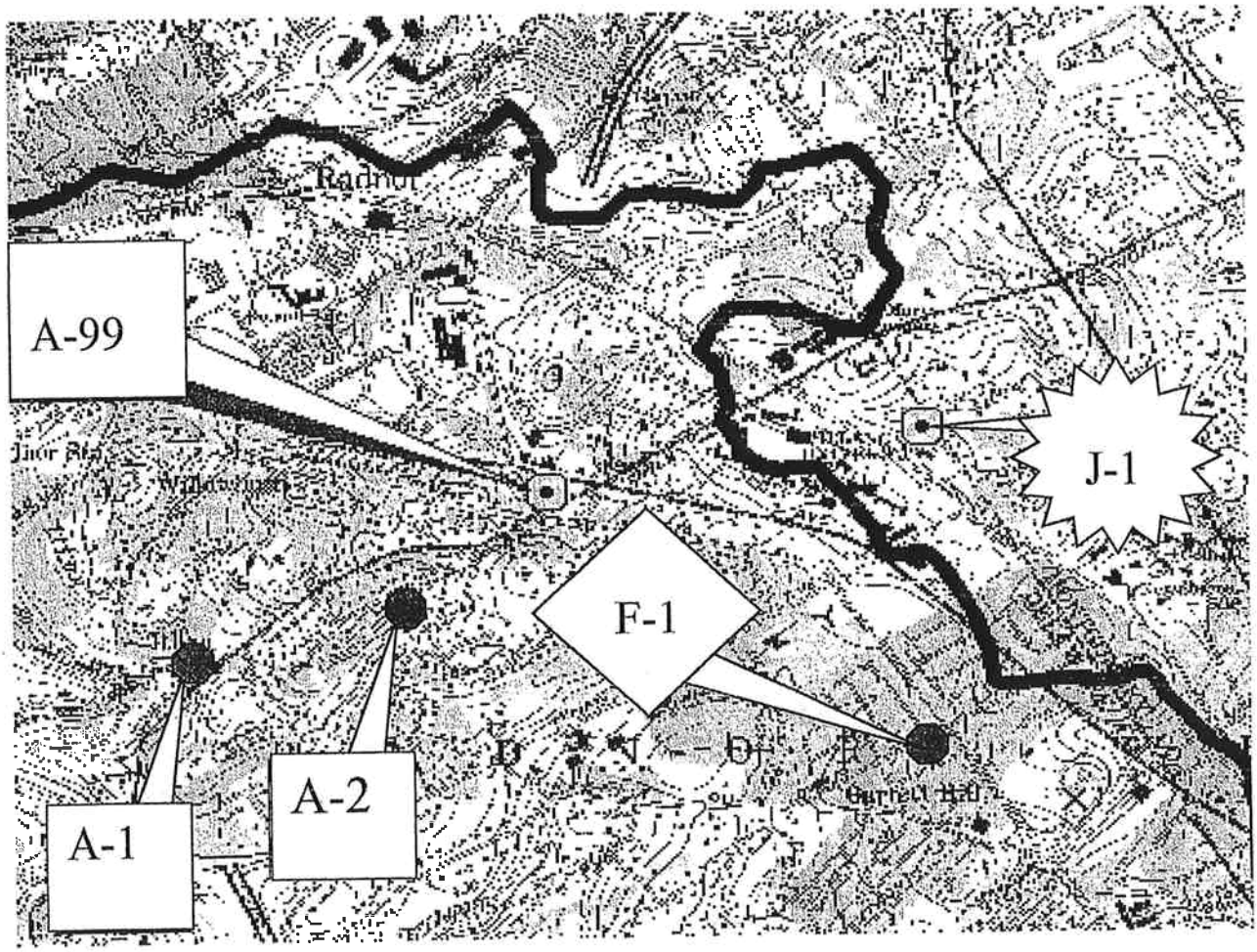
The sample map attached shows three problem areas (A99- A1 and A-2), one proposed flood control project (F-1) and one water quality problem (J1).

Use additional paper to provide <u>detailed</u> descriptions of your most serious problems and attach a map to show the location of the problem. Attach photographs, if available.

If you have any storm or combined sewers, please provide maps showing the collection system and overflow discharge locations and an estimate of the average annual discharge at each overflow point.

The more detail you provide, the better we will be able to evaluate the situation for your municipality. We appreciate your help.

Sample Location of Information from Data Collection Forms on the Municipal Map



Form A

STORM WATER PROBLEM AREAS FORM A. SHEET 1 OF 1

WATERSHED		FORM COMPLETED BY					Before Filling Out Form, See Instructions On Back							
Name:	CRUM/DARBY	Name:	C. SERPENTE											
Municipality:	MARPLE	Telephone:	610 940 1050				For County Use:							
County:	DELAWARE	Date:	6/6/05											
MAP NO. *		A- 1	A- 2	A- 3	A- 4	A- 5	A-	A-	A-	A-	A-	A-	A-	
Types of Storm Water Problems														
Flooding		X	X			X								
Accelerated Erosion	NO													
Sedimentation	NO													
Landslide	NO													
Groundwater				X	X									
Water Pollution														
Other (Explain)														
Explanation Line No. (On Back)														
Cause (s)														
Storm Water Volume		X	X	X	X	X								
Storm Water Velocity														
Storm Water Direction														
Water Obstruction														
Other (Explain)														
Explanation Line No. (On Back)														
Frequency														
Year Most Recent Occurred		05	05	05	05	05								
Year First Known Occurred														
Regularity														
More Than 1 Year		Y	Y	Y	Y	Y								
Less Than 1 Year														
Only During Agnes														
Duration (If Applicable)														
Less Than 1 Day		Y		Y										
1 Day + (Enter Days)			≈3			≈2								
Property Damage														
Loss of Life/Vital Services		X												
Private		X	X											
More Than One Owner														
Types of Properties														
Number of Properties														
Public (List Types)														
Explanation Line No. (On Back)														
Solutions														
Suggested														
Explanation Line No. (On Back)														
Formally Proposed														
Explanation Line No. (On Back)														

* Include Map ID No. if found on any other form listing proposed facilities.

A-1: BRIDGE OUT. APARTMENT DAMAGE.

A-2: HOUSE DAMAGE

A-5: FLOODING ON WATER COMPANY PROPERTY

INSTRUCTIONS

Begin with A.1 as the first map number to identify the first' storm water problem area. Illustrate the defined problem on the watershed map provided, and identify it with its map number.

For each storm water problem area within your municipality, enter the map identification number at the head of the column. Describe the problem by placing a check (4 in the appropriate blocks of the column under this map identification number.

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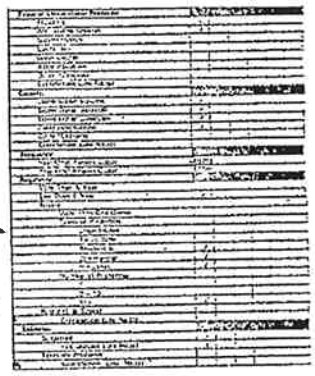
If storm water problem occurred during and after Agnes, describe the frequency of the problem after Agnes.

Use the explanation lines to list the types of public property damages ,e.g.roadways, hospitals, etc.

Enter the line no. (s) used to list the map ID no. (s) for the proposed facilities.



Definitions

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An area that defines the farthest extent of a storm water problem, including any area that experiences property damage, inundation, accelerated erosion, surface water pollution, groundwater pollution, landslides, or any other problem as a result of storm water runoff.

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Water in the ground below the water table.

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The removal of the surface of the land through the combined action of man's activities and the natural processes at a rate greater than would occur because of the natural process alone.

Sedimentation
The process by which soil or other surface materials, transported by surface water, is deposited on stream bottoms.

Water Obstruction
Any dike, bridge, culvert, wall, wingwall, fill, pier, wharf, embankment, abutment, or other structure located in, along, across, or projecting into any watercourse, floodway, or body of water.

EXPLANATION LINES (continued)

FORM C

EXISTING FLOOD CONTROL PROJECT FORM C. SHEET ____ OF ____

WATERSHED	FORM COMPLETED BY	TYPICAL TYPES OF FLOOD CONTROL PROJECTS
Name: CRUM/DARBY Municipality: MARPLE County: DELAWARE	Name: C. SERPENTE Telephone: 610.940.1050 Date: 6/7/05	Channel Excavation / Widening, Channel Realignment, Rock Riprap, Levee, Gabions, Pipe Channel, Dams, Floodwall, Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Year Constr Built	Expected Life Yrs.	Design Flood Frequency Yrs.	Design Flood Discharge C.F.S. (if known)	Owner Name, Address, and Phone
C-1	1000 FOOT LONG ROCK + WIRE MESH SWALE	2003	25			LAWRENCE COURT APARTMENTS
C-2	RECONSTRUCTED MANHOLE. INSTALLED BLACKTOP BERM IN DRIVEWAY	2005	25			ALLISON DRV.
C-3	ADDED FRENCH DRAINS. RECONSTRUCTED MANHOLE	2005	25			GLENSPRING CIRCLE
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C-						

C-1 => FLOODING STILL A PROBLEM

C-2, C-3 => IMPROVEMENT IN FLOODING

FORM D

PROPOSED FLOOD CONTROL PROJECT FORM D. SHEET OF

WATERSHED

Name: CRUM/DARBY
Municipality: MARPLE
County: DELAWARE

FORM COMPLETED BY

Name: C. SERPENTI
Telephone: 610.940.1050
Date: 6/7/05

TYPICAL TYPES OF FLOOD CONTROL PROJECTS

Channel Excavation / Widening
Channel Realignment
Rock Riprap
Levee
Gabions
Pipe Channel
Dams
Floodwall
Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Study Phase Begun			Year Constr. Planned	Projected Compltn. Date	Expected Life Yrs.	Design Flood		Map ID No. Form A*	Owner Name, Address, and Phone
		YES		N0				Frequency Yrs.	Discharge C.F.S.		
		Prelim.	Final								
D-											
D-											
D-											
D-											
D-											

* Enter the storm water problem area's Map ID No., if the proposed project will solve or reduce any / all of an identified drainage problem.

FORM E

EXISTING STORM WATER CONTROL FACILITIES FORM E. SHEET OF

WATERSHED	FORM COMPLETED BY	DEFINITION
Name: CRUM/DARBY Municipality: MARPLE County: DELAWARE	Name: C SERPENTE Telephone: 610.940.1050 Date: 6/8/05	Storm Water Control Facility A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.
For County Use:		

Map ID No.	Type of Storm Water Control Facility	Year Built	Contact Person Name, Address and Phone	Comments
E- 1	RETENTION BASIN	2004	PRIVATELY OWNED	NOT OWNED BY TOWNSHIP
E- 2	SWAMP/ WETLAND	X	Y	NATURAL SWAMP AREA
E- 3	RETENTION BASIN	1993	MARPLE TOWNSHIP	
E-				
E-				
E-				
E-				
E-				

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

Detention / Retention Basin

Natural Pond or Wetland

Parking Lot Pondling

Roof-Top Storage

Semi-Pervious Paving

Infiltration Device (Seepage / Recharge Basin or Underground Tank)

FORM F

STORMWATER FACILITIES

PROPOSED ~~FLOOD~~ CONTROL ~~PROJECT~~ FORM F. SHEET ____ OF ____

WATERSHED		FORM COMPLETED BY	
Name:	CRUM/DARBY	Name:	C. SERPONTE
Municipality:	MARPLE	Telephone:	
County:	DELAWARE	Date:	

DEFINITION

Storm Water Control Facility

A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.

For County Use:

Map ID No.	Type of Storm Water Control Facility	Proposed Constr. Dates Start	Proposed Constr. Dates End	Map No. Form A*	Contact Person Name, Address and Phone	Comments
F- 1	5 ADDITIONAL STORM SEWERS/INLETS	2005	2005		MARPLE TOWNSHIP	MARPLE GARDENS
F- 2	5 ADDITIONAL SEWERS/INLETS	2005	2005		" "	LANGFORD ROAD
F-						
F-						
F-						
F-						
F-						
F-						

* Enter the storm water problem area's Map ID No., if the proposed project will solve or reduce any / all of an identified drainage problem.

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

Detention / Retention Basin	Roof-Top Storage
Natural Pond or Wetland	Semi-Pervious Paving
Parking Lot Pondling	Infiltration Device (Seepage / Recharge Basin or Underground Tank)

FORM G (Front)

→ SEE ENCLOSED MAP OF SYSTEM

Stormwater Collection

EXISTING ~~FLOOD CONTROL PROJECT~~ FORM G.

SHEET ____ OF ____

WATERSHED

FORM COMPLETED BY

Name:

Municipality: MARPLE

County:

Name:

Telephone:

Date:

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1,G-2,G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map I.D. No.		System's Elements (x)			Measurements *				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												

* See measurement key on reverse side.

FORM H (Front)

Storm Water Collection

PROPOSED ~~FLOOD CONTROL PROJECT~~ FORM H. SHEET 1 OF 1

WATERSHED	FORM COMPLETED BY
Name: CRUM/DARBY	Name: C. SERPENTE
Municipality: MARPLE	Telephone: 610. 940. 1050
County: DELAWARE	Date: 6/9/05

INSTRUCTIONS

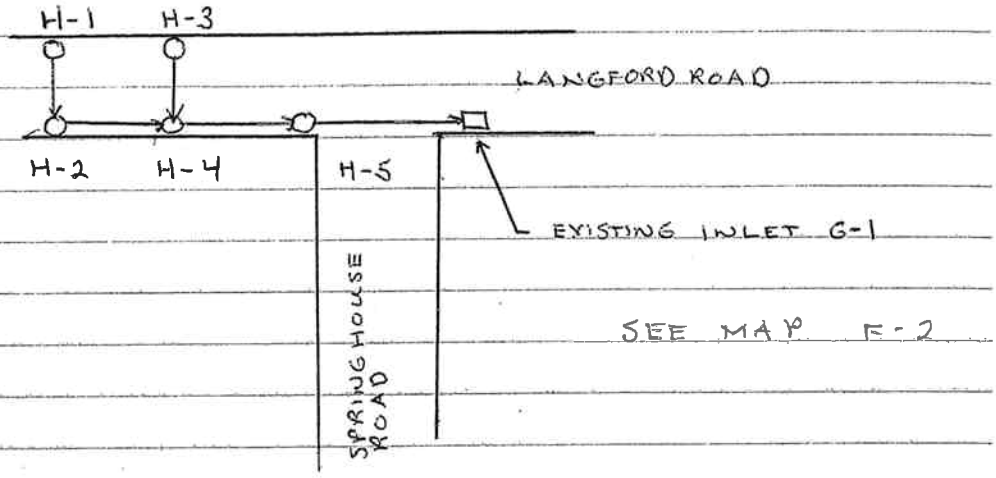
On the map for proposed storm water collection systems, diagram each proposed system. Indicate a map point to show changes in system elements, pipe size, pipe direction and connections to existing systems. For proposed additions to existing systems, diagram only the additions and their connection point into the existing system. Complete a separate form for each proposed, new system and one for each existing system having one or more proposed additions. Identify the points within a system consecutively (ex. H-1, H-2, H-3). Start the first point in each additional system 20 numbers higher (if H-3 ends one system, begin the next with H-23). Be sure to show the point where proposed additions connect into existing systems, using the map point number from the existing system form and map. See Sample Diagrams and Form on Reverse.

Map I.D. No.		System's Elements (x)			Measurements *				Material	Map I.D. Nos.**	Proposed Const. Dates		Design Data	Contact Person	Name of Final Ownership and	
From	To	Pipe	Open Channel	Swale	Pipe D	Open Channel / Swale TW	B	Depth		Form A	Start	End	Avail.	Name and Phone	Maintenance Responsibility	
H- 1	H- 5	X			18"Ø				SOLID ADS		2005	2005			MARPLE TOWNSHIP	SEE F-2
H- 25	H- 28	X			12"Ø				SOLID ADS		2005	2005			MARPLE TOWNSHIP	SEE F-1
H-	H-															
H-	H-															
H-	H-															
H-	H-															
H-	H-															
H-	H-															
H-	H-															
H-	H-															
H-	H-															
H-	H-															

* See measurement key on reverse side. ** Enter the storm water problem areas' Map I.D. Nos., if proposed project will solve or reduce any / all of the drainage problems.

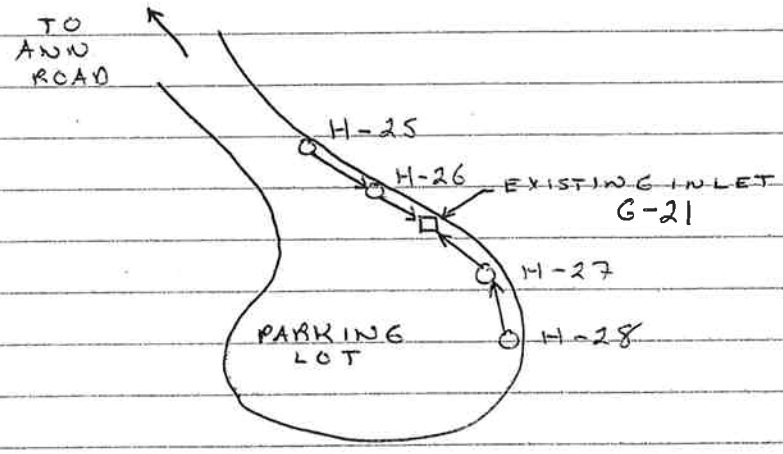
FORM H DATA

H-1 ⇒ H-5



SEE MAP F-2

H-25 ⇒ H-28 MARPLE GARDEN PARK



FORM I

NA

PRESENT & PROJECTED DEVELOPMENT IN THE FLOOD HAZARD AREA (FORM 1)

SHEET _____ OF _____

WATERSHED

Name:

Municipality: MARPLE

County:

FORM COMPLETED BY

Name:

Telephone:

Date:

For County Use:

DEFINITION

FLOOD HAZARD AREA:

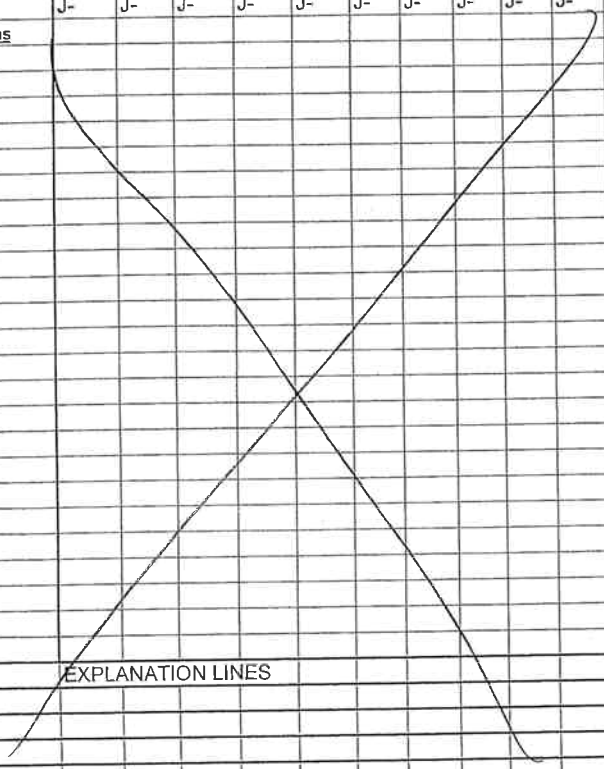
A NORMALLY DRY LAND AREA THAT HAS BEEN OR IS SUSCEPTABLE TO BEING INUNDATED BY THE 100-YEAR FLOOD.

Map ID No.	TYPE OF DEVELOPMENT	Year Built	Contact Person Name, Address and Phone	Comments
I -				
I -				
I -				
I -				
I -				
I -				
I -				

Form J

WATER QUALITY PROBLEM AREAS FORM J. SHEET_____ OF _____

WATERSHED					FORM COMPLETED BY								
Name:					Name:								
Municipality:	MARPLE				Telephone:								
County:					Date:								
SITE		J-	J-	J-	J-	J-	J-	J-	J-	J-	J-	J-	J-
Types of Water Quality Problems													
High Community Tolerence													
High Temperature													
High Turbidity													
Hydrocarbon Pollution													
Low Community Diversity													
Low Dissolved Oxygen													
Low pH													
Nutrient Enrichment													
Poor Habitat													
Other/Explanation Line No.													
Potential Cause(s)													
Agriculture													
Construction Site													
Erosion													
Lake Discharge													
STP Outfall													
Other/Explanation Line No.													
Frequency													
Year Most Recent Occurence													
Year First Known Occurence													
Source of Information													
County Water Quality Study													
Driveby													
Other/Explanation Line No.													
	EXPLANATION LINES												
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													



Form O - Outfall Data

Person: _____ Date: _____ Time Since Last Rain was ≥ 72 Ho

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Day

Municipality: MARPLE Name of receiving water: _____

Pipe Swale #	Photo #	Storm Drain? Yes/No Not Sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or de blocked catch basins or drain)

H/V = Horizontal to vertical ratio

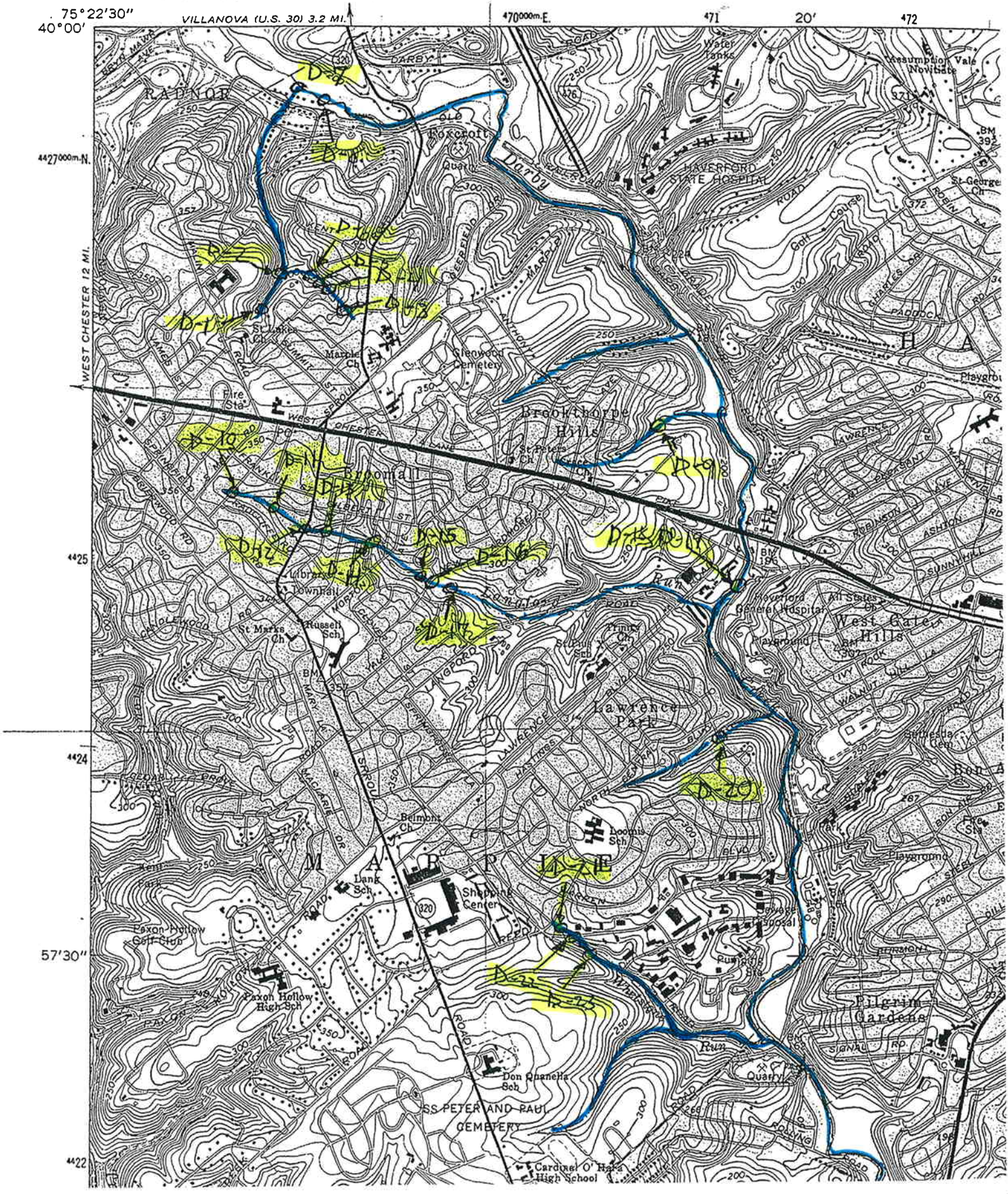
*1:1 = Vertical - rectangular channel

NOTES:

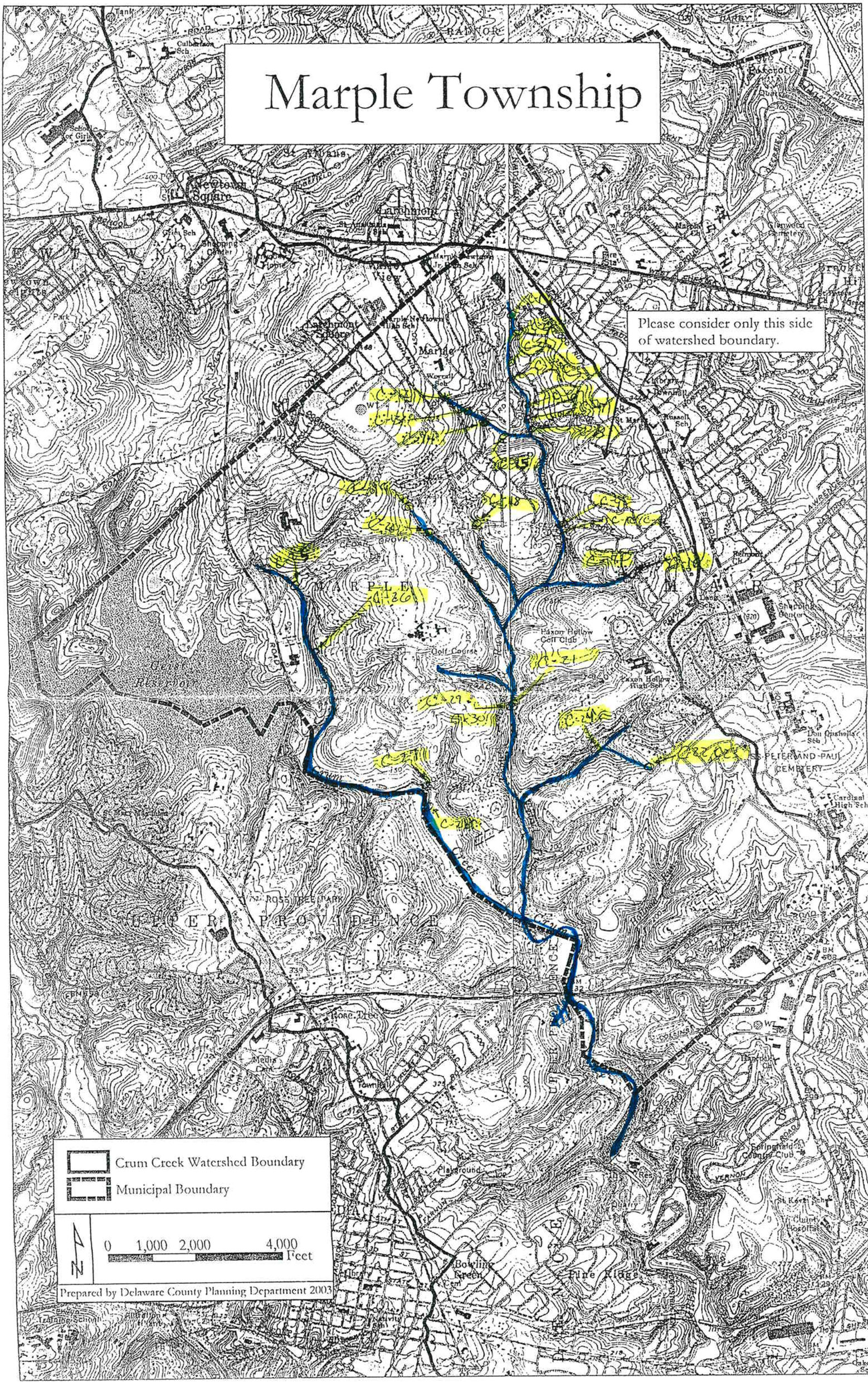
5964 III SW
VALLEY FORGE)

Lansdowne Quad.
Marple Twp.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



Marple Township



MEDIA BOROUGH

CRUM CREEK WATERSHED
ACT 167 STORMWATER MANAGEMENT PLAN

MUNICIPALITY QUESTIONNAIRE

Please fill out the following questionnaire and return it to Karen Holm at the Delaware County Planning Department, Court House and Government Center Building, 201 West Front St. Media, PA 19063 as soon as possible. If you have any questions or comments, or if you would like these forms in digital format, please call Karen at 610-891-5213 or e-mail her at holmk@co.delaware.pa.us.

PART I - GENERAL INFORMATION

Municipality: Borough of Media

Contact Person: Jeffrey A Smith

WPAC Designee:

Title: Borough Manager

Address: 301 N Jackson St 2nd Floor
Media PA 19063

Phone: 610-566-5210 Ext 242

Fax: 610-566-0335

Person Completing form (if different from Contact Person):

Name: Jim Jeffery Code Enforcement Director

Address: 301 N Jackson St 2nd Floor
Media PA 19063

Phone: 610-566-5210 x 246

Fax: 610-566-0335

E-mail: jim-jeffery@mediaborough.com

PART II - REGULATORY ACTIVITIES

A. Please indicate the regulations you currently use to manage development.

REGULATION	MUNICIPAL ORDINANCE	COUNTY ORDINANCE
Zoning Ordinance	✓	
Subdivision/Land Development Ordinance	✓	
Separate Stormwater Ordinance	✓	
Separate Floodplain Ordinance	✓	

B. Please indicate the agencies/individuals who review and approve land development plans and zoning variance/waiver requests.

ENTITY	LAND DEVELOPMENT PLANS		ZONING VARIANCE/WAIVER REQUESTS	
	REVIEW	APPROVE	REVIEW	APPROVE
Supervisors	✓	✓	✓	?
Municipal Engineering Department	✓	✓		
Municipal Planning Department	✓	✓	✓	
County Planning Department	✓	✓		
County Conservation District	✓	✓		
Zoning Hearing Board				✓
Consulting Engineer	✓	✓	✓	
Others (List Below				

C. Please provide **copies** of your zoning, subdivision/land development, and separate stormwater management and floodplain ordinances and your current zoning map when you return this questionnaire. Please list these documents below.

PART III - MUNICIPAL AND LOCAL PLANNING ACTIVITIES

Please indicate below whether your community has approved the following plans and maps and the date of the most recent update.

ITEM	APPROVED/DATE	IN PROGRESS	PLANNED WITHIN NEXT YEAR
PA Act 537 Sewage Facilities Plan	✓		
Comprehensive Land Use Plan	✓		
Existing Land Use Maps	✓		
Proposed Land Use Maps			
Zoning Maps	✓		

PART IV - FLOOD INSURANCE PROGRAM AND COMPREHENSIVE LAND USE PLAN

Please indicate below whether your community participates in the National Flood Insurance Program:

ITEM	PARTICIPATES (Y/N)
Flood Hazard Boundary Map (FHBM)	✓
Participates in FEMA Emergency Program	✓
Participates in FEMA Regular Program	✓

PART V - EXISTING STORMWATER RELATED PROBLEMS AND STRUCTURES

Please complete the matrices on the following pages (Forms A and C-J) to describe any significant stormwater-related problems (Form A), Existing or Proposed Flood Control Projects (Forms C & D), Existing or Proposed Storm Water Control Facilities (Forms E and F), Existing or Proposed Stormwater Collection Systems (Forms G & H), Present and Projected Development in the Flood Hazard Area (Form I), and Water Quality Problem Areas (Form J) that you are aware of in your municipality.

What we would like to ask of you is that you complete as much of the attached data collection forms as possible. There is a different form for each item of information as summarized in the attached "FORM DESCRIPTION SUMMARY. The process would be as follows starting with the problem areas (Form A):

- Place the location of the problem area on the map as shown in the attached example map.
- Draw a box on the map with the problem area identifier starting with A-1 with an arrow leading from the problem area identifier to the problem area.
- Place an A-1 in the first column of FORM A.
- Put a check in each box in the A-1 column that represents the problems associated with that particular problem area.
- Repeat with the next problem area (A-2) and so on.

- Repeat for existing flood control projects (FORM C) placing a triangle on the maps and starting the labeling with C-1.
- Repeat for all forms.

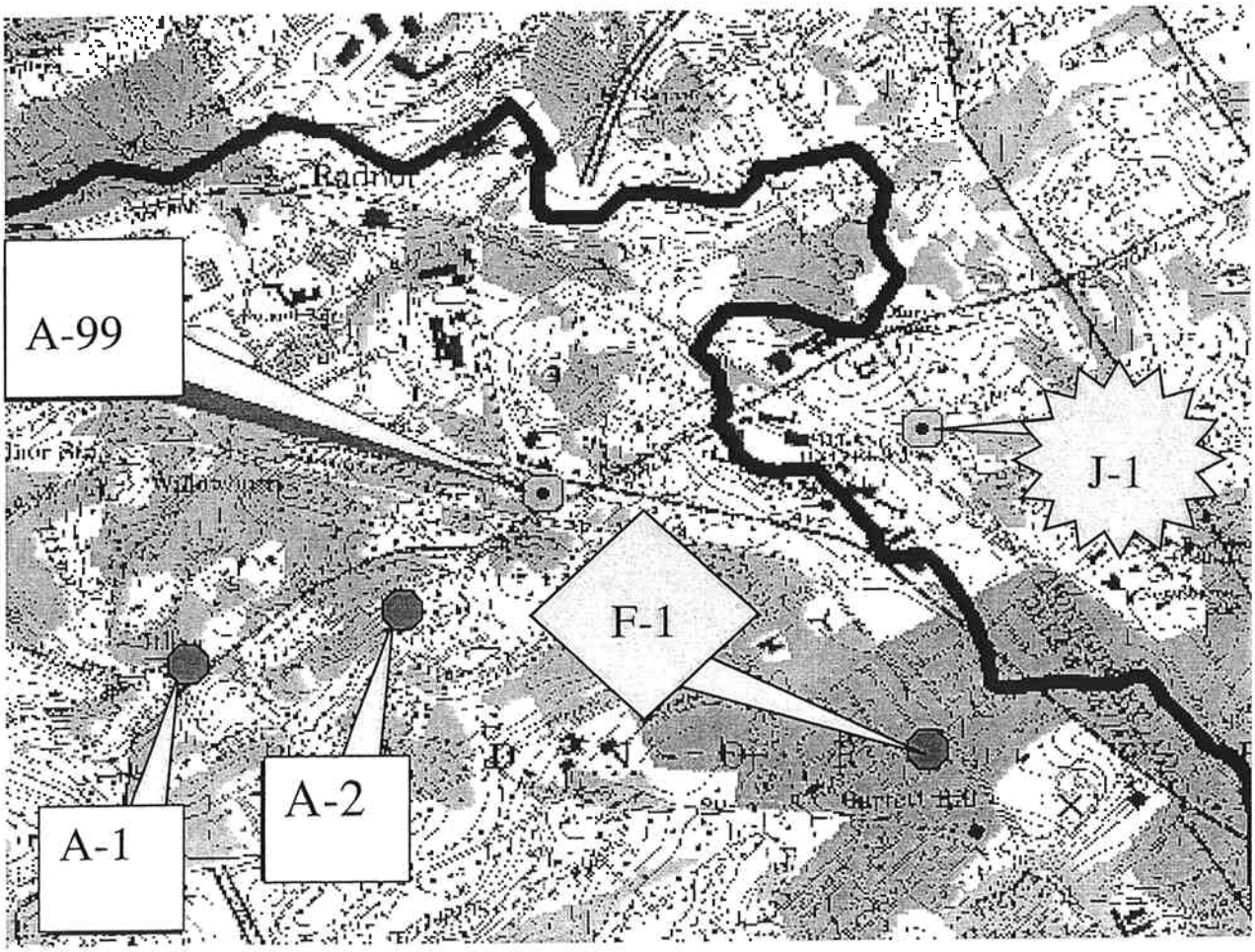
The sample map attached shows three problem areas (A99- A1 and A-2), one proposed flood control project (F-1) and one water quality problem (J1).

Use additional paper to provide detailed descriptions of your most serious problems and attach a map to show the location of the problem. Attach photographs, if available.

If you have any storm or combined sewers, please provide maps showing the collection system and overflow discharge locations and an estimate of the average annual discharge at each overflow point.

The more detail you provide, the better we will be able to evaluate the situation for your municipality. We appreciate your help.

Sample Location of Information from Data Collection Forms on the Municipal Map



Form Description Summary
Act 167 Watershed Storm Water Management Plan

Form	Description	Types of Examples	Sources of Information
A	Storm Water Problem Areas	Flooding Drainage Erosion/Sedimentation	Existing Studies or Reports Township Documentation Personal Memory Township Engineer
B	Obstructions	Bridges Culverts Fill Structures	Owner of Structure Township Files Subdivision Applications Roadmasters Township Engineer
C	Existing Flood Control Projects	Channel, Excavation Rip-Rap Floodwalls, etc.	Township Records Township Engineer Owner of Facility
D	Proposed Flood Control Projects	Channel Excavation Rip-Rap Floodwalls, etc.	Township Records Township Engineer Owner of Facility
E	Existing Storm Water Control Facility	Detention Basins Recharge Basins Roof-Top Storage	Subdivision Files Township Engineer Owner of Facility
F	Proposed Storm Water Control Facility	Detention Basins Recharge Basins Roof-Top Storage	Subdivision Files Township Engineer Owner of Facility
G	Existing Storm Water Collection System	Storm Sewers Man-Made Channels Diversions	Existing Plans Township Engineer Owner of System (Developers)
H	Proposed Storm Water Collection System	Storm Sewers Man-Made Channels Diversions	Existing Plans Township Engineer Owner of System (Developer)
I	Present & Projected Development in the Flood Hazard Area	Subdivision/Site Plans	Flood Insurance Studies Subdivision/Site Plans General Knowledge Township Engineer Private Flood Studies
J	Water Quality Problems	Construction Site Agriculture	Municipalities Conservation District

STORM WATER PROBLEM AREAS - FORM A sheet __ of __

WATERSHED Name: Municipality: County:	FORM COMPLETED BY Name: Telephone: Date:												
MAP NO.	sample A-99	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-
Types of Storm Water Problems													
Flooding	x												
Accelerated Erosion	x												
Sedimentation													
Landslide													
Groundwater													
Water Pollution	x												
Other (Explain)													
Explanation Line No.(s)													
Cause(s)													
Storm Water Volume	x												
Storm Water Velocity	x												
Storm Water Direction	x												
Water Obstruction	x												
Other (Explain)													
Explanation Line No.(s)													
Frequency													
Year Most Recent Occurred													
Year First Known to Occur													
Regularity													
More Than 1/Year	x												
Less Than 1/Year													
Only During Agnes or Floyd													
Duration (If Applicable)													
Less Than One Day	x												
One Day + (Enter Days)													
Property Damages													
Loss of Life / Vital Services													
Private													
More Than One Owner													
Types of Properties													
Undeveloped													
Agricultural													
Residential													
Commercial	x												
Industrial													
Number of Properties													
1													
2-10	x												
11+													
Public (List Types)													
Explanation Line No.(s)													
Solutions													
Suggested													
Explanation Line No.(s)	1												
Formally Proposed													
Explanation Line No.(s)													

EXPLANATION LINES

1

2

3

4

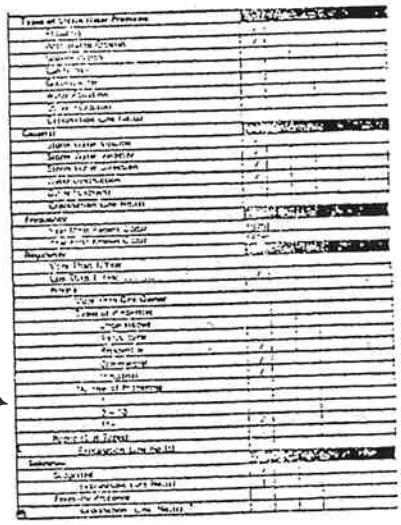
INSTRUCTIONS

Begin with A.1 as the first map number to identify the first' storm water problem area. Illustrate the defined problem on the watershed map provided, and identify it with its map number.

For each storm water problem area within your municipality, enter the map identification number at the head of the column. Describe the problem by placing a check (4 in the appropriate blocks of the column under this map identification number.

When an additional explanation is required, write the line number(s) used in the column marked "Explanation Line No. (s)".Example 1, 2-3, etc.

f storm water problem occurred during and after Agnes, describe the frequency of the problem after Agnes.



Use the explanation lines to list the types of public property damages e.g.roadways, hospitals, etc.

Enter the line no. (s) used to list the map ID no. (s) for the proposed facilities.

Definitions

Storm Water Problem Area
An area that defines the farthest extent of a storm water problem, including any area that experiences property damage, inundation, accelerated erosion, surface water pollution, groundwater pollution, landslides, or any other problem as a result of storm water runoff.

Groundwater
Water in the ground below the water table.

Accelerated Erosion
The removal of the surface of the land through the combined action of man's activities and the natural processes at a rate greater than would occur because of the natural process alone.

Sedimentation
The process by which soil or other surface materials, transported by surface water, is deposited on stream bottoms.

Water Obstruction
Any dike, bridge, culvert, wall, wingwall, fill, pier, wharf, embankment, abutment, or other structure located in, along, across, or projecting into any watercourse, floodway, or body of water.

EXPLANATION LINES (continued)

EXISTING FLOOD CONTROL PROJECT FORM C. SHEET _____ OF _____

WATERSHED	FORM COMPLETED BY	TYPICAL TYPES OF FLOOD CONTROL PROJECTS
Name: _____ Municipality: _____ County: _____	Name: _____ Telephone: _____ Date: _____	Channel Excavation / Widening, Channel Realignment, Rock Riprap, Levee, Gabions, Pipe Channel, Dams, Floodwall, Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Year Constr Built	Expected Life Yrs.	Design Flood Frequency Yrs.	Design Flood Discharge C.F.S. (if known)	Owner Name, Address, and Phone
C-						
C-						
C-						
C-						
C-						

PROPOSED FLOOD CONTROL PROJECT FORM D. SHEET _____ OF _____

WATERSHED	FORM COMPLETED BY	TYPICAL TYPES OF FLOOD CONTROL PROJECTS
Name: _____ Municipality: _____ County: _____	Name: _____ Telephone: _____ Date: _____	Channel Excavation / Widening, Channel Realignment, Rock Riprap, Levee, Gabions, Pipe Channel, Dams, Floodwall, Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Study Phase Begun			Year Constr. Planned	Projected Compltn. Date	Expected Life Yrs.	Design Flood		Map ID No. Form A*	Owner Name, Address, and Phone
		YES		NO				Frequency Yrs.	Discharge C.F.S.		
		Prelim.	Final								
D-											
D-											
D-											
D-											
D-											

* Enter the storm water problem area's Map ID No., if the proposed project will solve or reduce any / all of an identified drainage problem.

FORM E

EXISTING STORM WATER CONTROL FACILITIES FORM E. SHEET _____ OF _____

WATERSHED	FORM COMPLETED BY	DEFINITION
Name: _____ Municipality: _____ County: _____	Name: _____ Telephone: _____ Date: _____	Storm Water Control Facility A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.
For County Use:		

Map ID No.	Type of Storm Water Control Facility	Year Built	Contact Person Name, Address and Phone	Comments
E-				
E-				
E-				
E-				
E-				
E-				
E-				
E-				

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

Detention / Retention Basin

Natural Pond or Wetland

Parking Lot Pondling

Roof-Top Storage

Semi-Pervious Paving

Infiltration Device (Seepage /

PROPOSED FLOOD CONTROL PROJECT FORM F.

SHEET _____ OF _____

WATERSHED

Name:

Municipality:

County:

For County Use:

FORM COMPLETED BY

Name:

Telephone:

Date:

DEFINITION

Storm Water Control Facility

A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.

Map ID No.	Type of Storm Water Control Facility	Proposed Constr. Dates Start	Proposed Constr. Dates End	Map No. Form A*	Contact Person Name, Address and Phone	Comments
F-						
F-						
F-						
F-						
F-						
F-						
F-						
F-						

* Enter the storm water problem area's Map ID No., if the proposed project will solve or reduce any / all of an identified drainage problem.

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

- Detention / Retention Basin
- Natural Pond or Wetland
- Parking Lot Pondling
- Roof-Top Storage
- Semi-Pervious Paving
- Infiltration Device (Seepage / Recharge Basin or Underground Tank)

EXISTING STORM WATER COLLECTION FACILITIES FORM G. SHEET _____ OF _____

WATERSHED

Name:

Municipality:

County:

FORM COMPLETED BY

Name:

Telephone:

Date:

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1,G-2,G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map I.D. No.		System's Elements (x)			Measurements *						Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale			Material	Year Constr.			
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												

* See measurement key on reverse side.

FORM H

PROPOSED STORM WATER COLLECTION FACILITIES FORM H (10 YRS)

SHEET __________ OF __________

WATERSHED	FORM COMPLETED BY
Name:	Name:
Municipality:	Telephone:
County:	Date:

INSTRUCTIONS

On the map for proposed storm water collection systems, diagram each proposed system. Indicate a map point to show changes in system elements, pipe size, pipe direction and connections to existing systems. For proposed additions to existing systems, diagram only the additions and their connection point into the existing system. Complete a separate form for each proposed, new system and one for each existing system having one or more proposed additions. Identify the points within a system consecutively (ex. H-1, H-2, H-3). Start the first point in each additional system 20 numbers higher (if H-3 ends one system, begin the next with H-23). Be sure to show the point where proposed additions connect into existing systems, using the map point number from the existing system form and map. See Sample Diagrams and Form on Reverse.

Map I.D. No.		System's Elements (x)			Measurements *				Material	Map I.D. Nos.** Form A	Proposed Const. Dates		Design Data Avail.	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Open Channel / Swale									
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth			Start	End			
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														

* See measurement key on reverse side. ** Enter the storm water problem areas' Map I.D. Nos., if proposed project will solve or reduce any / all of the drainage problems.

PRESENT & PROJECTED DEVELOPMENT IN THE FLOOD HAZARD AREA (FORM 1)

SHEET _____ OF _____

WATERSHED

FORM COMPLETED BY

Name:

Municipality:

County:

For County Use:

Name:

Telephone:

Date:

DEFINITION

FLOOD HAZARD AREA:

A NORMALLY DRY LAND AREA THAT HAS BEEN OR IS SUSCEPTABLE TO BEING INUNDATED BY THE 100-YEAR FLOOD.

Map ID No.	TYPE OF DEVELOPMENT	Year Built	Contact Person Name, Address and Phone	Comments
1 -				
1 -				
1 -				
1 -				
1 -				
1 -				
1 -				

WATER QUALITY PROBLEM AREAS (FORM J)

Watershed
Name _____
Municipality _____
County _____

Form Completed By
Name _____
Telephone _____
Date _____

Site:	J-	J-	J-	J-	J-	J-	J-	J-
Types of Water Quality Problems								
High Community Tolerance								
High Temperature								
High Turbidity								
Hydrocarbon Pollution								
Low Community Diversity								
Low Dissolved Oxygen								
Low pH								
Nutrient Enrichment								
Poor Habitat								
Other / Explanation Line No.								
Potential Causes(s)								
Agriculture								
Construction Site								
Erosion								
Lake Discharge								
STP Outfall								
Other / Explanation Line No.								
Frequency								
Year Most Recent Occurrence								
Year First Known Occurrence								
Source of Information								
Streamwatch								
County Water Quality Study								
Driveby								
CCD Complaint Investigation								
Other / Explanation Line No.								

Explanation Lines
1. _____
2. _____
3. _____

Form O - Outfall Data

Person: O'Brien / Phillips Date: 02/09/04 Time Since Last Rain was ≥ 72 Hours: Yes ____

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 2 days (rained - 2/7/04 stop - @0600)

Municipality: Media Name of receiving water: Gayley Run - 1-5
Broomall Run - 6, 7, 8, 8A

Pipe Swale #	Photo # (Disk 3)	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)	Headwall Yes/No
1	1	YES	8:40 AM	24" 8"	0	10'	8'	1 TO 3	NO	NONE	RESID	0	YES
2	2 3	Yes	0905	No Pipe Eroded track	0	1'	2'	1:2	NO	"	"	0	No
2A	4	Yes	0915	18"	0	2'	4'	1:2	NO	"	"	0	No
3	5	Yes	0940	36"	0	3'	14'	1:1	NO	"	"	Minor Debris 0	Yes
4	6	Yes	1000	24"	10"	18"	15'	1:2	No	Clear	"	M.D. 0	Yes
5	7	Yes	1010	18"	0	2-3'	10'	1:1	No	None	Comm + Res	Debris 1	No
6	8	Yes	1035		0	3'	8'	1:3	No	Clear	Res	0	No
7													
8	9	Yes	1100	18	0	15'	30'	1:1	No	Clear	Res	0	No
8A	10	Yes	1105	18	0	15+	20'	1:1	No	None	Res	0	Yes

(all outside water shed)

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES: Ralph said out fall for #7 is same as for #6

Form O - Outfall Data

Person: O'Brien / Phillips Date: 2/9/04 Time Since Last Rain was ≥ 72 Hours: Yes No

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 2½

Municipality: Media Name of receiving water: Broomall Lake

Pipe Swale #	Photo # Disk 4	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)	Headwall Yes/No
9	4	Yes	1320	18"	0	2'	3'	1:1	No	Clear	Res	0	No
10	1	Yes	12:55	200' 15" pipe	0	20"	20"	1:4	No	Clear	Res	0	Yes
10A	2	Yes	1300	15" pipe	0	0"	2'	1:1.5	No	N/A	Res	1	Yes
10B	3	Yes	1306	18"	0	18"	Stream	Stream	No	N/A	"	0	No
11	5	Yes	1340	15"	0	18"	8'	1:3	No	N/A	Res	0	Yes
12	6	Yes	1350	8"	0	3'	Stream	1:5	No	Stream Clear	Res	0	Yes
13	7	Yes	1355	30"	0	5'	Stream	1:5	No	" "	Res	0	Yes
14	8	Yes	1405	12"	0	8'	Hillside	1:4	No Thick	Clear	"	0	Yes
15	9	Yes	1410	18"	0	2'	15'	1:5	No	N/A	Res	0	No
16	10	Yes	1430	2 ea. 1-48" 1-36"	2-3"	6'	20'	1:1	Yes	Clear	Res	0	Yes

(all outside water flow)

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

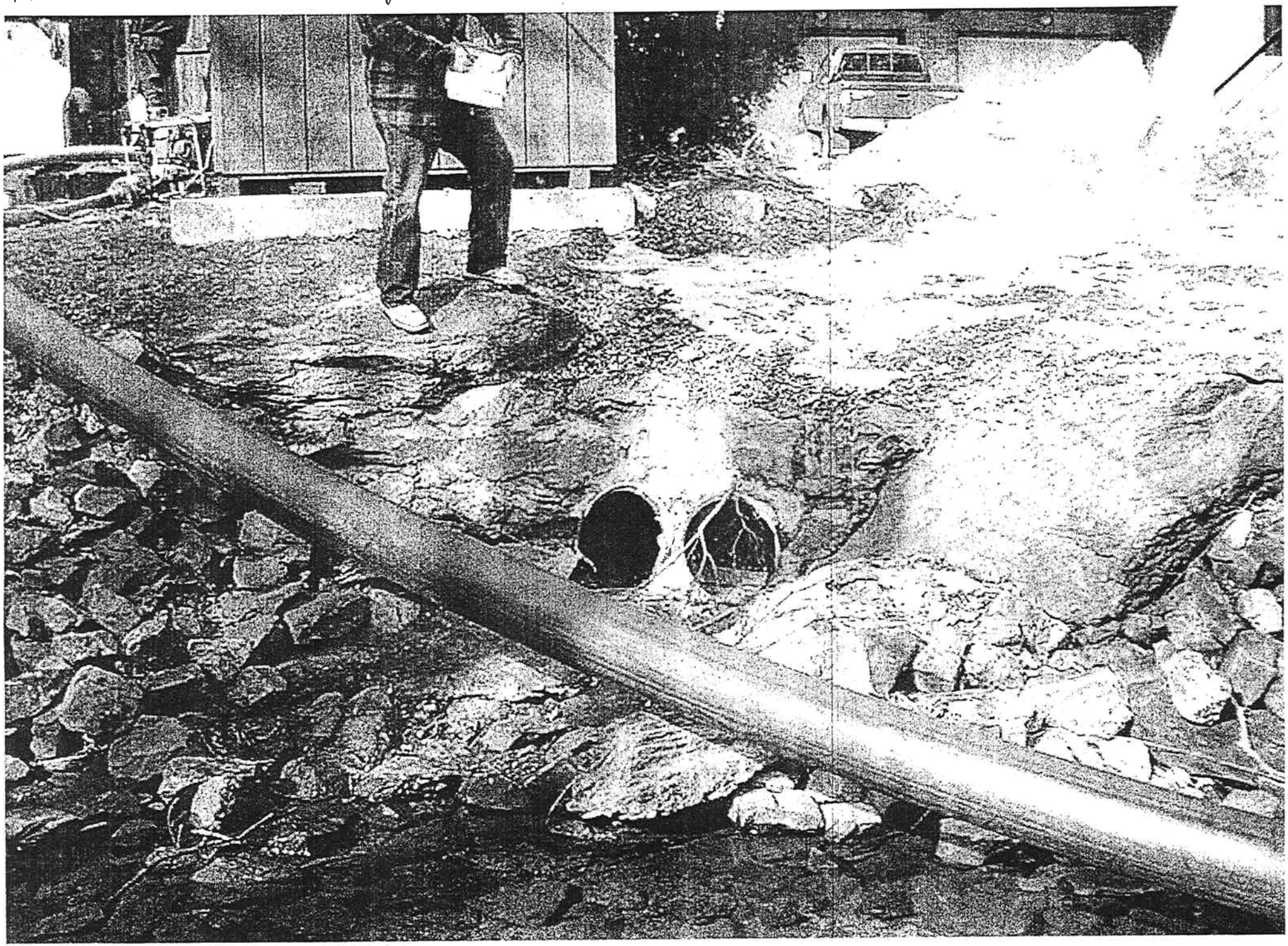
1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

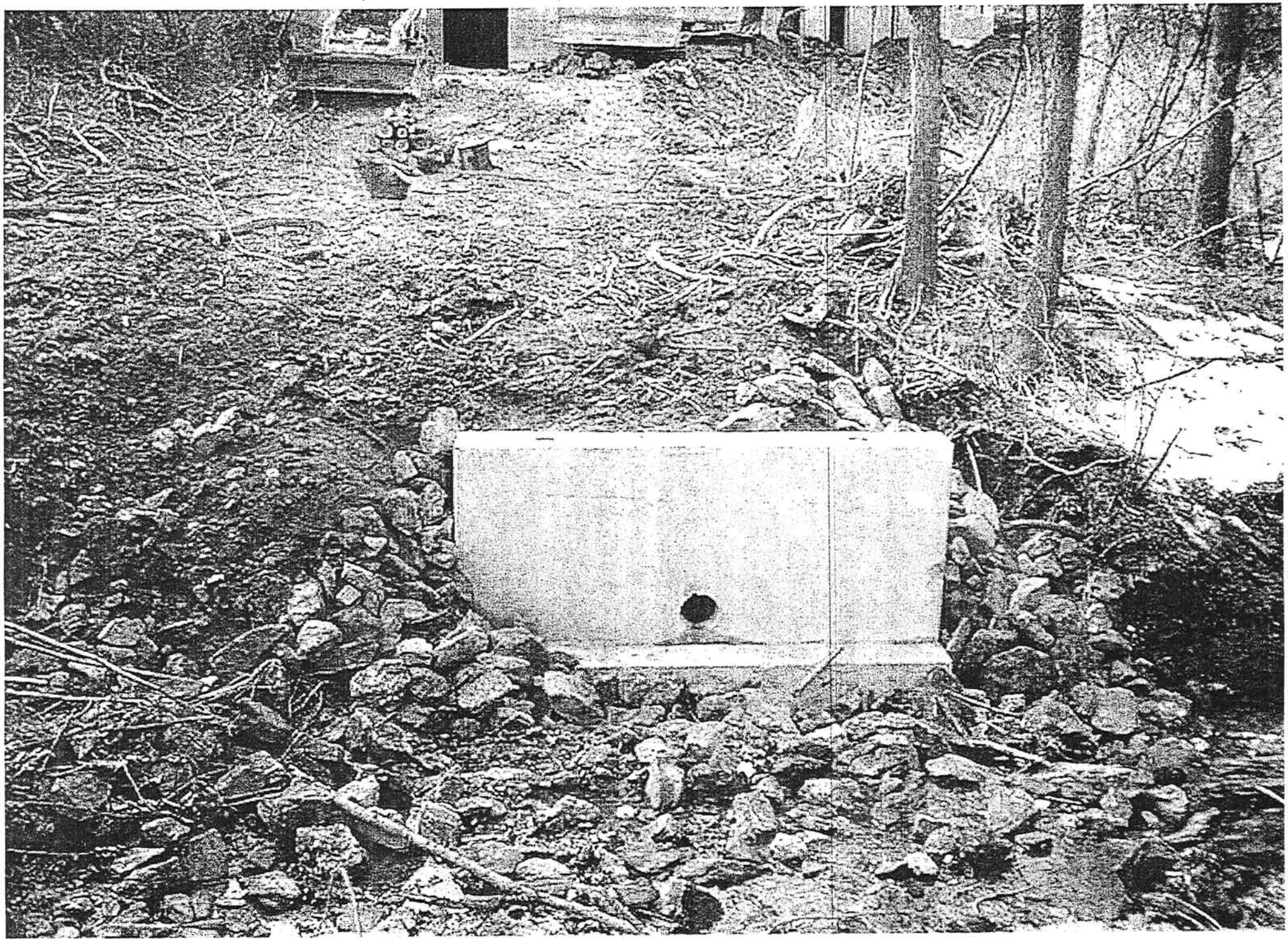
NOTES:



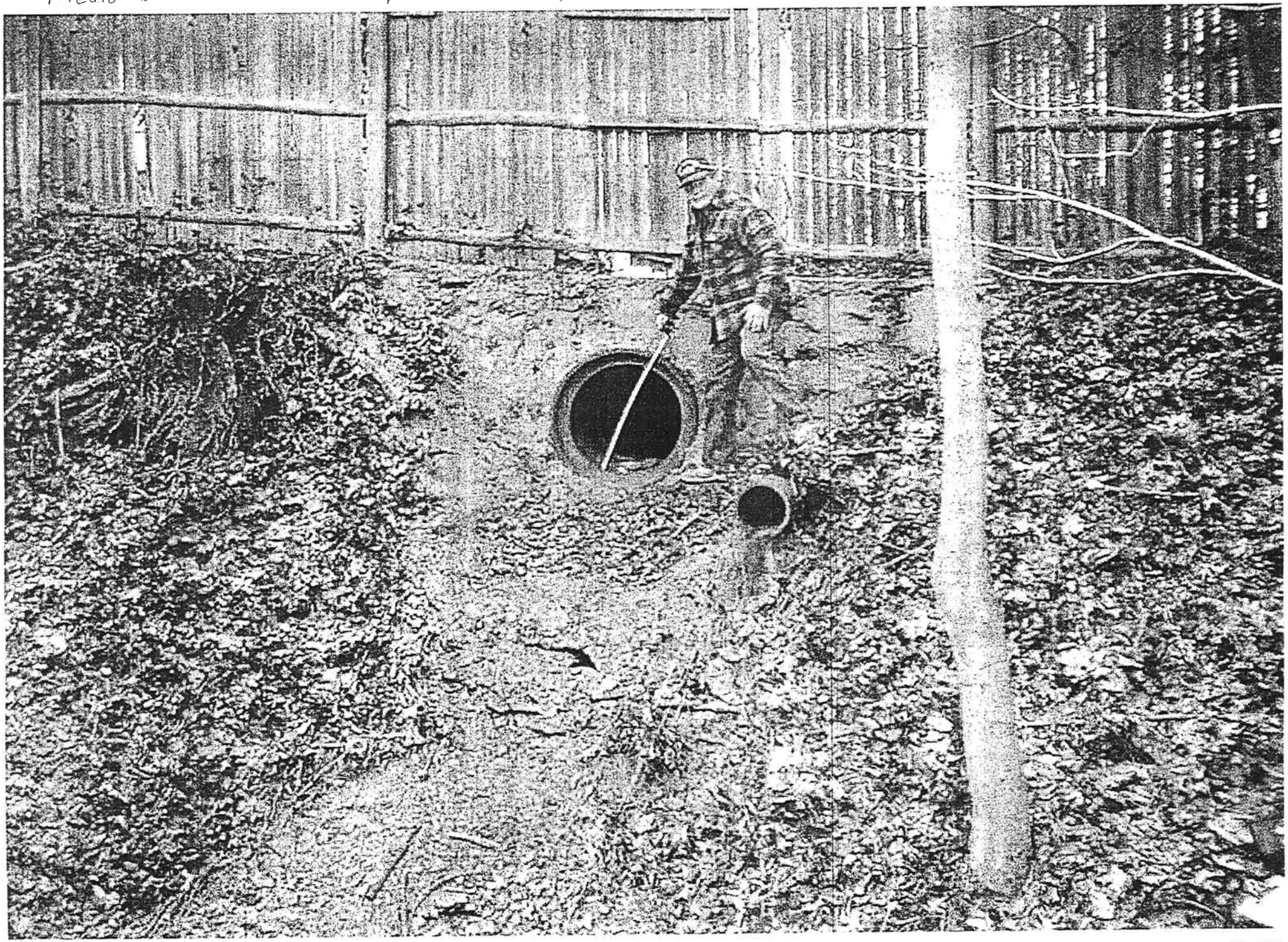
Media Disk 4 - Photo #2 - Pipe Swale # 10A

Media Disk 4 - Photo # 3 - Pipe Swale # 10B

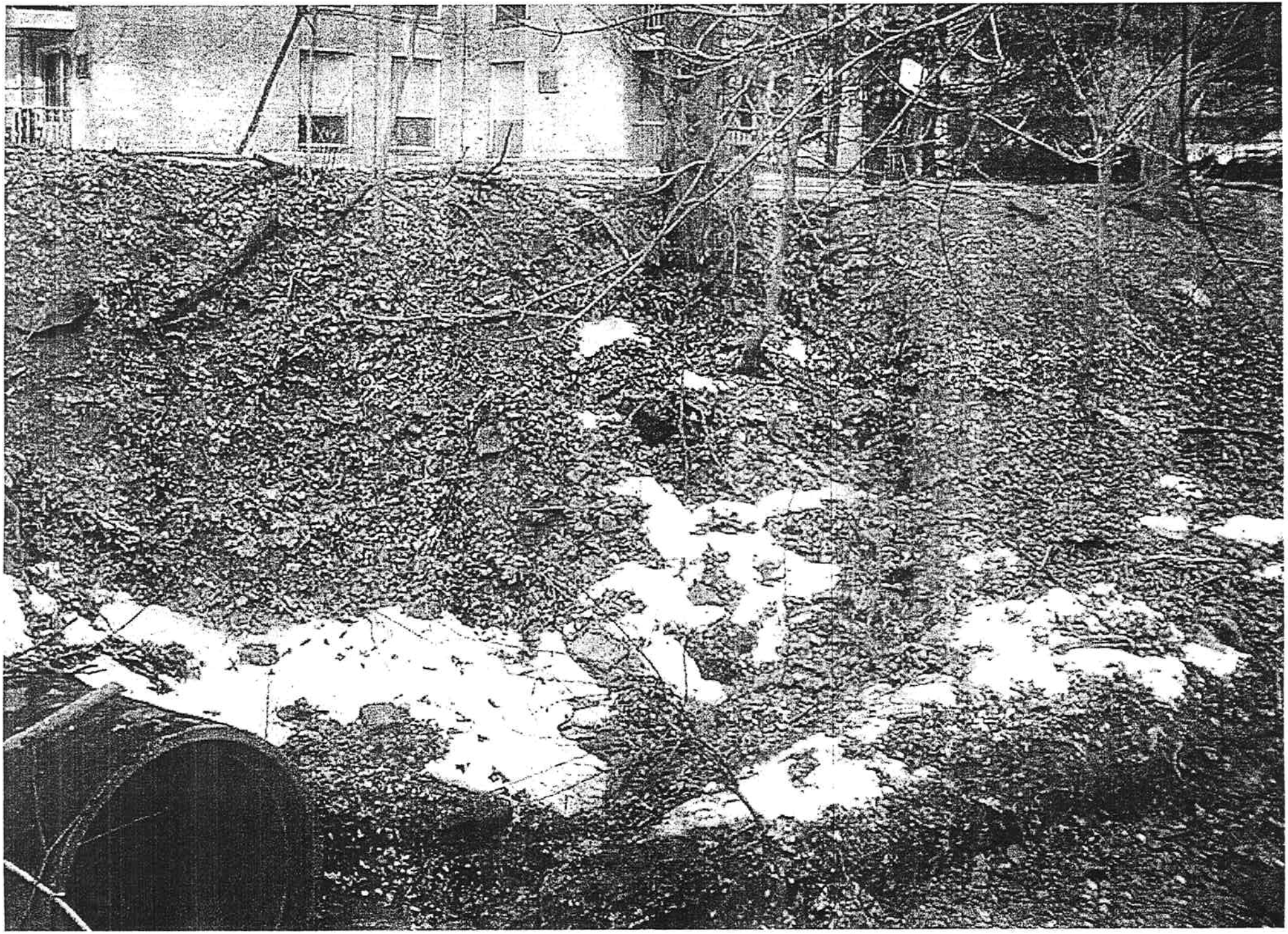
Media - Disk 4 - Photo # 4 - Pipe Swale # 9



Media Disk 4 - Photo # 8 - Pipe Swale # 14

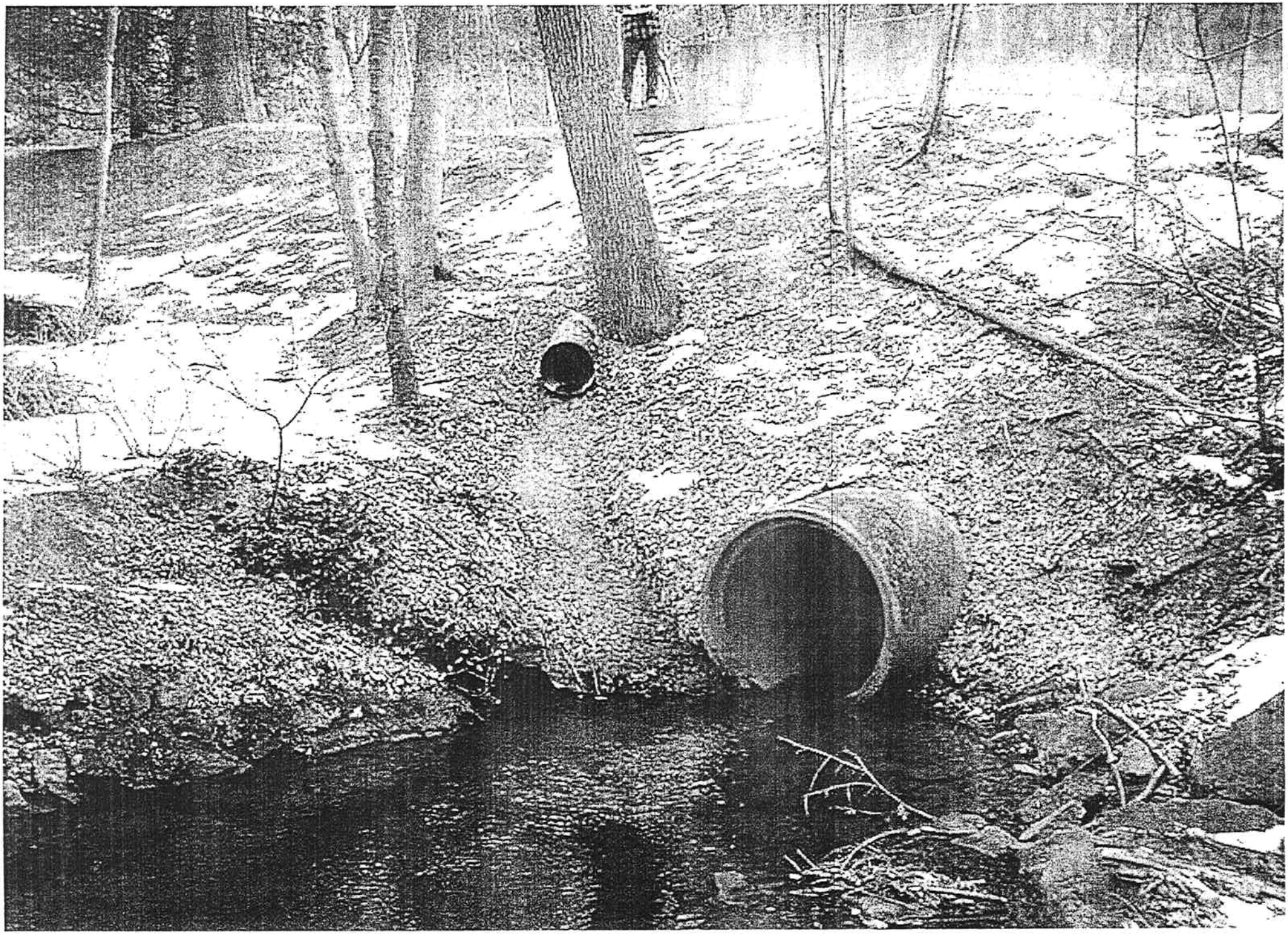


Media Disk 3 - Photo # 2 - Pipe Swale #2

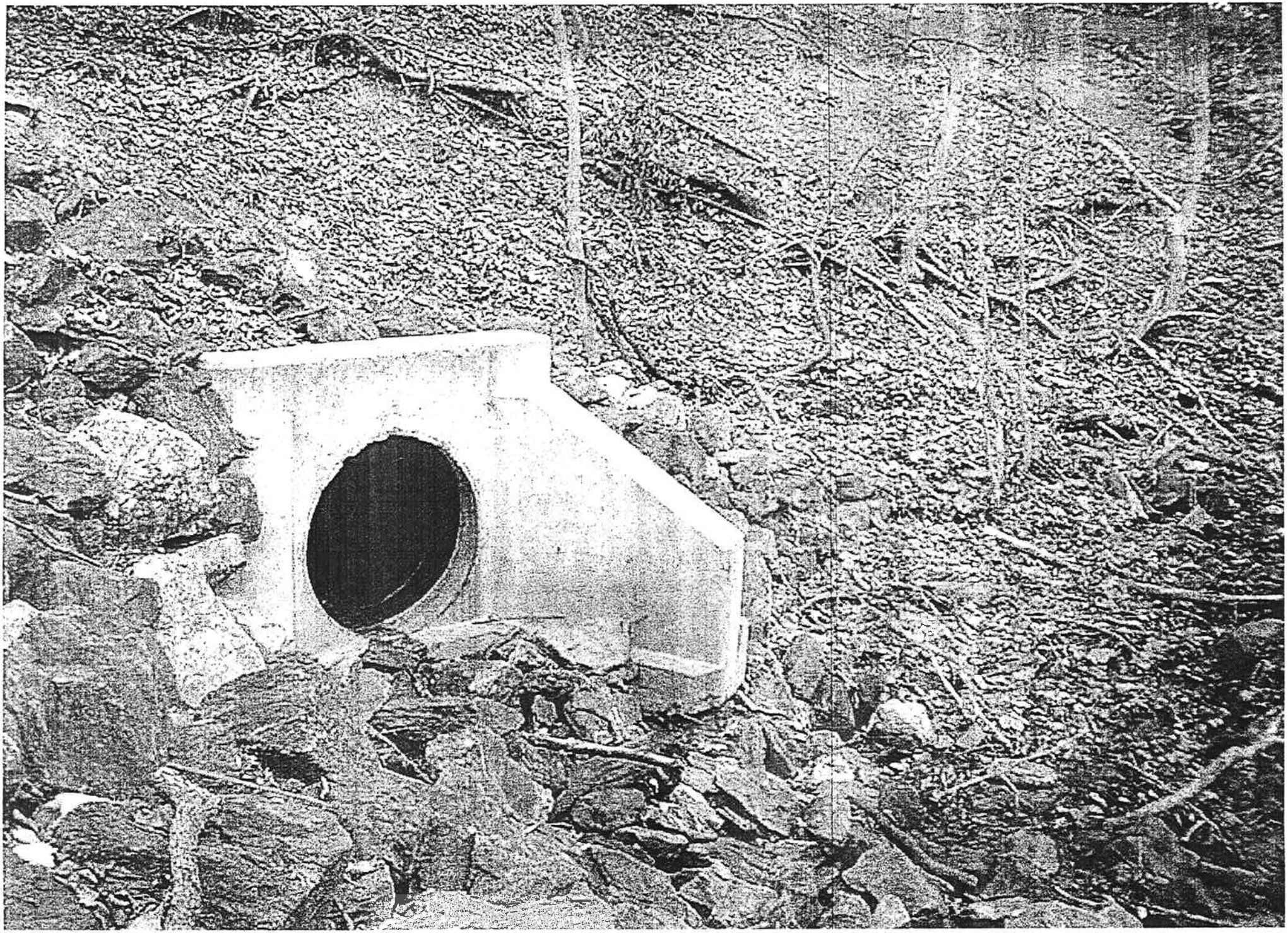


Media DisK3 - Photo #3 - Pipe Swale #2

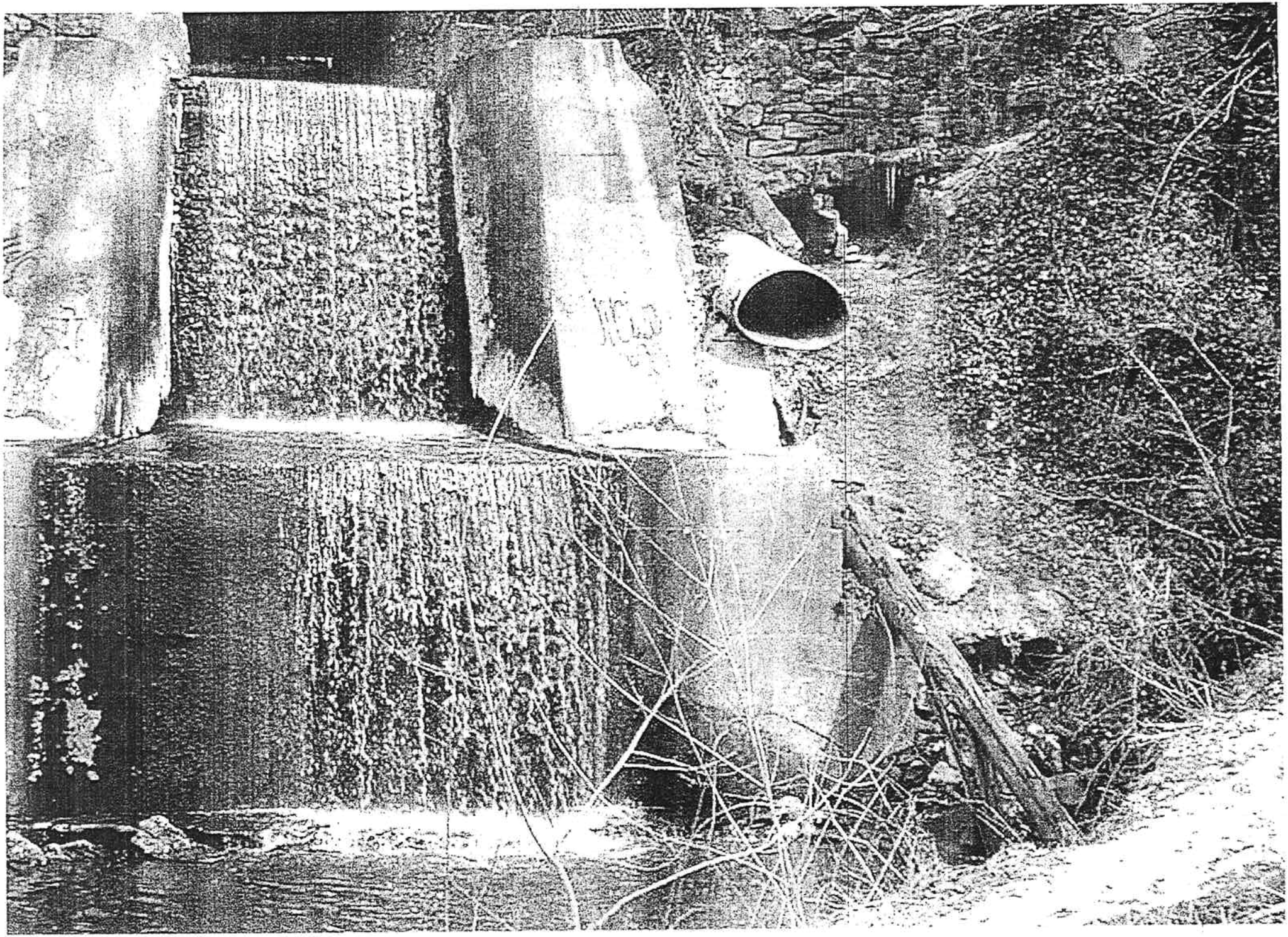
Media Disk3 - Photo #4 - Pipe Swale 2A



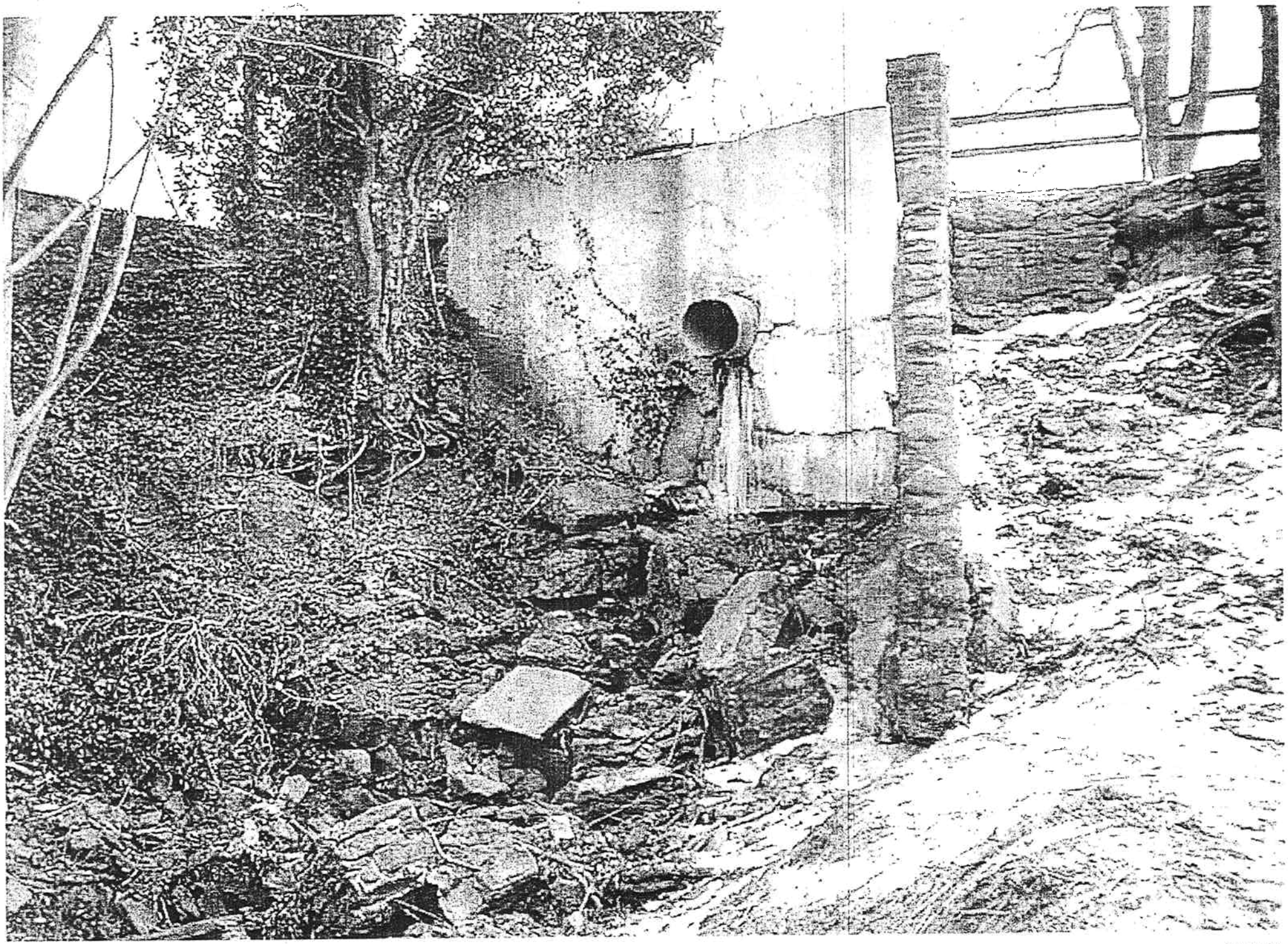
Media Disk 3 - Photo #5 - Pipe Shaft #3

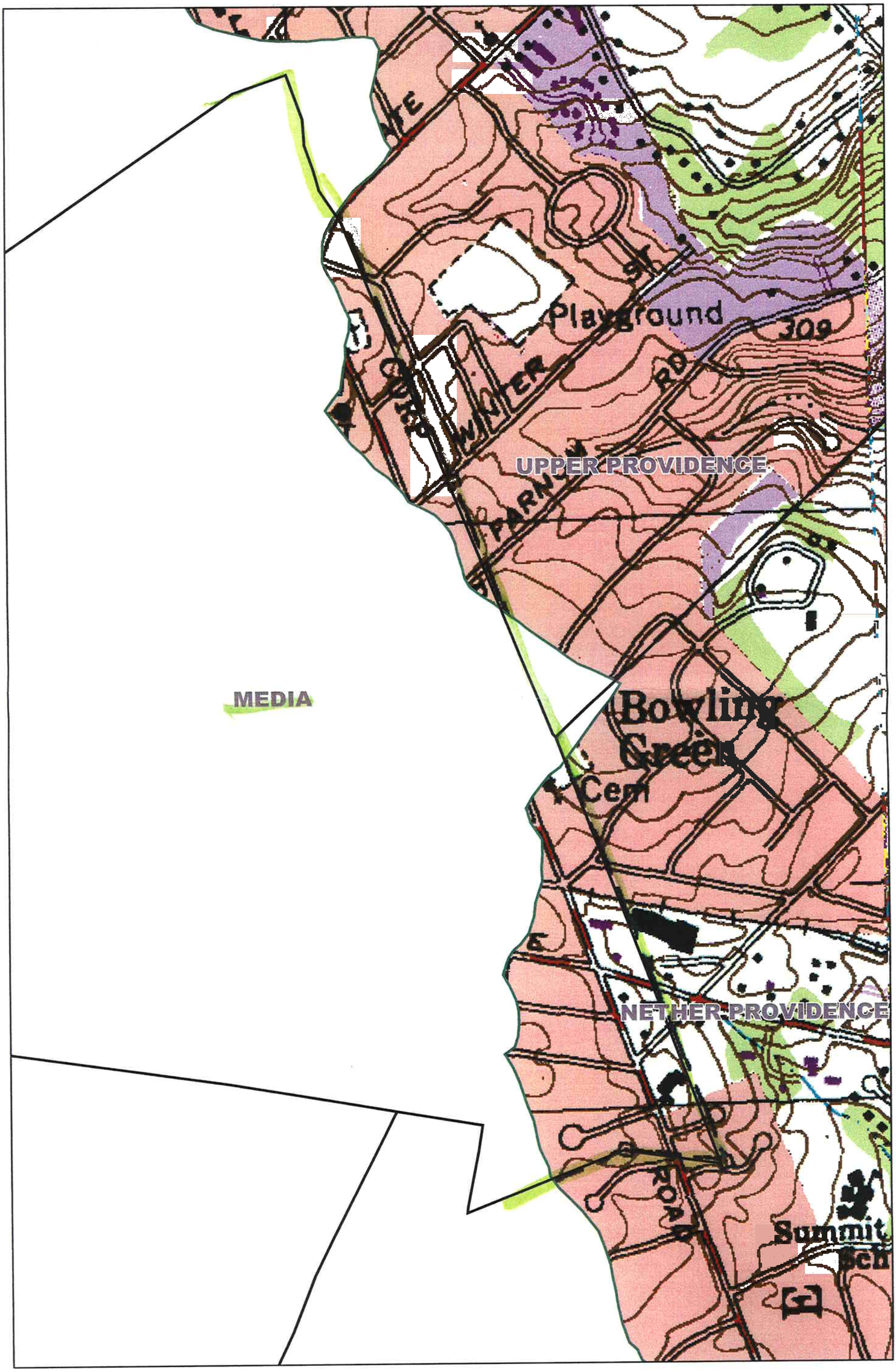


Media Disk 3 - Photo #6 - Type Swale #4



Media Disk 4 - Photo #10 - Fire Bullet 8A





CRUM CREEK WATERSHED - LOCATOR MAP

MORTON BOROUGH

Turning Ideas Into Reality

CATANIA ENGINEERING ASSOCIATES, INC.

Consulting Engineers & Land Surveyors

June 14, 2005
File No. 83500-115-CC

Chris Gallagher
Delaware County Planning Department
Office of Housing and Community Development
600 N. Jackson Street, Room 101
Media, PA 19063

RE: Crum Creek Watershed Act 167
Morton Borough

Dear Mr. Gallagher:

Enclosed, please find the completed municipal survey forms for the Crum Creek Watershed Act 167 Stormwater Management Plan.

If you have any questions, or require any additional information, please do not hesitate to contact me.

Very truly yours,

Jamie H Bricker

Jamie H. Bricker, E.I.T.
for Catania Engineering Associates, Inc.

JHB/pm
Enclosures
cc: Martha Preston, Secretary

520 W. MacDade Boulevard, Milmont Park, Pennsylvania 19033-3311
Phone: (610) 532-2884 Fax: (610) 532-2923 E-Mail: CEAINC1@aol.com

CRUM CREEK WATERSHED
ACT 167 STORMWATER MANAGEMENT PLAN

MUNICIPALITY QUESTIONNAIRE

Please fill out the following questionnaire and return it to Karen Holm at the Delaware County Planning Department, Court House and Government Center Building, 201 West Front St. Media, PA 19063 as soon as possible. If you have any questions or comments, or if you would like these forms in digital format, please call Karen at 610-891-5213 or e-mail her at holmk@co.delaware.pa.us.

PART I - GENERAL INFORMATION

Municipality: Morton Borough

Contact Person: Martha Preston, Secretary

WPAC Designee: Charles J. Lillicrapp, Jr.

Title: Councilman

Address: Highland & Sycamore Avenues

Morton, PA 19070

Phone: 610-543-4565

Fax: 610-543-8392

Person Completing form (if different from Contact Person):

Name: Jamie H. Bricker

Address: 520 W. MacDade Boulevard

Milmont Park, PA 19033-3311

Phone: 610-532-2884

Fax: 610-532-2923

E-mail: jamie@cataniaengineering.com

PART II - REGULATORY ACTIVITIES

A. Please indicate the regulations you currently use to manage development.

REGULATION	MUNICIPAL ORDINANCE	COUNTY ORDINANCE
Zoning Ordinance	No. 588	
Subdivision/Land Development Ordinance		X
Separate Stormwater Ordinance	pending	
Separate Floodplain Ordinance	No. 623	

B. Please indicate the agencies/individuals who review and approve land development plans and zoning variance/waiver requests.

ENTITY	LAND DEVELOPMENT PLANS		ZONING VARIANCE/WAIVER REQUESTS	
	REVIEW	APPROVE	REVIEW	APPROVE
Supervisors	X	X		
Municipal Engineering Department				
Municipal Planning Department	X			
County Planning Department	X			
County Conservation District	X			
Zoning Hearing Board			X	X
Consulting Engineer	X			
Others (List Below				

C. Please provide **copies** of your zoning, subdivision/land development, and separate stormwater management and floodplain ordinances and your current zoning map when you return this questionnaire. Please list these documents below.

Morton Borough Zoning Ordinance No. 588

Morton Borough Flood Hazard District Overlay (Zoning Ordinance) No. 623

PART III - MUNICIPAL AND LOCAL PLANNING ACTIVITIES

Please indicate below whether your community has approved the following plans and maps and the date of the most recent update.

ITEM	APPROVED/DATE	IN PROGRESS	PLANNED WITHIN NEXT YEAR
PA Act 537 Sewage Facilities Plan	3/13/2002		
Comprehensive Land Use Plan	10/2002		
Existing Land Use Maps	10/2002		
Proposed Land Use Maps	10/2002		
Zoning Maps	1995		

PART IV - FLOOD INSURANCE PROGRAM AND COMPREHENSIVE LAND USE PLAN

Please indicate below whether your community participates in the National Flood Insurance Program:

ITEM	PARTICIPATES (Y/N)
Flood Hazard Boundary Map (FHBM)	Y
Participates in FEMA Emergency Program	N
Participates in FEMA Regular Program	Y

PART V - EXISTING STORMWATER RELATED PROBLEMS AND STRUCTURES

Please complete the matrices on the following pages (Forms A and C-J) to describe any significant stormwater-related problems (Form A), Existing or Proposed Flood Control Projects (Forms C & D), Existing or Proposed Storm Water Control Facilities (Forms E and F), Existing or Proposed Stormwater Collection Systems (Forms G & H), Present and Projected Development in the Flood Hazard Area (Form I), and Water Quality Problem Areas (Form J) that you are aware of in your municipality.

What we would like to ask of you is that you complete as much of the attached data collection forms as possible. There is a different form for each item of information as summarized in the attached "FORM DESCRIPTION SUMMARY. The process would be as follows starting with the problem areas (Form A):

- Place the location of the problem area on the map as shown in the attached example map.
- Draw a box on the map with the problem area identifier starting with A-1 with an arrow leading from the problem area identifier to the problem area.
- Place an A-1 in the first column of FORM A.
- Put a check in each box in the A-1 column that represents the problems associated with that particular problem area.
- Repeat with the next problem area (A-2) and so on.

- Repeat for existing flood control projects (FORM C) placing a triangle on the maps and starting the labeling with C-1.
- Repeat for all forms.

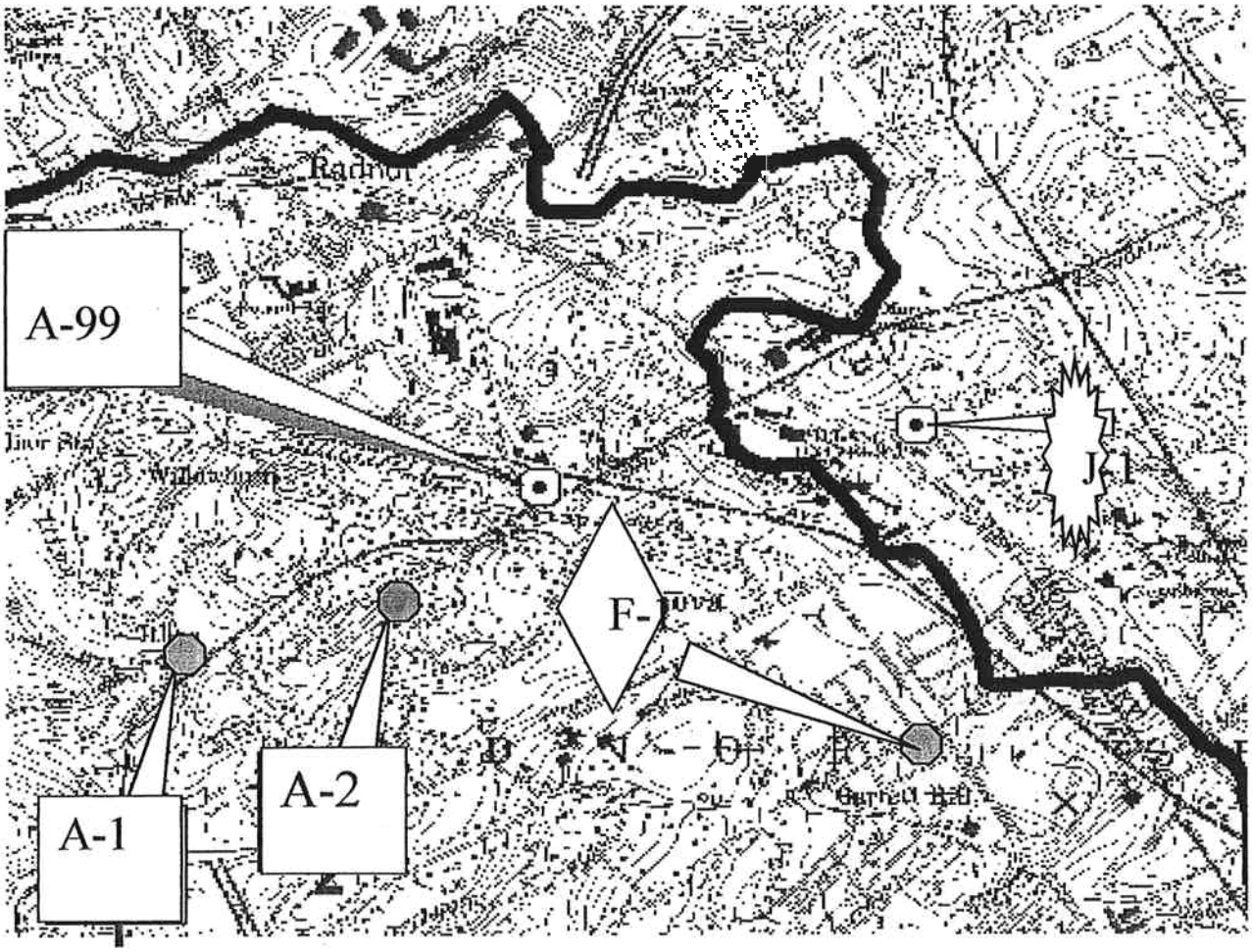
The sample map attached shows three problem areas (A99- A1 and A-2), one proposed flood control project (F-1) and one water quality problem (J1).

Use additional paper to provide <u>detailed</u> descriptions of your most serious problems and attach a map to show the location of the problem. Attach photographs, if available.

If you have any storm or combined sewers, please provide maps showing the collection system and overflow discharge locations and an estimate of the average annual discharge at each overflow point.

The more detail you provide, the better we will be able to evaluate the situation for your municipality. We appreciate your help.

Sample Location of Information from Data Collection Forms on the Municipal Map



FORM A - STORM WATER PROBLEM AREAS SHEET 1 OF 1

WATERSHED		FORM COMPLETED BY		Before Filling Out Form, See Instructions on Back
Name:	Crum Creek	Name:	Jamie H. Bricker	
Municipality:	Morton Borough	Telephone:	610-532-2884	For County Use:
County:	Delaware	Date:	8/5/2004	

MAP NO. *	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-
Types of Storm Water Problems												
Flooding												
Accelerated Erosion												
Sedimentation												
Landslide												
Groundwater												
Water Pollution												
Other (Explain)												
Explanation Line No. (On Back)												
Cause (s)												
Storm Water Volume												
Storm Water Velocity												
Storm Water Direction												
Water Obstruction												
Other (Explain)												
Explanation Line No. (On Back)												
Frequency												
Year Most Recent Occurred												
Year First Known Occurred												
Regularity												
More Than 1 Year												
Less Than 1 Year												
Only During Agnes												
Duration (If Applicable)												
Less Than 1 Day												
1 Day + (Enter Days)												
Property Damage												
Loss of Life/Vital Services												
Private												
More Than One Owner												
Types of Properties												
Number of Properties												
Public (List Types)												
Explanation Line No. (On Back)												
Solutions												
Suggested												
Explanation Line No. (On Back)												
Formally Proposed												
Explanation Line No. (On Back)												

* Include Map ID No. if found on any other form listing proposed facilities.

FORM C

EXISTING FLOOD CONTROL PROJECT FORM C. SHEET 1 OF 1

WATERSHED		FORM COMPLETED BY		TYPICAL TYPES OF FLOOD CONTROL PROJECTS		
Name:	Crum Creek	Name:	Jamie H. Wenger	Channel Excavation / Widening	Levee	Dams
Municipality:	Morton Borough	Telephone:	610-532-2884	Channel Realignment	Gabions	Floodwall
County:	Delaware	Date:	8/5/2004	Rock Riprap	Pipe Channel	Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Year Constr Built	Expected Life Yrs.	Design Flood Frequency Yrs.	Design Flood Discharge C.F.S. (if known)	Owner Name, Address, and Phone
C-	NONE No portions of Crum Creek or any of its tributaries lie in Morton.					
C-						
C-						
C-						
C-						

PROPOSED FLOOD CONTROL PROJECT FORM D. SHEET 1 OF 1

WATERSHED		FORM COMPLETED BY	
Name:	Crum Creek	Name:	Jamie H. Bricker
Municipality:	Morton Borough	Telephone:	610-532-2884
County:	Delaware	Date:	8/5/2004

TYPICAL TYPES OF FLOOD CONTROL PROJECTS

Channel Excavation / Widening	Levee	Dams
Channel Realignment	Gabions	Floodwall
Rock Riprap	Pipe Channel	Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Study Phase Begun			Year Constr. Planned	Projected Compltn. Date	Expected Life Yrs.	Design Flood		Map ID No. Form A*	Owner Name, Address, and Phone
		YES		N0				Frequency Yrs.	Discharge C.F.S.		
		Prelim.	Final								
D-	None No portions of Crum Crk or any of its tributaries lie within Morton.										
D-											
D-											
D-											
D-											

* Enter the storm water problem area's Map ID No., if the proposed project will solve or reduce any / all of an identified drainage problem.

FORM E

EXISTING STORM WATER CONTROL FACILITIES FORM E. SHEET 1 OF 1

WATERSHED	FORM COMPLETED BY	DEFINITION
Name: Crum Creek Municipality: Morton County: Delaware	Name: Jamie H. Bricker Telephone: 610-532-2884 Date: 8/5/2004	Storm Water Control Facility A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.
For County Use:		

Map ID No.	Type of Storm Water Control Facility	Year Built	Contact Person Name, Address and Phone	Comments
E-	None No stormwater control facilites exist within Morton Borough.			
E-				
E-				
E-				
E-				
E-				
E-				
E-				

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

Detention / Retention Basin

Natural Pond or Wetland

Parking Lot Pondling

Roof-Top Storage

Semi-Pervious Paving

Infiltration Device (Seepage / Recharge Basin or Underground Tank)

PROPOSED STORM WATER CONTROL FACILITIES FORM F. SHEET 1 OF 1

WATERSHED		FORM COMPLETED BY	
Name:	Crum Creek	Name:	Jamie H. Bricker
Municipality:	Morton	Telephone:	610-532-2884
County:	Delaware	Date:	8/5/2004

DEFINITION

Storm Water Control Facility

A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.

For County Use:

Map ID No.	Type of Storm Water Control Facility	Proposed Constr. Date		Map No. Form A*	Contact Person Name, Address and Phone	Comments
		Start	End			
F-	None No stormwater control facilites are proposed within Morton Borough.					
F-						
F-						
F-						
F-						
F-						
F-						
F-						

* Enter the stormwater problem area's Map ID No., if the proposed project will solve or reduce and / all of an identified drainage problem.

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

Detention / Retention Basin

Natural Pond or Wetland

Parking Lot Pondling

Roof-Top Storage

Semi-Pervious Paving

Infiltration Device (Seepage / Recharge Basin or Underground Tank)

FORM G

EXISTING FLOOD CONTROL PROJECT FORM G. SHEET 1 OF 1

WATERSHED

Name: Crum Creek
Municipalit Morton
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/5/2004

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-	G-	NONE											
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												

*See measurement key on reverse side

FORM H

PROPOSED FLOOD CONTROL PROJECT FORM H. SHEET 1 OF 1

WATERSHED	FORM COMPLETED BY	INSTRUCTIONS
Name: Crum Creek	Name: Jamie H. Bricker	On the map for proposed stormwater collection systems, diagram each proposed system. Indicate a map point to show changes in system elements, pipe size, pipe direction and connections to existing system. For proposed additions to existing systems, diagram only the additions and their connection point into the existing system. Complete a separate form for each proposed, new system and one for each existing system having one or more proposed additions. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher (if H-3 ends one system, begin the next with H-23). Be sure to show the point where proposed additions connect into existing systems, using the map point number from he existing system form and map. See Sample Diagrams and Form on Reverse.
Municipality: Morton	Telephone: 610-532-2884	
County: Delaware	Date: 8/5/2004	

Map ID No.		System's Elements (x)			Measurements*				Material	Map I.D Nos.**	Proposed Constr. Dates		Design Data	Contact Person	Name of Final Ownership and
					Pipe	Channel / Swale									
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth		Form A	Start	End	Available	Name and Phone	Maintenance Responsibility
H-	H-	NONE													
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														

*See measurement key on reverse side. **Enter the stormwater problem areas' Map I.D. Nos., if proposed project will solve or reduce any / all of the drainage problems.

FORM I

PRESENT & PROJECTED DEVELOPMENT IN THE FLOOD HAZARD AREA FORM I. SHEET 1 OF 1

WATERSHED		FORM COMPLETED BY		DEFINITION
Name:	Crum Creek	Name:	Jamie H. Bricker	FLOOD HAZARD AREA
Municipality:	Morton	Telephone:	610-532-2884	A normally dry land area that has been or is susceptible to being inundated by the 100-year flood.
County:	Delaware	Date:	8/5/2004	
For County Use:				

Map ID No.	TYPE OF DEVELOPMENT	Year Built	Contact Person Name, Address and Phone	Comments
I -	NONE There are no flood hazard areas in the Crum Creek watershed			
I -	portion of the Borough.			
I -				
I -				
I -				
I -				
I -				

Form J

WATER QUALITY PROBLEM AREAS FORM J. SHEET_____ OF _____

WATERSHED		FORM COMPLETED BY	
Name:	Crum Creek	Name:	Jamie H. Bricker
Municipality:	Morton Borough	Telephone:	610-532-2884
County:	Delaware	Date:	8/5/2004

SITE	J-	J-	J-	J-	J-	J-	J-	J-	J-	J-	J-
Types of Water Quality Problems											
High Community Tolerence	NONE										
High Temperature											
High Turbidity											
Hydrocarbon Pollution											
Low Community Diversity											
Low Dissolved Oxygen											
Low pH											
Nutrient Enrichment											
Poor Habitat											
Other/Explanation Line No.											
Potential Cause(s)											
Agriculture											
Construction Site											
Erosion											
Lake Discharge											
STP Outfall											
Other/Explanation Line No.											
Frequency											
Year Most Recent Occurence											
Year First Known Occurence											
Source of Information											
County Water Quality Study											
Driveby											
Other/Explanation Line No.											

EXPLANATION LINES

1. There are no Crum Creek Watershed tributaries in Morton Borough
2
3
4
5
6
7
8
9
10

Form O - Outfall Data

Person: Jamie H. Wenger Date: 2/26/04 Time Since Last Rain was > 72 Hours: Yes_____

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain: Two (2/24/04)

Municipality: Morton Borough Name of receiving water: Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
None												

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

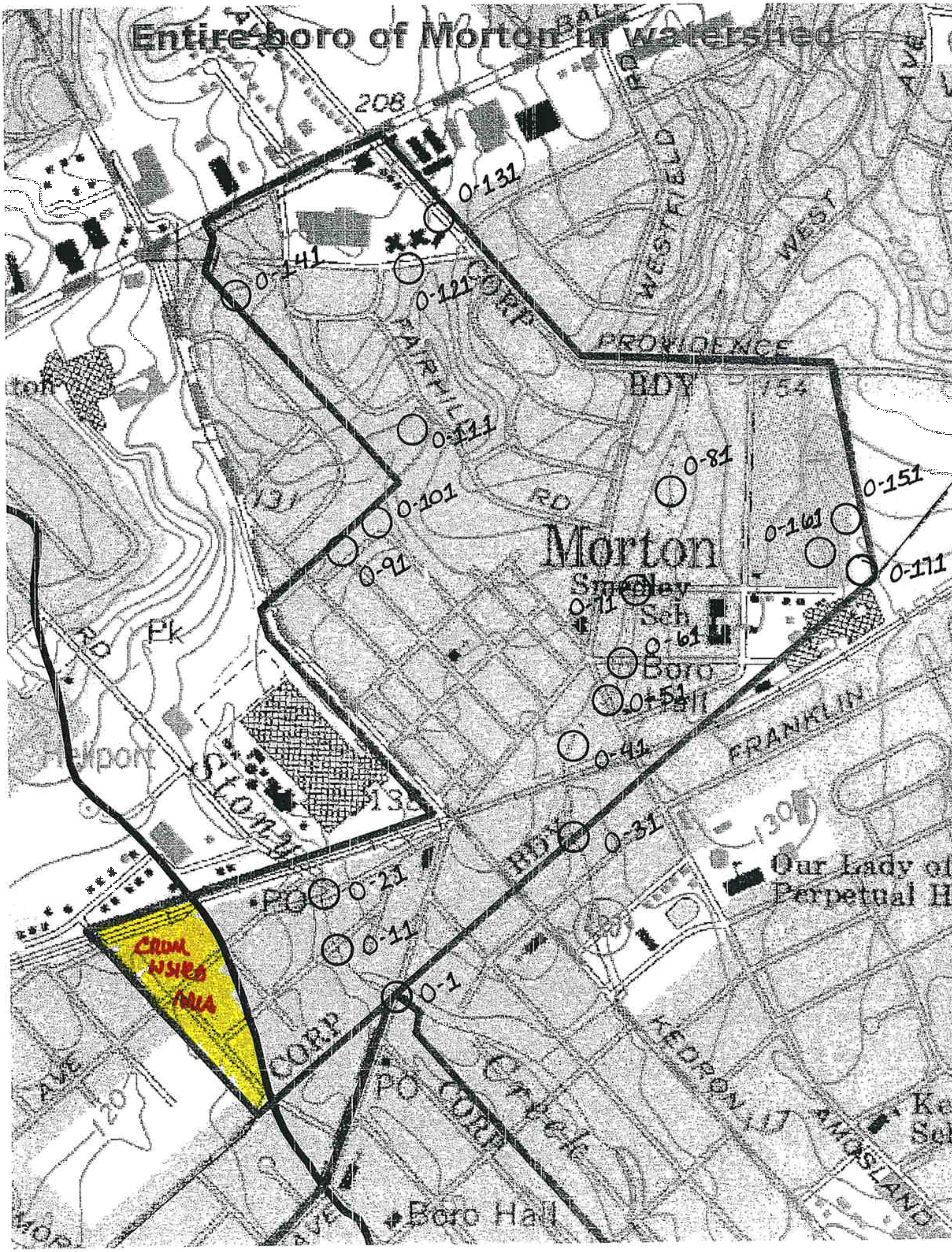
2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment deposition, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Morton Borough does not have any storm sewers or appurtenances connecting to outfalls on Crum Creek or in the Watershed


Entire boro of Morton in watershed
208
0-131
0-141
0-121
CORP
WESTFIELD
WEST
PROVIDENCE
RDY
754
FAIRHILL
0-111
0-81
RD
0-151
0-101
0-161
Morton
0-91
0-171
Smedley
Sch
0-71
0-61
Boro
0-51
Pk
RD
FRANKLIN
0-41
Heliport
130
RDY
0-31
Our Lady of
Perpetual H
PO
0-21
0-11
0-1
CORP
PO
CORP
Creek
KEDRON
AMOSLAND
AVE
Boro Hall

Form O - Outfall Data

Person: Jamie H. Wenger Date: 2/26/04 Time Since Last Rain was > 72 Hours: Yes_____

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain: Two (2/24/04)

Municipality: Morton Borough Name of receiving water: Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
None												

Rating System:

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1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

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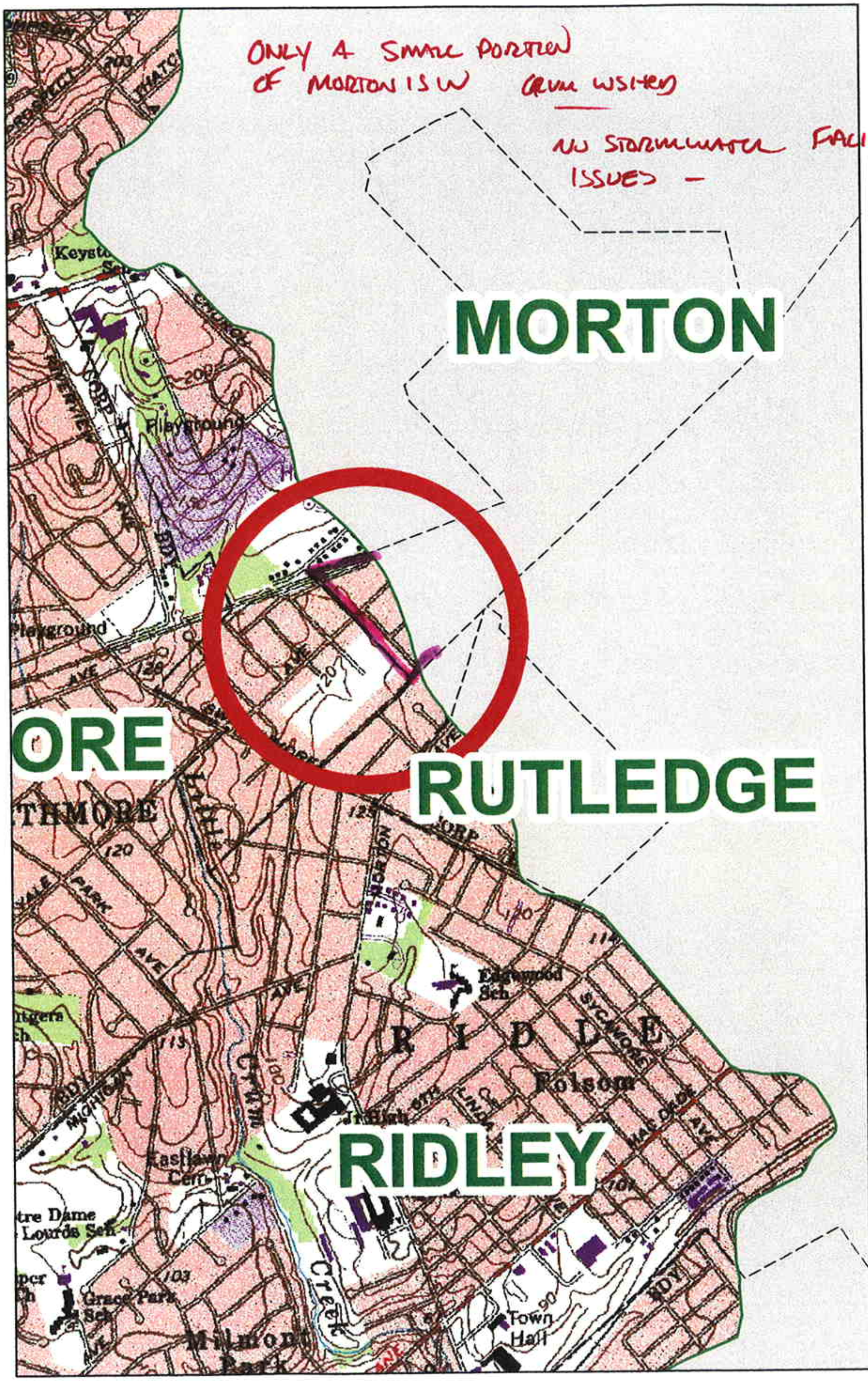
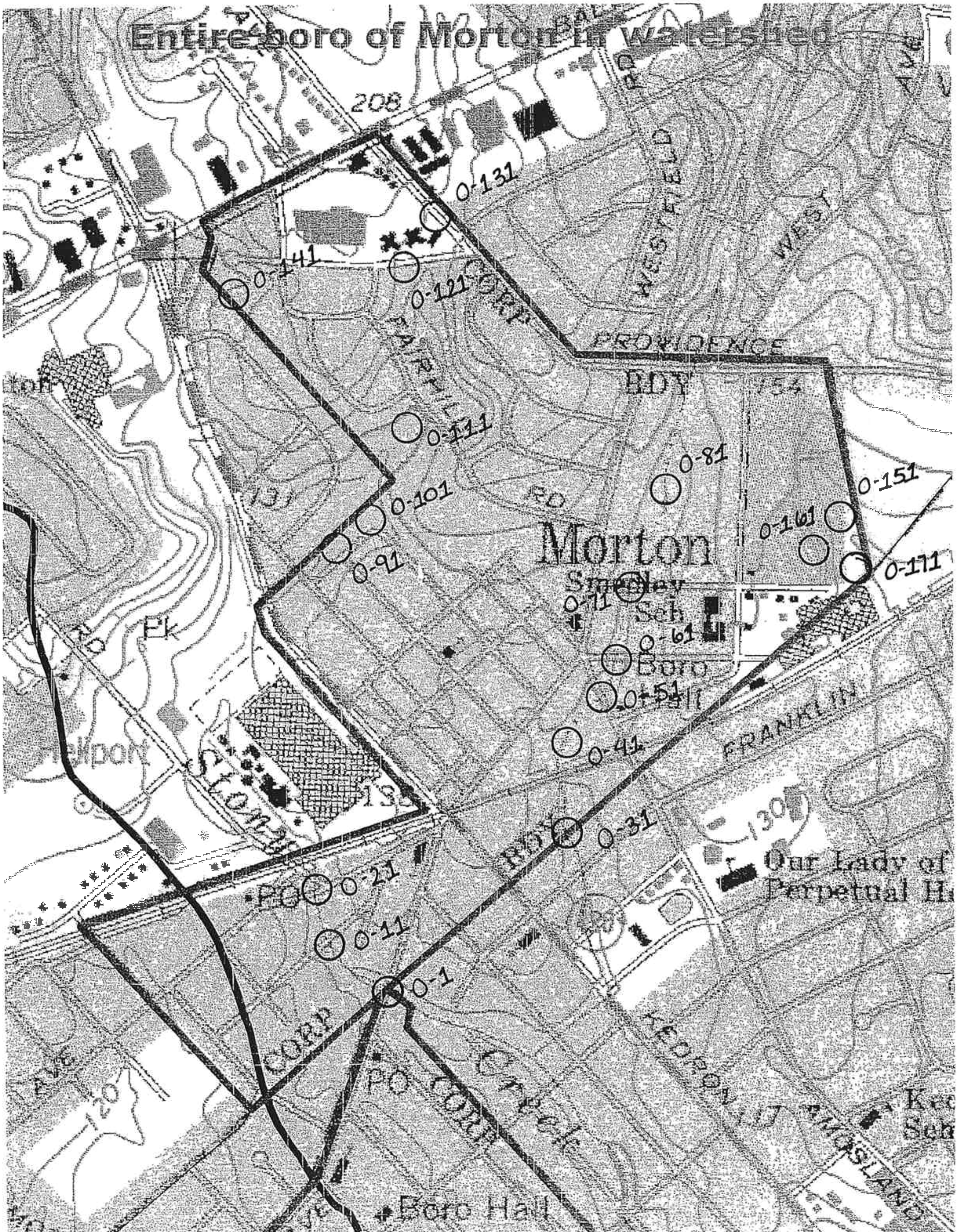
Morton Borough does not have any storm sewers or appurtenances connecting to outfalls on Crum Creek or in the Watershed


ONLY A SMALL PORTION
OF MORTON IS W CRUM WSHED
NO STORMWATER FACILITIES OR
ISSUES -
MORTON
RUTLEDGE
ORE
RIDLEY
Playground
Edgewood Sch
Folsom
Jr High
Eastlawn Cem
Grace Park Sch
Town Hall
Creek



Entire boro of Morton in watershed
0-131
0-141
0-121
0-111
0-81
0-151
0-101
0-161
0-91
0-171
Morton
Smedley Sch
0-71
0-61
Boro Hall
0-51
0-41
FRANKLIN
0-31
Our Lady of Perpetual H
0-21
PO
0-11
0-1
PROVIDENCE
WESTFIELD
FAIRHILL
CORP
BDY
RD
Pk
Heliport
Creek
Boro Hall
208
154
130
120

NETHER PROVIDENCE TOWNSHIP

TOWNSHIP OF NETHER PROVIDENCE

214 Sykes Lane, Wallingford, PA 19086-6350
(610) 566-4516 Fax (610) 892-2890

June 28, 2005

Mr. Chris Gallagher
Delaware County Planning Department
Court House/Government Center
201 W. Front Street
Media, PA 19063

Re: Storm Water Outfall Mapping

Dear Mr. Gallagher:

Enclosed for your file please find copies of "Form O - Outfall Data" for all of Nether Providence Township as well as color pictures for each outfall listing. Also enclosed is a storm sewer map for Nether Providence Township.

Please note that the "C" indicates those outfalls entering an unnamed tributary to Crum Creek. "D" indicates outfalls to Dicks Run that is tributary to Crum Creek. "V" indicates outfalls entering Vernon Run which is tributary to Ridley Creek (enters in Rose Valley Borough). "B" indicates outfalls into Beatty Run which is tributary to Ridley Creek. "B + #" indicates outfalls into a tributary of Beatty Run which ultimately enters Ridley Creek.

Please feel free to contact me if you have any questions.

Yours truly,

Gary J. Cummings
Township Manager

Cc: Jerry Breitmayer
Charles Catania, Jr.
Gary Snyder, NP EAC
Board of Commissioners

Nether Providence

FORM B - OBSTRUCTION DATA COLLECTION

SHEET 12 OF ______

Municipal Stream Obstruction Data

Watershed: Crum Creek

Municipality/County: Nether Providence

Records completed by: Brian Bruno

Field work personnel: " "

Date(s): 12/1 - 12/20/04

T= Amount of fill
D= Diameter
HT = Height
W = Width
PW = Pier Width

Material
msry = Stone Masonry Structure
CMP = Corrugated Metal Pipe
CPP = Corrugated Polyethylene Pipe
BCCMP = Bituminous Coated CMP
RCP = Reinforced Concrete Pipe
SP = Steel Pipe

Inlet Conditions
HW = Headwall
WW = Wingwall
SW = Sidewall

Map ID.	Owner or Address Of Obstruction	Capacity (CFS)	Nos. of?	Opening: Type: Part of Bridge?	Opening: Type: Culvert Purpose	Shape (✓): Culvert □	Shape (✓): Culvert ○	Shape (✓): Culvert ⬭	Shape (✓): Bridge ⌒	Shape (✓): Bridge ⊓	Measurements: T (ft)	D (ft)	HT (ft)	W (ft)	PW (ft)	skew angle	MATERIAL / INLET CONDITION	NOTES
NET 1	Rose Valley Rd over Crum		1	✓						✓	4		12	143	4	90	concrete	
NET 2	" " " over Dicks		1	✓						✓	1		9	12		90	concrete	
NET 3	" " over Dicks		1			✓					1		5	14.5		90	concrete, HW, WW	
NET 4	Dicks Run under TP		1	✓					✓		1		* back	10		90	MSRY	
NET 5	" " "		1	✓						✓	.8		7	42		90	metal / wood	
NET 6	Turnpike			✓														
NET 7	Dicks Run under TP		1	✓						✓	.8		2.5	20		90	metal/wood	
NET 8	Avondale		1			✓					2		3	10		90	concrete, HW	
NET 9	Avondale + Copples		1	✓						✓	2		6.5	10		90	Concrete, WW	
NET 10	Avondale		1	✓						✓	.2		4	32.5		90	wood	
NET 11	Avondale		1	✓						✓	1		4	12		90	concrete	
NET 12	217 "		1	✓						✓	1.5		3.8	9		90	concrete	
NET 13	213 "		1	✓						✓	1		8	10		90	concrete	
NET 14	" + Oak Knoll		1	✓						✓	1.5		4	19		45	concrete	
NET 15	Crum Ck Rd / Oak Valley Rd		1	✓						✓	1.5	–	3	12	–	90	Concrete / [illegible]	
NET 16	423 Oak Valley Rd		1				✓				.1	5.5	–	–	–	90	BCCMP / HW	Driveway bridges (NET 16–21)
NET 17	421 " "		1				✓				.1	5.5	–	–	–	90	BCCMP / HW	
NET 18	419 " "		1				✓				.1	5.5	–	–	–	90	BCCMP / HW	
NET 19	417 " "		1				✓				.1	5.5	–	–	–	90	BCCMP / HW	
NET 20	415 " "		1				✓				1	5.5	–	–	–	90	BCCMP / HW	
NET 21	413 " "		1				✓				.8	5.5	–	–	–	90	BCCMP / HW	
NET 22	Beatty Rd over Crum		1	✓						✓	6	–	10	85	–	90	Concrete / WW	
NET 23	501 Beatty Rd		1				✓				2	2.5	–	–	–	90	RCP / [illegible]	No channel / outfall pipe
NET 24	505 " "		1				✓				1	2.5	–	–	–	90	" "	
NET 25	[illegible] Dr / Meredith Dr		1				✓				2	3	–	–	–	90	RCP / HW, SW	
NET 26	708 Beechwood Rd		1				✓				1.5	4	–	–	–	90	RCP / HW	
NET 27	704 " "		1				✓				1.3	5	–		–	90	RCP / HW, SW	
NET 28	70_ " "		2				✓				5	2	–	–	–	90	RCP / HW, SW	Diagram
NET 29	Beechwood / Pine Ridge		1	✓						✓	.3	–	2.8	13	–	90	Wood	
NET 30	Pine Ridge Rd		1								1	–	4	6	–	90	BCCMP / HW, WW	
NET 31	606 Pine Ridge Rd		1	✓						✓	1.5	–	4	6	–	90	Concrete	Sounds like Stormy drainage
NET 32	2nd bridge		1	✓						✓	.8	–	3	4		90	Wood	
NET 33	" " RR culvert		1			✓					13	–	5	9	–	50	Concrete / HW, WW	
NET 34	Plush Mill Rd		1			✓					2	–	2.8	6	–	90	Concrete / HW, WW	
NET 35	Dicks Run South of Plush Mill			✓						✓	2	–	4	3	–	90	MSRY / HW	
NET 36	" Near RR track						✓				1.8	3	–	–	–	90	Concrete / HW, WW	

NET

FORM B - OBSTRUCTION DATA COLLECTION — SHEET 11 OF ____

Municipal Stream Obstruction Data

Watershed: Crum Creek

Municipality/County: Nether Providence /

Records completed by: Brian Bruno

Field work personnel: " "

Date(s): 12/1 - 12/20/04

T= Amount of fill	**Material**	**Inlet Conditions**
D= Diameter	msry = Stone Masonry Structure	HW = Headwall
HT = Height	CMP = Corrugated Metal Pipe	WW = Wingwall
W = Width	CPP = Corrugated Polyethylene Pipe	SW = Sidewall
PW = Pier Width	BCCMP = Bituminous Coated CMP	
	RCP = Reinforced Concrete Pipe	
	SP = Steel Pipe	

Map ID.	Owner or Address Of Obstruction	Capacity (CFS)	Nos. of?	Opening – Type: Part of Bridge?	Opening – Type: Culvert Purpose	Shape (✓) Culvert □	Shape (✓) Culvert ○	Shape (✓) Culvert ⬭	Shape (✓) Bridge ⌒	Shape (✓) Bridge ⊓	Measurements T (ft)	D (ft)	HT (ft)	W (ft)	PW (ft)	skew angle	MATERIAL / INLET CONDITION	NOTES
NET 37	Dicks Run Private Bridge		1	✓						✓	.5	—	3	15	—	90	Wood	
NET 38	Circle at Avondale near RR		1	✓						✓	1	—	4	25	—	90	Wood	
NET 39	RR Bridge over Dicks		1	✓					✓		[illegible]	—	X	15	—	90	MSRY / [illegible]	See Drawing
NET 40	Rogers Ln / Dicks Run		1	✓					✓		10	—	X	10	—	90	Concrete / [illegible]	See Drawing
NET 41	Ridley Mill Rd over Crum		1	✓						✓	3.5	—	9	67	—	90	Concrete	

Form O - Outfall Data

Person: Breitmayer, Jerome Date: 6/15/05 Time Since Last Rain was ≥ 72 Hours: Yes ✓

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 5

Municipality: Nether Providence Township Name of receiving water: Vernon Run

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
V1	Vern 1	Yes	1:00 Pm	30"	.1'	8'	14'	2:3	Yes	Clear	Res	1
V2	Vern 2	Yes	1:15 P	36"x2	.5'	4'	6'	3:2	Yes	Algae	Res	1
V3	Vern 3	Yes	1:30 P	30x2	1'	10'	14'	8:5	Yes	Clear	Res	0
V4	Vern 4	Yes	2:00 P	42"	.5	8'	10'	2:1	Yes	Clear	Res	0

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Vernon 2 – Dennis Lane
Twin 36" corrugated.
V-2

Vern 1 Sapovit & Rak
30"
V-1

Vern 3 – Twin 30" – Highland + Wall. Ave.
V-3

Vernon 4 – 42" concrete
Possum Hollow + Fox
V-4

Form O - Outfall Data

Person: Breitmayer Jerome Date: 6/15/05 6/16/05 Time Since Last Rain was ≥ 72 Hours: Yes √

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 6 +7

Municipality: Nether Providence Twp Name of receiving water: Dicks Run

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
D1												
D2	D2	~~YES~~	2:15 P	24"+8"	0	4'	8'	1:1	NO	N/A	Res	0
D3	D3	Yes	2:30 P	30"x2	.7	~~8'~~	8'	~~2~~:3	Yes	Clear	Res	0
D4	D4	Yes	2:40 P	18"	0	6'	10	5:~~8~~	NO	N/A	Res	0
D5	D5	Yes	7:30 A	18"	0	6'	12'	~~1~~:1	NO	N/A	Res	0
D6	D6	Yes	7:45 A	18"	0	3'	4'	~~2~~:3	NO	N/A	Res	0
D7	D7	Yes	7:45 A	18"	.1	~~4~~3'	4'	~~2~~:3	Yes	Clear	Res	0
D8	D8	Yes	8:00 A	18"	0	4'	8'	~~1~~:1	NO	N/A	Res	0
D9	D9	Yes	8:50 A	12"	.2	3'	3'	1.5:1	Yes	Clear	Res	0

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

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H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Form O - Outfall Data

Person: Boettmayer Jerome Date: 6/16 Time Since Last Rain was ≥ 72 Hours: Yes ✓

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 7

Municipality: Nether Providence Twp. Name of receiving water: Dicks Run

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
D10	D10	Yes	9:30A	18"	0	6'	16'	4:3	NO	N/A	Res	0
D11	D11	Yes	10:30A	18"	0	8'	10'	5:8	NO	N/A	Res	0
D12	D12	yes	10:40A	36"	.2	6'	12'	1:1	Yes	Clear	Res	0
D13	D13	yes	10:45A	10"	0	6'	12'	1:1	NO	N/A	Res	0
D14	D14	yes	11:00A	15"	0	10'	12'	3:5	NO	N/A	Res	0
D15	D15	NO	11:05A	N/A	N/A	.4'	12	3:7	NO	N/A	Res	0
D16	D16	yes	11:15A	18"	0	6'	10'	5:6	NO	N/A	Res	0
D17	D17	Yes	11:30A	18" x2	0	8'	12	3:4	NO	N/A	Res	0
D18	D18	yes	11:45A	12"	0	10'	10'	1:1	NO	N/A	Res	0

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

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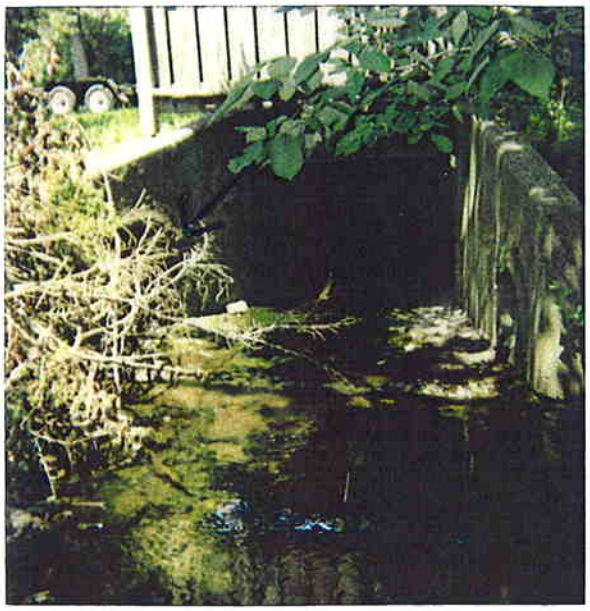
NOTES:



Dogwood @ Plush Mill - Dicks Run D-3

Plush Mill @ Dogwood D 2
2 exit pipes

D 5 - From Green Valley to concrete swail to Dicks Run

From Knoll to Dicks Run
D 4 - 18" concrete

D7 - Possumhollow to Dicks Run - Train Station

D6 - Possum Hollow To Dicks Run - Train Station

D9 - Avondale @ Cricket To Dicks Run

From Knoll @ Turner to Dicks Run. D8

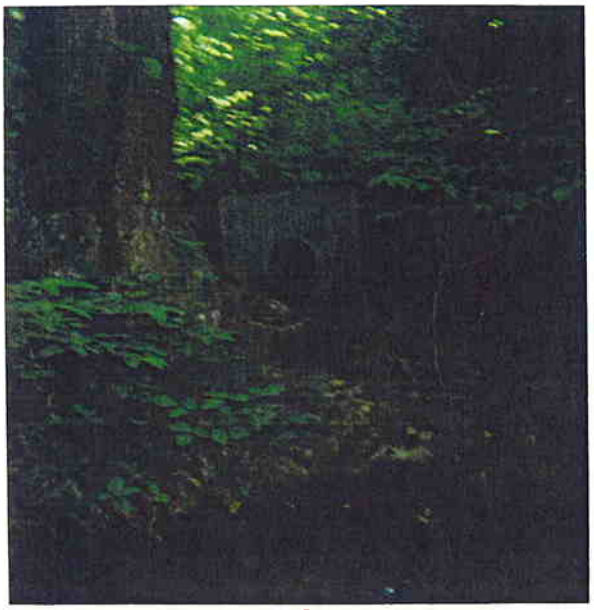
Avondale @ Knoll - to Dicks Run D11

D10 - Sykes Crl DeSac To Dicks Run

Under Avondale Rd @ Knoll to Dicks Run D13

Avondale @ Kershaw to Dicks Run D12

D15 - Topples @ Avondale Storm Drain Curb Swail. Entering Dicks Run



D14 - Col De Sac of KNOLL ed to Dicks Run

D17 - Avondale @ end of concrete sidewalk with Blue Route overhead to Dicks Run

D16 Avondale @ entrance of Leaf Site entering Dicks Run

D18 - Avondale just before intersection of Rivalley Road

Form O - Outfall Data

Person: Breitmayer, Jeron Date: 6/15/05 Time Since Last Rain was ≥ 72 Hours: Yes ✓

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 5

Municipality: Nether Providence Twp Name of receiving water: Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
C1	C1	Yes	11:00 A	24"	0	8'	8'	1:1	NO	N/A	Res	0
C2	C2	Yes	11:10A	24"	0	8'	8'	1:1	NO	N/A	Res	0
C3	C3	Yes	11:20A	24"	0	N/A	N/A	N/A	NO	N/A	Res	0
C4	C4	Yes	11:40A	30"	0	8'	8'	1:1	NO	N/A	Res	0
C5	C5	Yes	11:50 A	48"	.1	6'	8'	1:1	Yes	clear	Res	0

Rating System:

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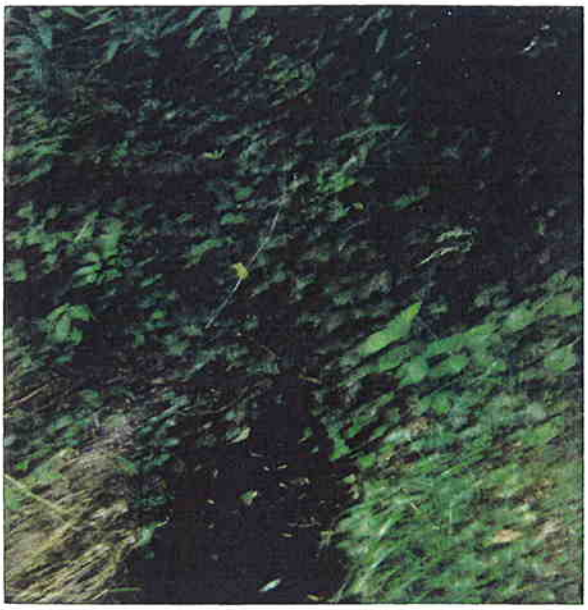
NOTES:



OAKvalley 2 of Crum

C2

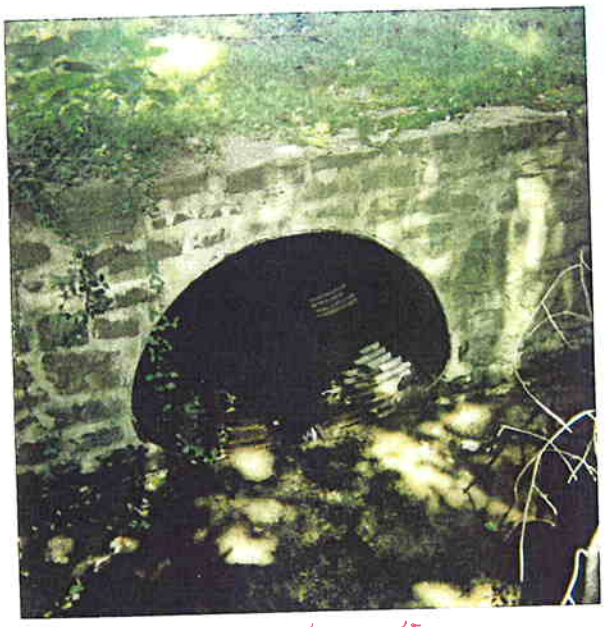
OAKVALLEY #1 Crumm

4 crumm - 817 Park Ridge to Beechwood

C4

ParkRidge #3 crum

C3



5 crumm - Intersection
Hemlock + Pine Ridge
C5

Form O - Outfall Data

Person: Breitmayer Jerome Date: 6/17/05 Time Since Last Rain was ≥ 72 Hours: Yes √

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 7

Municipality: Wether Providence TW Name of receiving water: Bratty Run

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
B1	B1	Yes	7:10 A	Direct	to Box Culvert			1:1	NA	Clear	Res	0
B2	B2	Yes	7:15 A	12"	0	6	6	1:1	NO	~~Clear~~ N/A	Res	0
B3	B3	yes	7:30 A	Direct	to Box	Culvert	4	1:1	NO	N/A	Res	0
B4	B4	Yes	7:40 A	18"	0	6	10	5:3	NO	N/A	Res	0
B5	B5	Yes	8:00 A	24"	0	8	8	1:1	NO	N/A	Res	0
B6	B6	Yes	8:15 A	18"	0	8	8	1:1	NO	N/A	Res	0
B7	B7	Yes	8:30 A	18"	0	8	8	1:1	NO	N/A	Res	0
B8	B8	Yes	8:45 A	Direct	to Box	Culvert		1:1	~~NO~~ YES	Clear	Res	0
B9	B9	Yes	9:00 A	18"	0	6	12	6:3	NO	N/A	Res	0

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Form O - Outfall Data

Person: Breitmayer Jerome Date: 6/17/05 Time Since Last Rain was ≥ 72 Hours: Yes ✓

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 7

Municipality: Nether Providence Twp - Name of receiving water: Beatty Run

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
B10	B10	Yes	9:15A	18"	0	10	20	2:1	NO	N/A	Res	0
B11	B11	Yes	9:30A	18"	0	6	12	2:1	NO	N/A	Res	0
B13	B13	Yes	9:40A	18"	0	8	8	1:1	NO	N/A	Res	0
B14	B14	Yes	9:55A	16"	0	8	8	1:1	NO	N/A	Res	0
B15	B15	Yes	10:10A	18"	0	6	12	2:1	NO	N/A	Res	0
B16	B16	Yes	10:15A	18"	0	6	12	2:1	NO	N/A	Res	0

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

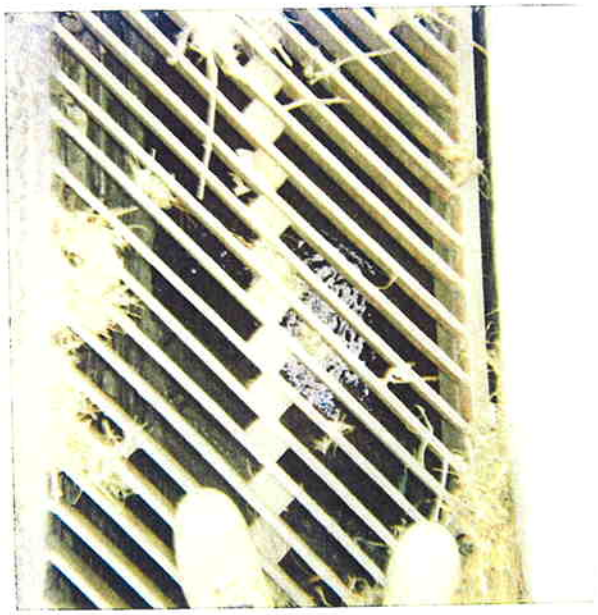
NOTES:

Dewey Lane – New Development
12" Pipe to Beatty A B2

Taylor Drive - Storm Drain
to Box Culvert Beatty Run
~~A~~1 B1

Bowers 12" Pipe

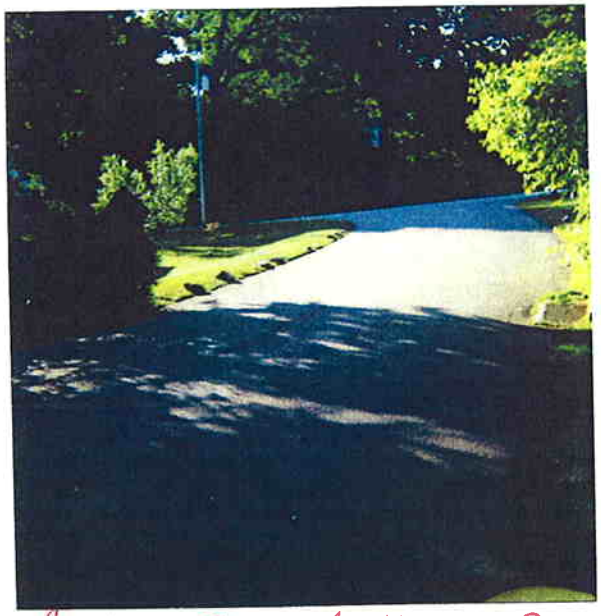
B 4



115 Meadow - Storm Drain Direct
to Box Culvert – Beatty Run
A B3

Beatty 6 - Berkshire to Beatty Run - B6

620 Morris - 24" to Beatty B5



Beatty 8 - Beatty 1 + 2 join at Devon + Waterford Open storm Box Culvert B8

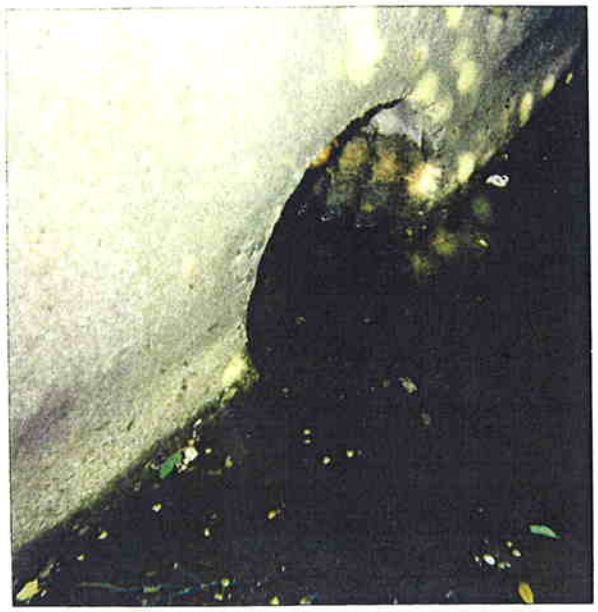
Beatty 7 - B7
19 Berkshire to Beatty Run

Beatty 10 c Waterford Circle to Beatty Run B10

Beatty 9 - 0 from Waterford way - 24c B-9

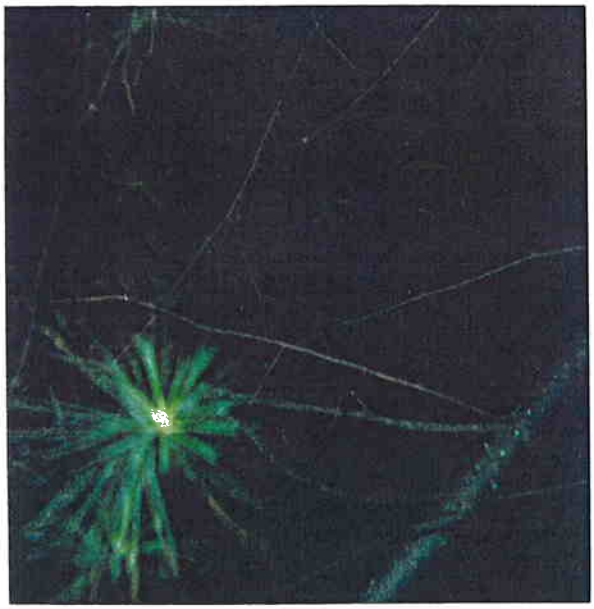
Beatty 12 - Pleasant 821 Hill

Beatty 11 - From Pleasant Hill Rd 809 B11

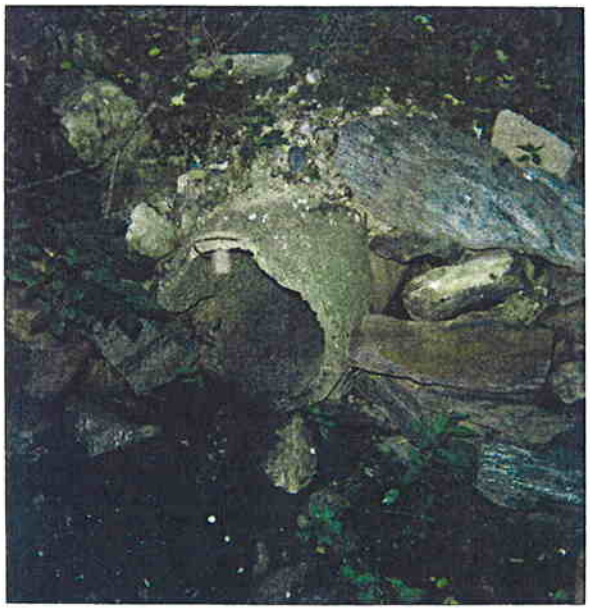


Beatty 14 – ~~403~~ Harvey
B14

37 Waterford Way
Beatty 13 B13



Beatty 16 – 806 Harvey
Acc
B16



Beatty 15
804 Harvey B15

Form O - Outfall Data

Person: Breitmayer, Jerome Ellis, John Date: 6/16/05 Time Since Last Rain was ≥ 72 Hours: Yes S

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 6

Municipality: Nether Providence Twp Name of receiving water: Beatty Run

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
BT1	BT 1	Yes	7:15	Box Culvert	Direct		N/I	A	Yes	Clear	Res	0
BT 2	BT 2	Yes	7:30	Box Culvert	Direct		N/I	A	Yes	Clear	Res	0
BT3	BT 3	Yes	7:45	24"	.2	8	8	1:1	Yes	Clear	Res	0
BT4	BT 4	Yes	7:50	Box Culvert	Direct	6	6	1:1	Yes	Clear	Res	0
BT5	BT 5	Yes	7:55	Box Culvert	Direct	6	6	1:1	Yes	Clear	Res	
BT6	BT 6	Yes	8:00	Box Culvert		6	6	1:1	Yes	Clear	Res	0
BT7	BT 7	Yes	8:30	Box Culvert	Direct	8	8	1:1	Yes	Clear	Res	0
BT8	BT 8	Yes	8:40	Box Culvert	Direct	8	12	3:2	Yes	Clear	Res	0
BT9	BT 9	Yes	8:5	18"	Concrete	Swale	N/A	N/A	NO	N/A	Res	0

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Form O - Outfall Data

Person: Ellis John Breitmayer Jerom Date: 6/17/05 Time Since Last Rain was ≥ 72 Hours: Yes √

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 7

Municipality: Nether Providence Twp Name of receiving water: Beatty Run

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
BT10	BT10	Yes	12:20 A	Box Culvert	0	12	12	1:1	NO	N/A	Res	0
BT11	BT11	Yes	12:10 P	18"	0	12	12	1:1	NO	N/A	Res	0
BT12	BT12	Yes	12:20 P	Box Culvert	Direct	4	6	3:2	NO	N/A	Res	0
BT13	BT13	Yes	12:36	Box Culvert	Direct	4	6	3:2	NO	N/A	Res	0

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

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H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

300 Fas filed

Bt 2

216 Laurel Lane
Direct to Box Culvert

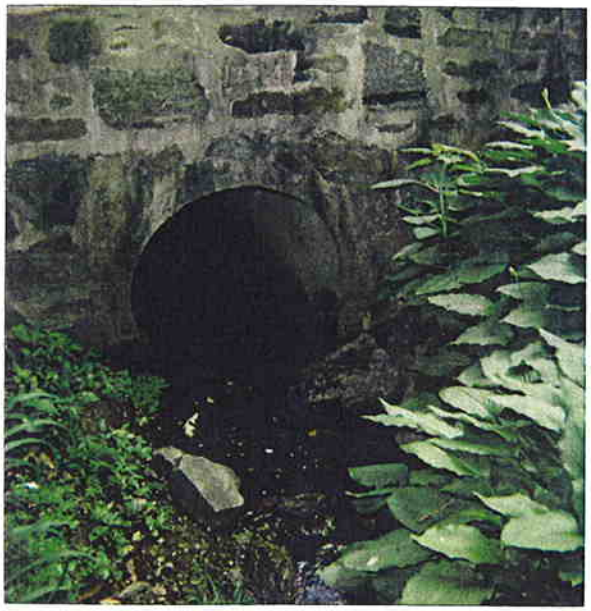
Bt 1

405 Scott Lane

Bt 4

Side yard of 300 Fairfield

Bt 3 24"



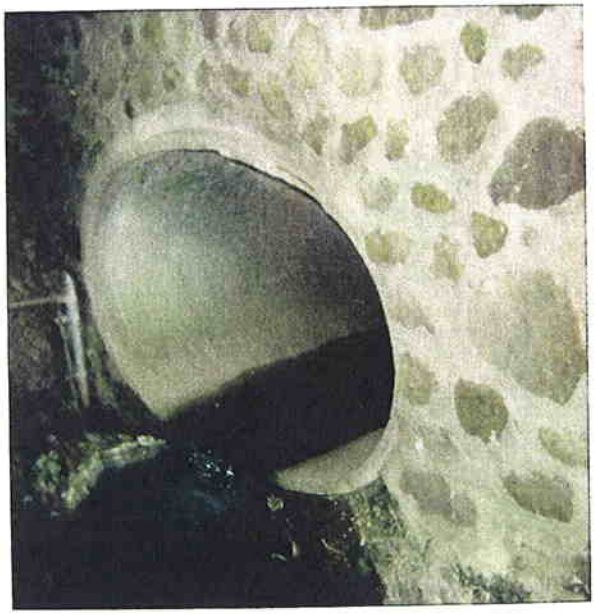
406 Scott Lane

Bt 6

Pt6

Pt5 404 Scott Lane

Bt ~~12~~ 8 Georgetown @ sheffield



407 Christian Lane Side YARD

~~Bt 6~~

BT 7

BT 10 532 Georgetown
TO Box Culvert

BT 9 Coy Creek side of House

BT 12 719 Oxford
Direct to Box culvert

BT 11 Georgetown 532

B+ 13 Devon At Waterford
Direct to Box Culvert

LEGEND:

- Inlet and Storm Sewer Pipe
- Inlet W/Curb Opening Only (No Grate)
- Storm Manhole
- Endwall/Headwall
- Bridge Culvert
- Retention/Detention Basin
- Tributary/Stream

STORM SEWER SYSTEM

NETHER PROVIDENCE TOWNSHIP

DELAWARE COUNTY, PENNSYLVANIA

Scale 300 0 300 600 Feet

JOHN P. DAMON ASSOCIATES, INC., CIVIL ENGINEERS (Sep90)
NDI ENGINEERING CO. (Jan96; Mar96; Jun98)

FN: NetherProv-Storm

Attachment III

NEWTOWN TOWNSHIP

CRUM CREEK WATERSHED
ACT 167 STORMWATER MANAGEMENT PLAN

MUNICIPALITY QUESTIONNAIRE

Please fill out the following questionnaire and return it to Karen Holm at the Delaware County Planning Department, Court House and Government Center Building, 201 West Front St. Media, PA 19063 as soon as possible. If you have any questions or comments, or if you would like these forms in digital format, please call Karen at 610-891-5213 or e-mail her at holmk@co.delaware.pa.us.

PART I - GENERAL INFORMATION

Municipality: Newtown Township

Contact Person: Maria Toglia & Linda Bower

WPAC Designee: _____

Title: Co Chairs of EAC

Address: Maria Toglia: 4115 Meadow Lane
Newtown Square, PA 19073

Phone: Maria Toglia: 610 325 · 7820

Fax: " 610 · 325 · 4324

Person Completing form (if different from Contact Person):

Name: _____

Address: _____

_____

Phone: _____

Fax: _____

E-mail: _____

PART II - REGULATORY ACTIVITIES

A. Please indicate the regulations you currently use to manage development.

REGULATION	MUNICIPAL ORDINANCE	COUNTY ORDINANCE
Zoning Ordinance	✓	
Subdivision/Land Development Ordinance	✓	
Separate Stormwater Ordinance	in process	
Separate Floodplain Ordinance		

B. Please indicate the agencies/individuals who review and approve land development plans and zoning variance/waiver requests.

ENTITY	LAND DEVELOPMENT PLANS		ZONING VARIANCE/WAIVER REQUESTS	
	REVIEW	APPROVE	REVIEW	APPROVE
Supervisors		✓	✓	✓
Municipal Engineering Department	✓		✓	
Municipal Planning Department	✓			
County Planning Department	✓			
County Conservation District	✓			
Zoning Hearing Board			special exceptions ✓	& variances
Consulting Engineer				
Others (List Below				

landscape engineer ✓

C. Please provide **copies** of your zoning, subdivision/land development, and separate stormwater management and floodplain ordinances and your current zoning map when you return this questionnaire. Please list these documents below.

zoning, land development ordinance, zoning map

storm water management ordinance is in progress

PART III - MUNICIPAL AND LOCAL PLANNING ACTIVITIES

Please indicate below whether your community has approved the following plans and maps and the date of the most recent update.

ITEM	APPROVED/DATE	IN PROGRESS	PLANNED WITHIN NEXT YEAR
PA Act 537 Sewage Facilities Plan	✓		
Comprehensive Land Use Plan	✓		
Existing Land Use Maps	✓		
Proposed Land Use Maps			
Zoning Maps	✓		

approval dates are unknown & all different

PART IV - FLOOD INSURANCE PROGRAM AND COMPREHENSIVE LAND USE PLAN

Please indicate below whether your community participates in the National Flood Insurance Program:

ITEM	PARTICIPATES (Y/N)
Flood Hazard Boundary Map (FHBM)	Y
Participates in FEMA Emergency Program	?
Participates in FEMA Regular Program	?

waiting to hear from Engineer.
Township didn't know

PART V - EXISTING STORMWATER RELATED PROBLEMS AND STRUCTURES

Please complete the matrices on the following pages (Forms A and C-J) to describe any significant stormwater-related problems (Form A), Existing or Proposed Flood Control Projects (Forms C & D), Existing or Proposed Storm Water Control Facilities (Forms E and F), Existing or Proposed Stormwater Collection Systems (Forms G & H), Present and Projected Development in the Flood Hazard Area (Form I), and Water Quality Problem Areas (Form J) that you are aware of in your municipality.

What we would like to ask of you is that you complete as much of the attached data collection forms as possible. There is a different form for each item of information as summarized in the attached "FORM DESCRIPTION SUMMARY. The process would be as follows starting with the problem areas (Form A):

- Place the location of the problem area on the map as shown in the attached example map.
- Draw a box on the map with the problem area identifier starting with A-1 with an arrow leading from the problem area identifier to the problem area.
- Place an A-1 in the first column of FORM A.
- Put a check in each box in the A-1 column that represents the problems associated with that particular problem area.
- Repeat with the next problem area (A-2) and so on.

STORM WATER PROBLEM AREAS - FORM A sheet 1 of 1

WATERSHED
Name: Crum Creek
Municipality: Newtown
County: Delaware

FORM COMPLETED BY
Name: Maria Taglia
Telephone: 610.325.9820
Date: 9.4.04

Letters correspond to Map Labled Stormwater Basins & Waterflow Concern Areas (Info. also available on GIS)

MAP NO.	sample A-99	A-	B 1/2	C	D	E	G	A-I	A-J	A-	A-	A-	A-
Types of Storm Water Problems													
Flooding	x	X	X	X	X	X	X	X	X				
Accelerated Erosion	x		X	X									
Sedimentation													
Landslide													
Groundwater													
Water Pollution	x												
Other (Explain)													
Explanation Line No.(s)				1			7	9	10				
Cause(s)													
Storm Water Volume	x	X	X	X	X	X	X	X	X				
Storm Water Velocity	x		X	X				X					
Storm Water Direction	x			X				X					
Water Obstruction	x					X	X		X				
Other (Explain)													
Explanation Line No.(s)					3	5	7		11				
Frequency													
Year Most Recent Occurred		2004 ?	2004 ?	2004 ?	2004 ?	2004 ?	2004 ?	? ?	? ?				
Year First Known to Occur													
Regularity													
More Than 1/Year	x	✓		✓	✓	✓	✓	?	?				
Less Than 1/Year													
Only During Agnes or Floyd													
Duration (If Applicable)													
Less Than One Day	x					✓		?	?				
One Day + (Enter Days)		✓	✓	✓	✓		✓						
Property Damages													
Loss of Life / Vital Services					X	X							
Private		X	X	X	X		X	X	X				
More Than One Owner		X	X	X			X						
Types of Properties													
Undeveloped													
Agricultural													
Residential		X	X	X	X	X	X		X				
Commercial	x							X					
Industrial													
Number of Properties													
1					X	X		X					
2-10	x	✓	✓	✓					X				
11+							X						
Public (List Types)													
Explanation Line No.(s)					4	6							
Solutions													
Suggested													
Explanation Line No.(s)	1			2									
Formally Proposed							X						
Explanation Line No.(s)							8						

EXPLANATION LINES

1 Uncontrolled runoff from Nolan property onto 3 Echo Valley Properties
2 Township, Brandywine Conservancy & Township considering options with Nolan
3 Crum Creek overflows onto street & property across street
4 Bartrum Bridge property - Road Closes
5 Waterflow obstructed by Goshen Rd.
6 Public Rd. - closes when flooded
7 standing water creates mold problem, impervious surfaces impedes infiltration

Newtown (NEW)

FORM B - OBSTRUCTION DATA COLLECTION SHEET 3 OF 15

Municipal Stream Obstruction Data

Watershed: Crum Creek

Municipality/County: Newtown / Delaware

Records completed by: Brian Bruno

Field work personnel: " "

Date(s): 12/1 - 12/20/04

T= Amount of fill
D= Diameter
HT = Height
W = Width
PW = Pier Width

Material
msry = Stone Masonry Structure
CMP = Corrugated Metal Pipe
CPP = Corrugated Polyethylene Pipe
BCCMP = Bituminous Coated CMP
RCP = Reinforced Concrete Pipe
SP = Steel Pipe

Inlet Conditions
HW = Headwall
WW = Wingwall
SW = Sidewall

Map ID.	Owner or Address Of Obstruction	Capacity (CFS)	Nos. of?	Opening Type: Part of Bridge?	Opening Type: Culvert Purpose	Shape (✓) Culvert □	Culvert O	Culvert ⬭	Bridge ∩	Bridge ⊓	T (ft)	D (ft)	HT (ft)	W (ft)	PW (ft)	skew angle	MATERIAL / INLET CONDITION	NOTES
NEW 1	Horse Farm off Goshen		1				✓				.6	1.5	–	–	–	90	CMP / WW, HW	
NEW 2	Boot Rd N Bridge		1				✓				1	5	–	–	–	90	MSRY	Lewis Run
NEW 3	Boot Rd S		1				✓				4	6	–	–	–	90	RCP / HW	
NEW 4	Goshen Rd / Lewis Run		1				✓				1.1	4.5	–	–	–	90	RCP / HW, ½ WW	
NEW 5	Crum Ck Rd		1	✓						✓	1	–	6.1	15.5	–	90	Concrete / WW	
NEW 6	" " Private Bridge		1	✓						✓	.7	–	4	12	–	90	Wood	
NEW 7	Pheasant Ln		1				✓				1.4	2.5	–	–	–	90	RCP / HW	
NEW 8	Battles Ln / Lewis Run		1					✓			4.1	–	5.5	8	–	90	RCP / HW, WW	
NEW 9	Echo Valley Ln / Lewis Run		1					✓			2	–	5.5	8	–	90	RCP / HW, WW	
NEW 10	Echo Valley Ln		1					✓			2.2	–	4	6	–	90	RCP / HW, WW	
NEW 11	" " / Meadow Ln		1				✓				2.5	2	–	–	–	90	RCP / HW, WW	No channel, underground
NEW 12	" " Private Bridge		1	✓						✓	.8	–	7	6	–	90	Wood	Estimate
NEW 13	331 Echo Valley Ln		1				✓				3	1.5	–	–	–	90	CMP	
NEW 14	Goshen Rd		1				✓				1	2	–	–	–	90	BCCMP / HW	
NEW 15	Pine St		1				✓				2.5	2	–	–	–	90	RCP / HW	
NEW 16	Main St / Summit		1				✓				5.3	3.5	–	–	–	90	RCP / HW	
NEW 17	Summit Ln		1				✓				3.2	2	–	–	–	90	BCCMP / HW	
NEW 18	Summit / Chester		1				✓				7	3.3	–	–	–	100	RCP / HW	
~~NEW 19~~	~~[illegible]~~		1				~~✓~~				~~[illegible]~~	~~3.5~~				~~90~~	~~[illegible]~~	~~[illegible]~~
NEW 19	Hickory Ln		1				✓				1	2	–	–	–	90	RCP / HW	
NEW 20	Private rd off Bishop Hollow		1				✓				2	1.5	–	–	–	90	CMP / HW	
NEW 21	William Spruce off "		1				✓				4.5	1.5	–	–	–	90	RCP / HW	
NEW 22	481 Bishop Hollow		1				✓				.6	4	–	–	–	90	RCP / HW	
NEW 23	401 " "		2				✓				2.5	2.5	–	–	–	90	SP / HW	See diagram
NEW 24	541 Bishop Hollow		1				✓				1.5	2.5	–	–	–	90	CMP / HW	
NEW 25	Darbyville / Bishop Hollow		1				✓				1	4	–	–	–	60	BCCMP / HW, ½ SW	
NEW 26	[illegible] Rd / [illegible]		1	✓						✓	2	–	7	12.5	–	90	Concrete / [illegible]	
NEW 27	Providence Rd / Pineville Dr		1				✓				2.3	2.5	–	–	–	90	~~RCP~~ / HW	
NEW 28	[illegible] Woods Rd		1				✓				1.5	4	–	–	–	90	RCP / HW, WW	
NEW 29	115 ↑		1				✓				2.5	4	–	–	–	90	CMP	[illegible]
NEW 30	111 ↑		1				✓				2.5	4	–	–	–	90	CMP	" "
NEW 31	Providence / Bishop Hollow		1				✓				3	1.5	–	–	–	90	SP / HW	
NEW 32	Horseshoe [illegible]		1				✓				5	3.5	–	–	–	90	CMP	[illegible]
NEW 33	[illegible]		1					✓			12	–	5	6.5	–	90	CMP / HW, WW	
NEW 34	[illegible] / Darbyville Rd		1	✓						✓	3.5	–	20	77	–	90	Concrete	* Ht Estimate
NEW 35	" / Bishop Hollow		1	✓						✓	3.5	–	18	75	–	90	" " / WW	

*Relabeled NEW34 - NEW44 to NEW27 - NEW37

I:\GISData\Misc-stormwater\Act167DOCS\DataCollectionForms\obsforms.xls

NEWton (NEW)

FORM B - OBSTRUCTION DATA COLLECTION	SHEET 15 OF 15

Municipal Stream Obstruction Data

Watershed: Crum Creek

Municipality/County: NEWtown / Delaware

Records completed by: Brian Bruno

Field work personnel: " "

Date(s): 12/1 - 12/20

T= Amount of fill
D= Diameter
HT = Height
W = Width
PW = Pier Width

Material
msry = Stone Masonry Structure
CMP = Corrugated Metal Pipe
CPP = Corrugated Polyethylene Pipe
BCCMP = Bituminous Coated CMP
RCP = Reinforced Concrete Pipe
SP = Steel Pipe

Inlet Conditions
HW = Headwall
WW = Wingwall
SW = Sidewall

Map ID.	Owner or Address Of Obstruction	Capacity (CFS)	Nos. of?	Type: Part of Bridge?	Type: Culvert Purpose	Shape (✓) Culvert □	Shape (✓) Culvert ○	Shape (✓) Culvert ⬭	Shape (✓) Bridge ⌒	Shape (✓) Bridge ⊓	T (ft)	D (ft)	HT (ft)	W (ft)	PW (ft)	skew angle	MATERIAL / INLET CONDITION	NOTES
NEW36	RT 252 / Dunlin Dr		1					X			1.7		2.6	4	-	90	CMP / WW	
NEW37	" "		1				X				1.4	2.8			-	90	SP / HW; ½ SW	
NEW38	RT 252 N		2					2			1		3	5	-	90		Pipes [illegible]
NEW39	RT 252 / Hunter Run		1				X				2	3	-	-	-	90	CMP / HW	
NEW40	Tree Farm Rd off 252		1			✓					6.5	-	5	16	-	10	Concrete / HW, WW	
NEW41	Tree Farm Rd / Hunter Run		1	✓						✓	7	-	6	32	-	45	" "	
NEW42	[illegible]		1				✓				4.8	1.5	-	-	-	90	CMP / [illegible]	
NEW43	[illegible]		1	✓						✓	1	-	4.5	5	-	90	MSRY	
NEW44	Sunrise Assisted Living		1				✓				8	1	-	-		10	RCP / [illegible]	

FORM C

EXISTING FLOOD CONTROL PROJECT FORM C. SHEET 1 OF 1

WATERSHED	FORM COMPLETED BY	TYPICAL TYPES OF FLOOD CONTROL PROJECTS		
Name: Crum Creek	Name: Toglia & Bower	Channel Excavation / Widening	Levee	Dams
Municipality: Newtown	Telephone: 610 356-0200	Channel Realignment	Gabions	Floodwall
County: Delaware	Date: 8.30.04	Rock Riprap	Pipe Channel	Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Year Constr Built	Expected Life Yrs.	Design Flood Frequency Yrs.	Design Flood Discharge C.F.S. (if known)	Owner Name, Address, and Phone
(D) C- 1	Culvert	03	?			Gosben Rd
(E) C- 2	Culvert	03	?			Boot & Gosben
not (F) -> in Watershed 2 C- 3	Rip Rap Stormdrain System	01	?			
C-	Blocked drain pipe repair		?			Near Sawmill & Timberlane Underdiscussion – not planned or approved yet
C-						

FORM D

PROPOSED FLOOD CONTROL PROJECT FORM D. SHEET 1 OF 1

WATERSHED	FORM COMPLETED BY	TYPICAL TYPES OF FLOOD CONTROL PROJECTS		
Name: Crum Creek	Name: Maria & Linda Italia Bauer	Channel Excavation / Widening	Levee	Dams
Municipality: Newtown	Telephone: 610.356.0200	Channel Realignment	Gabions	Floodwall
County: Delaware	Date: 8.30.04	Rock Riprap	Pipe Channel	Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Study Phase Begun			Year Constr. Planned	Projected Compltn. Date	Expected Life Yrs.	Design Flood		Map ID No. Form A*	Owner Name, Address, and Phone
		YES		N0				Frequency Yrs.	Discharge C.F.S.		
		Prelim.	Final								
(H) D- 1	Discharge System Into wetlands or	✓			05	05	?			D1	Newtown Heights
D-	approved area adjacent to creek							waiting to get info from the engineer			
D-											
D-											
D-											

* Enter the storm water problem area's Map ID No., if the proposed project will solve or reduce any / all of an identified drainage problem.

We have not identified water quality problem areas in our Township

WATER QUALITY PROBLEM AREAS (FORM J)

Watershed
Name: Crum Creek
Municipality: Newtown Township
County: Delaware

Form Completed By
Name: Maria Taglia
Telephone: 610.325 9820
Date: 9.15.04

Site:	J-	J-	J-	J-	J-	J-	J-	J-
Types of Water Quality Problems								
High Community Tolerance								
High Temperature								
High Turbidity								
Hydrocarbon Pollution								
Low Community Diversity								
Low Dissolved Oxygen								
Low pH								
Nutrient Enrichment								
Poor Habitat								
Other / Explanation Line No.								
Potential Causes(s)								
Agriculture								
Construction Site								
Erosion								
Lake Discharge								
STP Outfall								
Other / Explanation Line No.								
Frequency								
Year Most Recent Occurrence								
Year First Known Occurrence								
Source of Information								
Streamwatch								
County Water Quality Study								
Driveby								
CCD Complaint Investigation								
Other / Explanation Line No.								

Explanation Lines
1. _____
2. _____
3. _____

Newtown Boundary
Municipal Boundaries
Parcel Boundaries
Contours (20 Foot IntervalL)
Waterways
Stream walk points

Waterway Concern Areas

A - Flooding in heavy rain
B1 / B2 - Flooding in heavy rain / wet ground
C - Uncontrolled runoff into Echo ~~Canyon~~ Valley

Waterflow Concern Points

D - New culvert to control street flooding on Boot & Goshen Rds.
E - New culvert to control street flooding on Goshen
F - Rip rap stormdrain system
G - Flooding washout
H - New recharge system in wetlands
I - Runoff over berm
J - Runoff into condos from parking lot

F, I, + J - not in watermask

Basins (Identified & Potential)

0 - Requires Field Verification
1 - Bakers Lane
2 - Behind Pulte
4 - Harrison Track
5 - Basin behind Post Office
6 - Basin behind Post Office
7 - SAP Basin
8 - Nolan Property
9 - Nolan Property
10 - Franklin Farms - Roll International
11 - Sunny's Way
12 - New Development
13 - DeBotton
14 - Hunt Valley Circle
15 - Off Campus Blvd.
17 - Malin & Bryn Mawr
??

N

0 3,000 6,000 Feet

Newtown Township
Delaware County, Pennsylvania

Stormwater Basins & Waterflow Concern Areas

NATURAL LANDS TRUST

RIDLEY PARK BOROUGH

Turning Ideas Into Reality

CATANIA ENGINEERING ASSOCIATES, INC.

Consulting Engineers & Land Surveyors

November 16, 2005
File No. 83600-115-8

Justin D. Kauffman
Environmental Planner
Delaware County Planning Department
Court House & Government Center Building
201 West Front Street
Media, PA 19063

Re: Borough of Ridley Park
Crum Creek Act 167 Plan

Dear Mr. Kauffman:

Enclosed please find forms A through J completed for the Crum Creek Watershed portion of Ridley Park Borough.

Should you have any questions or comments, please feel free to contact me.

Very truly yours,

Jamie H. Bricker

Jamie H. Bricker, EIT
for Catania Engineering Assoc., Inc.

JHB/sjm
Enclosures
cc: Robert Poole

520 W. MacDade Boulevard, Milmont Park, Pennsylvania 19033-3311
Phone: (610) 532-2884 Fax: (610) 532-2923 E-Mail: CEAINC1@aol.com

DELAWARE COUNTY PLANNING DEPARTMENT

DCPD

Court House/ Government Center , 201 W. Front St., Media, PA 19063
Office Location: Toal Building, 2nd & Orange Sts., Media, PA 19063
Phone: (610) 891-5200 FAX: (610) 891-5203
E-mail: planning_department@co.delaware.pa.us

BORTON LAWSON LEHIGH VALLEY OFFICE
SRB
PAD
MJW
WSB
PAR
ADMIN
NOV 3 0 2005
☐ CORRESPONDENCE
☐ AGREEMENT
☐ CONTRACT
PROJECT NO.

TO: Bill Brokaw

FROM: Christopher Gallagher

DATE: 11/1/05

RE: Crum Creek Stormwater Management Plan
Ridley Park Borough Forms

Bill,

Please find attached Forms A through J for Ridley Park Borough.

If you require any additional information, please do not hesitate to contact me at (610)-891-5130.

FORM A - STORM WATER PROBLEM AREAS SHEET 1 OF 2

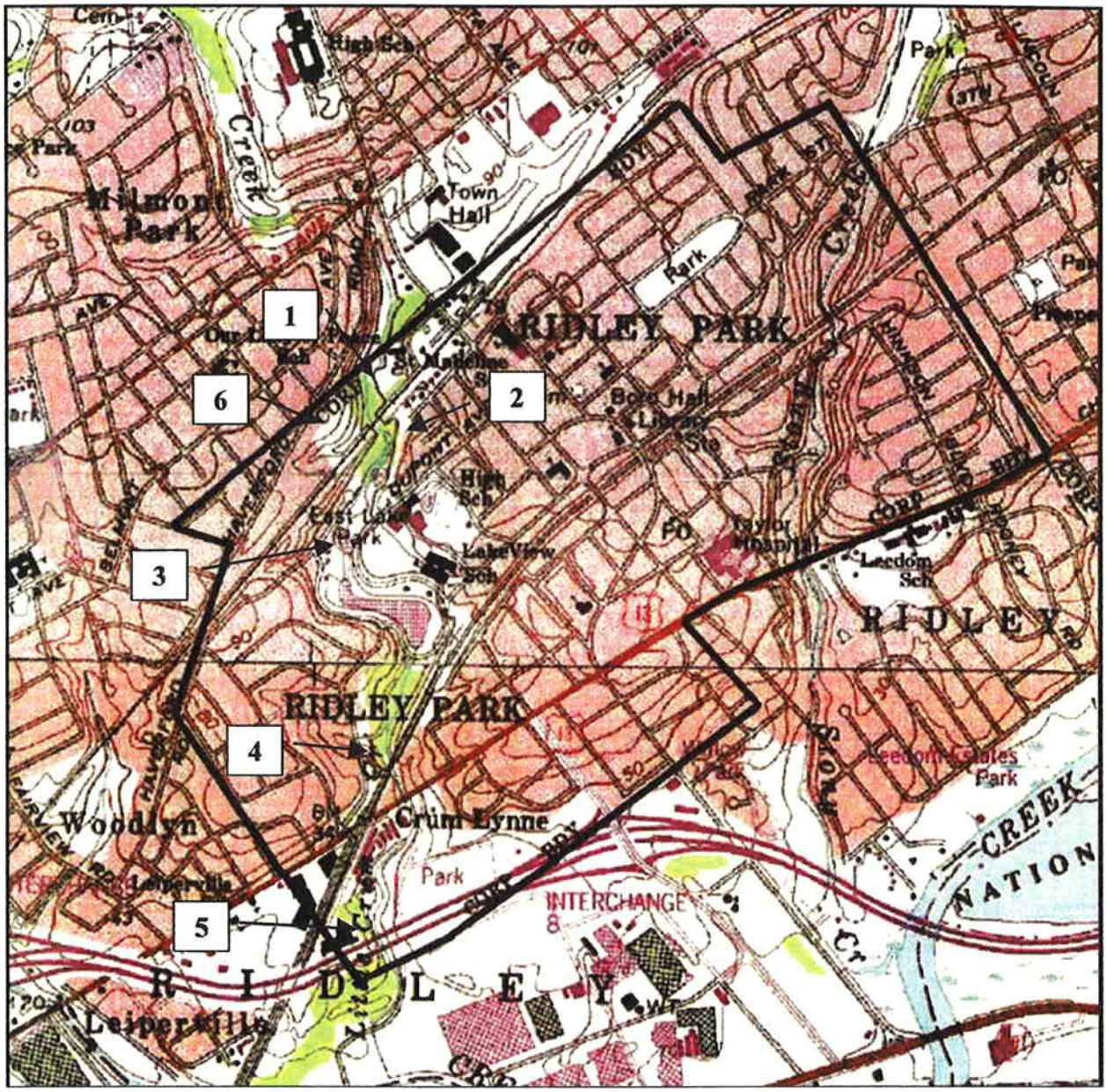
WATERSHED		FORM COMPLETED BY		Before Filling Out Form, See Instructions on Back
Name:	Crum Creek	Name:	Jamie H. Bricker	
Municipality:	Ridley Park Borough	Telephone:	610-532-2884	For County Use:
County:	Delaware	Date:	11/15/2005	

MAP NO. *	A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
Types of Storm Water Problems												
Flooding	X					X						
Accelerated Erosion	X	X		X	X							
Sedimentation			X									
Landslide												
Groundwater												
Water Pollution			X									
Other (Explain)						X						
Explanation Line No. (On Back)	1	2	3	4	5	6	7	8	9	10	11	12
Cause (s)												
Storm Water Volume	X	X		X	X	X						
Storm Water Velocity	X	X	X	X	X							
Storm Water Direction												
Water Obstruction	X											
Other (Explain)												
Explanation Line No. (On Back)												
Frequency												
Year Most Recent Occurred	2005	2005	2005	2005	2005	2005						
Year First Known Occurred	?	?	?	?	?	?						
Regularity												
More Than 1 Year	X	X	X	X	X	X						
Less Than 1 Year												
Only During Agnes												
Duration (If Applicable)												
Less Than 1 Day												
1 Day + (Enter Days)	1	1		1		1						
Property Damage												
Loss of Life/Vital Services												
Private	X	X		X	X	X						
More Than One Owner	X			X								
Types of Properties	R	R		R		R						
Number of Properties		1				1						
Public (List Types)			Rec									
Explanation Line No. (On Back)												
Solutions												
Suggested												
Explanation Line No. (On Back)												
Formally Proposed												
Explanation Line No. (On Back)												

* Include Map ID No. if found on any other form listing proposed facilities.

	FORM A - STORM WATER PROBLEM AREAS SHEET 2 OF 2
	EXPLANATION LINES
1	accelerated erosion and periodic flooding at Swim Club upstream of CSX RR culvert
2	accelerated erosion at end of East Rodgers Street
3	sedimentation in sediment basin above East Lake Park
4	accelerated erosion upstream of RR bridge
5	accelerated erosion upstream of I-95
6	flooding public safety issues
7	
8	
9	
10	
11	
12	

RIDLEY PARK BOROUGH



Ridley Park

FORM B - OBSTRUCTION DATA COLLECTION

SHEET 8 OF 15

Municipal Stream Obstruction Data

Watershed: Crum Creek

Municipality/County: Ridley Park / Delaware

Records completed by: Brian Bruno

Field work personnel: " "

Date(s): 12/1 - 12/20/04

T= Amount of fill
D= Diameter
HT = Height
W = Width
PW = Pier Width

Material
mary = Stone Masonry Structure
CMP = Corrugated Metal Pipe
CPP = Corrugated Polyethylene Pipe
BCCMP = Bituminous Coated CMP
RCP = Reinforced Concrete Pipe
SP = Steel Pipe

Inlet Conditions
HW = Headwall
WW = Wingwall
SW = Sidewall

Map ID.	Owner or Address Of Obstruction	Capacity (CFS)	Nos. of?	Opening Type: Part of Bridge?	Opening Type: Culvert Purpose	Shape (✓): Culvert □	Culvert ○	Culvert ⬭	Bridge ∩	Bridge ⊓	T (ft)	D (ft)	HT (ft)	W (ft)	PW (ft)	skew angle	MATERIAL / INLET CONDITION	NOTES
RP-1	Ridley Pk. pond									✓	10.5		13.5	73		90	concrete	

L:\GISData\Misc-stormwater\Act167DOCS\DataCollectionForms\obsforms.xls

FORM C

EXISTING FLOOD CONTROL PROJECT FORM C. SHEET 1 OF 1

WATERSHED		FORM COMPLETED BY		TYPICAL TYPES OF FLOOD CONTROL PROJECTS		
Name:	Crum Creek	Name:	Jamie H. Bricker	Channel Excavation / Widening	Levee	Dams
Municipality:	Ridley Park Borough	Telephone:	610-532-2884	Channel Realignment	Gabions	Floodwall
County:	Delaware	Date:	11/15/2005	Rock Riprap	Pipe Channel	Concrete Lining
For County Use:						

Map ID No.	Type of Flood Control Project	Year Constr Built	Expected Life Yrs.	Design Flood Frequency Yrs.	Design Flood Discharge C.F.S. (if known)	Owner Name, Address, and Phone
C-1	East Lake Park Dam rehab	1960 (?) 1994	100	N/A	N/A	Robert Poole (610) 532-2100 105 E. Ward Street, Ridley Park, PA 19078
C-2	East Lake Park Lake Bank Stabilization (rip rap)	1999	10	N/A	N/A	Robert Poole (610) 532-2100 105 E. Ward Street, Ridley Park, PA 19078
C-3	East Lake Park Debris & Sediment Removal	1999 2003 2004	5	N/A	N/A	Robert Poole (610) 532-2100 105 E. Ward Street, Ridley Park, PA 19078
C-4	Hillside Road Bank Stabilization & Channel Deflectors	2000	10	N/A	N/A	Robert Poole (610) 532-2100 105 E. Ward Street, Ridley Park, PA 19078
C-						

FORM D

PROPOSED FLOOD CONTROL PROJECT FORM D. SHEET 1 OF 1

WATERSHED		FORM COMPLETED BY		TYPICAL TYPES OF FLOOD CONTROL PROJECTS		
Name:	Crum Creek	Name:	Jamie H. Bricker	Channel Excavation / Widening	Levee	Dams
Municipality:	Ridley Park Borough	Telephone:	610-532-2884	Channel Realignment	Gabions	Floodwall
County:	Delaware	Date:	11/15/2005	Rock Riprap	Pipe Channel	Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Study Phase Begun			Year Constr. Planned	Projected Compltn. Date	Expected Life Yrs.	Design Flood		Map ID No. Form A*	Owner Name, Address, and Phone
		YES		N0				Frequency Yrs.	Discharge C.F.S.		
		Prelim.	Final								
D-1	East Lake Park Debris & Sediment Removal		X		2005	N/A				3	Robert Poole (610) 532-2100 105 E. Ward Street, Ridley Park, PA 19078
D-											
D-											
D-											
D-											

* Enter the storm water problem area's Map ID No., if the proposed project will solve or reduce any / all of an identified drainage problem.

FORM E

EXISTING STORM WATER CONTROL FACILITIES FORM E. SHEET 1 OF 1

WATERSHED	FORM COMPLETED BY	DEFINITION
Name: Crum Creek Municipality: Ridley Township County: Delaware	Name: Jamie H. Bricker Telephone: 610-532-2884 Date: 8/17/2004	Storm Water Control Facility A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.
For County Use:		

Map ID No.	Type of Storm Water Control Facility	Year Built	Contact Person Name, Address and Phone	Comments
E-1	Rodgers Street Storage Structure	1995	Robert Poole (610) 532-2100 105 E. Ward Street, Ridley Park, PA 19078	72" CMP underground storage pipes
E-2	Kings Court Retention Basin	?	Homeowners Association	
E-				
E-				
E-				
E-				
E-				
E-				

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

Detention / Retention Basin

Natural Pond or Wetland

Parking Lot Pondling

Roof-Top Storage

Semi-Pervious Paving

Infiltration Device (Seepage / Recharge Basin or Underground Tank)

FORM F

PROPOSED STORM WATER CONTROL FACILITIES FORM F. SHEET 1 OF 1

WATERSHED		FORM COMPLETED BY	
Name:	Crum Creek	Name:	Jamie H. Bricker
Municipality:	Ridley Park Borough	Telephone:	610-532-2884
County:	Delaware	Date:	11/15/2005

DEFINITION

Storm Water Control Facility

A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.

For County Use:

Map ID No.	Type of Storm Water Control Facility	Proposed Constr. Date		Map No. Form A*	Contact Person Name, Address and Phone	Comments
		Start	End			
F-	There are NO proposed stormwater control facilities within the Borough of Ridley Park					
F-						
F-						
F-						
F-						
F-						
F-						
F-						

* Enter the stormwater problem area's Map ID No., if the proposed project will solve or reduce and / all of an identified drainage problem.

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

Detention / Retention Basin

Natural Pond or Wetland

Parking Lot Pondling

Roof-Top Storage

Semi-Pervious Paving

Infiltration Device (Seepage / Recharge Basin or Underground Tank)

FORM G (1)

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 1 OF 13

WATERSHED		FORM COMPLETED BY		INSTRUCTIONS
Name:	Crum Creek	Name:	Jamie H. Bricker	Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.
Municipality:	Ridley Park Borough	Telephone:	610-532-2884	
County:	Delaware	Date:	11/15/2005	

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-1	G-2	X			24"				HDPE	2001	Y	Robert Poole 610-532-2100	Ridley Park Borough
G-2	G-3	X			24"				HDPE	2001	Y	Robert Poole 610-532-2101	Ridley Park Borough
G-3	G-4	X			24"				HDPE	2001	Y	Robert Poole 610-532-2102	Ridley Park Borough
G-4	G-5	X			18"				HDPE	2001	Y	Robert Poole 610-532-2103	Ridley Park Borough
G-4	G-6	X			18"				HDPE	2001	Y	Robert Poole 610-532-2104	Ridley Park Borough
G-26	G-27	X			?								Penn Dot
G-47	G-48	X			?						N	Robert Poole 610-532-2104	Ridley Park Borough
G-48	G-49	X			?						N	Robert Poole 610-532-2105	Ridley Park Borough
G-48	G-50	X			?						N	Robert Poole 610-532-2106	Ridley Park Borough

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 2 OF 13

WATERSHED

Name: Crum Creek
Municipality: Ridley Park Borough
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 11/15/2005

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-70	G-71	X									N	Robert Poole 610-532-2100	Ridley Park Borough
G-71	G-72	X									N	Robert Poole 610-532-2101	Ridley Park Borough
G-72	G-73	X									N	Robert Poole 610-532-2102	Ridley Park Borough
G-73	G-74	X									N	Robert Poole 610-532-2103	Ridley Park Borough
G-74	G-75	X									N	Robert Poole 610-532-2104	Ridley Park Borough
G-75	G-76	X									N	Robert Poole 610-532-2105	Ridley Park Borough
G-75	G-77	X									N	Robert Poole 610-532-2106	Ridley Park Borough
G-75	G-78	X									N	Robert Poole 610-532-2107	Ridley Park Borough
G-78	G-79	X									N	Robert Poole 610-532-2108	Ridley Park Borough
G-79	G-80	X									N	Robert Poole 610-532-2109	Ridley Park Borough
G-78	G-81	X									N	Robert Poole 610-532-2110	Ridley Park Borough
G-81	G-82	X									N	Robert Poole 610-532-2111	Ridley Park Borough

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 3 OF 13

WATERSHED

Name: Crum Creek
Municipality: Ridley Park Borough
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 11/15/2005

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-102	G-103	X			24"						N	Robert Poole 610-532-2100	Ridley Park Borough
G-103	G-104	X			18"						N	Robert Poole 610-532-2101	Ridley Park Borough
G-103	G-105	X			24"				RCP		N	Robert Poole 610-532-2102	Ridley Park Borough
G-105	G-106	X			15"						N	Robert Poole 610-532-2103	Ridley Park Borough
G-105	G-107				24"				RCP		N	Robert Poole 610-532-2104	Ridley Park Borough
G-107	G-108	X			12"						N	Robert Poole 610-532-2105	Ridley Park Borough
G-107	G-109	X			24"				RCP		N	Robert Poole 610-532-2106	Ridley Park Borough
G-109	G-110	X			24"						N	Robert Poole 610-532-2107	Ridley Park Borough
G-110	G-111	X			12"						N	Robert Poole 610-532-2108	Ridley Park Borough
G-110	G-112	X			24"						N	Robert Poole 610-532-2109	Ridley Park Borough
G-112	G-113	X									N	Robert Poole 610-532-2110	Ridley Park Borough
G-113	G-114	X									N	Robert Poole 610-532-2111	Ridley Park Borough
G-114	G-115	X									N	Robert Poole 610-532-2112	Ridley Park Borough

FORM G (3)

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 4 OF 13

WATERSHED

Name: Crum Creek
Municipality: Ridley Park Borough
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 11/15/2005

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-113	G-116	X									N	Robert Poole 610-532-2112	Ridley Park Borough
G-116	G-117	X									N	Robert Poole 610-532-2113	Ridley Park Borough
G-117	G-118	X									N	Robert Poole 610-532-2114	Ridley Park Borough

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 5 OF 13

WATERSHED
Name: Crum Creek
Municipality: Ridley Park Borough
County: Delaware

FORM COMPLETED BY
Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 11/15/2005

INSTRUCTIONS
Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-138	G-139	X			18"						N	Robert Poole 610-532-2112	Ridley Park Borough
G-139	G-140	X									N	Robert Poole 610-532-2113	Ridley Park Borough
G-140	G-141	X									N	Robert Poole 610-532-2114	Ridley Park Borough
G-141	G-142	X									N	Robert Poole 610-532-2115	Ridley Park Borough
G-162	G-163	X			18"						N	Robert Poole 610-532-2112	Ridley Park Borough
G-163	G-164	X									N	Robert Poole 610-532-2113	Ridley Park Borough
G-184	G-185	X			18"						N	Robert Poole 610-532-2112	Ridley Park Borough
G-185	G-186	X			18"						N	Robert Poole 610-532-2113	Ridley Park Borough
G-186	G-187	X									N	Robert Poole 610-532-2114	Ridley Park Borough
G-187	G-188	X									N	Robert Poole 610-532-2115	Ridley Park Borough

FORM G (4)

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 6 OF 13

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-208	G-209	X									N	Robert Poole 610-532-2115	Ridley Park Borough
G-229	G-230	X			18"						N	Robert Poole 610-532-2115	Ridley Park Borough
G-230	G-231	X			18"						N	Robert Poole 610-532-2116	Ridley Park Borough
G-230	G-232	X									N	Robert Poole 610-532-2117	Ridley Park Borough
G-232	G-233	X									N	Robert Poole 610-532-2118	Ridley Park Borough
G-253	G-254	X			18" (x2)						N	Robert Poole 610-532-2115	Ridley Park Borough
G-254	G-255	X									N	Robert Poole 610-532-2116	Ridley Park Borough
G-255	G-256	X									N	Robert Poole 610-532-2117	Ridley Park Borough
G-256	G-257	X									N	Robert Poole 610-532-2118	Ridley Park Borough
G-277	G-278	X			18"						N	Robert Poole 610-532-2118	Ridley Park Borough
G-278	G-279	X									N	Robert Poole 610-532-2119	Ridley Park Borough

FORM G (4)

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 7 OF 13

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-299	G-300	X									N	Robert Poole 610-532-2118	Ridley Park Borough
G-300	G-301	X									N	Robert Poole 610-532-2119	Ridley Park Borough
G-301	G-302	X									N	Robert Poole 610-532-2120	Ridley Park Borough
G-302	G-303	X									N	Robert Poole 610-532-2121	Ridley Park Borough
G-323	G-324	X			22"						N	Robert Poole 610-532-2118	Ridley Park Borough
G-324	G-325	X									N	Robert Poole 610-532-2119	Ridley Park Borough
G-325	G-326	X									N	Robert Poole 610-532-2120	Ridley Park Borough

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 8 OF 13

WATERSHED

Name: Crum Creek
Municipality: Ridley Park Borough
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 11/15/2005

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-346	G-347	X									N	Robert Poole 610-532-2118	Ridley Park Borough
G-347	G-348	X									N	Robert Poole 610-532-2119	Ridley Park Borough
G-368	G-369	X									N	Robert Poole 610-532-2118	Ridley Park Borough
G-369	G-370	X									N	Robert Poole 610-532-2119	Ridley Park Borough
G-390	G-391	X									N	Robert Poole 610-532-2118	Ridley Park Borough
G-391	G-392	X									N	Robert Poole 610-532-2119	Ridley Park Borough
G-392	G-393	X									N	Robert Poole 610-532-2120	Ridley Park Borough
G-391	G-394	X									N	Robert Poole 610-532-2121	Ridley Park Borough
G-394	G-395	X									N	Robert Poole 610-532-2122	Ridley Park Borough
G-395	G-396	X									N	Robert Poole 610-532-2123	Ridley Park Borough

FORM G (5)

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 9 OF 13

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-416	G-417	X									N	Robert Poole 610-532-2118	Ridley Park Borough
G-417	G-418	X									N	Robert Poole 610-532-2119	Ridley Park Borough
G-438	G-439	X									N	Robert Poole 610-532-2118	Ridley Park Borough
G-459	G-460	X									N	Robert Poole 610-532-2118	Ridley Park Borough
G-460	G-461		X								N	Robert Poole 610-532-2119	Ridley Park Borough
G-461	G-462	X									N	Robert Poole 610-532-2120	Ridley Park Borough
G-462	G-463		X								N	Robert Poole 610-532-2121	Ridley Park Borough
G-463	G-464	X									N	Robert Poole 610-532-2122	Ridley Park Borough

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 10 OF 13

WATERSHED

Name: Crum Creek
Municipality: Ridley Park Borough
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 11/15/2005

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-484	G-485	X			24"				CPP		Y	Robert Poole 610-532-2118	Ridley Park Borough
G-485	G-486	X			24"				CPP		Y	Robert Poole 610-532-2119	Ridley Park Borough
G-486	G-487	X			36"				CPP		Y	Robert Poole 610-532-2120	Ridley Park Borough
G-487	G-488	X			36"				CPP		Y	Robert Poole 610-532-2121	Ridley Park Borough
G-488	G-489	X							CPP		Y	Robert Poole 610-532-2122	Ridley Park Borough
G-488	G-490	X			30"				CPP		Y	Robert Poole 610-532-2123	Ridley Park Borough
G-490	G-491	X			-				CPP		Y	Robert Poole 610-532-2124	Ridley Park Borough
G-491	G-492	X			24"				CPP		Y	Robert Poole 610-532-2125	Ridley Park Borough
G-492	G-493	X			18"				CPP		Y	Robert Poole 610-532-2126	Ridley Park Borough
G-493	G-494	X			15"				CPP		Y	Robert Poole 610-532-2127	Ridley Park Borough
G-493	G-495	X			15"				CPP		Y	Robert Poole 610-532-2128	Ridley Park Borough

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 11 OF 13

WATERSHED

Name: Crum Creek
Municipality: Ridley Park Borough
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 11/15/2005

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-515	G-516	X			15"						N	Robert Poole 610-532-2118	Ridley Park Borough
G-516	G-517	X			15"						N	Robert Poole 610-532-2119	Ridley Park Borough
G-517	G-518	X			15"						N	Robert Poole 610-532-2120	Ridley Park Borough
G-538	G-539	X			15"						N	Robert Poole 610-532-2118	Ridley Park Borough
G-539	G-540	X			15"						N	Robert Poole 610-532-2119	Ridley Park Borough
G-560	G-561	X			36 x 24						N		CSX Railroad
G-561	G-562		X									Robert Poole 610-532-2118	Ridley Park Borough
G-562	G-564	X			18"						Y	Robert Poole 610-532-2119	Ridley Park Borough
G-564	G-563	X			72"						Y	Robert Poole 610-532-2120	Ridley Park Borough
G-564	G-565	X			72"						Y	Robert Poole 610-532-2121	Ridley Park Borough
G-565	G-566	X			24"						Y	Robert Poole 610-532-2122	Ridley Park Borough

FORM G (7)

EXISTING STORMWATER COLLECTION SYSTEM FORM G.													SHEET 12 OF 13
Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-566	G-567	X			24"						N	Robert Poole 610-532-2118	Ridley Park Borough
G-567	G-568	X			15"						N	Robert Poole 610-532-2119	Ridley Park Borough
G-568	G-569	X			15"						N	Robert Poole 610-532-2120	Ridley Park Borough
G-567	G-570	X			24"						N	Robert Poole 610-532-2121	Ridley Park Borough
G-570	G-571	X			18"						N	Robert Poole 610-532-2122	Ridley Park Borough
G-571	G-572	X			18"						N	Robert Poole 610-532-2123	Ridley Park Borough
G-572	G-573	X			15"						N	Robert Poole 610-532-2124	Ridley Park Borough

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 13 OF 13

WATERSHED

Name: Crum Creek
Municipality: Ridley Park Borough
County: Delaware

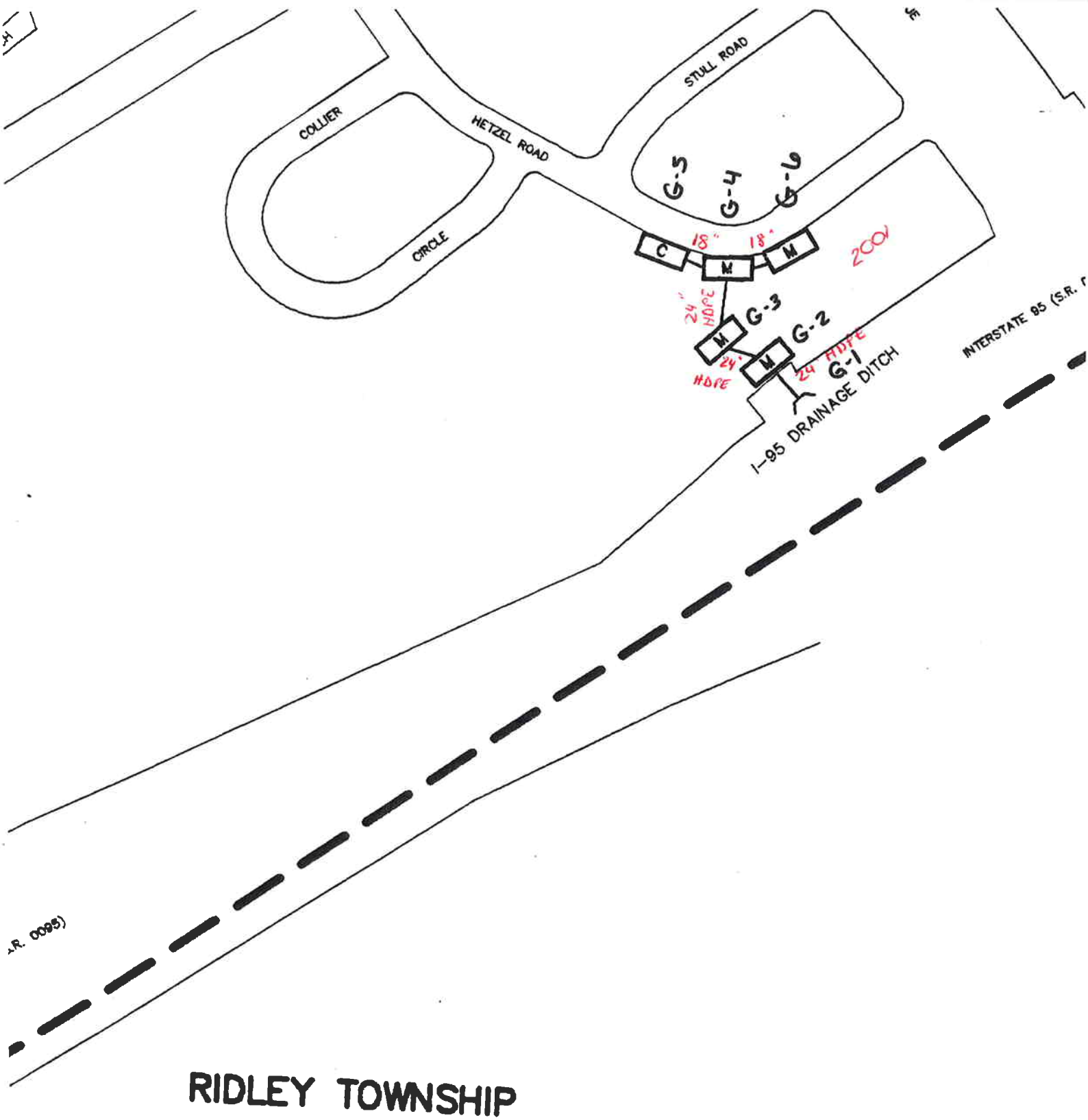
FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 11/15/2005

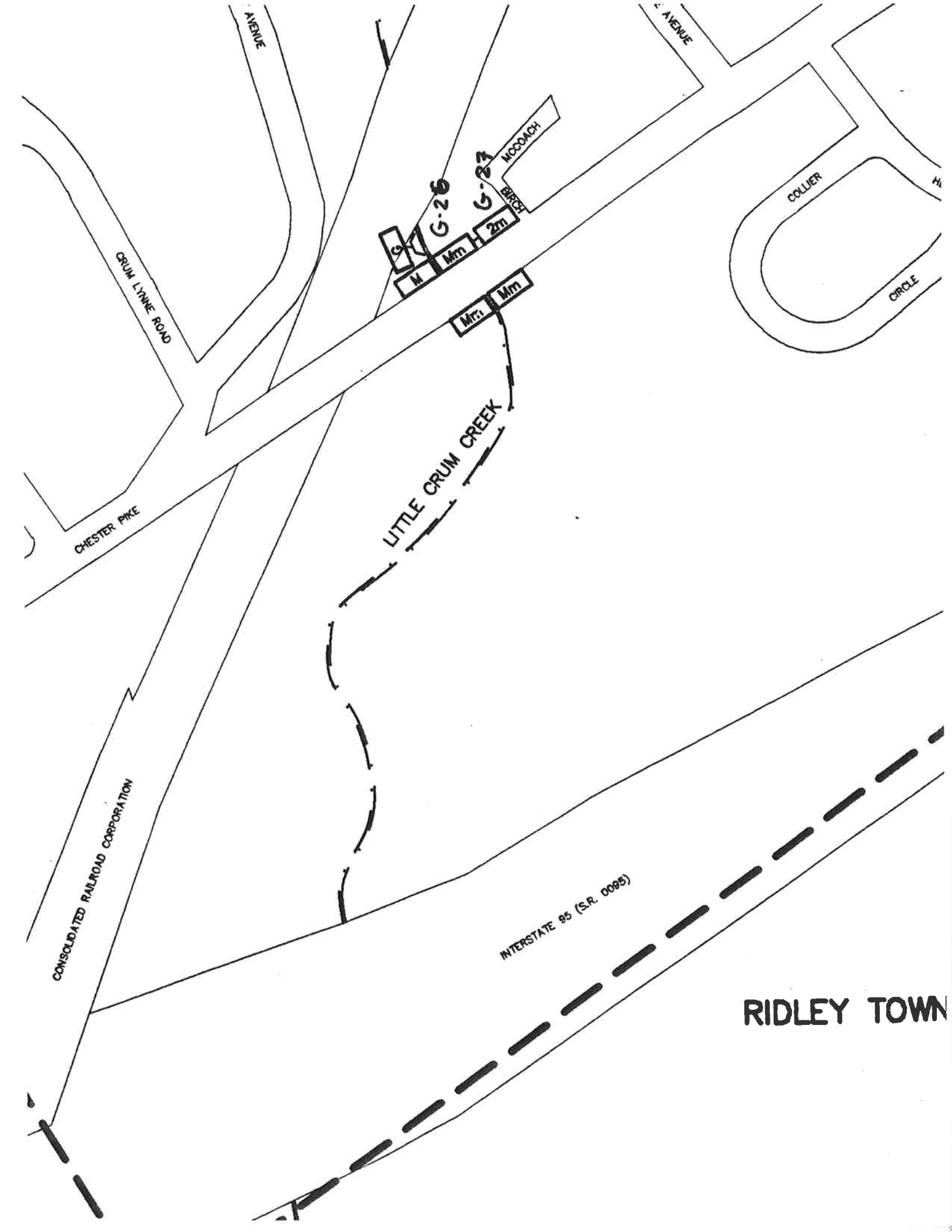
INSTRUCTIONS

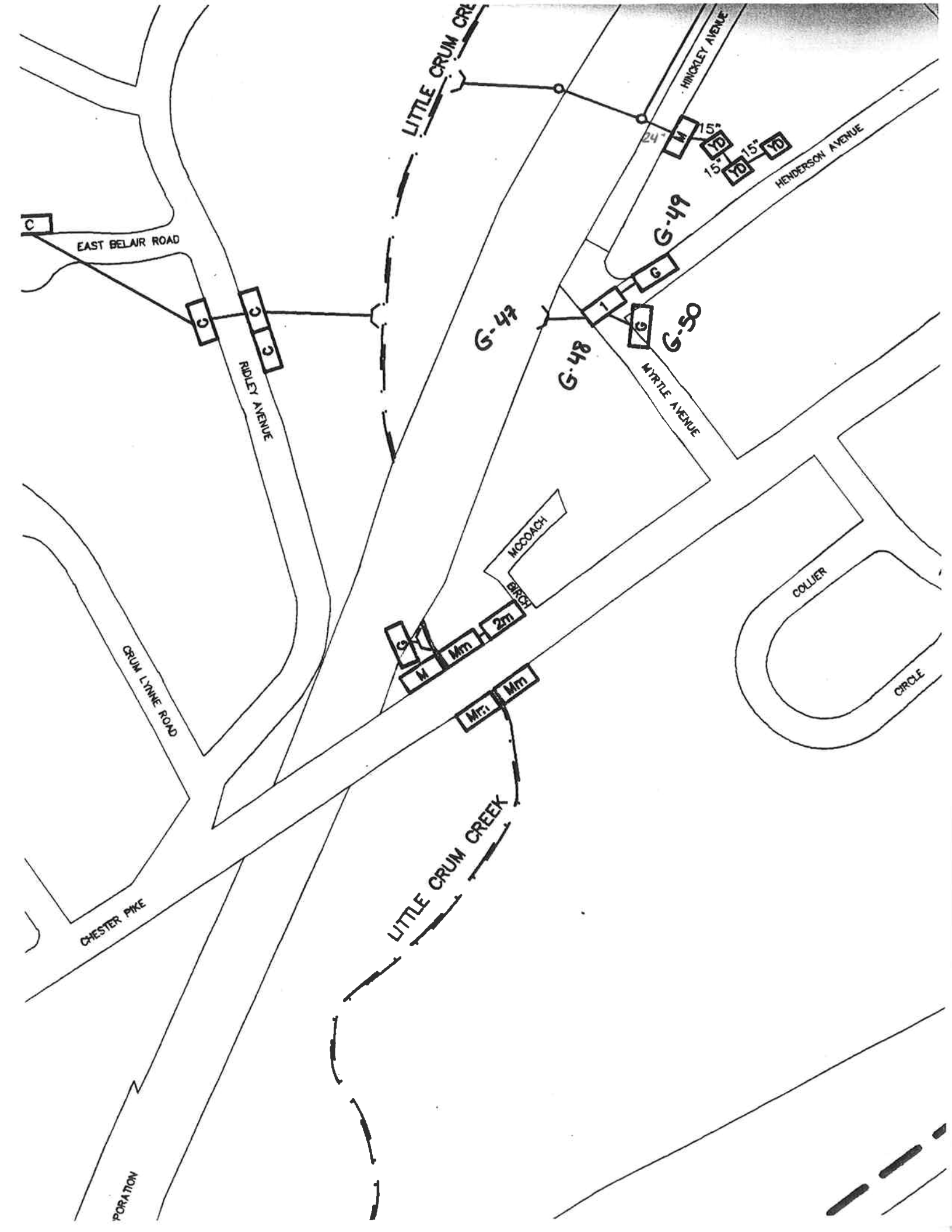
Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

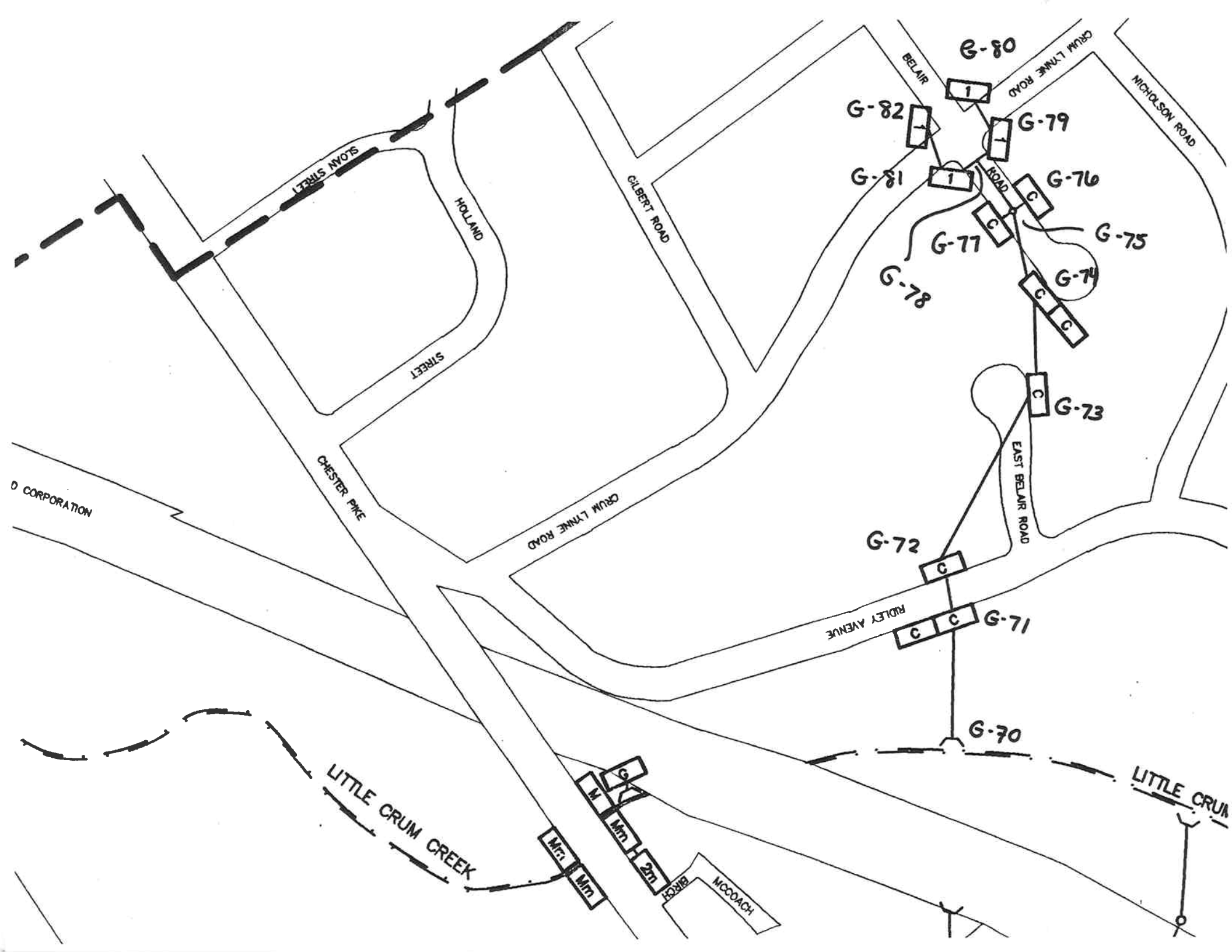
Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-593	G-594	X									N	Robert Poole 610-532-2118	Ridley Park Borough
G-594	G-595	X									N	Robert Poole 610-532-2119	Ridley Park Borough
G-595	G-596	X									N	Robert Poole 610-532-2120	Ridley Park Borough
G-596	G-597	X									N	Robert Poole 610-532-2121	Ridley Park Borough
G-597	G-598	X									N	Robert Poole 610-532-2122	Ridley Park Borough
G-595	G-599	X									N	Robert Poole 610-532-2123	Ridley Park Borough

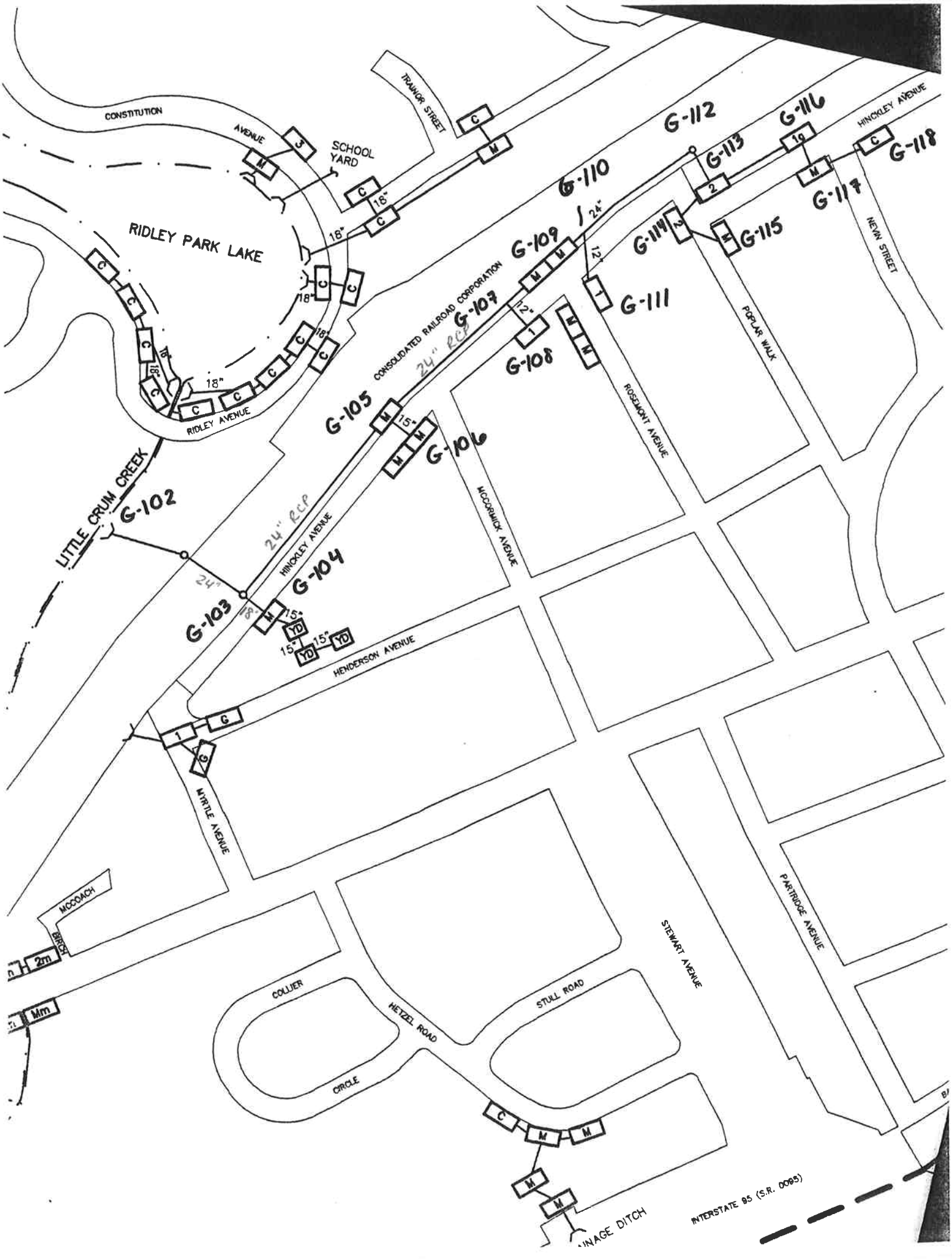


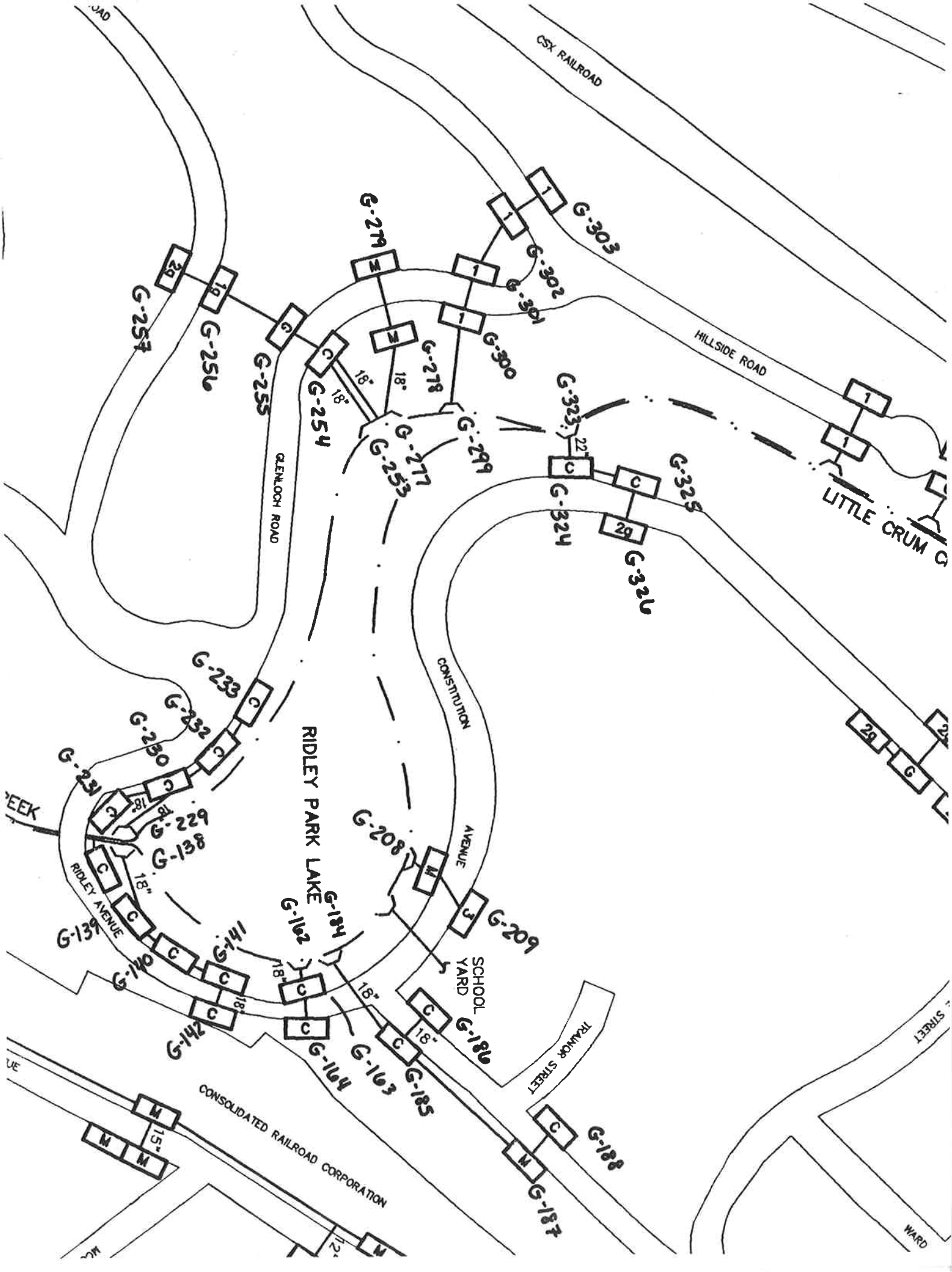
RIDLEY TOWNSHIP

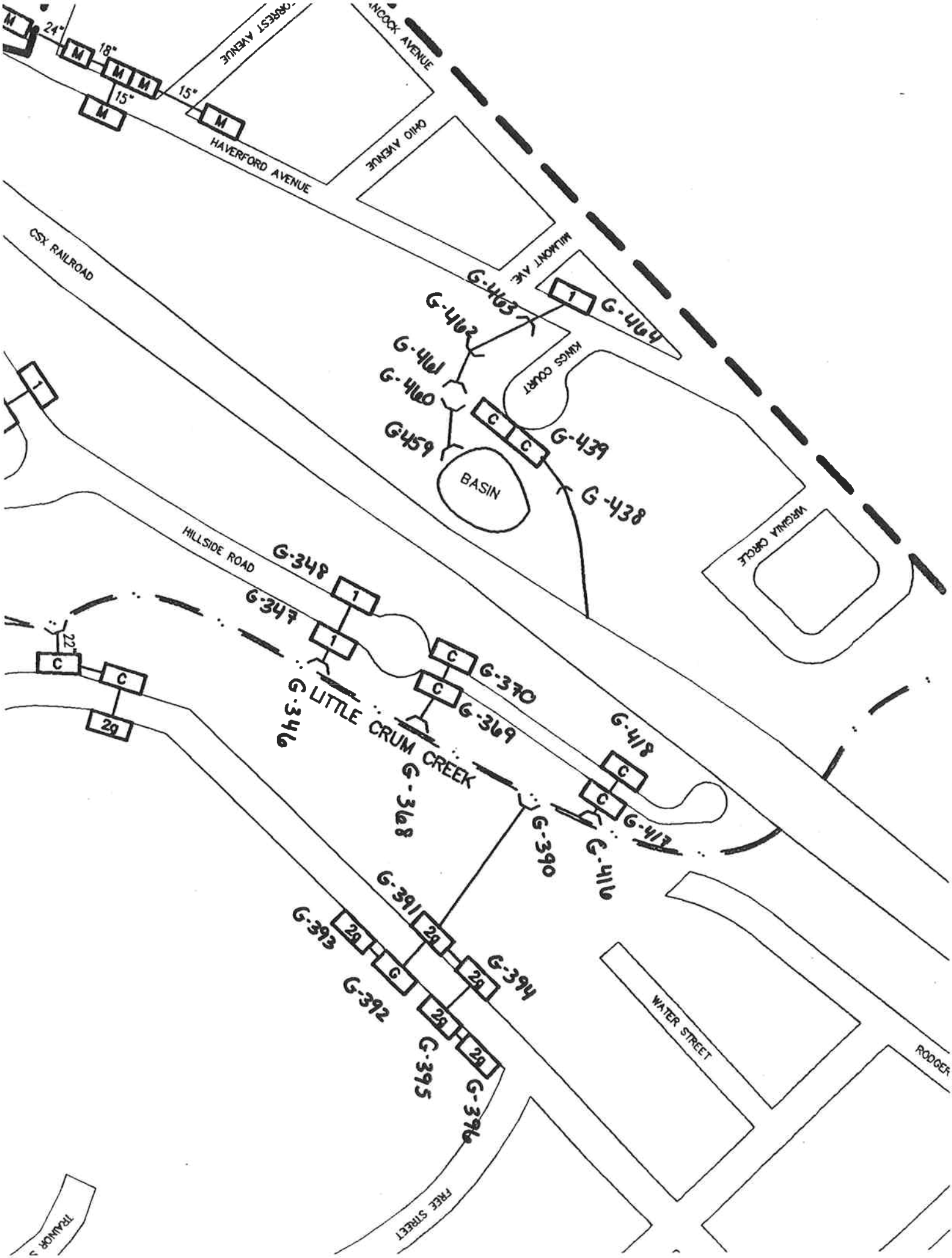

AVENUE
AVENUE
CRUM LYNNE ROAD
CHESTER PIKE
MCCOACH
BIRCH
COLLIER
CIRCLE
G-26
G-27
2m
Mm
M
Mm
Mm
LITTLE CRUM CREEK
CONSOLIDATED RAILROAD CORPORATION
INTERSTATE 95 (S.R. 0095)
RIDLEY TOWN


LITTLE CRUM CRE
HINCKLEY AVENUE
24"
M
15"
YD
15"
YD
15"
YD
HENDERSON AVENUE
G-49
G
G-47
1
G-48
G
G-50
MYRTLE AVENUE
C
EAST BELAIR ROAD
C
C
C
RIDLEY AVENUE
MCCOACH
BIRCH
2m
M
Mm
Mm
Mm
COLLIER
CIRCLE
CRUM LYNNE ROAD
CHESTER PIKE
LITTLE CRUM CREEK
PORATION

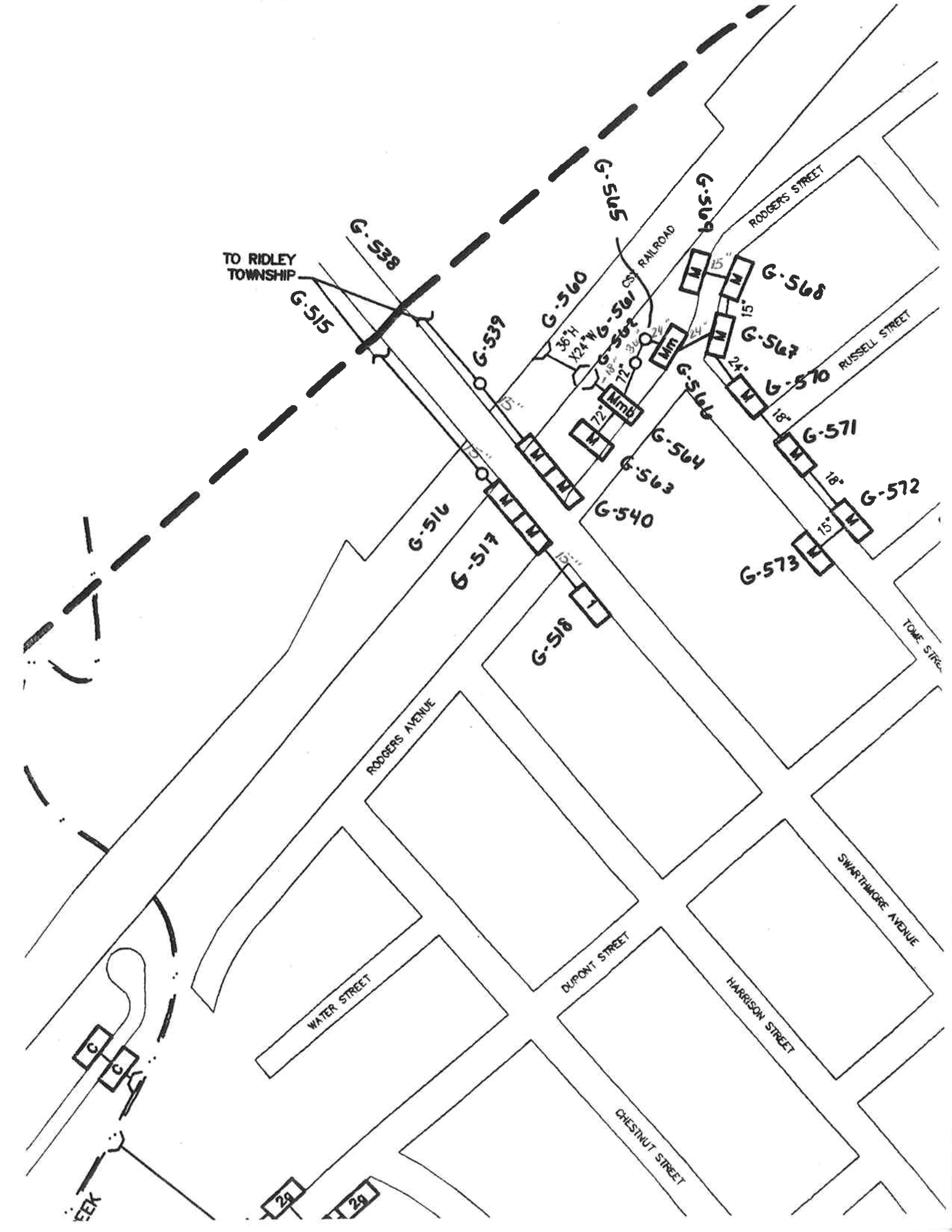

G-80
G-82
G-79
G-81
G-76
G-77
G-75
G-78
G-74
G-73
G-72
G-71
G-70
BELAIR
CRUM LYNNE ROAD
NICHOLSON ROAD
ROAD
SLOAN STREET
HOLLAND
STREET
GILBERT ROAD
CHESTER PIKE
CRUM LYNNE ROAD
EAST BELAIR ROAD
RIDLEY AVENUE
D CORPORATION
LITTLE CRUM CREEK
LITTLE CRUM
BIRCH
MCCOACH

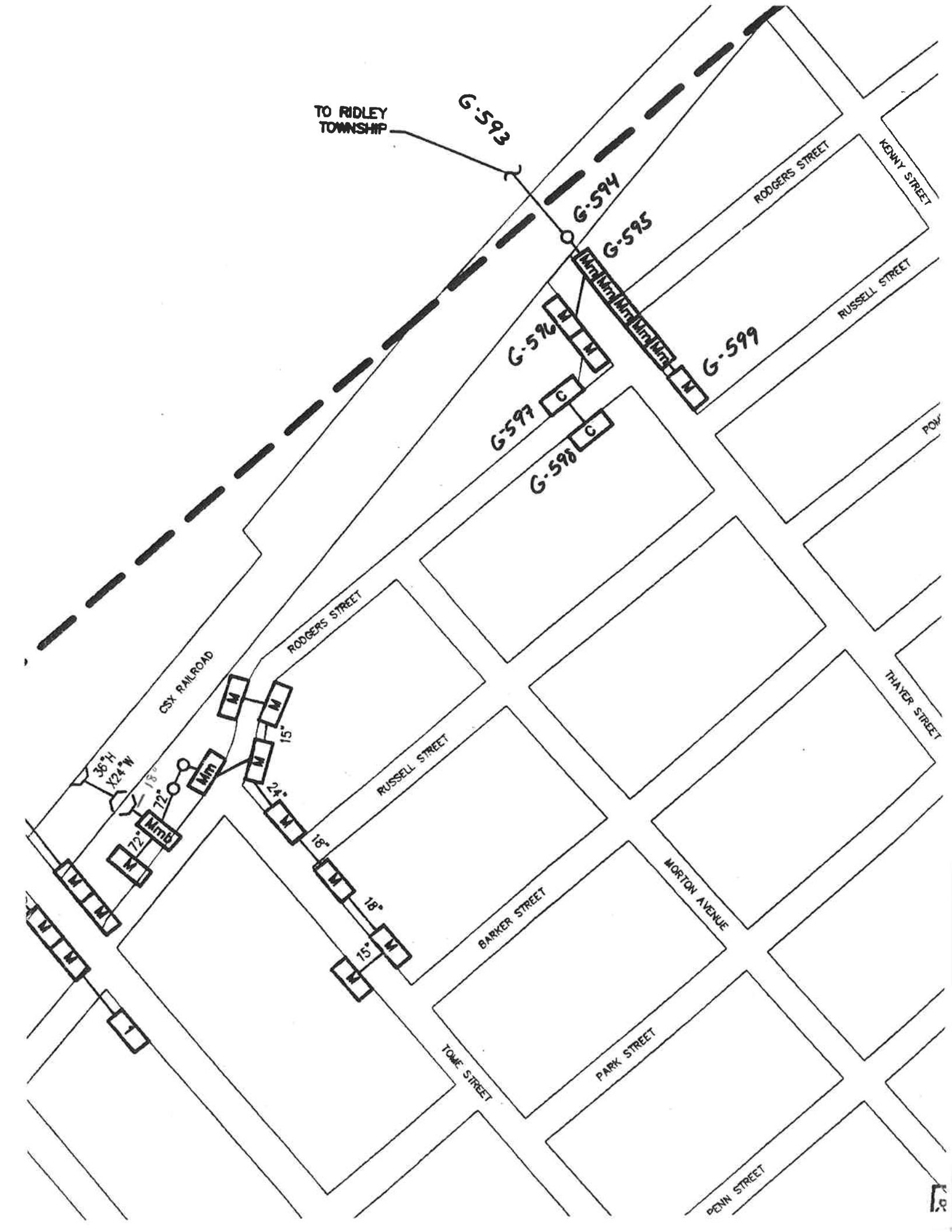

CONSTITUTION AVENUE
SCHOOL YARD
TRAVNOR STREET
RIDLEY PARK LAKE
RIDLEY AVENUE
LITTLE CRUM CREEK
CONSOLIDATED RAILROAD CORPORATION
HINCKLEY AVENUE
MCCORMICK AVENUE
ROSEMONT AVENUE
POPLAR WALK
NEVIN STREET
HENDERSON AVENUE
MYRTLE AVENUE
MCCOACH
BIRCH
COLLIER
CIRCLE
HETZEL ROAD
STULL ROAD
STEWART AVENUE
PARTRIDGE AVENUE
INTERSTATE 95 (S.R. 0095)
G-102
G-103
G-104
G-105
G-106
G-107
G-108
G-109
G-110
G-111
G-112
G-113
G-114
G-115
G-116
G-117
G-118
24" RCP
18"
15"
12"

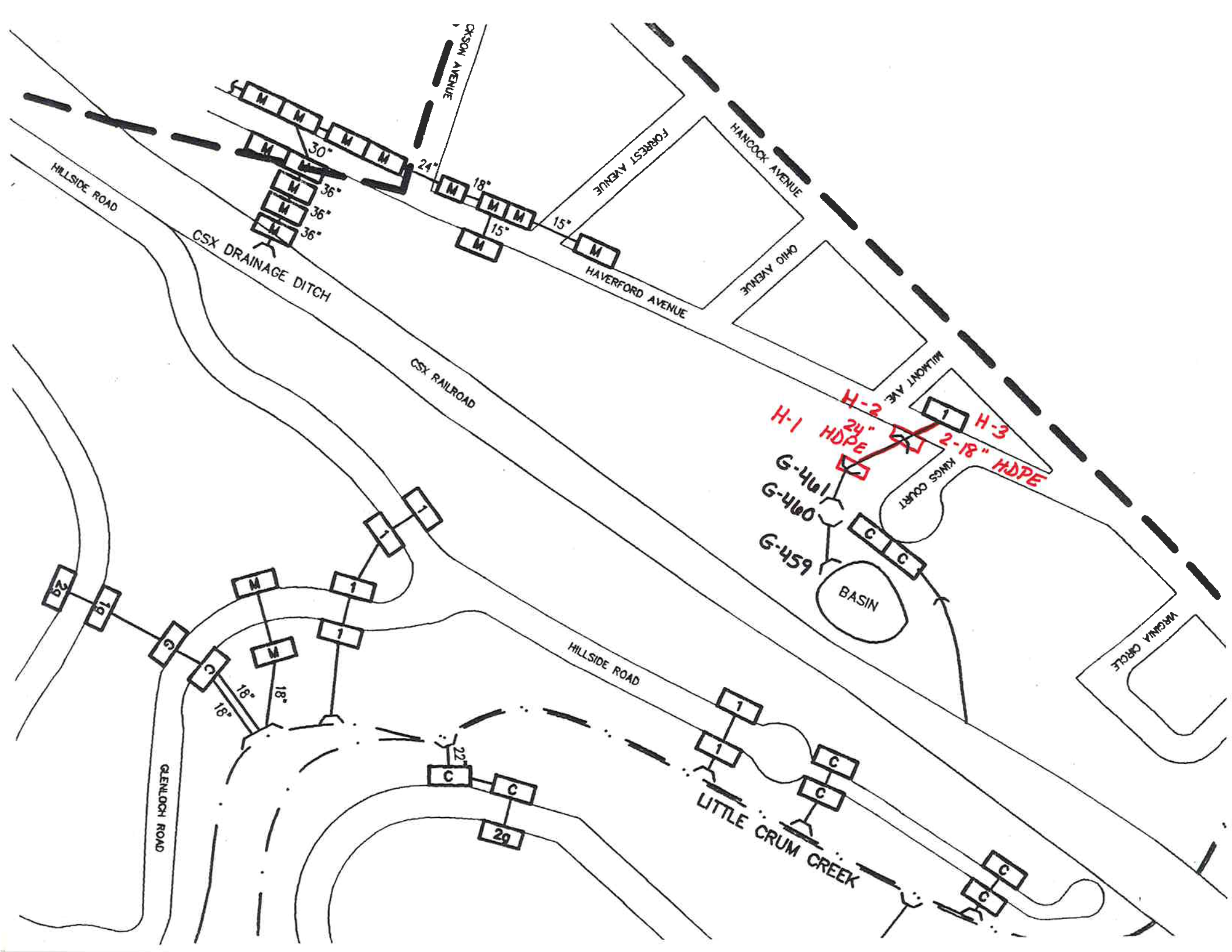

CSX RAILROAD
HILLSIDE ROAD
LITTLE CRUM C
GLENLOCH ROAD
CONSTITUTION AVENUE
RIDLEY PARK LAKE
RIDLEY AVENUE
SCHOOL YARD
TRAINOR STREET
CONSOLIDATED RAILROAD CORPORATION
WARD
G-303
G-302
G-301
G-300
G-299
G-279
G-278
G-277
G-254
G-253
G-255
G-256
G-257
G-323
G-325
G-324
G-326
G-233
G-232
G-230
G-231
G-229
G-138
G-139
G-140
G-141
G-142
G-162
G-184
G-208
G-209
G-180
G-185
G-163
G-164
G-188
G-187
18"
22"


HAVERFORD AVENUE
OHIO AVENUE
WILLMONT AVE
KINGS COURT
CSX RAILROAD
BASIN
HILLSIDE ROAD
LITTLE CRUM CREEK
WATER STREET
FREE STREET
G-463
G-462
G-461
G-460
G-459
G-464
G-439
G-438
G-348
G-347
G-346
G-370
G-369
G-368
G-418
G-413
G-416
G-390
G-391
G-393
G-392
G-394
G-395
G-396

VIRGINIA CIRCLE
MILMONT AVE.
KINGS COURT
BASIN
HANCOCK AVENUE
OHIO AVENUE
FORREST AVENUE
HAVERFORD AVENUE
JACKSON AVENUE
G-494
G-493
G-492
G-495
G-491
G-490
G-489
G-484
G-486
G-487
G-488
G-485
15"
18"
24"
30"
36"
24" CSP
CSX RAILROAD
CSX DRAINAGE DITCH
HILLSIDE ROAD
GLENLOCH ROAD
22"


TO RIDLEY TOWNSHIP
G-515
G-538
G-545
G-539
G-560
36"H X24"W
G-561
CSX RAILROAD
G-562
G-569
RODGERS STREET
15"
G-568
24"
G-567
RUSSELL STREET
G-570
18"
G-571
G-572
15"
G-573
G-566
G-564
G-563
G-540
G-516
G-517
G-518
RODGERS AVENUE
TOME STREET
WATER STREET
DUPONT STREET
HARRISON STREET
SWARTHMORE AVENUE
CHESTNUT STREET
29
29


TO RIDLEY TOWNSHIP
G-593
G-594
G-595
G-596
G-597
G-598
G-599
RODGERS STREET
KENNY STREET
RUSSELL STREET
CSX RAILROAD
RODGERS STREET
RUSSELL STREET
THAYER STREET
MORTON AVENUE
BARKER STREET
TOME STREET
PARK STREET
PENN STREET
36"H
X24"W
72"
72"
15"
24"
18"
18"
15"


HILLSIDE ROAD
CSX DRAINAGE DITCH
CSX RAILROAD
HAVERFORD AVENUE
FOREST AVENUE
HANCOCK AVENUE
OHIO AVENUE
MILLMONT AVE.
KINGS COURT
MACUNIA CIRCLE
GLENLOCH ROAD
LITTLE CRUM CREEK
BASIN
H-1
H-2
H-3
24" HDPE
2-18" HDPE
G-461
G-460
G-459
30"
24"
18"
15"
36"
36"
36"
18"
18"
18"
22"
20

FORM H

PROPOSED STORMWATER COLLECTION SYSTEM FORM H.

SHEET 1 OF 1

WATERSHED

Name: Crum Creek
Municipality: Ridley Park Borough
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 11/15/2005

INSTRUCTIONS

On the map for proposed stormwater collection systems, diagram each proposed system. Indicate a map point to show changes in system elements, pipe size, pipe direction and connections to existing system. For proposed additions to existing systems, diagram only the additions and their connection point into the existing system. Complete a separate form for each proposed, new system and one for each existing system having one or more proposed additions. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher (if H-3 ends one system, begin the next with H-23). Be sure to show the point where proposed additions connect into existing systems, using the map point number from he existing system form and map. See Sample Diagrams and Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Map I.D Nos.**	Proposed Constr. Dates		Design Data	Contact Person	Name of Final Ownership and
					Pipe	Channel / Swale									
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth		Form A	Start	End	Available	Name and Phone	Maintenance Responsibility
G-461	H-1	X			24"				RCP	A-6	Nov-05	Nov-05		Robert Poole 610-532-2100	Ridley Park Borough
H-1	H-2	X			24"				HDPE	A-6	Nov-05	Nov-05		Robert Poole 610-532-2101	Ridley Park Borough
H-2	H-3	X			18" (x2)				HDPE	A-6	Nov-05	Nov-05		Robert Poole 610-532-2102	Ridley Park Borough
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														

*See measurement key on reverse side. **Enter the stormwater problem areas' Map I.D. Nos., if proposed project will solve or reduce any / all of the drainage problems.

FORM I

PRESENT & PROJECTED DEVELOPMENT IN THE FLOOD HAZARD AREA FORM I. SHEET 1 OF 1

WATERSHED	FORM COMPLETED BY	DEFINITION
Name: Crum Creek Municipality: Ridley Park Borough County: Delaware	Name: Jamie H. Bricker Telephone: 610-532-2884 Date: 11/16/2005	FLOOD HAZARD AREA A normally dry land area that has been or is susceptible to being inundated by the 100-year flood.
For County Use:		

Map ID No.	TYPE OF DEVELOPMENT	Year Built	Contact Person Name, Address and Phone	Comments
I - 1	Ridley Park Swim Club, Recreation	1959 (?)	Box 352 Ridley Park, PA 19078	
I -				
I -				
I -				
I -				
I -				
I -				
I -				

Form J

WATER QUALITY PROBLEM AREAS FORM J.			SHEET 1 OF 1
WATERSHED		FORM COMPLETED BY	
Name:	Crum Creek	Name:	Jamie H. Bricker
Municipality:	Ridley Park Borough	Telephone:	610-532-2884
County:	Delaware	Date:	11/16/2005

SITE	J-1	J-	J-	J-	J-	J-	J-	J-	J-	J-
Types of Water Quality Problems										
High Community Tolerence										
High Temperature										
High Turbidity	X									
Hydrocarbon Pollution										
Low Community Diversity										
Low Dissolved Oxygen										
Low pH										
Nutrient Enrichment										
Poor Habitat										
Other/Explanation Line No.										
Potential Cause(s)										
Agriculture										
Construction Site										
Erosion	X									
Lake Discharge										
STP Outfall										
Other/Explanation Line No.	1									
Frequency										
Year Most Recent Occurence	2005									
Year First Known Occurence	?									
Source of Information										
County Water Quality Study										
Driveby	X									
Other/Explanation Line No.										

EXPLANATION LINES
1 Heavy sediment in basin above lake, dredging approximately every other year
2
3
4
5
6
7
8
9
10

Turning Ideas Into Reality

CATANIA ENGINEERING ASSOCIATES, INC.

Consulting Engineers & Land Surveyors

March 30, 2004
File No. 83600-115-8

Justin D. Kauffman
Delaware County Planning Department
Government Center
201 W. Front Street
Media, PA 19063-2751

Re: Borough of Ridley Park
Crum Creek Act 167 Stormwater Management Plan

Dear Mr. Kauffman:

Enclosed please find the completed Form O - Outfall Data and Storm Sewer Map locating all outfalls for the Crum Creek Watershed.

Should you have any questions or comments, please feel free to contact me.

Very truly yours,

Jamie H Wenger

Jamie H. Wenger, EIT
for Catania Engineering Assoc., Inc.

JHW/lns
Enclosure
cc: Bob Poole

520 W. MacDade Boulevard, Milmont Park, Pennsylvania 19033-3311
Phone: (610) 532-2884 Fax: (610) 532-2923 E-Mail: CEAINC1@aol.com

Form O - Outfall Data

Person: David Rowlyk, Highway Forman Date: 3/30/04 Time Since Last Rain was ≥ 72 Hours: Yes_____

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain: four

Municipality: Borough of Ridley Park Name of receiving water: Crum Creek via Little Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth (feet)	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
LCC - 1	N/A	Yes	2:30 PM	8"	0	12'	8'	1 : 4	No	N/A	residential	0
LCC - 11	N/A	Yes	2:24 PM	48"	2"	1'	8'	1 : 8	Yes	oil sheen / rust color	residential	1
LCC - 21	N/A	Yes	1:55 PM	18"	0	1'	4'	2 : 1	No	N/A	residential	0
LCC - 31	N/A	Yes	1:55 PM	18"	0	1'	4'	2 : 1	No	debris	residential	0
LCC - 41	N/A	Yes	2:00 PM	18"	0	1'	6'	2 : 1	No	N/A	residential	1
LCC - 51	N/A	Yes	2:05 PM	24"	0	1'	4'	2 : 1	No	N/A	residential	0
LCC - 61	N/A	Yes	2:05 PM	18"	0	2'	4'	2 : 1	No	N/A	residential	0
LCC - 71	N/A	Yes	2:06 PM	18"	0	2'	4'	2 : 1	No	N/A	residential	0
LCC - 81	N/A	Yes	1:32 PM	18"	0.5"	1'	2'	2 : 1	Yes	oil sheen / rust color	residential	1

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment deposition, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

***1:1** = Vertical - rectangular channel

NOTES:

Form O - Outfall Data Cont'd

Person: David Rowlyk, Highway Foreman Date: 3/30/04 Time Since Last Rain was ≥ 72 Hours: Yes_____

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain:

Municipality: Borough of Ridley Park Name of receiving water: Crum Creek

	Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth (feet)	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area	Rating (0-2)
010	LCC - 91	N/A	Yes	1:34 PM	36"	2"	1'	4'	2 : 1	Yes	rust color	residential	1
011	LCC - 101	N/A	Yes	1:36 PM	24"	0	1'	4'	2 : 1	No	N/A	residential	0
012	LCC - 111	N/A	Yes	1:16 PM	18"	0	3'	2'	1 : 3	No	N/A	residential	0
013	LCC - 121	N/A	Yes	1:18 PM	18"	0	2'	4'	1 : 3	No	N/A	residential	0
014	LCC - 131	N/A	Yes	1:20 PM	18"	0	1'	4'	1 : 5	No	N/A	recreational	0
015	LCC - 141	N/A	Yes	1:22 PM	18"	0	1.5'	3'	1 : 5	No	N/A	residential	0
016	LCC - 151	N/A	No Ditch	10:57 AM	None	0	0	0	1 : 2	No	N/A	residential	0
017	LCC - 161	N/A	Yes	11:00 AM	24"	0	6'	6'	1 : 2	No	N/A	residential	0
018	LCC - 171	N/A	Flat Ditch	11:05 AM	None	0	0	0	1 : 2	No	N/A	residential	0

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment deposition, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

***1:1** = Vertical - rectangular channel

NOTES:

Form O - Outfall Data Cont'd

Person: David Rowlyk, Highway Forman Date: 3/30/04 Time Since Last Rain was ≥ 72 Hours: Yes_____

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain: four

Municipality: Borough of Ridley Park Name of receiving water: Crum Creek via Little Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth (feet)	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
LCC - 181	N/A	Flat Ditch	11:06 AM	0	0	0	0	1 : 2	No	N/A	railroad	0
LCC - 191	N/A	Yes	1:07 PM	16"	0	3'	6'	1 : 2	No	algae, rust color	residential	1
LCC - 201	N/A	Yes	1:07 PM	36"	0	4'	6'	1 : 2	No	sediment	railroad / res.	0

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment deposition, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

RIDLEY TOWNSHIP

RIDLEY TOWNSHIP

STORMWATER INFORMATION

Provided for:

Act 167 Crum Creek Watershed

Stormwater Management Plan

Form Description Summary
Act 167 Watershed Storm Water Management Plan

Form	Description	Types of Examples	Sources of Information
A	Storm Water Problem Areas	Flooding Drainage Erosion/Sedimentation	Existing Studies or Reports Township Documentation Personal Memory Township Engineer
B	Obstructions	Bridges Culverts Fill Structures	Owner of Structure Township Files Subdivision Applications Roadmasters Township Engineer
C	Existing Flood Control Projects	Channel, Excavation Rip-Rap Floodwalls, etc.	Township Records Township Engineer Owner of Facility
D	Proposed Flood Control Projects	Channel Excavation Rip-Rap Floodwalls, etc.	Township Records Township Engineer Owner of Facility
E	Existing Storm Water Control Facility	Detention Basins Recharge Basins Roof-Top Storage	Subdivision Files Township Engineer Owner of Facility
F	Proposed Storm Water Control Facility	Detention Basins Recharge Basins Roof-Top Storage	Subdivision Files Township Engineer Owner of Facility
G	Existing Storm Water Collection System	Storm Sewers Man-Made Channels Diversions	Existing Plans Township Engineer Owner of System (Developers)
H	Proposed Storm Water Collection System	Storm Sewers Man-Made Channels Diversions	Existing Plans Township Engineer Owner of System (Developer)
I	Present & Projected Development in the Flood Hazard Area	Subdivision/Site Plans	Flood Insurance Studies Subdivision/Site Plans General Knowledge Township Engineer Private Flood Studies
J	Water Quality Problems	Construction Site Agriculture	Municipalities Conservation District

CRUM CREEK WATERSHED
ACT 167 STORMWATER MANAGEMENT PLAN

MUNICIPALITY QUESTIONNAIRE

Please fill out the following questionnaire and return it to Karen Holm at the Delaware County Planning Department, Court House and Government Center Building, 201 West Front St. Media, PA 19063 as soon as possible. If you have any questions or comments, or if you would like these forms in digital format, please call Karen at 610-891-5213 or e-mail her at holmk@co.delaware.pa.us.

PART I - GENERAL INFORMATION

Municipality: Ridley Township

Contact Person: Anne E. Howanski, Manager

WPAC Designee: Charles J. Catania, Jr.

Title: Township Engineer

Address: 520 W. MacDade Boulevard

Milmont Park, PA 19033-3311

Phone: 610-532-2884

Fax: 610-532-2923

Person Completing form (if different from Contact Person):

Name: Jamie H. Bricker

Address: 520 W. MacDade Boulevard

Milmont Park, PA 19033-3311

Phone: 610-532-2884

Fax: 610-532-2923

E-mail: jamie@cataniaengineering.com

PART II - REGULATORY ACTIVITIES

A. Please indicate the regulations you currently use to manage development.

REGULATION	MUNICIPAL ORDINANCE	COUNTY ORDINANCE
Zoning Ordinance	Chapter 325	
Subdivision/Land Development Ordinance	No. 1443	
Separate Stormwater Ordinance	No. 1688	
Separate Floodplain Ordinance	Under SLDO No. 1443	

B. Please indicate the agencies/individuals who review and approve land development plans and zoning variance/waiver requests.

ENTITY	LAND DEVELOPMENT PLANS		ZONING VARIANCE/WAIVER REQUESTS	
	REVIEW	APPROVE	REVIEW	APPROVE
Supervisors	X	X		
Municipal Engineering Department				
Municipal Planning Department	X		X	
County Planning Department	X		X	
County Conservation District	X	X		
Zoning Hearing Board			X	X
Consulting Engineer	X		X	
Others (List Below				

Township Commissioners are considered Supervisors. The Zoning Officer will forward the approved/disapproved variances to the applicant along with the necessary permit(s).

C. Please provide **copies** of your zoning, subdivision/land development, and separate stormwater management and floodplain ordinances and your current zoning map when you return this questionnaire. Please list these documents below.

Zoning Chapter 325
Subdivision and Land Development Ordinance No. 1443
Stormwater Management Design Ordinance No. 1688

PART III – MUNICIPAL AND LOCAL PLANNING ACTIVITIES

Please indicate below whether your community has approved the following plans and maps and the date of the most recent update.

ITEM	APPROVED/DATE	IN PROGRESS	PLANNED WITHIN NEXT YEAR
PA Act 537 Sewage Facilities Plan	March 2002		
Comprehensive Land Use Plan	Dec. 1974		
Existing Land Use Maps	Dec. 1974		
Proposed Land Use Maps	Dec. 1974		
Zoning Maps	May 2001	(revisions)	

PART IV – FLOOD INSURANCE PROGRAM AND COMPREHENSIVE LAND USE PLAN

Please indicate below whether your community participates in the National Flood Insurance Program:

ITEM	PARTICIPATES (Y/N)
Flood Hazard Boundary Map (FHBM)	Y
Participates in FEMA Emergency Program	N
Participates in FEMA Regular Program	Y

PART V - EXISTING STORMWATER RELATED PROBLEMS AND STRUCTURES

Please complete the matrices on the following pages (Forms A and C-J) to describe any significant stormwater-related problems (Form A), Existing or Proposed Flood Control Projects (Forms C & D), Existing or Proposed Storm Water Control Facilities (Forms E and F), Existing or Proposed Stormwater Collection Systems (Forms G & H), Present and Projected Development in the Flood Hazard Area (Form I), and Water Quality Problem Areas (Form J) that you are aware of in your municipality.

What we would like to ask of you is that you complete as much of the attached data collection forms as possible. There is a different form for each item of information as summarized in the attached "FORM DESCRIPTION SUMMARY. The process would be as follows starting with the problem areas (Form A):

- Place the location of the problem area on the map as shown in the attached example map.
- Draw a box on the map with the problem area identifier starting with A-1 with an arrow leading from the problem area identifier to the problem area.
- Place an A-1 in the first column of FORM A.
- Put a check in each box in the A-1 column that represents the problems associated with that particular problem area.
- Repeat with the next problem area (A-2) and so on.

- Repeat for existing flood control projects (FORM C) placing a triangle on the maps and starting the labeling with C-1.
- Repeat for all forms.

The sample map attached shows three problem areas (A99- A1 and A-2), one proposed flood control project (F-1) and one water quality problem (J1).

Use additional paper to provide <u>detailed</u> descriptions of your most serious problems and attach a map to show the location of the problem. Attach photographs, if available.

If you have any storm or combined sewers, please provide maps showing the collection system and overflow discharge locations and an estimate of the average annual discharge at each overflow point.

The more detail you provide, the better we will be able to evaluate the situation for your municipality. We appreciate your help.

Sample Location of Information from Data Collection Forms on the Municipal Map

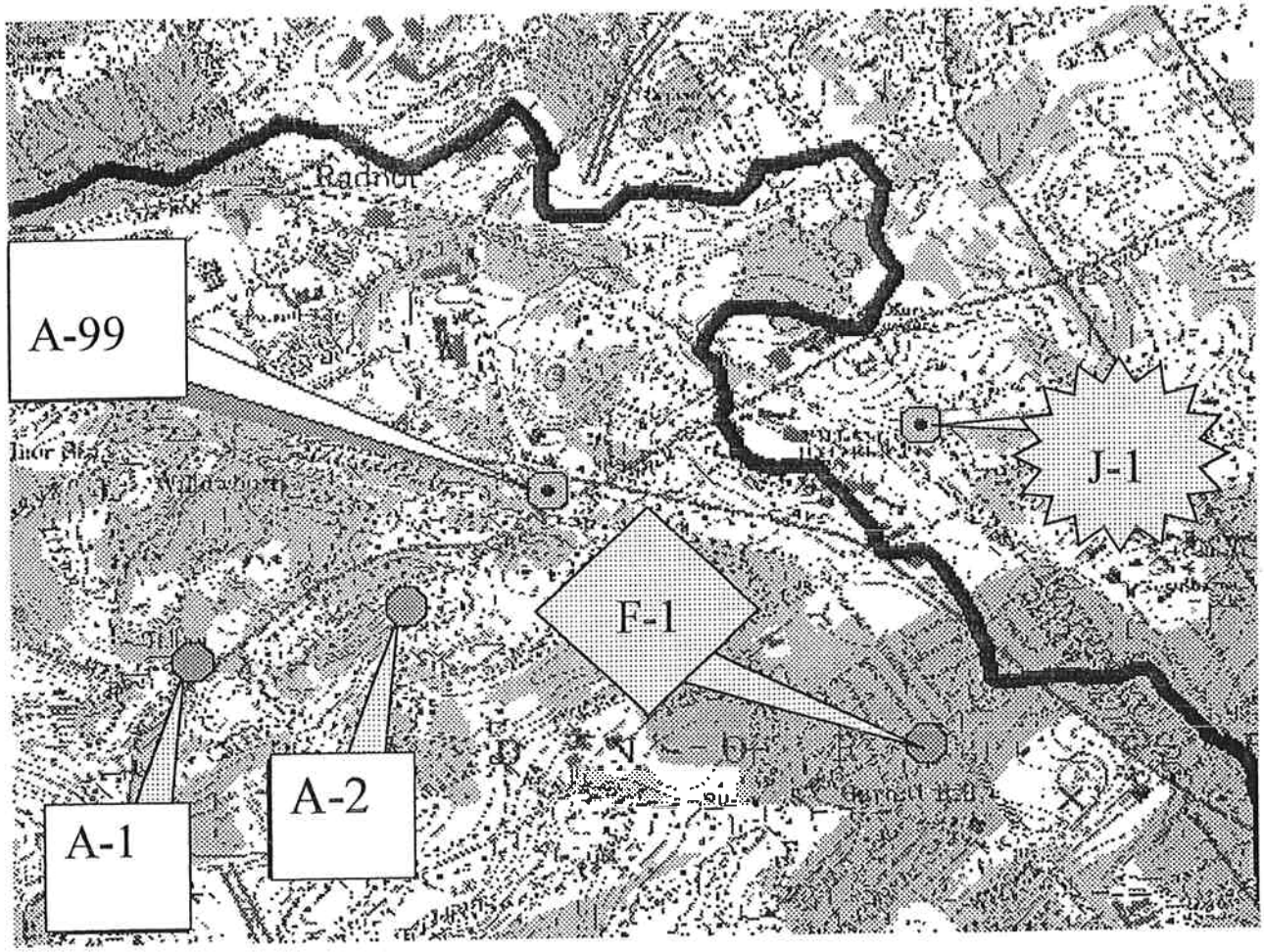


Table of Contents

FORM A - STORM WATER PROBLEM AREAS SHEET 1 OF 2

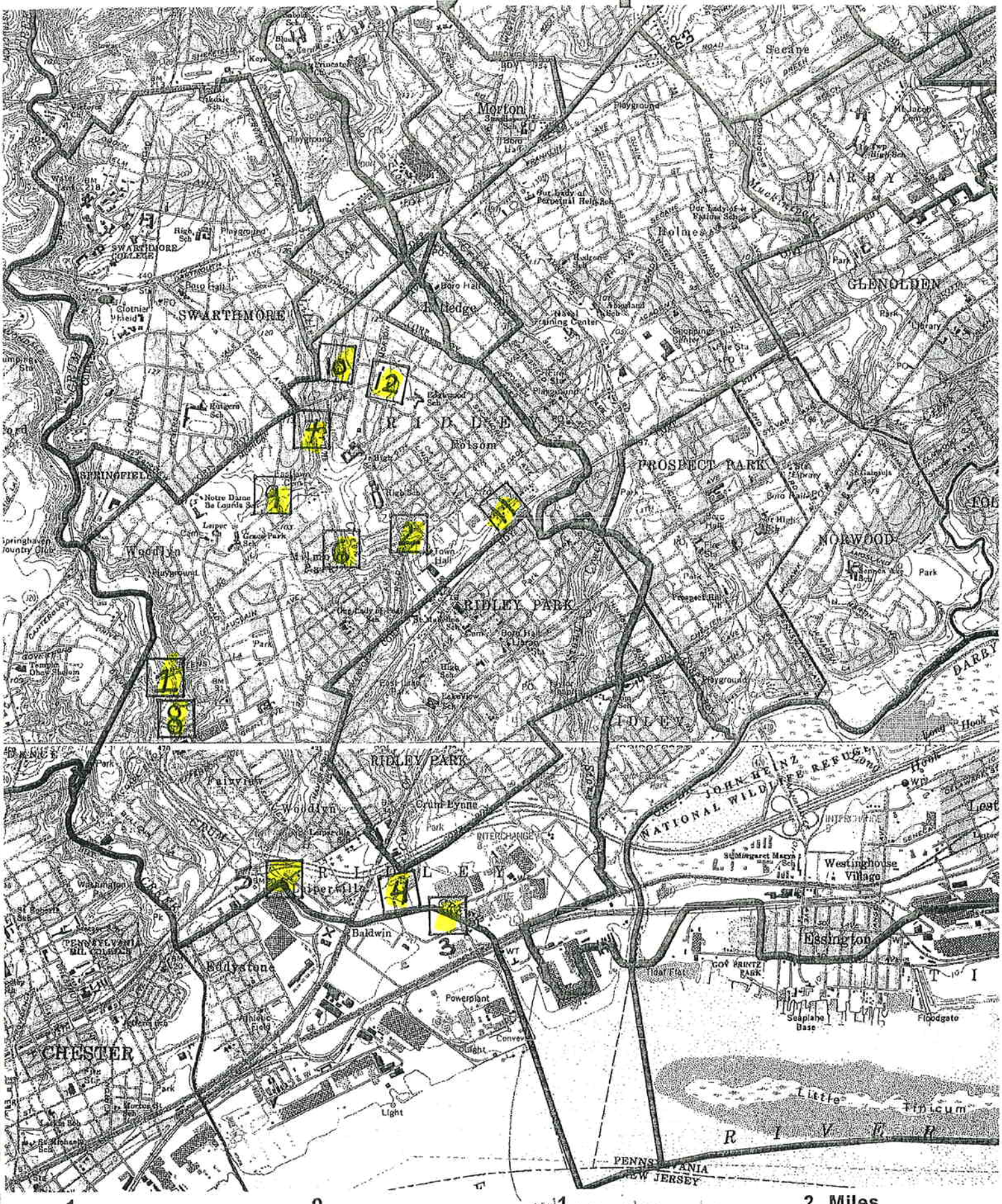
WATERSHED		FORM COMPLETED BY		Before Filling Out Form, See Instructions on Back
Name:	Crum Creek	Name:	Jamie H. Bricker	
Municipality:	Ridley Towship	Telephone:	610-532-2884	For County Use:
County:	Delaware	Date:	8/18/2004	

MAP NO. *	A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
Types of Storm Water Problems												
Flooding	X	X	X	X	X	X	X		X	X	X	
Accelerated Erosion	X					X	X	X	X	X	X	X
Sedimentation										X		
Landslide												
Groundwater												
Water Pollution												
Other (Explain)												
Explanation Line No. (On Back)	1	2	3	4	5	6	7	8	9	10	11	12
Cause (s)												
Storm Water Volume	X	X	X	X	X	X	X	X	X	X	X	
Storm Water Velocity	X					X	X	X	X	X		X
Storm Water Direction						X	X	X	X	X		
Water Obstruction					X		X		X	X	X	
Other (Explain)												
Explanation Line No. (On Back)												
Frequency												
Year Most Recent Occurred	2004	2004	2002	2002	2003	2004	2003	2004	2003	2002	2002	2002
Year First Known Occurred	?	?	?	?	?	?	?	?	?	?	?	?
Regularity												
More Than 1 Year	X	X					X					
Less Than 1 Year			X	X	X	X			X	X	X	
Only During Agnes												
Duration (If Applicable)												
Less Than 1 Day	X	X	X	X	X	X	X		X	X	X	
1 Day + (Enter Days)												
Property Damage												
Loss of Life/Vital Services					X							
Private			X	X		X	X	X	X	X	X	X
More Than One Owner						X	X	X	X	X	X	X
Types of Properties	R		Ind	Ind		R	R	R	R	R	R/C	R
Number of Properties			1	1		12	8	5	6	20	8	4
Public (List Types)		X			X							
Explanation Line No. (On Back)		2			5		7					
Solutions												
Suggested												
Explanation Line No. (On Back)												
Formally Proposed			X	X								
Explanation Line No. (On Back)			3	4								12

* Include Map ID No. if found on any other form listing proposed facilities.

	FORM A - STORM WATER PROBLEM AREAS SHEET 2 OF 2
	EXPLANATION LINES
1	CC flooding and erosion at Bullens Lane bridge
2	Lincoln St. flooding
3	CC flooding on Boeing's site, formally proposed floodwall to alleviate
4	LCC flooding on Boeing's site, formally proposed berm to protect site
5	CC flooding at Chester Pike bridge
6	LCC flooding and erosion at Manor Circle/Arlington upstream to the municipal boundary
7	LCC flooding behind Georgetown Road, several homes flooded, rock deflector installed
8	CC streambank erosion behind Valley Rd
9	LCC UNT flooding and erosion near Milmont Ave and Brookside Ave
10	LCC UNT flooding and erosion behind Muhlenberg Ave
11	2nd Avenue flooding
12	LCC UNT erosion near Edgewood Ave and Village Rd, rip rap installed

Ridley Twp.


Secane
Morton
Playground
DARBY
Holmes
GLENOLDEN
SWARTHMORE
RIDLEY
Folsom
PROSPECT PARK
NORWOOD
RIDLEY PARK
Woodlyn
Ridley Park
Crum Lynne
Eddystone
Baldwin
Essington
Westinghouse Village
CHESTER
Powerplant
Seaplane Base
Floodgate
Little Tinicum
PENNSYLVANIA
NEW JERSEY
1
0
1
2 Miles

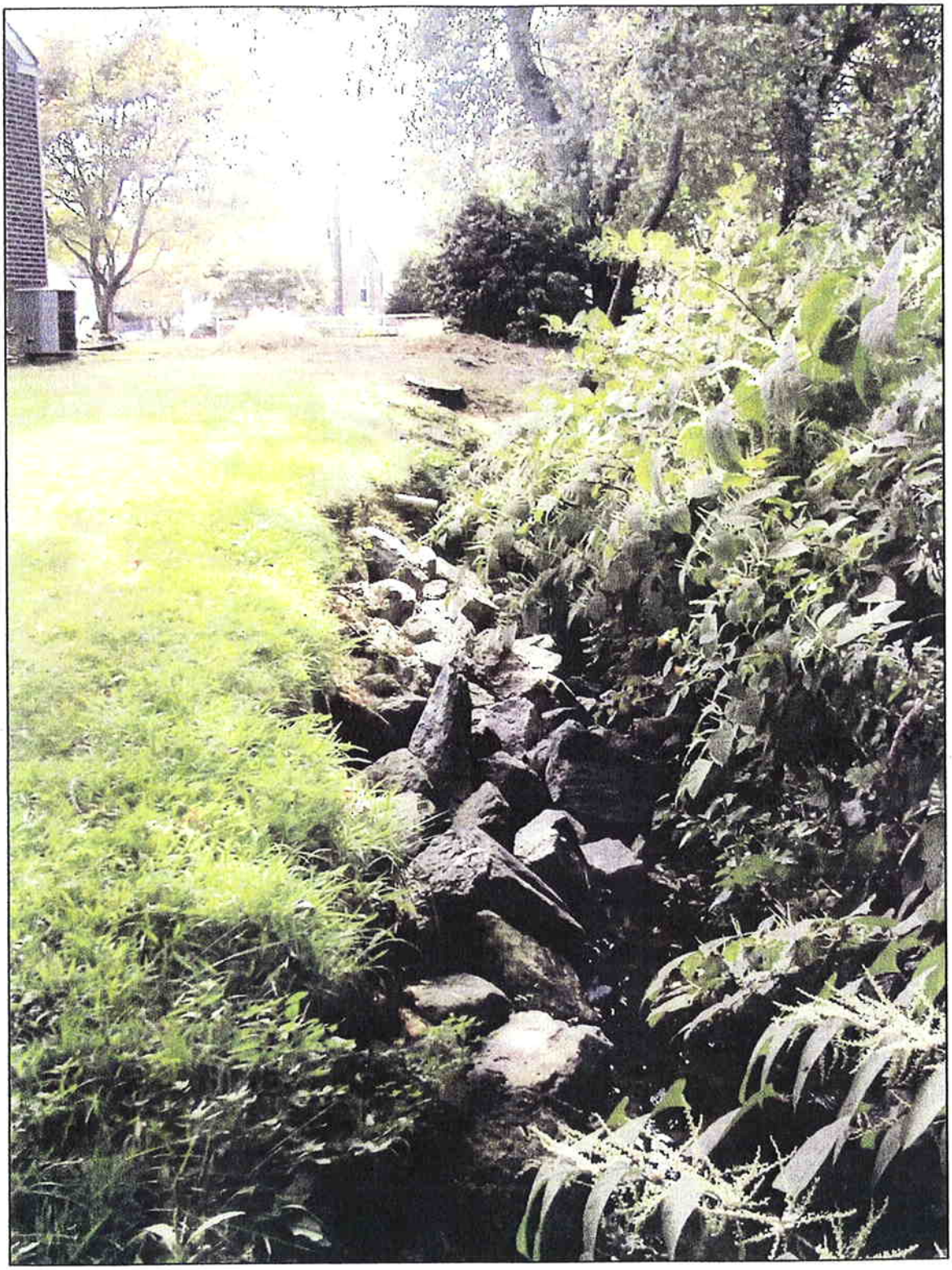
FORM C

EXISTING FLOOD CONTROL PROJECT FORM C. SHEET 1 OF 1

WATERSHED		FORM COMPLETED BY		TYPICAL TYPES OF FLOOD CONTROL PROJECTS		
Name:	Crum Creek	Name:	Jamie H. Bricker	Channel Excavation / Widening	Levee	Dams
Municipality:	Ridley Township	Telephone:	610-532-2884	Channel Realignment	Gabions	Floodwall
County:	Delaware	Date:	8/18/2004	Rock Riprap	Pipe Channel	Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Year Constr Built	Expected Life Yrs.	Design Flood Frequency Yrs.	Design Flood Discharge C.F.S. (if known)	Owner Name, Address, and Phone
C-1	rock deflector installed for bank stabilization on Little Crum Creek west of Georgetown Rd	2000	100	N/A	N/A	Anne E. Howanski (610) 534-4806 100 E. Mac Dade Blvd, Folsom, PA 19033
C-2	rip rap installed on eroded banks near Edgewood Ave and Village Rd	2003	10	N/A	N/A	see A-12 Theresa Banson (610) 338-0923 916 Edgewood Ave, Folsom, PA 19033
C-						
C-						
C-						



Little Crum Creek, Unnamed tributary
Rip rap bank stabilization near Edgewood Ave and Village Rd
Identified as A-12 and C-2

FORM D

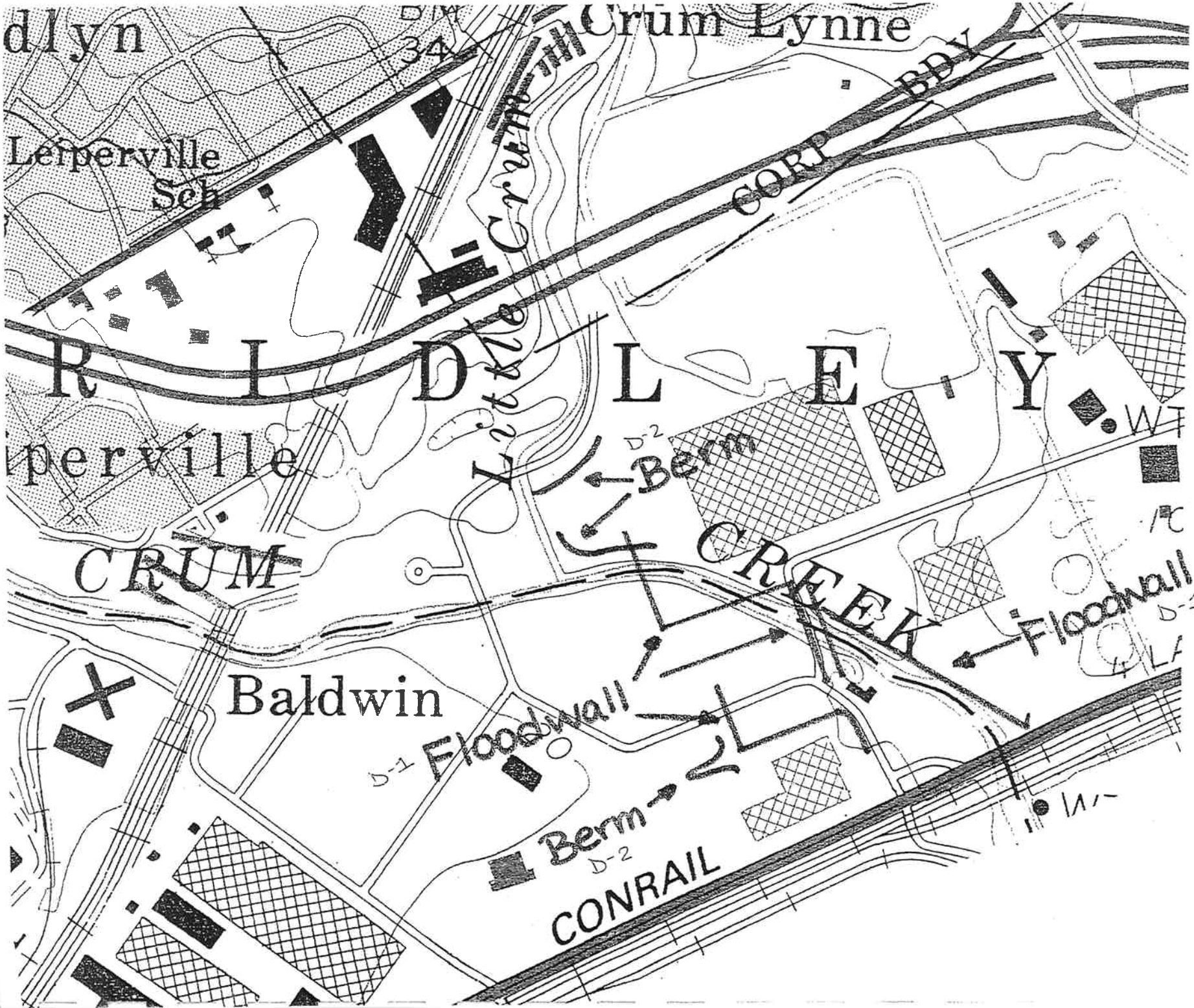
PROPOSED FLOOD CONTROL PROJECT FORM D. SHEET 1 OF 1

WATERSHED		FORM COMPLETED BY		TYPICAL TYPES OF FLOOD CONTROL PROJECTS		
Name:	Crum Creek	Name:	Jamie H. Bricker	Channel Excavation / Widening	Levee	Dams
Municipality:	Ridley Township	Telephone:	610-532-2884	Channel Realignment	Gabions	Floodwall
County:	Delaware	Date:	8/18/2004	Rock Riprap	Pipe Channel	Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Study Phase Begun			Year Constr. Planned	Projected Compltn. Date	Expected Life Yrs.	Design Flood		Map ID No. Form A*	Owner Name, Address, and Phone
		YES		NO				Frequency Yrs.	Discharge C.F.S.		
		Prelim.	Final								
D-1	floodwall		X		2004/ 2005	2005	100	100-yr.	10335	3	The Boeing Company (Dale Davis) P.O. Box 16858 P25-75 Philadelphia, PA 19142-0858 (610) 591-2006
D-2	berm		X		2004/ 2005	2005	100	100-yr.	10335	4	The Boeing Company (Dale Davis) P.O. Box 16858 P25-75 Philadelphia, PA 19142-0858 (610) 591-2006
D-											
D-											
D-											

* Enter the storm water problem area's Map ID No., if the proposed project will solve or reduce any / all of an identified drainage problem.


dlyn
Crum Lynne
Leperville
Sch
CORP
BDY
R I D L E Y
perville
CRUM
CREEK
Berm
D-2
Floodwall
D-1
Baldwin
CONRAIL

FORM E

EXISTING STORM WATER CONTROL FACILITIES FORM E. SHEET 1 OF 1

WATERSHED	FORM COMPLETED BY	DEFINITION
Name: Crum Creek Municipality: Ridley Township County: Delaware	Name: Jamie H. Bricker Telephone: 610-532-2884 Date: 8/17/2004	Storm Water Control Facility A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.
For County Use:		

Map ID No.	Type of Storm Water Control Facility	Year Built	Contact Person Name, Address and Phone	Comments
E-1	Retention Basin	1983	Janet Caranci, Executive Director (610) 490-6205 1855 Constitution Ave, Woodlyn PA 19094	Delaware County Housing Authority
E-2	Retention Basin	1983	Janet Caranci, Executive Director (610) 490-6206 1856 Constitution Ave, Woodlyn PA 19094	Delaware County Housing Authority
E-3	Retention Basin	2001	Swarthmore Green Estates Willowbend Drive, Folsom, PA 19033	Swarthmore Green Estates
E-				
E-				
E-				
E-				
E-				

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

Detention / Retention Basin

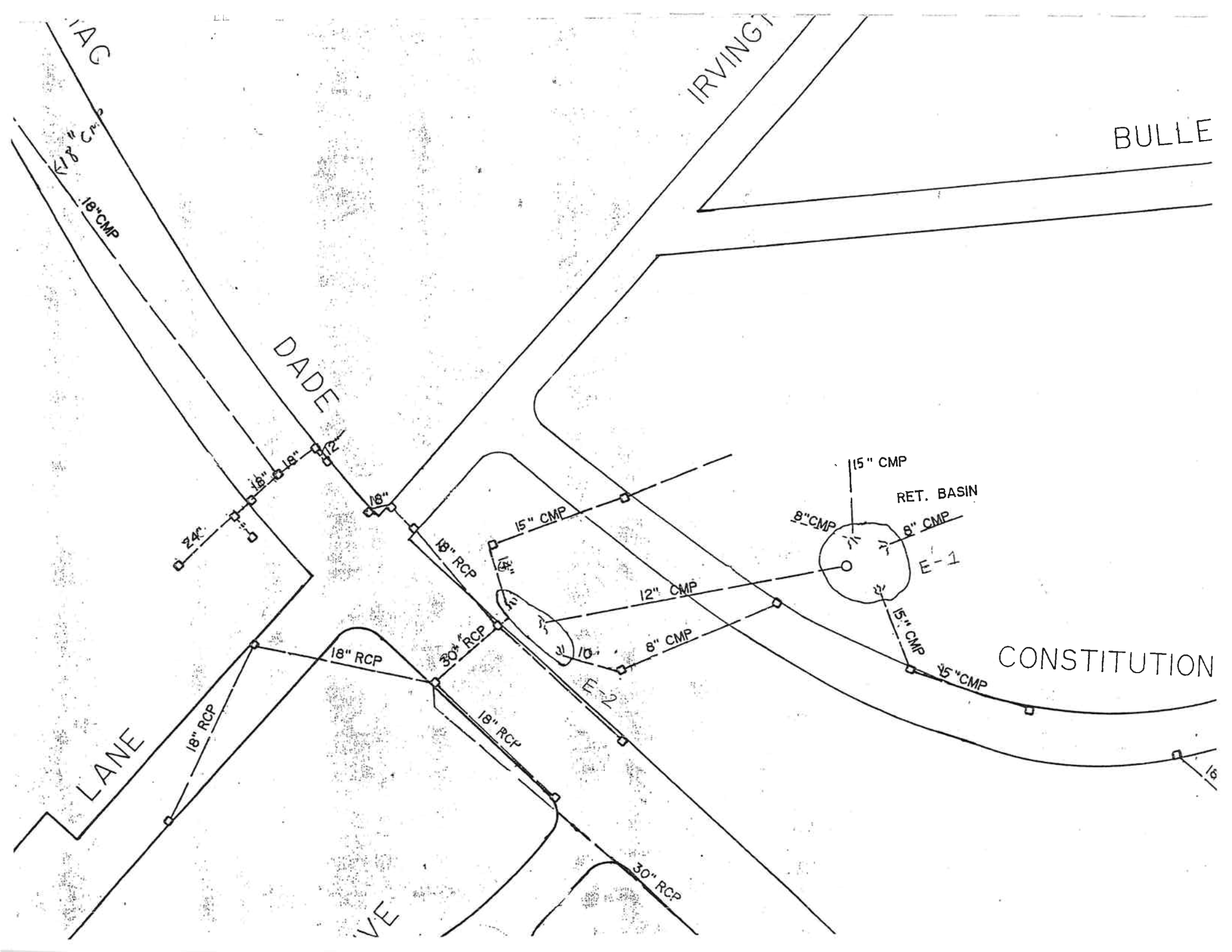
Natural Pond or Wetland

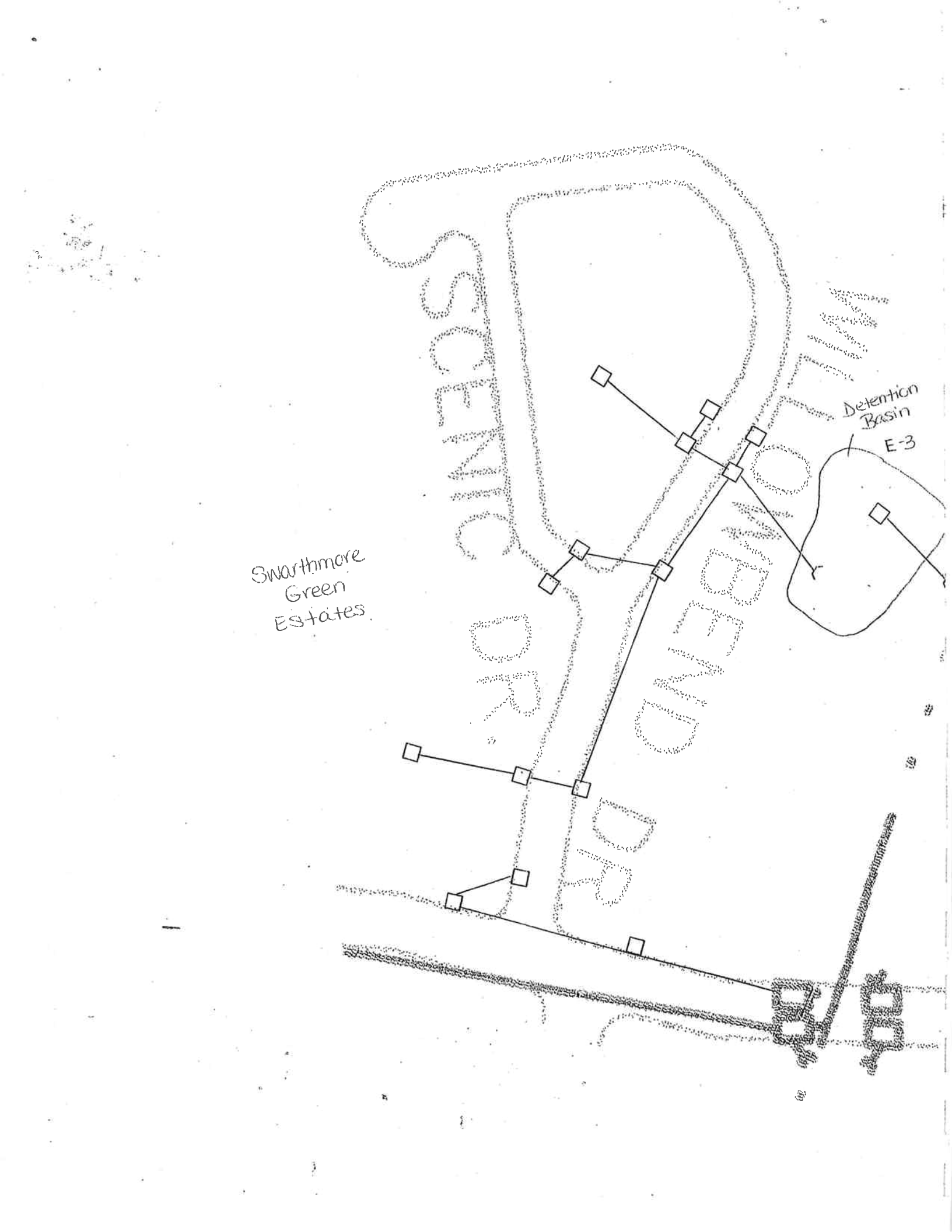
Parking Lot Pondling

Roof-Top Storage

Semi-Pervious Paving

Infiltration Device (Seepage / Recharge Basin or Underground Tank)


IAG
IRVING
BULLE
DADE
LANE
CONSTITUTION
18"CMP
18" RCP
30" RCP
15" CMP
12" CMP
8" CMP
RET. BASIN
E-1
E-2
24"


Detention Basin
E-3
Swarthmore
Green
Estates

FORM F

PROPOSED STORM WATER CONTROL FACILITIES FORM F. SHEET 1 OF 1

WATERSHED		FORM COMPLETED BY		DEFINITION
Name:	Crum Creek	Name:	Jamie H. Bricker	Storm Water Control Facility
Municipality:	Ridley Township	Telephone:	610-532-2884	A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.
County:	Delaware	Date:	8/17/2004	
For County Use:				

Map ID No.	Type of Storm Water Control Facility	Proposed Constr. Date Start	Proposed Constr. Date End	Map No. Form A*	Contact Person Name, Address and Phone	Comments
F-	No proposed stormwater control facilities exist within the Ridley Township, Crum Creek Watershed					
F-						
F-						
F-						
F-						
F-						
F-						
F-						

* Enter the stormwater problem area's Map ID No., if the proposed project will solve or reduce and / all of an identified drainage problem.

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

Detention / Retention Basin

Natural Pond or Wetland

Parking Lot Pondling

Roof-Top Storage

Semi-Pervious Paving

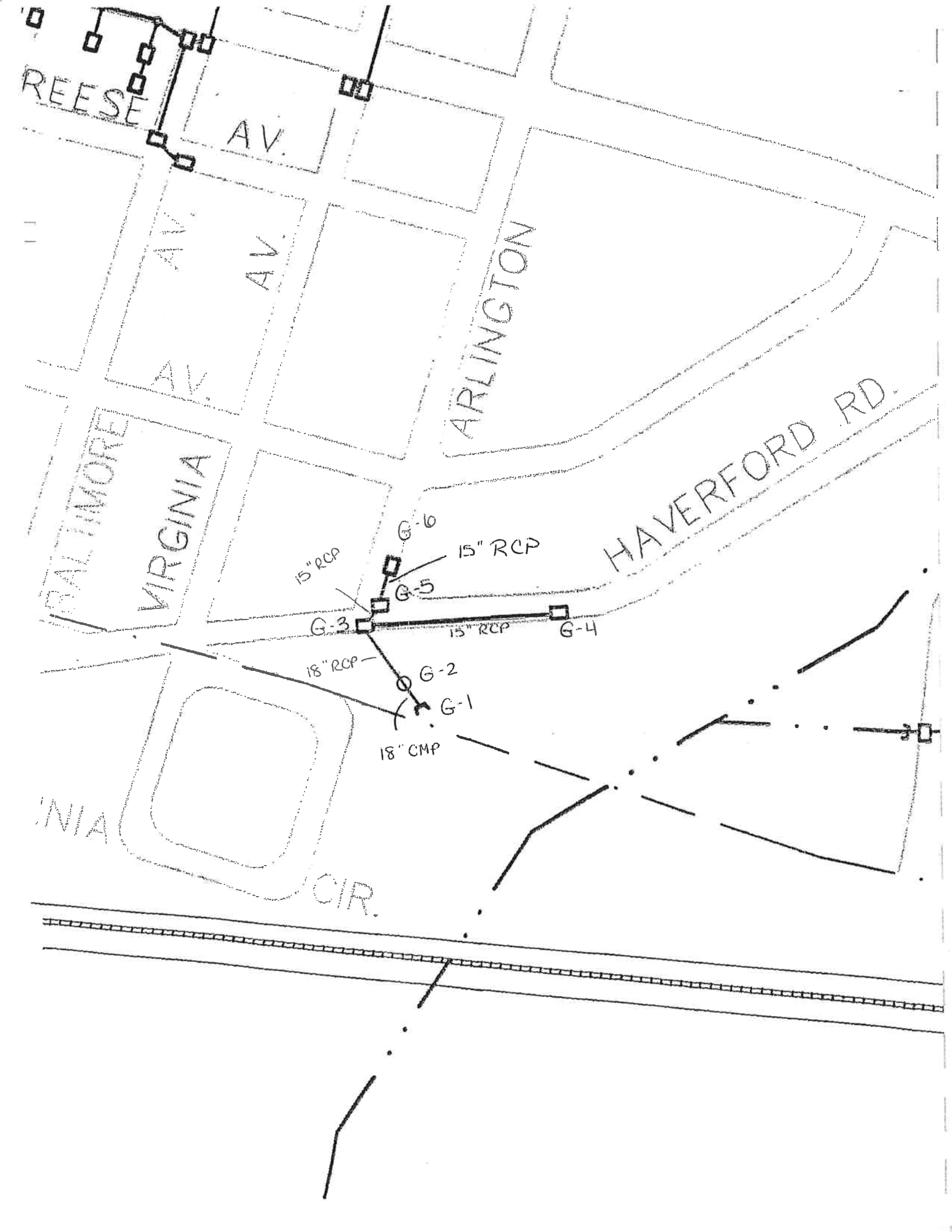
Infiltration Device (Seepage / Recharge Basin or Underground Tank)

FORM G (1)

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 1 OF 67

WATERSHED		FORM COMPLETED BY		INSTRUCTIONS
Name:	Crum Creek	Name:	Jamie H. Bricker	Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.
Municipality:	Ridley Township	Telephone:	610-532-2884	
County:	Delaware	Date:	8/9/2004	

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-1	G-2	X			18"				CMP	c. 1951	no	Anne Howanski 610-833-1922	Ridley Township
G-2	G-3	X			18"				RCP	c. 1951	no	Anne Howanski 610-833-1923	Ridley Township
G-3	G-4	X			15"				RCP	c. 1998	no	Anne Howanski 610-833-1923	Ridley Township
G-3	G-5	X			15"				RCP	c. 1951	no	Anne Howanski 610-833-1923	Ridley Township
G-5	G-6	X			15"				RCP	c. 1998	no	Anne Howanski 610-833-1924	Ridley Township


REESE
AV.
AV.
AV.
AV.
ARLINGTON
HAVERFORD RD.
BALTIMORE
VIRGINIA
G-6
15" RCP
15" RCP
G-5
G-3
15" RCP
G-4
18" RCP
G-2
G-1
18" CMP
CIR.

FORM G (2)

EXISTING STORMWATER COLLECTION SYSTEM FORM G.													SHEET 3 OF 67
Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-38	G-40	X			12"				RCP	c. 1995	no	Anne Howanski 610-833-1923	Ridley Township
G-29	G-41	X			30"				RCP	c. 1995	no	Anne Howanski 610-833-1924	Ridley Township
G-41	G-42	X			24"				RCP	c. 1995	no	Robert Poole 610-532-2100	Ridley Park Borough
G-42	G-43	X			18"				RCP	c. 1995	no	Robert Poole 610-532-2101	Ridley Park Borough
G-43	G-44	X			15"				RCP	c. 1995	no	Robert Poole 610-532-2102	Ridley Park Borough
G-43	G-45	X			15"				RCP	c. 1995	no	Robert Poole 610-532-2103	Ridley Park Borough

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 2 OF 67

WATERSHED

Name: Crum Creek
Municipality: Ridley Township
County: Delaware

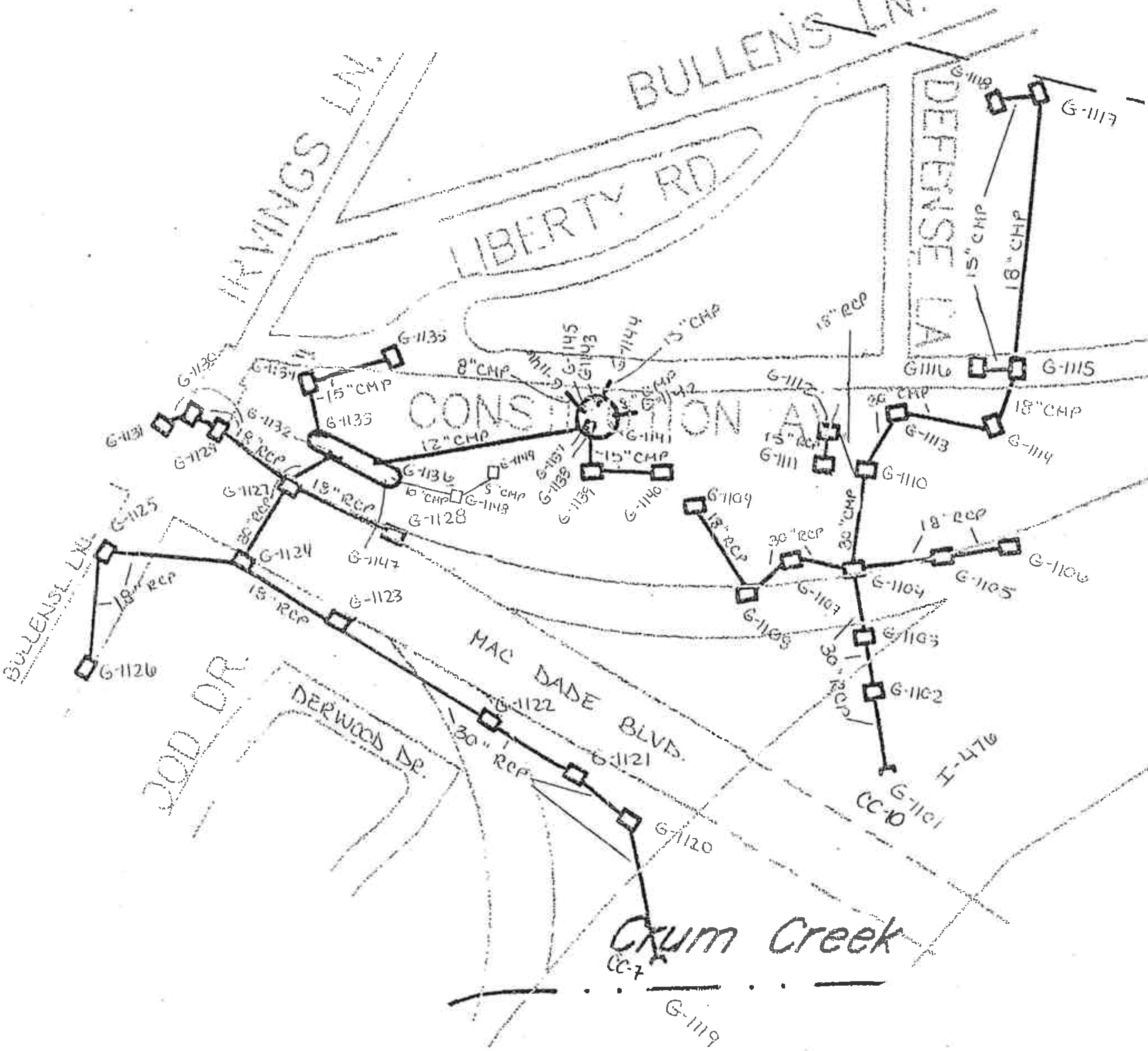
FORM COMPLETED BY

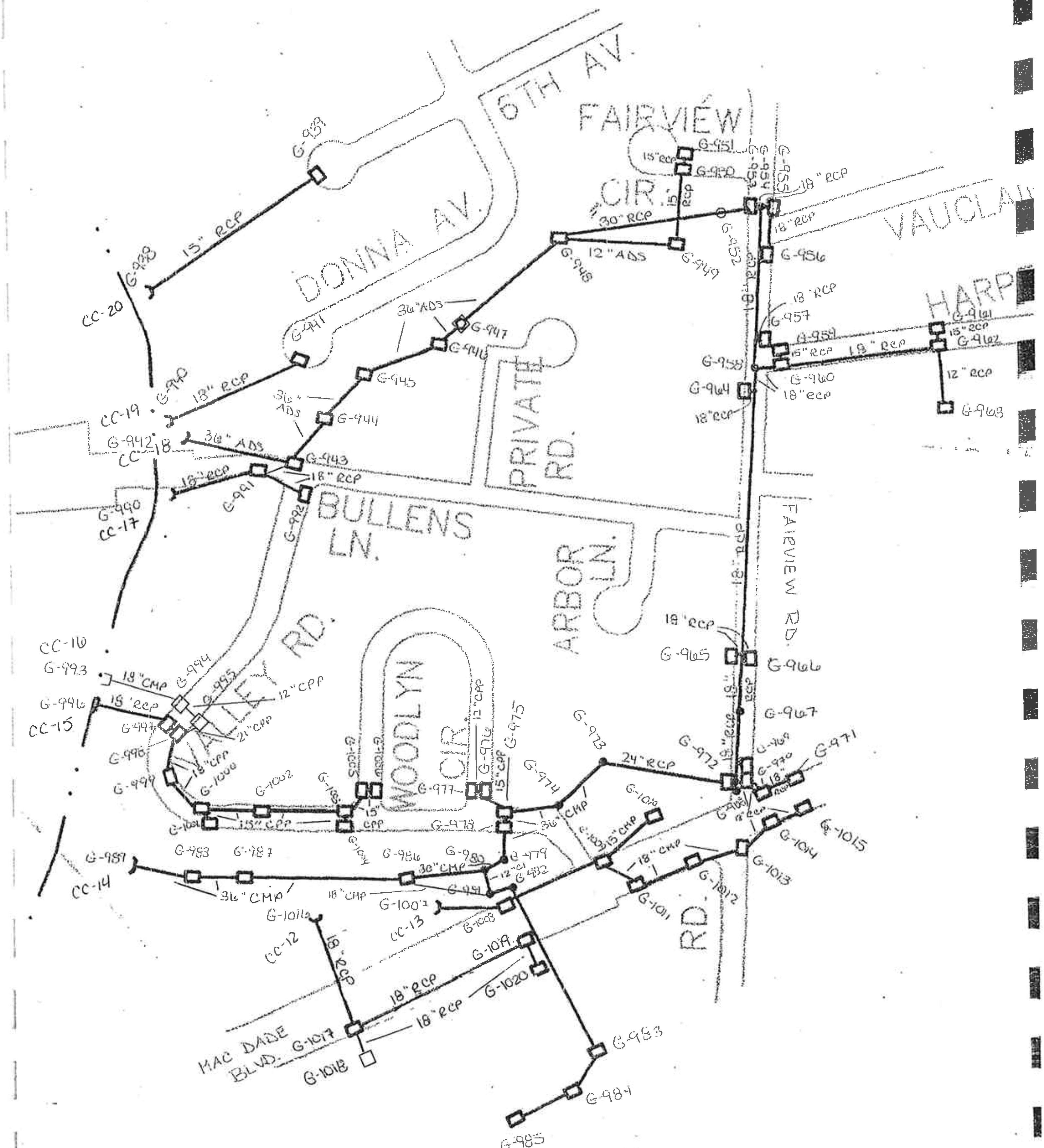
Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/9/2004

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-26	G-27	X			24"				Type 'S' CPP	c. 1995	no	Robert Poole 610-532-2100	Ridley Park Borough
G-27	G-28	X			36"				RCP	c. 1995	no	Anne Howanski 610-833-1922	Ridley Township
G-28	G-29	X			30"				RCP	c. 1995	no	Anne Howanski 610-833-1923	Ridley Township
G-29	G-30	X			12"				CPP	c. 1995	no	Anne Howanski 610-833-1924	Ridley Township
G-29	G-31	X			24"				RCP	c. 1995	no	Anne Howanski 610-833-1925	Ridley Township
G-31	G-32	X			24"				RCP	c. 1995	no	Anne Howanski 610-833-1926	Ridley Township
G-31	G-33	X			15"				RCP	c. 1995	no	Anne Howanski 610-833-1927	Ridley Township
G-32	G-34	X			15"				RCP	c. 1995	no	Anne Howanski 610-833-1928	Ridley Township
G-34	G-35	X			12"				RCP	c. 1995	no	Anne Howanski 610-833-1929	Ridley Township
G-34	G-36	X			15"				RCP	c. 1995	no	Anne Howanski 610-833-1930	Ridley Township
G-34	G-37	X			15"				RCP	c. 1995	no	Anne Howanski 610-833-1931	Ridley Township
G-37	G-38	X			15"				RCP	c. 1995	no	Anne Howanski 610-833-1922	Ridley Township
G-38	G-39	X			6"				RCP	c. 1995	no	Anne Howanski 610-833-1922	Ridley Township


BULLENS LN.
IRVINGS LN.
LIBERTY RD.
DEFENSE LA.
CONSTITUTION AV.
MAC DADE BLVD.
DERWOOD DR.
BULLENS LN.
I-476
Crum Creek
CC-7
CC-10
G-1117
G-1118
G-1115
G-1116
G-1114
G-1113
G-1110
G-1111
G-1109
G-1108
G-1107
G-1104
G-1105
G-1106
G-1103
G-1102
G-1101
G-1119
G-1120
G-1121
G-1122
G-1123
G-1124
G-1125
G-1126
G-1127
G-1128
G-1129
G-1131
G-1132
G-1133
G-1134
G-1135
G-1136
G-1140
G-1141
G-1142
G-1144
G-1147
G-1148
G-1149
15" CMP
18" CMP
18" RCP
30" RCP
30" CMP
12" CMP
8" CMP
15" RCP
30" RCP


6TH AV.
FAIRVIEW CIR.
DONNA AV.
VAUCLAIN
HARP
PRIVATE RD.
BULLENS LN.
ARBOR LN.
FAIRVIEW RD.
VALLEY RD.
WOODLYN CIR.
MAC DADE BLVD.
RD.
CC-20
CC-19
CC-18
CC-17
CC-16
CC-15
CC-14
CC-13
CC-12
G-938
G-939
G-940
G-941
G-942
G-943
G-944
G-945
G-946
G-947
G-948
G-949
G-950
G-951
G-952
G-953
G-954
G-955
G-956
G-957
G-958
G-959
G-960
G-961
G-962
G-963
G-964
G-965
G-966
G-967
G-968
G-969
G-970
G-971
G-972
G-973
G-974
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G-976
G-977
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G-980
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G-982
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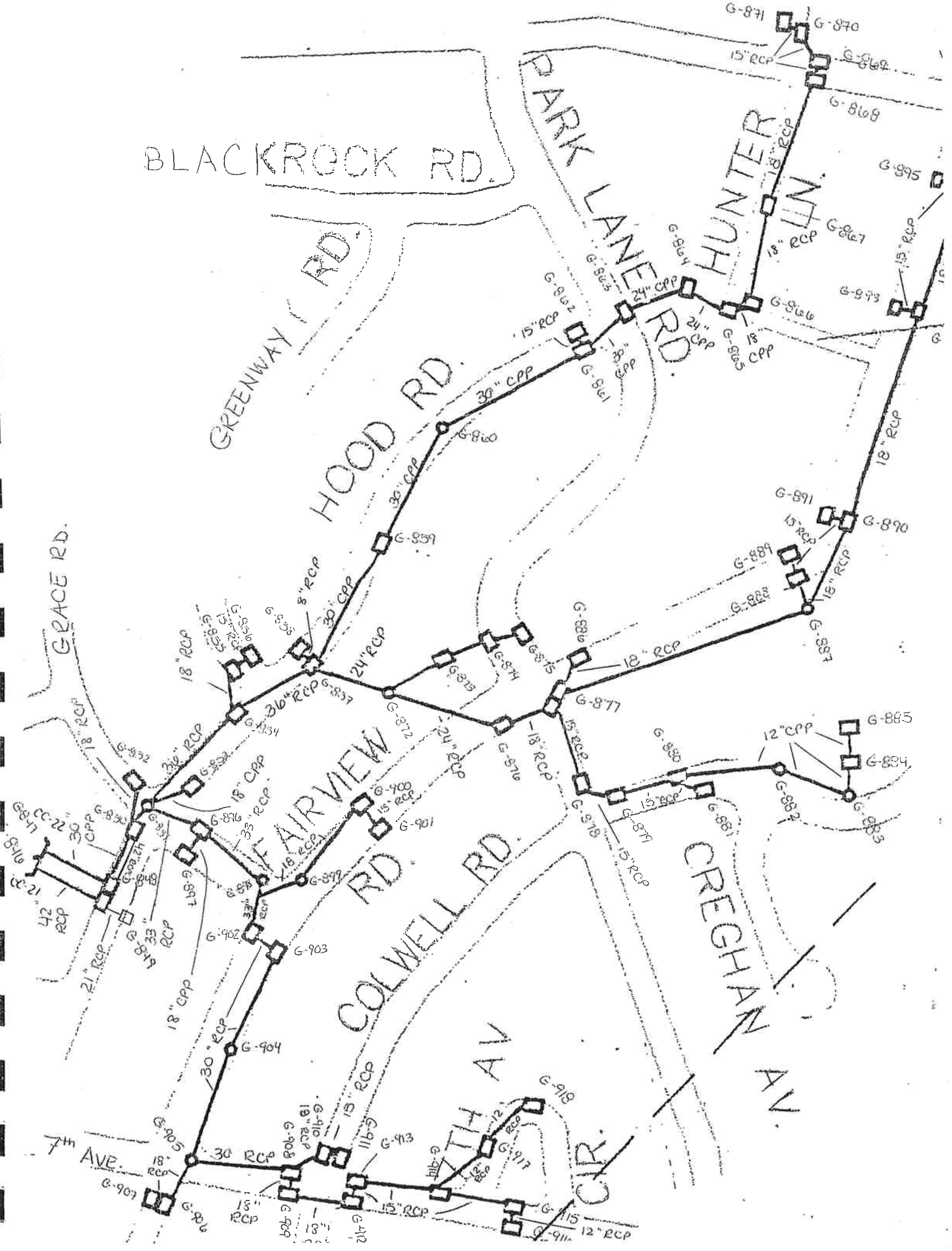
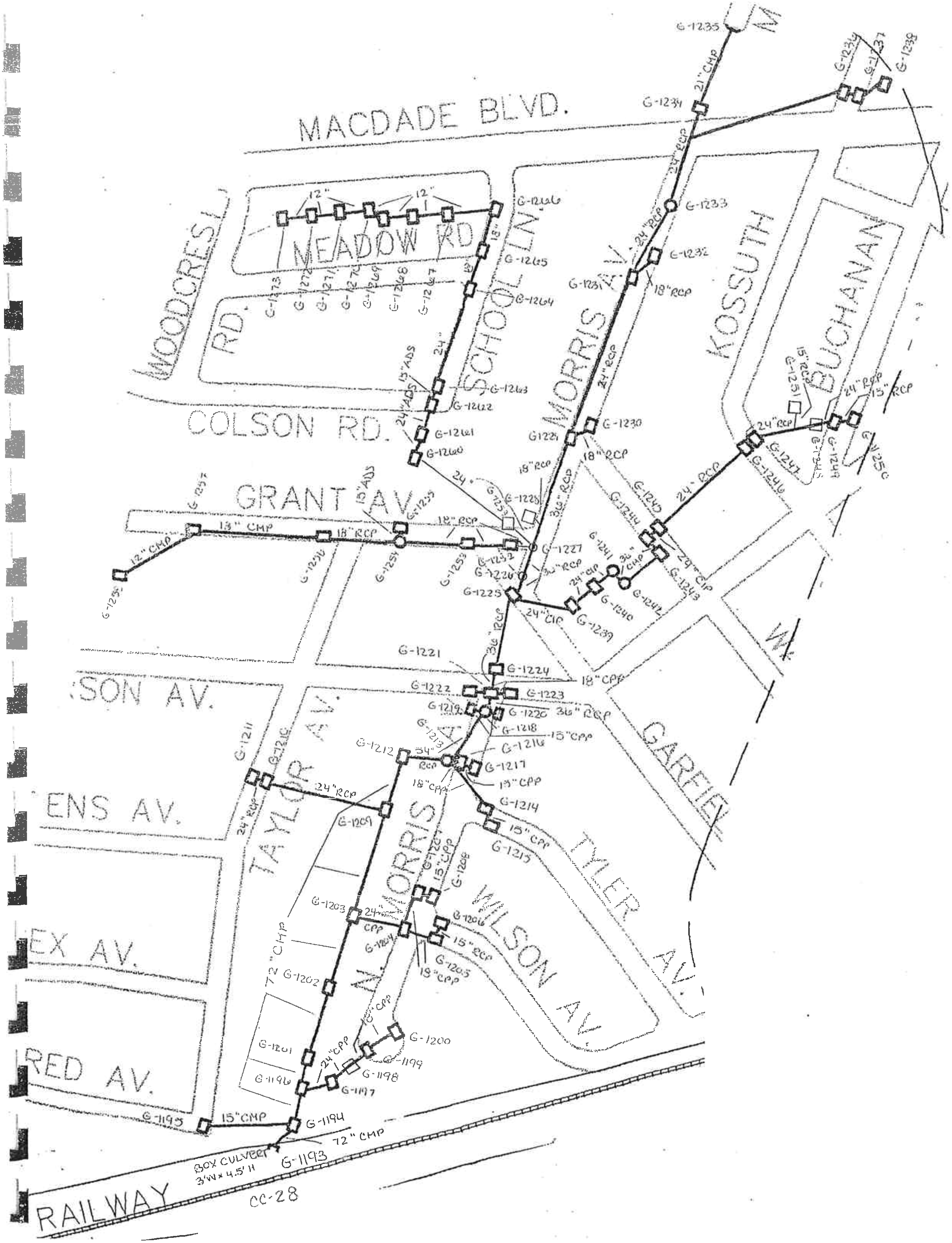
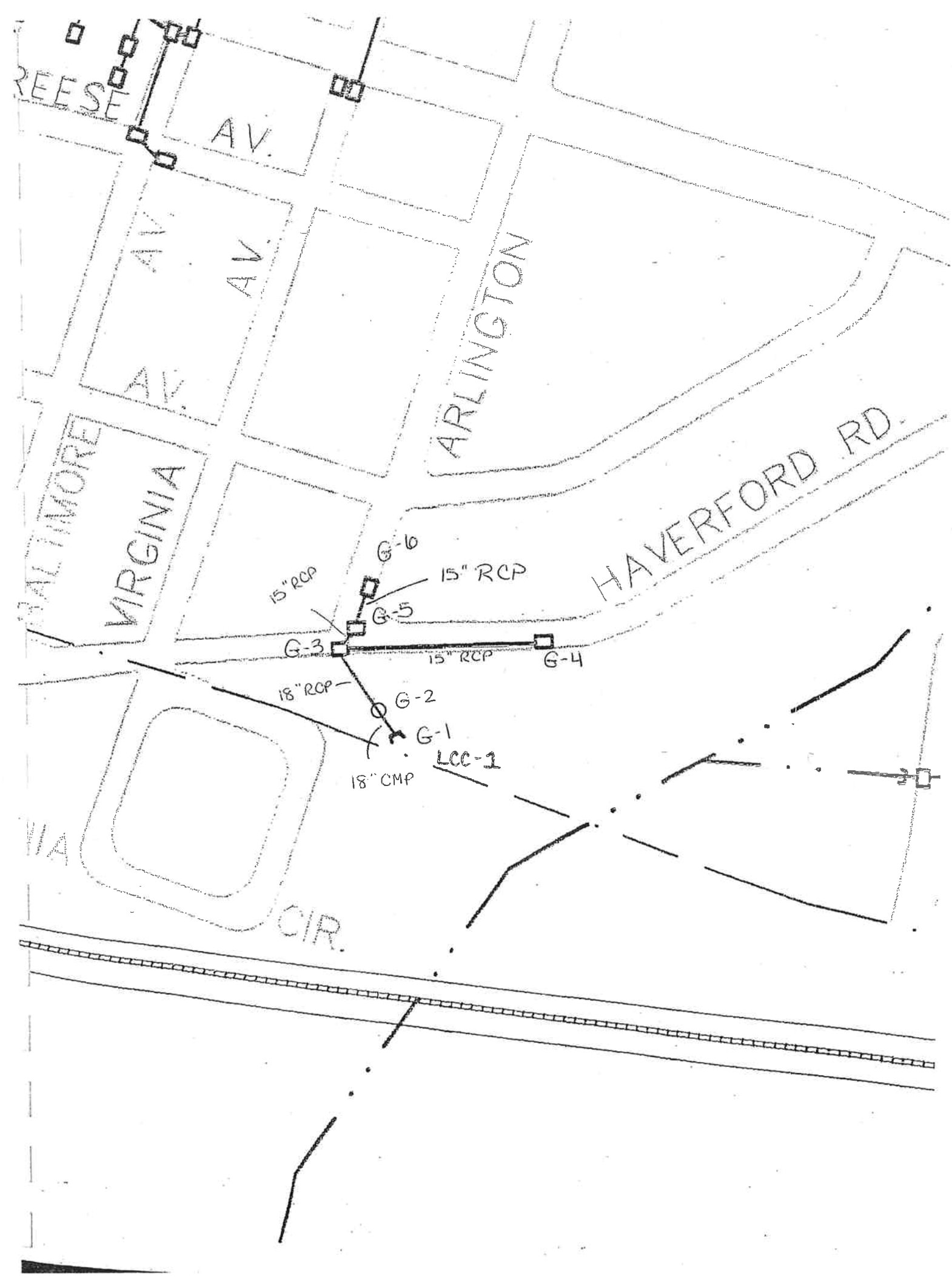
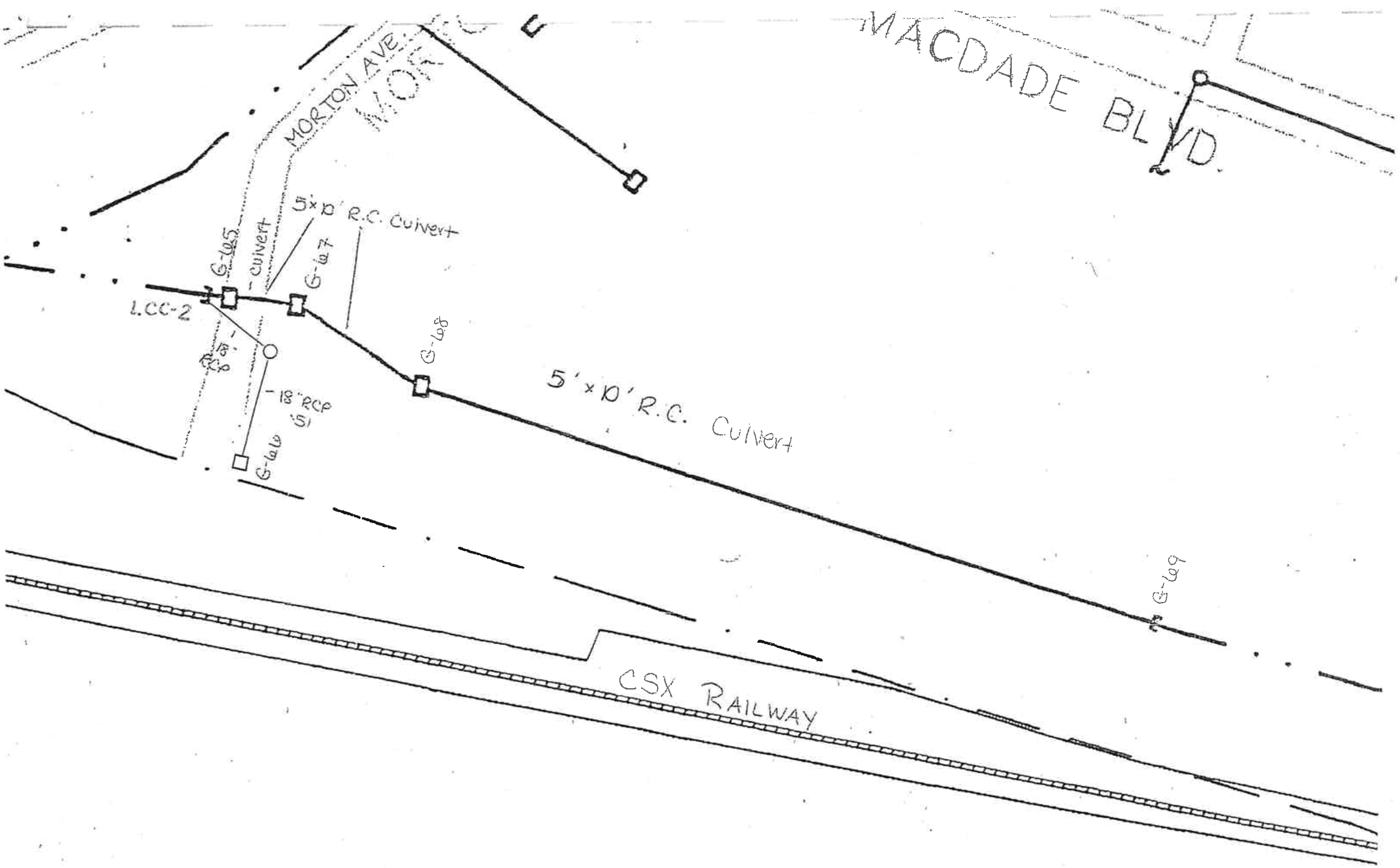
G-984
G-985
G-986
G-987
G-988
G-989
G-990
G-991
G-992
G-993
G-994
G-995
G-996
G-997
G-998
G-999
G-1000
G-1001
G-1002
G-1003
G-1004
G-1005
G-1006
G-1007
G-1008
G-1009
G-1010
G-1011
G-1012
G-1013
G-1014
G-1015
G-1016
G-1017
G-1018
G-1019
G-1020
15" RCP
30" RCP
12" ADS
36" ADS
18" RCP
12" RCP
24" RCP
36" CMP
18" CMP
15" CMP
12" CPP
21" CPP
18" CPP
15" CPP
18" CMP

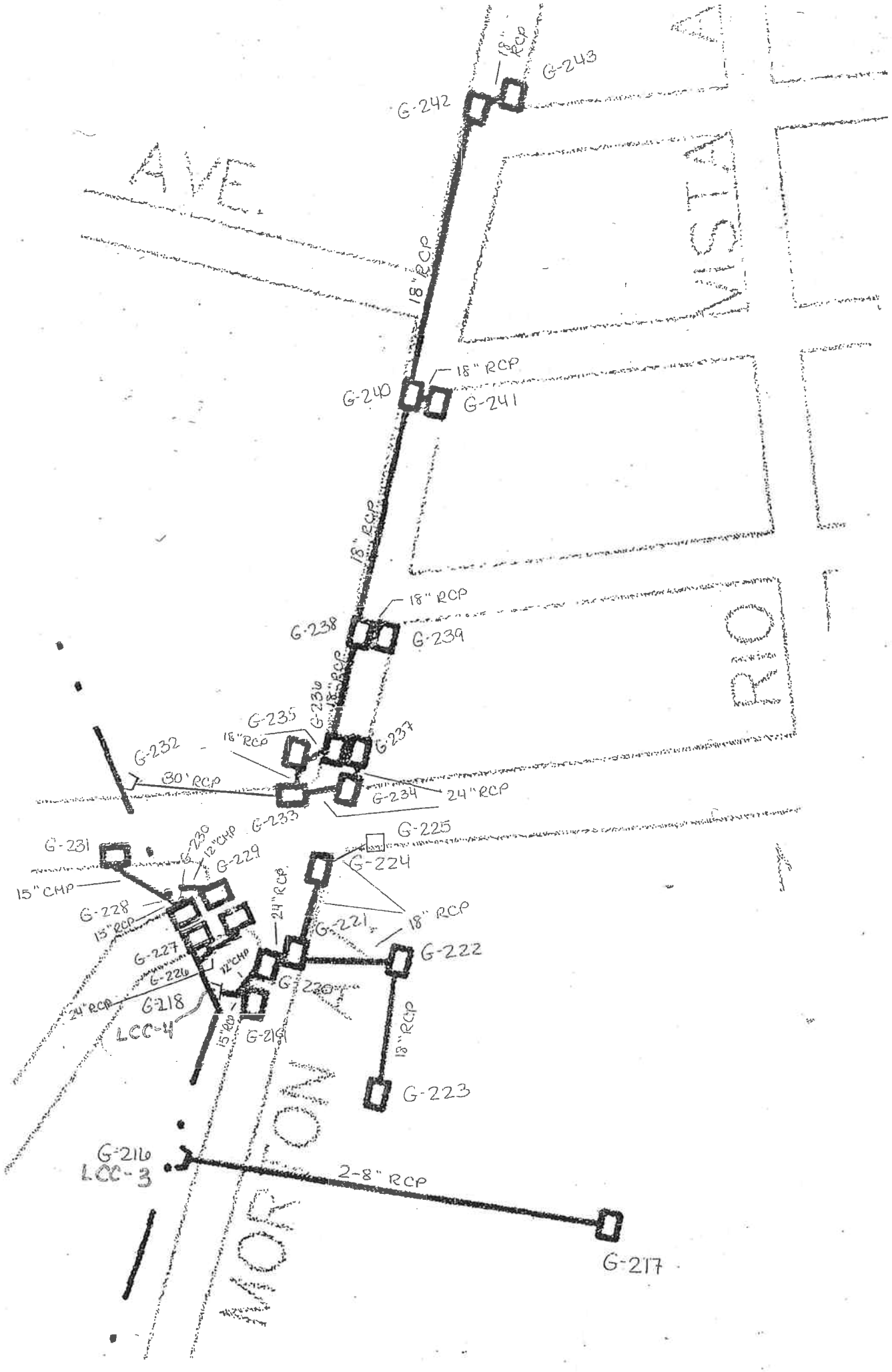

BLACKROCK RD.
PARK LANE RD.
HUNTER LN
GREENWAY RD.
HOOD RD.
GRACE RD.
FAIRVIEW RD.
COLWELL RD.
CREGHAN AV
7TH AV
7th AVE.
G-871
G-870
G-869
G-868
G-867
G-866
G-865
G-864
G-863
G-862
G-861
G-860
G-859
G-895
G-893
G-891
G-890
G-889
G-888
G-887
G-886
G-885
G-884
G-883
G-882
G-881
G-880
G-879
G-878
G-877
G-876
G-875
G-874
G-873
G-872
G-858
G-857
G-856
G-855
G-854
G-853
G-852
G-850
G-849
G-848
G-847
G-846
G-851
G-900
G-901
G-899
G-898
G-897
G-902
G-903
G-904
G-905
G-906
G-907
G-908
G-909
G-910
G-911
G-912
G-913
G-914
G-915
G-916
G-917
G-918
CC-22
CC-21
15" RCP
18" RCP
24" CPP
30" CPP
18" CPP
24" RCP
36" RCP
33" RCP
42" RCP
21" RCP
30" RCP
12" CPP
12" RCP
19" RCP
18" RCP

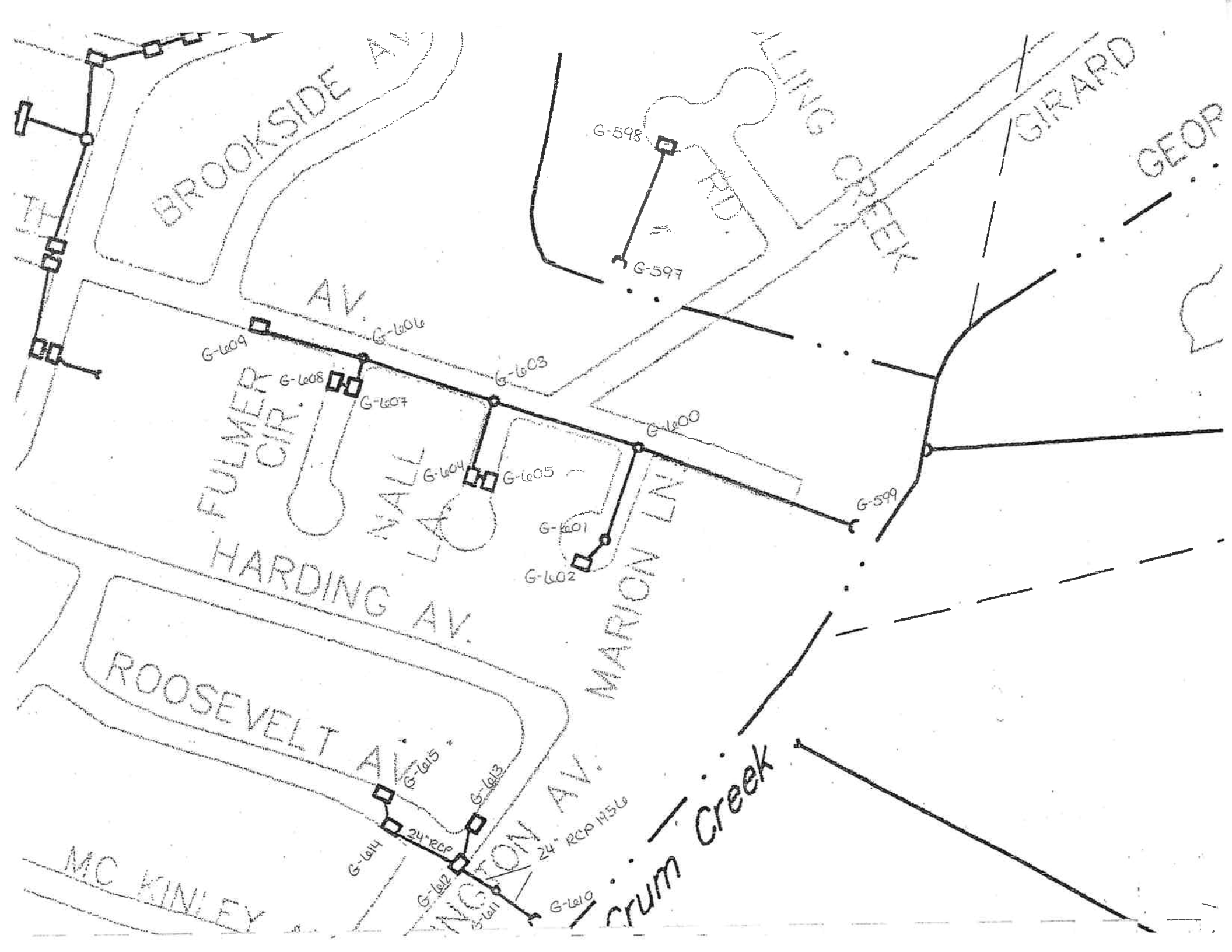
CC-23
G-804
30" RCP
15" RCP
G-811
G-812
15" RCP
27" RCP
G-813
G-807
G-808
G-809
18" RCP
15" RCP
G-810
G-812A
27" RCP
GRACE RD.
BLACKROCK FD.
CONWAY RD.
G-816
G-815
18" RCP
24" RCP
24" RCP
G-814
CONWAY CIR.
MICHIGAN AV.
SCHIAVELLO DR.
G-820
15" RCP
G-819
18" RCP
G-818
18" RCP
CONWAY CT.
21" RCP
G-823
8" DIP
G-821
8" DIP
G-822
BLACKROCK RD.
RAYMOND RD.
G-824
21" RCP
G-825
21" RCP
G-826
PARK LAN

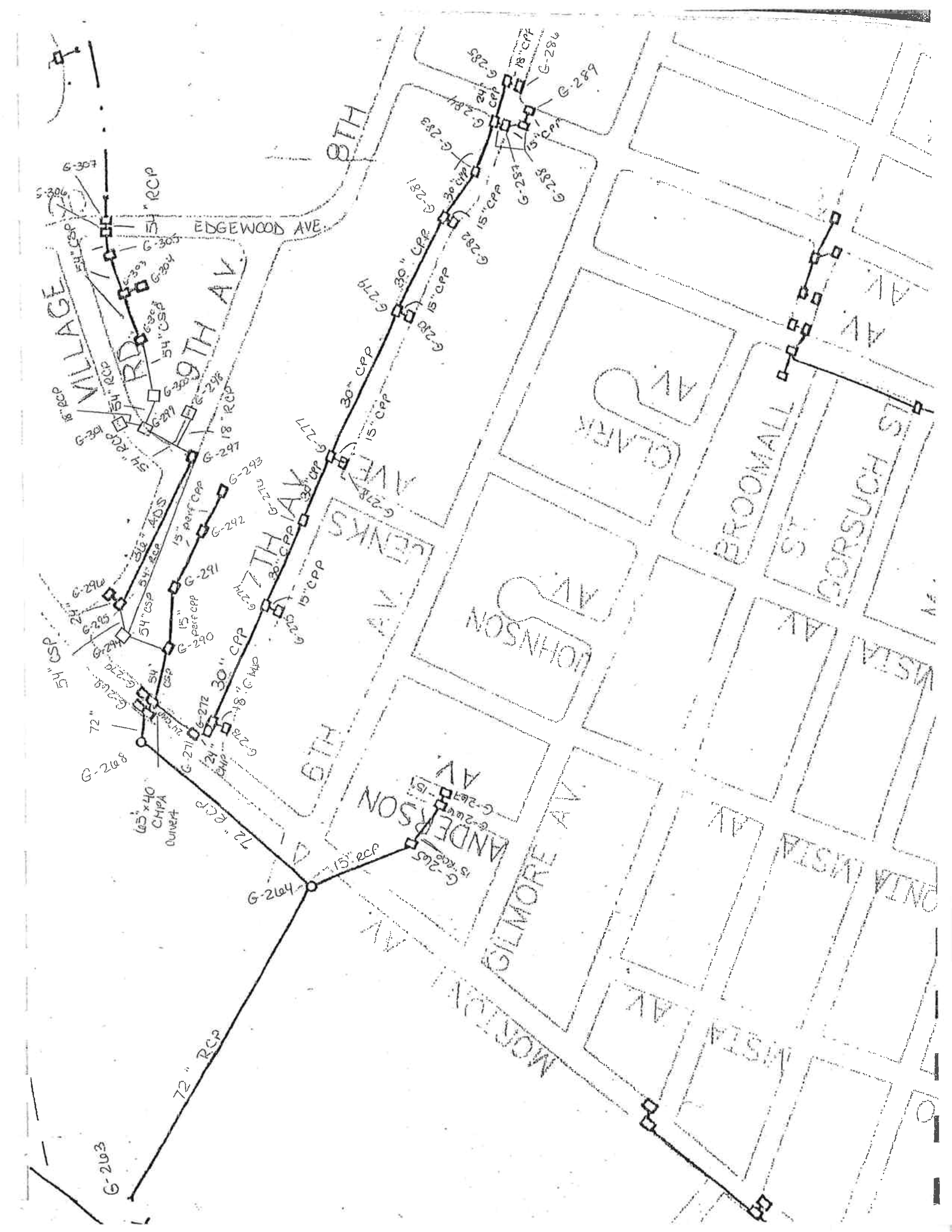

MACDADE BLVD.
MEADOW RD.
WOODCREST RD.
SCHOOL LN.
MORRIS AV.
KOSSUTH
BUCHANAN
COLSON RD.
GRANT AV.
SON AV.
ENS AV.
TAYLOR AV.
N. MORRIS AV.
GARFIELD
TYLER AV.
WILSON AV.
EX AV.
RED AV.
RAILWAY
BOX CULVERT 3'W x 4.5' H
G-1193
G-1194
72" CMP
15" CMP
G-1195
G-1200
G-1201
G-1202
G-1203
G-1209
G-1211
G-1221
G-1222
G-1223
G-1224
G-1225
G-1227
G-1230
G-1233
G-1234
G-1235
G-1266
24" RCP
18" RCP
36" RCP
CC-28


REESE
AV.
AV.
AV.
AV.
ARLINGTON
HAVERFORD RD.
VIRGINIA
G-6
15" RCP
15" RCP
G-5
G-3
15" RCP
G-4
18" RCP
G-2
G-1
LCC-1
18" CMP
CIR.

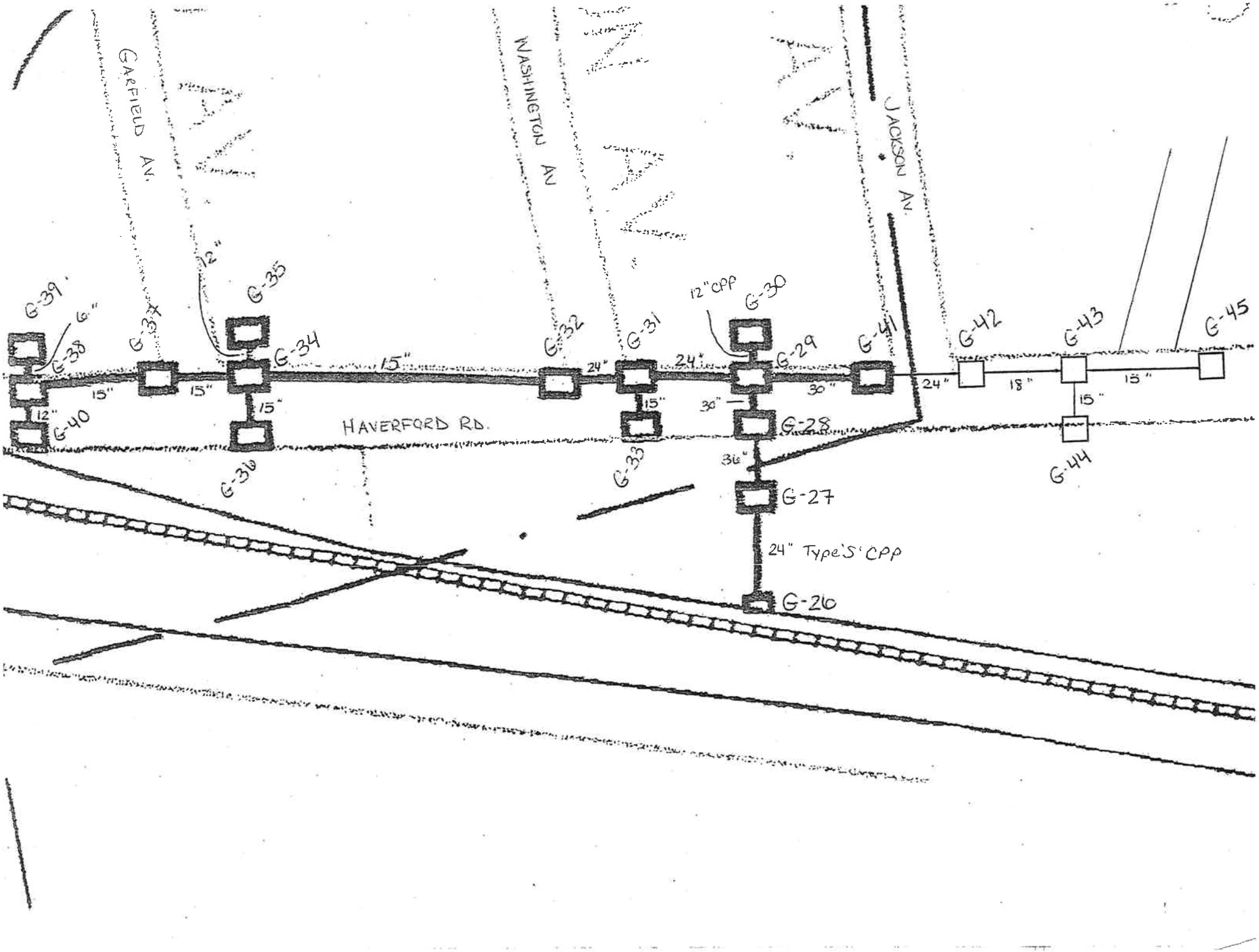

MACDADE BLVD.
MORTON AVE.
5'x10' R.C. Culvert
culvert
5'x10' R.C. Culvert
G-65
G-66
G-67
G-68
G-69
LCC-2
18" RCP
18" RCP (5)
CSX RAILWAY


AVE.
18" RCP
G-243
G-242
18" RCP
18" RCP
G-240
G-241
18" RCP
18" RCP
G-238
G-239
18" RCP
G-235
G-236
G-237
G-232
18" RCP
30" RCP
G-234
24" RCP
G-233
G-231
15" CMP
12" CMP
G-229
G-225
G-224
15" CMP
G-228
15" RCP
24" RCP
G-221
18" RCP
G-227
G-222
12" CMP
G-226
G-220
24" RCP
G-218
LCC-4
15" RCP
G-219
18" RCP
G-223
G-216
LCC-3
2-8" RCP
G-217


BROOKSIDE AV.
AV.
G-598
G-597
G-609
G-606
G-603
G-608
G-607
G-600
G-604
G-605
G-599
G-601
G-602
FULMER DR.
HALL LA.
MARION LN.
HARDING AV.
ROOSEVELT AV.
G-615
G-613
24" RCP
24" RCP
G-614
G-612
G-611
G-610
MC KINLEY
GIRARD
GEOR
crum Creek


EDGEWOOD AVE.
VILLAGE
RD.
9TH AV.
8TH
7TH AV.
6TH AV.
JENKS AVE
ANDERSON AV.
GILMORE AV.
JOHNSON AV.
CLARK AV.
BROOMALL ST.
GORSUCH ST
72" RCP
15" RCP
30" CPP
15" CPP
54" CSP
54" RCP
18" RCP
15" perf CPP
36" ADS
G-263
G-264
G-268
G-290
G-291
G-292
G-293
G-297
G-299
G-305
G-307
63" x 40 CMPA culvert

AV
EDGEWOOD
HAZEL
FERNWOOD
EVERGREEN
G-70
24" CPP
G-72
18" CPP
G-74
G-75


GARFIELD AV.
WASHINGTON AV
JACKSON AV.
HAVERFORD RD.
G-39
6"
G-38
G-37
12"
G-35
G-34
15"
G-32
24"
G-31
24"
12" CPP
G-30
G-29
G-41
G-42
G-43
G-45
15"
15"
15"
24"
18"
15"
12"
G-40
15"
30"
30"
G-28
G-36
G-33
G-44
36"
G-27
24" Type 'S' CPP
G-26

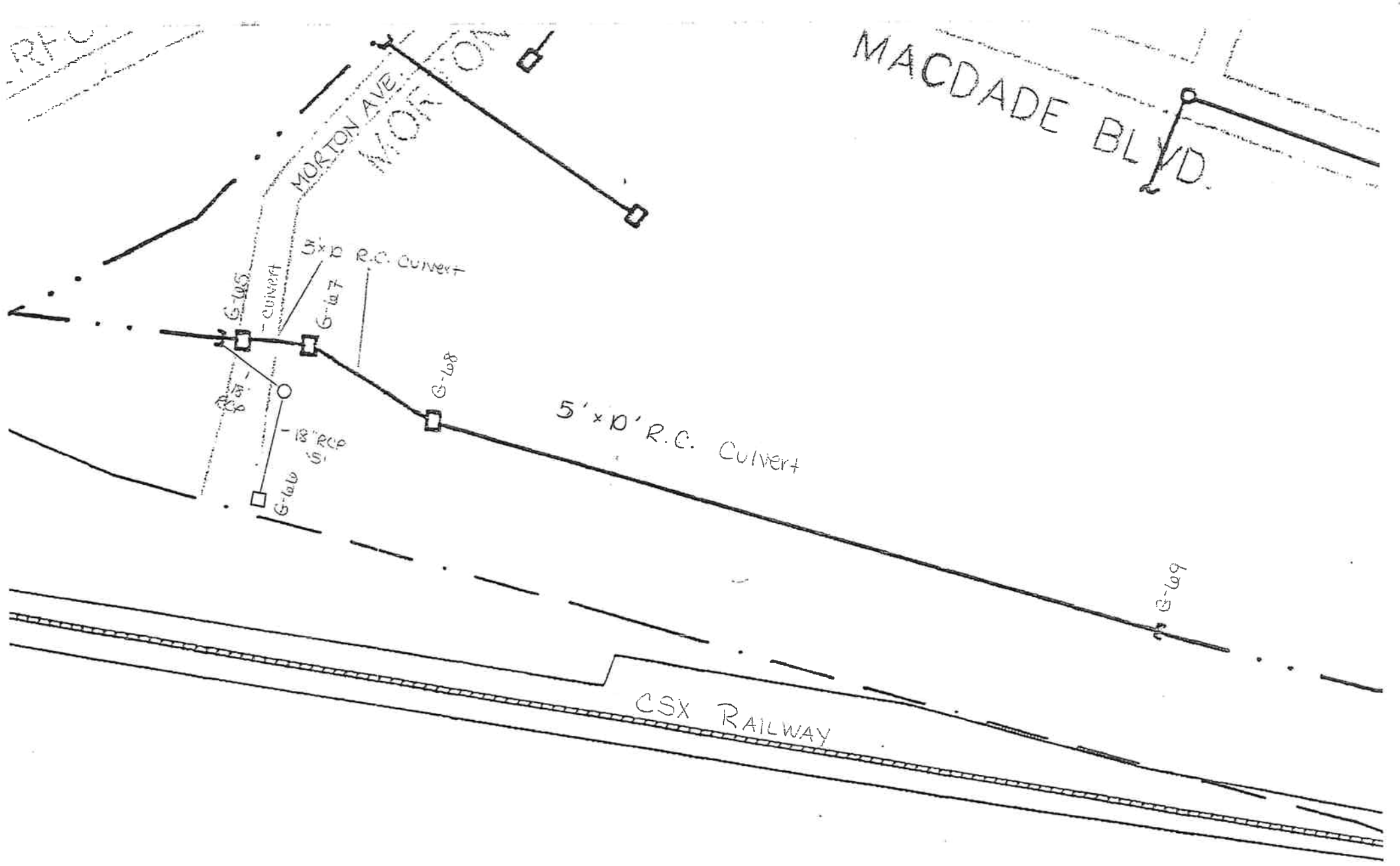
EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 4 OF 67

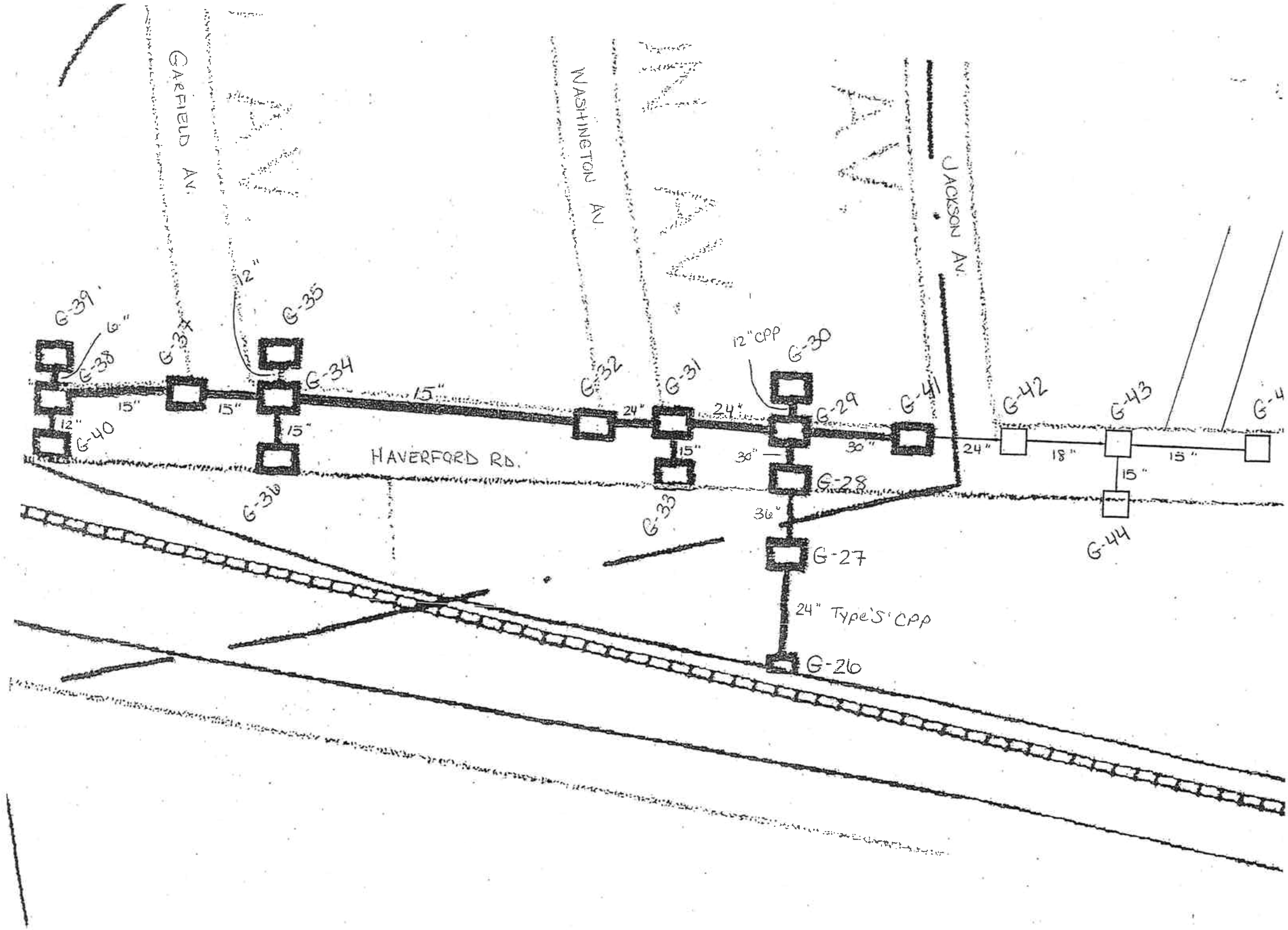
WATERSHED BY
Name: Bricker
Muni: 4
C

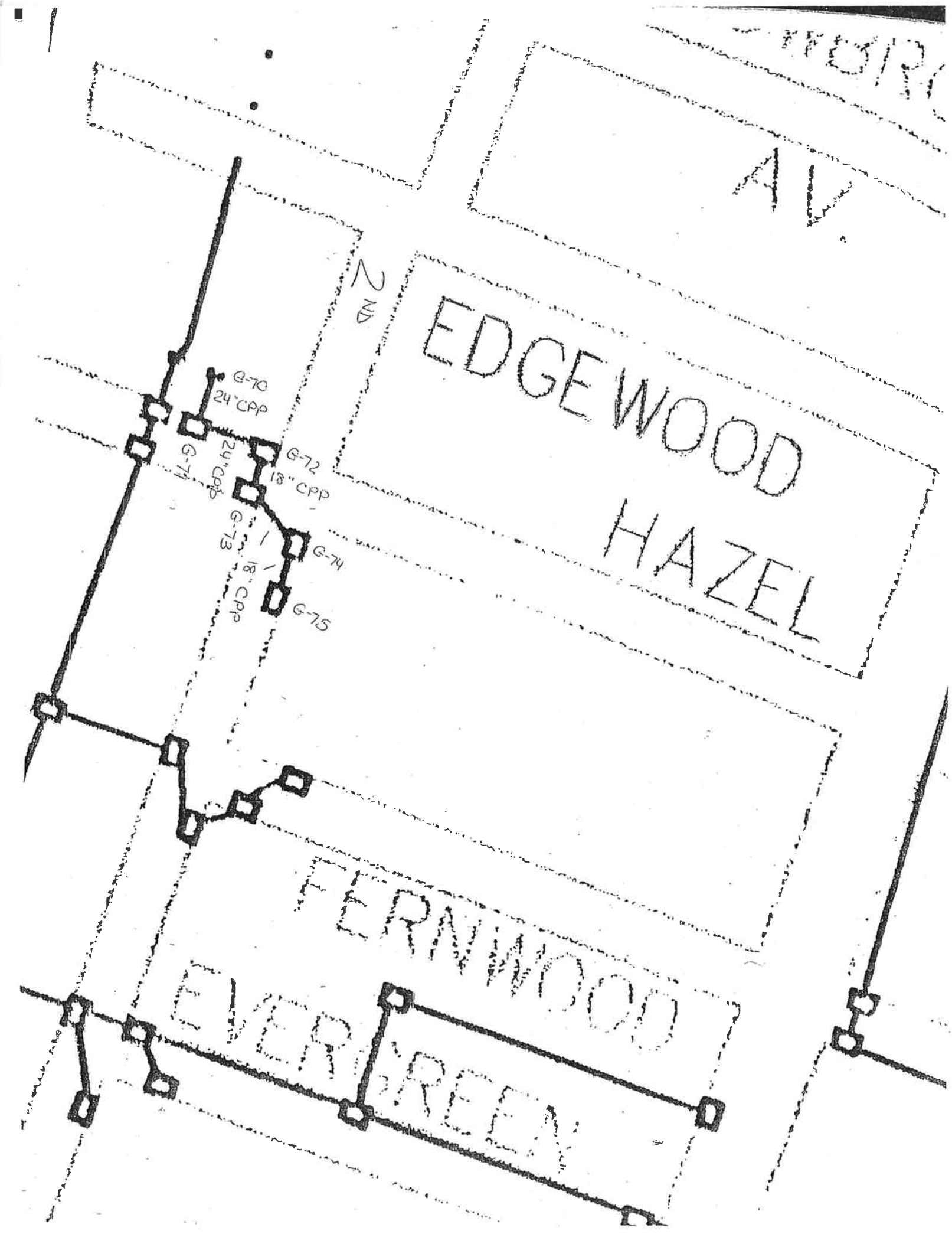
INSTRUCTIONS

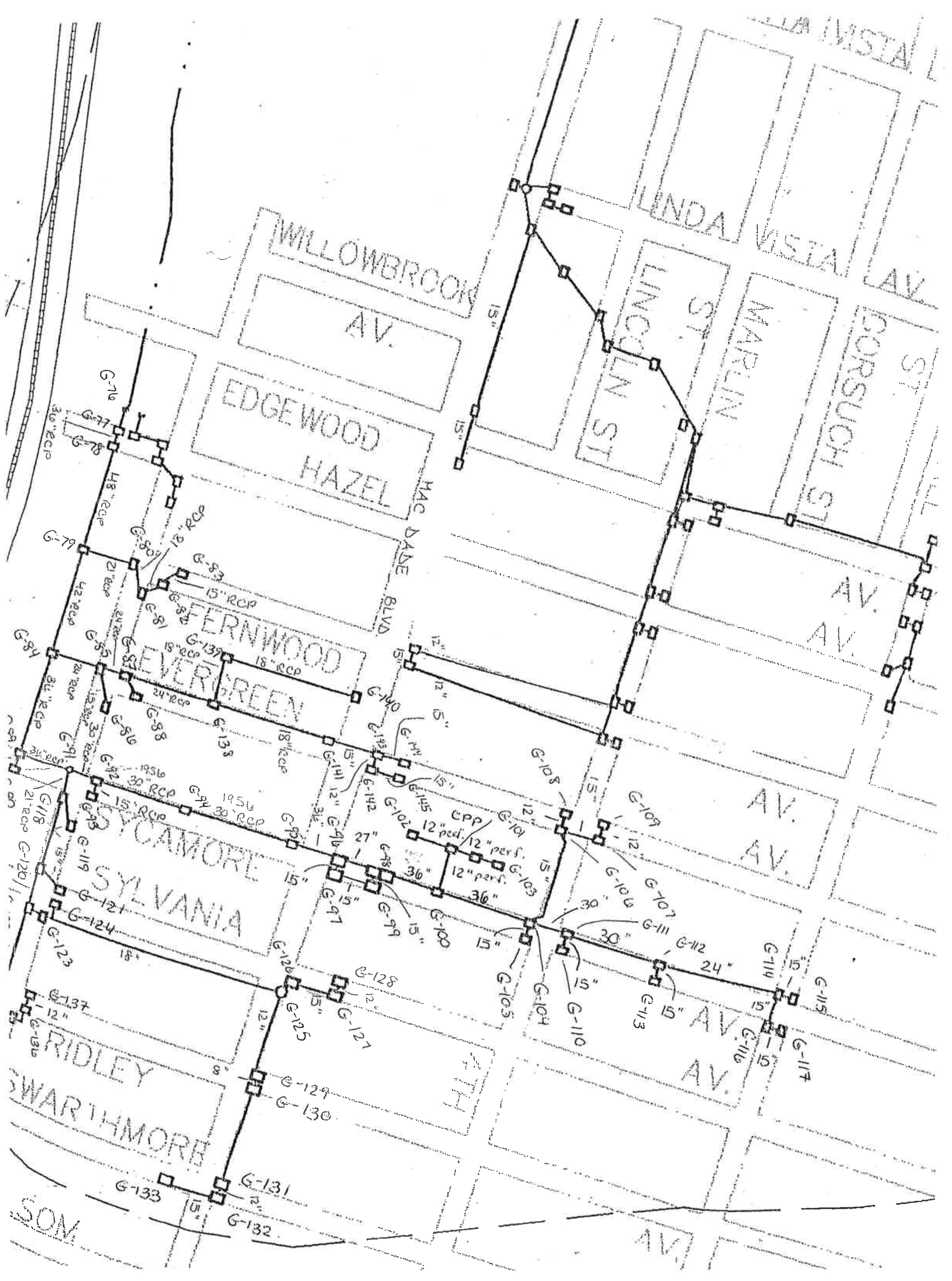
Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Measurements* Channel / Swale TW	B	Depth	Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
			RCP	c. 1951	no	Anne Howanski 610-833-1922	Ridley Township
			RC Culvert	c. 1996	no	Anne Howanski 610-833-1922	Ridley Township
			RC Culvert	c. 1996	no	Anne Howanski 610-833-1923	Ridley Township
			RC Culvert	c. 1996	no	Anne Howanski 610-833-1924	Ridley Township
			natural	-	no	Anne Howanski 610-833-1925	Ridley Township
			CPP	c. 1995	no	Anne Howanski 610-833-1926	Ridley Township
			CPP	c. 1995	no	Anne Howanski 610-833-1927	Ridley Township
			CPP	c. 1995	no	Anne Howanski 610-833-1928	Ridley Township
			CPP	c. 1995	no	Anne Howanski 610-833-1929	Ridley Township
			CPP	c. 1995	no	Anne Howanski 610-833-1930	Ridley Township


MACDADE BLVD.
MORTON AVE.
G-145
- Culvert
5'x
G-147
R.C. Culvert
G-148
5'x10' R.C. Culvert
18" RCP
G-149
CSX RAILWAY


HAVERFORD RD.
GARFIELD AV.
WASHINGTON AV.
JACKSON AV.
G-39
G-38
G-40
G-37
G-35
G-34
G-36
G-32
G-31
G-33
G-30
G-29
G-28
G-27
G-26
G-41
G-42
G-43
G-44
12"
15"
24"
30"
36"
18"
12" CPP
24" Type 'S' CPP


AV
2ND
EDGEWOOD
HAZEL
G-70
24" CPP
G-71
24" CPP
G-72
18" CPP
G-73
18" CPP
G-74
G-75
FERNWOOD
EVERGREEN



LINDA VISTA
LINDA VISTA AV.
WILLOWBROOK AV.
LINCOLN ST.
MARLIN ST.
GORSUCH ST.
EDGEWOOD
HAZEL
MAC DADE BLVD.
FERNWOOD
EVERGREEN
SYCAMORE
SYLVANIA
RIDLEY
SWARTHMORE
AV.
G-76
G-77
G-78
36" RCP
48" RCP
G-79
G-80
18" RCP
G-81
G-82
G-83
15" RCP
42" RCP
G-84
G-85
G-86
G-87
G-88
24" RCP
36" RCP
30" RCP
18" RCP
G-138
G-139
G-140
G-91
G-92
1956
30" RCP
G-93
G-94
G-95
G-96
G-97
G-98
G-99
G-100
G-101
G-102
G-103
G-104
G-105
G-106
G-107
G-108
G-109
G-110
G-111
G-112
G-113
G-114
G-115
G-116
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G-118
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G-120
G-121
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G-127
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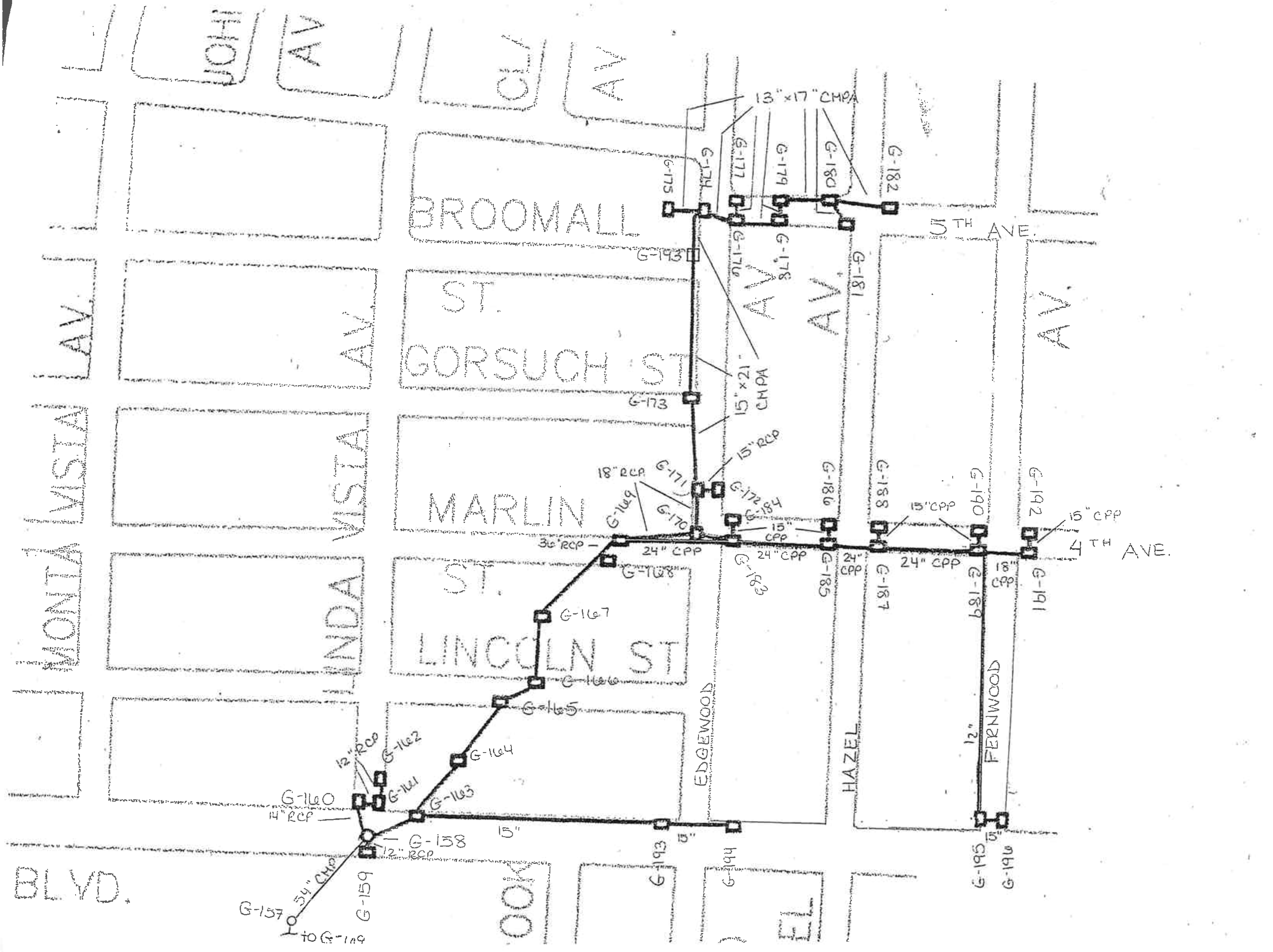
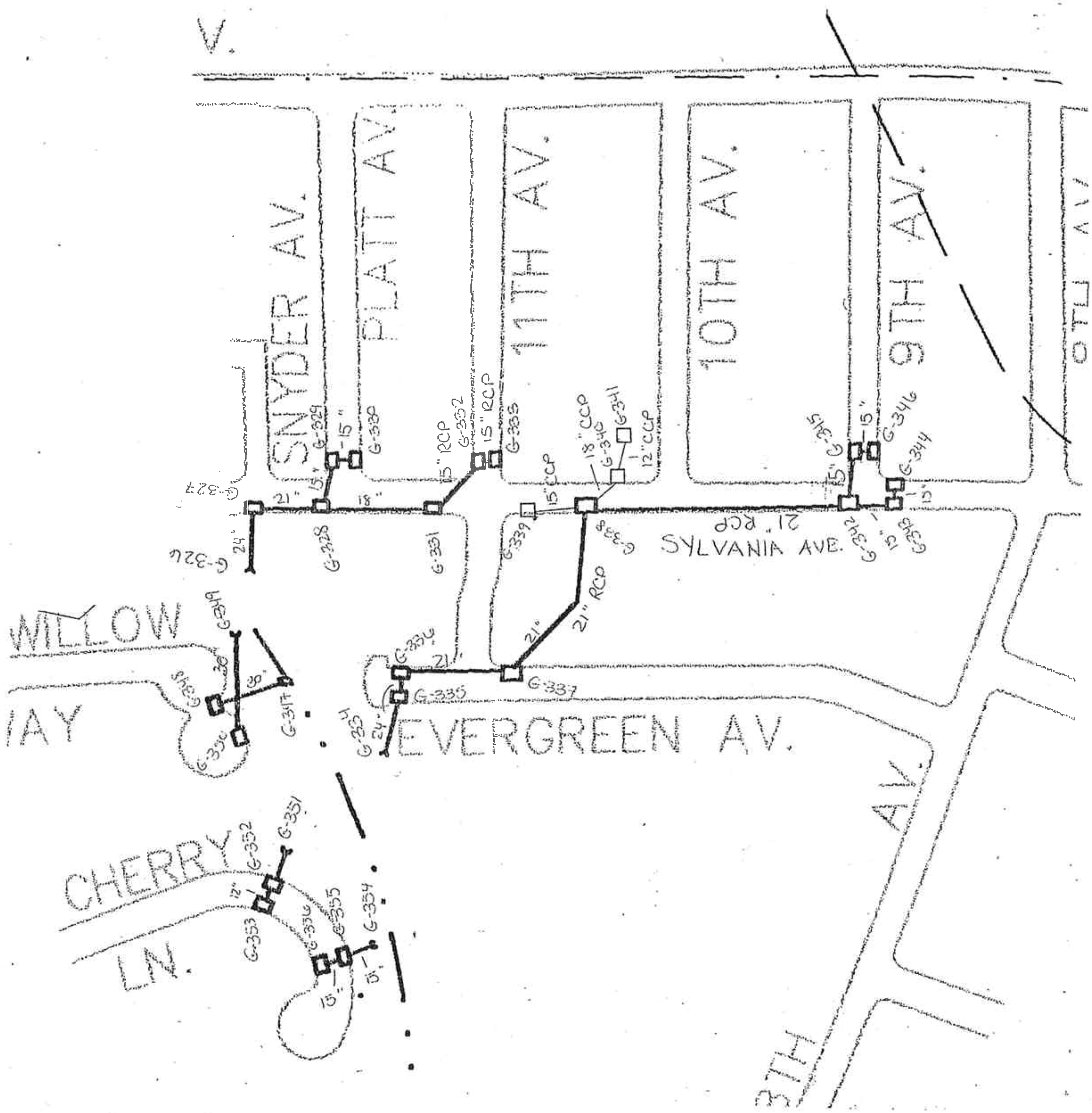
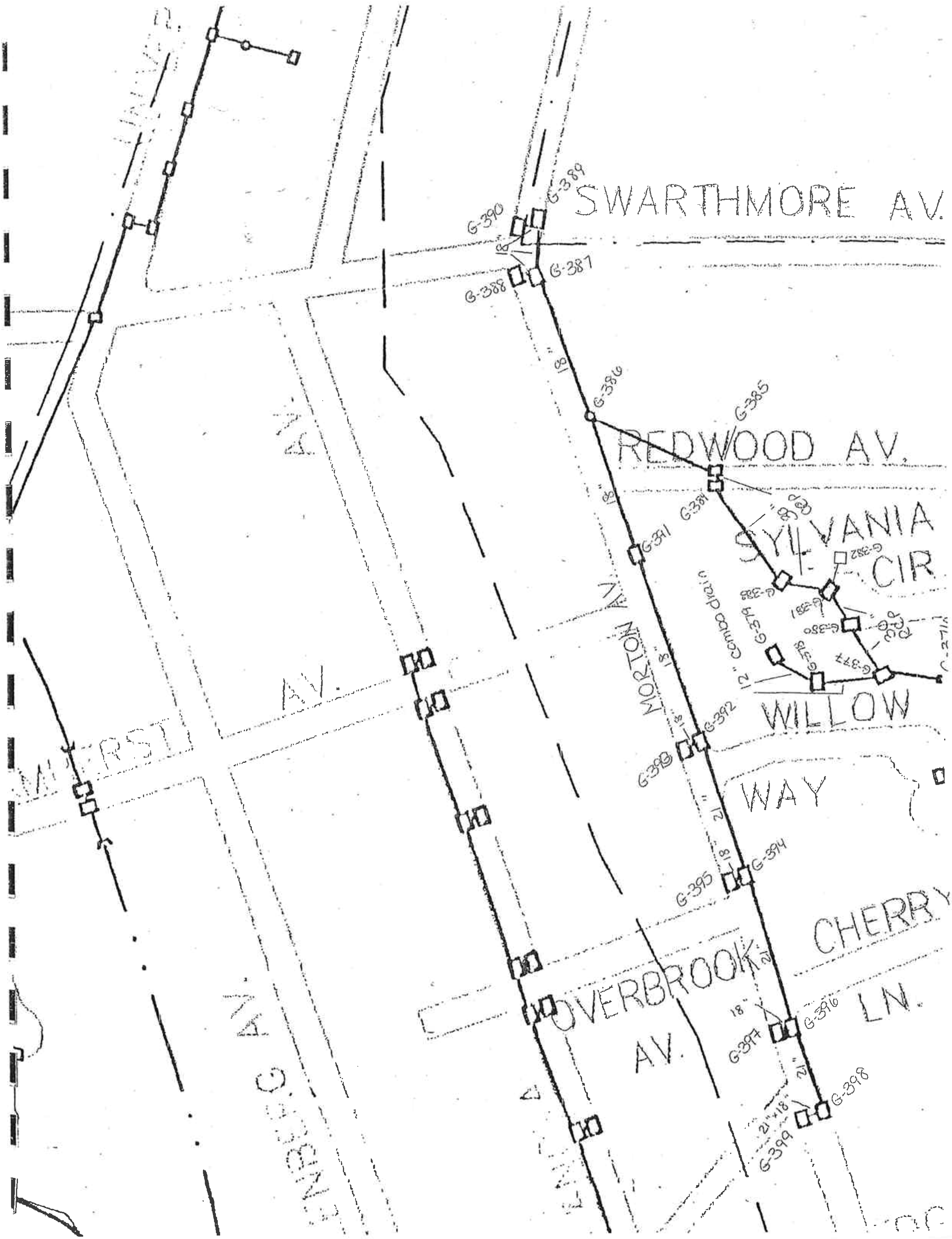
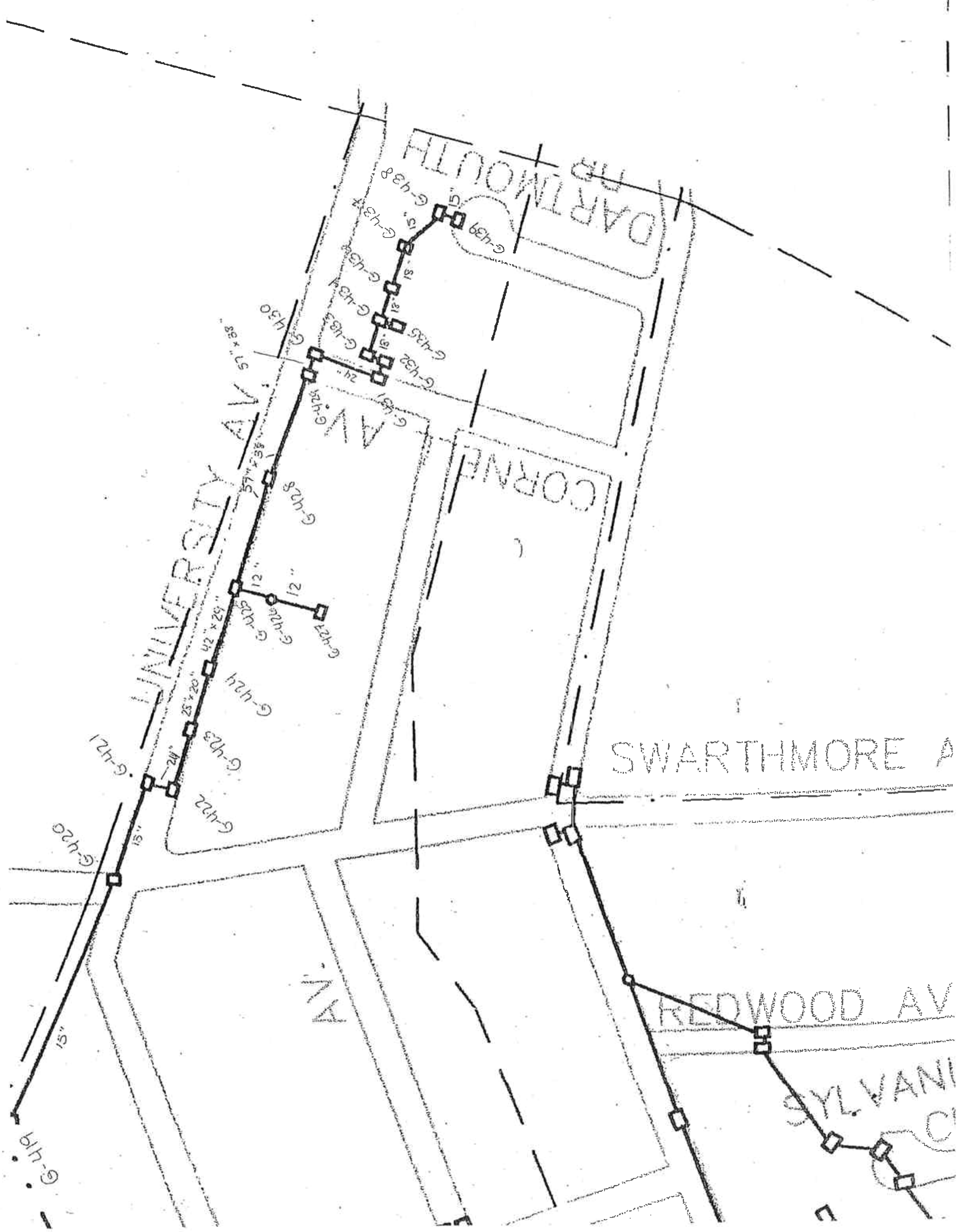
G-129
G-130
G-131
G-132
G-133
G-137
G-141
G-142
G-143
G-144
G-145
CPP
12" perf.
27"
36"
30"
24"
18"
15"
12"
8"

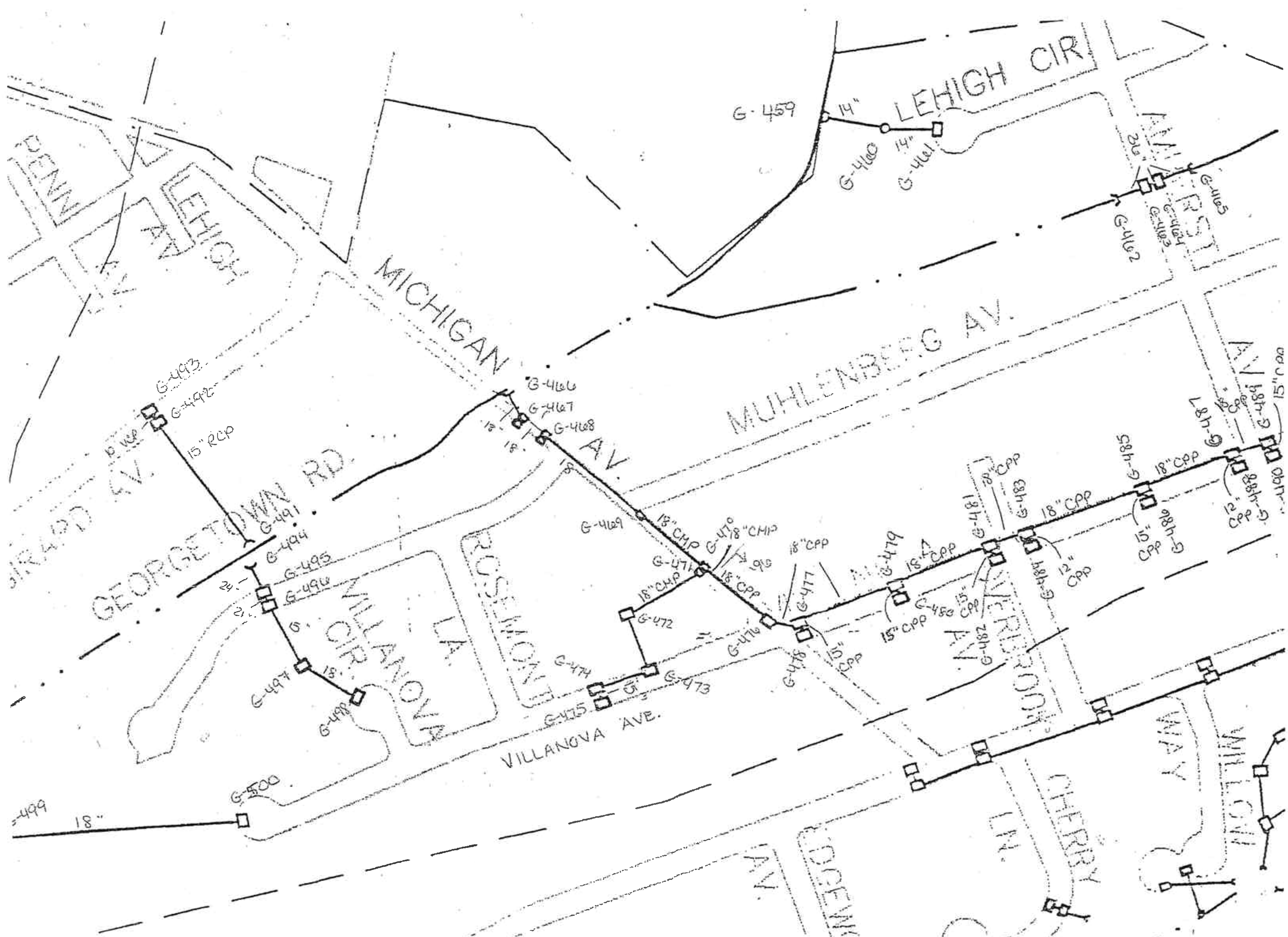

BROOMALL
GORSUCH ST
ST.
MARLIN
ST.
LINCOLN ST
5TH AVE.
4TH AVE.
EDGEWOOD
HAZEL
FERNWOOD
MONTA VISTA
LINDA VISTA
BLVD.
13"x17" CMPA
15"x21" CMPA
15" RCP
18" RCP
36" RCP
24" CPP
15" CPP
18" CPP
12" RCP
14" RCP
54" CMP
12"
15"
G-157
G-158
G-159
G-160
G-161
G-162
G-163
G-164
G-165
G-166
G-167
G-168
G-169
G-170
G-171
G-172 184
G-173
G-174
G-175
G-176
G-177
G-178
G-179
G-180
G-181
G-182
G-183
G-185
G-186
G-187
G-188
G-189
G-190
G-191
G-192
G-193
G-194
G-195
G-196
TO G-149


SNYDER AV.
PLATT AV.
11TH AV.
10TH AV.
9TH AV.
EVERGREEN AV.
SYLVANIA AVE.
WILLOW
CHERRY
LN.
AV.
21" RCP
15" RCP
18" CCP
12" CCP
15" CCP
G-326
G-327
G-328
G-329
G-330
G-331
G-332
G-333
G-334
G-335
G-336
G-337
G-338
G-339
G-340
G-341
G-342
G-343
G-344
G-345
G-346
G-347
G-348
G-349
G-351
G-352
G-353
G-354
G-355
G-356

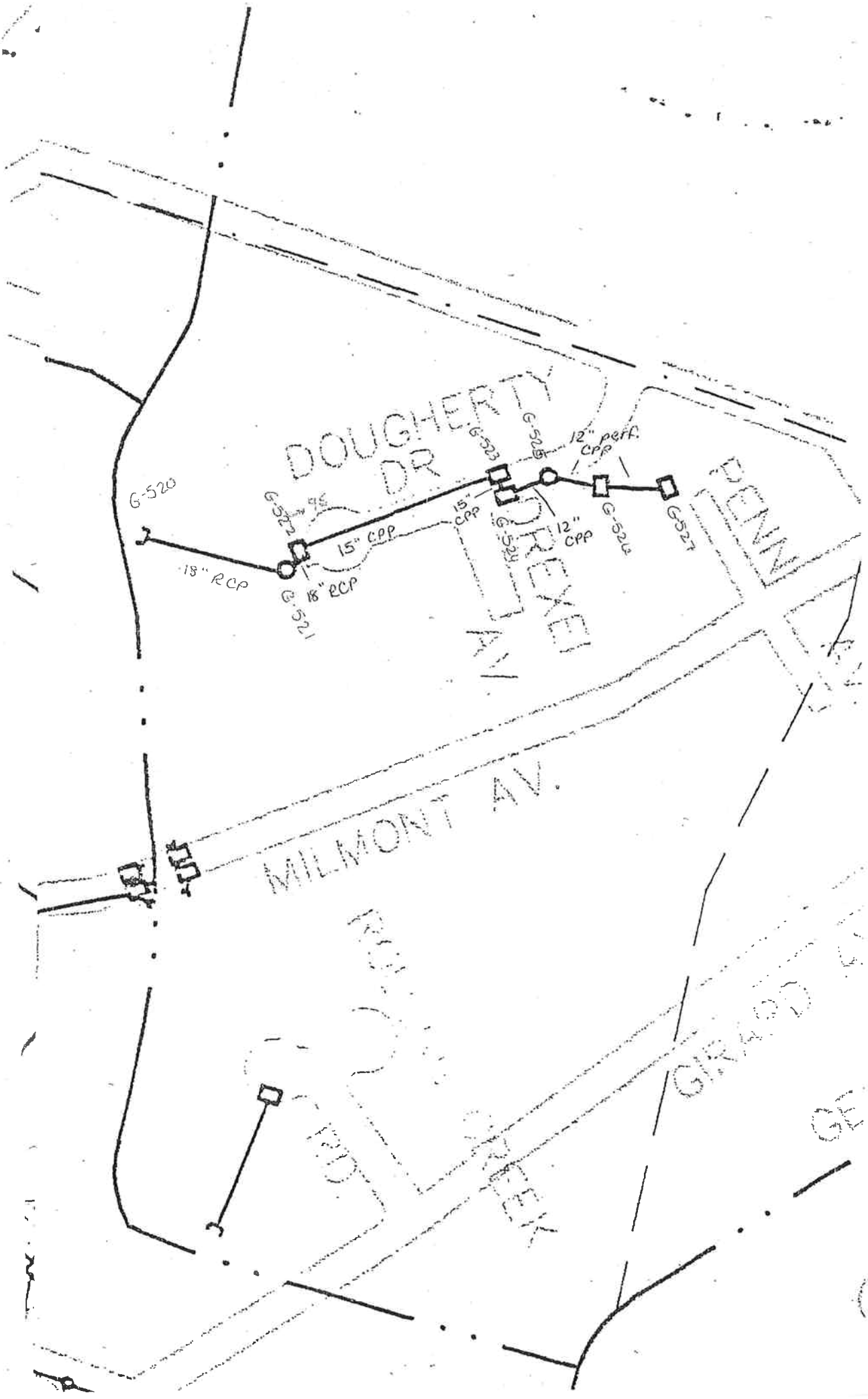

SWARTHMORE AV.
G-389
G-390
G-387
G-388
G-386
G-385
REDWOOD AV.
SYLVANIA
CIR.
G-371
MORTON AV.
12" combo drain
WILLOW
WAY
G-392
G-393
G-394
G-395
CHERRY
LN.
OVERBROOK
AV.
G-396
G-397
G-398
G-399
21"+18"
AV.



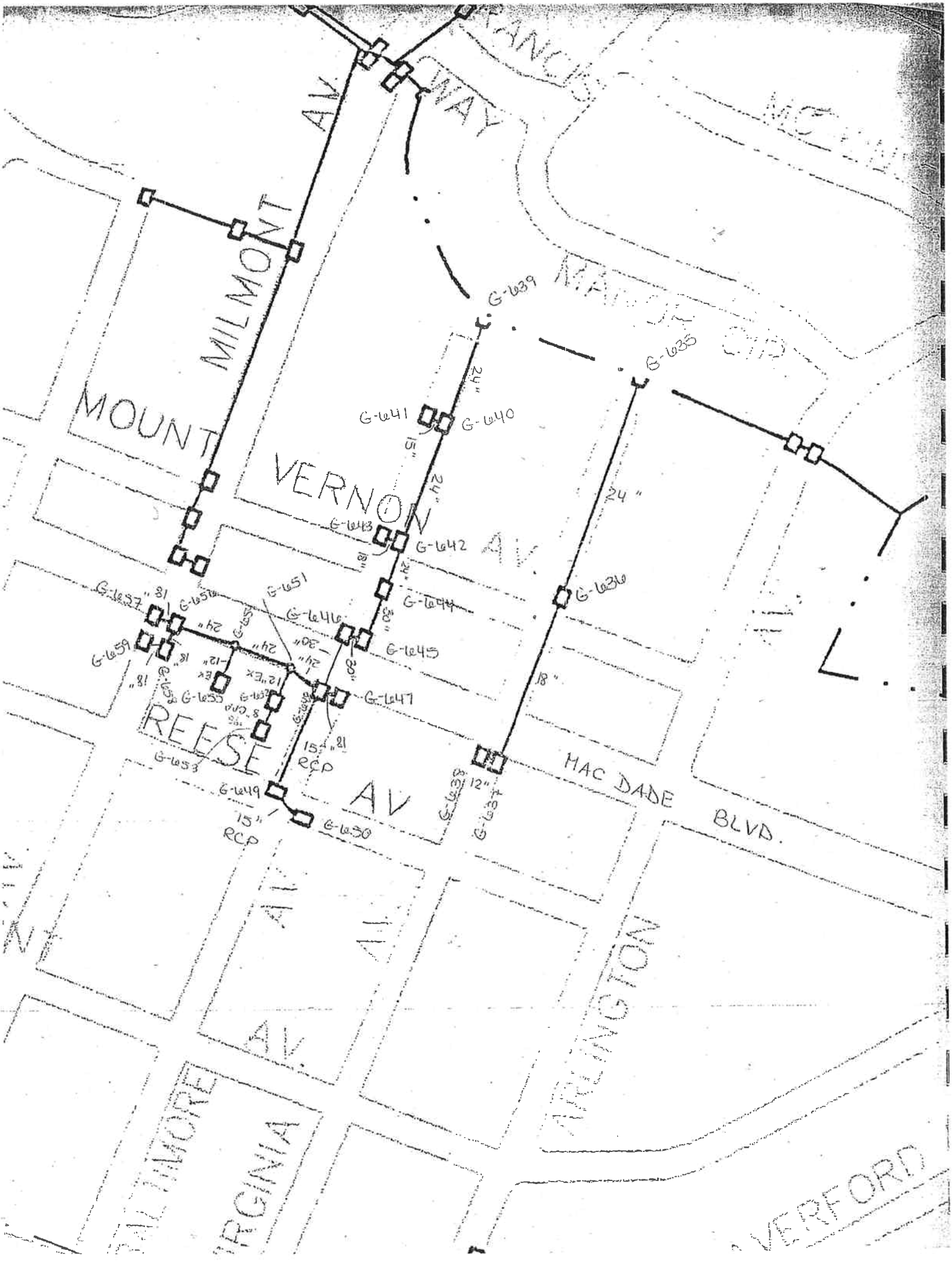
SWARTHMORE A
REDWOOD AV
SYLVANI
C
UNIVERSITY AV.
CORNE
AV.
DARTMOUTH
DR
AV.
G-419
G-420
G-421
G-422
G-423
G-424
G-425
G-426
G-427
G-428
G-429
G-430
G-431
G-432
G-433
G-435
G-438
G-439
15"
24"
25" x 20"
42" x 29"
12"
57" x 38"
18"

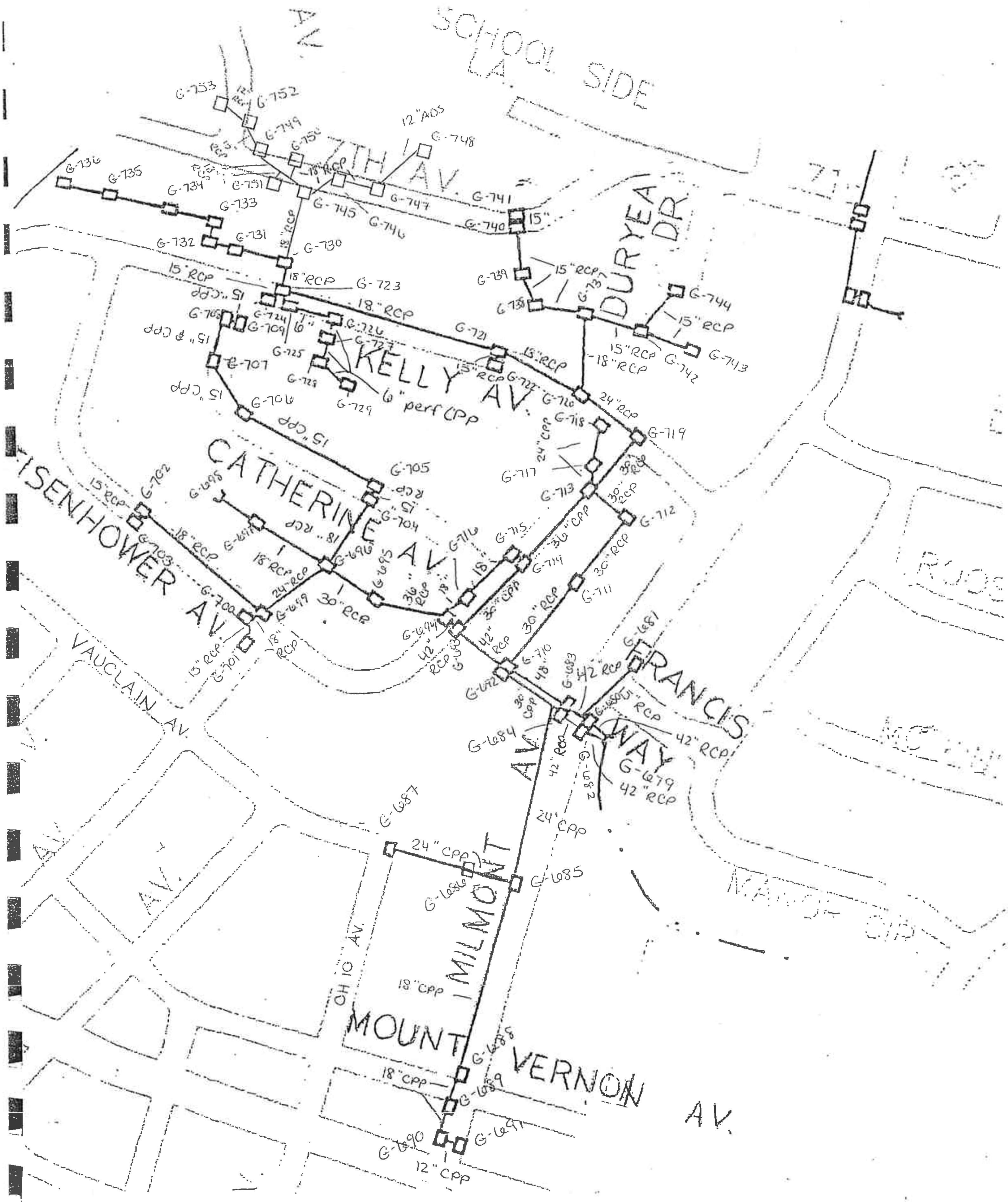


LEHIGH CIR
G-459
14"
G-460
14"
G-461
PENN
LEHIGH
AV.
MICHIGAN
AV.
MUHLENBERG AV.
GEORGETOWN RD.
G-493
G-492
15" RCP
G-491
G-494
G-495
G-496
G-497
G-498
18"
VILLANOVA CIR.
LA.
ROSEMONT
VILLANOVA AVE.
G-500
G-499
18"
G-466
G-467
G-468
G-469
18" CMP
G-470
18" CMP
G-471
18" CMP
G-472
G-473
G-474
G-475
G-476
18" CPP
G-477
18" CPP
G-478
15" CPP
G-479
18" CPP
15" CPP
G-480
15" CPP
G-481
18" CPP
G-482
G-483
G-484
12" CPP
18" CPP
G-485
15" CPP
G-486
18" CPP
G-487
18" CPP
G-488
12" CPP
G-489
15" CPP
G-490
G-462
G-463
G-464
G-465
AV.
CHERRY
LN.
WAY
WILLOW
AV.

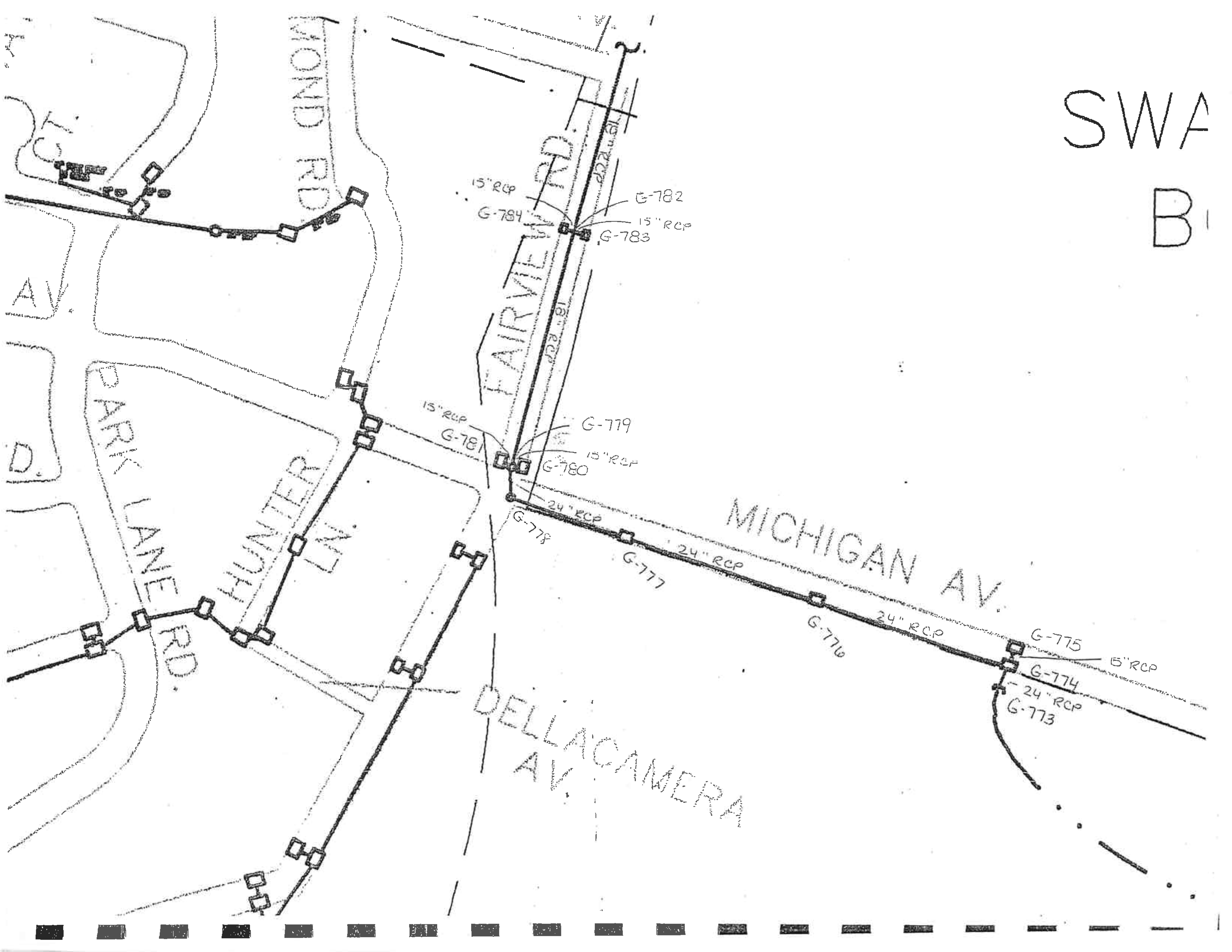

DOUGHERTY DR
DREXEL AV
PENN
MILMONT AV.
G-520
G-521
G-522
G-523
G-524
G-525
G-526
G-527
18" RCP
15" CPP
15" CPP
18" RCP
12" CPP
12" CPP
12" perf. CPP

G-546
12" combo 45 drain
G-565
18" RCP
G-564
G-563
15" RCP
18" RCP
15" RCP
G-560
15" RCP
G-561
G-562
G-559
G-558
G-557
18" RCP
G-555
G-554
G-556
18" RCP
24" CMP
G-553
G-552
30" RCP
18" RCP
G-551
18" RCP
G-547
G-548
30" RCP
G-549
WOODLAND AV
BROOKSIDE AV
SCENIC DR
MILLTOWN DR
WILMC


MILMONT AV.
MOUNT VERNON AV.
REESE AV
MAC DADE BLVD.
G-639
G-641
G-640
G-643
G-642
G-644
G-645
G-647
G-649
G-650
G-635
G-636
G-637
G-638
G-651
G-652
G-653
G-654
G-655
G-656
G-657
G-658
G-659
24"
15" RCP
12"
18"



SCHOOL LA.
SIDE
7TH AV.
DURYEA DR.
KELLY AV.
CATHERINE AV.
ISENHOWER AV.
VAUCLAIN AV.
FRANCIS WAY
MILMONT AV.
OHIO AV.
MOUNT VERNON AV.
G-753
G-752
G-749
G-750
G-751
G-748
12" ADS
G-736
G-735
G-734
G-733
G-732
G-731
G-730
G-745
G-746
G-747
G-741
G-740
15"
18" RCP
G-739
15" RCP
G-737
G-738
G-744
G-743
G-742
18" RCP
G-723
G-724
G-725
G-726
G-727
G-728
G-729
6" perf CPP
G-721
G-722
G-720
24" RCP
G-719
G-718
G-717
G-713
G-712
G-708
G-709
G-707
15" CPP
G-706
G-705
G-704
G-703
G-702
G-700
G-701
G-699
G-698
G-697
G-696
G-695
G-694
G-693
30" RCP
G-716
G-715
G-714
30" CPP
G-711
30" RCP
42" RCP
G-710
G-692
G-683
G-681
G-680
G-684
G-679
G-682
42" RCP
24" CPP
G-687
G-686
G-685
18" CPP
G-688
G-689
G-690
G-691
12" CPP


SWA
B
MICHIGAN AV.
FAIRVIEW RD
DELLACAMERA AV.
HUNTER LN
PARK LANE RD.
MOND RD
G-773
G-774
G-775
G-776
G-777
G-778
G-779
G-780
G-781
G-782
G-783
G-784
24" RCP
15" RCP
18" RCP

Form O - Outfall Data

Person: J. H. Bricker Date: 12/ Time Since Last Rain was > 72 Hours:

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain:

Municipality: Ridley Township Name of receiving water: Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
CC-1				12" TCP								
CC-2				36" RCP								
CC-3				18" RCP								
CC-4				24" RCP								
CC-5				18"								
CC-6				18"								
CC-7				30" RCP								
CC-8				27" RCP								
CC-9				30" RCP								

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment deposition, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

***1:1** = Vertical - rectangular channel

NOTES:

Form O - Outfall Data

Person: J. H. Bricker Date: 12/ Time Since Last Rain was > 72 Hours:

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain:

Municipality: Ridley Township Name of receiving water: Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
CC -10				30" RCP								
CC -11				18" RCP								
CC -12				18" RCP								
CC -13				?								
CC -14				36" CMP								
CC -15				18" RCP								
CC -16				18" CMP								
CC -17				18" RCP								
CC -18				36" ADS								

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment deposition, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

***1:1** = Vertical - rectangular channel

NOTES:

Form O - Outfall Data

Person: J. H. Bricker Date: 12/ 04 Time Since Last Rain was > 72 Hours:

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain:

Municipality: Ridley Township Name of receiving water: Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
CC -19				18" RCP								
CC -20				15" RCP								
CC -21				42" RCP								
CC -22				30" CPP								
CC -23				30" RCP								
CC -24				24" CSP								
CC -25				24" RCP								
CC -26				15" RCP								
CC -27				30" ADS								
CC- 28				72" CMP								

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

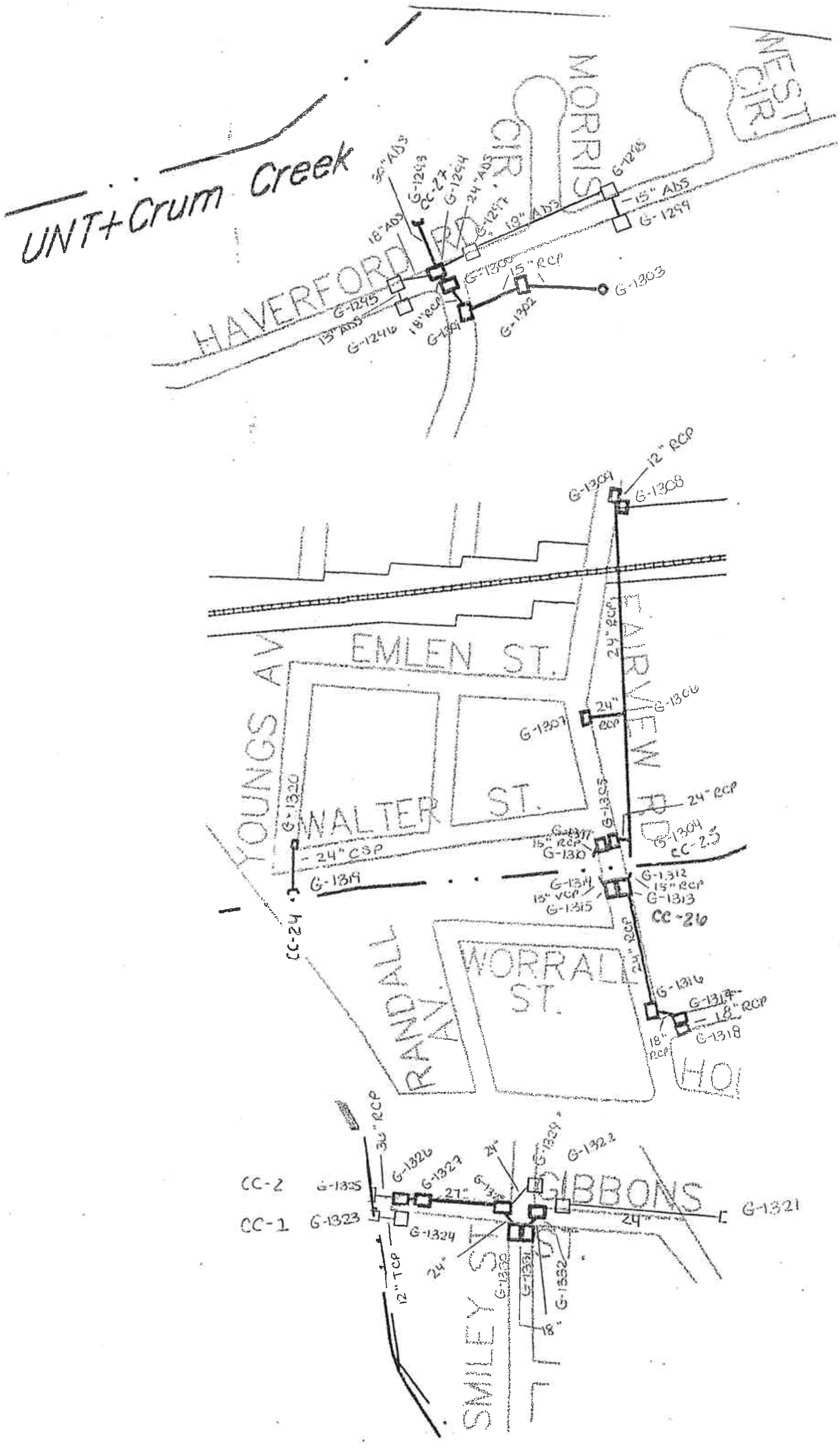
1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

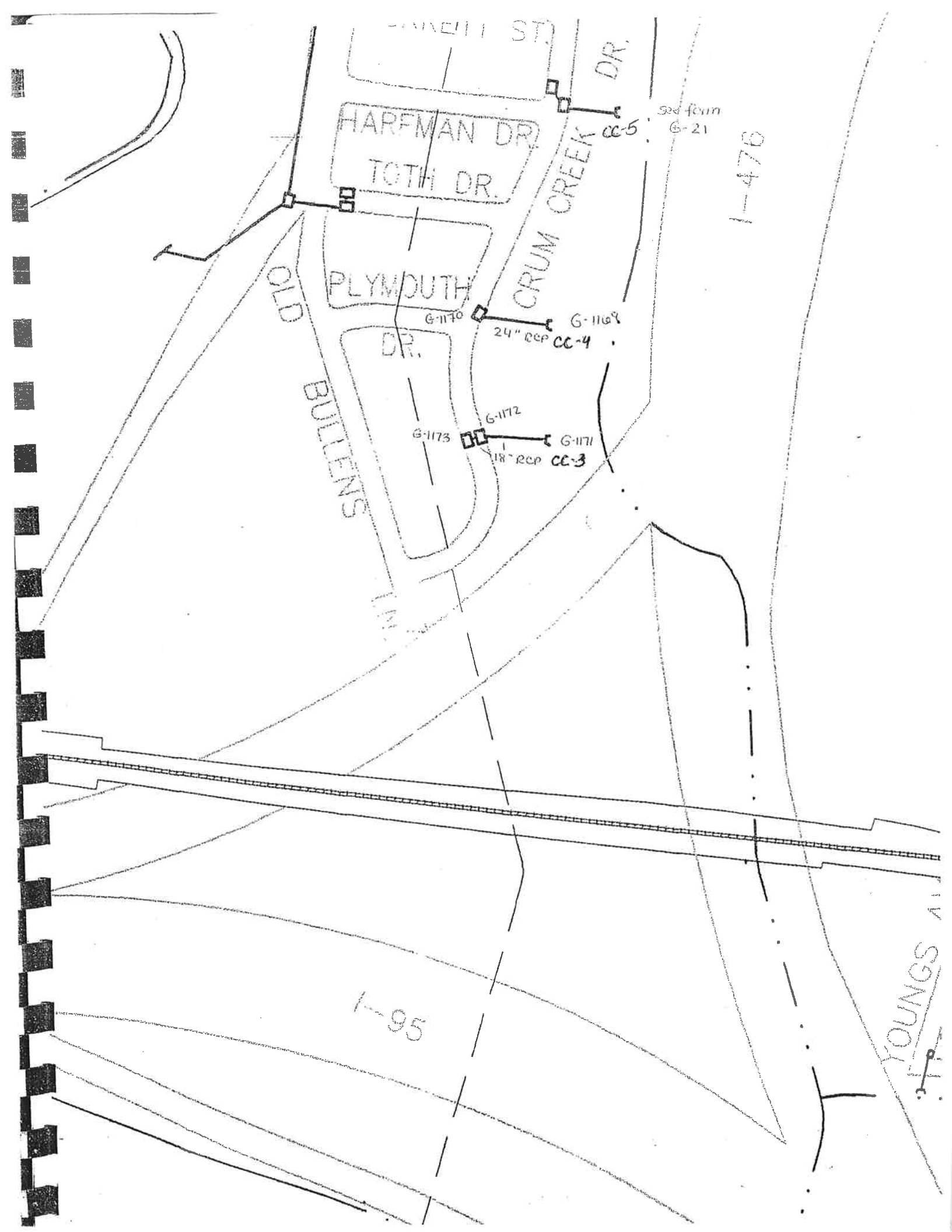
2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment deposition, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

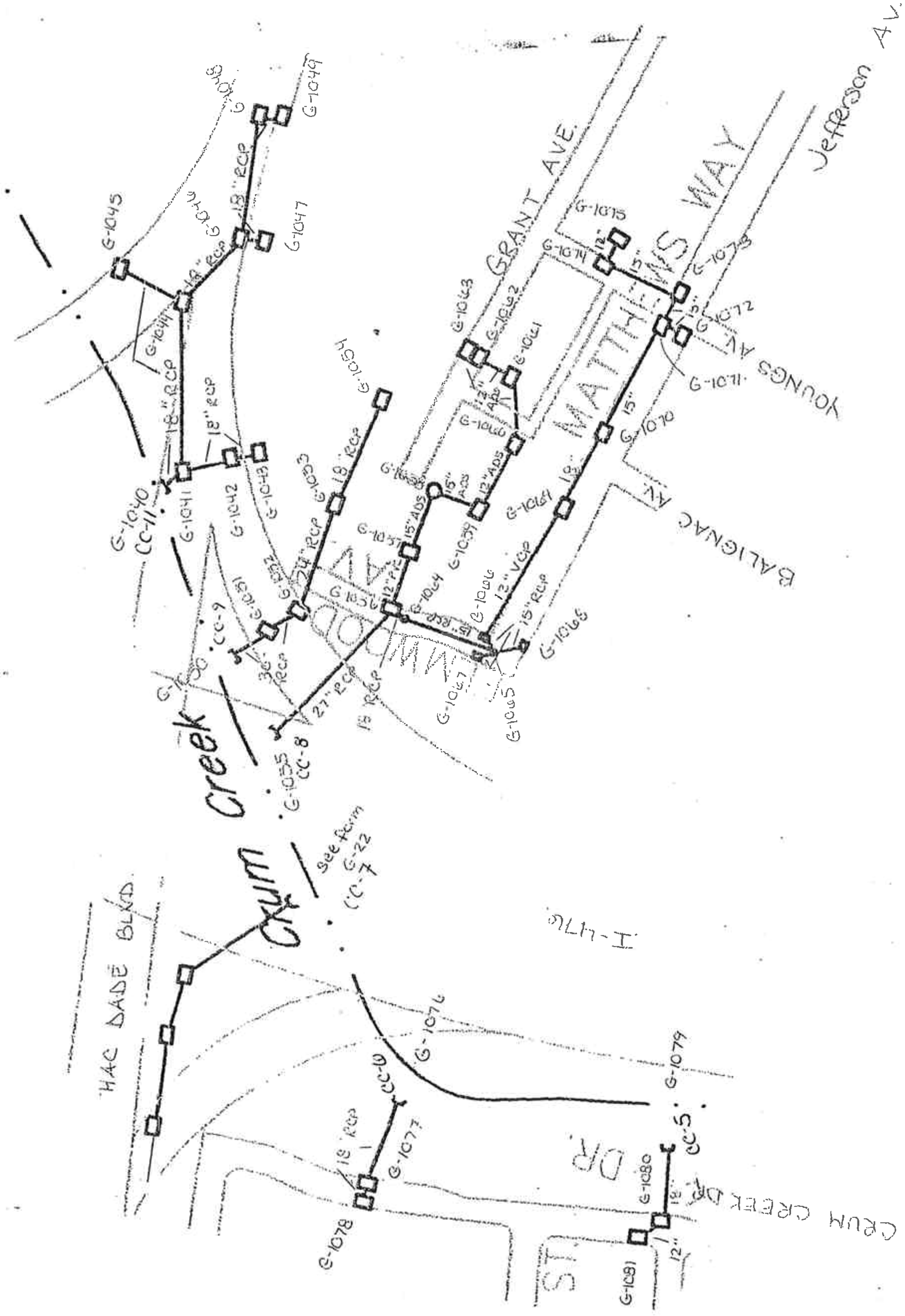
H/V = Horizontal to vertical ratio

***1:1** = Vertical - rectangular channel

NOTES:


UNT+Crum Creek
HAVERFORD RD.
MORRIS CIR.
WEST CIR.
30" ADS
18" ADS
24" ADS
15" ADS
G-1298
G-1299
G-1295
G-1296
G-1303
15" RCP
18" RCP
12" RCP
G-1309
G-1308
EMLEN ST.
FAIRVIEW RD.
24" RCP
G-1306
G-1307
YOUNGS AV
WALTER ST.
G-1320
24" CSP
G-1319
G-1304
CC-23
CC-24
G-1312
15" RCP
G-1313
G-1314
15" VCP
G-1315
CC-26
RANDALL AV.
WORRALL ST.
G-1316
G-1317
18" RCP
G-1318
30" RCP
G-1326
G-1327
G-1322
GIBBONS
G-1321
CC-2
G-1325
CC-1
G-1323
G-1324
12" TCP
24"
27"
18"
SMILEY ST.


HARFMAN DR.
TOTH DR.
PLYMOUTH
DR.
OLD BULLENS
CRUM CREEK
DR.
I-95
I-476
G-1170
G-1169
24" RCP
CC-4
G-1172
G-1173
G-1171
18" RCP
CC-3
CC-5
See form
G-21


GRANT AVE.
MATTHEWS WAY
Jefferson AV.
YOUNGS AV.
BALIGNAC AV.
Crum Creek
HAC DADE BLVD
CRUM CREEK DR.
DR.
ST.
I-476
see form G-22
CC-7
CC-8
CC-9
CC-11
CC-5
CC-6
G-1040
G-1041
G-1042
G-1043
G-1044
G-1045
G-1046
G-1047
G-1048
G-1049
G-1050
G-1051
G-1052
G-1053
G-1054
G-1055
G-1056
G-1057
G-1058
G-1059
G-1060
G-1061
G-1062
G-1063
G-1064
G-1065
G-1066
G-1067
G-1068
G-1069
G-1070
G-1071
G-1072
G-1073
G-1074
G-1075
G-1076
G-1077
G-1078
G-1079
G-1080
G-1081
18" RCP
24" RCP
27" RCP
36" RCP
15" RCP
15" ADS
12" ADS
12" PVC
12" VCP

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 5 OF 67

WATERSHED

Name: Crum Creek
Municipality: Ridley Township
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/9/2004

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-76	G-77	X			36"				RCP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township
G-77	G-78	X			36"				RCP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township
G-78	G-79	X			48"				RCP	c. 1955	no	Anne Howanski 610-833-1923	Ridley Township
G-79	G-80	X			21"				RCP	c. 1955	no	Anne Howanski 610-833-1924	Ridley Township
G-80	G-81	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1925	Ridley Township
G-81	G-82	X			18"				RCP	c. 1995	no	Anne Howanski 610-833-1926	Ridley Township
G-82	G-83	X			15"				RCP	c. 1995	no	Anne Howanski 610-833-1927	Ridley Township
G-79	G-84	X			42"				RCP	c. 1995	no	Anne Howanski 610-833-1928	Ridley Township
G-84	G-85	X			24"				RCP	c. 1995	no	Anne Howanski 610-833-1929	Ridley Township
G-85	G-86	X			15"				RCP	c. 1995	no	Anne Howanski 610-833-1930	Ridley Township
G-85	G-87	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1931	Ridley Township
G-87	G-88	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township
G-87	G-138	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township

FORM G (4)

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 6 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-138	G-139	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1923	Ridley Township
G-139	G-140	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1924	Ridley Township
G-138	G-141	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1925	Ridley Township
G-141	G-143	X			15"				RCP	c. 1995	no	Anne Howanski 610-833-1926	Ridley Township
G-143	G-142	X			12"				RCP	c. 1995	no	Anne Howanski 610-833-1927	Ridley Township
G-143	G-144	X			15"				RCP	c. 1995	no	Anne Howanski 610-833-1928	Ridley Township
G-142	G-145	X			15"				RCP	c. 1995	no	Anne Howanski 610-833-1929	Ridley Township
G-84	G-89	X			36"				RCP	c. 1995	no	Anne Howanski 610-833-1930	Ridley Township
G-89	G-90	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township
G-89	G-91	X			36"				RCP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township
G-91	G-92	X			30"				RCP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township
G-92	G-93	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1923	Ridley Township
G-92	G-94	X			30"				RCP	c. 1955	no	Anne Howanski 610-833-1924	Ridley Township
G-94	G-95	X			30"				RCP	c. 1955	no	Anne Howanski 610-833-1925	Ridley Township
G-95	G-96	X			36"				RCP	c. 1955	no	Anne Howanski 610-833-1926	Ridley Township
G-96	G-97	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1927	Ridley Township

FORM G (4)

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 7 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-96	G-98	X			27"				RCP	c. 1955	no	Anne Howanski 610-833-1928	Ridley Township
G-98	G-99	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1929	Ridley Township
G-98	G-100	X			36"				RCP	c.1995	no	Anne Howanski 610-833-1930	Ridley Township
G-100	G-101	X			12"				PCPP	c. 1995	no	Anne Howanski 610-833-1931	Ridley Township
G-101	G-102	X			12"				PCPP	c. 1995	no	Anne Howanski 610-833-1922	Ridley Township
G-101	G-103	X			12"				PCPP	c. 1995	no	Anne Howanski 610-833-1922	Ridley Township
G-100	G-104	X			36"				RCP	c. 1955	no	Anne Howanski 610-833-1923	Ridley Township
G-104	G-105	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1924	Ridley Township
G-104	G-106	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1925	Ridley Township
G-106	G-107	X			15"				RCP	c. 1995	no	Anne Howanski 610-833-1926	Ridley Township
G-107	G-109	X			12"				RCP	c. 1995	no	Anne Howanski 610-833-1927	Ridley Township
G-106	G-108	X			12"				RCP	c. 1995	no	Anne Howanski 610-833-1928	Ridley Township
G-104	G-111	X			30"				RCP	c. 1995	no	Anne Howanski 610-833-1929	Ridley Township
G-111	G-110	X			15"				RCP	c. 1995	no	Anne Howanski 610-833-1930	Ridley Township
G-111	G-112	X			30"				RCP	c. 1996	no	Anne Howanski 610-833-1931	Ridley Township
G-112	G-113	X			15"				RCP	c. 1995	no	Anne Howanski 610-833-1922	Ridley Township

FORM G (4)

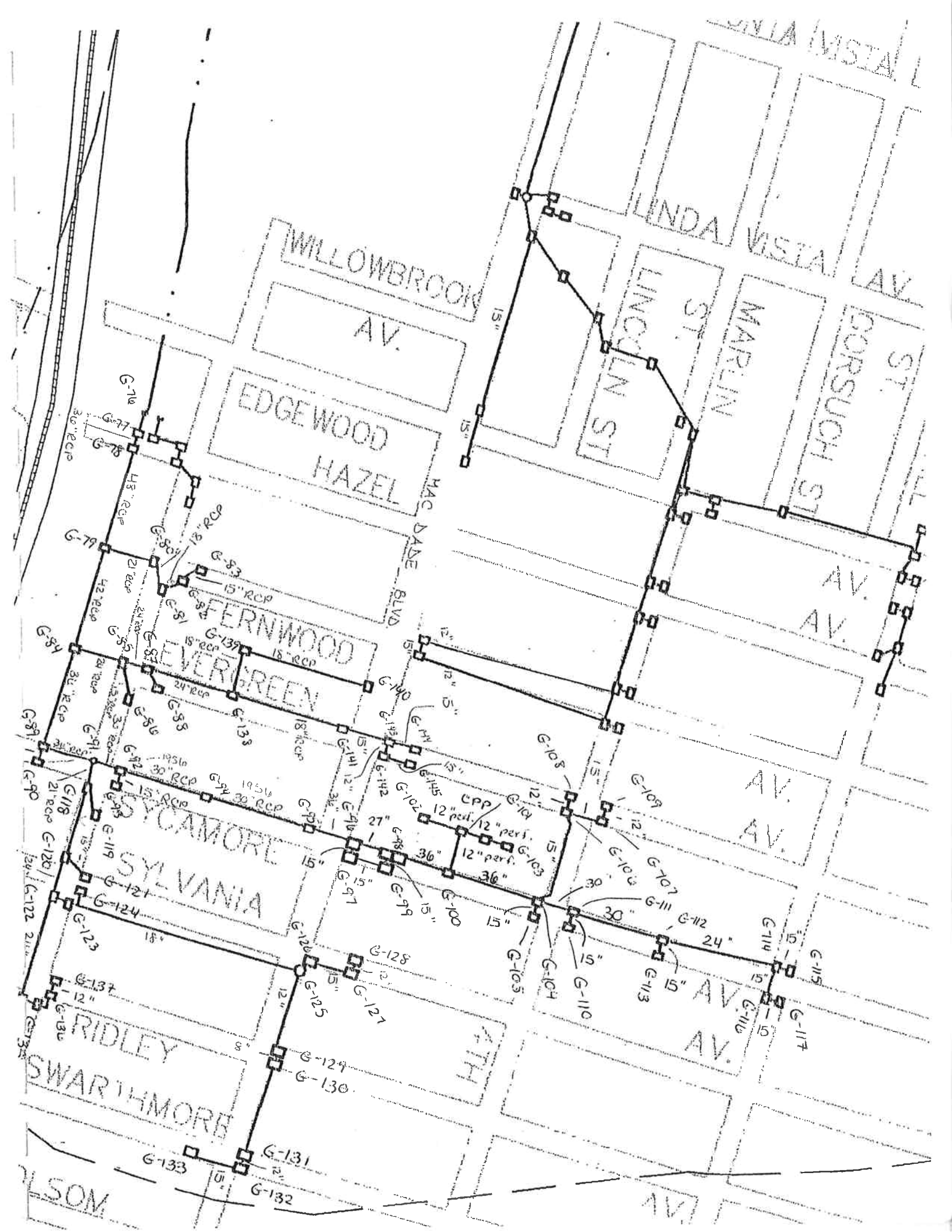
EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 8 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-112	G-114	X			24"				RCP	c. 1995	no	Anne Howanski 610-833-1922	Ridley Township
G-114	G-115	X			15"				RCP	c. 1995	no	Anne Howanski 610-833-1923	Ridley Township
G-114	G-116	X			15"				RCP	c. 1995	no	Anne Howanski 610-833-1924	Ridley Township
G-116	G-117	X			15"				RCP	c. 1995	no	Anne Howanski 610-833-1925	Ridley Township
G-91	G-118	X			21"				RCP	c. 1955	no	Anne Howanski 610-833-1926	Ridley Township
G-118	G-119	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1927	Ridley Township
G-118	G-120	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1928	Ridley Township
G-120	G-122	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1929	Ridley Township
G-120	G-121	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1930	Ridley Township
G-122	G-123	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1931	Ridley Township
G-123	G-125	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1931	Ridley Township
G-125	G-126	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township
G-126	G-127	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1923	Ridley Township
G-127	G-128	X			12"				RCP	c. 1955	no	Anne Howanski 610-833-1924	Ridley Township
G-125	G-129	X			12"				RCP	c. 1955	no	Anne Howanski 610-833-1925	Ridley Township
G-129	G-130	X			8"				RCP	c. 1995	no	Anne Howanski 610-833-1926	Ridley Township

FORM G (4)

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 9 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-130	G-131	X			15"				RCP	c. 1995	no	Anne Howanski 610-833-1927	Ridley Township
G-131	G-132	X			12"				RCP	c. 1995	no	Anne Howanski 610-833-1928	Ridley Township
G-132	G-133	X			15"				RCP	c. 1995	no	Anne Howanski 610-833-1929	Ridley Township
G-122	G-134	X			24"				RCP	c. 1995	no	Anne Howanski 610-833-1930	Ridley Township
G-134	G-135	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1931	Ridley Township
G-135	G-136	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1932	Ridley Township
G-136	G-137	X			12"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township


LINDA VISTA AV.
WILLOWBROOK AV.
EDGEWOOD HAZEL
MACDADE BLVD
FERNWOOD
EVERGREEN
SYCAMORE
SYLVANIA
RIDLEY
SWARTHMORE
LINCOLN ST.
MARLIN ST.
BORSUCH ST.
AV.
G-76
G-77
G-78
G-79
G-80
G-81
G-82
G-83
G-84
G-85
G-86
G-87
G-88
G-89
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G-102
G-103
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G-127
G-128
G-129
G-130
G-131
G-132
G-133
G-135
G-136
G-137
G-138
G-139
G-140
G-141
G-142
G-143
G-144
G-145
36" RCP
42" RCP
30" RCP
24" RCP
21" RCP
18" RCP
15" RCP
12" RCP
12" perf.
CPP
27"
36"
30"
24"
18"
15"
12"

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 10 OF 67

WATERSHED
Name: Crum Creek
Municipality: Ridley Township
County: Delaware

FORM COMPLETED BY
Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/10/2004

INSTRUCTIONS
Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-157	G-158	X			54"				CMP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township
G-158	G-159	X			12"				RCP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township
G-158	G-160	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1923	Ridley Township
G-160	G-161	X			12"				RCP	c. 1955	no	Anne Howanski 610-833-1924	Ridley Township
G-161	G-162	X			12"				RCP	c. 1955	no	Anne Howanski 610-833-1925	Ridley Township
G-158	G-163	X			36"				RCP	c. 1955	no	Anne Howanski 610-833-1926	Ridley Township
G-163	G-164	X			36"				RCP	c. 1955	no	Anne Howanski 610-833-1927	Ridley Township
G-164	G-165	X			36"				RCP	c. 1955	no	Anne Howanski 610-833-1928	Ridley Township
G-165	G-166	X			36"				RCP	c. 1955	no	Anne Howanski 610-833-1929	Ridley Township
G-166	G-167	X			36"				RCP	c. 1955	no	Anne Howanski 610-833-1930	Ridley Township
G-167	G-168	X			36"				RCP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township
G-168	G-169	X			36"				RCP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township
G-169	G-170	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 11 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-170	G-171	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1923	Ridley Township
G-171	G-172	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1924	Ridley Township
G-171	G-173	X			15"x21"				CMPA	c. 1993	no	Anne Howanski 610-833-1925	Ridley Township
G-173	G-193	X			15"x21"				CMPA	c. 1993	no	Anne Howanski 610-833-1926	Ridley Township
G-193	G-174	X			15"x21"				CMPA	c. 1993	no	Anne Howanski 610-833-1927	Ridley Township
G-174	G-175	X			13"x17"				CMPA	c. 1993	no	Anne Howanski 610-833-1928	Ridley Township
G-174	G-176	X			13"x17"				CMPA	c. 1993	no	Anne Howanski 610-833-1929	Ridley Township
G-176	G-177	X			13"x17"				CMPA	c. 1995	no	Anne Howanski 610-833-1930	Ridley Township
G-176	G-178	X			13"x17"				CMPA	c. 1995	no	Anne Howanski 610-833-1931	Ridley Township
G-178	G-179	X			13"x17"				CMPA	c. 1995	no	Anne Howanski 610-833-1922	Ridley Township
G-179	G-180	X			13"x17"				CMPA	c. 1995	no	Anne Howanski 610-833-1922	Ridley Township
G-180	G-181	X			13"x17"				CMPA	c. 1995	no	Anne Howanski 610-833-1923	Ridley Township
G-180	G-182	X			13"x17"				CMPA	c. 1995	no	Anne Howanski 610-833-1924	Ridley Township
G-169	G-183	X			24"				CPP	c. 1995	no	Anne Howanski 610-833-1925	Ridley Township
G-183	G-184	X			15"				CPP	c. 1995	no	Anne Howanski 610-833-1926	Ridley Township
G-183	G-185	X			24"				CPP	c. 1995	no	Anne Howanski 610-833-1927	Ridley Township

FORM G (5)

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 12 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-185	G-186	X			15"				CPP	c. 1995	no	Anne Howanski 610-833-1928	Ridley Township
G-185	G-187	X			24"				CPP	c. 1995	no	Anne Howanski 610-833-1929	Ridley Township
G-187	G-188	X			15"				CPP	c. 1995	no	Anne Howanski 610-833-1930	Ridley Township
G-187	G-189	X			15"				CPP	c. 1995	no	Anne Howanski 610-833-1931	Ridley Township
G-189	G-190	X			15"				CPP	c. 1995	no	Anne Howanski 610-833-1922	Ridley Township
G-189	G-191	X			18"				CPP	c. 1995	no	Anne Howanski 610-833-1922	Ridley Township
G-191	G-192	X			15"				CPP	c. 1995	no	Anne Howanski 610-833-1923	Ridley Township
G-163	G-193	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1924	Ridley Township
G-193	G-194	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1925	Ridley Township
G-189	G-195	X			12"				RCP	c. 1955	no	Anne Howanski 610-833-1926	Ridley Township
G-195	G-196	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1927	Ridley Township

4TH AVE
5TH AVE
FERNWOOD
HAZEL
EDGEWOOD
BROOMALL ST.
GORSUCH ST.
MARLIN ST.
LINCOLN ST.
MONTA VISTA
G-192
G-191
G-190
G-189
G-188
G-187
G-186
G-185
G-184
G-183
G-182
G-181
G-180
G-179
G-178
G-177
G-176
G-175
G-174
G-173
G-172
G-171
G-170
G-169
G-168
G-167
G-166
G-165
G-164
G-163
G-162
G-161
G-160
G-159
G-158
G-157
15" CPP
18" CPP
24" CPP
15" RCP
18" RCP
24" RCP
15" x 21" CMPA
13" x 17" CMPA
54" CMP

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 13 OF 67

WATERSHED

Name: Crum Creek
Municipality: Ridley Township
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/10/2004

INSTRUCTIONS

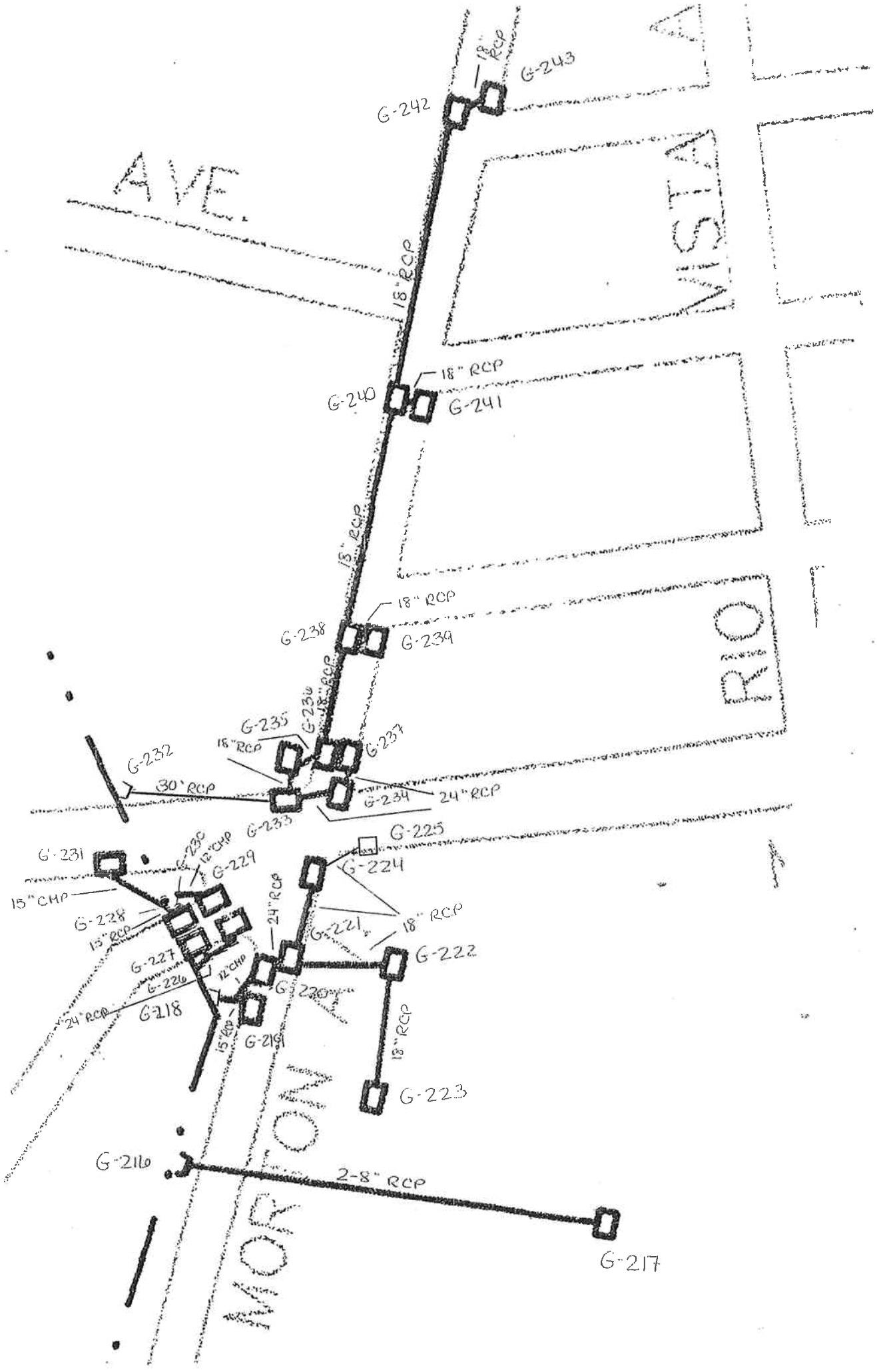
Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-216	G-217	X			2-8"				RCP	c. 1950	no	Anne Howanski 610-833-1922	Ridley Township
G-218	G-219	X			15"				RCP	c. 1950	no	Anne Howanski 610-833-1922	Ridley Township
G-218	G220	X			12"				CMP	c. 1950	no	Anne Howanski 610-833-1923	Ridley Township
G-220	G-221	X			24"				RCP	c. 1950	no	Anne Howanski 610-833-1924	Ridley Township
G-221	G-222	X			18"				RCP	c. 1950	no	Anne Howanski 610-833-1925	Ridley Township
G-222	G-223	X			18"				RCP	c. 1950	no	Anne Howanski 610-833-1926	Ridley Township
G-221	G-224	X			18"				RCP	c. 1950	no	Anne Howanski 610-833-1927	Ridley Township
G-224	G-225	X			18"				RCP	c. 1950	no	Anne Howanski 610-833-1928	Ridley Township
G-226	G-227	X			24"				RCP	c. 1950	no	Anne Howanski 610-833-1929	Ridley Township
G-228	G-229	X			12"				CMP	c. 1950	no	Anne Howanski 610-833-1930	Ridley Township
G-228	G-230	X			15"				RCP	c. 1950	no	Anne Howanski 610-833-1931	Ridley Township
G-230	G-231	X			15"				CMP	c. 1950	no	Anne Howanski 610-833-1922	Ridley Township
G-232	G-233	X			30"				RCP	c. 1950	no	Anne Howanski 610-833-1922	Ridley Township

FORM G (6)

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 14 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-233	G234	X			24"				RCP	c. 1950	no	Anne Howanski 610-833-1923	Ridley Township
G-234	G-237	X			24"				RCP	c. 1950	no	Anne Howanski 610-833-1924	Ridley Township
G-233	G-235	X			18"				RCP	c. 1950	no	Anne Howanski 610-833-1925	Ridley Township
G-235	G-236	X			18"				RCP	c. 1950	no	Anne Howanski 610-833-1926	Ridley Township
G-236	G-238	X			18"				RCP	c. 1950	no	Anne Howanski 610-833-1927	Ridley Township
G-238	G-239	X			18"				RCP	c. 1950	no	Anne Howanski 610-833-1928	Ridley Township
G-238	G-240	X			18"				RCP	c. 1950	no	Anne Howanski 610-833-1929	Ridley Township
G-240	G-241	X			18"				RCP	c. 1950	no	Anne Howanski 610-833-1930	Ridley Township
G-240	G-242	X			18"				RCP	c. 1950	no	Anne Howanski 610-833-1931	Ridley Township
G-242	G-243	X			18"				RCP	c. 1950	no	Anne Howanski 610-833-1932	Ridley Township


AVE.
18" RCP
G-243
G-242
18" RCP
G-240
G-241
15" RCP
18" RCP
G-238
G-239
G-235
18" RCP
G-236
48" RCP
G-237
G-232
30" RCP
G-234
24" RCP
G-233
G-225
G-231
12" CMP
G-229
G-224
15" CMP
G-228
15" RCP
24" RCP
18" RCP
G-221
G-222
G-227
12" CMP
G-226
G-220
24" RCP
G-218
15" RCP
G-219
18" RCP
G-223
G-216
2-8" RCP
G-217

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 15 OF 67

WATERSHED

Name: Crum Creek
Municipality: Ridley Township
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/10/2004

INSTRUCTIONS

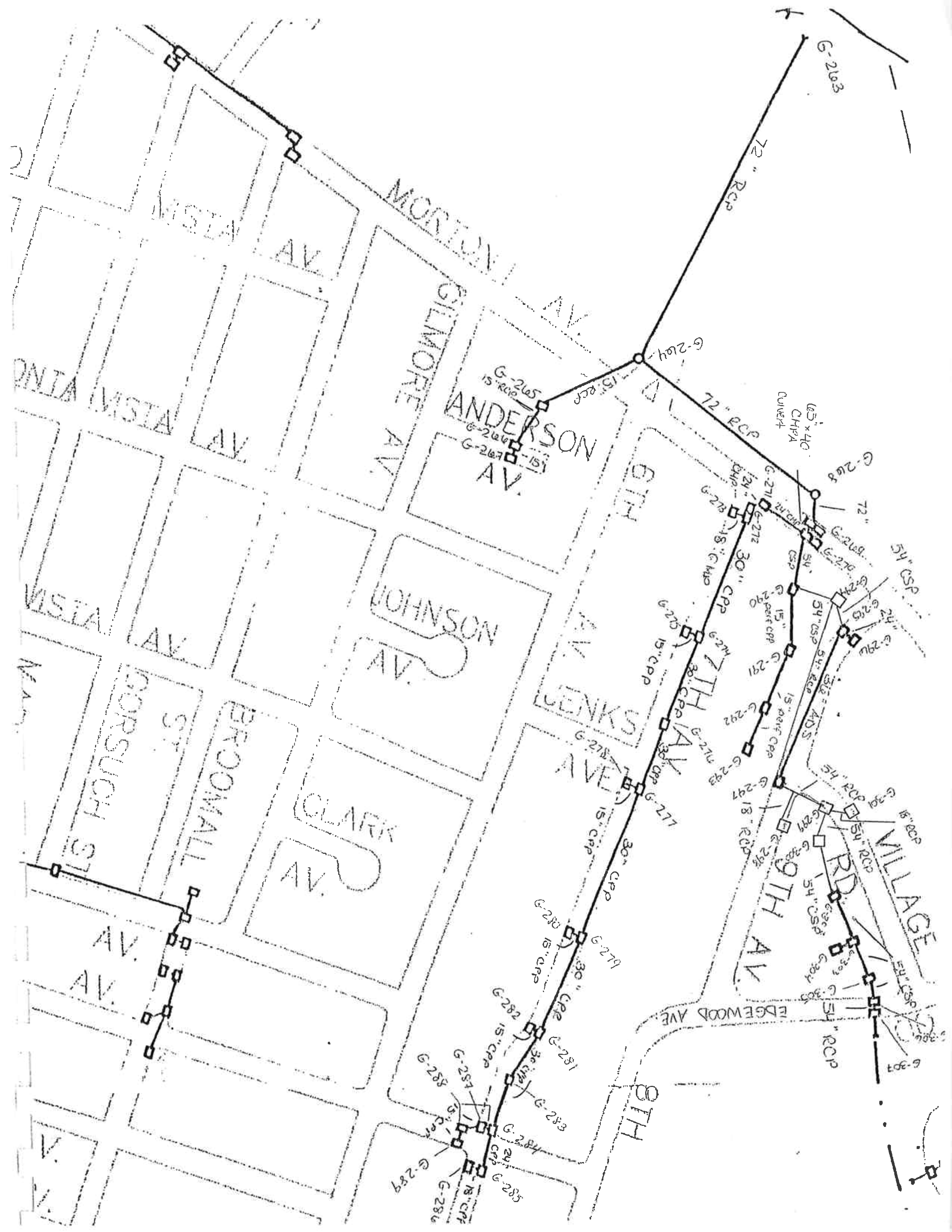
Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-263	G-264	X			72"				RCP	c. 1950	no	Anne Howanski 610-833-1922	Ridley Township
G-264	G-265	X			15"				RCP	c. 1950	no	Anne Howanski 610-833-1922	Ridley Township
G-265	G-266	X			15"				RCP	c. 1950	no	Anne Howanski 610-833-1923	Ridley Township
G-266	G-267	X			15"				RCP	c. 1950	no	Anne Howanski 610-833-1924	Ridley Township
G-264	G-268	X			72"				RCP	c. 1950	no	Anne Howanski 610-833-1925	Ridley Township
G-268	G-269	X			72"				RCP	c. 1950	no	Anne Howanski 610-833-1926	Ridley Township
G-269	G-270	X			65"x40"				CMPA	c. 1950	no	Anne Howanski 610-833-1927	Ridley Township
G-270	G-271	X			24"				CMP	c. 1995	no	Anne Howanski 610-833-1928	Ridley Township
G-271	G-272	X			24"				CMP	c. 1995	no	Anne Howanski 610-833-1929	Ridley Township
G-272	G-273	X			18"				CMP	c. 1995	no	Anne Howanski 610-833-1930	Ridley Township
G-272	G-274	X			30"				CPP	c. 1995	no	Anne Howanski 610-833-1931	Ridley Township
G-274	G-275	X			15"				CPP	c. 1995	no	Anne Howanski 610-833-1932	Ridley Township
G-274	G-276	X			30"				CPP	c. 1995	no	Anne Howanski 610-833-1933	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G.												SHEET 16 OF 67
Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-276	G-277	X			30"				CPP	c. 1995	no	Anne Howanski 610-833-1922	Ridley Township
G-277	G-278	X			15"				CPP	c. 1995	no	Anne Howanski 610-833-1922	Ridley Township
G-277	G-279	X			30"				CPP	c. 1995	no	Anne Howanski 610-833-1923	Ridley Township
G-279	G-280	X			15"				CPP	c. 1995	no	Anne Howanski 610-833-1924	Ridley Township
G-279	G-281	X			30"				CPP	c. 1995	no	Anne Howanski 610-833-1925	Ridley Township
G-281	G-282	X			15"				CPP	c. 1995	no	Anne Howanski 610-833-1926	Ridley Township
G-281	G-283	X			30"				CPP	c. 1995	no	Anne Howanski 610-833-1927	Ridley Township
G-283	G-284	X			30"				CPP	c. 1995	no	Anne Howanski 610-833-1928	Ridley Township
G-284	G-285	X			24"				CPP	c. 1995	no	Anne Howanski 610-833-1929	Ridley Township
G-285	G-286	X			18"				CPP	c. 1995	no	Anne Howanski 610-833-1930	Ridley Township
G-284	G-287	X			15"				CPP	c. 1995	no	Anne Howanski 610-833-1931	Ridley Township
G-287	G-288	X			15"				CPP	c. 1995	no	Anne Howanski 610-833-1932	Ridley Township
G-288	G-289	X			15"				CPP	c. 1995	no	Anne Howanski 610-833-1933	Ridley Township
G-270	G-290	X			54"				CSP	c. 1993	no	Anne Howanski 610-833-1922	Ridley Township
G-290	G-291	X			15"				PCPP	c. 1993	no	Anne Howanski 610-833-1922	Ridley Township
G-291	G-292	X			15"				PCPP	c. 1993	no	Anne Howanski 610-833-1923	Ridley Township

FORM G (7)

EXISTING STORMWATER COLLECTION SYSTEM FORM G.													SHEET 17 OF 67
Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-292	G-293	X			15"				PCPP	c. 1993	no	Anne Howanski 610-833-1924	Ridley Township
G-290	G-294	X			54"				CSP	c. 1993	no	Anne Howanski 610-833-1925	Ridley Township
G-294	G-295	X			54"				CSP	c. 1993	no	Anne Howanski 610-833-1926	Ridley Township
G-295	G-296	X			24"				CSP	c. 1993	no	Anne Howanski 610-833-1927	Ridley Township
G-295	G-297	X			36"				ADS	c. 1993	no	Anne Howanski 610-833-1928	Ridley Township
G-294	G-297	X			54"				RCP	c. 1950	no	Anne Howanski 610-833-1929	Ridley Township
G-297	G-299	X			54"				RCP	c. 1950	no	Anne Howanski 610-833-1929	Ridley Township
G-297	G-298	X			18"				RCP	c. 1950	no	Anne Howanski 610-833-1930	Ridley Township
G-299	G-301	X			18"				RCP	c. 1950	no	Anne Howanski 610-833-1931	Ridley Township
G-299	G-300	X			54"				RCP	c. 1950	no	Anne Howanski 610-833-1932	Ridley Township
G-300	G-302	X			54"				CSP	c. 1993	no	Anne Howanski 610-833-1933	Ridley Township
G-302	G-303	X			54"				CSP	c. 1993	no	Anne Howanski 610-833-1922	Ridley Township
G-303	G-304	X			15"				CSP	c. 1993	no	Anne Howanski 610-833-1923	Ridley Township
G-303	G-305	X			54"				CSP	c. 1993	no	Anne Howanski 610-833-1924	Ridley Township
G-305	G-306	X			54"				CSP	c. 1993	no	Anne Howanski 610-833-1925	Ridley Township
G-306	G-307	X			54"				RCP	c. 1950	no	Anne Howanski 610-833-1926	Ridley Township



MORTON AV.
GILMORE AV.
ANDERSON AV.
JOHNSON AV.
CLARK AV.
BROOMALL ST.
GORSUCH AV.
6TH AV.
7TH AV.
JENKS AVE.
9TH AV.
VILLAGE RD.
EDGEWOOD AVE
8TH
G-263
72" RCP
G-264
15" RCP
G-265
G-266
G-267
G-268
72"
63" x 40 CHIPA Culvert
G-269
G-270
G-271
G-272
G-273
G-274
G-275
G-276
G-277
G-278
30" CPP
15" CPP
54" CSP
G-290
15" perf CPP
G-291
G-292
G-293
G-294
G-295
36" ADS
54" RCP
G-297
G-299
18" RCP
G-301
G-303
G-304
G-305
G-307
G-279
G-280
G-281
G-282
G-283
G-284
G-285
G-286
G-287
G-288
G-289
24" CPP
18" CPP

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 18 OF 67

WATERSHED

Name: Crum Creek
Municipality: Ridley Township
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/10/2004

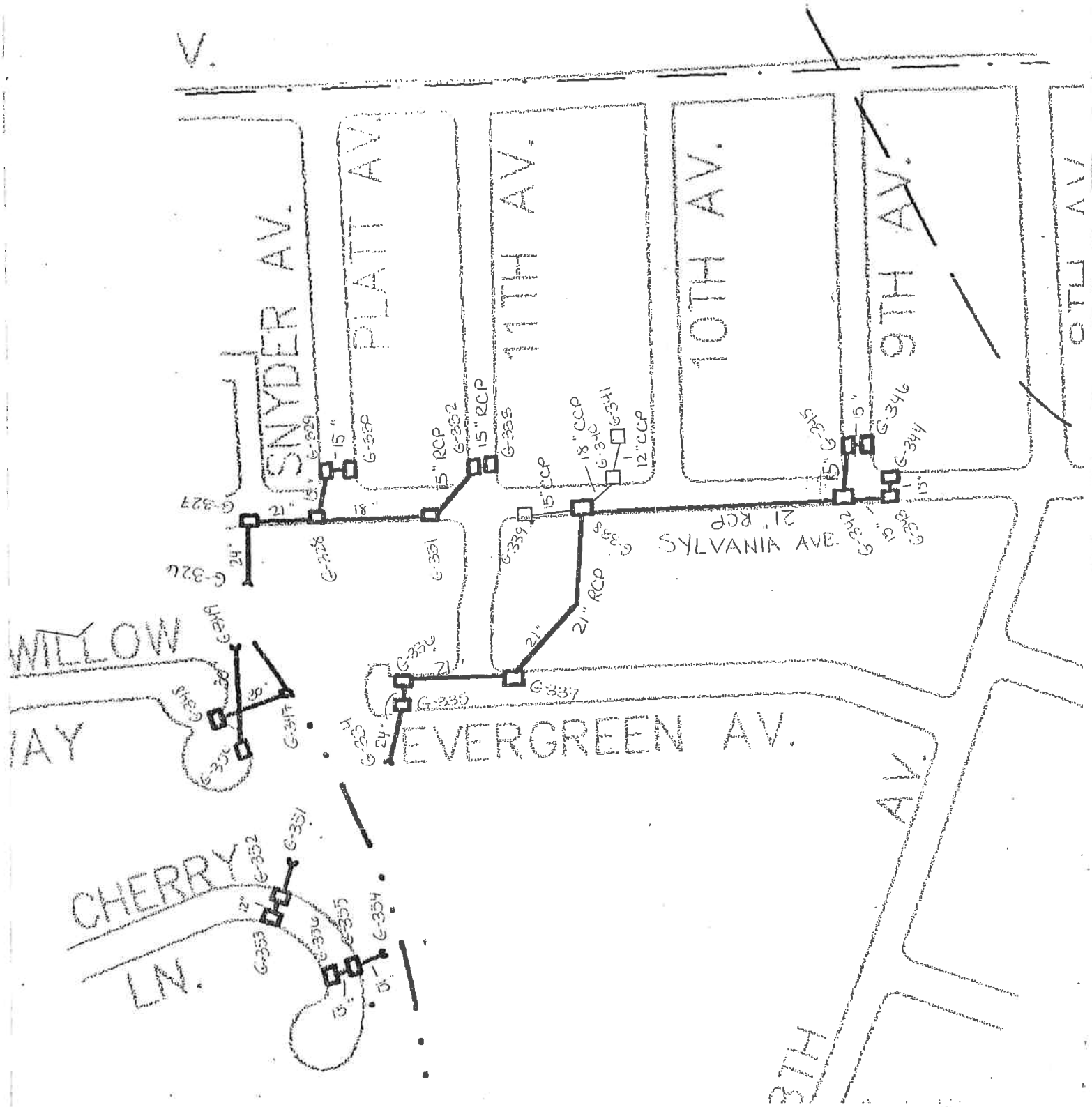
INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-326	G-327	X			24"				RCP	c. 1954	no	Anne Howanski 610-833-1933	Ridley Township
G-327	G-328	X			21"				RCP	c. 1954	no	Anne Howanski 610-833-1922	Ridley Township
G-328	G-329	X			15"				RCP	c. 1954	no	Anne Howanski 610-833-1923	Ridley Township
G-329	G-330	X			15"				RCP	c. 1954	no	Anne Howanski 610-833-1924	Ridley Township
G-328	G-331	X			18"				RCP	c. 1954	no	Anne Howanski 610-833-1925	Ridley Township
G-331	G-332	X			15"				RCP	c. 1954	no	Anne Howanski 610-833-1926	Ridley Township
G-332	G-333	X			15"				RCP	c. 1954	no	Anne Howanski 610-833-1927	Ridley Township
G-334	G-335	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1928	Ridley Township
G-335	G-336	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1929	Ridley Township
G-336	G-337	X			21"				RCP	c. 1955	no	Anne Howanski 610-833-1930	Ridley Township
G-337	G-338	X			21"				RCP	c. 1955	no	Anne Howanski 610-833-1931	Ridley Township
G-338	G-339	X			15"				CPP	c. 1995	no	Anne Howanski 610-833-1932	Ridley Township
G-338	G-340	X			18"				CPP	c. 1995	no	Anne Howanski 610-833-1933	Ridley Township

FORM G (8)

EXISTING STORMWATER COLLECTION SYSTEM FORM G.													SHEET 19 OF 67
Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-340	G-341	X			12"				CPP	c. 1995	no	Anne Howanski 610-833-1933	Ridley Township
G-338	G-342	X			21"				RCP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township
G-342	G-343	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1923	Ridley Township
G-343	G-344	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1924	Ridley Township
G-342	G-345	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1925	Ridley Township
G-345	G-346	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1926	Ridley Township
G-347	G-348	X			30"				RCP	c. 1965	no	Anne Howanski 610-833-1927	Ridley Township
G-349	G-350	X			30"				RCP	c. 1965	no	Anne Howanski 610-833-1928	Ridley Township
G-351	G-352	X			12"				RCP	c. 1985	no	Anne Howanski 610-833-1929	Ridley Township
G-352	G-353	X			12"				RCP	c. 1985	no	Anne Howanski 610-833-1930	Ridley Township
G-354	G-355	X			15"				RCP	c. 1985	no	Anne Howanski 610-833-1931	Ridley Township
G-355	G-356	X			15"				RCP	c. 1985	no	Anne Howanski 610-833-1932	Ridley Township


SNYDER AV.
PLATT AV.
11TH AV.
10TH AV.
9TH AV.
8TH AV.
SYLVANIA AVE.
EVERGREEN AV.
CHERRY LN.
21" RCP
15" RCP
18" CCP
12" CCP
15" CCP
24"
21"
18"
15"
12"

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 20 OF 67

WATERSHED

Name: Crum Creek
Municipality: Ridley Township
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/11/2004

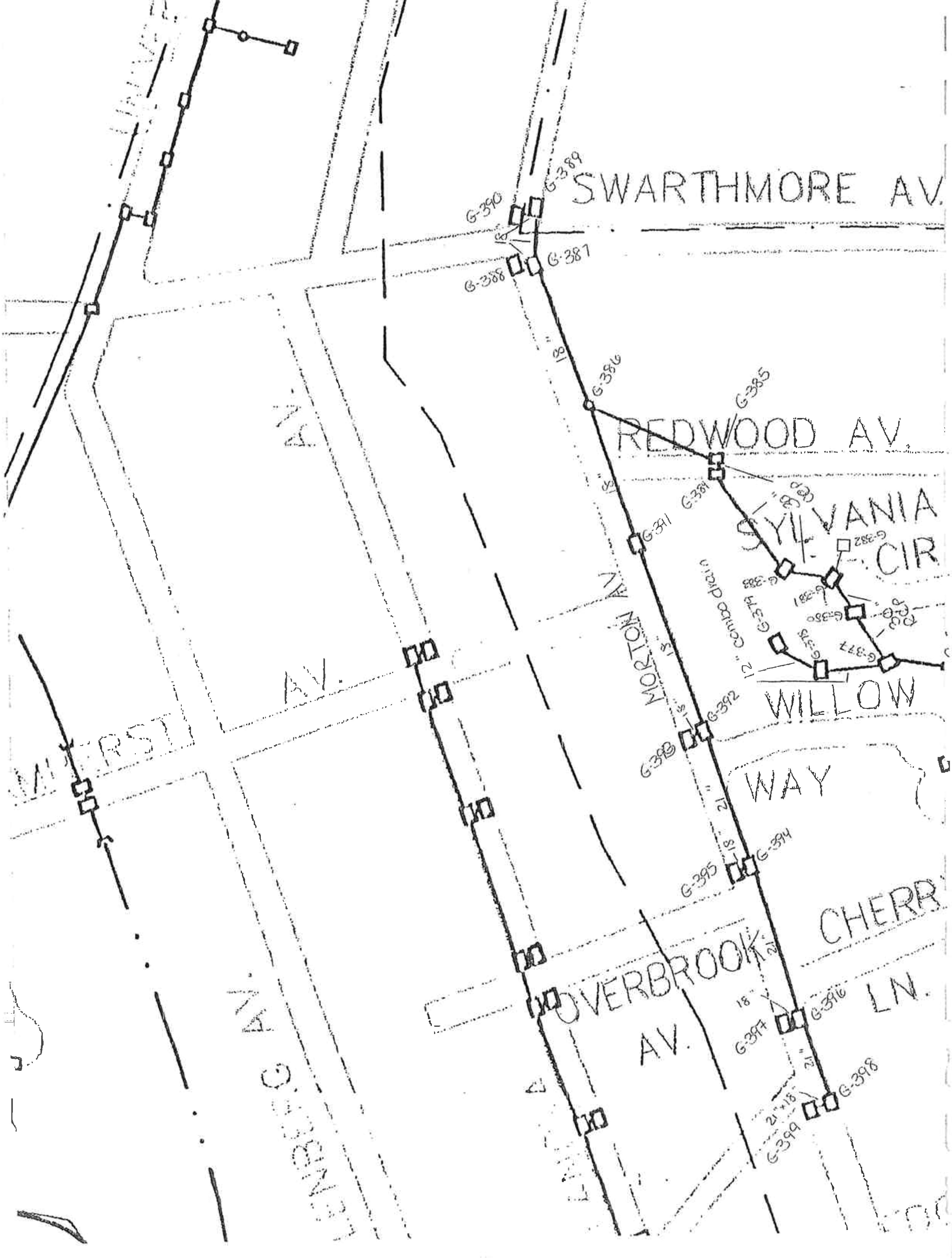
INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-376	G-377	X			30"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township
G-377	G-378	X			12"				combo drain	c. 1995	no	Anne Howanski 610-833-1922	Ridley Township
G-378	G-379	X			12"				combo drain	c. 1995	no	Anne Howanski 610-833-1923	Ridley Township
G-377	G-380	X			30"				RCP	c. 1955	no	Anne Howanski 610-833-1924	Ridley Township
G-380	G-381	X			30"				RCP	c. 1955	no	Anne Howanski 610-833-1925	Ridley Township
G-381	G-382	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1926	Ridley Township
G-381	G-383	X			30"				CPP	c. 1995	no	Anne Howanski 610-833-1927	Ridley Township
G-383	G-384	X			30"				CPP	c. 1995	no	Anne Howanski 610-833-1928	Ridley Township
G-384	G-385	X			30"				CPP	c. 1995	no	Anne Howanski 610-833-1929	Ridley Township
G-385	G-386	X			30"				RCP	c. 1955	no	Anne Howanski 610-833-1930	Ridley Township
G-386	G-387	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1931	Ridley Township
G-387	G-388	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1931	Ridley Township
G-387	G-389	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1932	Ridley Township

FORM G (9)

EXISTING STORMWATER COLLECTION SYSTEM FORM G.													SHEET 21 OF 67
Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-389	G-390	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township
G-386	G-391	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township
G-391	G-392	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1923	Ridley Township
G-392	G-393	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1924	Ridley Township
G-392	G-394	X			21"				RCP	c. 1955	no	Anne Howanski 610-833-1925	Ridley Township
G-394	G-395	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1926	Ridley Township
G-394	G-396	X			21"				RCP	c. 1955	no	Anne Howanski 610-833-1927	Ridley Township
G-396	G-397	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1928	Ridley Township
G-396	G-398	X			21"				RCP	c. 1955	no	Anne Howanski 610-833-1929	Ridley Township
G-398	G-399	X			21"x18"				CMPA	c. 1955	no	Anne Howanski 610-833-1930	Ridley Township



SWARTHMORE AV.
G-389
G-390
G-387
G-388
18"
G-386
G-385
REDWOOD AV.
G-384
SYLVANIA
CIR
G-391
G-382
G-383
G-381
G-380
G-377
G-379
G-378
12" combo drain
MORTON AV.
18"
AV.
WILLOW
WAY
G-392
G-393
21"
18"
G-394
G-395
CHERR
OVERBROOK AV.
G-396
G-397
LN.
G-398
G-399
21"+18"
AV.

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 22 OF 67

WATERSHED

Name: Crum Creek
Municipality: Ridley Township
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/11/2004

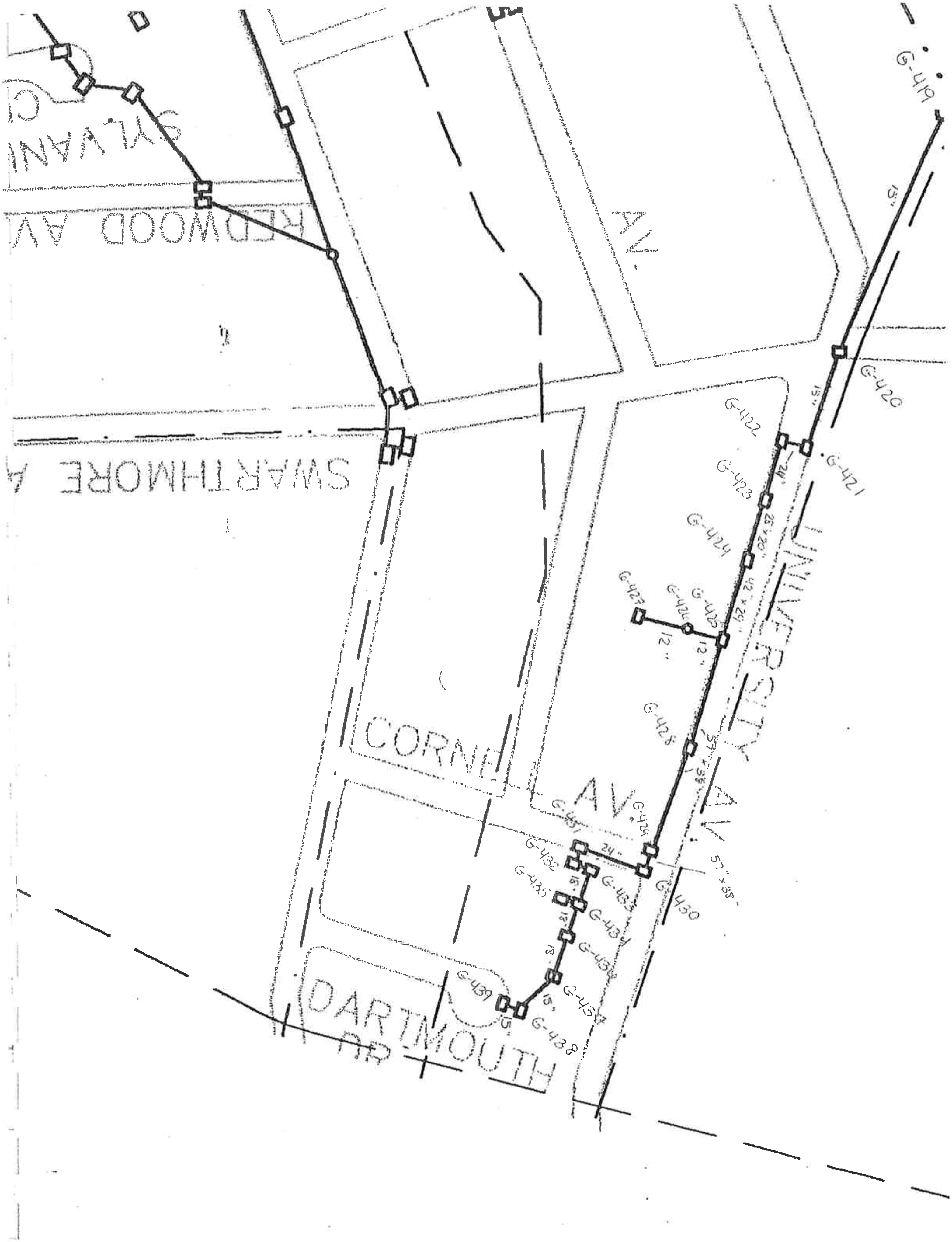
INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-419	G-420	X			15"				RCP	c. 1953	no	Anne Howanski 610-833-1933	Ridley Township
G-420	G-421	X			15"				RCP	c. 1953	no	Anne Howanski 610-833-1922	Ridley Township
G-421	G-422	X			24"				RCP	c. 1953	no	Anne Howanski 610-833-1923	Ridley Township
G-422	G-423	X			24"				RCP	c. 1953	no	Anne Howanski 610-833-1924	Ridley Township
G-423	G-424	X			28"x20"				CMPA	c. 1953	no	Anne Howanski 610-833-1925	Ridley Township
G-424	G-425	X			42"x29"				CMPA	c. 1953	no	Anne Howanski 610-833-1926	Ridley Township
G-425	G-426	X			12"				RCP	c. 1953	no	Anne Howanski 610-833-1927	Ridley Township
G-426	G-427	X			12"				RCP	c. 1953	no	Anne Howanski 610-833-1928	Ridley Township
G-425	G-428	X			57"x38"				CMPA	c. 1953	no	Anne Howanski 610-833-1929	Ridley Township
G-428	G-429	X			57"x38"				CMPA	c. 1953	no	Anne Howanski 610-833-1930	Ridley Township
G-429	G-430	X			57"x38"				CMPA	c. 1953	no	Anne Howanski 610-833-1931	Ridley Township
G-430	G-431	X			24"				RCP	c. 1953	no	Anne Howanski 610-833-1931	Ridley Township
G-431	G-432	X			24"				RCP	c. 1953	no	Anne Howanski 610-833-1932	Ridley Township

FORM G (10)

EXISTING STORMWATER COLLECTION SYSTEM FORM G.												SHEET 23 OF 67
Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-432	G-433	X			18"				RCP	c. 1953	no	Anne Howanski 610-833-1933	Ridley Township
G-433	G-434	X			18"				RCP	c. 1953	no	Anne Howanski 610-833-1922	Ridley Township
G-434	G-435	X			15"				RCP	c. 1953	no	Anne Howanski 610-833-1923	Ridley Township
G-434	G-436	X			18"				RCP	c. 1953	no	Anne Howanski 610-833-1924	Ridley Township
G-436	G-437	X			18"				RCP	c. 1953	no	Anne Howanski 610-833-1925	Ridley Township
G-437	G-438	X			15"				RCP	c. 1953	no	Anne Howanski 610-833-1926	Ridley Township
G-438	G-439	X			15"				RCP	c. 1953	no	Anne Howanski 610-833-1927	Ridley Township



SYLVANI
REDWOOD AV
AV.
SWARTHMORE A
CORNE
AV.
UNIVERSITY
AV.
DARTMOUTH
DR
G-419
15"
G-420
15"
G-421
G-422
24"
G-423
G-424
G-425
G-426
G-427
12"
12"
G-428
G-429
G-430
57"x38"
G-431
24"
G-432
G-433
G-434
G-435
G-436
G-437
15"
G-438
G-439
15"

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 24 OF 67

WATERSHED

Name: Crum Creek
Municipality: Ridley Township
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/11/2004

INSTRUCTIONS

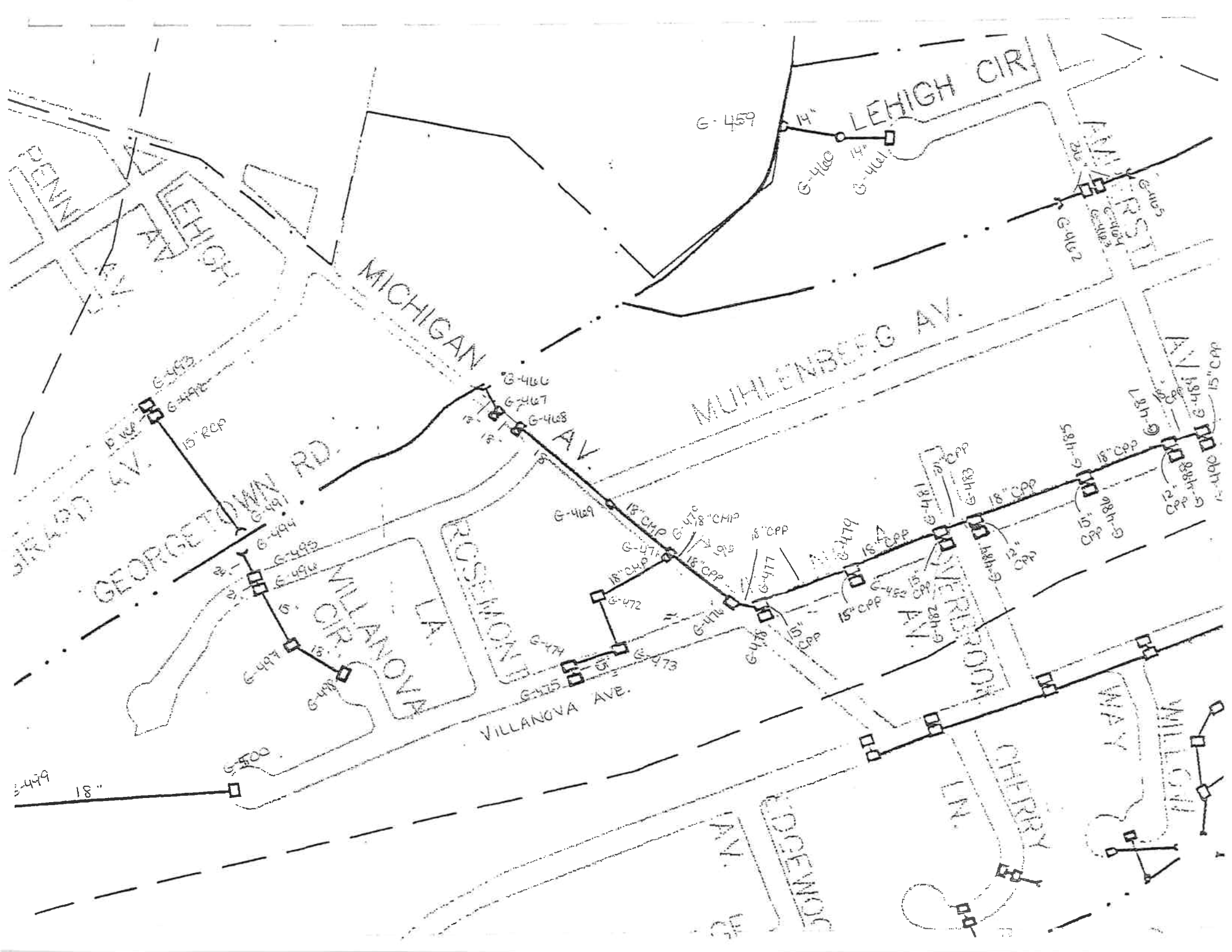
Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-459	G-460	X			14"				RCP	c. 1956	no	Anne Howanski 610-833-1933	Ridley Township
G-460	G-461	X			14"				RCP	c. 1956	no	Anne Howanski 610-833-1922	Ridley Township
G-462	G-463	X			36"				RCP	c. 1957	no	Anne Howanski 610-833-1923	Ridley Township
G-463	G-464	X			36"				RCP	c. 1957	no	Anne Howanski 610-833-1924	Ridley Township
G-464	G-465	X			36"				RCP	c. 1957	no	Anne Howanski 610-833-1925	Ridley Township
G-466	G-467	X			18"				RCP	c. 1957	no	Anne Howanski 610-833-1926	Ridley Township
G-467	G-467	X			18"				RCP	c. 1957	no	Anne Howanski 610-833-1927	Ridley Township
G-468	G-469	X			18"				RCP	c. 1957	no	Anne Howanski 610-833-1928	Ridley Township
G-469	G-470	X			18"				CMP	c. 1957	no	Anne Howanski 610-833-1929	Ridley Township
G-470	G-471	X			18"				CMP	c. 1957	no	Anne Howanski 610-833-1930	Ridley Township
G-471	G-472	X			18"				CMP	c. 1951	no	Anne Howanski 610-833-1931	Ridley Township
G-472	G-473	X			18"				RCP	c. 1951	no	Anne Howanski 610-833-1932	Ridley Township
G-473	G-474	X			15"				RCP	c. 1951	no	Anne Howanski 610-833-1933	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G.													SHEET 25 OF 67
Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-474	G-475	X			15"				RCP	c. 1951	no	Anne Howanski 610-833-1933	Ridley Township
G-470	G-476	X			18"				CPP	c. 1996	no	Anne Howanski 610-833-1922	Ridley Township
G-476	G-477	X			18"				CPP	c. 1996	no	Anne Howanski 610-833-1923	Ridley Township
G-477	G-478	X			15"				CPP	c. 1996	no	Anne Howanski 610-833-1924	Ridley Township
G-477	G-479	X			18"				CPP	c. 1996	no	Anne Howanski 610-833-1925	Ridley Township
G-479	G-480	X			15"				CPP	c. 1996	no	Anne Howanski 610-833-1926	Ridley Township
G-479	G-481	X			18"				CPP	c. 1996	no	Anne Howanski 610-833-1927	Ridley Township
G-481	G-482	X			15"				CPP	c. 1996	no	Anne Howanski 610-833-1928	Ridley Township
G-481	G-483	X			18"				CPP	c. 1996	no	Anne Howanski 610-833-1929	Ridley Township
G-483	G-484	X			12"				CPP	c. 1996	no	Anne Howanski 610-833-1930	Ridley Township
G-483	G-485	X			18"				CPP	c. 1996	no	Anne Howanski 610-833-1931	Ridley Township
G-485	G-486	X			15"				CPP	c. 1996	no	Anne Howanski 610-833-1932	Ridley Township
G-485	G-487	X			18"				CPP	c. 1996	no	Anne Howanski 610-833-1933	Ridley Township
G-487	G-488	X			12"				CPP	c. 1996	no	Anne Howanski 610-833-1933	Ridley Township
G-487	G-489	X			18"				CPP	c. 1996	no	Anne Howanski 610-833-1922	Ridley Township
G-489	G-490	X			15"				CPP	c. 1996	no	Anne Howanski 610-833-1923	Ridley Township

FORM G (11)

EXISTING STORMWATER COLLECTION SYSTEM FORM G.												SHEET 26 OF 67
Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-491	G-492	X			15"				RCP	c. 1961	no	Anne Howanski 610-833-1924	Ridley Township
G-492	G-493	X			10"				VCP	c. 1961	no	Anne Howanski 610-833-1925	Ridley Township
G-494	G-495	X			24"				RCP	c. 1957	no	Anne Howanski 610-833-1926	Ridley Township
G-495	G-496	X			21"				RCP	c. 1957	no	Anne Howanski 610-833-1927	Ridley Township
G-496	G-497	X			15"				RCP	c. 1957	no	Anne Howanski 610-833-1928	Ridley Township
G-497	G-498	X			18"				RCP	c. 1957	no	Anne Howanski 610-833-1929	Ridley Township
G-499	G-500	X			18"				RCP	c. 1951	no	Anne Howanski 610-833-1930	Ridley Township


LEHIGH CIR
LEHIGH AV.
PENN AV.
MICHIGAN AV.
MUHLENBERG AV.
GEORGETOWN RD.
GEORGETOWN RD.
VILLANOVA CIR.
VILLANOVA LA.
ROSEMONT AV.
VILLANOVA AVE.
CHERRY LN.
WAY
15" RCP
18" CMP
18" CPP
15" CPP
12" CPP
24"
18"
15"
14"

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 27 OF 67

WATERSHED

Name: Crum Creek
Municipality: Ridley Township
County: Delaware

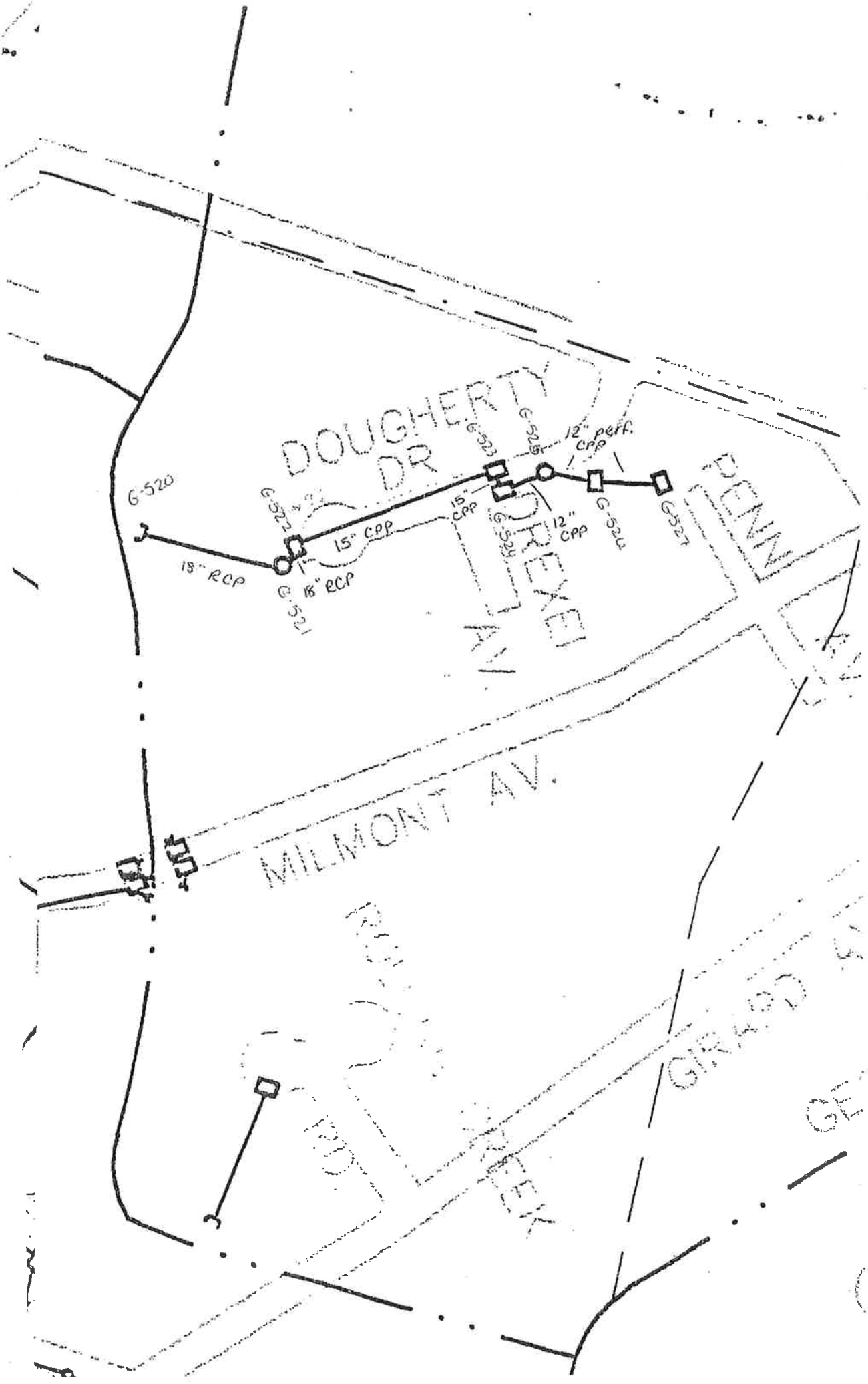
FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/11/2004

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-520	G-521	X			18"				RCP	c. 1953	no	Anne Howanski 610-833-1933	Ridley Township
G-521	G-522	X			18"				RCP	c. 1953	no	Anne Howanski 610-833-1922	Ridley Township
G-522	G-523	X			15"				CPP	c. 1995	no	Anne Howanski 610-833-1923	Ridley Township
G-523	G-524	X			15"				CPP	c. 1995	no	Anne Howanski 610-833-1924	Ridley Township
G-524	G-525	X			12"				CPP	c. 1995	no	Anne Howanski 610-833-1925	Ridley Township
G-525	G-526	X			12"				PCPP	c. 1995	no	Anne Howanski 610-833-1926	Ridley Township
G-526	G-527	X			12"				PCPP	c. 1995	no	Anne Howanski 610-833-1927	Ridley Township


DOUGHERTY DR
DREXEL AV.
MILMON AV.
PENN
G-520
G-522
G-523
G-525
G-526
G-524
G-527
G-521
18" RCP
15" CPP
15" CPP
12" CPP
12" perf. CPP
18" RCP

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 28 OF 67

WATERSHED

Name: Crum Creek
Municipality: Ridley Township
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/12/2004

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-547	G-548	X			36"				RCP	c. 1957	no	Anne Howanski 610-833-1933	Ridley Township
G-548	G-549	X			36"				RCP	c. 1957	no	Anne Howanski 610-833-1922	Ridley Township
G-549	G-550	X			18"				RCP	c. 1957	no	Anne Howanski 610-833-1923	Ridley Township
G-547	G-551	X			18"				RCP	c. 1957	no	Anne Howanski 610-833-1924	Ridley Township
G-551	G-552	X			18"				RCP	c. 1957	no	Anne Howanski 610-833-1925	Ridley Township
G-552	G-553	X			30"				RCP	c. 1957	no	Anne Howanski 610-833-1926	Ridley Township
G-553	G-554	X			18"				RCP	c. 1957	no	Anne Howanski 610-833-1926	Ridley Township
G-553	G-567	X			24"				CMP	c. 1957	no	Anne Howanski 610-833-1927	Ridley Township
G-554	G-555	X			18"				RCP	c. 1957	no	Anne Howanski 610-833-1928	Ridley Township
G-555	G-556	X			18"				RCP	c. 1957	no	Anne Howanski 610-833-1929	Ridley Township
G-556	G-557	X			18"				RCP	c. 1957	no	Anne Howanski 610-833-1930	Ridley Township
G-557	G-558	X			18"				RCP	c. 1957	no	Anne Howanski 610-833-1931	Ridley Township
G-558	G-559	X			18"				RCP	c. 1957	no	Anne Howanski 610-833-1932	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 29 OF 67

WATERSHED

Name: Crum Creek
Municipality: Ridley Township
County: Delaware

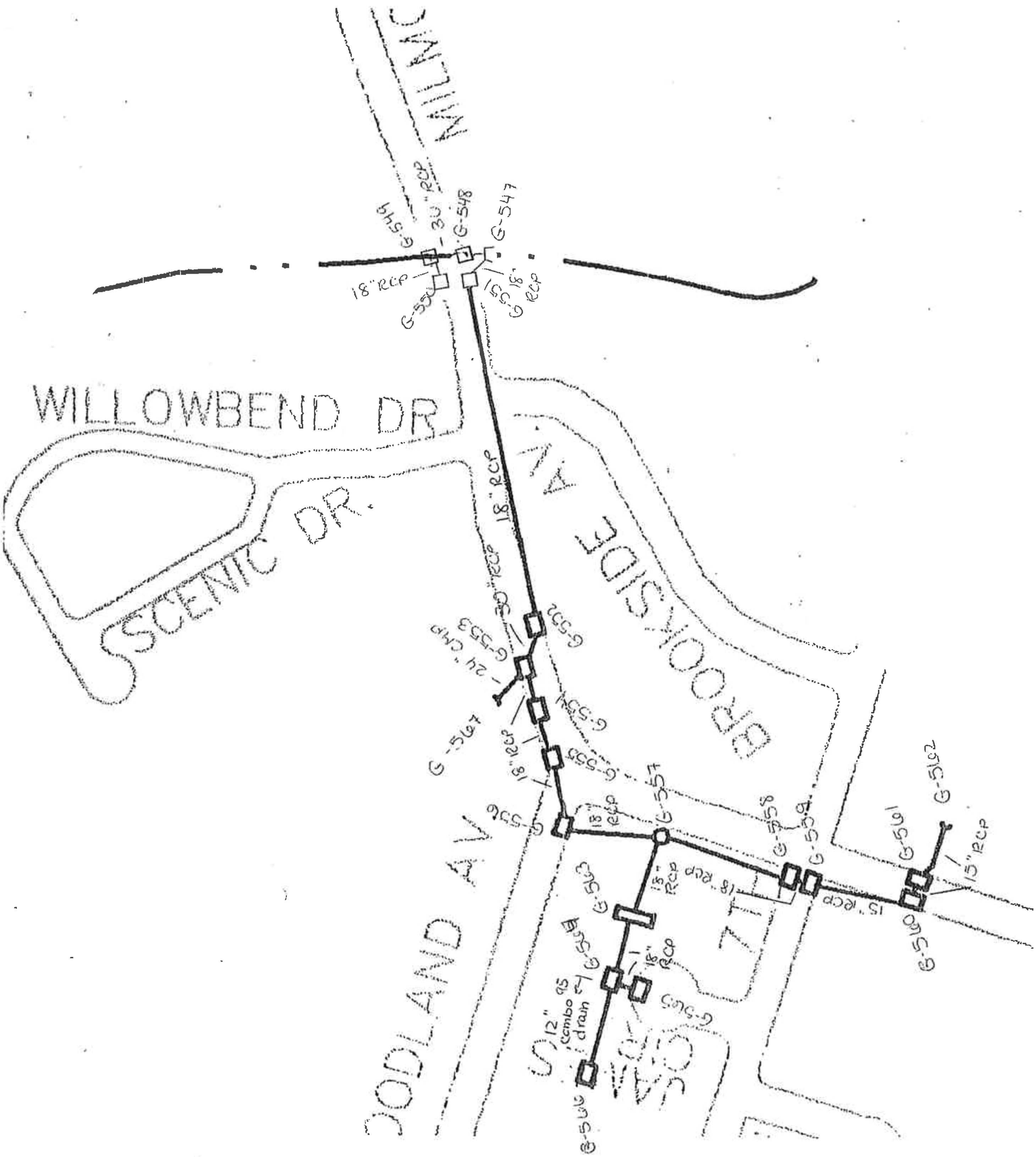
FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/11/2004

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-559	G-560	X			15"				RCP	c. 1957	no	Anne Howanski 610-833-1933	Ridley Township
G-560	G-561	X			15"				RCP	c. 1957	no	Anne Howanski 610-833-1933	Ridley Township
G-561	G-562	X			15"				RCP	c. 1957	no	Anne Howanski 610-833-1922	Ridley Township
G-557	G-563	X			18"				RCP	c. 1957	no	Anne Howanski 610-833-1923	Ridley Township
G-563	G-564	X			18"				RCP	c. 1957	no	Anne Howanski 610-833-1924	Ridley Township
G-564	G-565	X			18"				RCP	c. 1957	no	Anne Howanski 610-833-1925	Ridley Township
G-564	G-566	X			12"				combo drain	c. 1995	no	Anne Howanski 610-833-1926	Ridley Township



WILLOWBEND DR
SCENIC DR.
BROOKSIDE AV.
ODLAND AV
G-549
30" RCP
G-548
G-547
18" RCP
G-552
G-553
24" CMP
G-554
G-567
G-555
G-556
G-557
G-558
G-559
15" RCP
G-561
G-562
G-560
G-563
G-564
G-565
G-566

FORM G (14)

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 30 OF 67

WATERSHED

Name: Crum Creek
Municipality: Ridley Township
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/12/2004

INSTRUCTIONS

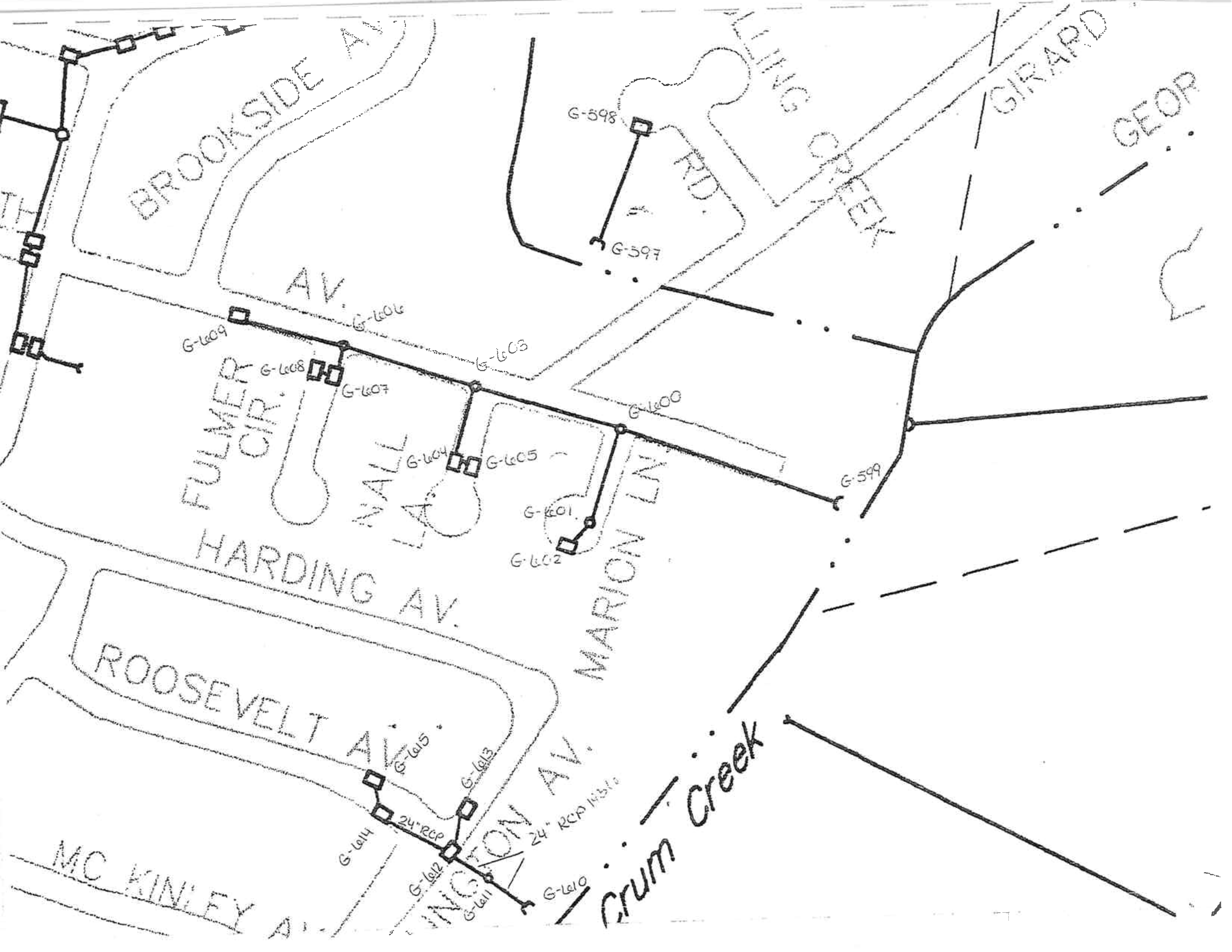
Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-597	G-598	X			18"				RCP	c. 1960	no	Anne Howanski 610-833-1933	Ridley Township
G-599	G-600	X			24"				RCP	c. 1966	no	Anne Howanski 610-833-1933	Ridley Township
G-600	G-601	X			18"				RCP	c. 1966	no	Anne Howanski 610-833-1922	Ridley Township
G-601	G-602	X			15"				RCP	c. 1966	no	Anne Howanski 610-833-1923	Ridley Township
G-600	G-603	X			24"				RCP	c. 1966	no	Anne Howanski 610-833-1924	Ridley Township
G-603	G-604	X			18"				RCP	c. 1980	no	Anne Howanski 610-833-1925	Ridley Township
G-604	G-605	X			15"				RCP	c. 1980	no	Anne Howanski 610-833-1926	Ridley Township
G-603	G-606	X			18"				RCP	c. 1966	no	Anne Howanski 610-833-1927	Ridley Township
G-606	G-607	X			18"				RCP	c. 1966	no	Anne Howanski 610-833-1928	Ridley Township
G-607	G-608	X			15"				RCP	c. 1966	no	Anne Howanski 610-833-1929	Ridley Township
G-606	G-609	X			18"				RCP	c. 1966	no	Anne Howanski 610-833-1930	Ridley Township
G-610	G-611	X			24"				RCP	c. 1952	no	Anne Howanski 610-833-1931	Ridley Township
G-611	G-612	X			24"				RCP	c. 1952	no	Anne Howanski 610-833-1932	Ridley Township

FORM G (14)

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 31 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-612	G-613	X			15"				RCP	c. 1952	no	Anne Howanski 610-833-1933	Ridley Township
G-612	G-614	X			24"				RCP	c. 1952	no	Anne Howanski 610-833-1933	Ridley Township
G-614	G-615	X			15"				RCP	c. 1952	no	Anne Howanski 610-833-1922	Ridley Township


BROOKSIDE AV.
AV.
FULMER CIR.
NALL LA.
HARDING AV.
ROOSEVELT AV.
MARION LN.
MC KINLEY AV.
GIRARD
GEOR
RD.
CREEK
Crum Creek
G-597
G-598
G-599
G-600
G-601
G-602
G-603
G-604
G-605
G-606
G-607
G-608
G-609
G-610
G-611
G-612
G-613
G-614
G-615
24" RCP
24" RCP

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 32 OF 67

WATERSHED

Name: Crum Creek
Municipality: Ridley Township
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/12/2004

INSTRUCTIONS

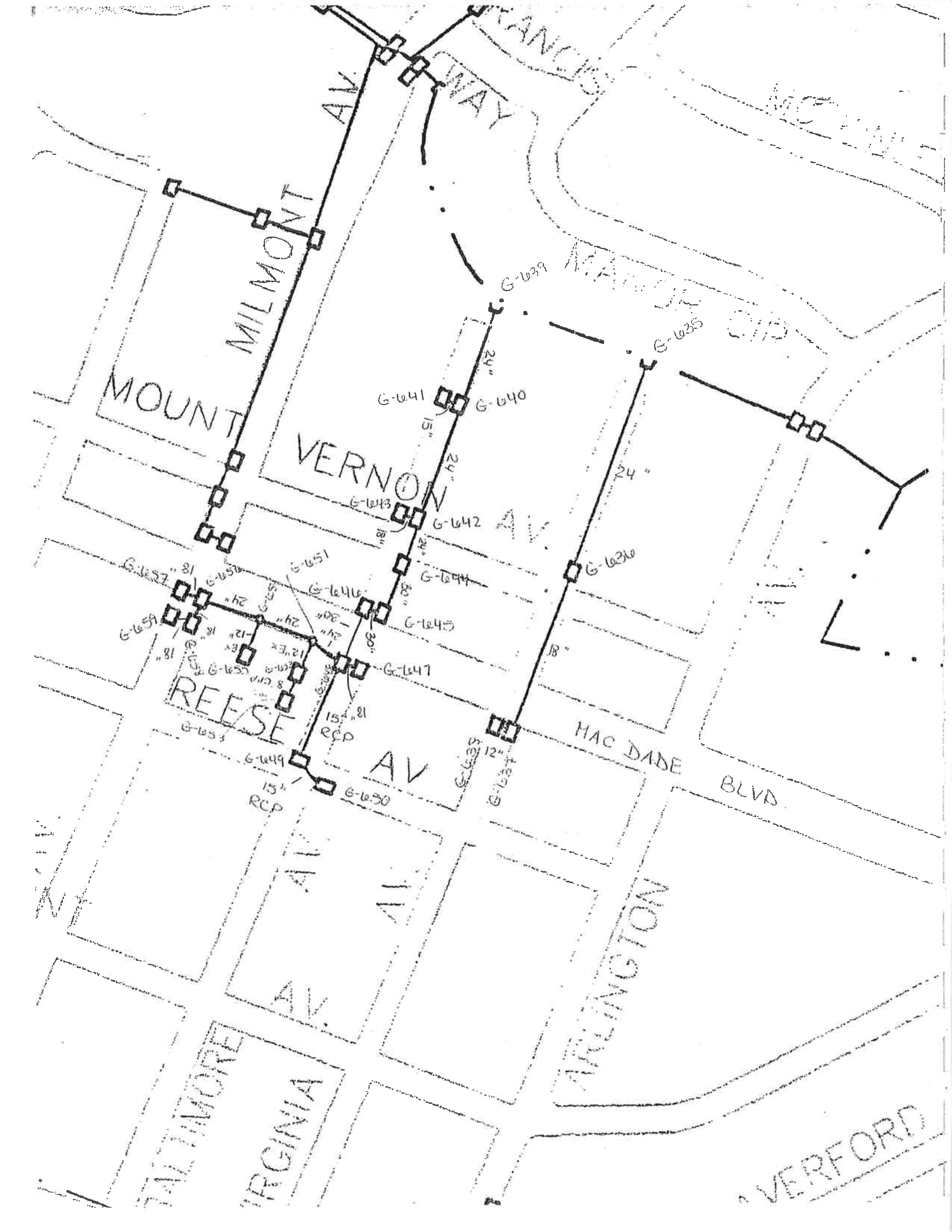
Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-635	G-636	X			24"				RCP	c. 1950	no	Anne Howanski 610-833-1933	Ridley Township
G-636	G-637	X			18"				RCP	c. 1950	no	Anne Howanski 610-833-1933	Ridley Township
G-637	G-638	X			12"				RCP	c. 1950	no	Anne Howanski 610-833-1922	Ridley Township
G-639	G-640	X			24"				RCP	c. 1950	no	Anne Howanski 610-833-1923	Ridley Township
G-640	G-641	X			15"				RCP	c. 1950	no	Anne Howanski 610-833-1924	Ridley Township
G-640	G-642	X			24"				RCP	c. 1950	no	Anne Howanski 610-833-1925	Ridley Township
G-642	G-643	X			18"				RCP	c. 1950	no	Anne Howanski 610-833-1926	Ridley Township
G-642	G-644	X			24"				RCP	c. 1950	no	Anne Howanski 610-833-1927	Ridley Township
G-644	G-645	X			30"				RCP	c. 1950	no	Anne Howanski 610-833-1928	Ridley Township
G-645	G-646	X			30"				RCP	c. 1950	no	Anne Howanski 610-833-1929	Ridley Township
G-646	G-648	X			30"				RCP	c. 1950	no	Anne Howanski 610-833-1930	Ridley Township
G-648	G-647	X			18"				RCP	c. 1950	no	Anne Howanski 610-833-1931	Ridley Township
G-648	G-649	X			15"				RCP	c. 1950	no	Anne Howanski 610-833-1932	Ridley Township

FORM G (15)

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 33 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-649	G-650	X			15"				RCP	c. 1950	no	Anne Howanski 610-833-1933	Ridley Township
G-648	G-651	X			24"				RCP	c. 1950	no	Anne Howanski 610-833-1933	Ridley Township
G-651	G-652	X			12"				RCP	c. 1950	no	Anne Howanski 610-833-1922	Ridley Township
G-652	G-653	X			8"				CPP	c. 1995	no	Anne Howanski 610-833-1923	Ridley Township
G-651	G-654	X			24"				RCP	c. 1950	no	Anne Howanski 610-833-1924	Ridley Township
G-654	G-655	X			12"				RCP	c. 1950	no	Anne Howanski 610-833-1925	Ridley Township
G-654	G-656	X			24"				RCP	c. 1950	no	Anne Howanski 610-833-1926	Ridley Township
G-656	G-657	X			18"				RCP	c. 1950	no	Anne Howanski 610-833-1927	Ridley Township
G-656	G-658	X			18"				RCP	c. 1950	no	Anne Howanski 610-833-1928	Ridley Township
G-658	G-659	X			18"				RCP	c. 1950	no	Anne Howanski 610-833-1929	Ridley Township


MILMONT AV.
WAY
MOUNT VERNON AV.
REESE AV
MAC DADE BLVD.
ARLINGTON
BALTIMORE
VIRGINIA
AV.
VERFORD
G-639
G-635
G-641
G-640
G-643
G-642
G-636
G-644
G-646
G-645
G-651
G-657
G-658
G-659
G-655
G-647
G-648
G-653
G-649
G-650
G-638
G-637
24"
15"
18"
30"
12"
15" RCP
12" EX
8" CMP

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 34 OF 67

WATERSHED

Name: Crum Creek
Municipality: Ridley Township
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/12/2004

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-679	G-680	X			42"				RCP	c. 1993	no	Anne Howanski 610-833-1933	Ridley Township
G-680	G-681	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township
G-680	G-683	X			42"				RCP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township
G-679	G-682	X			42"				RCP	c. 1993	no	Anne Howanski 610-833-1923	Ridley Township
G-682	G-684	X			42"				RCP	c. 1993	no	Anne Howanski 610-833-1924	Ridley Township
G-684	G-685	X			24"				CPP	c. 1993	no	Anne Howanski 610-833-1925	Ridley Township
G-685	G-686	X			24"				CPP	c. 1993	no	Anne Howanski 610-833-1926	Ridley Township
G-686	G-687	X			24"				CPP	c. 1993	no	Anne Howanski 610-833-1927	Ridley Township
G-685	G-688	X			18"				CPP	c. 1993	no	Anne Howanski 610-833-1928	Ridley Township
G-688	G-689	X			18"				CPP	c. 1993	no	Anne Howanski 610-833-1929	Ridley Township
G-689	G-690	X			18"				CPP	c. 1993	no	Anne Howanski 610-833-1930	Ridley Township
G-690	G-691	X			12"				CPP	c. 1993	no	Anne Howanski 610-833-1931	Ridley Township
G-684	G-692	X			30"				CPP	c. 1993	no	Anne Howanski 610-833-1932	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 35 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-692	G-693	X			42"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township
G-693	G-694	X			42"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township
G-694	G-695	X			36"				RCP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township
G-695	G-696	X			30"				RCP	c. 1955	no	Anne Howanski 610-833-1923	Ridley Township
G-696	G-697	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1924	Ridley Township
G-697	G-698	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1925	Ridley Township
G-696	G-699	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1926	Ridley Township
G-699	G-700	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1927	Ridley Township
G-700	G-701	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1928	Ridley Township
G-699	G-702	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1929	Ridley Township
G-702	G-703	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1930	Ridley Township
G-696	G-704	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1931	Ridley Township
G-704	G-705	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1932	Ridley Township
G-705	G-706	X			15"				CPP	c. 1995	no	Anne Howanski 610-833-1933	Ridley Township
G-706	G-707	X			15"				CPP	c. 1995	no	Anne Howanski 610-833-1934	Ridley Township
G-707	G-708	X			15"				CPP	c. 1995	no	Anne Howanski 610-833-1935	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 36 OF 67

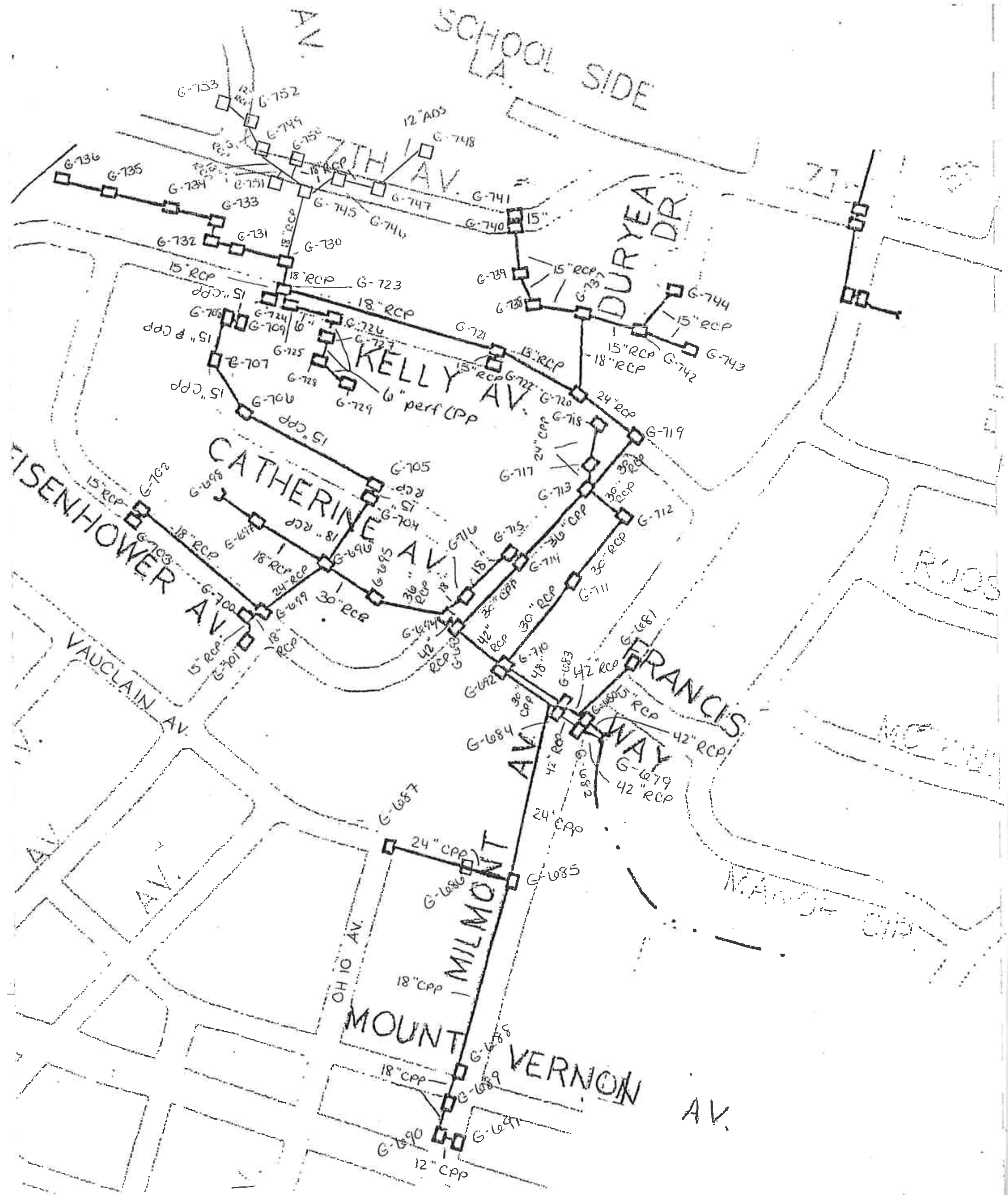
Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-708	G-709	X			15"				CPP	c. 1995	no	Anne Howanski 610-833-1933	Ridley Township
G-683	G-710	X			48"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township
G-710	G-711	X			30"				RCP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township
G-711	G-712	X			30"				RCP	c. 1955	no	Anne Howanski 610-833-1923	Ridley Township
G-712	G-713	X			30"				RCP	c. 1955	no	Anne Howanski 610-833-1924	Ridley Township
G-713	G-714	X			36"				CPP	c. 1995	no	Anne Howanski 610-833-1925	Ridley Township
G-714	G-693	X			30"				CPP	c. 1995	no	Anne Howanski 610-833-1926	Ridley Township
G-715	G-716	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1928	Ridley Township
G-716	G-694	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1929	Ridley Township
G-713	G-717	X			24"				CPP	c. 1995	no	Anne Howanski 610-833-1930	Ridley Township
G-717	G-718	X			24"				CPP	c. 1995	no	Anne Howanski 610-833-1931	Ridley Township
G-713	G-719	X			30"				RCP	c. 1955	no	Anne Howanski 610-833-1932	Ridley Township
G-719	G-720	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township
G-720	G-721	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1934	Ridley Township
G-721	G-722	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1935	Ridley Township
G-721	G-723	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 37 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-723	G-724	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township
G-725	G-726	X			6"				CPP	c. 1995	no	Anne Howanski 610-833-1923	Ridley Township
G-726	G-727	X			6"				PCPP	c. 1995	no	Anne Howanski 610-833-1924	Ridley Township
G-727	G-728	X			6"				PCPP	c. 1995	no	Anne Howanski 610-833-1925	Ridley Township
G-728	G-729	X			6"				PCPP	c. 1995	no	Anne Howanski 610-833-1926	Ridley Township
G-723	G-730	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1927	Ridley Township
G-730	G-731	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1928	Ridley Township
G-731	G-732	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1929	Ridley Township
G-732	G-733	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1930	Ridley Township
G-733	G-734	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1931	Ridley Township
G-734	G-735	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1932	Ridley Township
G-735	G-736	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township
G-720	G-737	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1934	Ridley Township
G-737	G-738	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1935	Ridley Township
G-738	G-739	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township
G-739	G-740	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 38 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-740	G-741	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township
G-737	G-742	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1923	Ridley Township
G-742	G-743	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1924	Ridley Township
G-742	G-744	X			15"				RCP	c. 1960	no	Anne Howanski 610-833-1925	Ridley Township
G-730	G-745	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1925	Ridley Township
G-745	G-746	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1926	Ridley Township
G-746	G-747	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1927	Ridley Township
G-747	G-748	X			12"				ADS	c. 1955	no	Anne Howanski 610-833-1928	Ridley Township
G-745	G-750	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1929	Ridley Township
G-745	G-751	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1930	Ridley Township
G-745	G-749	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1931	Ridley Township
G-749	G-752	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1932	Ridley Township
G-752	G-753	X			12"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township


SCHOOL LA.
SIDE
7TH AV.
DURYEA DR.
KELLY AV.
CATHERINE AV.
EISENHOWER AV.
VAUCLAIN AV.
FRANCIS WAY
MILMONT AV.
OHIO AV.
MOUNT VERNON AV.
G-753
G-752
G-749
G-750
G-751
G-748
12" ADS
G-736
G-735
G-734
G-733
G-745
G-747
G-746
G-741
G-740
15"
G-732
G-731
G-730
18" RCP
G-723
15" RCP
18" RCP
G-739
15" RCP
G-738
G-737
G-744
15" RCP
G-742
G-743
15" RCP
18" RCP
G-708
G-709
G-724
G-726
G-727
G-725
G-728
G-729
6" perf CPP
G-721
15" RCP
G-722
G-720
24" RCP
G-719
G-707
15" CPP
G-706
15" CPP
G-718
24" CPP
G-717
G-713
G-705
G-704
G-702
15" RCP
G-703
18" RCP
G-698
G-697
18" RCP
G-696
G-695
24" RCP
30" RCP
G-716
G-715
G-714
30" CPP
G-712
30" RCP
G-711
G-700
G-699
G-701
15" RCP
18" RCP
G-694
G-693
42" RCP
36" RCP
42" RCP
30" RCP
G-710
G-692
48"
G-683
42" RCP
G-681
G-680
G-684
42" RCP
G-682
G-679
42" RCP
24" CPP
G-687
24" CPP
G-686
G-685
18" CPP
G-688
18" CPP
G-689
G-690
G-691
12" CPP

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 39 OF 67

WATERSHED

Name: Crum Creek
Municipality: Ridley Township
County: Delaware

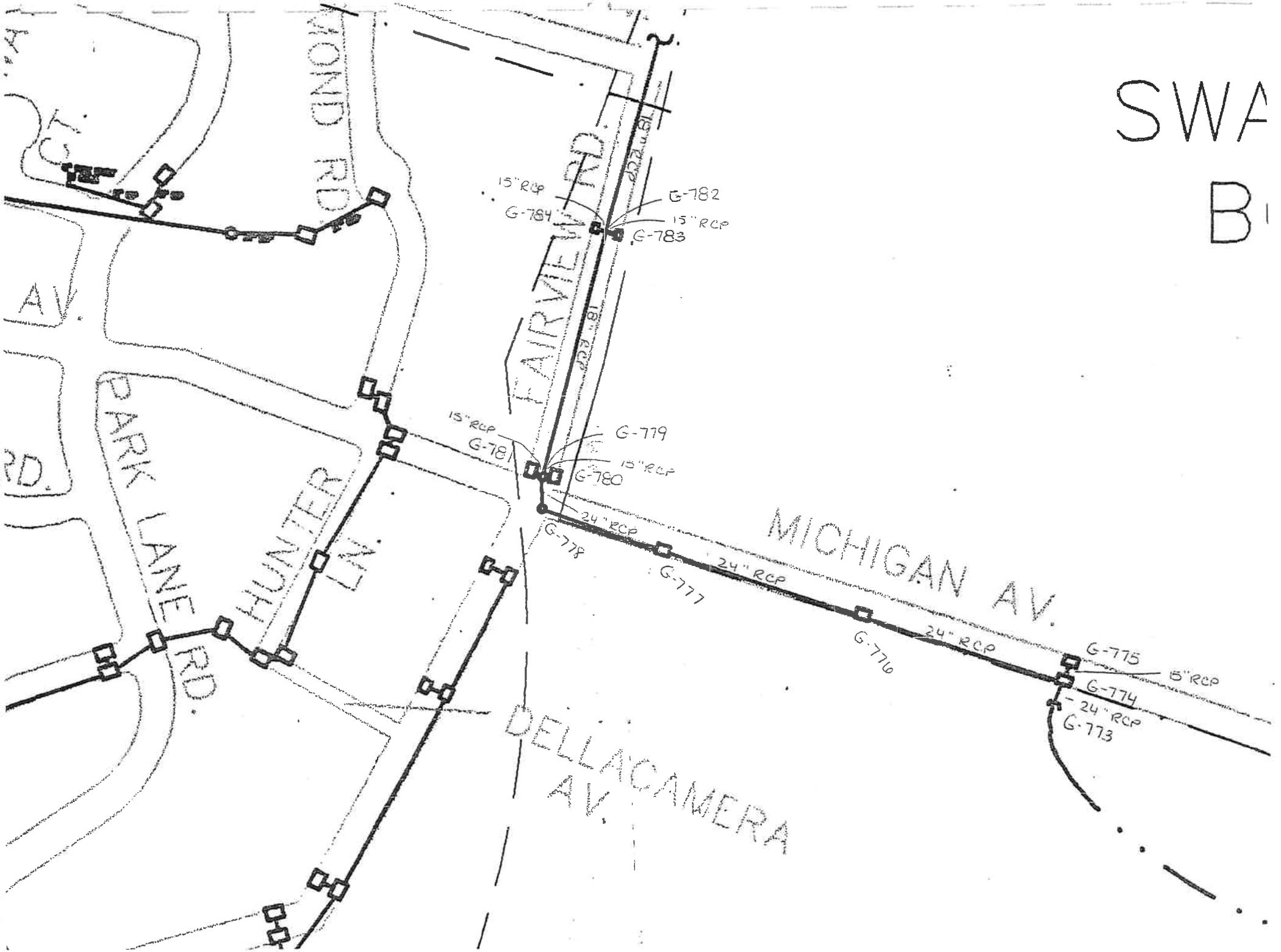
FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/16/2004

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-773	G-774	X			24"				RCP	c. 1957	no	Anne Howanski 610-833-1933	Ridley Township
G-774	G-775	X			15"				RCP	c. 1957	no	Anne Howanski 610-833-1933	Ridley Township
G-774	G-776	X			24"				RCP	c. 1957	no	Anne Howanski 610-833-1922	Ridley Township
G-776	G-777	X			24"				RCP	c. 1957	no	Anne Howanski 610-833-1923	Ridley Township
G-777	G-778	X			24"				RCP	c. 1957	no	Anne Howanski 610-833-1924	Ridley Township
G-778	G-779	X			24"				RCP	c. 1957	no	Anne Howanski 610-833-1925	Ridley Township
G-779	G-780	X			15"				RCP	c. 1957	no	Anne Howanski 610-833-1926	Ridley Township
G-779	G-781	X			15"				RCP	c. 1957	no	Anne Howanski 610-833-1927	Ridley Township
G-779	G-782	X			18"				RCP	c. 1957	no	Anne Howanski 610-833-1928	Ridley Township
G-782	G-783	X			15"				RCP	c. 1957	no	Anne Howanski 610-833-1929	Ridley Township
G-782	G-784	X			15"				RCP	c. 1957	no	Anne Howanski 610-833-1930	Ridley Township
G-782	G-Swarth-more Boro	X			18"				RCP	c. 1957	no	Anne Howanski 610-833-1931	Ridley Township


SWA
B
AV.
RD.
WOOD RD.
PARK LANE RD.
HUNTER LN.
FAIRVIEW RD.
DELLACAMERA AV.
MICHIGAN AV.
15" RCP
G-784
G-782
15" RCP
G-783
18" RCP
15" RCP
G-781
G-779
15" RCP
G-780
24" RCP
G-778
G-777
24" RCP
G-776
24" RCP
G-775
15" RCP
G-774
24" RCP
G-773

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 40 OF 67

WATERSHED
Name: Crum Creek
Municipality: Ridley Township
County: Delaware

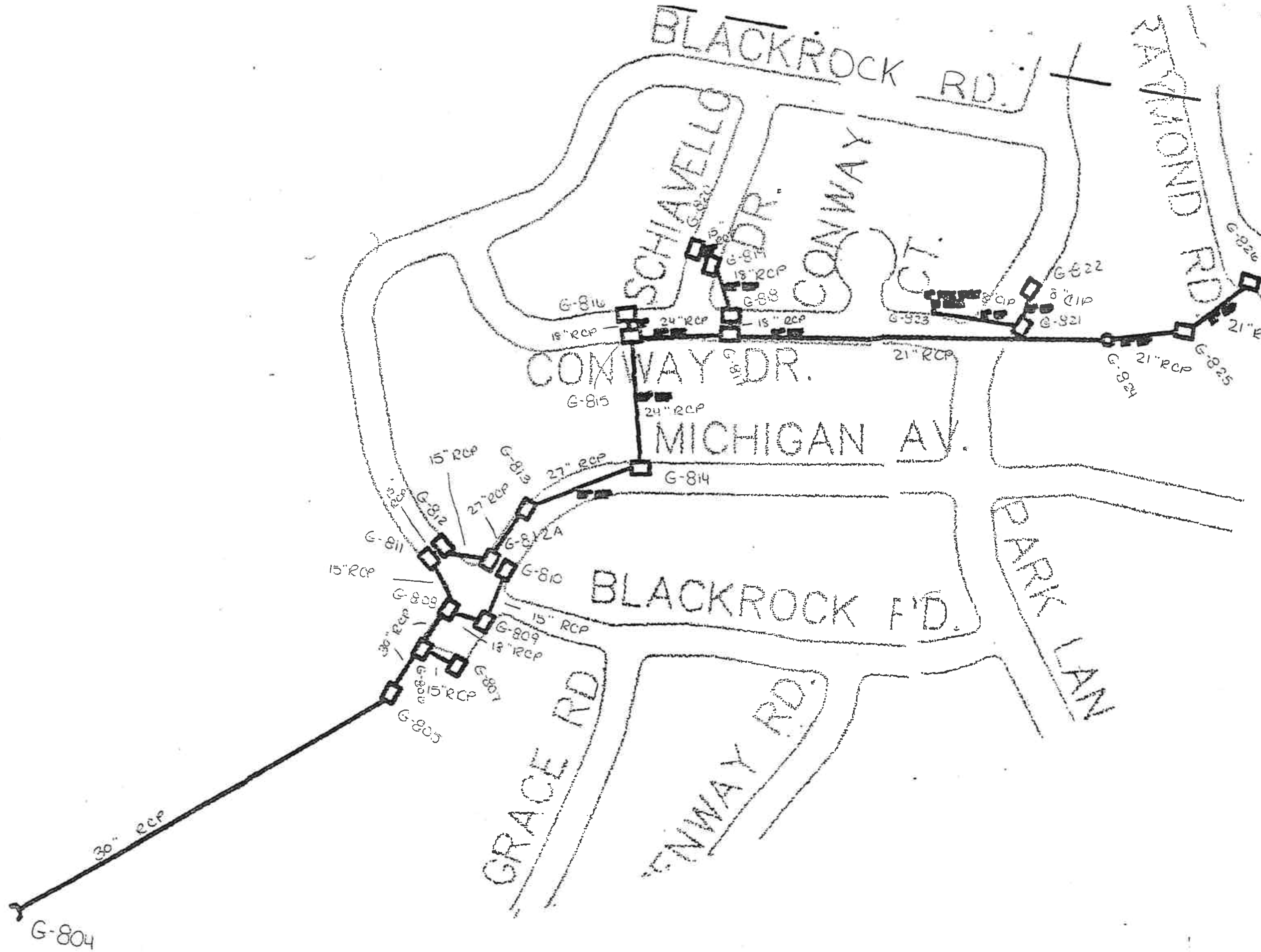
FORM COMPLETED BY
Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/16/2004

INSTRUCTIONS
Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-804	G-805	X			30"				RCP	c. 1953	no	Anne Howanski 610-833-1933	Ridley Township
G-805	G-806	X			30"				RCP	c. 1953	no	Anne Howanski 610-833-1933	Ridley Township
G-806	G-807	X			15"				RCP	c. 1953	no	Anne Howanski 610-833-1922	Ridley Township
G-806	G-808	X			30"				RCP	c. 1953	no	Anne Howanski 610-833-1923	Ridley Township
G-808	G-809	X			18"				RCP	c. 1953	no	Anne Howanski 610-833-1924	Ridley Township
G-809	G-810	X			15"				RCP	c. 1953	no	Anne Howanski 610-833-1925	Ridley Township
G-808	G-811	X			15"				RCP	c. 1953	no	Anne Howanski 610-833-1926	Ridley Township
G-811	G-812	X			15"				RCP	c. 1953	no	Anne Howanski 610-833-1927	Ridley Township
G-812	G-812A	X			15"				RCP	c. 1953	no	Anne Howanski 610-833-1928	Ridley Township
G-812A	G-813	X			27"				RCP	c. 1953	no	Anne Howanski 610-833-1929	Ridley Township
G-813	G-814	X			27"				RCP	c. 1953	no	Anne Howanski 610-833-1930	Ridley Township
G-814	G-815	X			24"				RCP	c. 1953	no	Anne Howanski 610-833-1931	Ridley Township
G-815	G-816	X			18"				RCP	c. 1953	no	Anne Howanski 610-833-1932	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 41 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-815	G-817	X			24"				RCP	c. 1953	no	Anne Howanski 610-833-1933	Ridley Township
G-817	G-818	X			18"				RCP	c. 1953	no	Anne Howanski 610-833-1933	Ridley Township
G-818	G-819	X			18"				RCP	c. 1953	no	Anne Howanski 610-833-1922	Ridley Township
G-819	G-820	X			15"				RCP	c. 1953	no	Anne Howanski 610-833-1923	Ridley Township
G-817	G-821	X			21"				RCP	c. 1953	no	Anne Howanski 610-833-1924	Ridley Township
G-821	G-822	X			8"				RCP	c. 1953	no	Anne Howanski 610-833-1925	Ridley Township
G-821	G-823	X			8"				RCP	c. 1953	no	Anne Howanski 610-833-1926	Ridley Township
G-821	G-824	X			21"				RCP	c. 1953	no	Anne Howanski 610-833-1927	Ridley Township
G-824	G-825	X			21"				RCP	c. 1953	no	Anne Howanski 610-833-1928	Ridley Township
G-825	G-826	X			21"				RCP	c. 1953	no	Anne Howanski 610-833-1929	Ridley Township


BLACKROCK RD.
SCHIAVELLO DR.
CONWAY CT.
CONWAY DR.
MICHIGAN AV.
BLACKROCK F'D.
GRACE RD
PARK LAN
NWAY RD.
AYMOND RD.
G-804
30" RCP
G-805
G-807
15"RCP
18"RCP
G-809
15" RCP
G-810
15"RCP
G-811
G-812
27"RCP
G-813
27" RCP
G-814
24"RCP
G-815
G-816
18"RCP
24"RCP
15" RCP
18"RCP
G-818
G-819
G-823
8" CIP
G-821
G-822
21"RCP
G-824
21"RCP
G-825
21"RCP
G-826

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 42 OF 67

WATERSHED

Name: Crum Creek
Municipality: Ridley Township
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/16/2004

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-846	G-848	X			42"				RCP	c. 1952	no	Anne Howanski 610-833-1933	Ridley Township
G-847	G-848	X			30"				CPP	c. 1993	no	Anne Howanski 610-833-1933	Ridley Township
G-848	G-849	X			21"				RCP	c.1952	no	Anne Howanski 610-833-1922	Ridley Township
G-848	G-850	X			30"				CPP	c. 1993	no	Anne Howanski 610-833-1923	Ridley Township
G-848	G-850	X			42"				RCP	c. 1952	no	Anne Howanski 610-833-1924	Ridley Township
G-850	G-852	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1924	Ridley Township
G-850	G-851	X			36"				RCP	c. 1952	no	Anne Howanski 610-833-1925	Ridley Township
G-851	G-853	X			18"				CPP	c. 1993	no	Anne Howanski 610-833-1926	Ridley Township
G-851	G-854	X			36"				RCP	c. 1952	no	Anne Howanski 610-833-1927	Ridley Township
G-854	G-855	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1928	Ridley Township
G-855	G-856	X			15"				RCP	c. 1952	no	Anne Howanski 610-833-1929	Ridley Township
G-854	G-857	X			36"				RCP	c. 1952	no	Anne Howanski 610-833-1930	Ridley Township
G-857	G-858	X			8"				RCP	c. 1952	no	Anne Howanski 610-833-1931	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 43 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-857	G-859	X			30"				CPP	c. 1995	no	Anne Howanski 610-833-1932	Ridley Township
G-859	G-860	X			30"				CPP	c. 1995	no	Anne Howanski 610-833-1933	Ridley Township
G-860	G-861	X			30"				CPP	c. 1995	no	Anne Howanski 610-833-1933	Ridley Township
G-861	G-862	X			15"				RCP	c. 1952	no	Anne Howanski 610-833-1922	Ridley Township
G-861	G-863	X			30"				CPP	c. 1995	no	Anne Howanski 610-833-1923	Ridley Township
G-863	G-864	X			24"				CPP	c. 1995	no	Anne Howanski 610-833-1924	Ridley Township
G-864	G-865	X			24"				CPP	c. 1995	no	Anne Howanski 610-833-1925	Ridley Township
G-865	G-866	X			18"				CPP	c. 1995	no	Anne Howanski 610-833-1926	Ridley Township
G-866	G-867	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1927	Ridley Township
G-867	G-868	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1928	Ridley Township
G-868	G-869	X			15"				RCP	c. 1952	no	Anne Howanski 610-833-1929	Ridley Township
G-869	G-870	X			15"				RCP	c. 1952	no	Anne Howanski 610-833-1930	Ridley Township
G-870	G-871	X			15"				RCP	c. 1952	no	Anne Howanski 610-833-1931	Ridley Township
G-857	G-872	X			24"				RCP	c. 1952	no	Anne Howanski 610-833-1932	Ridley Township
G-872	G-873	X							RCP	c. 1952	no	Anne Howanski 610-833-1930	Ridley Township
G-873	G-874	X							RCP	c. 1952	no	Anne Howanski 610-833-1931	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 44 OF 67

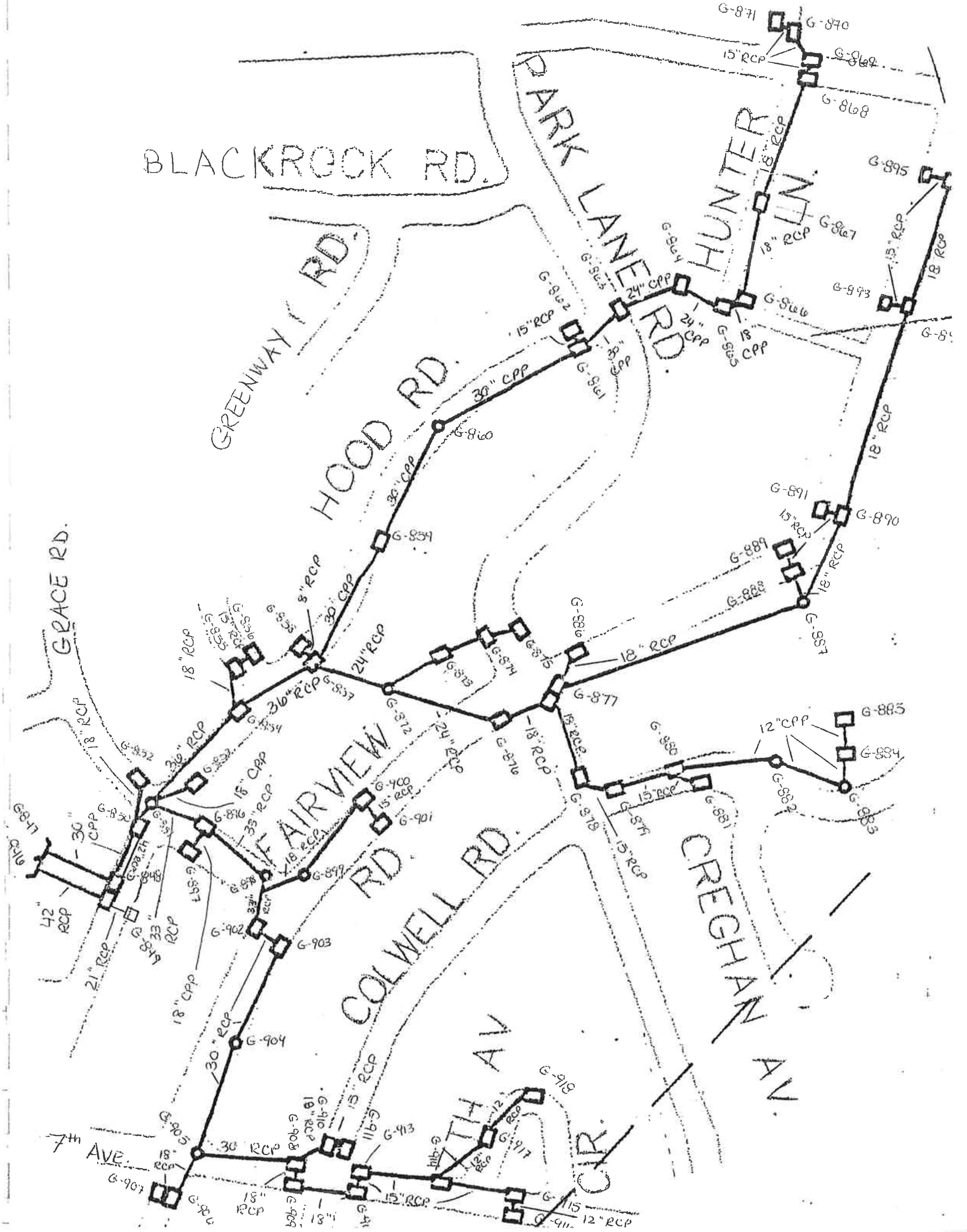
Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-874	G-875	X							RCP	c. 1952	no	Anne Howanski 610-833-1932	Ridley Township
G-872	G-876	X			24"				RCP	c. 1954	no	Anne Howanski 610-833-1933	Ridley Township
G-876	G-877	X			18"				RCP	c. 1954	no	Anne Howanski 610-833-1933	Ridley Township
G-877	G-878	X			18"				RCP	c. 1954	no	Anne Howanski 610-833-1922	Ridley Township
G-878	G-879	X			15"				RCP	c. 1954	no	Anne Howanski 610-833-1923	Ridley Township
G-879	G-880	X			15"				RCP	c. 1954	no	Anne Howanski 610-833-1924	Ridley Township
G-880	G-881	X			15"				RCP	c. 1954	no	Anne Howanski 610-833-1925	Ridley Township
G-880	G-882	X			12"				CPP	c. 1952	no	Anne Howanski 610-833-1926	Ridley Township
G-882	G-883	X			12"				CPP	c. 1952	no	Anne Howanski 610-833-1927	Ridley Township
G-883	G-884	X			12"				CPP	c. 1952	no	Anne Howanski 610-833-1928	Ridley Township
G-884	G-885	X			12"				CPP	c. 1952	no	Anne Howanski 610-833-1929	Ridley Township
G-877	G-886	X			18"				RCP	c. 1954	no	Anne Howanski 610-833-1930	Ridley Township
G-877	G-887	X			18"				RCP	c. 1954	no	Anne Howanski 610-833-1931	Ridley Township
G-887	G-888	X			18"				RCP	c. 1954	no	Anne Howanski 610-833-1932	Ridley Township
G-888	G-889	X			15"				RCP	c. 1954	no	Anne Howanski 610-833-1930	Ridley Township
G-887	G-890	X			18"				RCP	c. 1954	no	Anne Howanski 610-833-1931	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 45 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-890	G-891	X			15"				RCP	c. 1954	no	Anne Howanski 610-833-1932	Ridley Township
G-890	G-892	X			18"				RCP	c. 1954	no	Anne Howanski 610-833-1933	Ridley Township
G-892	G-893	X			15"				RCP	c. 1954	no	Anne Howanski 610-833-1933	Ridley Township
G-892	G-894	X			18"				RCP	c. 1954	no	Anne Howanski 610-833-1922	Ridley Township
G-894	G-895	X			15"				RCP	c. 1954	no	Anne Howanski 610-833-1923	Ridley Township
G-851	G-896	X			33"				RCP	c. 1952	no	Anne Howanski 610-833-1924	Ridley Township
G-896	G-897	X			18"				CPP	c. 1993	no	Anne Howanski 610-833-1925	Ridley Township
G-896	G-898	X			33"				RCP	c. 1952	no	Anne Howanski 610-833-1926	Ridley Township
G-898	G-899	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1927	Ridley Township
G-899	G-900	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1928	Ridley Township
G-900	G-901	X			15"				RCP	c. 1952	no	Anne Howanski 610-833-1929	Ridley Township
G-898	G-902	X			33"				RCP	c. 1952	no	Anne Howanski 610-833-1930	Ridley Township
G-902	G-903	X			30"				RCP	c. 1952	no	Anne Howanski 610-833-1931	Ridley Township
G-903	G-904	X			30"				RCP	c. 1952	no	Anne Howanski 610-833-1932	Ridley Township
G-904	G-905	X			30"				RCP	c. 1952	no	Anne Howanski 610-833-1930	Ridley Township
G-905	G-906	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1931	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 46 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-906	G-907	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1932	Ridley Township
G-905	G-908	X			30"				RCP	c. 1952	no	Anne Howanski 610-833-1932	Ridley Township
G-908	G-910	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1933	Ridley Township
G-910	G-911	X			15"				RCP	c. 1952	no	Anne Howanski 610-833-1933	Ridley Township
G-908	G-909	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1922	Ridley Township
G-909	G-912	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1923	Ridley Township
G-912	G-913	X			15"				RCP	c. 1967	no	Anne Howanski 610-833-1924	Ridley Township
G-913	G-914	X			15"				RCP	c. 1967	no	Anne Howanski 610-833-1925	Ridley Township
G-914	G-915	X			15"				RCP	c. 1967	no	Anne Howanski 610-833-1926	Ridley Township
G-915	G-916	X			12"				RCP	c. 1952	no	Anne Howanski 610-833-1927	Ridley Township
G-914	G-917	X			12"				RCP	c. 1952	no	Anne Howanski 610-833-1928	Ridley Township
G-917	G-918	X			12"				RCP	c. 1952	no	Anne Howanski 610-833-1929	Ridley Township



BLACKROCK RD.
PARK LANE RD.
HUNTER LN
GREENWAY RD.
HOOD RD.
GRACE RD.
FAIRVIEW RD.
COLWELL RD.
CREGHAN AV.
7th AVE.
G-871
G-870
G-869
G-868
15" RCP
18" RCP
G-867
G-866
G-865
G-864
G-863
G-862
G-861
G-860
24" CPP
30" CPP
15" RCP
G-895
G-893
18" RCP
15" RCP
G-891
G-890
G-889
G-888
G-887
G-886
18" RCP
G-859
G-858
G-857
G-856
G-855
G-854
G-852
24" RCP
36" RCP
G-872
G-873
G-874
G-875
G-876
G-877
G-878
G-879
G-880
G-881
G-882
G-883
G-884
G-885
12" CPP
15" RCP
18" RCP
G-850
G-849
G-847
42" RCP
21" RCP
33" RCP
18" CPP
G-896
G-898
G-899
G-900
G-901
G-902
G-903
G-904
G-905
G-907
G-913
G-917
G-918
30" RCP
12" RCP

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 47 OF 67

WATERSHED

Name: Crum Creek
Municipality: Ridley Township
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/16/2004

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-938	G-939	X			15"				RCP	c. 1959	no	Anne Howanski 610-833-1933	Ridley Township
G-940	G-941	X			18"				RCP	c. 1961	no	Anne Howanski 610-833-1933	Ridley Township
G-942	G-943	X			36"				ADS	c. 1991	no	Anne Howanski 610-833-1922	Ridley Township
G-943	G-944	X			36"				ADS	c. 1991	no	Anne Howanski 610-833-1923	Ridley Township
G-944	G-945	X			36"				ADS	c. 1991	no	Anne Howanski 610-833-1924	Ridley Township
G-945	G-946	X			36"				ADS	c. 1991	no	Anne Howanski 610-833-1924	Ridley Township
G-946	G-947	X			36"				ADS	c. 1991	no	Anne Howanski 610-833-1925	Ridley Township
G-947	G-948	X			36"				ADS	c. 1991	no	Anne Howanski 610-833-1926	Ridley Township
G-948	G-949	X			12"				ADS	c. 1991	no	Anne Howanski 610-833-1927	Ridley Township
G-949	G-950	X			15"				RCP	c. 1959	no	Anne Howanski 610-833-1928	Ridley Township
G-950	G-951	X			15"				RCP	c. 1959	no	Anne Howanski 610-833-1929	Ridley Township
G-948	G-952	X			30"				RCP	c. 1959	no	Anne Howanski 610-833-1930	Ridley Township
G-952	G-953	X			30"				RCP	c. 1959	no	Anne Howanski 610-833-1931	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 48 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-953	G-954	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1932	Ridley Township
G-954	G-955	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1933	Ridley Township
G-955	G-956	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1933	Ridley Township
G-954	G-957	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1922	Ridley Township
G-954	G-958	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1923	Ridley Township
G-958	G-960	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1924	Ridley Township
G-960	G-959	X			15"				RCP	c. 1959	no	Anne Howanski 610-833-1925	Ridley Township
G-960	G-962	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1926	Ridley Township
G-962	G-961	X			15"				RCP	c. 1959	no	Anne Howanski 610-833-1927	Ridley Township
G-962	G-963	X			12"				RCP	c. 1959	no	Anne Howanski 610-833-1928	Ridley Township
G-958	G-964	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1929	Ridley Township
G-958	G-965	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1930	Ridley Township
G-958	G-966	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1931	Ridley Township
G-958	G-967	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1932	Ridley Township
G-967	G-968	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1930	Ridley Township
G-968	G-969	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1931	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 49 OF 67

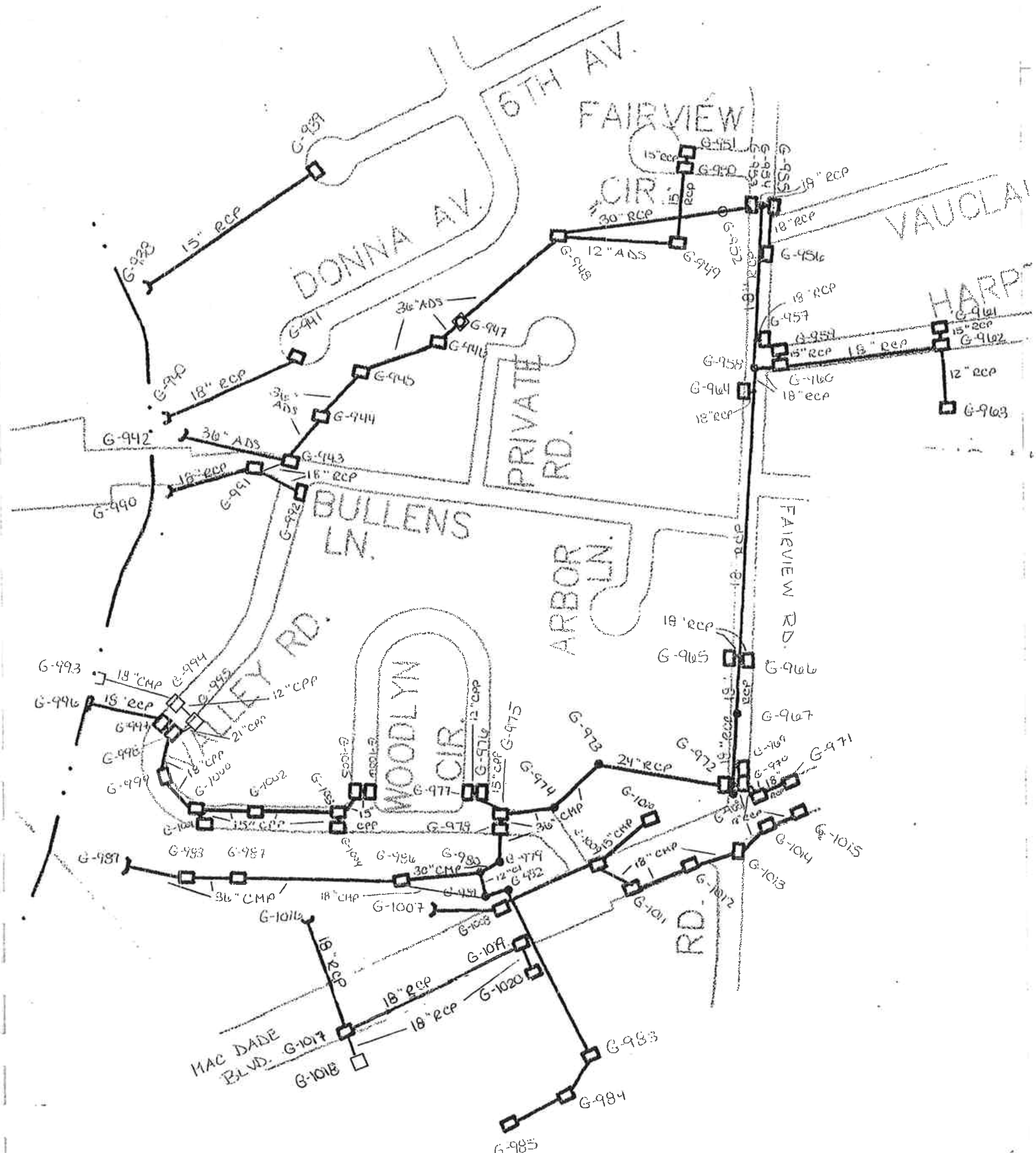
Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-969	G-970	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1932	Ridley Township
G-970	G-971	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1933	Ridley Township
G-968	G-972	X			24"				RCP	c. 1959	no	Anne Howanski 610-833-1933	Ridley Township
G-972	G-973	X			24"				RCP	c. 1959	no	Anne Howanski 610-833-1922	Ridley Township
G-973	G-974	X			36"				CMP	c. 1991	no	Anne Howanski 610-833-1923	Ridley Township
G-974	G-975	X			36"				CMP	c. 1991	no	Anne Howanski 610-833-1924	Ridley Township
G-975	G-976	X			15"				CPP	c. 1996	no	Anne Howanski 610-833-1925	Ridley Township
G-976	G-977	X			12"				CPP	c. 1996	no	Anne Howanski 610-833-1926	Ridley Township
G-975	G-978	X			36"				CMP	c. 1991	no	Anne Howanski 610-833-1927	Ridley Township
G-978	G-979	X			36"				CMP	c. 1991	no	Anne Howanski 610-833-1928	Ridley Township
G-979	G-980	X			30"				CMP	c. 1991	no	Anne Howanski 610-833-1929	Ridley Township
G-980	G-981	X			12"				CIP	c. 1959	no	Anne Howanski 610-833-1930	Ridley Township
G-981	G-982	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1931	Ridley Township
G-982	G-983	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1932	Ridley Township
G-983	G-984	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1930	Ridley Township
G-984	G-985	X			15"				RCP	c. 1959	no	Anne Howanski 610-833-1931	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 50 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-980	G-986	X			30"				CMP	c. 1959	no	Anne Howanski 610-833-1932	Ridley Township
G-986	G-981	X			18"				CMP	c. 1959	no	Anne Howanski 610-833-1933	Ridley Township
G-986	G-987	X			36"				CMP	c. 1991	no	Anne Howanski 610-833-1933	Ridley Township
G-987	G-988	X			36"				CMP	c. 1991	no	Anne Howanski 610-833-1933	Ridley Township
G-988	G-989	X			36"				CMP	c. 1991	no	Anne Howanski 610-833-1922	Ridley Township
G-990	G-991	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1923	Ridley Township
G-991	G-943	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1924	Ridley Township
G-991	G-992	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1925	Ridley Township
G-993	G-994	X			18"				CMP	c. 1996	no	Anne Howanski 610-833-1926	Ridley Township
G-994	G-995	X			12"				CPP	c. 1996	no	Anne Howanski 610-833-1927	Ridley Township
G-996	G-997	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1928	Ridley Township
G-997	G-998	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1929	Ridley Township
G-995	G-998	X			21"				CPP	c. 1996	no	Anne Howanski 610-833-1930	Ridley Township
G-998	G-999	X			18"				CPP	c. 1996	no	Anne Howanski 610-833-1931	Ridley Township
G-999	G-1000	X			18"				CPP	c. 1996	no	Anne Howanski 610-833-1932	Ridley Township
G-1000	G-1001	X			15"				CPP	c. 1996	no	Anne Howanski 610-833-1930	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 51 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-1000	G-1002	X			15"				CPP	c. 1996	no	Anne Howanski 610-833-1931	Ridley Township
G-1002	G-1003	X			15"				CPP	c. 1996	no	Anne Howanski 610-833-1932	Ridley Township
G-1003	G-1004	X			15"				CPP	c. 1996	no	Anne Howanski 610-833-1932	Ridley Township
G-1003	G-1005	X			15"				CPP	c. 1996	no	Anne Howanski 610-833-1933	Ridley Township
G-1005	G-1006	X			15"				CPP	c. 1996	no	Anne Howanski 610-833-1933	Ridley Township
G-1007	G-1008	X			24"				RCP	c. 1959	no	Anne Howanski 610-833-1922	Ridley Township
G-1008	G-1009	X			24"				RCP	c. 1959	no	Anne Howanski 610-833-1923	Ridley Township
G-1009	G-1010	X			15"				CMP	c. 1959	no	Anne Howanski 610-833-1924	Ridley Township
G-1009	G-1011	X			18"				CMP	c. 1959	no	Anne Howanski 610-833-1925	Ridley Township
G-1011	G-1012	X			18"				CMP	c. 1959	no	Anne Howanski 610-833-1926	Ridley Township
G-1012	G-1013	X			18"				CMP	c. 1959	no	Anne Howanski 610-833-1927	Ridley Township
G-1013	G-1014	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1928	Ridley Township
G-1014	G-1015	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1929	Ridley Township
G-1016	G-1017	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1930	Ridley Township
G-1017	G-1018	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1931	Ridley Township
G-1017	G-1019	X			18"				RCP	c. 1959	no	Anne Howanski 610-833-1932	Ridley Township
G-1019	G-1020	X			18"				RCP	c. 1959	no	Anne Howanski	Ridley Township


6TH AV.
FAIRVIEW CIR.
DONNA AV.
VAUCLAI
HARP
PRIVATE RD.
BULLENS LN.
ARBOR LN.
FAIRVIEW RD.
VALLEY RD.
WOODLYN CIR.
MAC DADE BLVD.
RD.
G-939
G-938
15" RCP
G-941
G-940
18" RCP
G-942
36" ADS
G-943
G-944
G-945
G-946
G-947
G-948
G-949
G-950
G-951
G-952
30" RCP
12" ADS
15" RCP
18" RCP
G-956
G-957
G-958
G-959
G-960
G-961
G-962
G-963
G-964
G-965
G-966
G-967
G-971
G-972
G-973
24" RCP
G-974
G-975
G-976
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G-1011
G-1012
G-1013
G-1014
G-1015
G-1016
G-1017
G-1018
G-1019
G-1020
18" CMP
12" CPP
21" CPP
15" CPP
36" CMP
30" CMP
12" RCP
18" CPP

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 52 OF 67

WATERSHED

Name: Crum Creek
Municipality: Ridley Township
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/17/2004

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

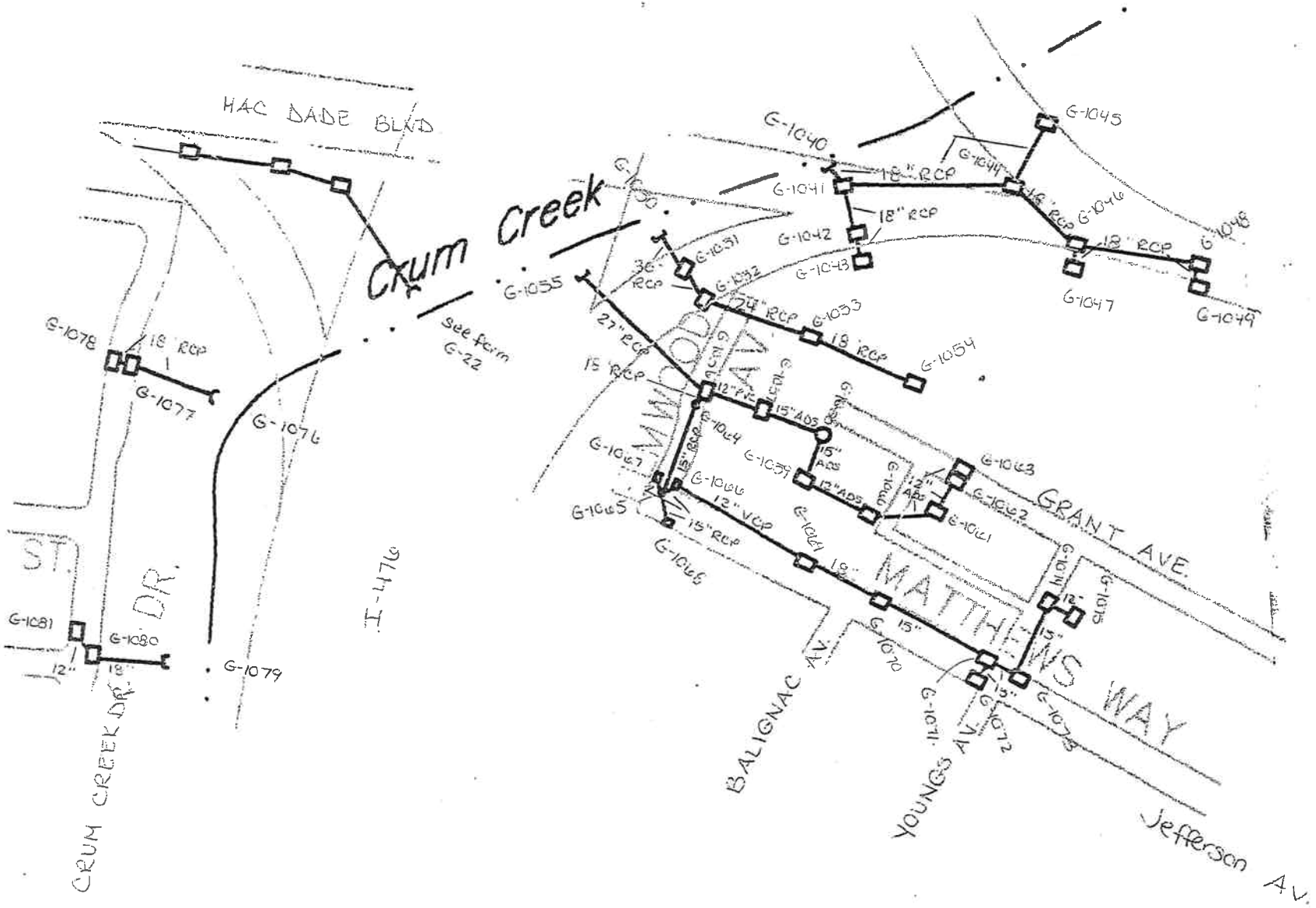
Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-1040	G-1041	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1933	Ridley Township
G-1041	G-1042	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1933	Ridley Township
G-1042	G-1043	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1922	Ridley Township
G-1041	G-1044	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1923	Ridley Township
G-1044	G-1045	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1924	Ridley Township
G-1044	G-1046	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1924	Ridley Township
G-1046	G-1047	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1925	Ridley Township
G-1046	G-1048	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1926	Ridley Township
G-1048	G-1049	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1927	Ridley Township
G-1050	G-1051	X			30"				RCP	c. 1952	no	Anne Howanski 610-833-1928	Ridley Township
G-1051	G-1052	X			30"				RCP	c. 1952	no	Anne Howanski 610-833-1929	Ridley Township
G-1052	G-1053	X			24"				RCP	c. 1952	no	Anne Howanski 610-833-1930	Ridley Township
G-1053	G-1054	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1931	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 53 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-1055	G-1056	X			27"				RCP	c. 1952	no	Anne Howanski 610-833-1932	Ridley Township
G-1056	G-1057	X			12"				PVC	c. 1952	no	Anne Howanski 610-833-1933	Ridley Township
G-1057	G-1058	X			15"				ADS	c. 1990	no	Anne Howanski 610-833-1933	Ridley Township
G-1058	G-1059	X			15"				ADS	c. 1990	no	Anne Howanski 610-833-1922	Ridley Township
G-1059	G-1060	X			12"				ADS	c. 1990	no	Anne Howanski 610-833-1923	Ridley Township
G-1060	G-1061	X			12"				ADS	c. 1990	no	Anne Howanski 610-833-1924	Ridley Township
G-1061	G-1062	X			12"				ADS	c. 1990	no	Anne Howanski 610-833-1925	Ridley Township
G-1062	G-1063	X			12"				ADS	c. 1990	no	Anne Howanski 610-833-1926	Ridley Township
G-1056	G-1064	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1927	Ridley Township
G-1064	G-1065	X			15"				RCP	c. 1952	no	Anne Howanski 610-833-1928	Ridley Township
G-1065	G-1066	X			15"				RCP	c. 1952	no	Anne Howanski 610-833-1929	Ridley Township
G-1065	G-1067	X			15"				RCP	c. 1952	no	Anne Howanski 610-833-1930	Ridley Township
G-1065	G-1068	X			15"				RCP	c. 1952	no	Anne Howanski 610-833-1931	Ridley Township
G-1066	G-1069	X			12"				VCP	c. 1952	no	Anne Howanski 610-833-1932	Ridley Township
G-1069	G-1070	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1930	Ridley Township
G-1070	G-1071	X			15"				RCP	c. 1952	no	Anne Howanski 610-833-1931	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 54 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-1071	G-1072	X			15"				RCP	c. 1952	no	Anne Howanski 610-833-1932	Ridley Township
G-1071	G-1073	X			15"				RCP	c. 1952	no	Anne Howanski 610-833-1933	Ridley Township
G-1073	G-1074	X			15"				RCP	c. 1952	no	Anne Howanski 610-833-1933	Ridley Township
G-1074	G-1075	X			12"				RCP	c. 1952	no	Anne Howanski 610-833-1922	Ridley Township
G-1076	G-1077	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1923	Ridley Township
G-1077	G-1078	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1924	Ridley Township
G-1079	G-1080	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1925	Ridley Township
G-1080	G-1081	X			12"				RCP	c. 1952	no	Anne Howanski 610-833-1926	Ridley Township


HAC DADE BLVD
Crum Creek
See Form G-22
G-1040
G-1041
G-1042
G-1043
G-1044
G-1045
G-1046
G-1047
G-1048
G-1049
G-1050
G-1051
G-1052
G-1053
G-1054
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G-1067
G-1068
G-1069
G-1070
G-1071
G-1072
G-1073
G-1074
G-1075
G-1076
G-1077
G-1078
G-1079
G-1080
G-1081
18" RCP
24" RCP
30" RCP
27" RCP
15" RCP
12" RCP
15" ADS
12" ADS
12" VCP
MAPLEWOOD
GRANT AVE.
MATTHEWS WAY
BALIGNAC AV.
YOUNGS AV.
Jefferson AV.
CRUM CREEK DR.
I-476

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 55 OF 67

WATERSHED

Name: Crum Creek
Municipality: Ridley Township
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/17/2004

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

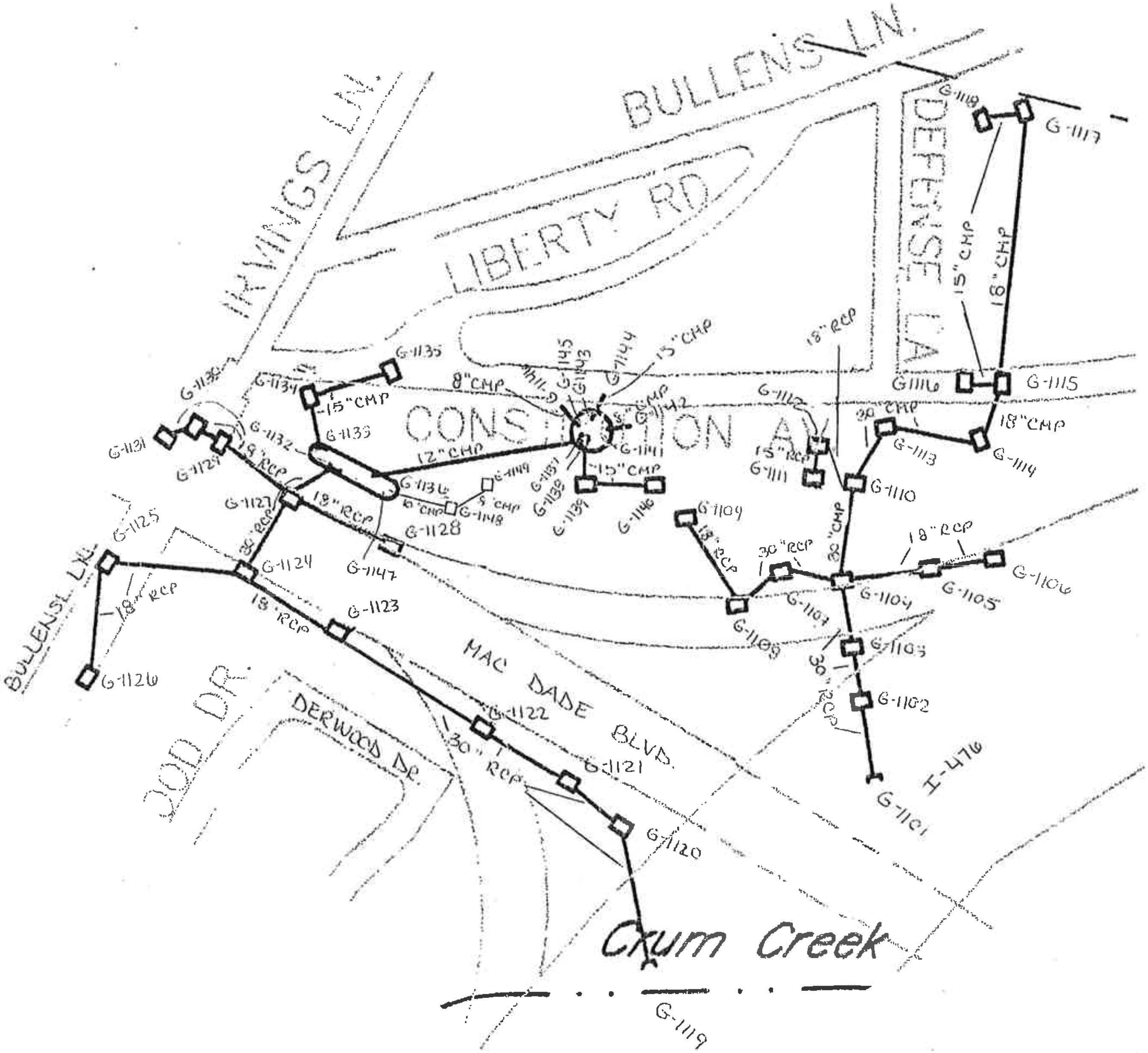
Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-1101	G-1102	X			30"				RCP	c. 1941	no	Anne Howanski 610-833-1933	Ridley Township
G-1102	G-1103	X			30"				RCP	c. 1941	no	Anne Howanski 610-833-1933	Ridley Township
G-1103	G-1104	X			30"				RCP	c. 1941	no	Anne Howanski 610-833-1922	Ridley Township
G-1104	G-1105	X			18"				RCP	c. 1941	no	Anne Howanski 610-833-1923	Ridley Township
G-1105	G-1106	X			18"				RCP	c. 1941	no	Anne Howanski 610-833-1924	Ridley Township
G-1104	G-1107	X			30"				RCP	c. 1941	no	Anne Howanski 610-833-1924	Ridley Township
G-1107	G-1108	X			30"				RCP	c. 1941	no	Anne Howanski 610-833-1925	Ridley Township
G-1108	G-1109	X			18"				RCP	c. 1941	no	Anne Howanski 610-833-1926	Ridley Township
G-1104	G-1110	X			30"				CMP	c. 1941	no	Anne Howanski 610-833-1927	Ridley Township
G-1110	G-1112	X			18"				RCP	c. 1941	no	Anne Howanski 610-833-1928	Ridley Township
G-1112	G-1111	X			15"				RCP	c. 1941	no	Anne Howanski 610-833-1929	Ridley Township
G-1110	G-1113	X			30"				CMP	c. 1941	no	Anne Howanski 610-833-1930	Ridley Township
G-1113	G-1114	X			30"				CMP	c. 1941	no	Anne Howanski 610-833-1931	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 56 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-1114	G-1115	X			18"				CMP	c. 1941	no	Anne Howanski 610-833-1932	Ridley Township
G-1115	G-1116	X			15"				CMP	c. 1941	no	Anne Howanski 610-833-1933	Ridley Township
G-1116	G-1117	X			18"				CMP	c. 1941	no	Anne Howanski 610-833-1933	Ridley Township
G-1117	G-1118	X			15"				CMP	c. 1941	no	Anne Howanski 610-833-1922	Ridley Township
G-1119	G-1120	X			30"				RCP	c. 1983	no	Anne Howanski 610-833-1923	Ridley Township
G-1120	G-1121	X			30"				RCP	c.1983	no	Anne Howanski 610-833-1924	Ridley Township
G-1121	G-1122	X			30"				RCP	c. 1983	no	Anne Howanski 610-833-1925	Ridley Township
G-1122	G-1123	X			30"				RCP	c. 1983	no	Anne Howanski 610-833-1926	Ridley Township
G-1123	G-1124	X			18"				RCP	c. 1983	no	Anne Howanski 610-833-1927	Ridley Township
G-1124	G-1125	X			18"				RCP	c. 1983	no	Anne Howanski 610-833-1928	Ridley Township
G-1125	G-1126	X			18"				RCP	c. 1983	no	Anne Howanski 610-833-1929	Ridley Township
G-1124	G-1127	X			30"				RCP	c. 1983	no	Anne Howanski 610-833-1930	Ridley Township
G-1127	G-1128	X			18"				RCP	c. 1983	no	Anne Howanski 610-833-1931	Ridley Township
G-1127	G-1129	X			18"				RCP	c. 1983	no	Anne Howanski 610-833-1932	Ridley Township
G-1129	G-1130	X			18"				RCP	c. 1983	no	Anne Howanski 610-833-1930	Ridley Township
G-1130	G-1131	X			18"				RCP	c. 1983	no	Anne Howanski 610-833-1931	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 57 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-1127	G-1132	X			30"				RCP	c. 1983	no	Anne Howanski 610-833-1932	Ridley Township
G-1133	G-1134	X			15"				CMP	c. 1983	no	Anne Howanski 610-833-1933	Ridley Township
G-1134	G-1135	X			15"				CMP	c. 1983	no	Anne Howanski 610-833-1933	Ridley Township
G-1136	G-1137	X			12"				CMP	c. 1983	no	Anne Howanski 610-833-1922	Ridley Township
G-1147	G-1148	X			10"				CMP	c. 1983	no	Anne Howanski 610-833-1923	Ridley Township
G-1148	G-1149	X			8"				CMP	c. 1983	no	Anne Howanski 610-833-1924	Ridley Township
G-1138	G-1139	X			15"				CMP	c. 1983	no	Anne Howanski 610-833-1923	Ridley Township
G-1139	G-1140	X			15"				CMP	c. 1983	no	Anne Howanski 610-833-1924	Ridley Township
G-1141	G-1142	X			8"				CMP	c. 1983	no	Anne Howanski 610-833-1925	Ridley Township
G-1143	G-1144	X			15"				CMP	c. 1983	no	Anne Howanski 610-833-1926	Ridley Township
G-1145	G-1146	X			8"				CMP	c. 1983	no	Anne Howanski 610-833-1926	Ridley Township


BULLENS LN.
IRVINGS LN.
LIBERTY RD.
DEFENSE LA.
CONSTITUTION AV.
MAC DADE BLVD.
DERWOOD DR.
BULLENS LN.
I-476
Crum Creek
G-1117
G-1118
15"CMP
18"CMP
G-1116
G-1115
18"CMP
G-1114
18"RCP
G-1112
15"RCP
G-1111
30"CMP
G-1113
G-1110
30"CMP
G-1109
18"RCP
30"RCP
G-1107
G-1104
G-1108
18"RCP
G-1105
G-1106
G-1103
30"RCP
G-1102
G-1101
G-1135
G-1134
15"CMP
G-1133
12"CMP
G-1136
8"CMP
G-1145
G-1143
G-1144
15"CMP
G-1142
G-1141
15"CMP
G-1140
G-1139
G-1146
G-1149
G-1148
G-1128
G-1147
G-1130
G-1131
G-1129
G-1132
18"RCP
G-1127
30"RCP
G-1124
G-1125
18"RCP
G-1126
18"RCP
G-1123
G-1122
30"RCP
G-1121
G-1120
G-1119

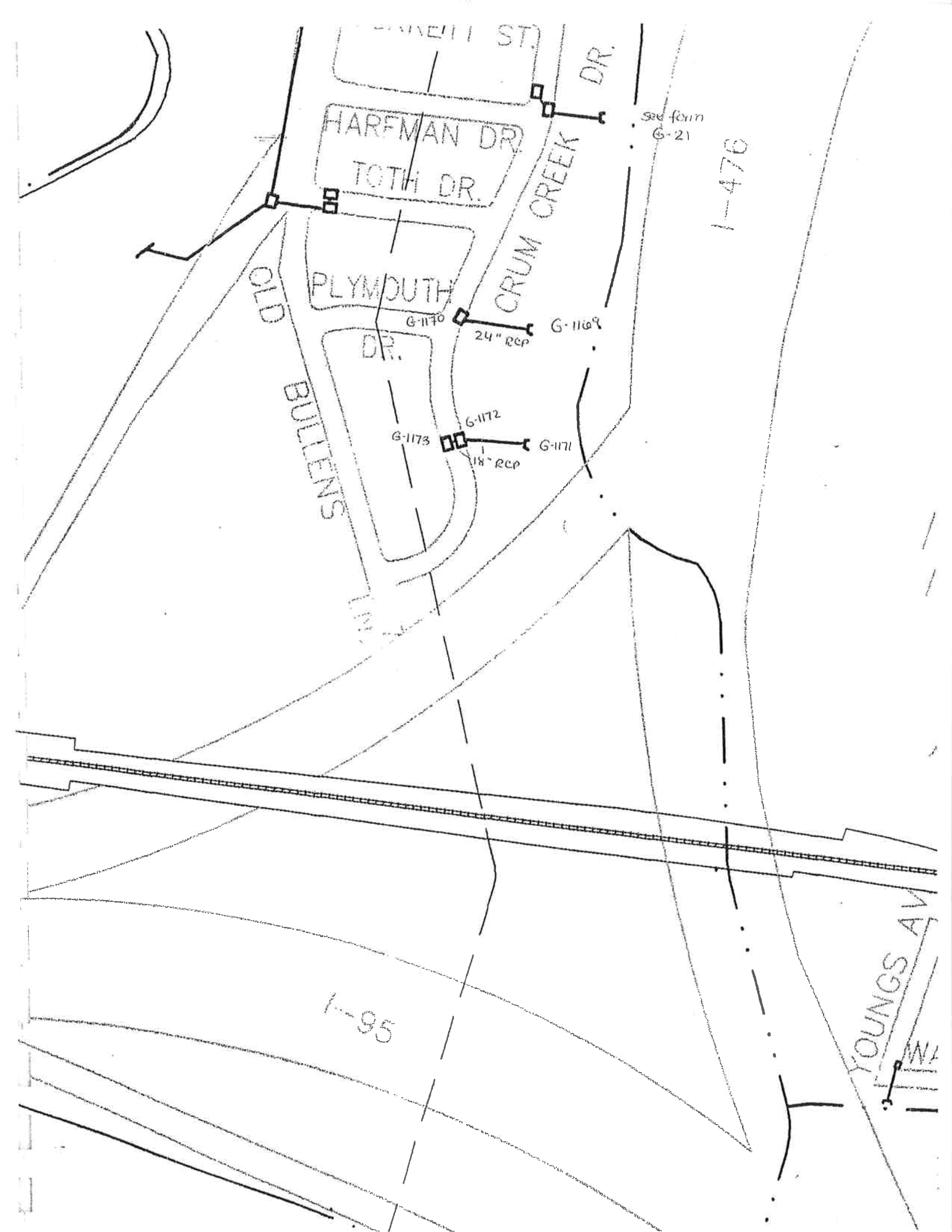
EXISTING EXISTING FLOOD CONTROL PROJECT FORM G. SHEET 58 OF 67

WATERSHED
Name: Crum Creek
Municipality: Ridley Township
County: Delaware

FORM COMPLETED BY
Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/17/2004

INSTRUCTIONS
Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-1169	G-1170	X			24"				RCP	c. 1952	no	Anne Howanski 610-833-1933	Ridley Township
G-1171	G-1172	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1933	Ridley Township
G-1172	G-1173	X			18"				RCP	c. 1952	no	Anne Howanski 610-833-1922	Ridley Township


HARFMAN DR.
TOTH DR.
PLYMOUTH DR.
CRUM CREEK DR.
OLD BULLENS LN.
I-476
I-95
YOUNGS AV
see form G-21
G-1170
24" RCP
G-1169
G-1172
G-1173
18" RCP
G-1171

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 59 OF 67

WATERSHED
Name: Crum Creek
Municipality: Ridley Township
County: Delaware

FORM COMPLETED BY
Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/17/2004

INSTRUCTIONS
Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-1193	G-1194	X			72"				CMP	c. 1990	no	Anne Howanski 610-833-1933	Ridley Township
G-1194	G-1195	X			15"				CMP	c. 1995	no	Anne Howanski 610-833-1933	Ridley Township
G-1194	G-1196	X			72"				CMP	c. 1990	no	Anne Howanski 610-833-1922	Ridley Township
G-1196	G-1197	X			24"				CPP	c. 2004	no	Anne Howanski 610-833-1923	Ridley Township
G-1197	G-1198	X			24"				CPP	c. 2004	no	Anne Howanski 610-833-1924	Ridley Township
G-1198	G-1199	X			18"				CPP	c. 2004	no	Anne Howanski 610-833-1925	Ridley Township
G-1199	G-1200	X			18"				CPP	c. 2004	no	Anne Howanski 610-833-1926	Ridley Township
G-1196	G-1201	X			72"				CMP	c. 1990	no	Anne Howanski 610-833-1927	Ridley Township
G-1201	G-1202	X			72"				CMP	c. 1995	no	Anne Howanski 610-833-1928	Ridley Township
G-1202	G-1203	X			72"				CMP	c. 1995	no	Anne Howanski 610-833-1929	Ridley Township
G-1203	G-1204	X			24"				CPP	c. 2004	no	Anne Howanski 610-833-1930	Ridley Township
G-1204	G-1205	X			18"				CPP	c. 2004	no	Anne Howanski 610-833-1931	Ridley Township
G-1205	G-1206	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1932	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 60 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-1204	G-1207	X			18"				CPP	c. 2004	no	Anne Howanski 610-833-1933	Ridley Township
G-1207	G-1208	X			15"				CPP	c. 2004	no	Anne Howanski 610-833-1933	Ridley Township
G-1203	G-1209	X			72"				CMP	c. 1995	no	Anne Howanski 610-833-1922	Ridley Township
G-1209	G-1210	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1923	Ridley Township
G-1210	G-1211	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1924	Ridley Township
G-1209	G-1212	X			72"				CMP	c. 1995	no	Anne Howanski 610-833-1925	Ridley Township
G-1212	G-1213	X			54"				RCP	c. 1955	no	Anne Howanski 610-833-1926	Ridley Township
G-1213	G-1214	X			18"				CPP	c. 2004	no	Anne Howanski 610-833-1927	Ridley Township
G-1214	G-1215	X			15"				CPP	c. 2004	no	Anne Howanski 610-833-1928	Ridley Township
G-1213	G-1216	X			18"				CPP	c. 2004	no	Anne Howanski 610-833-1929	Ridley Township
G-1216	G-1217	X			15"				CPP	c. 2004	no	Anne Howanski 610-833-1930	Ridley Township
G-1213	G-1218	X			54"				RCP	c. 1955	no	Anne Howanski 610-833-1931	Ridley Township
G-1218	G-1219	X			15"				CPP	c. 2004	no	Anne Howanski 610-833-1932	Ridley Township
G-1218	G-1220	X			15"				CPP	c. 2004	no	Anne Howanski 610-833-1933	Ridley Township
G-1218	G-1221	X			36"				RCP	c. 1955	no	Anne Howanski 610-833-1934	Ridley Township
G-1221	G-1222	X			18"				CPP	c. 2004	no	Anne Howanski 610-833-1935	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 61 OF 87

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-1221	G-1223	X			18"				CPP	c. 2004	no	Anne Howanski 610-833-1933	Ridley Township
G-1221	G-1224	X			36"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township
G-1224	G-1225	X			36"				RCP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township
G-1225	G-1226	X			36"				RCP	c. 1955	no	Anne Howanski 610-833-1923	Ridley Township
G-1226	G-1227	X			36"				RCP	c. 1955	no	Anne Howanski 610-833-1924	Ridley Township
G-1227	G-1228	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1925	Ridley Township
G-1227	G-1229	X			36"				RCP	c. 1955	no	Anne Howanski 610-833-1926	Ridley Township
G-1229	G-1230	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1927	Ridley Township
G-1229	G-1231	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1928	Ridley Township
G-1231	G-1232	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1929	Ridley Township
G-1231	G-1233	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1930	Ridley Township
G-1233	G-1234	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1931	Ridley Township
G-1234	G-1235	X			21"				CMP	c. 1955	no	Anne Howanski 610-833-1932	Ridley Township
G-1233	G-1236	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township
G-1236	G-1237	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1934	Ridley Township
G-1237	G-1238	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1935	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 62 OF 67

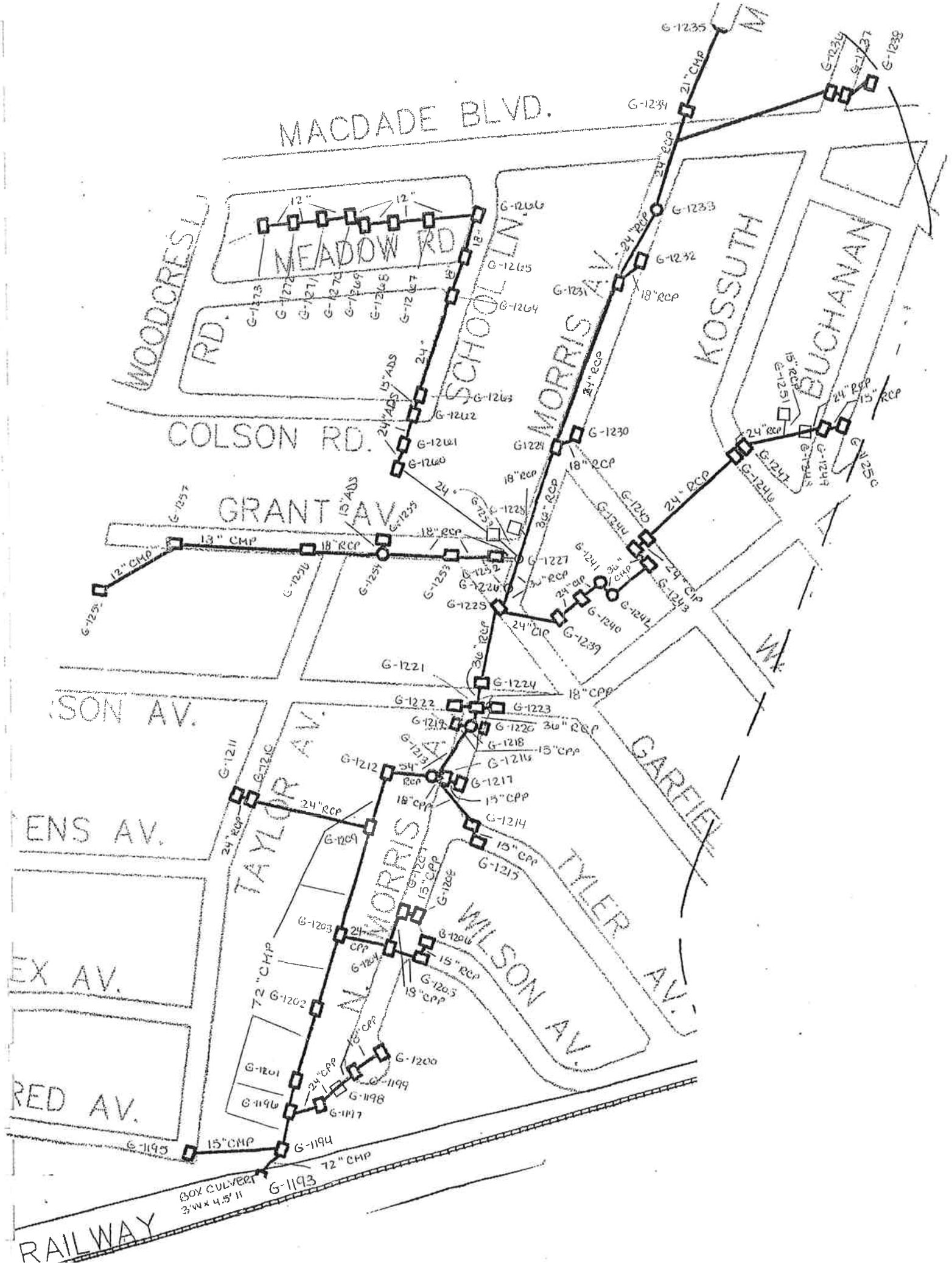
Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-1225	G-1239	X			24"				CIP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township
G-1239	G-1240	X			24"				CIP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township
G-1240	G-1241	X			24"				CIP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township
G-1241	G-1242	X			36"				CMP	c. 1989	no	Anne Howanski 610-833-1923	Ridley Township
G-1242	G-1243	X			36"				CMP	c. 1989	no	Anne Howanski 610-833-1924	Ridley Township
G-1243	G-1244	X			36"				CMP	c. 1989	no	Anne Howanski 610-833-1925	Ridley Township
G-1244	G-1245	X			24"				CIP	c. 1955	no	Anne Howanski 610-833-1926	Ridley Township
G-1245	G-1246	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1927	Ridley Township
G-1246	G-1247	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1928	Ridley Township
G-1247	G-1248	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1929	Ridley Township
G-1248	G-1249	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1930	Ridley Township
G-1249	G-1250	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1931	Ridley Township
G-1247	G-1251	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township
G-1227	G-1252	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1934	Ridley Township
G-1252	G-1253	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1935	Ridley Township
G-1253	G-1254	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 63 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-1254	G-1255	X			15"				ADS	c. 1991	no	Anne Howanski 610-833-1933	Ridley Township
G-1254	G-1256	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township
G-1256	G-1257	X			18"				CMP	c. 1955	no	Anne Howanski 610-833-1923	Ridley Township
G-1257	G-1258	X			12"				CMP	c. 1955	no	Anne Howanski 610-833-1924	Ridley Township
G-1227	G-1259	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1925	Ridley Township
G-1259	G-1260	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1926	Ridley Township
G-1260	G-1261	X			24"				ADS	c. 1991	no	Anne Howanski 610-833-1927	Ridley Township
G-1261	G-1262	X			24"				ADS	c. 1991	no	Anne Howanski 610-833-1928	Ridley Township
G-1262	G-1263	X			15"				ADS	c. 1991	no	Anne Howanski 610-833-1929	Ridley Township
G-1263	G-1264	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1930	Ridley Township
G-1264	G-1265	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1931	Ridley Township
G-1265	G-1266	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1932	Ridley Township
G-1266	G-1267	X			12"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township
G-1267	G-1268	X			12"				RCP	c. 1955	no	Anne Howanski 610-833-1934	Ridley Township
G-1268	G-1269	X			12"				RCP	c. 1955	no	Anne Howanski 610-833-1935	Ridley Township
G-1269	G-1270	X			12"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 64 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-1270	G-1271	X			12"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township
G-1271	G-1272	X			12"				RCP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township
G-1272	G-1273	X			12"				RCP	c. 1955	no	Anne Howanski 610-833-1923	Ridley Township


MACDADE BLVD.
MEADOW RD.
WOODCREST RD.
COLSON RD.
GRANT AV.
SCHOOL LN.
MORRIS AV.
KOSSUTH
BUCHANAN
TAYLOR AV.
WILSON AV.
TYLER AV.
GARFIELD
RAILWAY
BOX CULVERT 3'W x 4.5'H
G-1193
G-1194
G-1195
G-1196
G-1197
G-1198
G-1199
G-1200
G-1201
G-1202
G-1203
G-1204
G-1205
G-1206
G-1207
G-1208
G-1209
G-1210
G-1211
G-1212
G-1213
G-1214
G-1215
G-1216
G-1217
G-1218
G-1219
G-1220
G-1221
G-1222
G-1223
G-1224
G-1225
G-1226
G-1227
G-1228
G-1229
G-1230
G-1231
G-1232
G-1233
G-1234
G-1235
G-1236
G-1237
G-1238
G-1239
G-1240
G-1241
G-1242
G-1243
G-1244
G-1245
G-1246
G-1247
G-1248
G-1249
G-1250
G-1251
G-1252
G-1253
G-1254
G-1255
G-1256
G-1257
12" CMP
13" CMP
15" CMP
18" CMP
21" CMP
24" CMP
30" CMP
36" CMP
72" CMP
12" RCP
15" RCP
18" RCP
24" RCP
30" RCP
36" RCP
12" CPP
15" CPP
18" CPP
24" CPP
15" ADS
24" ADS

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 65 OF 67

WATERSHED

Name: Crum Creek
Municipality: Ridley Township
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/17/2004

INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

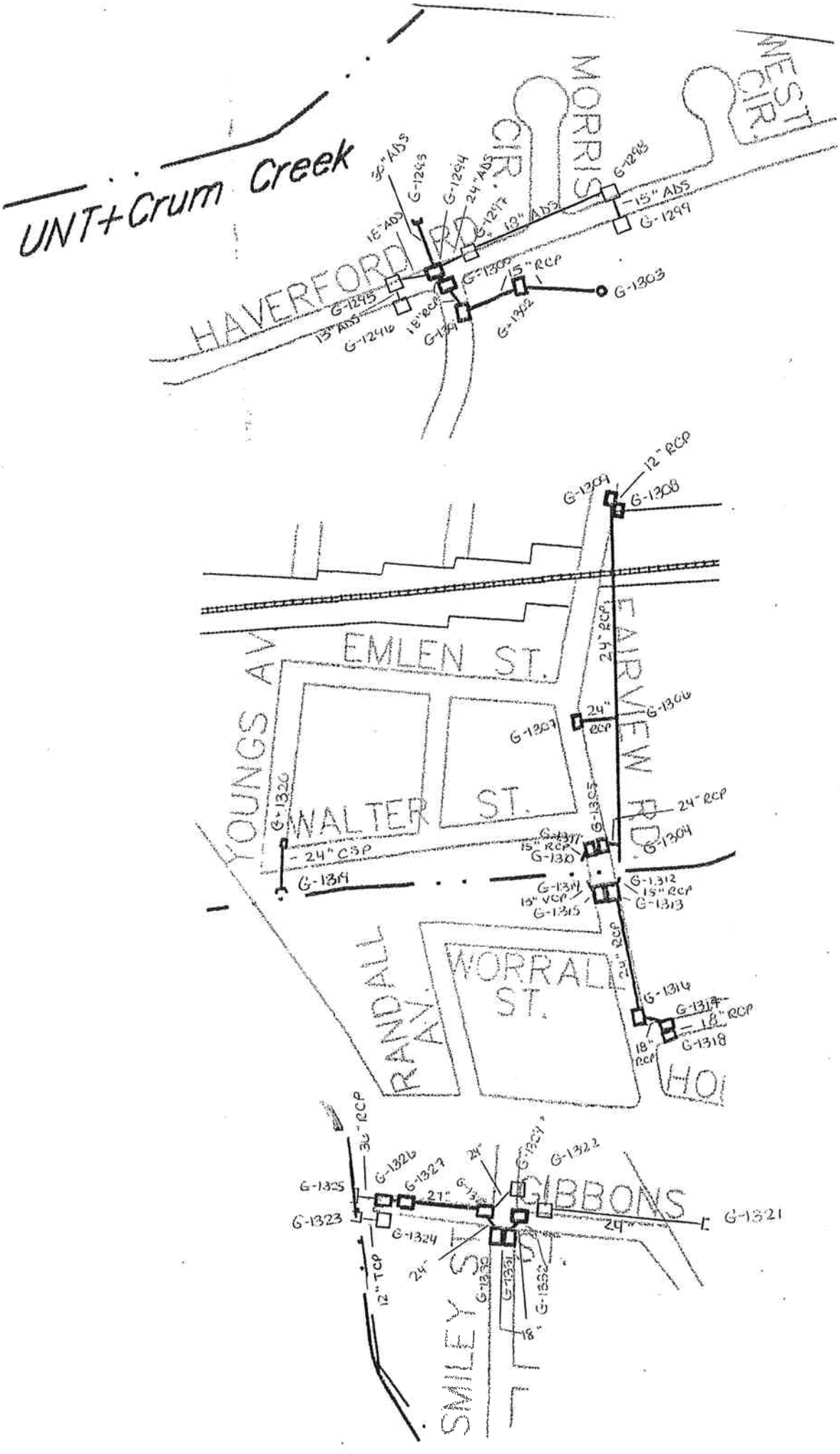
Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-1293	G-1294	X			30"				ADS	c. 1990	no	Anne Howanski 610-833-1933	Ridley Township
G-1294	G-1295	X			18"				ADS	c. 1990	no	Anne Howanski 610-833-1933	Ridley Township
G-1295	G-1296	X			15"				ADS	c. 1990	no	Anne Howanski 610-833-1922	Ridley Township
G-1294	G-1297	X			24"				ADS	c. 1990	no	Anne Howanski 610-833-1923	Ridley Township
G-1297	G-1298	X			18"				ADS	c. 1990	no	Anne Howanski 610-833-1924	Ridley Township
G-1298	G-1299	X			15"				ADS	c. 1990	no	Anne Howanski 610-833-1925	Ridley Township
G-1294	G-1300	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1926	Ridley Township
G-1300	G-1301	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1927	Ridley Township
G-1301	G-1302	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1928	Ridley Township
G-1302	G-1303	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1929	Ridley Township
G-1304	G-1305	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1930	Ridley Township
G-1304	G-1306	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1931	Ridley Township
G-1306	G-1307	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1932	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 66 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-1306	G-1308	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township
G-1308	G-1309	X			12"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township
G-1310	G-1311	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1922	Ridley Township
G-1312	G-1313	X			15"				RCP	c. 1955	no	Anne Howanski 610-833-1923	Ridley Township
G-1314	G-1315	X			15"				VCP	c. 1955	no	Anne Howanski 610-833-1924	Ridley Township
G-1313	G-1316	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1925	Ridley Township
G-1316	G-1317	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1926	Ridley Township
G-1317	G-1318	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1927	Ridley Township
G-1319	G-1320	X			24"				CSP	c. 1973	no	Anne Howanski 610-833-1928	Ridley Township
G-1321	G-1322	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1929	Ridley Township
G-1323	G-1324	X			12"				TCP	c. 1955	no	Anne Howanski 610-833-1930	Ridley Township
G-1325	G-1326	X			36"				RCP	c. 1955	no	Anne Howanski 610-833-1931	Ridley Township
G-1326	G-1327	X			36"				RCP	c. 1955	no	Anne Howanski 610-833-1932	Ridley Township
G-1327	G-1328	X			27"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township
G-1328	G-1329	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township
G-1328	G-1330	X			24"				RCP	c. 1955	no	Anne Howanski 610-833-1934	Ridley Township

EXISTING STORMWATER COLLECTION SYSTEM FORM G. SHEET 67 OF 67

Map ID No.		System's Elements (x)			Measurements*				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-1330	G-1331	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township
G-1331	G-1332	X			18"				RCP	c. 1955	no	Anne Howanski 610-833-1933	Ridley Township


UNT to Crum Creek
HAVERFORD RD
MORRIS CIR
WEST CIR
30" ADS
G-1263
G-1264
24" ADS
G-1267
18" ADS
G-1268
15" ADS
G-1299
16" ADS
G-1265
G-1300
15" RCP
G-1303
13" ADS
G-1266
18" RCP
G-1301
G-1302
G-1309
12" RCP
G-1308
EMLEN ST.
YOUNGS AV
FAIRVIEW RD
24" RCP
24" RCP
G-1306
G-1307
WALTER ST.
G-1320
24" CSP
G-1319
G-1305
24" RCP
G-1304
G-1317
15" RCP
G-1310
G-1311
15" VCP
G-1315
G-1312
15" RCP
G-1313
RANDALL AV
WORRAL ST.
24" RCP
G-1316
G-1317
18" RCP
18" RCP
G-1318
HO
30" RCP
G-1326
G-1327
24"
G-1328
G-1322
G-1325
27"
GIBBONS
G-1321
G-1323
G-1324
24"
24"
12" TCP
G-1330
G-1331
G-1332
18"
SMILEY ST

PROPOSED FLOOD CONTROL PROJECT FORM H. SHEET 1 OF 1

FORM COMPLETED BY

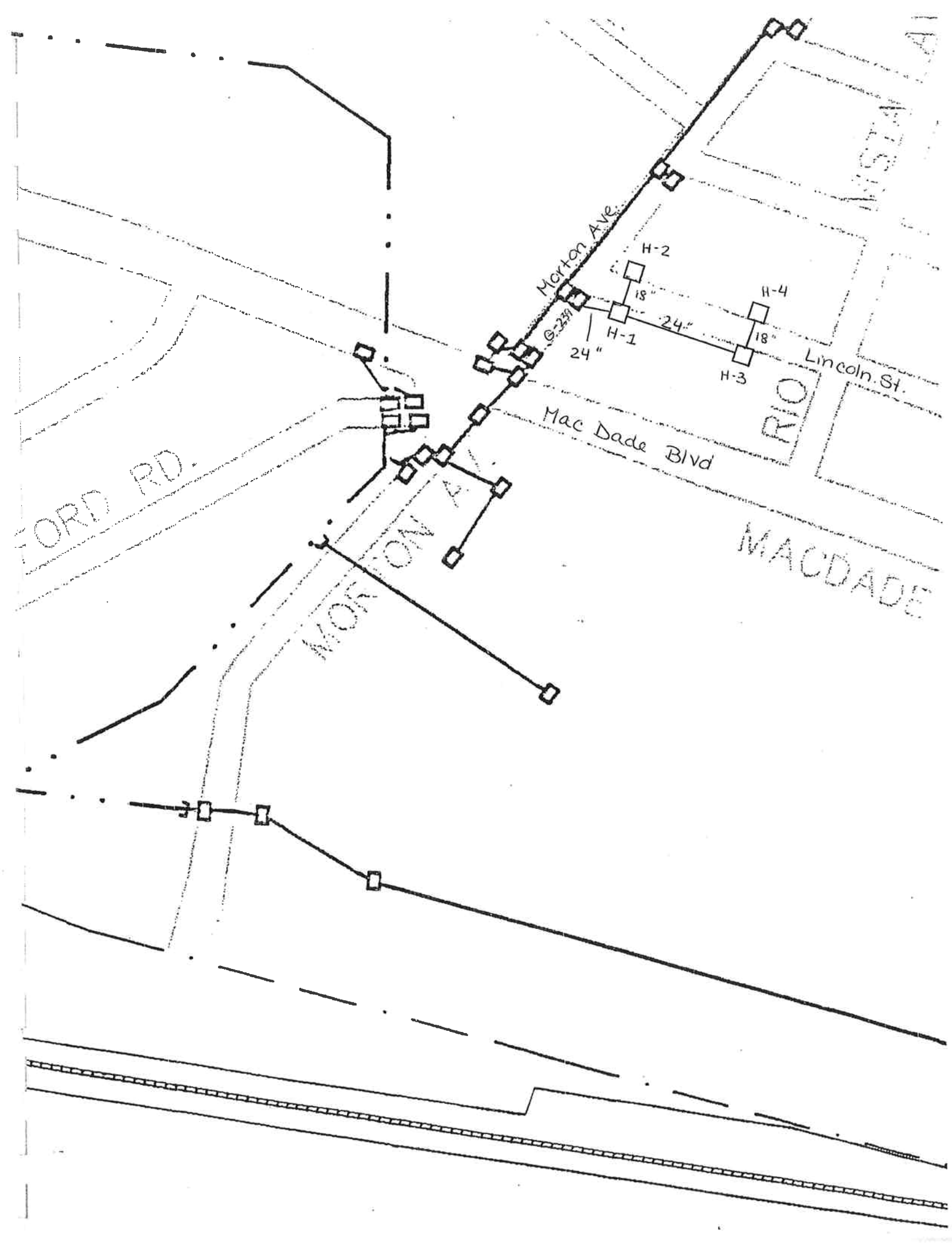
Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/17/2004

INSTRUCTIONS

On the map for proposed stormwater collection systems, diagram each proposed system. Indicate a map point to show changes in system elements, pipe size, pipe direction and connections to existing system. For proposed additions to existing systems, diagram only the additions and their connection point into the existing system. Complete a separate form for each proposed, new system and one for each existing system having one or more proposed additions. Identify the points within a system consecutively (ex. G-1, G-2, G-3). Start the first point in each additional system 20 numbers higher (if H-3 ends one system, begin the next with H-23). Be sure to show the point where proposed additions connect into existing systems, using the map point number from he existing system form and map. See Sample Diagrams and Form on Reverse.

em's Elements (x)		Measurements*				Material	Map I.D Nos.**	Proposed Constr. Dates		Design Data	Contact Person	Name of Final Ownership and
		Pipe	Channel / Swale									
Open Channel	Swale	D	TW	B	Depth		Form A	Start	End	Available	Name and Phone	Maintenance Responsibility
		24"				HDPE	2	Sep-04	Dec-04	yes	Anne Howanski 610-833-1922	Ridley Township
		18"				HDPE	2	Sep-04	Dec-04	yes	Anne Howanski 610-833-1923	Ridley Township
		24"				HDPE	2	Sep-04	Dec-04	yes	Anne Howanski 610-833-1924	Ridley Township
		18"				HDPE	2	Sep-04	Dec-04	yes	Anne Howanski 610-833-1925	Ridley Township

ide. **Enter the stormwater problem areas' Map I.D. Nos., if proposed project will solve or reduce any / all of the drainage problems.


Morton Ave.
H-2
18"
H-4
24"
H-1
18"
H-3
24"
Lincoln St.
Mac Dade Blvd
MACDADE
RD.
MORTON AVE.

PRESENT & PROJECTED DEVELOPMENT IN THE FLOOD HAZARD AREA FORM I. SHEET 1 OF 3

WATERSHED

Name: Crum Creek
Municipality: Ridley Township
County: Delaware

FORM COMPLETED BY

Name: Jamie H. Bricker
Telephone: 610-532-2884
Date: 8/23/2004

DEFINITION

FLOOD HAZARD AREA
A normally dry land area that has been or is susceptible to being inundated by the 100-year flood.

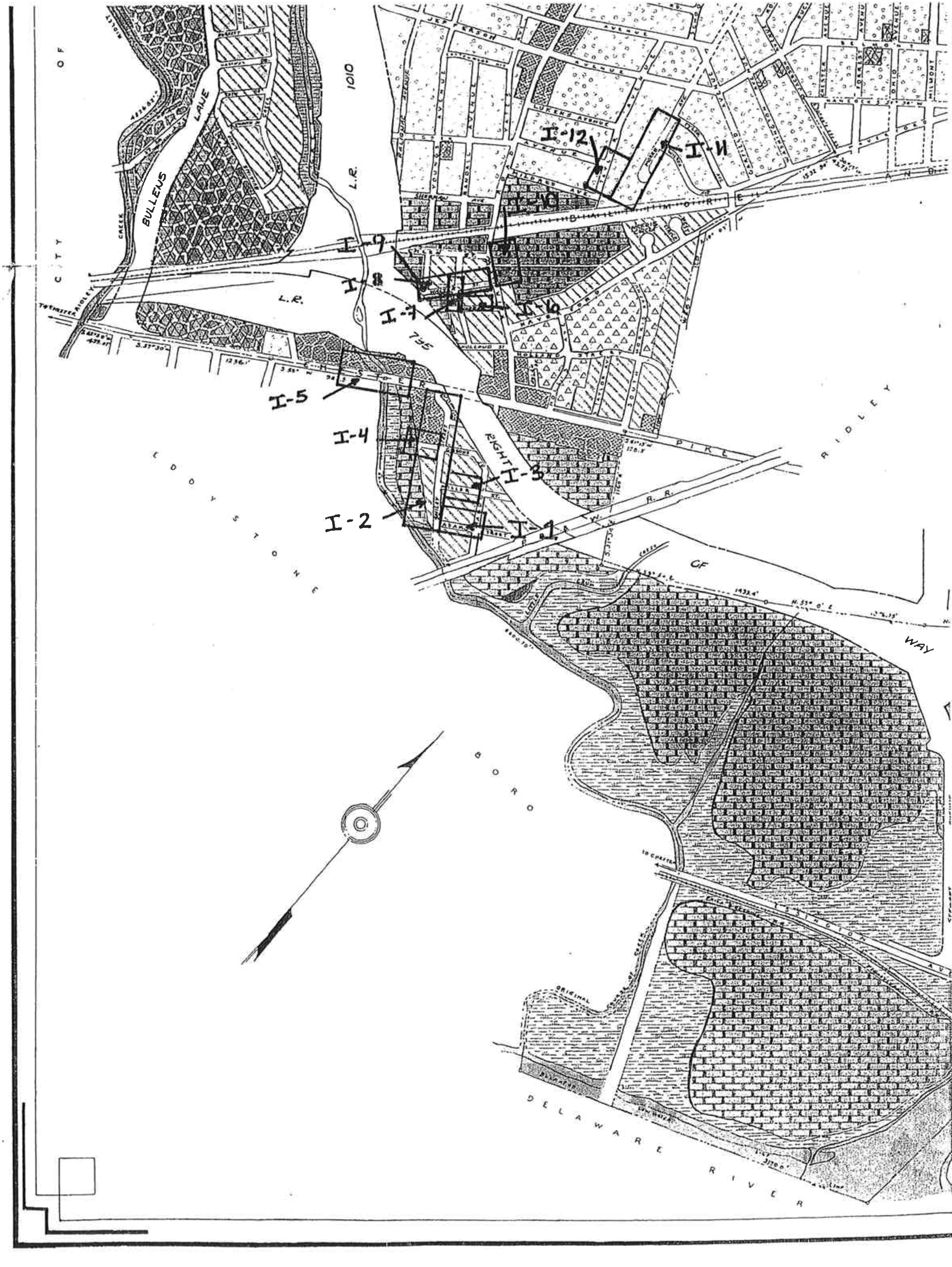
For County Use:

Map ID No.	TYPE OF DEVELOPMENT	Year Built	Contact Person Name, Address and Phone	Comments
I - 1	Residential - 1300 block Adams St.	?	Various Owners	
I - 2	Residential and Industrial 600 block Smiley St	?	Various Owners	
I - 3	Residential 1300 Block Miller St	?	Various Owners	
I - 4	Residential, Commercial, and Industrial 1400 block Gibbons St	?	Various Owners	
I - 5	Industrial and Commercial south 1400 block Chester Pk north 1400 and 1500 blk Chester Pk	?	Various Owners	
I - 6	Residential north 1300 block Worrall St	?	Various Owners	
I - 7	Residential 100 block Randall St.	?	Various Owners	
I - 8	Industrial and Residential Walter St.	?	Various Owners	

PRESENT & PROJECTED DEVELOPMENT IN THE FLOOD HAZARD AREA FORM I. SHEET 2 OF 3

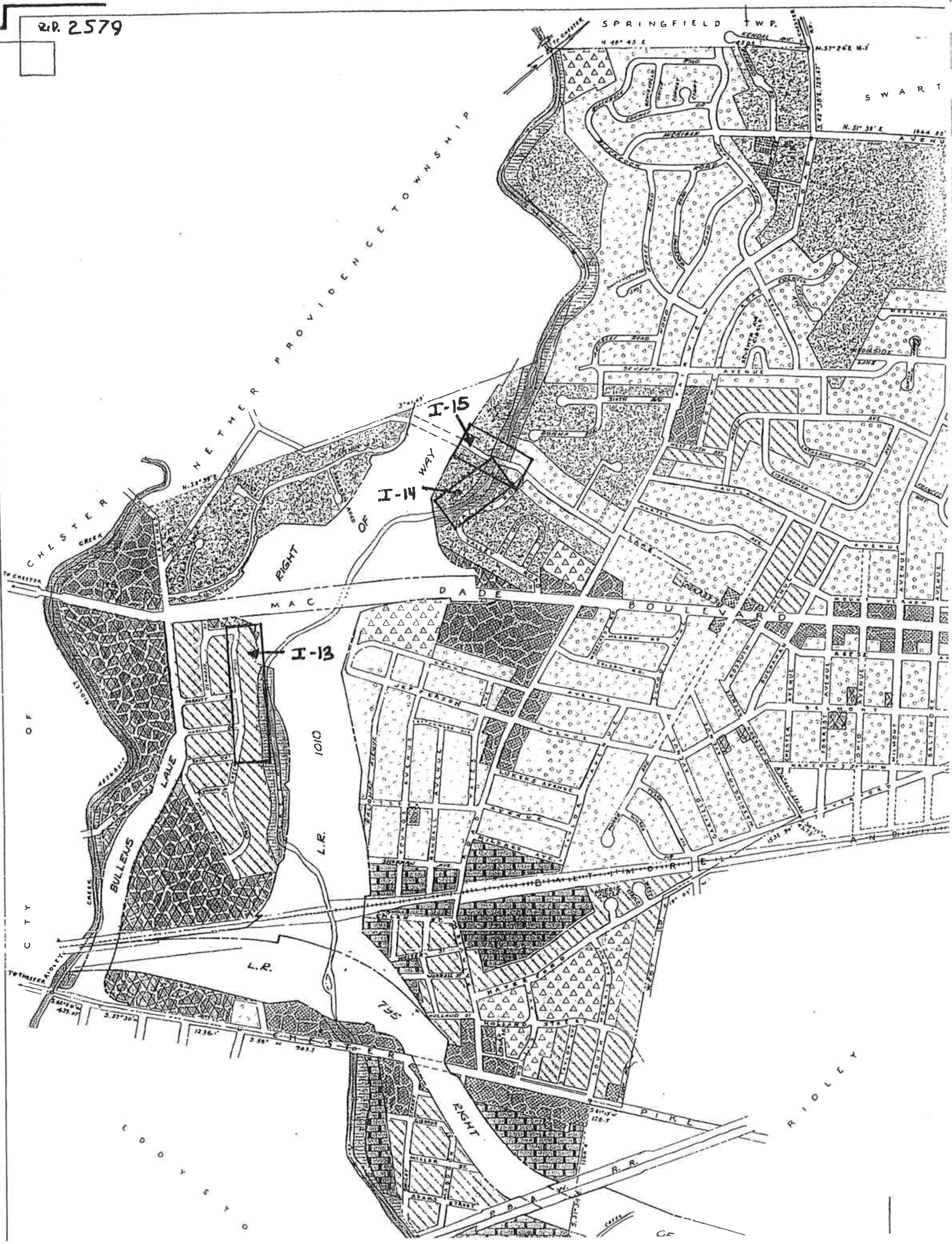
Map ID No.	TYPE OF DEVELOPMENT	Year Built	Contact Person Name, Address and Phone	Comments
I - 9	Industrial and Residential lower 100 block Youngs St.	?	Various Owners	
I - 10	Industrial 200 block Fairview Rd.	?	Various Owners	
I - 11	Residential west lower 100 block Morris Ave	1970	Various Owners	
I - 12	Residential east lower 100 block Taylor Ave	1970	Various Owners	
I - 13	Residential east upper 100 and 200 block Crum Creek Drive	1965	Various Owners	most structures are above the flood hazard, yards encroach and experience flooding
I - 14	Residential west upper 1300 block Valley Road	1953	Various Owners	
I - 15	Residential Bullens Lane from Valley Rd west to twp boundary	1965	Various Owners	area displays frequent flooding
I - 16	Residential east 20 block Haverford Road	1953	Various Owners	
I - 17	Residential and Commercial Morton Ave twp boundary to Mac Dade	?	Various Owners	
I - 18	Apartment and Residential north lower 200 and 100 blocks Mac Dade Boulevard	1974	Various Owners	
I - 19	Residential 129 and 131 Marlin St	1958	Various Owners	

PRESENT & PROJECTED DEVELOPMENT IN THE FLOOD HAZARD AREA FORM I.				SHEET 3 OF 3
Map ID No.	TYPE OF DEVELOPMENT	Year Built	Contact Person Name, Address and Phone	Comments
I - 20	Residential east 400 thru 600 blocks Arlington Ave	1951	Various Owners	
I - 21	Ridley Township High School Morton Ave	1938	Various Owners	structures are above the flood hazard, fields encroach floodplain
I - 22	Residential west 900 block Georgetown Rd	1957	Various Owners	homes often flooded
I - 23	Residential east 900 and lower 1000 blocks Girard Avenue	1961	Various Owners	structures above flood hazards, yards encroach floodplain
I - 24	Residential 300 block Michigan Ave	1957	Various Owners	
I-				no furture development is expected in the flood hazard area

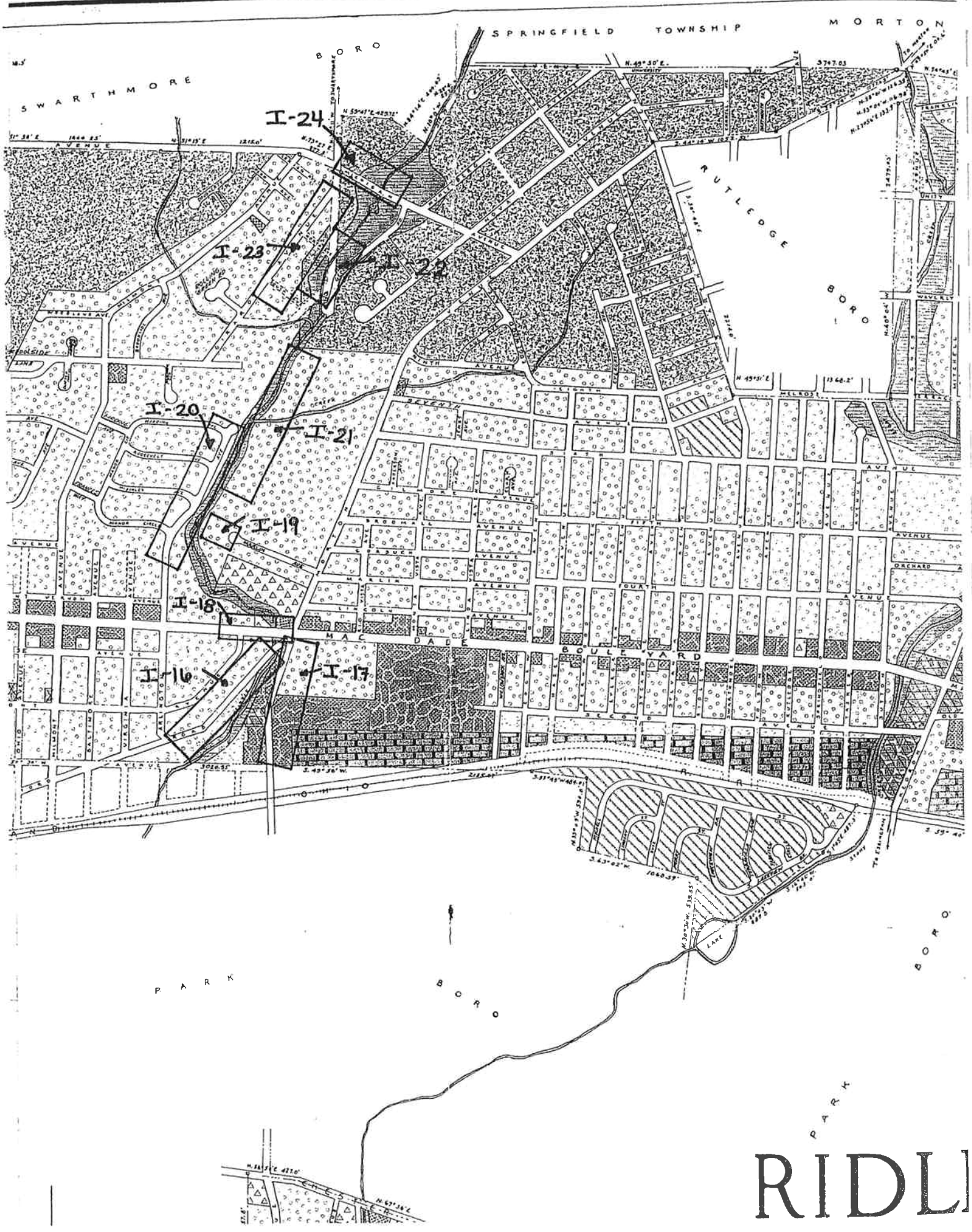


I-1
I-2
I-3
I-4
I-5
I-6
I-7
I-8
I-9
I-10
I-11
I-12
DELAWARE RIVER
EDDYSTONE
BORO
RIDLEY
CITY OF
BULLENS
LANE
L.R.
1010
735
RIGHT
PIKE
WAY
OF
JEFFERSON
LUKENS AVENUE
TO CHESTER
ORIGINAL

R.P. 2579



SPRINGFIELD TWP.
SWART
NETHER PROVIDENCE TOWNSHIP
CHESTER CREEK
TO CHESTER
I-15
I-14
I-13
RIGHT OF WAY
MAC DADE BOULEVARD
JEFFERSON
1010
L.R.
BULLENS LANE
CITY OF CHESTER
CREEK
L.R.
735
CHESTER PIKE
RIGHT
RIDLEY
P.B. & W. R.R.
BALTIMORE
SEVENTH AVENUE
SIXTH AVE
LUKENS AVENUE

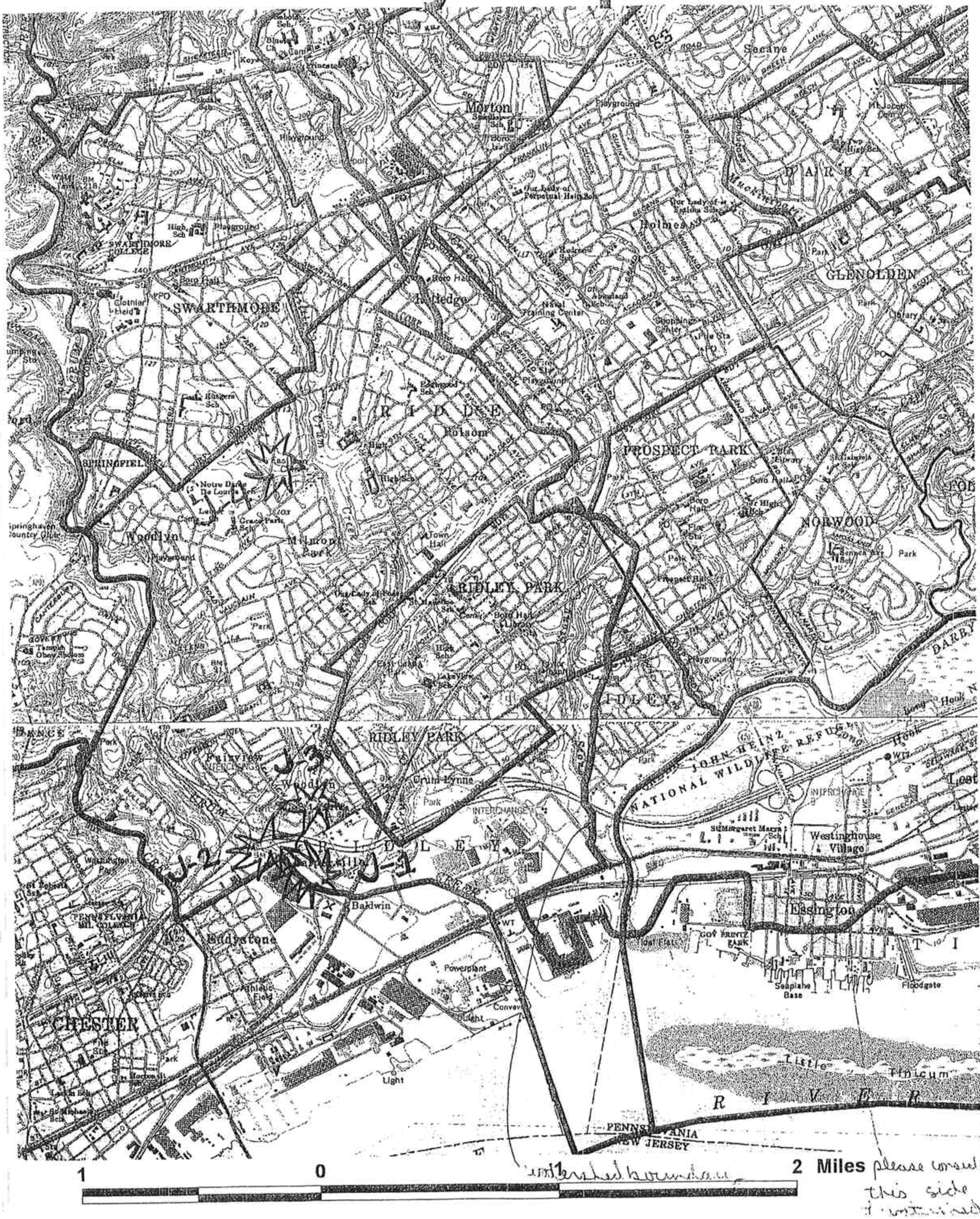

SPRINGFIELD TOWNSHIP
MORTON
SWARTHMORE
BORO
I-24
I-23
I-22
I-20
I-21
I-19
I-18
I-16
I-17
RUTLEDGE
BORO
MACDADE
BOULEVARD
PARK
BORO
LAKE
RIDL

Form J

WATER QUALITY PROBLEM AREAS FORM J.											SHEET 1 OF 1
WATERSHED				FORM COMPLETED BY							
Name:	Crum Creek			Name:	Jamie H. Bricker						
Municipality:	Ridley Township			Telephone:	610-532-2884						
County:	Delaware			Date:	8/25/2004						
SITE	J-1	J-2	J-3	J-4	J-	J-	J-	J-	J-	J-	J-
Types of Water Quality Problems											
High Community Tolerence	X		X								
High Temperature											
High Turbidity											
Hydrocarbon Pollution		?		?							
Low Community Diversity											
Low Dissolved Oxygen											
Low pH											
Nutrient Enrichment											
Poor Habitat	X		X								
Other/Explanation Line No.											
Potential Cause(s)											
Agriculture											
Construction Site											
Erosion											
Lake Discharge											
STP Outfall		X									
Other/Explanation Line No.	1	2	3	4							
Frequency											
Year Most Recent Occurence	2004	2004	2004	2004							
Year First Known Occurence	?	?	?	?							
Source of Information											
County Water Quality Study											
Driveby	X	X	X	X							
Other/Explanation Line No.											

EXPLANATION LINES
1 below Chester pike, lined channel, shopping carts in stream, heavy silt, no visible wildlife
2 orange sediment deposits, oil sheen visible
3 algea and heavy debris in channelized stream
4 orange sediment deposits, foamy film on water surface
5
6
7
8
9
10

Ridley Twp.


Secane
Morton
Holmes
DARBY
GLENOLDEN
SWARTHMORE COLLEGE
SWARTHMORE
Rutledge
Naval Training Center
RIDLEY
Folsom
SPRINGFIELD
PROSPECT PARK
NORWOOD
Woodlyn
Milmont Park
RIDLEY PARK
Crum Lynne
JOHN HEINZ NATIONAL WILDLIFE REFUGE
Westinghouse Village
Essington
Baldwin
Eddystone
CHESTER
Powerplant
Little Tinicum
RIVER
PENNSYLVANIA
NEW JERSEY
Seaplane Base
Floodgate
1
0
1
2 Miles

J-1, Baldwin Towers: shopping cart and silt in channel

J-1, Baldwin Towers: lined channel

J-2, Chester Pike: orange deposits

J-2, Chester Pike: orange deposits coming from outfall channel

J-2, Chester Pike: outfall pipe feeding orange channel

J-3, Walter St: concrete channel

J-3, Walter St: heavy debris in channel

J-4, Milmont Ave: orange sediment

J-4, Milmont Ave: foam on water surface

Form O - Outfall Data

Person: J. H. Bricker Date: 12/04 Time Since Last Rain was > 72 Hours:

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain:

Municipality: Ridley Township Name of receiving water: Crum Creek via Little Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
LCC -1				18" CMP								
LCC -2				18" RCP								
LCC -3												
LCC -4												
LCC -5												
LCC -6												
LCC -7												
LCC -8												
LCC -9												

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment deposition, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

***1:1** = Vertical - rectangular channel

NOTES:

Form O - Outfall Data Cont'd

Person: J. H. Bricker Date: 12/04 Time Since Last Rain was > 72 Hours:

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain:

Municipality: Ridley Township Name of receiving water: Crum Creek via Little Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
LCC -10												
LCC -11												
LCC -12												
LCC -13												
LCC -14												
LCC -15												
LCC -16												
LCC -17												
LCC -18												

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment deposition, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

***1:1** = Vertical - rectangular channel

NOTES:

Form O - Outfall Data Cont'd

Person: J. H. Bricker Date: 12/04 Time Since Last Rain was > 72 Hours:

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain:

Municipality: Ridley Township Name of receiving water: Crum Creek via Little Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
LCC -19												
LCC -20												
LCC -21												
LCC -22												
LCC -23												
LCC -24												
LCC -25												
LCC -26												
LCC -27												

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment deposition, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

***1:1** = Vertical - rectangular channel

NOTES:

Form O - Outfall Data Cont'd

Person: J. H. Bricker Date: 12/04 Time Since Last Rain was > 72 Hours:

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain:

Municipality: Ridley Township Name of receiving water: Crum Creek via Little Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
LCC -28												
LCC -29												
LCC -30												
LCC -31												
LCC -32												
LCC -33												
LCC -34												
LCC -35												
LCC -36												

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment deposition, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

***1:1** = Vertical - rectangular channel

NOTES:

Form O - Outfall Data Cont'd

Person: J. H. Bricker Date: 12/04 Time Since Last Rain was > 72 Hours:

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain:

Municipality: Ridley Township Name of receiving water: Crum Creek via Little Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
LCC -37												
LCC -38												

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment deposition, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

***1:1** = Vertical - rectangular channel

NOTES:

FORM A - STORM WATER PROBLEM AREAS SHEET 1 OF 1

CRUM CREEK WATERSHED	FORM COMPLETED BY	Before Filling Out Form, See Instructions On Back
Name:	Name: C.J. Catania Jr	
Municipality: Ridley Township	Telephone: 610-532-2884	For County Use:
County: Delaware	Date: July30,2003	

MAP NO. *	A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-	A-
Types of Storm Water Problems												
Flooding			x	x	x	x	x			x		
Accelerated Erosion		x			x	x	x	x	x	x		
Sedimentation	x					x						
Landslide												
Groundwater												
Water Pollution												
Other (Explain)												
Explanation Line No. (On Back)	1	2	3	6	7	8	9	10	11	12		
Cause (s)												
Storm Water Volume			x	x	x	x	x			x		
Storm Water Velocity		x			x	x	x	x	x			
Storm Water Direction		x			x	x	x	x				
Water Obstruction			x		x	x	x			x		
Other (Explain)												
Explanation Line No. (On Back)			4									
Frequency												
Year Most Recent Occurred			2003	2002	2003	2002	2003			2002		
Year First Known Occurred			?	?	?	?	?					
Regularity												
More Than 1 Year							x					
Less Than 1 Year			x	x	x	x				x		
Only During Agnes or Floyd												
Duration (If Applicable)												
Less Than 1 Day			x	x	x	x	x			x		
1 Day + (Enter Days)												
Property Damage												
Loss of Life/Vital Services			x									
Private		x			x	x	x	x	x	x		
More Than One Owner		x			x	x	x	x	x	x		
Types of Properties		R		Ind	R	R	R	R	R	R/C		
Number of Properties		5		1	6	20	8	12	4	8		
Public (List Types)												
Explanation Line No. (On Back)			5									
Solutions												
Suggested												
Explanation Line No. (On Back)												
Formally Proposed												
Explanation Line No. (On Back)												

* Include Map ID No. if found on any other form listing proposed facilities.

INSTRUCTIONS

Begin with A-1 as the first map number to identify the first storm water problem area. Illustrate the defined problem on the watershed map provided, and identify it with its map number.

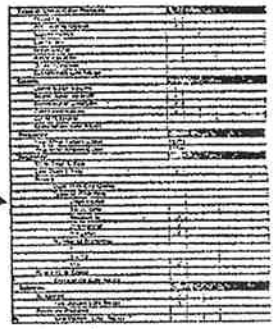
For each storm water problem area within your municipality, enter the map identification number at the head of the column. Describe the problem by placing a check (4 in the appropriate blocks of the column under this map identification number.

When an additional explanation is required, write the line number(s) used in the column marked "Explanation Line No. (s)".Example 1, 2-3, etc.

If storm water problem occurred during and after Agnes, describe the frequency of the problem after Agnes.

Use the explanation lines to list the types of public property damages ,e.g.roadways, hospitals, etc.

Enter the line no. (s) used to list the map ID no. (s) for the proposed facilities.



Definitions

Storm Water Problem Area
An area that defines the farthest extent of a storm water problem, including any area that experiences property damage, inundation, accelerated erosion, surface water pollution, groundwater pollution, landslides, or any other problem as a result of storm water runoff.

Groundwater
Water in the ground below the water table.

Accelerated Erosion
The removal of the surface of the land through the combined action of man's activities and the natural processes at a rate greater than would occur because of the natural process alone.

Sedimentation
The process by which soil or other surface materials, transported by surface water, is deposited on stream bottoms.

Water Obstruction
Any dike, bridge, culvert, wall, wingwall, fill, pier, wharf, embankment, abutment, or other structure located in, along, across, or projecting into any watercourse, floodway, or body of water.

EXPLANATION LINES (continued)

1 PennDOT installed flood cell that accumulates sedimentation decreasing flood cell capacity
2 Streambank erosion along rear of homes on Valley Rd
3 Chester Pike flooding
4 culvert under Chester Pike
5 Chester Pike closed to traffic during flooding
6 Boeing Industrial facility flooding
7 Milmont Avenue near Brookside Lane flooding & erosion
8 Muhlenberg Ave flooding and erosion
9 Georgetown Rd flooding and erosion
10 Ridley High School/Arlington Ave erosion
11 Edgewood Ave erosion
12 2nd Ave flooding

Ridley Township

Problem Areas

RUTLEDGE BOROUGH

Turning Ideas Into Reality

CATANIA ENGINEERING ASSOCIATES, INC.

Consulting Engineers & Land Surveyors

May 19, 2005
File No. 83350-115

Karen Holm
Delaware County Planning Department
Court House & Government Center Building
201 West Front Street
Media, PA 19063

RE: Crum Creek, Act 167
Rutledge Borough

Dear Karen:

Enclosed, please find the following:

1. Act 167 Municipality Questionnaire
2. Zoning Ordinance
3. Zoning Map
4. SLDO
5. Map of Storm Sewer System

Should you have any questions or comments, please feel free to contact me.

Very truly yours,

Charles J. Catania, Jr., PE
for Catania Engineering Associates, Inc.

CJC, Jr/pm
Enclosures
cc: Ed McGaughey

520 W. MacDade Boulevard, Milmont Park, Pennsylvania 19033-3311
Phone: (610) 532-2884 Fax: (610) 532-2923 E-Mail: CEAINC1@aol.com

CRUM CREEK WATERSHED
ACT 167 STORMWATER MANAGEMENT PLAN

MUNICIPALITY QUESTIONNAIRE

Please fill out the following questionnaire and return it to Karen Holm at the Delaware County Planning Department, Court House and Government Center Building, 201 West Front St. Media, PA 19063 as soon as possible. If you have any questions or comments, or if you would like these forms in digital format, please call Karen at 610-891-5213 or e-mail her at holmk@co.delaware.pa.us.

PART I - GENERAL INFORMATION

Municipality: Rutledge Borough

Contact Person: Edward O. McGaughey

WPAC Designee: Charles J. Catania, Jr.

Title: Township Engineer

Address: 500 W. MacDade Boulevard

Milmont Park, PA 19033-3[illegible]

Phone: 610-5[illegible]

Fax: [illegible]

Person Completing form (if different from Contact Person):

Name: Charles J Catania, Jr & Christine Pace

Address: 500 W MacDade Boulevard

Milmont Park, PA 19033-[illegible]

Phone: 610-532-2884

Fax: 610-532-[illegible]2

E-mail:

J:\Environmental\Crum Creek Stormwater Plan\Survey Forms\Questionnaire.doc

PART II - REGULATORY ACTIVITIES

A. Please indicate the regulations you currently use to manage development.

REGULATION	MUNICIPAL ORDINANCE	COUNTY ORDINANCE
Zoning Ordinance	No. 414	
Subdivision/Land Development Ordinance	No. 262	
Separate Stormwater Ordinance		
Separate Floodplain Ordinance		

B. Please indicate the agencies/individuals who review and approve land development plans and zoning variance/waiver requests.

ENTITY	LAND DEVELOPMENT PLANS		ZONING VARIANCE/WAIVER REQUESTS	
	REVIEW	APPROVE	REVIEW	APPROVE
Supervisors	X	X		
Municipal Engineering Department				
Municipal Planning Department	X			
County Planning Department	X			
County Conservation District	X	X		
Zoning Hearing Board			X	X
Consulting Engineer	X			
Others (List Below				

C. Please provide **copies** of your zoning, subdivision/land development, and separate stormwater management and floodplain ordinances and your current zoning map when you return this questionnaire. Please list these documents below.

Zoning ordinance No. 414
Land subdivision ordinance No. 262

PART III - MUNICIPAL AND LOCAL PLANNING ACTIVITIES

Please indicate below whether your community has approved the following plans and maps and the date of the most recent update.

ITEM	APPROVED/DATE	IN PROGRESS	PLANNED WITHIN NEXT YEAR
PA Act 537 Sewage Facilities Plan	Y		
Comprehensive Land Use Plan		X	
Existing Land Use Maps		X	
Proposed Land Use Maps		X	
Zoning Maps	X		

PART IV - FLOOD INSURANCE PROGRAM AND COMPREHENSIVE LAND USE PLAN

Please indicate below whether your community participates in the National Flood Insurance Program:

ITEM	PARTICIPATES (Y/N)
Flood Hazard Boundary Map (FHBM)	Y
Participates in FEMA Emergency Program	Y
Participates in FEMA Regular Program	Y

PART V - EXISTING STORMWATER RELATED PROBLEMS AND STRUCTURES

Please complete the matrices on the following pages (Forms A and C-J) to describe any significant stormwater-related problems (Form A), Existing or Proposed Flood Control Projects (Forms C & D), Existing or Proposed Storm Water Control Facilities (Forms E and F), Existing or Proposed Stormwater Collection Systems (Forms G & H), Present and Projected Development in the Flood Hazard Area (Form I), and Water Quality Problem Areas (Form J) that you are aware of in your municipality.

What we would like to ask of you is that you complete as much of the attached data collection forms as possible. There is a different form for each item of information as summarized in the attached "FORM DESCRIPTION SUMMARY. The process would be as follows starting with the problem areas (Form A):

- Place the location of the problem area on the map as shown in the attached example map.
- Draw a box on the map with the problem area identifier starting with A-1 with an arrow leading from the problem area identifier to the problem area.
- Place an A-1 in the first column of FORM A.
- Put a check in each box in the A-1 column that represents the problems associated with that particular problem area.
- Repeat with the next problem area (A-2) and so on.

- Repeat for existing flood control projects (FORM C) placing a triangle on the maps and starting the labeling with C-1.
- Repeat for all forms.

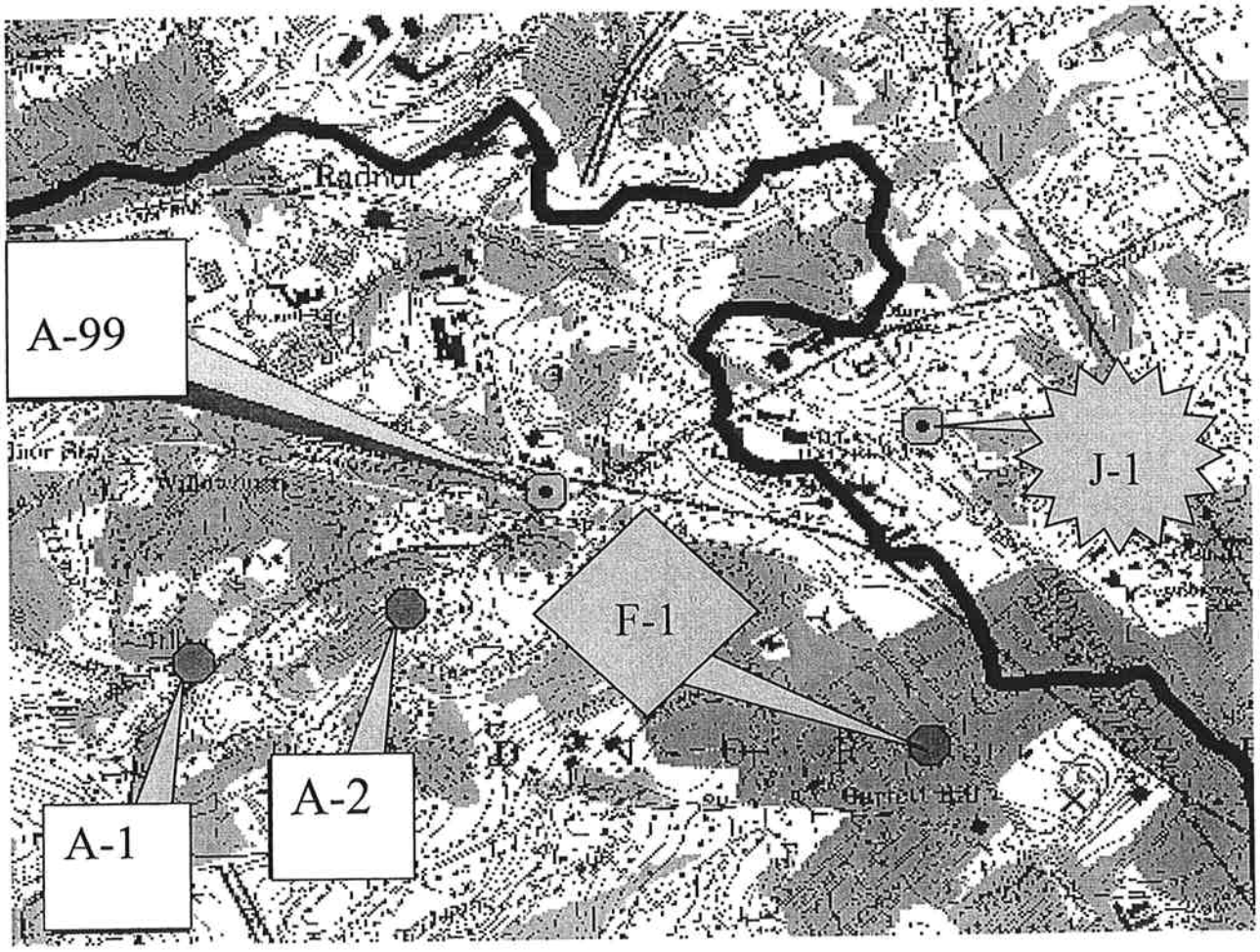
The sample map attached shows three problem areas (A99- A1 and A-2), one proposed flood control project (F-1) and one water quality problem (J1).

Use additional paper to provide detailed descriptions of your most serious problems and attach a map to show the location of the problem. Attach photographs, if available.

If you have any storm or combined sewers, please provide maps showing the collection system and overflow discharge locations and an estimate of the average annual discharge at each overflow point.

The more detail you provide, the better we will be able to evaluate the situation for your municipality. We appreciate your help.

Sample Location of Information from Data Collection Forms on the Municipal Map



FORM DESCRIPTION SUMMARY
ACT 167 WATERSHED STORMWATER MANAGEMENT PLAN

Form	Symbol	Description	Types of Examples	Sources of Information
A		Stormwater Problem Areas	Flooding, Drainage, Erosion/Sedimentation	Existing studies or reports, Township Documentation, Personal memory, Township engineer
B		Obstructions	Bridges. Culverts, Fill, Structures	Owner or structure, township files, subdivision applications, roadmaster, township engineer
C		Existing Flood Control Projects	Channel excavation, rip rap, floodwalls, etc.	Township records, township engineer, owner of facilitiy
D		Proposed Flood Control Projects	Channel excavation, rip rap, floodwalls, etc.	Township records, township engineer, owner of facilitiy
E		Existing Stormwater Control Facilities	Detention basins, recharge basins, roof-top stroage	Subdivision files, township engineer, owner of facility
F		Proposed Stormwater Control Facilities	Detention basins, recharge basins, roof-top stroage	Subdivision files, township engineer, owner of facility
G		Existing Stormwater Collection Systems	Storm sewers, man-made channels, diversions	Existing plans, township engineer, owner of system
H		Proposed Stormwater Collection Systems	Storm sewers, man-made channels, diversions	Existing plans, township engineer, owner of system
I		Present & Projected Development in Flood Hazard Areas	Subdivision / site plans	Flood Insurance Studies, Subdivision / Site Plans, General knowledge, Township engineer, Private flood studies
J		Water Quality Problem Areas	Construction sites, agriculture	Municipalities, Conservation District

Turning Ideas Into Reality

CATANIA ENGINEERING ASSOCIATES, INC.

Consulting Engineers & Land Surveyors

February 26, 2004
File No. 83350-115-W

Justin D. Kauffman
Delaware County Planning Department
Government Center
201 W. Front Street
Media, PA 19063-2751

Re: Rutledge Borough
Darby - Cobbs Creek Act 167 Stormwater Management Plan
Crum Creek Act 167 Stormwater Management Plan

Dear Mr. Kauffman:

Enclosed please find completed Form O - Outfall Data for the above referenced projects. Please note that there are no outfalls in the Borough. A map of the storm sewer system is attached.

Should you have any questions or comments, please feel free to contact me.

Very truly yours,

Jamie H. Wenger

Jamie H. Wenger, EIT
for Catania Engineering Assoc., Inc.

JHW/drl
Enclosure
cc: Rutledge Borough

520 W. MacDade Boulevard, Milmont Park, Pennsylvania 19033-3311
Phone: (610) 532-2884 Fax: (610) 532-2923 E-Mail: CEAINC1@aol.com

Form A

STORM WATER PROBLEM AREAS FORM A. SHEET 1 OF 1

WATERSHED

Name: Crum Creek
Municipality: Rutledge
County: Delaware

FORM COMPLETED BY

Name: Christie Pale
Telephone: 610 532 2884
Date: 5/18/05

Before Filling Out Form, See Instructions On Back

For County Use:

MAP NO. *	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-
Types of Storm Water Problems												
Flooding					NONE							
Accelerated Erosion												
Sedimentation												
Landslide												
Groundwater												
Water Pollution												
Other (Explain)												
Explanation Line No. (On Back)												
Cause (s)												
Storm Water Volume												
Storm Water Velocity												
Storm Water Direction												
Water Obstruction												
Other (Explain)												
Explanation Line No. (On Back)												
Frequency												
Year Most Recent Occurred												
Year First Known Occurred												
Regularity												
More Than 1 Year												
Less Than 1 Year												
Only During Agnes												
Duration (If Applicable)												
Less Than 1 Day												
1 Day + (Enter Days)												
Property Damage												
Loss of Life/Vital Services												
Private												
More Than One Owner												
Types of Properties												
Number of Properties												
Public (List Types)												
Explanation Line No. (On Back)												
Solutions												
Suggested												
Explanation Line No. (On Back)												
Formally Proposed												
Explanation Line No. (On Back)												

* Include Map ID No. if found on any other form listing proposed facilities.

INSTRUCTIONS

Begin with A.1 as the first map number to identify the first' storm water problem area. Illustrate the defined problem on the watershed map provided, and identify it with its map number.

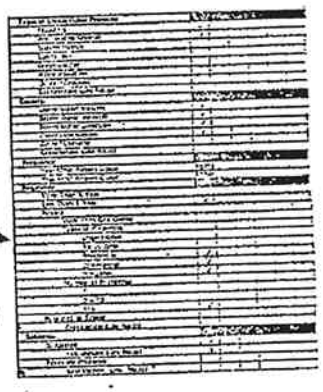
For each storm water problem area within your municipality, enter the map identification number at the head of the column. Describe the problem by placing a check (4 in the appropriate blocks of the column under this map identification number.

When an additional explanation is required, write the line number(s) used in the column marked "Explanation Line No. (s)".Example 1, 2-3, etc.

If storm water problem occurred during and after Agnes, describe the frequency of the problem after Agnes.

Use the explanation lines to list the types of public property damages ,e.g.roadways, hospitals, etc.

Enter the line no. (s) used to list the map ID no. (s) for the proposed facilities.



Definitions

Storm Water Problem Area
An area that defines the farthest extent of a storm water problem, including any area that experiences property damage, inundation, accelerated erosion, surface water pollution, groundwater pollution, landslides, or any other problem as a result of storm water runoff.

Groundwater
Water in the ground below the water table.

Accelerated Erosion
The removal of the surface of the land through the combined action of man's activities and the natural processes at a rate greater than would occur because of the natural process alone.

Sedimentation
The process by which soil or other surface materials, transported by surface water, is deposited on stream bottoms.

Water Obstruction
Any dike, bridge, culvert, wall, wingwall, fill, pier, wharf, embankment, abutment, or other structure located in, along, across, or projecting into any watercourse, floodway, or body of water.

EXPLANATION LINES (continued)

FORM C

EXISTING FLOOD CONTROL PROJECT FORM C. SHEET 1 OF 1

WATERSHED	FORM COMPLETED BY	TYPICAL TYPES OF FLOOD CONTROL PROJECTS
Name: Crum Creek Municipality: Rutledge County: Delaware	Name: Christine Pace Telephone: 610-532-2884 Date: 5/18/05	Channel Excavation / Widening Channel Realignment Rock Riprap Levee Gabions Pipe Channel Dams Floodwall Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Year Constr Built	Expected Life Yrs.	Design Flood Frequency Yrs.	Design Flood Discharge C.F.S. (if known)	Owner Name, Address, and Phone
C-	NONE					
C-						
C-						
C-						
C-						

FORM D

PROPOSED FLOOD CONTROL PROJECT FORM D. SHEET 1 OF 1

WATERSHED	FORM COMPLETED BY	TYPICAL TYPES OF FLOOD CONTROL PROJECTS
Name: Cuma Creek Municipality: Rainier County: Thurston	Name: Christie Price Telephone: 610 522 2884 Date: 5/18/05	Channel Excavation / Widening Channel Realignment Rock Riprap Levee Gabions Pipe Channel Dams Floodwall Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Study Phase Begun			Year Constr. Planned	Projected Compltn. Date	Expected Life Yrs.	Design Flood		Map ID No. Form A*	Owner Name, Address, and Phone
		YES		N0				Frequency Yrs.	Discharge C.F.S.		
		Prelim.	Final								
D-	NONE										
D-											
D-											
D-											
D-											

* Enter the storm water problem area's Map ID No., if the proposed project will solve or reduce any / all of an identified drainage problem.

FORM E

EXISTING STORM WATER CONTROL FACILITIES FORM E. SHEET 1 OF 1

WATERSHED	FORM COMPLETED BY	DEFINITION
Name: Crum creek Municipality: Rutledge County: Delaware	Name: Christine Race Telephone: 610 532 2814 Date: 9/18/05	Storm Water Control Facility A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.
For County Use:		

Map ID No.	Type of Storm Water Control Facility	Year Built	Contact Person Name, Address and Phone	Comments
E-	NONE			
E-				
E-				
E-				
E-				
E-				
E-				
E-				

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

Detention / Retention Basin

Natural Pond or Wetland

Parking Lot Pondling

Roof-Top Storage

Semi-Pervious Paving

Infiltration Device (Seepage / Recharge Basin or Underground Tank)

FORM F

PROPOSED FLOOD CONTROL PROJECT FORM F. SHEET 1 OF 1

WATERSHED		FORM COMPLETED BY	
Name:	Crum Creek	Name:	Christine Pace
Municipality:	Rutledge	Telephone:	610 566 8654
County:	Delaware	Date:	5/18/05

DEFINITION

Storm Water Control Facility

A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.

For County Use:

Map ID No.	Type of Storm Water Control Facility	Proposed Constr. Dates Start	Proposed Constr. Dates End	Map No. Form A*	Contact Person Name, Address and Phone	Comments
F-	NONE					
F-						
F-						
F-						
F-						
F-						
F-						
F-						

* Enter the storm water problem area's Map ID No., if the proposed project will solve or reduce any / all of an identified drainage problem.

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

Detention / Retention Basin	Roof-Top Storage
Natural Pond or Wetland	Semi-Pervious Paving
Parking Lot Pondling	Infiltration Device (Seepage / Recharge Basin or Underground Tank)

FORM G (Front)

EXISTING FLOOD CONTROL PROJECT FORM G. SHEET 1 OF 1

WATERSHED

Name: Crum Creek

Municipality: Rutledge

County: Delaware

FORM COMPLETED BY

Name: Christine Pace

Telephone: (610) 566-4584

Date: 5/18/05

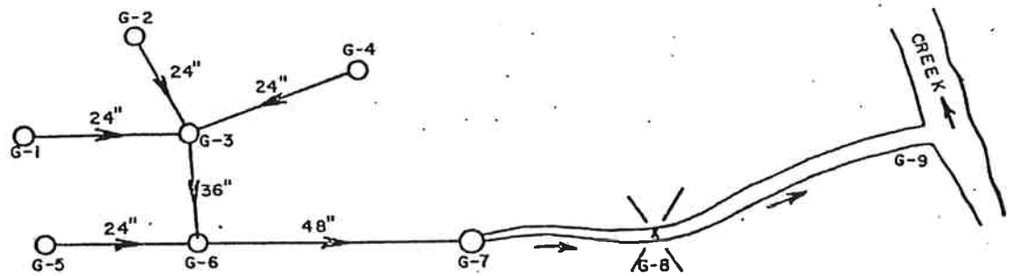
INSTRUCTIONS

Diagram each system on the appropriate map. Establish map points to show changes in system elements, pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific information on construction is available. Use a separate form for each system. Identify the points within a system consecutively (ex. G-1,G-2,G-3). Start the first point in each additional system 20 numbers higher. For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

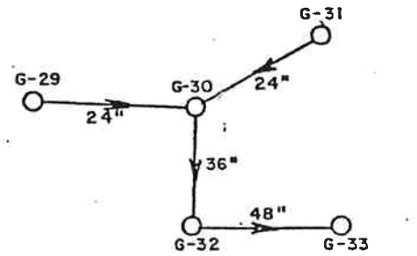
Map I.D. No.		System's Elements (x)			Measurements *				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-	G-	NONE											
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												

* See measurement key on reverse side.

Measurement Key
D = Diameter TW = Top Width B = Bottom Width

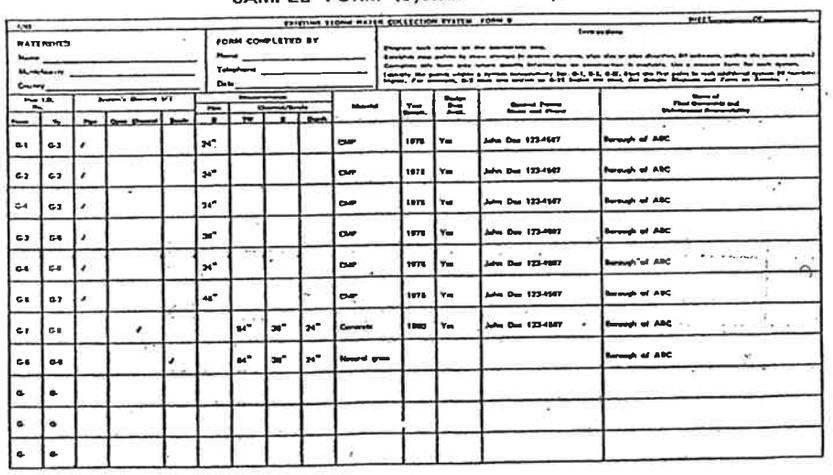


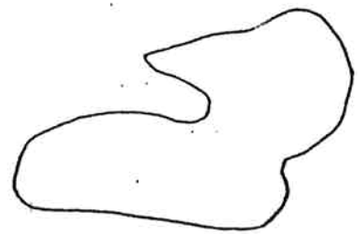
SAMPLE DIAGRAM FOR SYSTEM ONE



SAMPLE DIAGRAM FOR SYSTEM TWO

SAMPLE FORM (System One Only)





Outline known areas where construction exists but construction data is unavailable.

FORM H (Front)

PROPOSED FLOOD CONTROL PROJECT FORM H. SHEET 1 OF 1

WATERSHED		FORM COMPLETED BY	
Name:	Crum Creek	Name:	Christina Paul
Municipality:	Rutledge	Telephone:	610 532 2881
County:	Delaware	Date:	5/18/05

INSTRUCTIONS

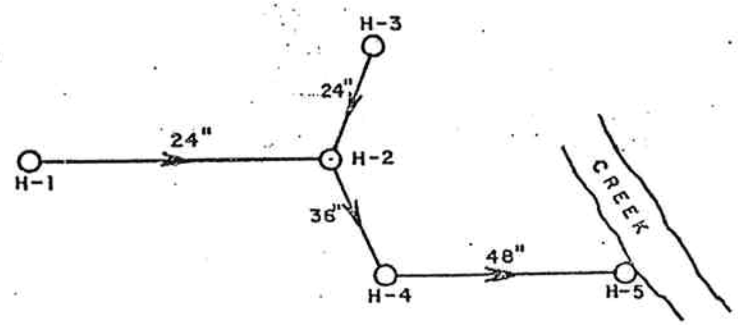
On the map for proposed storm water collection systems, diagram each proposed system. Indicate a map point to show changes in system elements, pipe size, pipe direction and connections to existing systems. For proposed additions to existing systems, diagram only the additions and their connection point into the existing system. Complete a separate form for each proposed, new system and one for each existing system having one or more proposed additions. Identify the points within a system consecutively (ex. H-1, H-2, H-3). Start the first point in each additional system 20 numbers higher (if H-3 ends one system, begin the next with H-23). Be sure to show the point where proposed additions connect into existing systems, using the map point number from the existing system form and map. See Sample Diagrams and Form on Reverse.

Map I.D. No. From	Map I.D. No. To	System's Elements (x) Pipe	System's Elements (x) Open Channel	System's Elements (x) Swale	Measurements * Pipe D	Measurements * Open Channel / Swale TW	Measurements * Open Channel / Swale B	Measurements * Open Channel / Swale Depth	Material	Map I.D. Nos.** Form A	Proposed Const. Dates Start	Proposed Const. Dates End	Design Data Avail.	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
H-	H-	NONE													
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														

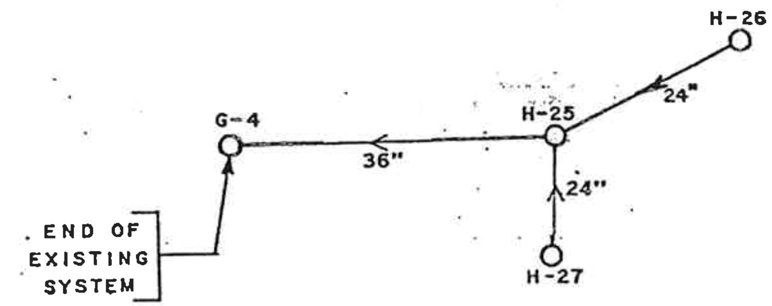
* See measurement key on reverse side. ** Enter the storm water problem areas' Map I.D. Nos., if proposed project will solve or reduce any / all of the drainage problems.

SAMPLE DIAGRAMS

Measurement Key
D = Diameter TW = Top Width B = Bottom Width



NEW SYSTEM



ADDITION TO EXISTING SYSTEM

SAMPLE FORM (New System Only)

PROPOSED STORM WATER COLLECTION SYSTEMS FORM H — SHEET ____ OF ____

WATERSHED
Name ______
Municipality ______
County ______

FORM COMPLETED BY
Name ______
Telephone ______
Date ______

Instructions: [illegible]

Map I.D. No. From	Map I.D. No. To	Pipe	Open Channel	Swale	Pipe D	TW	B	Depth	Material	Map I.D. Nos.* Form A	Start	End	[illegible]	Contact Person Name and Phone	[illegible] Maintenance Responsibility
H-1	H-2	✓			24"				CMP	A-1	1962	1963	Yes	John Doe 123-4567	Borough of ABC
H-2	H-3	✓			24"				CMP	A-4	1962	1963	Yes	John Doe 123-4567	Borough of ABC
H-2	H-4	✓			36"				CMP	A-2	1962	1963	Yes	John Doe 123-4567	Borough of ABC
H-4	H-5	✓			48"				CMP	A-2	1963	1063	Yes	John Doe 123-4567	Borough of ABC
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														
H-	H-														

*[illegible]

FORM I

PRESENT & PROJECTED DEVELOPMENT IN THE FLOOD HAZARD AREA (FORM 1)

SHEET 1 OF 1

WATERSHED	FORM COMPLETED BY
Name: Crum Creek	Name: Christine Raul
Municipality: Rutledge	Telephone: 610 532 2884
County: Delaware	Date: 5/18/05
For County Use:	

DEFINITION

FLOOD HAZARD AREA:

A NORMALLY DRY LAND AREA THAT HAS BEEN OR IS SUSCEPTABLE TO BEING INUNDATED BY THE 100-YEAR FLOOD.

Map ID No.	TYPE OF DEVELOPMENT	Year Built	Contact Person Name, Address and Phone	Comments
I -	NONE			
I -				
I -				
I -				
I -				
I -				
I -				

Form J

		WATER QUALITY PROBLEM AREAS FORM J. SHEET 1 OF 1												
WATERSHED					FORM COMPLETED BY									
Name:	Coon Creek				Name:		Christie Pace							
Municipality:	Rutledge				Telephone:		610 532 2884							
County:	Delaware				Date:		5/16/05							
SITE		J-	J-	J-	J-	J-	J-	J-	J-	J-	J-	J-	J-	
Types of Water Quality Problems														
High Community Tolerence														
High Temperature														
High Turbidity														
Hydrocarbon Pollution														
Low Community Diversity														
Low Dissolved Oxygen														
Low pH														
Nutrient Enrichment														
Poor Habitat														
Other/Explanation Line No.														
Potential Cause(s)														
Agriculture														
Construction Site														
Erosion														
Lake Discharge														
STP Outfall														
Other/Explanation Line No.														
Frequency														
Year Most Recent Occurence														
Year First Known Occurence														
Source of Information														
County Water Quality Study														
Driveby														
Other/Explanation Line No.														
		EXPLANATION LINES												
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														

Form O - Outfall Data

Person: Jamie H. Wenger Date: 2/25/04 Time Since Last Rain was ≥ 72 Hours: Yes_____

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain: One (2/24/04)

Municipality: Rutledge Borough Name of receiving water: Darby Creek via Stoney Creek via Ridley Township System

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
None												

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Rutledge Borough Storm Sewer System is tied into Ridley Township's System, two outfalls on Stoney Creek outside of the Borough boundary convey storm water from within the Borough

Form O - Outfall Data

Person: Jamie H. Wenger Date: 2/25/04 Time Since Last Rain was > 72 Hours: Yes_____

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain: One (2/24/04)

Municipality: Rutledge Borough Name of receiving water: Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
None												

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

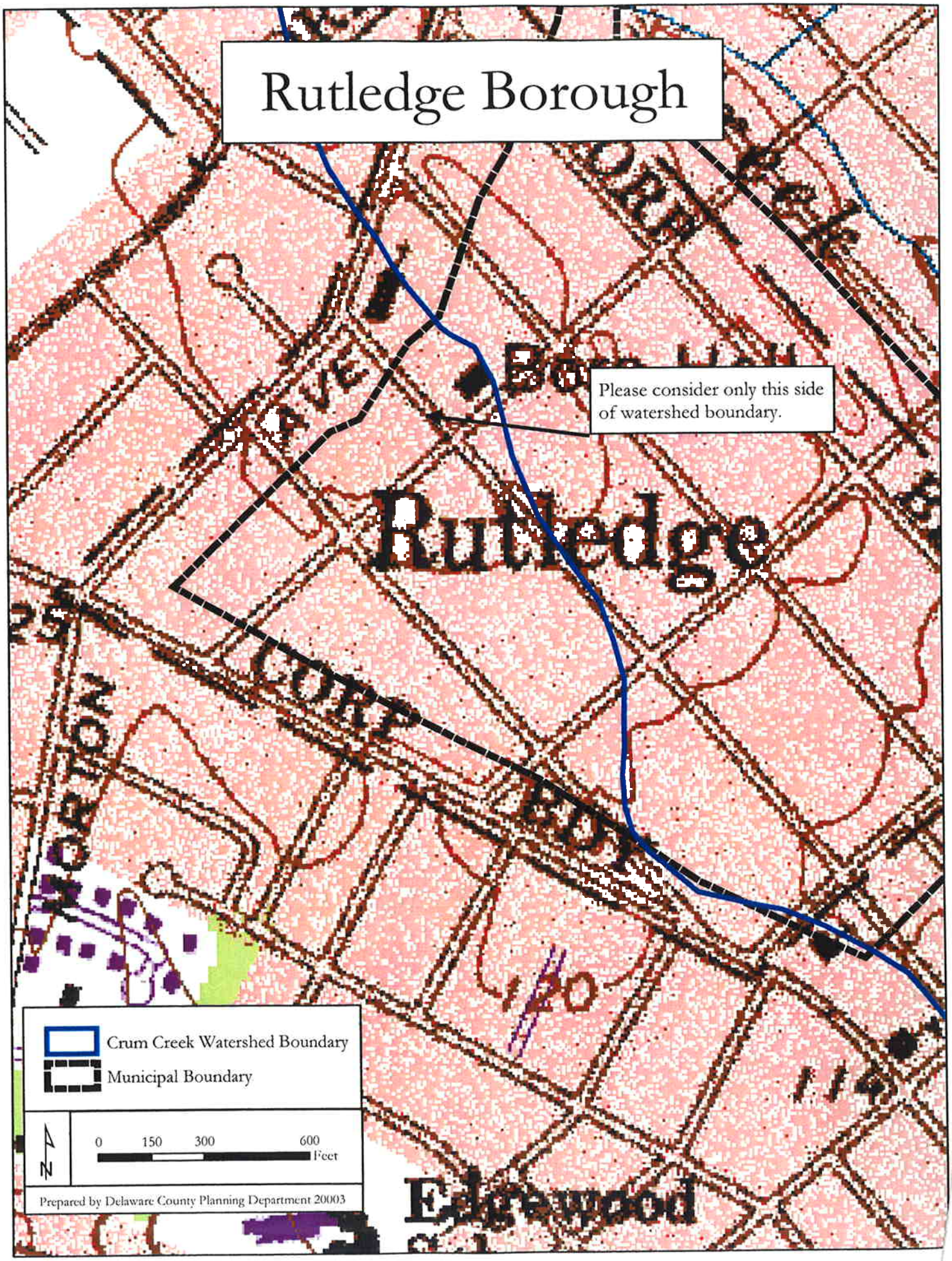
2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Rutledge Borough does not have any storm sewers or appurtenances connecting to outfalls on Crum Creek or in the Watershed


Rutledge Borough
Please consider only this side of watershed boundary.
Rutledge
Crum Creek Watershed Boundary
Municipal Boundary
N
0 150 300 600
Feet
Prepared by Delaware County Planning Department 20003
Edgewood

Form O - Outfall Data

Person: Jamie H. Wenger Date: 2/25/04 Time Since Last Rain was > 72 Hours: Yes_____

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain: One (2/24/04)

Municipality: Rutledge Borough Name of receiving water: Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
None												

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

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H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Rutledge Borough does not have any storm sewers or appurtenances connecting to outfalls on Crum Creek or in the Watershed

SPRINGFIELD TOWNSHIP

Pennoni
PENNONI ASSOCIATES INC.
CONSULTING ENGINEERS

SPTW 0402
(SPTW 0500.04)

September 9, 2005

Ms. Karen Holm
Delaware County Planning Department
Government Center Building
201 West Front Street
Media, PA 19063

Re: Springfield Township, Delaware County
Crum Creek Watershed Act 167 Stormwater Management Plan - Phase II

Dear Ms. Holm:

In accordance with the Act 167 Stormwater Management Plan for the Crum Creek Watershed, please accept the attached municipal survey forms on behalf of Springfield Township, Delaware County.

Should you have any questions or comments, please feel free to contact the undersigned.

Very truly yours,

PENNONI ASSOCIATES INC.

J. Mastronardo

Joseph Mastronardo, P.E.
Project Engineer

cc: Michael T. LeFevre, Township Manager, w/enclosure

CRUM CREEK WATERSHED
ACT 167 STORMWATER MANAGEMENT PLAN

MUNICIPALITY QUESTIONNAIRE

Please fill out the following questionnaire and return it to Karen Holm at the Delaware County Planning Department, Court House and Government Center Building, 201 West Front St. Media, PA 19063 as soon as possible. If you have any questions or comments, or if you would like these forms in digital format, please call Karen at 610-891-5213 or e-mail her at holmk@co.delaware.pa.us.

PART I - GENERAL INFORMATION

Municipality: Springfield Township

Contact Person: Michael T. LeFevre, Township Manager

WPAC Designee: Joseph A. Mastronardo, P.E.

Title: Township Consulting Engineer

Address: Pennoni Associates, Inc.

3001 Market Street, Philadelphia, PA 10104

Phone: (215) 222-3000 x3545

Fax: (215) 222-0598

Person Completing form (if different from Contact Person):

Name: Joseph A. Mastronardo, P.E.

Address: Pennoni Associates, Inc.

3001 Market Street, Philadelphia, PA 10104

Phone: (215) 222-3000 x3545

Fax: (215) 222-0598

E-mail: jmastronardo@pennoni.com

PART II - REGULATORY ACTIVITIES

A. Please indicate the regulations you currently use to manage development.

REGULATION	MUNICIPAL ORDINANCE	COUNTY ORDINANCE
Zoning Ordinance	X	
Subdivision/Land Development Ordinance	X	
Separate Stormwater Ordinance	X	
Separate Floodplain Ordinance		

B. Please indicate the agencies/individuals who review and approve land development plans and zoning variance/waiver requests.

ENTITY	LAND DEVELOPMENT PLANS		ZONING VARIANCE/WAIVER REQUESTS	
	REVIEW	APPROVE	REVIEW	APPROVE
Supervisors		X		X
Municipal Engineering Department				
Municipal Planning Department	X (Codes Dept.)		X	
County Planning Department	X			
County Conservation District	X			
Zoning Hearing Board				X
Consulting Engineer	X		X	
Others (List Below				

C. Please provide **copies** of your zoning, subdivision/land development, and separate stormwater management and floodplain ordinances and your current zoning map when you return this questionnaire. Please list these documents below.

Chapter 123 – Subdivision and Land Development
Chapter 143 - Zoning
Ordinance No. 1429 – Stormwater Management

PART III - MUNICIPAL AND LOCAL PLANNING ACTIVITIES

Please indicate below whether your community has approved the following plans and maps and the date of the most recent update.

ITEM	APPROVED/DATE	IN PROGRESS	PLANNED WITHIN NEXT YEAR
PA Act 537 Sewage Facilities Plan	**APPROVED**		
Comprehensive Land Use Plan	**APPROVED/1983**		
Existing Land Use Maps	**APPROVED/1983**		
Proposed Land Use Maps	**APPROVED/1983**		
Zoning Maps	**APPROVED/1985**		

PART IV - FLOOD INSURANCE PROGRAM AND COMPREHENSIVE LAND USE PLAN

Please indicate below whether your community participates in the National Flood Insurance Program:

ITEM	PARTICIPATES (Y/N)
Flood Hazard Boundary Map (FHBM)	**YES**
Participates in FEMA Emergency Program	**YES**
Participates in FEMA Regular Program	**YES**

PART V - EXISTING STORMWATER RELATED PROBLEMS AND STRUCTURES

Please complete the matrices on the following pages (Forms A and C-J) to describe any significant stormwater-related problems (Form A), Existing or Proposed Flood Control Projects (Forms C & D), Existing or Proposed Storm Water Control Facilities (Forms E and F), Existing or Proposed Stormwater Collection Systems (Forms G & H), Present and Projected Development in the Flood Hazard Area (Form I), and Water Quality Problem Areas (Form J) that you are aware of in your municipality.

What we would like to ask of you is that you complete as much of the attached data collection forms as possible. There is a different form for each item of information as summarized in the attached "FORM DESCRIPTION SUMMARY. The process would be as follows starting with the problem areas (Form A):

- Place the location of the problem area on the map as shown in the attached example map.
- Draw a box on the map with the problem area identifier starting with A-1 with an arrow leading from the problem area identifier to the problem area.
- Place an A-1 in the first column of FORM A.
- Put a check in each box in the A-1 column that represents the problems associated with that particular problem area.
- Repeat with the next problem area (A-2) and so on.

- Repeat for existing flood control projects (FORM C) placing a triangle on the maps and starting the labeling with C-1.
- Repeat for all forms.

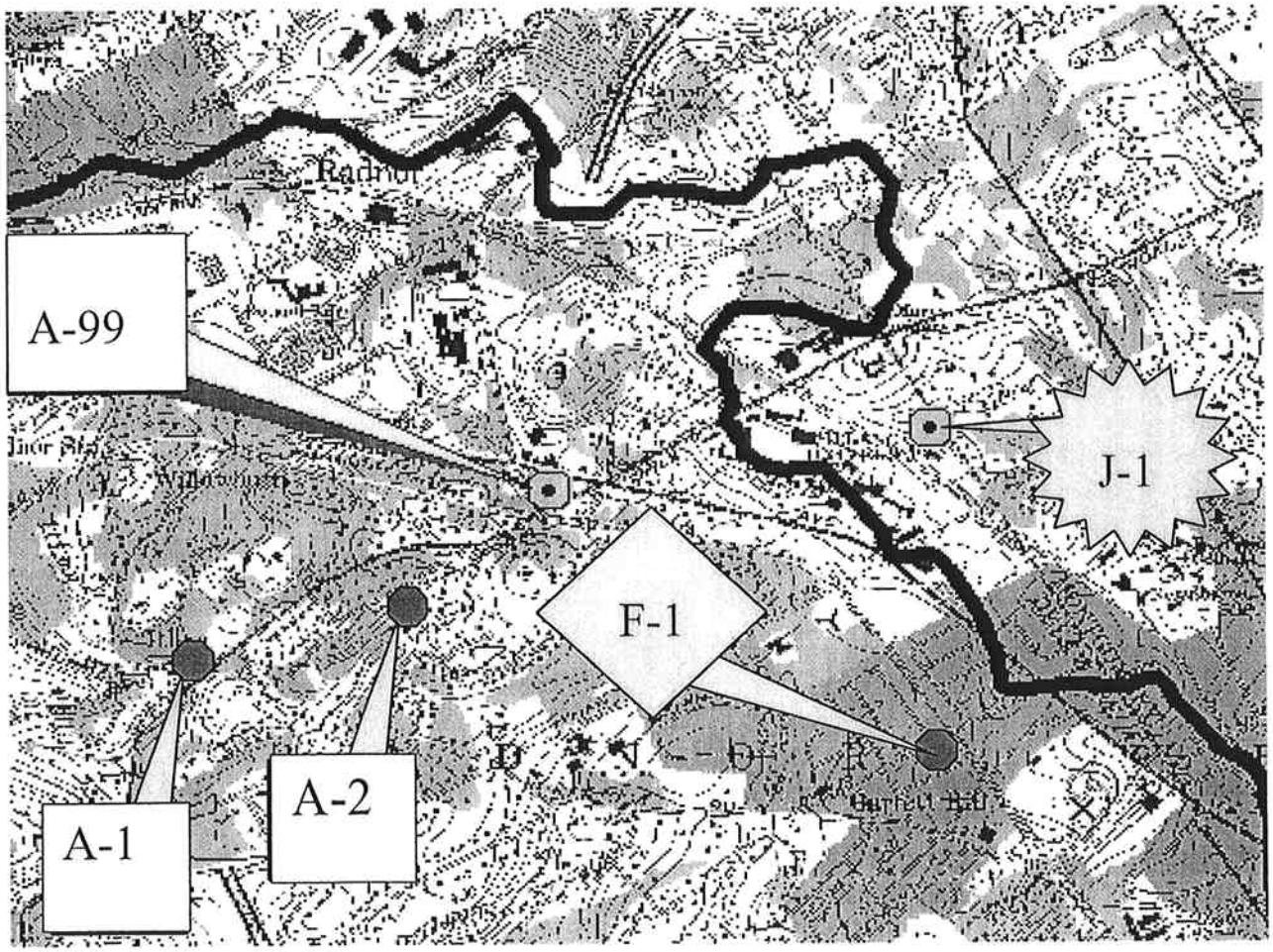
The sample map attached shows three problem areas (A99- A1 and A-2), one proposed flood control project (F-1) and one water quality problem (J1).

Use additional paper to provide detailed descriptions of your most serious problems and attach a map to show the location of the problem. Attach photographs, if available.

If you have any storm or combined sewers, please provide maps showing the collection system and overflow discharge locations and an estimate of the average annual discharge at each overflow point.

The more detail you provide, the better we will be able to evaluate the situation for your municipality. We appreciate your help.

Sample Location of Information from Data Collection Forms on the Municipal Map



Form A

STORM WATER PROBLEM AREAS FORM A. SHEET 1 OF 1

WATERSHED			FORM COMPLETED BY						Before Filling Out Form, See Instructions On Back				
Name:	Crum Creek		Name:		Joseph Mastronardo								
Municipality:	Springfield Twp		Telephone:		(215) 222-3000				For County Use:				
County:	Delaware Cty		Date:		7/18/2005								
MAP NO. *		A-	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-
Types of Storm Water Problems													
Flooding													
Accelerated Erosion													
Sedimentation													
Landslide													
Groundwater													
Water Pollution													
Other (Explain)													
Explanation Line No. (On Back)													
Cause (s)													
Storm Water Volume													
Storm Water Velocity													
Storm Water Direction													
Water Obstruction													
Other (Explain)													
Explanation Line No. (On Back)													
Frequency													
Year Most Recent Occurred													
Year First Known Occurred													
Regularity													
More Than 1 Year													
Less Than 1 Year													
Only During Floyd													
Duration (If Applicable)													
Less Than 1 Day													
1 Day + (Enter Days)													
Property Damage													
Loss of Life/Vital Services													
Private													
More Than One Owner													
Types of Properties													
Number of Properties													
Public (List Types)													
Explanation Line No. (On Back)													
Solutions													
Suggested													
Explanation Line No. (On Back)													
Formally Proposed													
Explanation Line No. (On Back)													

NOT APPLICABLE

* Include Map ID No. if found on any other form listing proposed facilities.

Springfield (SPR)

FORM B - OBSTRUCTION DATA COLLECTION SHEET 10 OF ____

Municipal Stream Obstruction Data

Watershed: Crum Creek

Municipality/County: Springfield / Delaware

Records completed by: Brian B[illegible]

Field work personnel: "

Date(s): 12/1 - 12/20

T= Amount of fill
D= Diameter
HT = Height
W = Width
PW = Pier Width

Material
msry = Stone Masonry Structure
CMP = Corrugated Metal Pipe
CPP = Corrugated Polyethylene Pipe
BCCMP = Bituminous Coated CMP
RCP = Reinforced Concrete Pipe
SP = Steel Pipe

Inlet Conditions
HW = Headwall
WW = Wingwall
SW = Sidewall

Map ID	Owner or Address Of Obstruction	Capacity (CFS)	Nos. of?	Opening Type: Part of Bridge?	Opening Type: Culvert Purpose	Shape (✓) Culvert □	Culvert O	Culvert ⬭	Bridge ⌒	Bridge ⊓	Measurements: T (ft)	D (ft)	HT (ft)	W (ft)	PW (ft)	skew angle	MATERIAL / INLET CONDITION	NOTES
SPR 1	Country club Rd		1				✓				4	4.5	–	–	–	90	CMP / HW	
SPR 2	Lewis Rd		1				✓				7.5	5	–	–	–	90	RCP / HW	
SPR 3	Sidewalk Bridge 525 RT 420		1	✓						✓	1	–	6.5	22	–	90	Concrete	
SPR 4	RT 420 culvert		2			1	1				2	2	4	4	–	90	Concrete / HW, WW	Diagram
SPR 5	433 Kerr Rd		1				✓				3.[illegible]	4.5	–	–	–	90	RCP / HW, SW	
SPR 6	433 Kerr Rd Yard Bridge		1	✓						✓	.5	–	3	4	–	90	Wood	
SPR 7	RT 420 Sidewalk / Funeral Home		1	✓						✓	1	–	4	19.5	–	90	Concrete	
SPR 8	RT 420 Culvert / "		1			✓					2	–	2	17	–	90	Concrete / [illegible]	
SPR 9	RT 420 Sidewalk		1	✓						✓	1	–	7	19	–	90	concrete	
SPR 10	" " Culvert		1			✓					2	–	7	10	–	90	Concrete / HW, SW	
SPR 11	RT 420 S Sidewalk		1	✓						✓	1	–	12	21	–	90	Concrete	
SPR 12	RT 420 S Culvert		1			✓					4	–	4	4	–	90	Concrete / HW, WW	
SPR 13	RT 420 Dairy Cottage		1	✓						✓	.6	–	4.5	4	–	90	Wood	Estimate
SPR 14	Thompson Rd		1	✓						✓	10	–	5	10	–	90	Concrete	
SPR 15	2 Thompson Rd		1	✓						✓	1.5	–	5.5	8	–	90	Concrete	
SPR 16	RR Bridge off Thompson		1	✓						✓	12	–	2.5	10	–	90	MSRY / HW, WW	
SPR 17	RT 320 Bridge		1	✓														No Obst.
SPR 18	RR tracks off 320		1	✓						✓	7	–	7.5	15	–	45	MSRY, HW, WW	
SPR 19	Park Near Turnpike		1	✓						✓	1.5	–	4	32	–	90	Concrete, HW, WW	
SPR 20	Park Bridge over Crum		1	✓														No Obst.
SPR 21	Park Rd culvert						✓				3.5	3	–	–	–	90	RCP	
SPR 22	TP over Crum																	No Ob
SPR 23	Park Rd over Crum																	Bridge gone / New one being [illegible]
SPR 24	TP over crum																	No Ob

FORM C

EXISTING FLOOD CONTROL PROJECT FORM C. SHEET 1 OF 1

WATERSHED	FORM COMPLETED BY	TYPICAL TYPES OF FLOOD CONTROL PROJECTS
Name: Crum Creek Municipality: Springfield Township County: Delaware County	Name: Joseph Mastronardo Telephone: (215) 222-3000 Date: 7/18/2005	Channel Excavation / Widening Channel Realignment Rock Riprap Levee Gabions Pipe Channel Dams Floodwall Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Year Constr Built	Expected Life Yrs.	Design Flood Frequency Yrs.	Design Flood Discharge C.F.S. (if known)	Owner Name, Address, and Phone
C-						
C-						
C-						
C-						
C-						

NOT APPLICABLE

FORM D

PROPOSED FLOOD CONTROL PROJECT FORM D. SHEET ____ OF ____

WATERSHED	FORM COMPLETED BY	TYPICAL TYPES OF FLOOD CONTROL PROJECTS
Name: Crum Creek Municipality: Springfield Township County: Delaware County	Name: Joseph Mastronardo Telephone: (215) 222-3000 Date: 7/18/2005	Channel Excavation / Widening Channel Realignment Rock Riprap Levee Gabions Pipe Channel Dams Floodwall Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Study Phase Begun			Year Constr. Planned	Projected Compltn. Date	Expected Life Yrs.	Design Flood		Map ID No. Form A*	Owner Name, Address, and Phone
		YES		N0				Frequency Yrs.	Discharge C.F.S.		
		Prelim.	Final								
D-											
D-											
D-											
D-											
D-											

NOT APPLICABLE

* Enter the storm water problem area's Map ID No., if the proposed project will solve or reduce any / all of an identified drainage problem.

FORM E

EXISTING STORM WATER CONTROL FACILITIES FORM E. SHEET 1 OF 1

WATERSHED	FORM COMPLETED BY	DEFINITION
Name: _____ Municipality: _____ County: _____	Name: _____ Telephone: _____ Date: _____	Storm Water Control Facility A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.
For County Use:		

Map ID No.	Type of Storm Water Control Facility	Year Built	Contact Person Name, Address and Phone	Comments
E-1	Detention Basin		Frank Pappa	Lincoln Ave. and Millison Dr.
E-2	Detention Basin		Frank Pappa	Capie Polk Dr. and Millison Dr.
E-3	Detention Basin		Frank Pappa	Farmhouse Cr. and Swarthmore Ave.
E-				
E-				
E-				
E-				
E-				

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

Detention / Retention Basin

Natural Pond or Wetland

Parking Lot Pondling

Roof-Top Storage

Semi-Pervious Paving

Infiltration Device (Seepage / Recharge Basin or Underground Tank)

FORM F

PROPOSED FLOOD CONTROL PROJECT FORM F. SHEET 1 OF 1

WATERSHED	
Name:	Crum Creek
Municipality:	Springfield Township
County:	Delaware County

FORM COMPLETED BY	
Name:	Joseph Mastronardo
Telephone:	(215) 222-3000
Date:	7/18/2005

DEFINITION

Storm Water Control Facility

A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.

For County Use:

Map ID No.	Type of Storm Water Control Facility	Proposed Constr. Dates Start	End	Map No. Form A*	Contact Person Name, Address and Phone	Comments
F-1	Subsurface Detention / Infiltration Basin	Jul-2005	Jul-2006		Springfield Township Michael LeFevre, Township Manager	Willow Bay Subdivision Route 320 & Beatty Road
F-2	Subsurface Detention / Infiltration Basin	Constructed, Pending Dedication			Springfield Township Michael LeFevre, Township Manager	Springfield Chase Subdivision Beatty Road & Kelli Lane
F-3	Subsurface Detention / Infiltration Basin	Constructed, Pending Dedication			Springfield Township Michael LeFevre, Township Manager	Springfield Chase Subdivision Beatty Road & Kelli Lane
F-						
F-						
F-						
F-						
F-						

* Enter the storm water problem area's Map ID No., if the proposed project will solve or reduce any / all of an identified drainage problem.

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

Detention / Retention Basin	Roof-Top Storage
Natural Pond or Wetland	Semi-Pervious Paving
Parking Lot Pondling	Infiltration Device (Seepage / Recharge Basin or Underground Tank)

FORM G (Front)

EXISTING FLOOD CONTROL PROJECT FORM G. SHEET ____ OF ____

WATERSHED		FORM COMPLETED BY		INSTRUCTIONS
				Diagram each system on the appropriate map. Establish map points to show changes in system elements,
Name:	Crum Creek	Name:	Joseph Mastronardo	pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific
Municipality:	Springfield Twp	Telephone:	(215) 222-3000	information on construction is available. Use a separate form for each system. Identify the points within a
County:	Delaware	Date:	8/29/2005	system consecutively (ex. G-1,G-2,G-3). Start the first point in each additional system 20 numbers higher.
				For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

Map I.D. No.		System's Elements (x)			Measurements *						Design		Name of Final
					Pipe	Channel / Swale			Material	Year	Data	Contact Person	Ownership and
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth		Constr.	Available	Name and Phone	Maintenance Responsibility
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												

SEE ATTACHED MAPPING

* See measurement key on reverse side.

Crum Creek Stormsewers

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
	1297		22-23C 4' GRATE	22-22C 4' GRATE	1986	15" CMP/PVT	118'	CRUM CREEK
	1270		23-79C M.H.	23-80C M.H.	1970	18" RCP	17'	CRUM CREEK
	1271		23-84C TYPE M IN	23-83C M.H.	1992	18" RCP/PVT	160'	CRUM CREEK
	1272		23-81C TRENCH B	23-83C M.H.	1992	18" CMP/PVT	166'	CRUM CREEK
	1273		23-83C M.H.	23-82C TYPE M IN	1992	18" RCP/PVT	24'	CRUM CREEK
	1274		23-82C TYPE M IN	23-80C M.H.	1992	18" RCP/PVT	9'	CRUM CREEK
	1577		19-136C M.H.	19-137C CONC. H	1996	15" CORR. I. PIPE	46'	CRUM CREEK
	1276		23-86C INV. 48" C	23-87C INV. 48" C	1987	48" CMP DET. TA	52'	CRUM CREEK
	1253		23-58C 4' SPEC.	23-59C 4' SPEC.	1972	18" RCP/PVT	41'	CRUM CREEK
	1300		22-26C 4' GRATE	22-27C 4' GRATE	1986	15" CMP/PVT	192'	CRUM CREEK
	1572		18-1C 2-4' SPEC.	19-132C M.H.	1996	18" CORR. I. PIPE	290'	CRUM CREEK
	1573		19-132C M.H.	19-133C M.H. Uun	1996	18" CORR. I. PIPE	225'	CRUM CREEK
	1574		19-134C 4' SPEC.	Uunderg'd Storage S	1996	15" CORR. I. PIPE	24'	CRUM CREEK
	1575		19-135C 4' SPEC.	Uunderg'd Storage S	1996	15" CORR. I. PIPE	10'	CRUM CREEK
	1858		18-5 Type C	18-4 Type C	1996	30" ACMP Pvt	48'	CRUM CREEK
	1275		23-85C TYPE C IN	23-86C INV. 48" C	1987	12" CMP/PVT	15'	CRUM CREEK
	1241		23-48C 6' GRATE	23-47C 6' GRATE	1972	24" RCP/PVT	216'	CRUM CREEK
	1217		23-19C TYPE C	23-20C CONC HD	1985	18" RCP/PVT	45'	CRUM CREEK
	1220		23-29C 6' GRATE	23-23C 6' GRATE	1964	18" RCP/PVT	45'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
	1222		23-27C 6' GRATE	23-28C 6' GRATE	1970	12" RCP/PVT	15'	CRUM CREEK
	1224		23-30C 4' GRATE	23-31C TYPE M	1970	12" RCP/PVT	265'	CRUM CREEK
	1225		23-32C TYPE M.	23-31C TYPE M 4"	1994	36" CMP/PVT.	120'	CRUM CREEK
	1226		23-31C TYPE M	23-24C 6' GRATE	1970	PVT	15'	CRUM CREEK
	1269		23-78C M.H.	23-79C M.H.	1970	15" RCP/PVT	212'	CRUM CREEK
	1229		23-34C 4' SPEC.	23-35C 4' GRATE	1991	15" CORR. I.P./PV	50'	CRUM CREEK
	1268		23-77C 4' GRATE	23-78C M.H.	1970	15" RCP/PVT	20'	CRUM CREEK
	1242		23-50C 6' GRATE	23-49C 6' GRATE	1972	18" RCP/PVT	215'	CRUM CREEK
	1243		23-49C 6' GRATE	23-47C 6' GRATE	1972	18" RCP/PVT	200'	CRUM CREEK
	1244		23-47C 6' GRATE	23-46C 6' GRATE	1972	36" RCP/PVT	216'	CRUM CREEK
	1251		23-56C 4' SPEC.	23-57C 4' SPEC.	1972	18" RCP/PVT	14'	CRUM CREEK
	1252		23-57C 4' SPEC.	23-59C 4' SPEC.	1972	18" RCP/PVT	18'	CRUM CREEK
	1578		19-138C 4' GRATE	19-139C 4' SPEC.	1984	72" Corr. I. P. Unde	140'	CRUM CREEK
	1228		23-33C CONC. TR	23-25C 6' GRATE	1991	15" CORR. I.P./PV	10'	CRUM CREEK
	1601		BLDG. UD.	19-164 M.H.	1980	12" RCP PVT.	120'	CRUM CREEK
	1545		19-105C 4'x2' GRA	19-106C M.H.	1955	12" TCP PVT.	112'	CRUM CREEK
	1546		19-106C M.H.	19-107C M.H.	1955	15" TCP PVT.	284'	CRUM CREEK
	1547		19-107C M.H.	19-104C 4' PDH SP	1955	15" TCP PVT.	250'	CRUM CREEK
	1555		19-115C 4' GRATE	19-117C 4' GRATE	1958	18" RC UD	196'	CRUM CREEK
	1598		19-160C M.H.	19-162C GRATE I	1963	12" RCP PVT.	21'	CRUM CREEK
	1576		19-136C M.H.	19-111C 4' SPEC.	1996	18" CORR. I. PIPE	73'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
	1600		24-3C M.H.	19-160C M.H.	1980	12" RCP PVT.	216'	CRUM CREEK
	1542		19-101C M.H.	19-102C 12"x24" G	1955	15" TCP PVT.	44'	CRUM CREEK
	1602		BLDG. UD.	19-166 M.H.	1980	8" RCP PVT.		CRUM CREEK
	1603		19-166C M.H.	19-165C M.H.	1980	8" RCP PVT.	25'	CRUM CREEK
	1604		19-165 M.H.	19-164C M.H.	1980	8" RCP PVT.	54'	CRUM CREEK
	1605		19-167C TYPE C	19-169C M.H.	1996	15" ACMP PVT.	18'	CRUM CREEK
	1606		19-168C TYPE C	72" ACMP	1996	15" ACMP PVT.	15'	CRUM CREEK
	1857		23-4 Type C	18-5 Type C	1996	30" ACMP Pvt	43'	CRUM CREEK
	1599		19-162C GRATE I	19-163C Junct. Wit	1963	30" RCP PVT.	126'	CRUM CREEK
	1596		19-158C M.H.	19-161C Junct. Wit	1980	15" RCP PVT.	118'	CRUM CREEK
	1579		19-139C 4' SPEC.	19-140C 4' GRATE	1984	12" CORR. IP PVT.	125'	CRUM CREEK
	1582		19-142C 5' SQ GR	JUNCT. @ 24" RC	1963	18" RCP PVT.	110'	CRUM CREEK
	1584		19-146C CO	19-145C 4' SQ GR	1963	12" RCP PVT.	260'	CRUM CREEK
	1587		19-149C 4' SQ GR	19-150C JUNCT @	1963	24" RCP PVT.	75'	CRUM CREEK
	1592		19-156C GRATE I	19-157C M.H.	1980	12" CIP PVT.	100'	CRUM CREEK
	1593		BLDG UD	19-159 M.H.	1980	10" CIP PVT.		CRUM CREEK
	1544		19-103C 12"x24" G	19-104C 4' PDH SP	1955	PVT.	24'	CRUM CREEK
	1595		19-157C M.H.	19-158C M.H.	1980	12" CIP PVT.	47'	CRUM CREEK
	1543		19-102C 12"x24" G	19-103C 12"x24" G	1955	PVT.	208'	CRUM CREEK
	1597		24-3C M.H.	19-160C M.H.	1980	12" RCP PVT.	214'	CRUM CREEK
	1538		19-97C 4'x2' GRAT	19-98C 4'x2' GRAT	1956	12" TCP PVT.	233'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
	1539		19-98C 4'x2' GRAT	19-99C 4'x2' GRAT	1955	15" TCP PVT.	206'	CRUM CREEK
	1540		19-99C 4'x2' GRAT	19-100C M.H.	1955	15" TCP PVT.	95'	CRUM CREEK
	1541		19-100C M.H.	19-101C M.H.	1955	15" TCP PVT.	178'	CRUM CREEK
	1214		23-15C TYPE M	23-16C TYPE C	1985	18" RCP/PVT	40'	CRUM CREEK
	1594		19-159C M.H.	19-157C M.H.	1980	10" CIP PVT.	55'	CRUM CREEK
	296		7-32 C 4' TYPE M.	7-34 C 4' TYPE M.	1990	24" or 30" RCP	225'	CRUM CREEK
	289		7-25 C 4' TYPE M.	7-27 C 4' TYPE M.	1990	18" or 21" RCP	350'	CRUM CREEK
	290		7-28 C 4' TYPE M.	7-27 C 4' TYPE M.	1990	18" RCP	74'	CRUM CREEK
	291		7-27 C 4' TYPE M.	7-29 C 4' TYPE M.	1990	21" or 27" RCP	150'	CRUM CREEK
	292		7-30 C 4' TYPE S.	7-31 C 4' TYPE M.	1990	18" RCP	40'	CRUM CREEK
	293		7-31 C 4' TYPE M.	7-29 C 4' TYPE M.	1990	18" RCP	60'	CRUM CREEK
	1216		23-17C TYPE C	23-18C TYPE C	1985	18" RCP/PVT	48'	CRUM CREEK
	295		7-33 C 4' TYPE S.	7-32 C 4' TYPE M.	1990	18" RCP	60'	CRUM CREEK
	1043		27-15C 4' GRATE	27-14C 4' TYPE C	1990	15" RCP/PVT	20'	CRUM CREEK
	297		7-35 C 4' TYPE M.	7-34 C 4' TYPE M.	1990	18" RCP	60'	CRUM CREEK
	298		7-36 C M.H.	7-37 C 4' TYPE M.	1990	18" RCP	220'	CRUM CREEK
	299		7-37 C 4' TYPE M.	7-38 C M.H.	1990	24" RCP	260'	CRUM CREEK
	300		7-38 C M.H.	7-39 C CONC HD	1990	24" RCP	100'	CRUM CREEK
	301		7-40 C CONC HD	7-41 C M.H.	1990	36" RCP	375'	CRUM CREEK
	302		7-41 C M.H.	7-42 C CONC HD	1990	36" RCP	16'	CRUM CREEK
	294		7-29 C 4' TYPE M.	7-32 C 4' TYPE M.	1990	21" or 27" RCP	216'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
	1484		19-45C TRENCH D	CONN. THRU CU	1966			CRUM CREEK
	1476		19-34C 4' GRATE	19-35C 4' GRATE	1966	10" RCP PVT.		CRUM CREEK
	1477		19-35C 4' GRATE	19-36C 4' GRATE	1966	12" RCP PVT.		CRUM CREEK
	1478		19-36C 4' GRATE	19-14C 4' GRATE	1966	12" RCP PVT.		CRUM CREEK
	1479		19-43C 4' GRATE	19-42C 4' GRATE	1966	10" RCP PVT.		CRUM CREEK
	1480		19-42C 4' GRATE	19-38C 4' GRATE	1966	12" RCP		CRUM CREEK
	1481		19-38C 4' GRATE	19-37C 4' GRATE	1966	12" RCP		CRUM CREEK
	288		7-26 C 4' TYPE M.	7-25 C 4' TYPE M.	1990	18" RCP	60'	CRUM CREEK
	1483		19-44C TRENCH D	12" RCP	1966	5" IRON		CRUM CREEK
	287		7-24 C 4' TYPE M.	7-25 C 4' TYPE M.	1990	18" RCP	350'	CRUM CREEK
	1037		27-8C 4' SPEC.		1961	18" RC UD		CRUM CREEK
	1038		27-9C 4' GRATE	27-10C 4' GRATE	1965	12" CMP/PVT	192'	CRUM CREEK
	1039		27-10C 4' GRATE	27-11C 4' GRATE	1965	18" CMP/PVT	174'	CRUM CREEK
	1040		27-12C 4' GRATE	27-11C 4' GRATE	1965	12" CMP/PVT	216'	CRUM CREEK
	1041		27-11C 4' GRATE	27-15C 4' GRATE	1965	24" CMP/PVT	296'	CRUM CREEK
	1099		24-4C 5'x5' GRATE	24-5C 5'x5' GRATE	1963	18" CMP/PVT	316'	CRUM CREEK
	1482		19-37C 4' GRATE	19-20C 4' GRATE	1966	12" RCP		CRUM CREEK
	1202		23-3C TYPE C	23-4C TYPE C	1995	24" ACMP/PVT	203'	CRUM CREEK
	322		60" HOLDING TA	8-182 C Modified T	1995	60 CMP	20"	CRUM CREEK
	1187		23-14C 4' SPEC.	24-111C 4' SPEC.	1985	21" RCP	48'	CRUM CREEK
	1192		24-109C 4' SPEC.	24-110C 4' GRATE	1985	30" RCP	48'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
	1196		23-18C 6' GRATE	24-116C GRATE	1985	18" RCP PVT	120'	CRUM CREEK
	1198		23-18C TYPE C	24-116C 6' GRATE	1985	18" RCP/PVT	120'	CRUM CREEK
	1199		18-8 C M.H.	23-2C TYPE C	1995	18" ACMP/PVT	245'	CRUM CREEK
	1073			26-1C TYPE C INL	1993	12" CIP (ROOF DR	470'	CRUM CREEK
	1201		23-2C TYPE C	23-3C TYPE C	1995	21" ACMP/PVT	30'	CRUM CREEK
	1302		22-28C 4' GRATE	22-29C CONC. RA	1986	24" CMP/PVT	27'	CRUM CREEK
	1205		23-6C M.H.	23-8C M.H.	1958	18" RCP	112'	CRUM CREEK
	1208		18-6C TYPE C	23-8C M.H.	1995	18" ACMP	12'	CRUM CREEK
	1211		23-11C TYPE C	23-12C TYPE C	1985	15" RCP/PVT	48'	CRUM CREEK
	1212		23-12C TYPE C	23-13C TYPE C	1985	18" RCP/PVT	65'	CRUM CREEK
	1213		23-13C TYPE C	23-14C TYPE C	1985	21" RCP/PVT	48'	CRUM CREEK
	1206		18-3C GRATE M.H	23-8C M.H.	1995	18" HCMP/PVT	55'	CRUM CREEK
	1200		23-1C TYPE C	23-2C TYPE C	1995	15" ACMP/PVT	63'	CRUM CREEK
	1119		24-30C YARD DR	24-31C YARD DR	1951	10" TCP	98'	CRUM CREEK
	1215		23-16C TYPE C	23-17C TYPE C	1985	18" RCP/PVT	60'	CRUM CREEK
	1100		24-5C 5'x5' GRATE	24-6C JUNCT 8'x5'	1963	24" RCP/PVT.		CRUM CREEK
	1101		24-8C 5'x5' GRATE	24-9C JUNCT 8'x5'	1980			CRUM CREEK
	1113		24-19C TYPE C IN	24-20C TYPE C IN	1987	36" CORR. I PERF.	215'	CRUM CREEK
	1114		24-21C M.H.	24-22C M.H.	1987	8"PVC PERF. PIPE	250'	CRUM CREEK
	1116		24-27C YARD DR	24-28C YARD DR	1951	8" TCP	80'	CRUM CREEK
	1151		24-56C 4' SPEC.	24-57C 6' SPEC.	1980	36" RCP	78'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
	1118		24-29C YARD DR	24-30C YARD DR	1951	8" TCP	98'	CRUM CREEK
	1098		19-164C M.H.	24-3C M.H.	1980	12" RCP/PVT	100'	CRUM CREEK
	1120		24-31C YARD DR	24-32C YARD DR	1951	10" TCP	105'	CRUM CREEK
	1121		24-32C YARD DR	24-33C YARD DR	1951	12" TCP	105'	CRUM CREEK
	1122		24-33C YARD DR	24-26C 2'x3' GRAT	1951	15" RCP	297'	CRUM CREEK
	1123		24-26C 2'x3' GRAT	24-24C 8'x4' CONC	1951	15" RCP	42'	CRUM CREEK
	1133		24-46C 4' PDH SPE	24-47C 6' GRATE	1957	27" RCP	50'	CRUM CREEK
	1301		22-27C 4' GRATE	22-28C 4' GRATE	1986	21" CMP/PVT	132'	CRUM CREEK
	1117		24-28C YARD DR	24-29C YARD DR	1951	8" TCP	83'	CRUM CREEK
	1870		18-12 6' Grate	18-18 MH Junct. Bo	1972	30" RCP Pvt	96'	CRUM CREEK
	1863		18-10 6' Grate	18-11 6' Grate	1972	18" RCP Pvt	264'	CRUM CREEK
	1882		18-30 6' Grate	18-21 6' Grate	1972	15" RCP Pvt	106'	CRUM CREEK
	1881		BLDG	18-30 6' Grate	1972	15" RCP Pvt		CRUM CREEK
	1880		18-20 6' Grate	18-21 6' Grate	1972	18" RCP Pvt		CRUM CREEK
	1879		18-23 4' Grate & Tr	18-22 6' Grate	1972	18" RCP Pvt	112'	CRUM CREEK
	1876		18-26 6' Grate	18-25 4' Spec	1972	18" RCP Pvt	58'	CRUM CREEK
	1883		18-21 6' Grate	18-22 6' Grate	1972	18" RCP Pvt		CRUM CREEK
	1984		18-145 Precast Outl	18-146 Conc HDW	1997	18" RCP Pvt	75'	CRUM CREEK
	1885		23-80 MH	18-31 MH	1970	18" RCP Pvt	294'	CRUM CREEK
	1869		18-17 6' Grate	18-12 6' Grate	1972	18" RCP Pvt	170'	CRUM CREEK
	1868		18-14 MH	18-12 6' Grate	1972	RCP Pvt	236'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
	1867		18-16 MH	18-14 MH	1972	18" RCP Pvt	196'	CRUM CREEK
	1866		18-15 MH	18-14 MH	1972	18" RCP Pvt	298'	CRUM CREEK
	1865		18-13 6' Grate	18-12 6' Grate	1972	18" RCP Pvt	168'	CRUM CREEK
	1864		18-11 6' Grate	18-12 6' Grate	1972	18" RCP Pvt	340'	CRUM CREEK
	1873		18-29 4' Spec	18-27 6' Grate	1972	18" RCP Pvt	295'	CRUM CREEK
	1976		18-134 4' Type C	18-135 4' Type C	1995	18" CMP Pvt	95'	CRUM CREEK
	1983		18-144 Trench Drai	18-147 Double Type	1997	15" ADS Pvt	40'	CRUM CREEK
	1982		18-142 4' Type C	18-143 Conc HDW	1997	18" ADS Pvt	45'	CRUM CREEK
	1925		18-65 MH	18-70 Stone HDW	1963	48" RCP	24'	CRUM CREEK
	1981		18-140 4' Type C	18-141 4' Type C	1995	15" CMP Pvt	170'	CRUM CREEK
	1980		18-139 4' Type M	18-140 4' Type C	1995	15" CMP Pvt	88'	CRUM CREEK
	1979		18-138 4' Type C	18-139 4' Type M	1995	15" CMP Pvt	112'	CRUM CREEK
	1860		18-4 Type C	18-2 MH	1996	30" ACMP Pvt	75'	CRUM CREEK
	1977		18-135 4' Type C	18-136 4' Type C	1995	18" CMP Pvt	65'	CRUM CREEK
	1871		18-18 MH Junct. Bo	18-19 Disch to Cree	1972	RCP Pvt		CRUM CREEK
	1975		18-133 4' Type C	18-134 4' Type C	1995	15" CMP Pvt	25'	CRUM CREEK
	1985		18-149 MH	18-147 Double Type	1997	3-48" ACP Det. Sys.	80'	CRUM CREEK
	1974		18-132 4' Type C	18-133 4' Type C	1995	15" CMP Pvt	72'	CRUM CREEK
	1973		18-131 4' Type C	18-132 4' Type C	1995	15" CMP Pvt	62'	CRUM CREEK
	1898		18-46 MH	18-45 Stone HDW	1949	24" RCP	120'	CRUM CREEK
	1886		23-87 INV 48" CM	18-31 MH	1987	12" CMP Pvt	60'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
	1978		18-136 4' Type C	18-137 Conc HDW	1995	18" CMP Pvt	53'	CRUM CREEK
	1861		18-2 MH	18-3 MH	1996	72" ACMP Pvt	43'	CRUM CREEK
13-10C 4' TYPE M	1694	13-11C 4' TYPE M	12-73 4' TYPE M	12-70 4' TYPE M	1990	27" or 36" RCP	316'	CRUM CREEK
13-11C 4' TYPE M	1695	13-12C 4' TYPE M	12-70 4' TYPE M	12-69 4' TYPE M	1990	30" RCP	62'	CRUM CREEK
13-12C 4' TYPE M	1697	14-7C 4' TYPE M	12-69 4' TYPE M	12-66 4' TYPE M	1990	30" or 42" RCP	300'	CRUM CREEK
13-13C 4' TYPE S	1698	14-7C 4' TYPE M	12-65 4' TYPE S	12-66 4' TYPE M	1990	18" RCP	56'	CRUM CREEK
13-14C 4' TYPE S	1701	14-9C 4' TYPE M	12-62 4' TYPE S	12-63 4' TYPE M	1990	18" RCP	58'	CRUM CREEK
13-15C 4' TYPE S	1704	14-10C 4' TYPE M	12-59 4' TYPE S	12-58 4' TYPE M	1990	18" RCP	53'	CRUM CREEK
13-16C 4' TYPE M	1706	14-11C 4' TYPE M	12-55 4' TYPE M	12-88 4' TYPE M	1990	18" RCP	54'	CRUM CREEK
13-17C MH	1711	13-18C MH	12-90 MH	12-87 MH	1990	24" CIP	150'	CRUM CREEK
13-18C MH	1712	13-19C CONC HD	12-87 MH	12-86 CONC HDW	1990	36" CiP	60'	CRUM CREEK
13-1C 4' TYPE S	1682	13-2C 4' TYPE M	12-85 4' TYPE S	12-84 4' TYPE M	1990	18" RCP	56'	CRUM CREEK
13-20C 4' TYPE C	1679	13-23C 4' TYPE C	12-52 4' TYPE C	12-54 4' TYPE C	1986	18" ACP	67'	CRUM CREEK
13-21C 4' TYPE C	1677	13-22C 4' TYPE C	12-50 4' TYPE C	12-51 4' TYPE C	1986	18" ACP	32'	CRUM CREEK
13-22C 4' TYPE C	1678	13-23C 4' TYPE C	12-51 4' TYPE C	12-54 4' TYPE C	1986	18" ACP	38'	CRUM CREEK
13-23C 4' TYPE C	1680	13-24C CONC HD	12-54 4' TYPE C	12-53 CONC HDW	1986	24" ACP	55'	CRUM CREEK
13-25C MH	1714	13-26C CONC HD	12-79 MH	12-80 CONC HDW	1990	36" CiP	30'	CRUM CREEK
13-2C 4' TYPE M	1683	13-3C 4' TYPE S	12-84 4' TYPE M	12-83 4' TYPE S	1990	27" RCP	65'	CRUM CREEK
13-3C 4' TYPE S	1684	13-4C 4' TYPE S	12-83 4' TYPE S	12-82 4' TYPE S	1990	27" or 33" RCP	240'	CRUM CREEK
13-4C 4' TYPE S	1685	13-5C 4' TYPE M	12-82 4' TYPE S	12-81 4' TYPE M	1990	27" or 33" RCP	246'	CRUM CREEK
13-5C 4' TYPE M	1686	13-7C 4' TYPE M	12-81 4' TYPE M	12-76 4' TYPE M	1990	27" or 33" RCP	246'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
13-6C 4' TYPE S	1688	13-7C 4' TYPE M	12-89 4' TYPE S	12-76 4' TYPE M	1990	18" RCP	72'	CRUM CREEK
13-7C 4' TYPE M	1689	13-10C 4' TYPE M	12-76 4' TYPE M	12-73 4' TYPE M	1990	27" or 36" RCP	196'	CRUM CREEK
13-8C 4' TYPE C	1690	13-9C 4' TYPE C	12-75 4' TYPE C	12-74 4' TYPE C	1990	18" RCP	62'	CRUM CREEK
13-9C 4' TYPE C	1691	13-10C 4' TYPE M	12-74 4' TYPE C	12-73 4' TYPE M	1990	18" CIP	46'	CRUM CREEK
14-10C 4' TYPE M	1705	14-13C 4' TYPE M	12-58 4' TYPE M	12-57 4' TYPE M	1990	48" CIP	51'	CRUM CREEK
14-11C 4' TYPE M	1707	14-12C 4' TYPE M	12-88 4' TYPE M	12-56 4' TYPE M	1990	18" RCP	54'	CRUM CREEK
14-12C 4' TYPE M	1708	14-13C 4' TYPE M	12-56 4' TYPE M	12-57 4' TYPE M	1990	18" RCP	210'	CRUM CREEK
14-13C 4' TYPE M	1709	14-14C CONC HD	12-57 4' TYPE M	12-60 CONC HDW	1990	36" CiP	60'	CRUM CREEK
14-15C BARREL R	1710	13-17C MH	12-61 BARREL RIS	12-90 MH	1990	24" CIP	290'	CRUM CREEK
14-16C 4' SPEC	1666	14-17C 4' SPEC	12-39 4' SPEC	12-38 4' SPEC	1977	22"x13" CMP	35'	CRUM CREEK
14-17C 4' SPEC	1667	14-19C 4' SPEC	12-38 4' SPEC	12-40 4' SPEC	1977	24" RCUD	214'	CRUM CREEK
14-18C 4' SPEC	1668	14-19C 4' SPEC	12-41 4' SPEC	12-40 4' SPEC	1977	22"x13" CMP	45'	CRUM CREEK
14-19C 4' SPEC	1669	14-20C 4' SPEC	12-40 4' SPEC	12-42 4' SPEC	1977	24" RCUD	211'	CRUM CREEK
14-1C 4' TYPE M	1713	13-25C MH	12-78 4' TYPE M	12-79 MH	1990	36" RCP	210'	CRUM CREEK
14-20C 4' SPEC	1670	14-21C 4' SPEC	12-42 4' SPEC	12-43 4' SPEC	1977	24" RCUD	96'	CRUM CREEK
14-21C 4' SPEC	1671	14-22C 4' SPEC	12-43 4' SPEC	12-44 4' SPEC	1977	18"x29" CMP	40'	CRUM CREEK
14-21C 4' SPEC	1672	14-23C 4' SPEC	12-43 4' SPEC	12-45 4' SPEC	1977	21" RCUD	91'	CRUM CREEK
14-23C 4' SPEC	1673	14-24C 4' SPEC	12-45 4' SPEC	12-46 4' SPEC	1977	21" RCUD	100'	CRUM CREEK
14-24C 4' SPEC	1674	14-25C 4' SPEC	12-46 4' SPEC	12-47 4' SPEC	1977	21" RCUD	144'	CRUM CREEK
14-25C 4' SPEC	1675	14-27C 4' SPEC	12-47 4' SPEC	12-49 4' SPEC	1977	29"x18" CMP	64'	CRUM CREEK
14-26C 4' SPEC	1676	14-27C 4' SPEC	12-48 4' SPEC	12-49 4' SPEC	1977	18" RCUD	92'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
14-28C 4' SPEC	1656	14-29C 4' SPEC	12-26 4' SPEC	12-27 4' SPEC	1964	18" RCP	44'	CRUM CREEK
14-29C 4' SPEC	1657	14-30C 4' SPEC	12-27 4' SPEC	12-28 4' SPEC	1964	18" RCP	145'	CRUM CREEK
14-2C 4' TYPE S	1687	13-6C 4' TYPE S	12-77 4' TYPE S	12-89 4' TYPE S	1990	18" RCP	74'	CRUM CREEK
14-30C 4' SPEC	1658	14-31C STONE HD	12-28 4' SPEC	12-29 STONE HD	1964	18" RCP	175'	CRUM CREEK
14-32C 4' SPEC	1659	14-33C 6' SPEC	12-30 4' SPEC	12-31 6' SPEC	1964	18" RCP	36'	CRUM CREEK
14-33C 6' SPEC	1660	14-34C MH	12-31 6' SPEC	12-32 MH	1964	21" RCP	50'	CRUM CREEK
14-34C MH	1661	14-35C STONE HD	12-32 MH	12-33 STONE HD	1964	21" RCP	92'	CRUM CREEK
14-36C 6' SPEC	1652	14-37C 6' SPEC	12-21 6' SPEC	12-22 6' SPEC	1964	15" RCP	190'	CRUM CREEK
14-37C 6' SPEC	1653	14-38C STONE HD	12-22 6' SPEC	12-23 STONE HD	1964	18" RCP	190'	CRUM CREEK
14-39C End Conc E	1654	14-40C End Conc E	12-25 End Conc Ero	12-24 End Conc Ero	1963	3'-8" Conc Dish Gut	284'	CRUM CREEK
14-3C CONC HDW	1692	14-4C 4' TYPE M	12-71 CONC HDW	12-72 4' TYPE M	1990	18" CIP	75'	CRUM CREEK
14-41C 6' SPEC.	1628	14-42C 4' SPEC	12-1 6' SPEC.	12-2 4' SPEC	1957	30" RCP	38'	CRUM CREEK
14-42C 4' SPEC	1629	14-43C Stone HDW	12-2 4' SPEC	12-3 Stone HDW	1958	30" RCP	188"	CRUM CREEK
14-44C 4' SPEC	1662	14-45C 4' SPEC	12-34 4' SPEC	12-35 4' SPEC	1964	15" RCP	36'	CRUM CREEK
14-45C 4' SPEC	1663	14-46C MH	12-35 4' SPEC	12-36 MH	1964	18" RCP	84'	CRUM CREEK
14-46C MH	1664	14-47C STONE HD	12-36 MH	12-37 STONE HD	1964	18" RCP	130'	CRUM CREEK
14-48C 6' SPEC	1639	14-49C 6' SPEC	12-4 6' SPEC	12-5 6' SPEC	1956	18" RCP	36'	CRUM CREEK
14-49C 6' SPEC	1640	14-50C 4' GRATE	12-5 6' SPEC	12-6 4' GRATE	1956	21" RCP	140'	CRUM CREEK
14-4C 4' TYPE M	1693	13-10C 4' TYPE M	12-72 4' TYPE M	12-73 4' TYPE M	1990	18" RCP	146'	CRUM CREEK
14-50C 4' GRATE	1641	14-51C 4' SPEC	12-6 4' GRATE	12-7 4' SPEC	1956	21" RCP	135'	CRUM CREEK
14-51C 4' SPEC	1642	14-52C 6' SPEC	12-7 4' SPEC	12-8 6' SPEC	1956	24" RCP	98'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
14-52C 6' SPEC	1643	14-53C 6' SPEC	12-8 6' SPEC	12-9 6' SPEC	1956	30" RCP	32'	CRUM CREEK
14-53C 6' SPEC	1644	14-54C STONE HD	12-9 6' SPEC	12-10 STONE HD	1956	30" RCP	343'	CRUM CREEK
14-55C 6' SPEC	1650	14-56C 6' SPEC	12-18 6' SPEC	12-19 6' SPEC	1956	18" RCP	36'	CRUM CREEK
14-56C 6' SPEC	1651	14-57C 6 STONE H	12-19 6' SPEC	12-20 6 STONE HD	1956	24" RCP	210'	CRUM CREEK
14-58C 6' SPEC	1648	14-59C 4' SPEC	12-15 6' SPEC	12-16 4' SPEC	1956	18" RCP	36'	CRUM CREEK
14-59C 4' SPEC	1649	14-60C STONE HD	12-16 4' SPEC	12-17 STONE HD	1956	21" RCP	152'	CRUM CREEK
14-5C 4' TYPE M	1696	13-12C 4' TYPE M	12-68 4' TYPE M	12-69 4' TYPE M	1990	18" RCP	72'	CRUM CREEK
14-61C 6' SPEC	1645	14-62C 4' SPEC	12-11 6' SPEC	12-12 4' SPEC	1956	18" RCP	50'	CRUM CREEK
14-62C 4' SPEC	1646	14-63C 4' SPEC	12-12 4' SPEC	12-13 4' SPEC	1956	18" RCP	250'	CRUM CREEK
14-63C 4' SPEC	1647	14-64C STONE HD	12-13 4' SPEC	12-14 STONE HD	1956	21" RCP	150'	CRUM CREEK
14-65C 4' SPEC	1775	14-66C 4' SPEC	13-72 4' SPEC	13-73 4' SPEC	1957	18" RCP	34'	CRUM CREEK
14-66C 4' SPEC	1776	14-67C STONE HD	13-73 4' SPEC	13-74 STONE HD	1957	21' RCP	158'	CRUM CREEK
14-68C 4' SPEC	1781	14-69C 4' SPEC	13-80 4' SPEC	13-81 4' SPEC	1957	18" RCP	32'	CRUM CREEK
14-69C 4' SPEC	1782	14-70C STONE HD	13-81 4' SPEC	13-82 STONE HD	1958	21" RCP	187'	CRUM CREEK
14-6C 4' TYPE S	1699	14-7C 4' TYPE M	12-67 4' TYPE S	12-66 4' TYPE M	1990	18" RCP	54'	CRUM CREEK
14-71C	1800	14-41C 6' SPEC.	13-83	12-1 6' SPEC.				CRUM CREEK
14-72C 4' SPEC	1777	14-73C 4' SPEC	13-75 4' SPEC	13-76 4' SPEC	1957	15" RCP	32'	CRUM CREEK
14-73C 4' SPEC	1778	14-74C 4' SPEC	13-76 4' SPEC	13-77 4' SPEC	1957	18" RCP	262'	CRUM CREEK
14-74C 4' SPEC	1779	14-75C 4' SPEC	13-77 4' SPEC	13-78 4' SPEC	1957	21" RCP	38'	CRUM CREEK
14-75C 4' SPEC	1780	14-76C 4' GRATE	13-78 4' SPEC	13-79 4' GRATE	1957	24" RCP	133'	CRUM CREEK
14-76C 4' GRATE	1627	14-41C 6' SPEC.	13-79 4' GRATE	12-1 6' SPEC.	1957	24" RCP	132'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
14-77C 6' GRATE	1729	14-78C 6' SPEC	13-19 6' GRATE	13-20 6' SPEC	1956	18" RCP	30'	CRUM CREEK
14-78C 6' SPEC	1730	14-49C STONE HD	13-20 6' SPEC	13-21 STONE HD	1956	24" RCP	125'	CRUM CREEK
14-7C 4' TYPE M	1700	14-9C 4' TYPE M	12-66 4' TYPE M	12-63 4' TYPE M	1990	42" CIP	270'	CRUM CREEK
14-80C 4' GRATE	1716	14-82C 4' GRATE	13-7 4' GRATE	13-6 4' GRATE	1955	18" RCP	67'	CRUM CREEK
14-81C CONC HD	1715	14-82C 4' GRATE	13-8 CONC HDW	13-6 4' GRATE	1955	18" RCP	112'	CRUM CREEK
14-82C 4' GRATE	1717	15-32C 4' GRATE	13-6 4' GRATE	13-9 4' GRATE		15" CMP	356'	CRUM CREEK
14-83C TRENCH D	1726	14-84C 4' GRATE	13-16 TRENCH DR	13-17 4' GRATE	1962	4" CIP	39'	CRUM CREEK
14-84C 4' GRATE	1727	15-36C 4' GRATE	13-17 4' GRATE	13-18 4' GRATE	1962	12" RCP	228'	CRUM CREEK
14-8C 4' TYPE S	1702	14-9C 4' TYPE M	12-64 4' TYPE S	12-63 4' TYPE M	1990	18" RCP	56'	CRUM CREEK
14-9C 4' TYPE M	1703	14-10C 4' TYPE M	12-63 4' TYPE M	12-58 4' TYPE M	1990	48" CIP	196'	CRUM CREEK
15-100C HDW	1849	15-103C #1 OM	14-158 HDW	14-154 #1 OM		RCP	187'	CRUM CREEK
15-101C #1 OM	1850	15-102C #1 OM	14-155 #1 OM	14-156 #1 OM			35'	CRUM CREEK
15-102C #1 OM	1851	15-103C #1 OM	14-156 #1 OM	14-154 #1 OM			42'	CRUM CREEK
15-103C #1 OM	1852	15-104C #1 OM	14-154 #1 OM	14-153 #1 OM			34'	CRUM CREEK
15-104C #1 OM	1853	15-108C MH	14-153 #1 OM	14-157 MH			34'	CRUM CREEK
15-105C #2 OM &	1843	15-106C #1 OM &	14-140 #2 OM & Gr	14-151 #1 OM & Gr		18" RCP	150'	CRUM CREEK
15-106C #1 OM &	1844	15-107C #1 OM	14-151 #1 OM & Gr	14-152 #1 OM		42" RCP	46'	CRUM CREEK
15-107C #1 OM	1845	15-108C MH	14-152 #1 OM	14-157 MH	1955	42" RCP	45'	CRUM CREEK
15-108C MH	1854	15-109C Stone HD	14-157 MH	14-160 Stone HDW	1955	42" RCP	113'	CRUM CREEK
15-10C 6' SPEC	1771	15-11C JUNCT BO	13-67 6' SPEC	13-68 JUNCT BOX	1955	24" RCP	144'	CRUM CREEK
15-110C 2 #1 OM	1855	15-111C Conc HD	14-162 2 #1 OM	14-161 Conc HDW		24" RCP	113'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
15-112C 4' Type C	1959	15-113C MH	18-116 4' Type C	18-117 MH	1995	18" RCP	12'	CRUM CREEK
15-113C MH	1960	21-3C MH	18-117 MH	18-119 MH		18" RCP	387'	CRUM CREEK
15-11C JUNCT. BO	462	15-1C JUNCT. BO	13-68 JUNCT. BO	8-13 JUNCT. BOX	1965	24" RCP	158'	CRUM CREEK
15-12C CHANNEL	1773	15-13C 8.5'x5' CON	13-69A CHANNEL	13-70 8.5'x5' CONC	1967	4'x3' Stone Masonry	170'	CRUM CREEK
15-13C HDW CON	1774	15-14C HDW CON	13-70 HDW CONC	13-71 HDW CONC	1926	8'x5' Conc Box Cul	31.5'	CRUM CREEK
15-15C #1 OM & G	1783	15-16C 4' STD INL	13-85 #1 OM & GR	13-84 4' STD INLE	1935	12" RCP	6'	CRUM CREEK
15-16C 4' STD INL	1784	15-18C 4' STD INL	13-84 4' STD INLE	13-87 4' STD INLE	1935	36" RCP	36'	CRUM CREEK
15-17C #1 OM & G	1785	15-18C 4' STD INL	13-86 #1 OM & GR	13-87 4' STD INLE	1935	12" RCP	6'	CRUM CREEK
15-18C 4' STD INL	1786	15-19C DROP JUN	13-87 4' STD INLE	13-88 DROP JUNC	1973	36" RCP	52'	CRUM CREEK
15-1C JUNCT. BO	461	15-2C STONE HD	8-13 C JUNCT. BO	8-14 C STONE HD	1965	60" RCP	128'	CRUM CREEK
15-20C 4' SPEC	1767	15-21C 4' SPEC	13-63 4' SPEC	13-64 4' SPEC	1955	15" RCP	33'	CRUM CREEK
15-21C 4' SPEC	1768	15-22C STONE HD	13-64 4' SPEC	13-65 STONE HD	1955	18" RCP	130'	CRUM CREEK
15-23C 6' SPEC	1765	15-24C 6' SPEC	13-60 6' SPEC	13-61 6' SPEC	1955	18" RCP	38'	CRUM CREEK
15-24C 6' SPEC	1766	15-25C STONE HD	13-61 6' SPEC	13-62 STONE HD	1955	21" RCP	240'	CRUM CREEK
15-26C 4' SPEC	1750	15-27C 4' SPEC	13-40 4' SPEC	13-41 4' SPEC	1955	15" RCP	35'	CRUM CREEK
15-27C 4' SPEC	1751	15-28C STONE HD	13-41 4' SPEC	13-42 STONE HD	1955	18" RCP	128'	CRUM CREEK
15-29C 4' SPEC	1752	15-30C 4' SPEC	13-43 4' SPEC	13-44 4' SPEC	1955	15" RCP	35'	CRUM CREEK
15-30C 4' SPEC	1753	15-31C STONE HD	13-44 4' SPEC	13-45 STONE HD	1955	18" RCP	132'	CRUM CREEK
15-32C 4' GRATE	1718	15-33C 4' GRATE	13-9 4' GRATE	13-5 4' GRATE	1950	27" RCP	75'	CRUM CREEK
15-33C 4' GRATE	1719	15-34C 4' GRATE	13-5 4' GRATE	13-12 4' GRATE	1950	27" RCP	232'	CRUM CREEK
15-34C 4' GRATE	1720	15-38C 6' GRATE	13-12 4' GRATE	13-3 6' GRATE	1950	27" RCP	70'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
15-35C STONE HD	1721	15-37C 6' GRATE	13-1 STONE HDW	13-2 6' GRATE	1958	24" RCP	13'	CRUM CREEK
15-36C 4' GRATE	1728	15-37C 6' GRATE	13-18 4' GRATE	13-2 6' GRATE	1962	12" RCP	128'	CRUM CREEK
15-37C 6' GRATE	1722	15-38C BEGIN OP	13-2 6' GRATE	13-3 6' GRATE	1950	24" RCP	38'	CRUM CREEK
15-38C 6' GRATE	2000	15-39C END 36" R	13-3 6' GRATE	END 36" RCP		36" RCP		CRUM CREEK
15-3CONC HDW	391	15-4C CONC HDW	8-104 CONC HDW	8-105 C CONC HD	1926	11.5'x4' CONC BO	35'	CRUM CREEK
15-40C	2001	15-41C						CRUM CREEK
15-42C 4' GRATE	1723	15-43C 4' GRATE	13-10 4' GRATE	13-11 4' GRATE		18" RCP	45'	CRUM CREEK
15-44C 4' SPEC	1754	15-45C 4' SPEC	13-46 4' SPEC	13-47 4' SPEC	1955	15" RCP	38'	CRUM CREEK
15-45C 4' SPEC	1755	15-46C 6' SPEC	13-47 4' SPEC	13-48 6' SPEC	1955	18" RCP	54'	CRUM CREEK
15-46C 6' SPEC	1756	15-47C 6' SPEC	13-48 6' SPEC	13-49 6' SPEC	1955	21" RCP	56'	CRUM CREEK
15-47C 6' SPEC	1757	15-48 4' GRATE	13-49 6' SPEC	13-50 4' GRATE	1955	24" RCP	154'	CRUM CREEK
15-48 4' GRATE	1758	15-49C 4' GRATE	13-50 4' GRATE	13-51 4' GRATE	1976	24" RCP	72'	CRUM CREEK
15-49C 4' GRATE	1759	15-50C STONE HD	13-51 4' GRATE	13-52 STONE HD	1976	24" RCP	63'	CRUM CREEK
15-51C CONC HD	1738	15-53C 6' GRATE	13-26 CONC HDW	13-13 6' GRATE		30" RCP	138'	CRUM CREEK
15-52C STONE HD	1724	15-53C 6' GRATE	13-14 STONE HD	13-13 6' GRATE	1958	15" RCP	11'	CRUM CREEK
15-53C 6' GRATE	1725	15-55C MH	13-13 6' GRATE	13-15 MH	1950	30" RCP	60'	CRUM CREEK
15-54C 4' GRATE	1749	JUNCT 30" RCP	13-39 4' GRATE	JUNCT 30" RCP	1955	18" RCP	6'	CRUM CREEK
15-55C MH	1731	15-56C #1 OM	13-15 MH	13-19 #1 OM	1955	30" RCP	133'	CRUM CREEK
15-56C #1 OM	1732	15-57C #1 OM	13-19 #1 OM	13-20 #1 OM	1955	30" RCP	43'	CRUM CREEK
15-57C #1 OM	1733	15-58C 4' GRATE	13-20 #1 OM	13-21 4' GRATE	1955	30" RCP	115'	CRUM CREEK
15-58C 4' GRATE	1734	15-59C #1 OM	13-21 4' GRATE	13-23 #1 OM	1955	30" RCP	122'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
15-59C #1 OM	1735	15-60C #1 OM	13-23 #1 OM	13-22 #1 OM	1955	30" RCP	8'	CRUM CREEK
15-5C #30 M & GR	386	15-6C #3OM & GR	8-97 C #30 M & G	8-98 C #3OM & GR		12" RCP		CRUM CREEK
15-60C #1 OM	1736	15-61 2-#1 OM	13-22 #1 OM	13-24 2-#1 OM	1955	36" RCP	36'	CRUM CREEK
15-61 2-#1 OM	1737	15-62C STONE HD	13-24 2-#1 OM	13-25 STONE HD	1955	36" RCP	150'	CRUM CREEK
15-63C 4' SPEC	1760	15-64C 4' SPEC	13-53 4' SPEC	13-54 4' SPEC	1955	15" RCP	36'	CRUM CREEK
15-64C 4' SPEC	1761	15-65C STONE HD	13-54 4' SPEC	13-55 STONE HD	1955	18" RCP	133'	CRUM CREEK
15-66C CONC HD	1739	15-68C MH	13-27 CONC HDW	13-28 MH	1950	18" RCP	90'	CRUM CREEK
15-67C 4' GRATE	1748	JUNCT 18" RCP	13-38 4' GRATE	JUNCT 18" RCP		18" RCP	6'	CRUM CREEK
15-68C MH	1740	15-69C #1 OM	13-28 MH	13-29 #1 OM	1955	18" RCP	120'	CRUM CREEK
15-69C #1 OM	1741	15-70C #1 OM	13-29 #1 OM	13-30 #1 OM	1955	21" RCP	36'	CRUM CREEK
15-6C #3OM & GR	387	15-7C GRATE	8-98 C #30 M & G	8-99 C GRATE		12" RCP		CRUM CREEK
15-70C #1 OM	1742	15-71C STONE HD	13-30 #1 OM	13-31 STONE HD	1955	24" RCP	110'	CRUM CREEK
15-72C CONC HD	1743	15-73C MH	13-32 CONC HDW	13-33 MH	1950	24" RCP	62'	CRUM CREEK
15-73C MH	1744	15-74C #1 OM & G	13-33 MH	13-34 #1 OM & GR	1955	24" RCP	148'	CRUM CREEK
15-74C #1 OM & G	1745	15-75C 4' GRATE I	13-34 #1 OM & GR	13-35 4' GRATE IN	1955	24" RCP	34'	CRUM CREEK
15-75C 4' GRATE I	1746	15-76C 2-#1 OM	13-35 4' GRATE IN	13-36 2-#1 OM	1955	24" RCP	35'	CRUM CREEK
15-76C 2-#1 OM	1747	15-77C STONE HD	13-36 2-#1 OM	13-37 STONE HD	1955	27" RCP	114'	CRUM CREEK
15-78C STONE HD	1762	15-81C STONE HD	13-56 STONE HD	13-57 STONE HD	1955	60" RCP	100'	CRUM CREEK
15-79C 6' SPEC	1763	CONN TO 60" RCP	13-58 6' SPEC	CONN TO 60" RCP	1955			CRUM CREEK
15-80C 6' SPEC	1764	CONN TO 60" RCP	13-59 6' SPEC	CONN TO 60" RCP	1955	18" RCP	12'	CRUM CREEK
15-82C HDW CON	1787	15-83C END CON	13-89 HDW CONC	13-90 END CONC	1926	4'x4' Conc Box Cul	42'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
15-83C END CON	1788	15-84C End Stone	13-90 END CONC	13-91 End Stone &	1972	4'x3' Stone Masonry	150'	CRUM CREEK
15-85C Clean Out	1789	15-93C Clean Out	13-92 Clean Out	13-101 Clean Out	1961	8" to 12" CI Rain W	382'	CRUM CREEK
15-86C 24"x36" CB	1790	Conn to Main Front	13-93 24"x36" CB	Conn to Main Front	1961	8" CIP PVT	40'	CRUM CREEK
15-87C END ROOF	1791	Conn to Main Front	13-96 END ROOF	Conn to Main Front	1961	8" to 10" CIP PVT	130'	CRUM CREEK
15-88C 24"x36" CB	1792	Conn to Roof Drain	13-95 24"x36" CB	Conn to Roof Drain	1961	4" CIP PVT	12'	CRUM CREEK
15-89C 24"x36" CB	1793	Conn to Main Front	13-94 24"x36" CB	Conn to Main Front	1961	8" CIP PVT	40'	CRUM CREEK
15-8C 6' SPEC	1769	15-10C 6' SPEC	13-69 6' SPEC	13-67 6' SPEC	1955	21" RCP	80'	CRUM CREEK
15-90C Conn to Bld	1799	15-96C CONC HD	13-103 Conn to Bld	13-100 CONC HD	1961	4" to 15" CIP PVT	110'	CRUM CREEK
15-91C Clean Out	1795	Conn to 10" Main D	13-99 Clean Out	Conn to 10" Main D	1961	8" to 10" CIP PVT	150'	CRUM CREEK
15-92C 4' CB	1796	Conn to 8" Main Dr	13-102 4' CB	Conn to 8" Main Dr	1961	4" CIP PVT	16'	CRUM CREEK
15-93C Clean Out	1794	Conn to 15" Main D	13-101 Clean Out	Conn to 15" Main D	1961	12" CIP PVT	40'	CRUM CREEK
15-94C 12"x16" 20'	1797	Conn to 15" Main D	13-97 12"x16" 20' L	Conn to 15" Main D	1961	6" CIP PVT	56'	CRUM CREEK
15-95C 24"x36" CB	1798	Conn to 15" Main D	13-98 24"x36" CB	Conn to 15" Main D	1961	4" CIP PVT	12'	CRUM CREEK
15-97C End Culvert	1846	15-99C Grate Inlet	14-159 End Culvert	14-150 Grate Inlet				CRUM CREEK
15-98C Conc HDW	1847	Box Culvert	14-149 Conc HDW	Box Culvert			16'	CRUM CREEK
15-99C Grate Inlet	1848	15-108C MH	14-150 Grate Inlet	14-157 MH			330'	CRUM CREEK
15-9C 6' SPEC	1770	15-10C 6' SPEC	13-66 6' SPEC	13-67 6' SPEC	1955	18" RCP	42'	CRUM CREEK
16-108C #2 OM &	1832	16-109C #2 OM &	14-135 #2 OM & Gr	14-136 #2 OM & Gr				CRUM CREEK
16-109C #2 OM &	1833	16-110C #2 OM &	14-136 #2 OM & Gr	14-137 #2 OM & Gr				CRUM CREEK
16-110C #2 OM &	1834	16-112C #2 OM &	14-137 #2 OM & Gr	14-138 #2 OM & Gr				CRUM CREEK
16-111C #2 OM &	1835	16-112C #2 OM &	14-139 #2 OM & Gr	14-138 #2 OM & Gr				CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
16-112C #2 OM &	1836	15-105C #2 OM &	14-138 #2 OM & Gr	14-140 #2 OM & Gr				CRUM CREEK
16-113C 4' Spec	1826	16-114C 4' Spec	14-128 4' Spec	14-129 4' Spec	1977	15" RCP	32'	CRUM CREEK
16-114C 4' Spec	1827	16-115C 4' Spec	14-129 4' Spec	14-130 4' Spec	1977	15" RCP	76'	CRUM CREEK
16-115C 4' Spec	1828	16-116C 4' Spec	14-130 4' Spec	14-131 4' Spec	1969	18" RCP	55'	CRUM CREEK
16-116C 4' Spec	1829	16-118C #2 OM &	14-131 4' Spec	14-132 #2 OM & Gr	1969	18" RCP	135'	CRUM CREEK
16-117C #2 OM &	1830	16-118C #2 OM &	14-133 #2 OM & Gr	14-132 #2 OM & Gr		18" TCP	22'	CRUM CREEK
16-118C #2 OM &	1831	16-119C End 18" T	14-132 #2 OM & Gr	14-134 End 18" TC		18" TCP	52'	CRUM CREEK
16-120C 4' Spec	1814	16-121C 4' Spec	14-128 4' Spec	14-129 4' Spec	1955	15" RCP	28'	CRUM CREEK
16-121C 4' Spec	1815	16-122C 4' Spec	14-129 4' Spec	14-106 4' Spec	1955	18" RCP		CRUM CREEK
16-122C 4' Spec	1801	16-123C 4' Spec	14-106 4' Spec	14-107 4' Spec	1955	18" RCP	26'	CRUM CREEK
16-123C 4' Spec	1802	16-124C 4' Grate	14-107 4' Spec	14-108 4' Grate	1964	24" RCP	82'	CRUM CREEK
16-124C 4' Grate	1803	16-125C 4' Grate	14-108 4' Grate	14-109 4' Grate	1964	24" RCP	80'	CRUM CREEK
16-125C 4' Grate	1804	16-126C 6' Grate	14-109 4' Spec	14-110 6' Grate		24" RCP	116'	CRUM CREEK
16-126C 6' Grate	1805	16-127C 6' Grate	14-110 6' Grate	14-111 6' Grate		36" RCP	34'	CRUM CREEK
16-127C 6' Grate	1806	16-128C MH	14-111 6' Grate	14-112 MH	1957	36" RCP	24'	CRUM CREEK
16-128C MH	1807	16-129C Stone HD	14-112 MH	14-113 Stone HDW	1957	36" RCP	180'	CRUM CREEK
16-129C Stone HD	1808	16-131C Stone HD	14-113 Stone HDW	14-114 Stone HDW	1967	3'x3' Stone Channel	125'	CRUM CREEK
16-130C OM & GR	1816	Connect to Channel	14-130 #1 OM	Connect to Channel	1967	18" RCP	15'	CRUM CREEK
16-131C Stone HD	1809	16-132C 4' Grate	14-114 Stone HDW	14-115 4' Grate	1967	45"x29" LO-HED R	100'	CRUM CREEK
16-132C 4' Grate	1810	16-143C 4' Grate	14-115 4' Grate	14-116 4' Grate	1959	36" RCP	120'	CRUM CREEK
16-133C 4' Spec	1817	16-134C 4' Spec	14-119 4' Spec	14-120 4' Spec	1955	18" RCP	26'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
16-134C 4' Spec	1818	16-135C HDW at C	14-120 4' Spec	14-121 HDW at Ch	1955	18" RCP	130'	CRUM CREEK
16-135C HDW at C	1819	16-136C HDW	14-121 HDW	14-122 HDW	1967	Stone Channel 3' Wi	218'	CRUM CREEK
16-136C HDW	1820	16-137C 4' Spec	14-122 HDW	14-123 4' Spec	1953	24" RCP	165'	CRUM CREEK
16-137C 4' Spec	1821	16-138C 4' Spec	14-123 4' Spec	14-124 4' Spec		36" RCP	34'	CRUM CREEK
16-138C 4' Spec	1822	16-141C 4' Grate	14-124 4' Spec	14-125 4' Grate	1977	36" RCP	155'	CRUM CREEK
16-139C 4' Spec	1823	16-140C 4' Spec	14-126 4' Spec	14-127 4' Spec	1977	18" RCP	32'	CRUM CREEK
16-140C 4' Spec	1824	16-141C 4' Grate	14-127 4' Spec	14-125 4' Grate	1977	18" RCP	115'	CRUM CREEK
16-141C 4' Grate	1825	16-142C 4' Grate	14-125 4' Grate	14-118 4' Grate	1977	36"RCP	170'	CRUM CREEK
16-142C 4' Grate	1813	16-143C 4' Grate	14-118 4' Grate	14-116 4' Grate	1959	36" RCP	70'	CRUM CREEK
16-143C 4' Grate	1811	16-144C 4' Spec	14-116 4' Grate	14-117 4' Spec	1959	48" RCP	134'	CRUM CREEK
16-144C 4' Spec	1812	16-145C 4' Spec	14-117 4' Spec	14-105 4' Spec	1959	48" RCP	34'	CRUM CREEK
16-145C 6' SPEC.	1522	16-154C 4' GRATE	14-105C 6' SPEC.	19-81C 4' GRATE	1959	48" RCP	282'	CRUM CREEK
16-146C End 12" V	1837	16-147C #2 OM Inl	14-141 End 12" VC	14-142 #2 OM Inlet		12" VCP	85'	CRUM CREEK
16-147C #2 OM Inl	1838	16-148C #2 OM Inl	14-142 #2 OM Inlet	14-143 #2 OM Inlet		12" VCP	33'	CRUM CREEK
16-148C #2 OM Inl	1839	16-149C End 12" V	14-143 #2 OM Inlet	14-144 End 12" VC		12" VCP	84'	CRUM CREEK
16-150C End 12" V	1840	16-151C #2 OM	14-145 End 12" VC	14-146 #2 OM		12" VCP	136'	CRUM CREEK
16-151C #2 OM	1841	16-152C #2 OM Inl	14-146 #2 OM Inlet	14-147 #2 OM Inlet		12" VCP	33'	CRUM CREEK
16-152C #2 OM Inl	1842	16-153C Conc HD	14-147 #2 OM Inlet	14-148 Conc HDW		12" VCP	13'	CRUM CREEK
16-154C 4' GRATE	1523	22-26C 4' GRATE J	19-81C 4' GRATE	19-82C 4' GRATE J	1959	48" RCP	136'	CRUM CREEK
17-52C 2-#1 OM	1986	17-53C 2-#1 OM	15-85 2-#1 OM	15-86 2-#1 OM	1953	18" RCP	28'	CRUM CREEK
17-53C 2-#1 OM	1443	23-5C STONE HD	15-86C 2- #1 OM	20-108C STONE H	1953	24" RCP	184'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
17-54C #1 OM	1987	17-55C #1 OM	15-87 #1 OM	15-88 #1 OM		24" RCP	27'	CRUM CREEK
17-55C #1 OM	1988	17-56C End 24" RC	15-88 #1 OM	15-89 End 24" RCP	1958	24" RCP	192'	CRUM CREEK
17-56C (field chk fo	1345	23-18C INV. IRON	15-89C	20-7C INV. IRON P		24" IRON PIPE AR	+-60'	CRUM CREEK
17-57C 2- 6' GRAT	1437	23-42C M.H.	15-90C 2- 6' GRAT	20-41C M.H.	1954	15" RCP	217'	CRUM CREEK
18-7 2 Type C	1856	18-8 MH	18-7 2 Type C	18-8 MH	1996	18" ACMP Pvt	140'	CRUM CREEK
20-10C 6' GRATE	1249	20-11C 6' GRATE	23-53C 6' GRATE	23-55C 6' GRATE	1972	48" RCP/PVT	14'	CRUM CREEK
20-11C 6' GRATE	1250	20-12C 4' SPEC.	23-55C 6' GRATE	23-59C 4' SPEC.	1972	48" RCP/PVT	180'	CRUM CREEK
20-12C 4' SPEC.	1254	20-13C M.H.	23-59C 4' SPEC.	23-60C M.H.	1972	48" RCP/PVT	162'	CRUM CREEK
20-13C M.H.	1255	20-14C 6' GRATE	23-60C M.H.	23-61C 6' GRATE	1972	48" RCP/PVT	283'	CRUM CREEK
20-14C 6' GRATE	1862	20-15C MH	23-61 6' Grate	18-9 MH	1972	48" RCP Pvt	212'	CRUM CREEK
20-1C 4' SPEC.	1303	20-2C 4' SPEC.	17-1C 4' SPEC.	17-2C 4' SPEC.		18" RCP	18'	CRUM CREEK
20-2C 4' SPEC.	1304	20-3C END 18" RC	17-2C 4' SPEC	17-3C END 18" RC		18" RCP		CRUM CREEK
20-4C STONE HD	1305	20-5C END 30" RC	17-4C STONE HD	17-5C END 30" RC		30" RCP	40'	CRUM CREEK
20-6C 6' GRATE	1240	20-7C 6' GRATE	23-45C 6' GRATE	23-46C 6' GRATE	1972	36" RCP/PVT	291'	CRUM CREEK
20-7C 6' GRATE	1245	20-8C 6' GRATE	23-46C 6' GRATE	23-51C 6' GRATE	1972	36" RCP/PVT	255'	CRUM CREEK
20-8C 6' GRATE	1246	20-9C 6' GRATE	23-51C 6' GRATE	23-52C 6' GRATE	1972	48" RCP/ PVT	216'	CRUM CREEK
20-9C 6' GRATE	1247	20-10C 6' GRATE	23-52C 6' GRATE	23-53C 6' GRATE	1972	48" RCP/PVT	177'	CRUM CREEK
21-100C #1 OM Inl	1890	21-101C #1 OM Inl	18-35 #1 OM Inlet	18-34 #1 OM Inlet	1954	15" RCP	90'	CRUM CREEK
21-101C #1 OM Inl	1891	21-102C #1 OM &	18-34 #1 OM Inlet	18-36 #1 OM & Gra	1954	24" RCP	233'	CRUM CREEK
21-102C #1 OM &	1892	21-103C #1 OM Inl	18-36 #1 OM & Gra	18-37 #1 OM Inlet	1954	24" RCP	34'	CRUM CREEK
21-103C #1 OM Inl	1893	21-104C #1 OM Inl	18-37 #1 OM Inlet	18-38 #1 OM Inlet	1954	27" RCP	74'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
21-104C #1 OM Inl	1936	21-105C Stone HD	18-38 #1 OM	18-39 Stone HDW	1954	30" RCP	160'	CRUM CREEK
21-106C 4' GRATE	1623	21-107C 4' GRATE	19-189C 4' GRATE	19-188C 4' GRATE	1974	15" RCP	28'	CRUM CREEK
21-107C 4' GRATE	1624	21-109C 4' GRATE	19-188C 4' GRATE	19-190C 4' GRATE	1974	15" RCP	150'	CRUM CREEK
21-108C 4' GRATE	1625	21-109C 4' GRATE	19-191C 4' GRATE	19-190C 4' GRATE	1974	15" RCP	32'	CRUM CREEK
21-109C 4' GRATE	1626	21-111C 4' GRATE	19-190C 4' GRATE	19-172C 4' GRATE	1974	15" RCP	442'	CRUM CREEK
21-10C Type C	1970	21-12C 4' Grate	18-127 Type C	18-128 4' Grate	1995	21" RCP	223'	CRUM CREEK
21-110C 4' GRATE	1608	21-111C 4' GRATE	19-171 4' GRATE	19-172C 4' GRATE	1963	15" RCP	28'	CRUM CREEK
21-111C 4' GRATE	1609	21-113C 4' GRATE	19-172C 4' GRATE	19-173C 4' GRATE	1963	18" RCP	12'	CRUM CREEK
21-112C 6' SPEC.	1607	21-113C 4' GRATE	19-174C 6' SPEC.	19-173C 4' GRATE	1963	21" RCP	32'	CRUM CREEK
21-113C 4' GRATE	1610	21-114C 4' SPEC.	19-173C 4' GRATE	19-175C 4' SPEC.	1963	21" RCP	18'	CRUM CREEK
21-114C 4' SPEC.	1611	21-121C 4' SPEC.	19-175C 4' SPEC.	19-176C 4' SPEC.	1963	21" RCP	53'	CRUM CREEK
21-115C 6' SPEC.	1613	21-117C 4' SPEC.	19-182C 6' SPEC.	19-181C 4' SPEC.	1963	21" RCP	51'	CRUM CREEK
21-116C 4' GRATE	1612	21-117C 4' SPEC.	19-180C 4' GRATE	19-181C 4' SPEC.	1963	15" RCP	32'	CRUM CREEK
21-117C 4' SPEC.	1614	21-119C M.H.	19-181C 4' SPEC.	19-178C M.H.	1963	24" RCP	25'	CRUM CREEK
21-118C 4' GRATE	1615	21-119C M.H.	19-179C 4' GRATE	19-178C M.H.	1963	18" RCP	48'	CRUM CREEK
21-119C M.H.	1616	21-120C 4' SPEC.	19-178C M.H.	19-177C 4' SPEC.	1963	24" RCP	8'	CRUM CREEK
21-11C Type C	1971	Conn to Exist 21"	18-129 Type C	Conn to Exist 21"	1995	18" RCP	6'	CRUM CREEK
21-120C 4' SPEC.	1617	21-121C 4' SPEC.	19-177C 4' SPEC.	19-176C 4' SPEC.	1963	30" RCP	42'	CRUM CREEK
21-121C 4' SPEC.	1899	21-55C 6' SPEC	19-176 4' Spec	18-46 6' Spec	1963	36" RCP	211'	CRUM CREEK
21-122C 4' SPEC.	1552	21-124C 4' GRATE	19-111C 4' SPEC.	19-113C 4' GRATE	1958	18" RCP	80'	CRUM CREEK
21-123C 4' GRATE	1551	21-124C 4' GRATE	19-112C 4' GRATE	19-113C 4' GRATE	1958	18" RC UD	112'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
21-124C 4' GRATE	1553	21-126C 4' GRATE	19-113C 4' GRATE	19-115C 4' GRATE	1958	18" RC UD	272'	CRUM CREEK
21-125C 6' SPEC.	1554	21-126C 4' GRATE	19-114C 6' SPEC.	19-115C 4' GRATE	1958	18" RCP	64'	CRUM CREEK
21-127C TYPE C	1207	21-139C M.H.	19-170C TYPE C	23-8C M.H.	1995	18" ACMP	78'	CRUM CREEK
21-128C 4' SPEC.	1256	21-129C 4' SPEC.	23-62C 4' SPEC.	23-63C 4' SPEC.	1972	18" RCP/PVT	122'	CRUM CREEK
21-129C 4' SPEC.	1872	21-130C 4' SPEC.	23-63 4' SPEC.	18-29 4' SPEC.	1972	18" RCP Pvt	84'	CRUM CREEK
21-12C 4' Grate	1972	21-13C Conc HDW	18-128 4' Grate	18-130 Conc HDW	1995	21" RCP	110'	CRUM CREEK
21-131C 6' Grate	1875	21-132 4' Spec	18-27 6' Grate	18-25 4' Spec	1972	18" RCP Pvt	17'	CRUM CREEK
21-132C 4' Spec	1877	21-133C 6' Grate	18-25 4' Spec	18-24 6' Grate	1972	18" RCP Pvt	62'	CRUM CREEK
21-133C 6' Grate	1878	21-134C 6' Grate	18-24 6' Grate	18-22 6' Grate	1972	18" RCP Pvt	317'	CRUM CREEK
21-134C 6' Grate	1884	End 24"	18-22 6' Grate	End 24"	1972	24" RCP Pvt		CRUM CREEK
21-136C TYPE C	1203	21-138C M.H.	23-5C TYPE C	23-6C M.H.	1958	18" RCP	198'	CRUM CREEK
21-137C TYPE C	1204	21-138C M.H.	23-7C TYPE C	23-6C M.H.	1995	18" RCP	15'	CRUM CREEK
21-139C M.H.	1209	21-141C TYPE C	23-8C M.H.	23-9C TYPE C	1958	18" RCP	82'	CRUM CREEK
21-140C TYPE C	1210	21-141C TYPE C	23-10C TYPE C	23-9C TYPE C	1985	18" CMP	124'	CRUM CREEK
21-141C TYPE C	1186	21-149C TYPE C	23-9C 4' SPEC.	24-111C TYPE C	1985	18" RCP	142'	CRUM CREEK
21-142C 4' GRATE	1218	21-143C 4' GRATE	23-21C 4' GRATE	23-22C 4' GRATE	1958	18" RC UD	248'	CRUM CREEK
21-143C 4' GRATE	1219	21-144C 6' GRATE	23-22C 4' GRATE	23-23C 6' GRATE	1958	18" RC UD	248'	CRUM CREEK
21-144C 6' GRATE	1221	21-145C 6' GRATE	23-23C 6' GRATE	23-28C 6' GRATE	1958	24" RCP UD	83'	CRUM CREEK
21-145C 6' GRATE	1223	21-146C 6' GRATE	23-28C 6' GRATE	23-24C 6' GRATE	1958	24" RCP UD	389'	CRUM CREEK
21-146C 6' GRATE	1227	21-147C 6' GRATE	23-24C 6' GRATE	23-25C 6' GRATE	1958	24" RC UD	224'	CRUM CREEK
21-147C 6' GRATE	1232	26-4C 6' GRATE	23-25C 6' GRATE	23-26C 6' GRATE	1958	30" RC UD	372'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
21-148C 4' GRATE	1230	26-1C CONN TO 3	23-35C 4' GRATE	23-36C CONN TO	1958	18" RCP	12'	CRUM CREEK
21-149C 4' SPEC.	1188	26-7C 4' GRATE	24-111C 4' SPEC.	24-112C 4' GRATE	1985	24" RCP	232'	CRUM CREEK
21-14C Stone Conc	1943	21-15C Stone Conc	18-92 Stone Conc C	18-93 Stone Conc C		12'x7' Box Culvert	60'	CRUM CREEK
21-150C 4' SPEC.	1184	21-151C 4' SPEC.	24-106C 4' SPEC.	24-107C 4' SPEC.	1985	15" RCP	60'	CRUM CREEK
21-151C 4' SPEC.	1185	26-8C 4' SPEC.	24-107C 4' SPEC.	24-109C 4' SPEC.	1985	15" RCP	83'	CRUM CREEK
21-16C #1 OM	1939	21-17C #1 OM	18-86 #1 OM	18-87 #1 OM	1954	15" RCP	34'	CRUM CREEK
21-17C #1 OM	1940	21-18C #1 OM & G	18-87 #1 OM	18-88 #1 OM & Gra	1954	18" RCP	176'	CRUM CREEK
21-18C #1 OM & G	1941	21-19C Stone HDW	18-88 #1 OM & Gra	18-89 Stone HDW	1954	18" RCP	125'	CRUM CREEK
21-1C Type C	1961	21-3C MH	18-118 Type C	18-119 MH	1995	18" RCP	4'	CRUM CREEK
21-20C Conc HDW	1947	21-21C 4' Spec	18-98 Conc HDW	18-112 4' Spec		24" RCP	8'	CRUM CREEK
21-21C 4' Spec	1952	21-23C 6' Spec	18-112 4' Spec	18-99 6' Spec		24" RCP	45'	CRUM CREEK
21-22C 6' Spec	1953	21-23C 6' Spec	18-113 6' Spec	18-99 6' Spec		15" RCP	8'	CRUM CREEK
21-23C 6' Spec	1954	21-24C RR Tie End	18-99 6' Spec	18-115 RR Tie End		24" RCP	30'	CRUM CREEK
21-25C Conc HDW	1955	21-26C Conc HDW	18-105 Conc HDW	18-106 Conc HDW			42'	CRUM CREEK
21-27C Stone HDW	1956	21-28C End CMP	18-107 Stone HDW	18-108 End CMP		12" CMP	75'	CRUM CREEK
21-29C Conc HDW	1957	21-31C Conc HDW	18-110 Conc HDW	18-111 Conc HDW		15" RCP	100'	CRUM CREEK
21-2C Type C	1962	21-3C MH	18-120 Type C	18-119 MH		18" RCP	60'	CRUM CREEK
21-30C End 12" CI	1958	Junct 15" RCP	18-109 End 12" CIP	Junct 15" RCP		12 CIP	80'	CRUM CREEK
21-32C #1 OM	1937	21-33C #1 OM	18-83 #1 OM	18-84 #1 OM	1954	15" RCP	34'	CRUM CREEK
21-33C #1 OM	1938	21-34C Stone HDW	18-84 #1 OM	18-85 Stone HDW	1954	15" RCP	160'	CRUM CREEK
21-35C Stone HDW	1944	21-36C #1 OM & G	18-94 Stone HDW	18-95 #1 OM & Gra	1954	18" RCP	12'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
21-36C #1 OM & G	1945	21-37C #1 OM & G	18-95 #1 OM & Gra	18-96 #1 OM & Gra	1954	18" RCP	40'	CRUM CREEK
21-37C #1 OM & G	1946	21-38C Stone HDW	18-96 #1 OM & Gra	18-97 Stone HDW	1954	18" RCP	12'	CRUM CREEK
21-39C Conc HDW	1950	21-40C 4' Spec	18-103 Conc HDW	18-104 4' Spec		18" RCP	35'	CRUM CREEK
21-3C MH	1963	21-4C Type C	18-119 MH	18-121 Type C		18" RCP	118'	CRUM CREEK
21-40C 4' Spec	1951	21-41C End Sts	18-104 4' Spec	18-114 End Sts				CRUM CREEK
21-42C 4' Grate	1949	21-43C 4' Spec	18-102 4' Grate	18-28 4' Spec	1972	18" RCP	40'	CRUM CREEK
21-43C 4' Spec	1874	21-131C 6' Grate	18-28 4' Spec	18-27 6' Grate	1972	18" RCP Pvt	140'	CRUM CREEK
21-44C Stone HDW	1934	21-45C Stone HDW	18-79 Stone HDW	18-80 Stone HDW		10'x7' Stone & Conc	70'	CRUM CREEK
21-46C #1 OM	1894	21-49C3 #1 OM	18-40 #1 OM	18-43 #1 OM	1949	18" RCP	24'	CRUM CREEK
21-47C #1 OM	1895	21-49C3 #1 OM	18-41 #1 OM	18-43 #1 OM	1949	15" RCP	36'	CRUM CREEK
21-48C #1 OM	1896	21-49C3 #1 OM	18-42 #1 OM	18-43 #1 OM	1949	18" RCP	36'	CRUM CREEK
21-49C3 #1 OM	1897	21-50C MH	18-43 #1 OM	18-44 MH	1949	24" RCP	152'	CRUM CREEK
21-4C Type C	1964	21-7C Type C	18-121 Type C	18-124 Type C		18" RCP	186'	CRUM CREEK
21-50C M.H.	2008	21-51C Stone HDW	18-44C M.H.	18-45C Stone HDW	1949	24" RCP	120'	CRUM CREEK
21-52C Stone HDW	1933	21-53C MH	18-76 Stone HDW	18-77 MH		18" CIP	60'	CRUM CREEK
21-53C M.H.	2009	21-54C END 24" R	18-77 M.H.	18-78 END 24" RC		24" RCP		CRUM CREEK
21-55C 6' Spec	1900	21-58C 4' Grate	18-46 6' Spec	18-48 4' Grate	1963	42" RCP	65'	CRUM CREEK
21-56C 4' Grate	1903	21-57C 4' Grate	18-75 4' Grate	18-74 4' Grate	1964	15" RCP	30'	CRUM CREEK
21-57C 4' Grate	1904	21-58C 4' Grate	18-74 4' Grate	18-48 4' Grate	1964	18" RCP	28'	CRUM CREEK
21-58C 4' Grate	1901	21-65C MH	18-48 4' Grate	18-51 MH	1963	42" RCP	34'	CRUM CREEK
21-59C 6' Spec	1902	21-62C 4' Grate	18-47 6' Spec	18-73 4' Grate	1963	18" RCP	34'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
21-5C Type C	1965	21-6C MH	18-122 Type C	18-123 MH	1995	18" RCP	88'	CRUM CREEK
21-60C 4' Grate	1905	21-62C 4' Grate	18-71 4' Grate	18-73 4' Grate	1964	15" RCP	25'	CRUM CREEK
21-61C 4' Grate	1906	21-62C 4' Grate	18-72 4' Grate	18-73 4' Grate	1964	15" RCP	16'	CRUM CREEK
21-62C 4' Grate	1907	21-63C 4' Spec	18-73 4' Grate	18-49 4' Spec	1964	18" RCP	24'	CRUM CREEK
21-63C 4' Spec	1908	21-64C 4' Spec	18-49 4' Spec	18-50 4' Spec	1963	21" RCP	34'	CRUM CREEK
21-64C 4' Spec	1909	21-65C MH	18-50 4' Spec	18-51 MH	1963	21" RCP	7'	CRUM CREEK
21-65C MH	1910	21-69C MH	18-51 MH	18-52 MH	1963	48" RCP	224'	CRUM CREEK
21-66C 4' Grate	1911	21-67C 6' Grate	18-55 4' Grate	18-54 6' Grate	1963	15" RCP	Stand Pipe	CRUM CREEK
21-67C 6' Grate	1912	21-68C 4' Spec	18-54 6' Grate	18-53 4' Spec	1963	21" RCP	58'	CRUM CREEK
21-68C 4' Spec	1913	21-69C MH	18-53 4' Spec	18-52 MH	1963	21" RCP	6'	CRUM CREEK
21-69C MH	1914	21-70C MH	18-52 MH	18-56 MH	1963	48" RCP	150'	CRUM CREEK
21-6C MH	1966	21-7C Type C	18-123 MH	18-124 Type C	1995	18" RCP	46'	CRUM CREEK
21-70C MH	1915	21-74C MH	18-56 MH	18-57 MH	1963	48" RCP	116'	CRUM CREEK
21-71C 4' Grate	1916	21-72C 6' Grate	18-60 4' Grate	18-59 6' Grate	1963	15" RCP	Stand Pipe	CRUM CREEK
21-72C 6' Grate	1917	21-73C 4' Spec	18-59 6' Grate	18-58 4' Spec	1963	18" RCP	31'	CRUM CREEK
21-73C 4' Spec	1918	21-74C MH	18-58 4' Spec	18-57 MH	1963	18" RCP	6'	CRUM CREEK
21-74C MH	1919	21-75C MH	18-57 MH	18-60 MH	1963	48" RCP	68'	CRUM CREEK
21-75C MH	1920	21-79C MH	18-60 MH	18-64 MH	1963	48" RCP	127'	CRUM CREEK
21-76C 4' Spec	1921	21-77C 4' Spec	18-61 4' Spec	18-62 4' Spec	1963	18" RCP	44'	CRUM CREEK
21-77C 4' Spec	1922	21-78C 4' Spec	18-62 4' Spec	18-63 4' Spec	1963	18" RCP	33'	CRUM CREEK
21-78C 4' Spec	1923	21-79C MH	18-63 4' Spec	18-64 MH	1963	18" RCP	26'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
21-79C MH	1924	21-80C5 MH	18-64 MH	18-65 MH	1963	48" RCP	207'	CRUM CREEK
21-7C Type C	1967	21-8C Type C	18-124 Type C	18-125 Type C	1995	18" RCP	70'	CRUM CREEK
21-82C #1 OM & G	1929	21-83C #1 OM & G	18-76 #1 OM & Gra	18-77 #1 OM & Gra	1953	15" RCP	37'	CRUM CREEK
21-83C #1 OM & G	1930	21-85C #1 OM	18-77 #1 OM & Gra	18-67 #1 OM	1953	18" RCP	130'	CRUM CREEK
21-84C Stone HDW	1926	21-85C #1 OM	18-66 Stone HDW	18-67 #1 OM	1953	15" RCP	90'	CRUM CREEK
21-85C #1 OM	1927	21-86C #1 OM	18-67 #1 OM	18-68 #1 OM	1953	24" RCP	58'	CRUM CREEK
21-86C #1 OM	1928	21-87C Stone HDW	18-68 #1 OM	18-69 Stone HDW	1953	27" RCP	132'	CRUM CREEK
21-88C #1 OM	1931	21-89C #1 OM	18-78 #1 OM	18-79 #1 OM	1953	18" RCP	34'	CRUM CREEK
21-89C #1 OM	1932	21-90C Stone HDW	18-79 #1 OM	18-80 Stone HDW	1953	21" RCP	105'	CRUM CREEK
21-8C Type C	1968	21-9C Type C	18-125 Type C	18-126 Type C	1995	21" RCP	112'	CRUM CREEK
21-91C #1 OM	1942	21-92C Stone HDW	18-90 #1 OM	18-91 Stone HDW	1954	15" RCP	145'	CRUM CREEK
21-93C 4' Grate	1948	21-94C Stone HDW	18-100 4' Grate	18-101 Stone HDW	1950	15" RCP	115'	CRUM CREEK
21-95C #1 OM & G	1935	21-96C Stone HDW	18-81 #1 OM & Gra	18-82 Stone HDW	1954	15" RCP	170'	CRUM CREEK
21-97C MH	1887	21-99C 6' Grate	18-31 MH	18-32 6' Grate	1954	24" RCP Pvt	45'	CRUM CREEK
21-98C Stone HDW	1888	21-99C 6' Grate	18-33 Stone HDW	18-32 6' Grate	1954	24" RCP	110'	CRUM CREEK
21-99C 6' Grate	1889	21-101C #1 OM Inl	18-32 6' Grate	18-34 #1 OM Inlet	1954	24" RCP	186'	CRUM CREEK
21-9C Type C	1969	21-10C Type C	18-126 Type C	18-127 Type C	1995	21" RCP	50'	CRUM CREEK
22-100C 4' SQ GR	1585	22-101C 4' SQ GR	19-145C 4' SQ GR	19-147C 4' SQ GR	1963	30" RCP PVT.	150'	CRUM CREEK
22-101C 4' SQ GR	1586	22-102C JUNCT @	19-147C 4' SQ GR	19-148C JUNCT @	1963	30" RCP PVT.	340'	CRUM CREEK
22-103C 6' SPEC.	1444	22-104C 6' SPEC.	19-1 6' SPEC.	19-2 6' SPEC.	1957	18" RCP	34'	CRUM CREEK
22-104C 6' SPEC.	1445	22-105C 4' GRATE	19-2 6' SPEC.	19-3 4' GRATE	1957	21" RCP	87'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
22-105C 4' GRATE	1446	22-106C JUNCT M.	19-3 4' GRATE	19-4 JUNCT M.H.	1957	21" RCP	56'	CRUM CREEK
22-106C JUNCT M.	1447	22-107C 4' GRATE	19-4 JUNCT. BOX	19-5 4' GRATE	1964	24" RCP	100'	CRUM CREEK
22-107C 4' GRATE	1448	22-108C 4' GRATE	19-5 4' GRATE	19-6 4' GRATE	1964	24" RCP	324'	CRUM CREEK
22-108C 4' GRATE	1449	22-109C 4' GRATE	19-6 4' GRATE	19-7 4' GRATE	1964	24" RCP	202'	CRUM CREEK
22-109C 4' GRATE	1451	22-110C BOX CUL	19-7 4' GRATE	19-8 BOX CULV.	1964	24" RCP	100'	CRUM CREEK
22-10C 4' PDH SPE	1548	22-11C 4' SPEC.	19-104C 4' PDH SP	19-108C 4' SPEC.	1955	24" RCP	205'	CRUM CREEK
22-110C BOX CUL	1452	22-111C 36" PIPE	19-8 BOX CULV.	19-9 36" PIPE OUT		7'-6"x3' BOX CUL	+-185	CRUM CREEK
22-111C 36" PIPE	1453	22-115C 6' GRATE	19-9 36" PIPE OUT	19-10 6' GRATE IN		36" RCP	30'	CRUM CREEK
22-112C 4' GRATE	1455	22-115C 6' GRATE	19-14 4' GRATE	19-10 6' GRATE IN	1958	18" RCP	310'	CRUM CREEK
22-113C 4' GRATE	1456	22-114C JUNCT. 1	19-15 4' GRATE	19-16 JUNCT. 18"	1958	18" RCP	10'	CRUM CREEK
22-115C 6' GRATE	1457	22-117C 4' GRATE	19-10 6' GRATE IN	19-12 4' GRATE	1958	36" RCP	68'	CRUM CREEK
22-116C 4' GRATE	1458	22-117C 4' GRATE	19-11 4' GRATE	19-12 4' GRATE	1958	18" RCP	60'	CRUM CREEK
22-117C 4' GRATE	1459	22-118C M.H. GRA	19-12 4' GRATE	19-13 M.H. GRATE		36" RCP	56'	CRUM CREEK
22-118C M.H. GRA	1373	22-119C M.H. GRA	19-13 M.H. GRATE	20-96 M.H. GRATE	1969	36" RCP	150'	CRUM CREEK
22-119C M.H. GRA	1374	22-120C M.H. GRA	20-96 M.H. GRATE	20-97 M.H. GRATE	1969	36" RCP	82'	CRUM CREEK
22-11C 4' SPEC.	1549	22-12C 4' SPEC.	19-108C 4' SPEC.	19-109C 4' SPEC.	1958	24" RCP	32'	CRUM CREEK
22-120C M.H. GRA	1442	22-121C M.H. GRA	20-97 M.H. GRATE	20-98 M.H. GRATE	1969	42" RCP	164'	CRUM CREEK
22-121C M.H. GRA	1460	22-123C HDW @ C	20-98 M.H. GRATE	19-17 HDW @ CH	1969	48" RCP	50'	CRUM CREEK
22-122C 3' GRATE	1461	22-123C HDW @ C	19-18 3' GRATE	19-17 HDW @ CH		12" RCP	100'	CRUM CREEK
22-123C HDW @ C	1462	22-124C HDW @ B	19-17 HDW @ CH	19-19 HDW @ BO	1973	8'x3' STONE MAS	172'	CRUM CREEK
22-125C 2- #1 OM	1097	22-126C #1 OM	24-1C 2- #1 OM	24-2C #1 OM	1953	18" RCP	27'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
22-126C #1 OM	1580	22-98C 4' SQ GRA	24-2C #1 OM	19-143C 4' SQ GR	1953	18" RCP	180'	CRUM CREEK
22-127C CONC HD	1111	27-15C CONC HD	24-7C CONC HDW	24-18C CONC HD	1964	8'x18' 2'-3' Rip-Rap	+-1000'	CRUM CREEK
22-12C 4' SPEC.	1550	22-18C M.H.	19-109C 4' SPEC.	19-110C M.H.	1958	24" RCP	88'	CRUM CREEK
22-13C 4' GRATE	1556	22-14C 4' GRATE	19-116C 4' GRATE	19-117C 4' GRATE	1958	18" RCP	64'	CRUM CREEK
22-14C 4' GRATE	1557	22-15C 4' GRATE	19-117C 4' GRATE	19-118C 4' GRATE	1958	18" RC UD	108'	CRUM CREEK
22-15C 4' GRATE	1558	22-17C 4' GRATE	19-118C 4' GRATE	19-119C 4' GRATE	1958	24" RC UD	96'	CRUM CREEK
22-16C 4' GRATE	1559	22-17C 4' GRATE	19-120C 4' GRATE	19-119C 4' GRATE	1958	18" RCP	64'	CRUM CREEK
22-17C 4' GRATE	1560	22-18C M.H.	19-119C 4' GRATE	19-110C M.H.	1958	24" RC UD	76'	CRUM CREEK
22-18C M.H.	1561	22-20C M.H.	19-110C M.H.	19-121C M.H.	1958	30" RC UD	288'	CRUM CREEK
22-19C 4' GRATE	1562	22-20C M.H.	19-122C 4' GRATE	19-121C M.H.	1958	18" RCP	64'	CRUM CREEK
22-1C 4' GRATE	1618	22-3C 4' GRATE	19-183C 4' GRATE	19-184C 4' GRATE	1974	15" RCP	211'	CRUM CREEK
22-20C M.H.	1563	22-22C 4' GRATE	19-121C M.H.	19-123C 4' GRATE	1958	30" RC UD	504'	CRUM CREEK
22-21C 6' SPEC.	1564	22-22C 4' GRATE	19-124C 6' SPEC.	19-123C 4' GRATE	1958	18" RCP	64'	CRUM CREEK
22-22C 4' GRATE	1565	22-23C M.H.	19-123C 4' GRATE	19-125C M.H.	1958	30" RC UD	308'	CRUM CREEK
22-23C M.H.	1566	22-24C 4' SPEC.	19-125C M.H.	19-126C 4' SPEC.	1958	30" RC UD	224'	CRUM CREEK
22-24C 4' SPEC.	1567	22-92C 10'x7' CON	19-126C 4' SPEC.	19-52C 10'x7' CON	1958	30" RC UD	56'	CRUM CREEK
22-25C 4' GRATE	1524	22-26C 4' GRATE J	19-85C 4' GRATE	19-82C 4' GRATE J	1959	15" RCP	64'	CRUM CREEK
22-26C 4' GRATE J	1525	22-30C 6' SPEC.	19-82C 4' GRATE J	19-83C 6' SPEC.	1959	48" RCP	138'	CRUM CREEK
22-27C 4' SPEC.	1526	22-28C 4' SPEC.	19-88C 4' SPEC.	19-87C 4' SPEC.	1959	15" RCP	38'	CRUM CREEK
22-28C 4' SPEC.	1527	22-29C 4' SPEC.	19-87C 4' SPEC.	19-86C 4' SPEC.	1959	15" RCP	45'	CRUM CREEK
22-29C 4' SPEC.	1528	22-30C 6' SPEC.	19-86C 4' SPEC.	19-83C 6' SPEC.	1959	15" RCP	128'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
22-2C 4' GRATE	1619	22-3C 4' GRATE	19-185C 4' GRATE	19-184C 4' GRATE	1974	15" RCP	22'	CRUM CREEK
22-30C 6' SPEC.	1529	22-31C 6' GRATE	19-83C 6' SPEC.	19-84C 6' GRATE	1959	54" RCP	30'	CRUM CREEK
22-31C 6' GRATE	1530	22-32 JUNCT. BO	19-84C 6' GRATE	19-89C JUNCT. BO	1975	54" RCP	15'	CRUM CREEK
22-32 JUNCT. BO	1531	22-34C 4' SPEC.	19-89C JUNCT. BO	19-90C 4' SPEC.	1975	54" RCP	44'	CRUM CREEK
22-33C 4' SPEC.	1532	22-34C 4' SPEC.	19-91C 4' SPEC.	19-90C 4' SPEC.	1975	15" RCP	34'	CRUM CREEK
22-34C 4' SPEC.	1533	22-35C 4' SPEC.	19-90C 4' SPEC.	19-92C 4' SPEC.	1975	54" RCP	130'	CRUM CREEK
22-35C 4' SPEC.	1534	22-37C 4' SPEC.	19-92C 4' SPEC.	19-94C 4' SPEC.	1975	54" RCP	170'	CRUM CREEK
22-36C 4' SPEC.	1535	22-37C 4' SPEC.	19-93C 4' SPEC.	19-94C 4' SPEC.	1975	15" RCP	37'	CRUM CREEK
22-37C 4' SPEC.	1536	22-38C 4' SPEC.	19-94C 4' SPEC.	19-95C 4' SPEC.	1975	60" RCP	70'	CRUM CREEK
22-38C 4' SPEC.	1537	22-39C STONE HD	19-95C 4' SPEC.	19-96C STONE HD	1975	60" RCP	112'	CRUM CREEK
22-3C 4' GRATE	1620	22-5C 4' GRATE	19-184C 4' GRATE	19-186C 4' GRATE	1974	15" RCP	105'	CRUM CREEK
22-40C #1 OM	1510	22-41C #1 OM	19-69C #1 OM	19-68C #1 OM	1954	15" RCP	45'	CRUM CREEK
22-41C #1 OM	1511	22-42C #1 OM	19-68C #1 OM	19-70C #1 OM	1954	18" RCP	65'	CRUM CREEK
22-42C #1 OM	1512	22-43C 4' SPEC.	19-70C #1 OM	19-71C 4' SPEC.	1966	21" RCP	240'	CRUM CREEK
22-43C 4' SPEC.	1513	22-44C 4' SPEC.	19-71C 4' SPEC.	19-72C 4' SPEC.	1966	24" RCP	220'	CRUM CREEK
22-44C 4' SPEC.	1514	22-45C 4' SPEC.	19-72C 4' SPEC.	19-73C 4' SPEC.	1966	24" RCP	278'	CRUM CREEK
22-45C 4' SPEC.	1515	22-46C JUNCT. BO	19-73C 4' SPEC.	19-74C JUNCT. BO	1966	30" RCP	220'	CRUM CREEK
22-46C JUNCT. BO	1516	22-49C 2-4' SPEC. I	19-74C JUNCT BO	19-59C 2-4' SPEC. I	1966	30" RCP	50'	CRUM CREEK
22-47C STONE HD	1520	22-48C 6' SPEC.	19-76C STONE HD	19-75C 6' SPEC.	1959	48" RCP	225'	CRUM CREEK
22-48C 6' SPEC.	1521	22-49C 2-4' SPEC. I	19-75C 6' SPEC.	19-59C 2-4' SPEC. I		36" RCP	50'	CRUM CREEK
22-49C 2-4' SPEC. I	1500	22-66C Junct. Box	19-59C 2-4' SPEC. I	19-58C Junct. Box	1974	58"x36" CORR. I. P	126'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
22-4C 4' GRATE	1621	22-5C 4' GRATE	19-187C 4' GRATE	19-186C 4' GRATE	1974	15" RCP	22'	CRUM CREEK
22-50C CONC. HD	1499	22-66C Junct. Box	19-57C CONC. HD	19-58C Junct. Box	1974	81"x59" CORR. I. P	180'	CRUM CREEK
22-51C 6' GRATE	1497	22-52C 6' GRATE	19-54C 6' GRATE	19-55C 6' GRATE	1974	18" RCP	96'	CRUM CREEK
22-52C 6' GRATE	1498	22-65C 6' GRATE	19-55C 6' GRATE	19-56C 6' GRATE	1974	18" RCP	104'	CRUM CREEK
22-53C 4' SPEC.	1468	22-54C 6' GRATE	19-26C 4' SPEC.	19-27C 6' GRATE	1967	15" RCP	66'	CRUM CREEK
22-54C 6' GRATE	1469	22-55C 4' GRATE	19-27C 6' GRATE	19-28C 4' GRATE		18" RCP	325'	CRUM CREEK
22-55C 4' GRATE	1470	22-56C 4' GRATE	19-28C 4' GRATE	19-29C 4' GRATE	1969	18" RCP	24'	CRUM CREEK
22-56C 4' GRATE	1471	22-57C M.H. JUNC	19-29C 4' GRATE	19-32C M.H. JUNC		21" RCP	160'	CRUM CREEK
22-57C M.H. JUNC	1472	22-58C M.H.	19-32C M.H. JUNC	19-33C M.H.	1983	21" RCP	66'	CRUM CREEK
22-58C M.H.	1473	22-59C 5- #1 GRAT	19-33C M.H.	19-39C 5- #1 GRAT	1983	21" RCP	140'	CRUM CREEK
22-59C 5- #1 GRAT	1474	22-60C 6' SPEC.	19-39C 5- #1 GRAT	19-40C 6' SPEC.	1961	24" RCP	98'	CRUM CREEK
22-5C 4' GRATE	1622	21-107C 4' GRATE	19-186C 4' GRATE	19-188C 4' GRATE	1974	15" RCP	121'	CRUM CREEK
22-60C 6' SPEC.	1475	22-61C 6' SPEC.	19-40C 6' SPEC.	19-41C 6' SPEC.	1961	24" RCP	28'	CRUM CREEK
22-61C 6' SPEC.	1485	22-62C 4' GRATE	19-41C 6' SPEC.	19-46C 4' GRATE	1961	24" RCP	16'	CRUM CREEK
22-62C 4' GRATE	1493	22-63C 4' GRATE	19-46C 4' GRATE	19-47C 4' GRATE		36" CMP	148'	CRUM CREEK
22-63C 4' GRATE	1494	22-64C 3.5'x11' GR	19-47C 4' GRATE	19-53C 3.5'x11' GR		36" RCP	290'	CRUM CREEK
22-64C 3.5'x11' GR	1495	22-65C 6' GRATE	19-53C 3.5'x11' GR	19-56C 6' GRATE	1964	36" RCP	92'	CRUM CREEK
22-65C 6' GRATE	1496	22-66C Junct. Box	19-56C 6' GRATE	19-58C Junct. Box	1964	36" RCP	60'	CRUM CREEK
22-66C Junct. Box	1501	22-72C Junct. Box	19-58C JUNCT. BO	19-62C Junct. Box	1974	112"x75" CORR. I.	320'	CRUM CREEK
22-67C 6' GRATE	1504	22-68C 6' GRATE	19-65C 6' GRATE	19-64C 6' GRATE	1974	15" RCP	145'	CRUM CREEK
22-68C 6' GRATE	1505	22-69C 6' GRATE	19-64C 6' GRATE	19-63C 6' GRATE	1974	15" RCP	94'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
22-69C 6' GRATE	1506	22-72C Junct. Box	19-63C 6' GRATE	19-62C Junct. Box	1974	18" RCP	76'	CRUM CREEK
22-6C #1 OM	1517	22-7C #1 OM	19-80C #1 OM	19-79C #1 OM	1950	18" RCP	147'	CRUM CREEK
22-70C 6' GRATE	1502	22-71C 6' GRATE	19-60C 6' GRATE	19-61C 6' GRATE	1974	15" RCP	124'	CRUM CREEK
22-71C 6' GRATE	1503	22-72C Junct. Box	19-61C 6' GRATE	19-62C Junct. Box	1974	18" RCP	135'	CRUM CREEK
22-72C Junct. Box	1508	22-74C Junct. Box	19-62C Junct. Box	19-67C Junct. Box	1974	112"x75" Smooth Fl	67'	CRUM CREEK
22-73C 6' GRATE	1507	112"x75" PIPE AR	19-66C 6' GRATE	112"x75" PIPE AR	1974		11'	CRUM CREEK
22-74C Junct. Box	1509	22-93C MH Junct.	19-67C Junct. Box	19-152C MH Junct.		10'x7' CONC. ARC	112'	CRUM CREEK
22-75C 4' GRATE	1492	10'x7' CONC. ARC	19-51C 4' GRATE	10'x7' CONC. ARC	1958	18" RCP	8'	CRUM CREEK
22-76C 6' SPEC.	1569	22-78C M.H.	19-128C 6' SPEC.	19-129C M.H.	1958	18" RCP	28'	CRUM CREEK
22-77C 6' SPEC.	1568	22-78C M.H.	19-127C 6' SPEC.	19-129C M.H.	1958	18" RC UD	48'	CRUM CREEK
22-78C M.H.	1570	22-79C 4' SPEC.	19-129C M.H.	19-130C 4' SPEC.	1958	18" RCP	88'	CRUM CREEK
22-79C 4' SPEC.	1571	22-80C Conn To 10'	19-130C 4' SPEC.	19-131C Conn To 1	1958	18" RCP	92'	CRUM CREEK
22-7C #1 OM	1518	22-8C #1 OM	19-79C #1 OM	19-78C #1 OM		18" RCP	34'	CRUM CREEK
22-81C 4' GRATE	1463	22-82C 4' GRATE	19-20C 4' GRATE	19-21C 4' GRATE	1958	18" RCP	56'	CRUM CREEK
22-82C 4' GRATE	1464	22-83C 4' PDH SPE	19-21C 4' GRATE	19-22C 4' PDH SPE	1958	18" RC UD	274'	CRUM CREEK
22-83C 4' PDH SPE	1465	22-85C M.H.	19-22C 4' PDH SPE	19-31C M.H.	1958	18" RC UD	18'	CRUM CREEK
22-84C 4' SPEC.	1467	22-85C M.H.	19-30C 4' SPEC.	19-31C M.H.	1983	15" CMP	37'	CRUM CREEK
22-85C M.H.	1466	22-86C 4' GRATE	19-31C M.H.	19-23C 4' GRATE	1958	18" RCP	64'	CRUM CREEK
22-86C 4' GRATE	1486	22-87C 4' GRATE	19-23C 4' GRATE	19-24C 4' GRATE	1958	18" RCP	65'	CRUM CREEK
22-87C 4' GRATE	1487	22-89C 4' GRATE	19-24C 4' GRATE	19-25C 4' GRATE	1958	18" RC UD	208'	CRUM CREEK
22-88C 4' GRATE	1488	22-89C 4' GRATE	19-48C 4' GRATE	19-25C 4' GRATE	1958	18" RCP	64'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
22-89C 4' GRATE	1489	22-90C 4' GRATE	19-25C 4' GRATE	19-49C 4' GRATE	1958	18" RC UD	156'	CRUM CREEK
22-8C #1 OM	1519	22-9C END 24" RC	19-78C #1 OM	19-77C END 24" R		24" RCP	48'	CRUM CREEK
22-90C 4' GRATE	1490	22-91C 4' SPEC.	19-49C 4' GRATE	19-50C 4' SPEC.	1958	18" RC UD	176'	CRUM CREEK
22-91C 4' SPEC.	1491	22-92C 10'x7' CON	19-50C 4' SPEC.	19-52C 10'x7' CON	1958	18" RC UD	150'	CRUM CREEK
22-93C M.H. Junct.	1588	22-94C M.H.	19-152C M.H. Junct	19-153C M.H.	1967	8'x5' CONC. BOX	151'	CRUM CREEK
22-94C M.H.	1589	22-95C CONC. HD	19-153C M.H.	19-151C CONC. H	1967	8'x5' CONC. BOX	169'	CRUM CREEK
22-95C CONC. HD	1590	22-96C Conc. HDW	19-151C CONC. H	19-154C Conc. HD	1967	10'-12'x4' Stone Ma	97'	CRUM CREEK
22-96C Conc. HDW	1591	22-97C Junct. With	19-154C Conc. HD	19-155C Junct. Wit	1967	12'x3' CONC. BOX	75'	CRUM CREEK
22-97C Junct With	1102	22-127C CONC HD	19-155C Junct With	24-7C CONC HDW	1963	8'x5' CONC BOX C	738'	CRUM CREEK
22-98C 4' SQ GRA	1581	22-99C 4' SQ GRA	19-143C 4' SQ GR	19-144C 4' SQ GR	1963	24" RCP PVT.	305'	CRUM CREEK
22-99C 4' SQ GRA	1583	22-100C 4' SQ GR	19-144C 4' SQ GR	19-145C 4' SQ GR	1963	24" RCP PVT.	341'	CRUM CREEK
23-10C 4' SPEC.	1376	23-11C 4' GRATE	20-102 4' SPEC.	20-103 4' GRATE	1958	18" RCP	76'	CRUM CREEK
23-11C 4' GRATE	1377	23-12C 4' GRATE	20-103 4' GRATE	20-104 4' GRATE	1958	18" RC UD	260'	CRUM CREEK
23-12C 4' GRATE	1454	22-115C 6' GRATE	20-104 4' GRATE	19-10 6' GRATE IN	1958	18" RC UD	252'	CRUM CREEK
23-13C 6' GRATE	1369	23-15C 2-6' GRAT	20-95 6' GRATE	20-94 2-6' GRATES	1962	18" RCP	224'	CRUM CREEK
23-14C 2-6' GRAT	1368	23-15C 2-6' GRAT	20-93 2-6' GRATES	20-94 2-6' GRATES	1962	18" RCP	223'	CRUM CREEK
23-15C 2-6' GRAT	1370	23-16C M.H. GRA	20-94 2-6' GRATES	20-100 M.H. GRAT	1962	27" RCP	186'	CRUM CREEK
23-16C M.H. GRA	1371	23-17C M.H. GRA	20-100 M.H. GRAT	20-99 M.H. GRATE	1962	27" RCP	111'	CRUM CREEK
23-17C M.H. GRA	1372	22-121C M.H. GRA	20-99 M.H. GRATE	20-98 M.H. GRATE	1962	27" RCP	110'	CRUM CREEK
23-18C BEGIN ST	1346	23-19C STONE HD	20-7 BEGIN STOR	20-6 STONE HDW	1966	2'x3' STONE MAS	485'	CRUM CREEK
23-19C STONE HD	1347	23-24C 2-4' GRAT	20-6 STONE HDW	20-5 2-4' GRATES		24" RCP	+-75'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
23-20C 4' GRATE	1350	23-23C 4' GRATE	20-9 4' GRATE	20-8 4' GRATE	1958	18" RCP	48'	CRUM CREEK
23-21C 4' GRATE	1348	23-22C 6' GRATE	20-11 4' GRATE	20-10 6' GRATE	1958	18" RCP UD	132'	CRUM CREEK
23-22C 6' GRATE	1349	23-23C 4' GRATE	20-10 6' GRATE	20-8 4' GRATE	1958	18" RCP UD	76'	CRUM CREEK
23-23C 4' GRATE	1351	23-24C 2- 4' GRAT	20-8 4' GRATE	20-5 2- 4' GRATES	1958	24" RCP UD	48'	CRUM CREEK
23-24C (2) 4' GRA	1352	23-28C 4' PDH SPE	20-5 (2) 4' GRATES	20-4 4' PDH SPEC.	1958	30" RCP	64'	CRUM CREEK
23-25C 4' GRATE I	1342	23-26C 4' PDH SPE	20-1 4' GRATE INL	20-2 4' PDH SPEC.	1958	18" RCP	44'	CRUM CREEK
23-26C 4' PDH SPE	1343	23-27C 4' PDH SPE	20-2 4' PDH SPEC.	20-3 4' PDH SPEC.	1958	18" RCP	64'	CRUM CREEK
23-27C 4' PDH SPE	1344	23-28C 4' PDH SPE	20-3 4' PDH SPEC.	20-4 4' PDH SPEC.	1958	18" RCP UD	216'	CRUM CREEK
23-28C 4' PDH SPE	1353	23-33C 6' GRATE	20-4 4' PDH SPEC.	20-12 6' GRATE	1970	24" RCP	140'	CRUM CREEK
23-29C 3' GRATE	1356	23-30C 4' GRATE	20-14 3' GRATE	20-13 4' GRATE	1970	12" RCP	140'	CRUM CREEK
23-30C 4' GRATE	1357	23-33C 6' GRATE	20-13 4' GRATE	20-12 6' GRATE	1970	15" RCP	145'	CRUM CREEK
23-31C 3' GRATE	1354	23-32C 4' GRATE	20-16 3' GRATE	20-15 4' GRATE	1970	12" RCP	150'	CRUM CREEK
23-32C 4' GRATE	1355	23-33C 6' GRATE	20-15 4' GRATE	20-12 6' GRATE	1970	15" RCP	140'	CRUM CREEK
23-33C 6' GRATE	1358	23-36C 6' GRATE	20-12 6' GRATE	20-17 6' GRATE	1970	24" RCP	142'	CRUM CREEK
23-34C 3' GRATE	1360	23-36C 6' GRATE	20-18 3' GRATE	20-17 6' GRATE	1970	15" RCP	188'	CRUM CREEK
23-35C 3' GRATE	1359	23-36C 6' GRATE	20-19 3' GRATE	20-17 6' GRATE	1970	15" RCP	158'	CRUM CREEK
23-36C 6' GRATE	1361	23-37C SPEC GRA	20-17 6' GRATE	20-20 SPEC GRAT	1970	24" RCP	8'	CRUM CREEK
23-37C SPEC GRA	1362	23-38C 6' GRATE	20-20 SPEC GRAT	20-21 6' GRATE	1976		0	CRUM CREEK
23-38C 6' GRATE	1363	23-39C #1 OM & G	20-21 6' GRATE	20-22 #1 OM & GR	1976	24" / 30" RCPS	146'	CRUM CREEK
23-39C #1 OM & G	1364	23-40C #1 OM & G	20-22 #1 OM & 6'	20-23 #1 OM & GR	1976	2-30" RCPS	40'	CRUM CREEK
23-40C #1 OM & G	1365	23-41C CONC HD	20-23 #1 OM & 6'	20-24 CONC HDW	1992	48" CORR. ALUM.	183'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
23-42C M.H.	1414	23-43C 3' GRATE	20-41 M.H.	20-40 3' GRATE	1954	15" RCP	43'	CRUM CREEK
23-43C 3' GRATE	1415	23-44C M.H.	20-40 3' GRATE	20-39 M.H.	1954	15" RCP	185'	CRUM CREEK
23-44C M.H.	1416	23-45C M.H.	20-39 M.H.	20-38 M.H.	1954	15" RCP	146'	CRUM CREEK
23-45C M.H.	1417	23-49C JUNCT BO	20-38 M.H.	20-34 JUNCT BOX	1954	15" RCP	161'	CRUM CREEK
23-46C 4' PDH SPE	1434	23-47C 4' PDH SPE	20-35 4' PDH SPEC	20-36 4' PDH SPEC	1958	18" RCP	28'	CRUM CREEK
23-47C 4' PDH SPE	1435	23-48C JUNCT. BO	20-36 4' PDH SPEC	20-37 JUNCT. BO	1958	18" RCP	12'	CRUM CREEK
23-48C JUNCT. BO	1436	23-58C M.H.	20-37 JUNCT BOX	20-33 M.H.		18" RCP	30'	CRUM CREEK
23-50C 4' PDH SPE	1426	23-51C 4' PDH SPE	20-25 4' PDH SPEC	20-26 4' PDH SPEC	1958	18" RCP	52'	CRUM CREEK
23-51C 4' PDH SPE	1427	23-52C 4' GRATE	20-26 4' PDH SPEC	20-27 4' GRATE	1958	18" RCP UD	104'	CRUM CREEK
23-52C 4' GRATE	1428	23-53C 4' PDH SPE	20-27 4' GRATE	20-28 4' PDH SPEC	1958	18" RCP	64'	CRUM CREEK
23-53C 4' PDH SPE	1429	23-55C 4' PDH SPE	20-28 4' PDH SPEC	20-29 4' PDH SPEC	1958	18" RCP UD	180'	CRUM CREEK
23-54C 4' PDH SPE	1430	23-55C 4' PDH SPE	20-30 4' PDH SPEC	20-29 4' PDH SPEC	1958	18" RCP	64'	CRUM CREEK
23-55C 4' PDH SPE	1431	23-56C 4' PDH SPE	20-29 4' PDH SPEC	20-31 4' PDH SPEC	1958	18" RCP UD	164'	CRUM CREEK
23-56C 4' PDH SPE	1432	23-57C 4' PDH SPE	20-31 4' PDH SPEC	20-32 4' PDH SPEC	1958	18" RCP UD	176'	CRUM CREEK
23-57C 4' PDH SPE	1433	23-58C M.H.	20-32 4' PDH SPEC	20-33 M.H.	1958	18" RCP	48'	CRUM CREEK
23-58C M.H.	1418	23-61C 4' GRATE	20-33 M.H.	20-43 4' GRATE	1952	30" RCP	100'	CRUM CREEK
23-59C 4' PDH SPE	1419	CONN. TO 30" RC	20-42 4' PDH SPEC	CONN. TO 30" RC	1958	18" RCP	46'	CRUM CREEK
23-60C #1 OM	1420	23-61C 4' GRATE	20-44 #1 OM	20-43 4' GRATE	1952	15" RCP	36'	CRUM CREEK
23-61C 4' GRATE	1421	23-62C #1 OM	20-43 4' GRATE	20-45 #1 OM	1952	36" RCP	200'	CRUM CREEK
23-62C #1 OM INL	1422	23-63C GRATE IN	20-45 #1 OM INLE	20-46 GRATE INL	1952	36" RCP	66'	CRUM CREEK
23-63C GRATE IN	1423	23-65C UNKNOW	20-46 GRATE INL	20-47 UNKNOWN		36" RCP	50'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
23-64C END 30" R	1424	23-65C UNKNOW	20-55A END 30" R	20-47 UNKNOWN	1953	30" RCP	210'	CRUM CREEK
23-65C UNKNOW	1425	23-66C #1 OM INL	20-47 UNKNOWN	20-48 #1 OM INLE	1953	42" RCP	285'	CRUM CREEK
23-66C #1 OM INL	1402	23-71C #1 OM INL	20-48 #1 OM INLE	20-49 #1 OM INLE	1952	48" RCP	28'	CRUM CREEK
23-67C #1 OM INL	1403	23-68C #1 OM INL	20-53 #1 OM INLE	20-54 #1 OM INLE	1952	15" RCP	30'	CRUM CREEK
23-68C #1 OM INL	1404	23-69C #1 OM INL	20-54 #1 OM INLE	20-51 #1 OM INLE	1952	15" UNDER DRAI	310'	CRUM CREEK
23-69C #1 OM INL	1405	23-70C #1 OM INL	20-51 #1 OM INLE	20-52 #1 OM INLE	1952	15" UNDER DRAI	48'	CRUM CREEK
23-6C NO 1 OM	1438	23-7C NO 1 OM	20-105 NO 1 OM	20-106 NO 1 OM		30" CORR IRON PI	40'	CRUM CREEK
23-70C #1 OM INL	1406	23-71C #1 OM INL	20-52 #1 OM INLE	20-49 #1 OM INLE	1952	24" RCP	132'	CRUM CREEK
23-71C #1 OM INL	1407	23-72C STONE HD	20-49 #1 OM INLE	20-50 STONE HD	1952	48" RCP	133'	CRUM CREEK
23-73C #1 OM INL	1408	23-74C #1 OM INL	20-55 #1 OM INLE	20-56 #1 OM INLE	1952	18" RCP	28'	CRUM CREEK
23-74C #1 OM INL	1409	23-75C STONEY C	20-56 #1 OM INLE	20-57 STONEY CR	1952	24" CORR. I.P.	140'	CRUM CREEK
23-76C STONE HD	1410	23-77C STONE HD	20-58 STONE HD	20-59 STONE HD	1952	3'x6' CONC BOX C	62'	CRUM CREEK
23-77C STONE HD	1411	23-78C END CHA	20-59 STONE HD	20-60 END CHAN	1970	6'x3' STONE CHA	167'	CRUM CREEK
23-79C HDW STO	1412	23-80C HDW STO	20-61 HDW STON	20-62 HDW STON		5'x9' STONE ARC		CRUM CREEK
23-7C NO 1 OM	1439	23-8C 4' GRATE	20-106 NO 1 OM	20-107 4' GRATE	1970	24" RCP	130'	CRUM CREEK
23-81C 2'x4' GRAT	1392	23-82C 2'x4' GRAT	20-67 2'x4' GRATE	20-68 2'x4' GRATE	1980	12" ACP	120'	CRUM CREEK
23-82C 2'x4' GRAT	1393	23-83C 2'x4' GRAT	20-68 2'x4' GRATE	20-69 2'x4' GRATE	1980	12" ACP	180'	CRUM CREEK
23-83C 2'x4' GRAT	1394	23-85C M.H.	20-69 2'x4' GRATE	20-71 M.H.	1980	12" ACP	109'	CRUM CREEK
23-84C 2'x4' GRAT	1395	23-85C M.H.	20-70 2'x4' GRATE	20-71 M.H.	1980	12" ACP	193'	CRUM CREEK
23-85C M.H.	1396	23-86C M.H.	20-71 M.H.	20-72 M.H.	1980	18" ACP	103'	CRUM CREEK
23-86C M.H.	1397	23-87C M.H.	20-72 M.H.	20-73 M.H.	1980	18" ACP	380'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
23-87C M.H.	1398	24-15C CONC. HD	20-73 M.H.	20-74 CONC. HDW	1980	18" ACP	446'	CRUM CREEK
23-88C 6' SPEC.	1385	23-89C 6' SPEC.	20-92 6' SPEC.	20-85 6' SPEC.	1970	18" RCP	66'	CRUM CREEK
23-89C 6' SPEC.	1386	24-26C 6' SPEC.	20-85 6' SPEC.	20-83 6' SPEC.	1970	24" RCP	164'	CRUM CREEK
23-8C 4' GRATE	1450	22-109C 4' GRATE	20-107 4' GRATE	19-7 4' GRATE	1964	24" RCP	190'	CRUM CREEK
23-90C 4' SPEC.	1388	23-91C 4' SPEC.	20-88 4' SPEC.	20-89 4' SPEC.	1970	18" RCP	38'	CRUM CREEK
23-91C 4' SPEC.	1389	23-92C 4' SPEC.	20-89 4' SPEC.	20-90 4' SPEC.	1970	18" RCP	215'	CRUM CREEK
23-92C 4' SPEC.	1366	23-93C 4' SPEC.	20-90 4' SPEC.	20-91 4' SPEC.	1970	21" RCP	212'	CRUM CREEK
23-93C 4' SPEC.	1367	24-26C 6' SPEC.	20-91 4' SPEC.	20-83 6' SPEC.	1970	21" RCP	269'	CRUM CREEK
23-94	2012	3'x6' CONC BOX C						CRUM CREEK
23-95	2013	3'x6' CONC BOX C						CRUM CREEK
23-9C 4' GRATE	1375	23-10C 4' SPEC.	20-101 4' GRATE	20-102 4' SPEC.	1958	18" RCP	48'	CRUM CREEK
24-11C 4' PDH SPE	1413	24-12C 4' PDH SPE	20-63 4' PDH SPEC	20-64 4' PDH SPEC	1961	18" RCP	28'	CRUM CREEK
24-12C 4' PDH SPE	1390	24-13C M.H.	20-64 4' PDH SPEC	20-65 M.H.	1961	18" RCP	100'	CRUM CREEK
24-13C M.H.	1391	24-14C STONE HD	20-65 M.H.	20-66 STONE HD	1961	18" RCP	80'	CRUM CREEK
24-16C CONC. HD	1399	24-20C M.H.	20-75 CONC. HDW	20-77 M.H.	1980	42" RCP	80'	CRUM CREEK
24-17C 6' PDH SPE	1400	24-18C 6' PDH SPE	20-78 6' PDH SPEC	20-79 6' PDH SPEC	1980	15" RCP	74'	CRUM CREEK
24-18C 6' PDH SPE	1401	24-19C 6' PDH SPE	20-79 6' PDH SPEC	20-76 6' PDH SPEC	1980	18" RCP	28'	CRUM CREEK
24-19C 6' PDH SPE	1378	24-20C M.H.	20-76 6' PDH SPEC	20-77 M.H.	1980	21" RCP	113'	CRUM CREEK
24-20C M.H.	1379	24-22C 6' PDH GR	20-77 M.H.	20-81 6' PDH GRA	1980	42" RCP	120'	CRUM CREEK
24-21C 4' PDH GR	1380	24-22C 6' PDH GR	20-80 4' PDH GRA	20-81 6' PDH GRA	1980	15" RCP	16'	CRUM CREEK
24-22C 6' PDH GR	1381	24-27C 6' PDH GR	20-81 6' PDH GRA	20-84 6' PDH GRA	1970	42" RCP	370'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
24-23C 6' SPEC.	1382	24-24C 4' SPEC.	20-86 6' SPEC.	20-87 4' SPEC.	1970	18" RCP	34'	CRUM CREEK
24-24C 4' SPEC.	1383	24-25C 6' SPEC.	20-87 4' SPEC.	20-82 6' SPEC.	1970	18" RCP	178'	CRUM CREEK
24-25C 6' SPEC.	1384	24-26C 6' SPEC.	20-82 6' SPEC.	20-83 6' SPEC.	1970	30" RCP	34'	CRUM CREEK
24-26C 6' SPEC.	1387	24-27C 6' PDH GR	20-83 6' SPEC.	20-84 6' PDH GRA	1970	30" RCP	117'	CRUM CREEK
25-10C 4' SPEC.	1286	25-11C 4' GRATE	22-11C 4' SPEC.	22-12C 4' GRATE		18" RCP	138'	CRUM CREEK
25-11C 4' GRATE	1287	25-12C 4' GRATE	22-12C 4' GRATE	22-13C 4' GRATE		18" RCP	138'	CRUM CREEK
25-12C 4' GRATE	2010	25-13C 4' GRATE	22-13C 4' GRATE	22-14C 4' GRATE		18" RCP	140'	CRUM CREEK
25-13C 4' GRATE	1289	25-15C 4' GRATE	22-14C 4' GRATE	22-15C 4' GRATE		18" RCP	82'	CRUM CREEK
25-14C 4' GRATE	1290	25-15C 4' GRATE	22-16C 4' GRATE	22-15C 4' GRATE		18" RCP	78'	CRUM CREEK
25-15C 4' GRATE	1291	25-16C 4' GRATE	22-15C 4' GRATE	22-9C 4' GRATE		18" RCP	36'	CRUM CREEK
25-16C 4' GRATE	1292	25-17C	22-9C 4' GRATE	22-17C				CRUM CREEK
25-18C CONC. HD	1294	25-19C CONC HD	22-18C CONC. HD	22-19C CONC HD		30" CMP		CRUM CREEK
25-1C 6' GRATE	1278	25-2C 6' GRATE	22-1C 6' GRATE	22-2C 6' GRATE	1958	18" RCP	60'	CRUM CREEK
25-20C END 12" CI	1295	25-21C TYPE C	22-20C END 12" CI	22-21C TYPE C	1986	12"-15" CIP to CM	204'	CRUM CREEK
25-21C TYPE C	1296	25-22C 4' GRATE	22-21C TYPE C	22-22C 4' GRATE	1986	15" CMP/PVT	116'	CRUM CREEK
25-22C 4' GRATE	1298	25-23C 4' GRATE	22-22C 4' GRATE	22-24C 4' GRATE	1986	21" CMP/PVT	132'	CRUM CREEK
25-23C 4' GRATE	1299	25-24C CONC HD	22-24C 4' GRATE	22-25C CONC HD	1986	21" CMP/PVT	32'	CRUM CREEK
25-25C 6' GRATE	1257	25-29C 6' GRATE	23-64C 6' GRATE	23-65C 6' GRATE	1958	18" RCP UD	224'	CRUM CREEK
25-26C 4' SPEC.	1258	25-28C M.H.	23-68C 4' SPEC.	23-67C M.H.	1972	18" RCP	36'	CRUM CREEK
25-27C 6' GRATE	1259	25-28C M.H.	23-66C 6' GRATE	23-67C M.H.	1972	18" RCP	22'	CRUM CREEK
25-28C M.H.	1260	25-29C 6' GRATE	23-67C M.H.	23-65C 6' GRATE	1958	18" RCP	84'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
25-29C 6' GRATE	1261	25-30C 6' GRATE	23-65C 6' GRATE	23-69C 6' GRATE	1958	18" RCP UD	276'	CRUM CREEK
25-2C 6' GRATE	1279	25-3C M.H.	22-2C 6' GRATE	22-3C M.H.	1958	24" RCP	260'	CRUM CREEK
25-30C 6' GRATE	1262	25-31C 6' GRATE	23-69C 6' GRATE	23-70C 6' GRATE	1958	18" RCP UD	100'	CRUM CREEK
25-31C 6' GRATE	1263	25-35C M.H.	23-70C 6' GRATE	23-74C M.H.	1958	24" RCP	72'	CRUM CREEK
25-32C 6' GRATE	1264	25-33C 6' GRATE	23-71C 6' GRATE	23-72C 6' GRATE	1972	RCP	30'	CRUM CREEK
25-33C 6' GRATE	1265	25-34C 4' SPEC.	23-72C 6' GRATE	23-73C 4' SPEC.	1972	RCP	40'	CRUM CREEK
25-34C 4' SPEC.	1266	25-35C M.H.	23-73C 4' SPEC.	23-74C M.H.	1972	RCP	28'	CRUM CREEK
25-35C M.H.	1267	25-36C 6' GRATE	23-74C M.H.	23-75C 6' GRATE	1958	24" RCP UD	284'	CRUM CREEK
25-36C 6' GRATE	1277	25-2C 6' GRATE	23-75C 6' GRATE	22-2C 6' GRATE	1958	24" RCP UD	296'	CRUM CREEK
25-37C 4' SPEC.	1248	20-10C 6' GRATE	23-54C 4' SPEC.	23-53C 6' GRATE	1972	18" RCP/PVT	57'	CRUM CREEK
25-38C M.H.	1293	25-18C CONC HD	23-76C M.H.	22-18C CONC HD		30"/24" CMP	380'/92'	CRUM CREEK
25-39C 6' GRATE	1234	25-40C 4' SPEC IN	23-41C 6' GRATE	23-42C 4' SPEC IN	1958	18" RCP	112'	CRUM CREEK
25-40C 4' SPEC IN	1235	25-42C 4' SPEC. IN	23-42C 4' SPEC.	23-44C 4' SPEC. IN	1958	18" RCP	112'	CRUM CREEK
25-41C 4' GRATE	1236	25-42C 4' SPEC. IN	23-43C 4' GRATE	23-44C 4' SPEC. IN	1958	18" RCP	24'	CRUM CREEK
25-42C 4' SPEC. IN	1237	25-43C M.H.	23-44C 4' SPEC. IN	23-39C M.H.	1958	18" RCP	68'	CRUM CREEK
25-43C M.H.	1238	25-44C 4' SPEC.	23-39C M.H.	23-40C 4' SPEC.	1972	36" RCP	16'	CRUM CREEK
25-44C 4' SPEC.	1239	20-6C 6' GRATE	23-40C 4' SPEC.	23-45C 6' GRATE	1972	36" RCP/PVT	180'	CRUM CREEK
25-4C CONC. HD	1280	25-3C M.H.	22-4C CONC. HD	22-3C M.H.	1958	24" RCP	128'	CRUM CREEK
25-5C 4' SPEC.	1281	25-6C 4' GRATE	22-5C 4' SPEC.	22-6C 4' GRATE		18" RCP	140'	CRUM CREEK
25-6C 4' GRATE	1282	25-7C 4' SPEC.	22-6C 4' GRATE	22-7C 4' SPEC.		18" RCP	136'	CRUM CREEK
25-7C 4' SPEC.	1283	25-8C 4' SPEC.	22-7C 4' SPEC.	22-8C 4' SPEC.		18" RCP	144'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
25-8C 4' SPEC.	1284	25-16C 4' SPEC.	22-8C 4' SPEC.	22-9C 4' SPEC.		18" RCP	88'	CRUM CREEK
25-9C 4' SPEC.	1285	25-16C 4' SPEC.	22-10C 4' SPEC.	22-9C 4' SPEC.		18" RCP	76'	CRUM CREEK
26-10C 4' GRATE	1194	26-11C 4' GRATE	24-110C 4' GRATE	24-115C 4' GRATE	1985	36" RCP/PVT	132'	CRUM CREEK
26-11C 4' GRATE	1195	26-12C 6' GRATE	24-115C 4' GRATE	24-116C 6' GRATE	1985	36" RCP/PVT	335'	CRUM CREEK
26-12C 6' GRATE	1197	26-13C CONC HD	24-116C 6' GRATE	24-117 CONC HD	1985	36" RCP/PVT	75'	CRUM CREEK
26-14C 4' SPEC.	1182	26-15C 4' SPEC.	24-101C 4' SPEC.	24-105C 4' SPEC.	1985	18" RCP	120'	CRUM CREEK
26-15C 4' SPEC.	1183	26-16C CONC HD	24-105C 4' SPEC.	24-102C CONC HD	1985	18" RCP	37'	CRUM CREEK
26-17C	2011	26-18 HDW	24-103C	24-104C HDW		42" CMP		CRUM CREEK
26-19C 3' GRATE I	1180	26-20C 4' SPEC.	24-98C 3' GRATE I	24-99C 4' SPEC.		12" CORR. I.P.	21'	CRUM CREEK
26-20C 4' SPEC.	1181	26-21C CONC HD	24-99C 4' SPEC.	24-100C CONC HD	1986	15" RCP	180'	CRUM CREEK
26-22C CONC HD	1179	26-23C CONC HD	24-96C CONC HD	24-97C CONC HD	1981	24" RCP	56'	CRUM CREEK
26-24C 4' SPEC.	1171	26-25C 4' SPEC.	24-87C 4' SPEC.	24-88C 4' SPEC.	1980	18" RCP	34'	CRUM CREEK
26-25C 4' SPEC.	1172	26-26C 4' GRATE	24-88C 4' SPEC.	24-89C 4' GRATE	1980	18" RCP	196'	CRUM CREEK
26-26C 4' GRATE	1173	26-27C 4' SPEC.	24-89C 4' SPEC.	24-90C 4' SPEC.	1980	18" RCP	6'	CRUM CREEK
26-27C 4' SPEC.	1174	26-30C 4' SPEC.	24-90C 4' SPEC.	24-91C 4' SPEC.	1980	18" RCP	216'	CRUM CREEK
26-28C 4' SPEC.	1175	26-29C 4' SPEC.	24-92C 4' SPEC.	24-93C 4' SPEC.	1980	18" RCP	33'	CRUM CREEK
26-29C 4' SPEC.	1176	26-30C 4' SPEC.	24-93C 4' SPEC.	24-91C 4' SPEC.	1980	18" RCP	86'	CRUM CREEK
26-2C 4' GRATE	1231	26-3C CONN TO 3	23-37C 4' GRATE	23-38C CONN TO	1958	18" RCP	16'	CRUM CREEK
26-30C 4' SPEC.	1177	26-31C 2-6' SPEC. I	24-91C 4' SPEC.	24-94C 2-6' SPEC. I	1980	21" RCP	236'	CRUM CREEK
26-31C 2-6' SPEC. I	1178	26-32C CONC HD	24-94C 2-6' SPEC. I	24-95C CONC HD	1980	18" 4-RCP	32'	CRUM CREEK
26-4C 6' GRATE	1233	25-43C M.H.	23-26C 6' GRATE	23-39C M.H.	1958	30" RC UD	307'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
26-5C 4' SPEC.	1189	26-6C 4' SPEC.	24-114C 4' SPEC.	24-113C 4' SPEC.	1985	18" RCP	87'	CRUM CREEK
26-6C 4' SPEC.	1190	26-7C 4' GRATE	24-113C 4' SPEC.	24-112C 4' GRATE	1985	18" RCP	40'	CRUM CREEK
26-7C 4' GRATE	1191	26-8C 4' SPEC.	24-112C 4' GRATE	24-109C 4' SPEC.	1985	30" RCP	82'	CRUM CREEK
26-9C 4' SPEC.	1193	26-10C 4' GRATE	24-108C 4' SPEC.	24-110C 4' GRATE	1985	18" RCP/PVT	60'	CRUM CREEK
27-10C TYPE C IN	1109	27-11C TYPE M IN	24-13C TYPE C IN	24-16C TYPE M IN	1992	18" RCP	19'	CRUM CREEK
27-11C TYPE M IN	1110	27-12C END WAL	24-16C TYPE M IN	24-17C END WAL	1992	18" RCP	32'	CRUM CREEK
27-13C BEGIN 8'x3	1126	27-14C BEGIN 2'x6	24-37C BEGIN 8'x3	24-38C BEGIN 2'x6	1972	8'x3' STONE MAS	750'	CRUM CREEK
27-15C CONC HD	1112	27-19C END BOX	24-18C CONC HD	24-23C END BOX	1951	2'-8'x4' CONC BOX	815'	CRUM CREEK
27-16C 2- 2'x3' GR	1115	27-17C 2-2'x3' GRA	24-24C 2- 2'x3' GR	24-25C 2-2'x3' GRA	1951			CRUM CREEK
27-19C BEGIN 10'x	1127	27-26C Begin 14'x5'	24-23C BEGIN 10'x	24-39C Begin 14'x5'	1964	10'x32' Rip-Rap Tra	856'	CRUM CREEK
27-1C #1 OM INLE	1124	27-2C 2-#1 OM IN	24-34C #1 OM INL	24-35C 2-#1 OM IN	1952	18" RCP	27'	CRUM CREEK
27-20C #1 OM INL	1129	27-21C #1 OM INL	24-40C #1 OM INL	24-41C #1 OM INL	1953	12" RCP	28'	CRUM CREEK
27-21C #1 OM INL	1130	27-23C 2-#1 OM IN	24-41C #1 OM INL	24-42C 2-#1 OM IN	1953	24" RCP	230'	CRUM CREEK
27-22C #1 OM INL	1128	27-23C 2-#1 OM IN	24-44C #1 OM INL	24-42C 2-#1 OM IN	1953	18" RCP	180'	CRUM CREEK
27-23C 2-#1 OM IN	1131	27-24C 2-#1 OM IN	24-42 2-#1 OM INL	24-43C 2-#1 OM IN	1953	36" RCP	28'	CRUM CREEK
27-24C 2-#1 OM IN	1132	27-25C END 36" R	24-43C 2-#1 OM IN	24-45C END 36" R	1953	36" RCP	200'	CRUM CREEK
27-27C 4' SPEC.	1135	27-28C 4' SPEC.	24-70C 4' SPEC.	24-71C 4' SPEC.	1957	15" RCP	40'	CRUM CREEK
27-28C 4' SPEC.	1136	27-29C 4' SPEC.	24-71C 4' SPEC.	24-72C 4' SPEC.	1957	18" RCP	80'	CRUM CREEK
27-29C 4' SPEC.	1137	27-32C 4' SPEC.	24-72C 4' SPEC.	24-73C 4' SPEC.	1957	24" RCP	110'	CRUM CREEK
27-2C 2-#1 OM IN	1125	27-3C END 18" PIP	24-35C 2-#1 OM IN	24-36C END 18" PI	1952	18" RCP	160'	CRUM CREEK
27-30C 4' GRATE	1138	27-31C 4' GRATE	24-74C 4' GRATE	24-75C 4' GRATE	1957	12" RCP	108'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
27-31C 4' GRATE	1139	27-32C 4' SPEC.	24-75C 4' GRATE	24-73C 4' SPEC.	1957	15" RCP	95'	CRUM CREEK
27-32C 4' SPEC.	1140	27-33C 4' SPEC.	24-73C 4' SPEC.	24-76C 4' SPEC.	1957	27" RCP	54'	CRUM CREEK
27-33C 4' SPEC.	1141	27-34C 4' SPEC.	24-76C 4' SPEC.	24-46C 4' SPEC.	1957	27" RCP	50'	CRUM CREEK
27-35C 4' SPEC.	1142	27-37C 6' GRATE	24-69C 4' SPEC.	24-47C 6' GRATE	1957	15" RCP	68'	CRUM CREEK
27-36C 4' PDH SPE	1134	27-37C 6' GRATE	24-48C 4' PDH SPE	24-47C 6' GRATE	1980	18" RCP	66'	CRUM CREEK
27-37C 6' GRATE	1143	27-38C JUNCT. BO	24-47C 6' GRATE	24-49C JUNCT. BO	1980	30" RCP	205'	CRUM CREEK
27-38C JUNCT. BO	1144	27-39C M.H.	24-49C JUNCT. BO	24-50C M.H.	1980	30" RCP	105'	CRUM CREEK
27-39C M.H.	1145	27-40C CONC HD	24-50C M.H.	24-51C CONC HD	1980	30" RCP	10'	CRUM CREEK
27-40C CONC HD	1146	27-41C CONC HD	24-51C CONC HD	24-52C CONC HD		CREEK	165'	CRUM CREEK
27-41C CONC HD	1147	27-42C M.H.	24-52C CONC HD	24-53C M.H.	1980	36" RCP	10'	CRUM CREEK
27-42C M.H.	1148	27-43C 4' GRATE	24-53C M.H.	24-54C 4' GRATE	1980	36" RCP	126'	CRUM CREEK
27-43C 4' GRATE	1149	27-44C M.H.	24-54C 4' GRATE	24-55C M.H.	1980	36" RCP	94'	CRUM CREEK
27-44C M.H.	1150	27-45C 4' SPEC.	24-55C M.H.	24-56C 4' SPEC.	1980	36" RCP	87'	CRUM CREEK
27-46C 4' GRATE	1153	27-47C 4' SPEC.	24-59C 4' GRATE	24-60C 4' SPEC.	1980	18" RCP	203'	CRUM CREEK
27-47C 4' SPEC.	1154	27-48C 4' SPEC.	24-60C 4' SPEC.	24-61C 4' SPEC.	1980	18" RCP	40'	CRUM CREEK
27-48C 4' SPEC.	1155	27-49C 4' SPEC.	24-61C 4' SPEC.	24-62C 4' SPEC.	1980	18" RCP	46'	CRUM CREEK
27-49C 4' SPEC.	1156	27-50C 4' SPEC.	24-62C 4' SPEC.	24-63C 4' SPEC.	1980	18" RCP	28'	CRUM CREEK
27-4C TYPE C INL	1103	27-7C TYPE M INL	24-9C TYPE C INL	24-10C TYPE M IN	1992	18" RCP	92'	CRUM CREEK
27-50C 4' SPEC.	1157	27-51C 4' SPEC.	24-63C 4' SPEC.	24-64C 4' SPEC.	1980	21" RCP	186'	CRUM CREEK
27-51C 4' SPEC.	1158	27-53C M.H.	24-64C 4' SPEC.	24-65C M.H.	1980	21" RCP	68'	CRUM CREEK
27-52C 4' SPEC.	1159	27-53C M.H.	24-66C 4' SPEC.	24-65C M.H.	1980	18" RCP	60'	CRUM CREEK

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27-53C M.H.	1160	27-55C 4' SPEC.	24-65C M.H.	24-67C 4' SPEC.	1980	24" RCP	296'	CRUM CREEK
27-55C 4' SPEC.	1162	27-56C 6' SPEC.	24-67C 4' SPEC.	24-57C 6' SPEC.	1980	24" RCP	306'	CRUM CREEK
27-56C 4' SPEC.	1161	27-57C 4' SPEC.	24-68C 4' SPEC.	24-67C 4' SPEC.	1980	18" RCP	32'	CRUM CREEK
27-56C 6' SPEC.	1152	27-57C CONC HD	24-57C 6' SPEC.	24-58C CONC HD	1980	36" RCP	78'	CRUM CREEK
27-58C 6' GRATE	1163	27-59C 6' GRATE	24-77C 6' GRATE	24-78C 6' GRATE	1980	18" RCP	34'	CRUM CREEK
27-59C 6' GRATE	1164	27-61C 4' SPEC.	24-78C 6' GRATE	24-80C 4' SPEC.	1980	18" RCP	238'	CRUM CREEK
27-5C TYPE C INL	1104	27-6C TYPE C INL	24-11C TYPE C IN	24-12C TYPE C IN	1992	18" RCP	38'	CRUM CREEK
27-60C 4' SPEC.	1165	27-61C 4' SPEC.	24-79C 4' SPEC.	24-80C 4' SPEC.	1980	18" RCP	32'	CRUM CREEK
27-61C 4' SPEC.	1166	27-63C 4' SPEC.	24-80C 4' SPEC.	24-81C 4' SPEC.	1980	18" RCP	215'	CRUM CREEK
27-62C 4' SPEC.	1167	27-63C 4' SPEC.	24-82C 4' SPEC.	24-81C 4' SPEC.	1980	18" RCP	33'	CRUM CREEK
27-63C 4' SPEC.	1168	27-64C CONC HD	24-81C 4' SPEC.	24-83C CONC HD	1980	18" RCP	112'	CRUM CREEK
27-65C 4' SPEC.	1169	27-66C 4' SPEC.	24-84C 4' SPEC.	24-85C 4' SPEC.	1980	18" RCP	40'	CRUM CREEK
27-66C 4' SPEC.	1170	27-67C CONC HD	24-85C 4' SPEC.	24-86C CONC HD	1980	18" RCP	50'	CRUM CREEK
27-68C END OPEN	1077	27-69C END 12" R	26-5C END OPEN	26-6C END 12" RC	1961	10'wide x12" deep	300'	CRUM CREEK
27-69C END 12" R	1078	27-73C #1 OM & G	26-6C END 12" RC	26-4C #1 OM & GR	1961	12" RCP	105'	CRUM CREEK
27-6C TYPE C INL	1105	27-7C TYPE M INL	24-12C TYPE C IN	24-10C TYPE M IN	1992	18" RCP	56'	CRUM CREEK
27-70C TYPE C IN	1074	27-71C M.H.	26-1C TYPE C INL	26-2 C M.H.	1993	8" CMP	5'	CRUM CREEK
27-71C M.H.	1075	27-72C #2 OM & G	26-2C M.H.	26-3C #2 OM & GR		8" CMP	50'	CRUM CREEK
27-72C #2 OM & G	1076	27-73C #1 OM & G	26-3C #2 OM & GR	26-4C #1 OM & GR		8" RCP	137'	CRUM CREEK
27-73C #1 OM & G	1079	27-76C #1 OM & G	26-4C #1 OM & GR	26-8C #1 OM & GR	1961	15" RCP	130'	CRUM CREEK
27-74C #2 OM	1082	27-75C #2 OM	26-13C #2 OM	26-7C #2 OM	1937	12" CIP	32'	CRUM CREEK

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27-75C #2 OM	1083	27-76C #1 OM & G	26-7C #2 OM	26-8C #1 OM & GR	1937	12" 2-12" CORR.I.	45'	CRUM CREEK
27-76C #1 OM & G	1084	27-77C 6' SPEC.	26-8C #1 OM & GR	26-9C 6' SPEC.	1960	21" RC PIPE	30'	CRUM CREEK
27-77C 6' SPEC.	1085	30-3C STONE HD	26-9 6' SPEC.	26-10 STONE HD	1960	21" RCP	167'	CRUM CREEK
27-7C TYPE M INL	1106	27-10C TYPE C IN	24-10C TYPE M IN	24-13C TYPE C IN	1992	18" RCP	36'	CRUM CREEK
27-8C TYPE C INL	1107	27-9C TYPE C INL	24-14C TYPE C IN	24-15C TYPE C IN	1992	18" RCP	38'	CRUM CREEK
27-9C TYPE C INL	1108	27-10C TYPE C IN	24-15C TYPE C IN	24-13C TYPE C IN	1992	18" RCP	98'	CRUM CREEK
29-1C CONC. HD	1058	29-4C STONE HD	26-54C CONC. HD	26-55C STONE HD	1952	2-42" RCP	165'	CRUM CREEK
29-2C #1 OM & GR	1060	CONN. TO 42" RC	26-57C #1 OM & G	CONN. TO 42" RC	1952	15" RCP	30'	CRUM CREEK
29-3C #1 OM & GR	1059	CONN. TO 42" RC	26-56C #1 OM & G	CONN. TO 42" RC	1952	15" RCP	20'	CRUM CREEK
29-5C 6' SPEC.	1057	29-6C STONE HD	26-52C 6' SPEC.	26-53C STONE HD	1958	18" RCP	146'	CRUM CREEK
30-10C 12" PVC C.	1091	30-12C 4' GRATE	26-20C 12" PVC C.	26-21C 4' GRATE	1997	8" POLY ETHYLE	120'	CRUM CREEK
30-11C 12" PVC C.	1090	30-12C 4' GRATE	26-22C 12" PVC C.	26-21C 4' GRATE	1997	8" POLY ETHELE	120'	CRUM CREEK
30-12C 4' GRATE	1092	30-13C 4' TYPE C	26-21C 4' GRATE	26-23C 4' TYPE C	1997	18" CMP	125'	CRUM CREEK
30-13C 4' TYPE C	1093	30-15C "T" CONN.	26-23C 4' TYPE C	26-19C "T" CONN.	1997	18" CMP	30'	CRUM CREEK
30-14C METAL FL	1089	30-18C METAL FL	26-18C METAL FL	26-29C METAL FL	1997	66" CMP	260'	CRUM CREEK
30-16C 2 TYPE C	1094	30-17C "T" CONN.	26-25C 2 TYPE C	26-24C "T" CONN.	1997	18" CMP	53'	CRUM CREEK
30-19C 12" PVC C.	1095	30-20C 12" PVC C.	26-26C 12" PVC C.	26-27C 12" PVC C.	1997	8" POLY ETHELE	80'	CRUM CREEK
30-1C #2 OM	1080	30-2C #2 OM	26-11C #2 OM	26-12C #2 OM	1937	12" TCP	30'	CRUM CREEK
30-20C 12" PVC C.	1096	30-21C END 8" PO	26-27C 12" PVC C.	26-28C END 8" PO	1997	8" POLY ETHELE	30'	CRUM CREEK
30-22C 12" PVC C.	1061	30-23C 12" PVC C.	26-30C 12" PVC C.	26-31C 12" PVC C.	1997	8" POLY ETHYLE	260'	CRUM CREEK
30-23C 12" PVC C.	1062	30-24C 4' TYPE C	26-31C 12" PVC C.	26-32C 4' TYPE C	1997	8" POLY ETHYLE	110'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
30-24C 4' TYPE C	1063	30-25C 4' TYPE C	26-32C 4' TYPE C	26-33C 4' TYPE C	1997	18" CMP	30'	CRUM CREEK
30-25C 4' TYPE C	1064	30-26C CONC HD	26-33C 4' TYPE C	26-34C CONC HD	1997	18" CMP	20'	CRUM CREEK
30-27C CONC HD	1065	30-33C & 30-34C 4'	26-35C CONC HD	26-41C & 26-44C	1997	46"x36" 2- CMPS	220'	CRUM CREEK
30-28C 4' TYPE C	1066	30-31C M.H.	26-36C 4' TYPE C	26-39C M.H.	1997	18" CMP	70'	CRUM CREEK
30-29C 4' TYPE C	1067	30-31C M.H.	26-37C 4' TYPE C	26-39C M.H.	1997	18" CMP	15'	CRUM CREEK
30-2C #2 OM	1081	27-74C #2 OM	26-12C #2 OM	26-13C #2 OM	1937	12" TCP	277'	CRUM CREEK
30-30C 4' TYPE C	1068	30-31C M.H.	26-38C 4' TYPE C	26-39C M.H.		12" CMP	78'	CRUM CREEK
30-31C M.H.	1069	30-32C 4' TYPE C	26-39C M.H.	26-40C 4' TYPE C	1997	18" CMP	25'	CRUM CREEK
30-34C #1 OM	1070	30-35C M.H.	26-44C #1 OM	26-45C M.H.	1964	48" RCP	170'	CRUM CREEK
30-35C M.H.	1071	30-36C STONE HD	26-45C M.H.	26-46C STONE HD	1964	48" RCP	46'	CRUM CREEK
30-36C STONE HD	1072	30-37C CONC HD	26-46C STONE HD	26-47C CONC HD		CREEK	138'	CRUM CREEK
30-37C CONC HD	1054	30-41C CONC HD	26-47C CONC. HD	26-51C CONC HD	1998	2-42" CMP	70'	CRUM CREEK
30-38C 4' TYPE C	1055	30-39C 4' TYPE C	26-49C 4' TYPE C	26-48C 4' TYPE C	1998	18" PEP	30'	CRUM CREEK
30-39C 4' TYPE C	1056	30-40C JUNCT. 42"	26-48C 4' TYPE C	26-50C JUNCT. 42"	1998	18" PEP	65'	CRUM CREEK
30-4C CONC HDW	1086	30-5C STONE HD	26-14C CONC HD	26-15C STONE HD	1994	30"x48" CMP	27'	CRUM CREEK
30-6C END 8" CM	1087	30-7C END 8" CM	26-42C END 8" C	26-43C END 8" C	1994	8" CMP	55'	CRUM CREEK
30-8C CONC HDW	1088	30-9C CONC HDW	26-16C CONC HD	26-17C CONC HD	1994	18" CMP	22'	CRUM CREEK
31-10C 4' TYPE C	1042	31-11C 4' TYPE C	27-13C 4' TYPE C	27-14 C 4' TYPE C	1990	18" RC UD	165'	CRUM CREEK
31-11C 4' TYPE C	1044	31-12C 4' TYPE C	27-14C 4' TYPE C	27-16C 4' TYPE C	1990	21" RC UD	163'	CRUM CREEK
31-12C 4' TYPE C	1048	31-13C 4' TYPE C	27-16C 4' TYPE C	27-20C 4' TYPE C	1990	24" RCP	40'	CRUM CREEK
31-13C 4' TYPE C	1049	31-14C 4' TYPE M	27-20C 4' TYPE C	27-21C 4' TYPE M	1990	24" RCP	366'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
31-15C 4' TYPE M	1050	31-16C 4' TYPE M	27-22C 4' TYPE M	27-23C 4' TYPE M	1990	18" RCP	66'	CRUM CREEK
31-16C 4' TYPE M	1051	31-17C 4' TYPE M	27-23C 4' TYPE M	27-24C 4' TYPE M	1990	18" RCP	39'	CRUM CREEK
31-17C 4' TYPE M	1052	31-18C 4' TYPE M	27-24C 4' TYPE M	27-25C 4' TYPE M	1990	18" RCP	30'	CRUM CREEK
31-18C 4' TYPE M	1053	31-19C END 24" (P	27-25C 4' TYPE M	27-26C END 24" (P	1990	24" RCP	78'	CRUM CREEK
31-1C 4' SPEC.	1031	31-2C 4' SPEC.	27-1C 4' SPEC.	27-2C 4' SPEC.	1961	18" RCP	34'	CRUM CREEK
31-2C 4' SPEC.	1032	31-3C 4' SPEC.	27-2C 4' SPEC.	27-3C 4' SPEC.	1961	18" RC UD	286'	CRUM CREEK
31-3C 4' SPEC.	1033	31-4C 4' SPEC.	27-3C 4' SPEC.	27-4C 4' SPEC.	1961	18" RCP	42'	CRUM CREEK
31-4C 4' SPEC.	1034	31-6C M.H.	27-4C 4' SPEC.	27-5C M.H.	1961	18" RCP	93'	CRUM CREEK
31-5C 4' GRATE	1035	31-6C M.H.	27-6C 4' GRATE	27-5C M.H.		18" RCP	100'	CRUM CREEK
31-7C 4' TYPE C	1045	31-8C 4' TYPE C	27-17C 4' TYPE C	27-18C 4' TYPE C	1990	18" RC UD	220'	CRUM CREEK
31-8C 4' TYPE C	1046	31-9C 4' TYPE C	27-18C 4' TYPE C	27-19C 4' TYPE C	1990	18" RC UD	161'	CRUM CREEK
31-9C 4' TYPE C	1047	31-12C 4' TYPE C	27-19C 4' TYPE C	27-16C 4' TYPE C	1990	18" RCP	39'	CRUM CREEK
32-1C 4' SPEC.	1036	32-2C 4' SPEC.	27-7C 4' SPEC.	27-8C 4' SPEC.	1961	18" RCP	34'	CRUM CREEK
7-(MARPLE TWP)	1681	13-2C 4' TYPE M	7-34 4' TYPE M	12-84 4' TYPE M	1990	24" or 30" RCP	400'	CRUM CREEK
8-10C 4' SPEC.	285	8-11C 4' SPEC.	7-19 C 4' SPEC.	7-22 C 4' SPEC.	1977	18" RC UD	218'	CRUM CREEK
8-11C 4' SPEC.	286	8-12C 4' SPEC.	7-22 C 4' SPEC.	7-23 C 4' SPEC.	1977	18" CMP	96'	CRUM CREEK
8-12C 4' SPEC.	1665	14-17C 4' SPEC	7-23 4' SPEC	12-38 4' SPEC	1977	24" RCP	224'	CRUM CREEK
8-13C 4' SPEC.	268	8-14C 4' SPEC.	7-1 C 4' SPEC.	7-2 C 4' SPEC.	1977	22"x13" CMP	35'	CRUM CREEK
8-14C 4' SPEC.	392	8-59C 4' SPEC.	7-2 C 4' SPEC.	8-106 C 4' SPEC.	1977	18"RC UD	200'	CRUM CREEK
8-15C GRATE INL	271	8-16C GRATE INL	7-5 C GRATE INLE	7-6 C GRATE INLE	1953	18" RCP	34'	CRUM CREEK
8-16C GRATE INL	272	8-17C #1 OM	7-6 C GRATE INLE	7-7 C #1 OM	1953	18" RCP	100'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
8-17C #1 OM	273	8-18C #1 OM	7-7 C # 1 OM	7-8 C #1 OM	1953	24" RCP	34'	CRUM CREEK
8-18C #1 OM	274	8-19C M.H.	7-8 C #1 OM	7-9 C M.H.	1953	24" RCP	108'	CRUM CREEK
8-1C 4' SPEC.	276	8-2C 4' SPEC.	7-12 C 4' SPEC.	7-13 C 4' SPEC.	1977	18" RC UD	200'	CRUM CREEK
8-20C 6' SPEC.	269	8-21C 6' SPEC.	7-3 C 6' SPEC.	7-4 C 6' SPEC.	1964	18" RCP	35'	CRUM CREEK
8-21C 6' SPEC.	347	8-84C 4' GRATE	7-4 C 6' SPEC.	8-130 C 4' GRATE	1964	24" RCP	100'	CRUM CREEK
8-22C 4' SPEC.	275	8-23C 4' SPEC	7-10 C 4' SPEC.	7-11 C 4' SPEC	1964	15" RCP	110'	CRUM CREEK
8-23C 4' SPEC	1655	14-28C 4' SPEC	7-11 4' SPEC	12-26 4' SPEC	1964	18" RCP	170'	CRUM CREEK
8-24C TYPE J	317	8-25C TYPE J	8-175 C TYPE J	8-176 C TYPE J	1970	18" RCP	32'	CRUM CREEK
8-26C M.H.	318	8-27C M.H.	8-177 C M.H.	8-178 C M.H.	1960	12" RCP	153'	CRUM CREEK
8-27C M.H.	319	8-31C M.H.	8-178 C M.H.	8-179 C M.H.	1995	15" RCP	43'	CRUM CREEK
8-28C M.H.	321	8-31C M.H.	8-180 C M.H.	8-179 C M.H.	1960	30" CMP	68'	CRUM CREEK
8-29C TYPE C INL	320	Connect To 60" Hol	8-181 C TYPE C IN	Connect To 60" Hol	1995	24" CMP	33'	CRUM CREEK
8-2C 4' SPEC.	277	8-4C M.H.	7-13 C 4' SPEC.	7-15 C M.H.	1977	22"x13" CORR.I. U	58'	CRUM CREEK
8-30C Modified Ty	303	8-31C M.H.	8-182 C Modified T	8-179 C M.H.	1995	24" CMP	20'	CRUM CREEK
8-31C M.H.	304	8-32C TYPE M.	8-179 C M.H.	8-183 C TYPE M.	1967	24" RCP	20'	CRUM CREEK
8-32C TYPE M.	305	8-33C 4' GRATE	8-183 C TYPE M.	8-184 C 4' GRATE	1967	24" RCP	230'	CRUM CREEK
8-34C 4' GRATE	340	9-61C 4' GRATE	8-151 C 4' GRATE	8-148 C 4' GRATE	1970	18" RCP	44'	CRUM CREEK
8-35C 4' SPEC.	331	8-36C 4' SPEC.	8-167 C 4' SPEC.	8-168 C 4' SPEC.	1970	18" RCP	210'	CRUM CREEK
8-36C 4' SPEC.	332	8-37C 4' SPEC.	8-168 C 4' SPEC.	8-169 C 4' SPEC.	1970	18" RCP	293'	CRUM CREEK
8-37C 4' SPEC.	333	8-53C M.H.	8-169 C 4' SPEC.	8-165 C M.H.	1970	18" RCP	350'	CRUM CREEK
8-38C 4' INLET	326	8-40C M.H.	8-163 C 4' INLET	8-162 C M.H.	1970	18" RCP	33'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
8-39C 4' INLET	327	8-40C M.H.	8-164 C 4' INLET	8-162 C M.H.	1970	18" RCP	33'	CRUM CREEK
8-3C 4' SPEC.	278	8-4C M.H.	7-14 C 4' SPEC.	7-15 C M.H.	1977	18" RC UD	50'	CRUM CREEK
8-40C M.H.	328	8-45C M.H.	8-162 C M.H.	8-160 C M.H.	1970	30" RCP	550'	CRUM CREEK
8-41C 4' INLET	345	8-42C M.H.	8-157 C 4' INLET	8-156 C M.H.	1970	18" RCP	33'	CRUM CREEK
8-42C M.H.	346	8-43C 4' SPEC.	8-156 C M.H.	8-158 C 4' SPEC.	1970	21" RC UD	334'	CRUM CREEK
8-43C 4' SPEC.	323	8-44C 4' SPEC.	8-158 C 4' SPEC.	8-159 C 4' SPEC.	1970	24" RC UD	358'	CRUM CREEK
8-44C 4' SPEC.	324	8-45C M.H.	8-159 C 4' SPEC.	8-160 C M.H.	1970	24" RCP	56'	CRUM CREEK
8-45C M.H.	329	8-46C 4' INLET	8-160 C M.H.	8-161 C 4' INLET	1970	30" RCP	37'	CRUM CREEK
8-46C 4' INLET	330	8-53C M.H.	8-161 C 4' INLET	8-165 C M.H.	1970	30" RCP	125'	CRUM CREEK
8-47C 4' SPEC.	334	8-53C M.H.	8-166 C 4' SPEC.	8-165 C M.H.	1970	24" RCP	42'	CRUM CREEK
8-48C 4' SPEC.	312	8-49C 4' SPEC.	8-170 C 4' SPEC.	8-171 C 4' SPEC.	1970	18" RCP	45'	CRUM CREEK
8-49C 4' SPEC.	313	8-50C TYPE J	8-171 C 4' SPEC.	8-172 C TYPE J	1970	18" RCP	44'	CRUM CREEK
8-4C M.H.	279	8-5C 4' SPEC.	7-15 C M.H.	7-16C 4' SPEC.	1977	18" RC UD	224'	CRUM CREEK
8-50C TYPE J	314	8-51C TYPE J	8-172 C TYPE J	8-173 C TYPE J	1970	18" RCP	44'	CRUM CREEK
8-51C TYPE J	315	8-52C TYPE J	8-173 C TYPE J	8-174 C TYPE J	1970	18" RCP	34'	CRUM CREEK
8-52C TYPE J	316	8-53C M.H.	8-174 C TYPE J	8-165 C M.H.	1970	18" RCP	22'	CRUM CREEK
8-53C M.H.	311	MARPLE TWP. 4'	8-165 C M.H.	MARPLE TWP. 4'	1970	36" RCP	170'	CRUM CREEK
8-54C #1 OM	306	8-55C 2- GRATE I	8-185 C #1 OM	8-186 C 2- GRATE	1953	15" RCP	65'	CRUM CREEK
8-55C 2- GRATE I	270	8-17C #1 OM	8-186 2 2- GRATE I	7-7 C #1 OM	1953	18" RCP	292'	CRUM CREEK
8-56C 2-6' GRATE	449	8-57C 2-6' GRATE	8-22 C 2-6' GRATE	8-21 C 2-6' GRATE	1957	18" RCP	320'	CRUM CREEK
8-57C 2-6' GRATE	450	9-83C 2-6' GRATE	8-21 C 2-6' GRATE	8-20 C 2-6' GRATE	1957	21" RCP	224'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
8-58C 4' SPEC.	393	8-59C 4' SPEC.	8-107 C 4' SPEC.	8-106 C 4' SPEC.	1977	22"x13" CMP	35'	CRUM CREEK
8-59C 4' SPEC.	394	8-61C M.H.	8-106 C 4' SPEC.	8-108 C M.H.	1977	18" RC UD	230'	CRUM CREEK
8-5C 4' SPEC.	280	8-6C 4' SPEC.	7-16 C 4' SPEC.	7-17 C 4' SPEC.	1977	21" RC UD	248'	CRUM CREEK
8-60C 4' SPEC.	371	8-61C M.H.	8-109C 4' SPEC.	8-108 C M.H.	1977	22"x13" CMP	26'	CRUM CREEK
8-61C M.H.	372	8-63C 4' SPEC.	8-108 C M.H.	8-110 C 4' SPEC.	1977	18" RC UD	180'	CRUM CREEK
8-62C 4' SPEC.	373	8-63C 4' SPEC.	8-111 C 4' SPEC.	8-110 C 4' SPEC.	1977	22"x13" CMP	37'	CRUM CREEK
8-63C 4' SPEC.	374	8-65C 4' SPEC.	8-110 C 4' SPEC.	8-112 C 4' SPEC.	1977	18" RC UD	220'	CRUM CREEK
8-64C 4' SPEC.	375	8-65C 4' SPEC.	8-113 C 4' SPEC.	8-112 C 4' SPEC.	1977	22"x13" CMP	47'	CRUM CREEK
8-65C 4' SPEC.	376	8-66C 4' SPEC.	8-112 C 4' SPEC.	8-114 C 4' SPEC.	1977	18" CMP	53'	CRUM CREEK
8-66C 4' SPEC.	377	8-71 M.H.	8-114 C 4' SPEC.	8-115 C M.H.	1950	18" RCP	32'	CRUM CREEK
8-67C TYPE M	379	8-69C TYPE M	8-119 C TYPE M	8-117 C TYPE M	1950		48'	CRUM CREEK
8-68C 4' SPEC.	378	8-69C TYPE M	8-118 C 4' SPEC.	8-117 C TYPE M	1950	15" RCP	34'	CRUM CREEK
8-69C TYPE M	380	8-71C M.H.	8-117 C TYPE M	8-115 C M.H.	1950	22"x13" CPA	112'	CRUM CREEK
8-6C 4' SPEC.	281	8-7C 4' SPEC.	7-17 C 4' SPEC.	7-20 C 4' SPEC.	1977	21" RC UD	228'	CRUM CREEK
8-70C 4' SPEC.	381	8-71C M.H.	8-116 C 4' SPEC.	8-115 C M.H.	1950	18" RCP	32'	CRUM CREEK
8-71 M.H.	382	8-122 C JUNCT 15"	8-115 C JUNCT 15"	8-122 C JUNCT 15"	1950	24" RCP	210'	CRUM CREEK
8-71C M.H.	361	8-78C TYPE M	8-115 C M.H.	8-124 C TYPE M	1950	24" RCP	395'	CRUM CREEK
8-72C 4' SPEC.	360	8-74C JUNCT 24"	8-121 C 4' SPEC.	8-122 C JUNCT 24"	1950	15" RCP	34'	CRUM CREEK
8-73C TYPE M.	359	8-74C JUNCT 24"	8-120 C TYPE M.	8-122 C JUNCT 24"	1950	15" RCP	3'	CRUM CREEK
8-75C GRATE INL	362	8-78C TYPE M	8-123 C GRATE IN	8-124 C TYPE M	1950	24" RCP	46'	CRUM CREEK
8-76C TYPE M	363	8-77C TYPE M	8-126 C TYPE M	8-127 C TYPE M	1957	18" RCP	28'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
8-77C TYPE M	364	8-78C TYPE M	8-127 C TYPE M	8-124 C TYPE M	1950	24" RCP	140'	CRUM CREEK
8-78C TYPE M	365	8-79C 4' SPEC	8-124 C TYPE M	8-125 C 4' SPEC	1950	24" RCP	38'	CRUM CREEK
8-7C 4' SPEC.	282	8-8C 4' SPEC.	7-20 C 4' SPEC.	7-21 C 4' SPEC.	1977	21" RC UD	70'	CRUM CREEK
8-80C 4' SPEC.	366	8-81C End 24" RCP	8-128 C 4' SPEC.	8-133 C End 24" R	1957	24" RCP	43'	CRUM CREEK
8-81C BEGIN 78" 6	367	8-82C STONE HD	8-133 C BEGIN 78"	8-129 C STONE H	1977	78" WIDE	200'	CRUM CREEK
8-82C STONE HD	368	8-85C 4' GRATE	8-129 C STONE H	8-130 C 4' GRATE	1977	24" RCP	70'	CRUM CREEK
8-83C 4' GRATE	369	8-84C 4' GRATE	8-132 C 4' GRATE	8-131 C 4' GRATE	1977	12" RC UD	82'	CRUM CREEK
8-84C 4' GRATE	370	8-85C 4' GRATE	8-131 C 4' GRATE	8-130 C 4' GRATE	1977	12" RC UD	350'	CRUM CREEK
8-8C 4' SPEC.	283	8-12C 4' SPEC.	7-21 C 4' SPEC.	7-23 C 4' SPEC.	1977	18"x29" CMP	43'	CRUM CREEK
8-9C 4' SPEC.	284	8-10C 4' SPEC.	7-18 C 4' SPEC.	7-19 C 4' SPEC.	1977	18" RC UD	187'	CRUM CREEK
9-100C TYPE M. I	428	9-101C #1OM & G	8-55 C TYPE M. IN	8-49 C #1OM & GR	1983	12" CORRI. UD.	284'	CRUM CREEK
9-101C #1OM & G	429	9-104C #1OM & G	8-49 C #1OM & GR	8-52 C #1OM & GR	1955	18" RCP	72'	CRUM CREEK
9-102C #1OM & G	425	9-103C #1OM & G	8-50 C #1OM & GR	8-51 C #1OM & GR	1955	15" RCP	42'	CRUM CREEK
9-103C #1OM & G	426	9-104C #1OM & G	8-51 C #1OM & GR	8-52 C #1OM & GR	1955	18" RCP	50'	CRUM CREEK
9-104C #1OM & G	430	9-105C STONE HD	8-52 C #1OM & GR	8-53 C STONE HD	1955	24" RCP	150'	CRUM CREEK
9-106C 2-6' SPEC.	432	9-107C M.H.	8-24 C 2-6' SPEC.	8-25 C M.H.	1957	18" RCP	72'	CRUM CREEK
9-107C M.H.	433	9-108C 2- #1 OM	8-25 C M.H.	8-32 C 2- #1 OM	1955	21" RCP	135'	CRUM CREEK
9-108C 2- #1 OM	434	9-110C #1 GRATE	8-32 C 2- #1 OM.	8-33 C #1 GRATE	1955	21" RCP	50'	CRUM CREEK
9-109C #1 OM	435	9-110C #1 GRATE	8-34 C #1 OM	8-33 C #1 GRATE	1955	15" RCP	75'	CRUM CREEK
9-110C #1 GRATE	436	9-112C 2- #1 OM	8-33 C #1 GRATE	8-36 C 2- #1 OM	1955	24" RCP	195'	CRUM CREEK
9-111C 2- #1 OM	437	9-112C 2- #1 OM	8-35 C 2- #1 OM	8-36 C 2- #1 OM	1955	18" RCP	36'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
9-112C 2- #1 OM	438	9-113C JUNCT 48"	8-36 C 2- #1 OM	8-37 C JUNCT 48"	1955	30" RCP	140'	CRUM CREEK
9-114C STONE HD	407	9-115C STONE HD	8-56 C STONE HD	8-57 C STONE HD	1955	48" RCP	45'	CRUM CREEK
9-116C 2- #1 OM.	408	9-117C 2- #1 OM.	8-58 C 2- #1 OM.	8-59 C 2- #1 OM.	1955	24" RCP	36'	CRUM CREEK
9-117C 2- #1 OM.	409	9-118C STONE HD	8-59 C 2- #1 OM.	8-60 C STONE HD	1955	24" RCP	150'	CRUM CREEK
9-119C 4' SPEC.	411	9-120C 4' SPEC.	8-67 C 4' SPEC.	8-68 C 4' SPEC.	1959	15" RCP	32'	CRUM CREEK
9-120C 4' SPEC.	412	9-121C M.H.	8-68 C 4' SPEC.	8-69 C M.H.	1959	18" RCP	119'	CRUM CREEK
9-121C M.H.	413	9-122C STONE HD	8-69 C M.H.	8-70 C STONE HD	1959	18" RCP	126'	CRUM CREEK
9-123C 6' SPEC.	415	9-124C 4' SPEC.	8-73 C 6' SPEC.	8-74 C 4' SPEC.	1956	18" RCP	35'	CRUM CREEK
9-124C 4' SPEC.	416	9-125C 4' SPEC.	8-74 C 4' SPEC.	8-75 C 4' SPEC.	1956	21" RCP	50'	CRUM CREEK
9-125C 4' SPEC.	417	9-126C 4' SPEC.	8-75 C 4' SPEC.	8-76 C 4' SPEC.	1956	21" RCP	173'	CRUM CREEK
9-126C 4' SPEC.	418	9-127C #1OM & G	8-76 C 4' SPEC	8-77 C #1OM & GR	1954	21" RCP	39'	CRUM CREEK
9-127C #1OM & G	395	9-128C #1OM & G	8-77 C #1OM & GR	8-78 C #1OM & GR	1954	24"RCP	35'	CRUM CREEK
9-128C #1OM & G	396	9-131C #1OM & G	8-78 C #1OM & GR	8-79 C #1OM & GR	1954	24" RCP	33'	CRUM CREEK
9-129C #1OM & G	397	9-130C #1OM & G	8-80 C #1OM & GR	8-81 C #1OM & GR	1954	18" RCP	33'	CRUM CREEK
9-130C #1OM & G	398	9-131C #1OM & G	8-81 C #1OM & GR	8-79 C #1OM & GR	1954	18" RCP	87'	CRUM CREEK
9-131C #1OM & G	399	9-132C STONE HD	8-79 C #1OM & GR	8-82 C STONE HD	1954	27" RCP	125'	CRUM CREEK
9-133C #1OM & G	405	9-134C OM & GRA	8-90 C #1OM & GR	8-86 C OM & GRA		12" RCP	28'	CRUM CREEK
9-134C OM & GRA	406	9-135C OM & GRA	8-86 C OM & GRA	8-87 C OM & GRA		12" RCP	130'	CRUM CREEK
9-135C OM & GRA	383	9-136C OM & GRA	8-87 C OM & GRA	8-88 C OM & GRA		12" RCP	28'	CRUM CREEK
9-136C OM & GRA	384	9-137C END 12" PI	8-88 C OM & GRA	8-89 C END 12" PI		12"		CRUM CREEK
9-138C #1OM & G	401	9-139C #1OM & G	8-85 C #1OM & GR	8-91 C #1OM & GR	1949	15" RCP	20'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
9-139C #1OM & G	402	9-140C #1OM & G	8-91 C #1OM & GR	8-92 C #1OM & GR	1949	18" RCP	34'	CRUM CREEK
9-140C #1OM & G	403	9-141C M. H.	8-92 C #1OM & GR	8-93 C M. H.	1949	18" RCP	156'	CRUM CREEK
9-141C M. H.	404	9-142C STONE HD	8-93 C M. H.	8-94 C STONE HD	1949	20" RCP	300'	CRUM CREEK
9-143C STONE HD	388	9-144C #1OM & G	8-100 C STONE H	8-101 C #1OM & G	1953	54" RCP	29'	CRUM CREEK
9-144C #1OM & G	389	9-145C #1OM & G	8-101 C #1OM & G	8-102 C #1OM & G	1953	54" RCP	26'	CRUM CREEK
9-145C #1OM & G	390	9-146C STONE HD	8-102 C #1OM & G	8-103 C STONE H	1960	54" RCP	138'	CRUM CREEK
9-146C STONE HD	1772	15-12C MATCH 4'x	8-103 STONE HD	13-69A MATCH 4'	1973	2'x5' Stone Masonry	366'	CRUM CREEK
9-147C 6' SPEC.	414	9-148C STONE HD	8-71 C 6' SPEC.	8-72 C STONE HD	1958	15" RCP	185'	CRUM CREEK
9-149C #1OM & G	400	9-150C OM & GRA	8-83 C #1OM & GR	8-84 C OM & GRA			56'	CRUM CREEK
9-151C OM & GRA	385	9-152C OM & GRA	8-95 C OM & GRA	8-96 C OM & GRA		12"		CRUM CREEK
9-1C 4' SPEC.	137	9-3C 4' SPEC.	3-68 C 4' SPEC.	3-70 C 4' SPEC.	1970	18" RCP	118'	CRUM CREEK
9-2C 4' GRATE	138	9-3C 4' SPEC.	3-69 C 4' GRATE	3-70 C 4' SPEC.	1970	18" RCP	72'	CRUM CREEK
9-3C 4' SPEC.	139	9-4C M.H.	3-70 C 4' SPEC.	3-71 C M.H.	1970	24" RCP	153'	CRUM CREEK
9-41C 4' SPEC.	348	9-42C 4' SPEC.	8-133 C 4' SPEC.	8-134 C 4' SPEC.	1970	18" RC UD	270'	CRUM CREEK
9-42C 4' SPEC.	349	9-44C 4' SPEC.	8-134 C 4' SPEC.	8-136 C 4' SPEC.	1970	18" RC UD	271'	CRUM CREEK
9-43C 4' GRATE	350	CONN TO 18" RC	8-135 C 4' GRATE	CONN TO 18" RC		18" RCP	24'	CRUM CREEK
9-44C 4' SPEC.	351	9-45C 4' SPEC.	8-136 C 4' SPEC.	8-137 C 4' SPEC.	1970	18" RC UD	228'	CRUM CREEK
9-45C 4' SPEC.	352	9-46C TYPE J	8-137 C 4' SPEC.	8-138 C TYPE J	1970	18" RCP	105'	CRUM CREEK
9-46C TYPE J	353	9-47C 4' SPEC.	8-138 C TYPE J	8-139 C 4' SPEC.	1970	18" RCP	58'	CRUM CREEK
9-47C 4' SPEC.	307	9-50C 4' SPEC.	8-139 C 4' SPEC.	8-187 C 4' SPEC.	1970	24" RCP	185'	CRUM CREEK
9-48C 4' GRATE	309	9-49C 4' SPEC	8-189 C 4' GRATE	8-188 C 4' SPEC	1970	18" RCP	58'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
9-49C 4' SPEC	310	9-50C 4' SPEC.	8-188 C 4' SPEC.	8-187 C 4' SPEC.	1970	18" RCP	36'	CRUM CREEK
9-50C 4' SPEC.	136	9-3C 4' SPEC.	8-187 C 4' SPEC.	3-70 C 4' SPEC.	1970	24" RCP	232'	CRUM CREEK
9-51C 4' SPEC.	342	9-52C TYPE J	8-153 C 4' SPEC.	8-154 C TYPE J	1970	22"x13" CMP	68'	CRUM CREEK
9-52C TYPE J	343	8-42C M.H.	8-154 C TYPE J	8-156 C M.H.	1970	18" RCP	64'	CRUM CREEK
9-53C TYPE J	344	8-42C M.H.	8-155 C TYPE J	8-156 C M.H.	1970	18" RCP	45'	CRUM CREEK
9-54C 4' GRATE	354	9-56C M.H.	8-140 C 4' GRATE	8-142 C M.H.	1970	18" RCP	34'	CRUM CREEK
9-55C 4' GRATE	355	9-56C M.H.	8-141 C 4' GRATE	8-142 C M.H.	1970	18" RCP	34'	CRUM CREEK
9-56C M.H.	356	9-59C M.H.	8-142 C M.H.	8-143 C M.H.	1970	18" RCP	290'	CRUM CREEK
9-57C 4' GRATE	357	9-59C M.H.	8-144 C 4' GRATE	8-143 C M.H.	1970	18" RCP	34'	CRUM CREEK
9-58C 4' GRATE	358	9-59C M.H.	8-145 C 4' GRATE	8-143 C M.H.	1970	18" RCP	34'	CRUM CREEK
9-59C M.H.	335	9-65C M.H.	8-143 C M.H.	8-146 C M.H.	1970	18" RCP	292'	CRUM CREEK
9-60C 4' GRATE	339	9-61C 4' GRATE	8-149 C 4' GRATE	8-148 C 4' GRATE	1970	18" RCP	56'	CRUM CREEK
9-61C 4' GRATE	341	9-65C M.H.	8-148 C 4' GRATE	8-146 C M.H.	1970	18" RCP	34'	CRUM CREEK
9-62C 4' GRATE	336	9-64C 4' GRATE	8-150 C 4' GRATE	8-147 C 4' GRATE	1970	18" RCP	56'	CRUM CREEK
9-63C 4' GRATE	337	9-64C 4' GRATE	8-152 C 4' GRATE	8-147 C 4' GRATE	1970	18" RCP	44'	CRUM CREEK
9-64C 4' GRATE	338	9-65C M.H.	8-147 C 4' GRATE	8-146 C M.H.	1970	18" RCP	34'	CRUM CREEK
9-65C M.H.	325	8-40C M.H.	8-146 C M.H.	8-162 C M.H.	1970	30" RCP	274'	CRUM CREEK
9-66C 4' SPEC.	441	9-69C 4' SPEC.	8-41 C 4' SPEC.	8-40 C 4' SPEC.	1971	18" RCP UD	210'	CRUM CREEK
9-67C 4' SPEC.	439	9-68C 4' SPEC.	8-38 C 4' SPEC.	8-39 C 4' SPEC.	1971	18" RCP UD	403'	CRUM CREEK
9-68C 4' SPEC.	440	9-69C 4' SPEC.	8-39 C 4' SPEC.	8-40 C 4' SPEC.	1971	18" RCP UD	190'	CRUM CREEK
9-69C 4' SPEC.	442	9-70C 4' SPEC.	8-40 C 4' SPEC.	8-42 C 4' SPEC.	1957	24" RCP	180'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
9-6C 4' GRATE	308		3-67 C 4' GRATE	8-189 C 4' GRATE	1970	18" RCP	43'	CRUM CREEK
9-70C 4' SPEC.	419	9-71C 4' GRATE	8-42 C 4' SPEC.	8-43 C 4' GRATE	1957	24" RCP	132'	CRUM CREEK
9-71C 4' GRATE	420	9-72C 6' SPEC.	8-43 C 4' GRATE	8-44 6' SPEC.	1957	27" RCP	70'	CRUM CREEK
9-72C 6' SPEC.	421	9-73C M.H.	8-44 C 6' SPEC.	8-45 C M.H.	1957	27" RCP	32'	CRUM CREEK
9-73C M.H.	422	9-74C 2- #1 OM.	8-45 C M.H.	8-46 C 2- #1 OM.	1955	24" RCP	125'	CRUM CREEK
9-74C 2- #1 OM.	423	9-75C 2- #1 OM.	8-46 C 2- #1 OM.	8-47 C 2- #1 OM.	1955	24" RCP	36'	CRUM CREEK
9-75C 2- #1 OM.	424	9-76C STONE HD	8-47 C 2- #1 OM.	8-48 C STONE HD	1955	24" RCP	280'	CRUM CREEK
9-77C 2-6' GRATE	443	9-78C 6' GRATE	8-29 C 2-6' GRATE	8-28 C 6' GRATE	1957	21" RCP	342'	CRUM CREEK
9-78C 6' GRATE	444	9-80C 4' SPEC.	8-28 C 6' GRATE	8-27 C 4' SPEC.	1957	21" RCP	235'	CRUM CREEK
9-79C 6' SPEC.	445	9-80C 4' SPEC.	8-30 C 6' SPEC.	8-27 C 4' SPEC.	1957	21" RCP	270'	CRUM CREEK
9-80C 4' SPEC.	446	9-81C M.H.	8-27 C 4' SPEC.	8-26 C M.H.	1957	30" RCP	390'	CRUM CREEK
9-81C M.H.	447	9-82C 4' SPEC.	8-26 C M.H.	8-23 C 4' SPEC.	1957	30" RCP	350'	CRUM CREEK
9-82C 4' SPEC.	448	9-84C M.H.	8-23 C 4' SPEC.	8-19 C M.H.	1957	30" RCP	328'	CRUM CREEK
9-83C 2-6' GRATE	451	9-84C M.H.	8-20 C 2-6' GRATE	8-19 C M.H.	1957	21" RCP	32'	CRUM CREEK
9-84C M.H.	452	9-85C M.H.	8-19 C M.H.	8-18 C M.H.	1957	36" RCP	105'	CRUM CREEK
9-85C M.H.	453	9-86C 4' GRATE	8-18 C M.H.	8-17 C 4' GRATE	1957	30" RCP	148'	CRUM CREEK
9-86C 4' GRATE	454	9-87C M.H.	8-17 C 4' GRATE	8-31 C M.H.	1957	24" RCP	270'	CRUM CREEK
9-87C M.H.	431	9-90C 6' SPEC.	8-31C M.H.	8-12 C 6' SPEC.	1957	24" RCP	284'	CRUM CREEK
9-88C STONE HD	463	9-89C 6' SPEC.	8-16 C STONE HD	8-15 C 6' SPEC.	1968	24" RCP	40'	CRUM CREEK
9-89C 6' SPEC.	464	9-90C 6' SPEC.	8-15 C 6' SPEC.	8-12 C 6' SPEC.	1954	30" RCP	40'	CRUM CREEK
9-90C 6' SPEC.	466	9-92C STONE HD	8-12 C 6' SPEC.	8-11 C STONE HD	1955	30" RCP	275'	CRUM CREEK

FROM (NEW)	ID	TO (NEW)	FROM (OLD)	TO (OLD)	CONST DATE	PIPE	LENGTH	BASIN
9-90C 6' SPEC.	465	9-91C STONE HD	8-12 C 6' SPEC.	8-10 C STONE HD	1954	30" RCP	355'	CRUM CREEK
9-91C STONE HD	459	9-98C JUNCT. BO	8-10 C STONE HD	8-8 C JUNCT. BOX	1956	36" RCP	75'	CRUM CREEK
9-91C STONE HD	458	9-98C JUNCT. BO	8-10 C STONE HD	8-8 C JUNCT. BOX	1955	4'x4' 54" BOX CUL	78'	CRUM CREEK
9-93C STONE HD	410	9-94C STONE HD	8-61 C STONE HD	8-62 C STONE HD	1955			CRUM CREEK
9-95C 4' SPEC.	457	JUNCT 54" RCP	8-9 C 4' SPEC.	JUNCT 54" RCP	1955	18" RCP	76'	CRUM CREEK
9-96C 4' SPEC.	455	9-97C 4' SPEC.	8-6 C 4' SPEC.	8-7 C 4' SPEC.	1955	15" RCP	34'	CRUM CREEK
9-97C 4' SPEC.	456	9-98C JUNCT BOX	8-7 C 4' SPEC.	8-8 C JUNCT BOX	1955	18" RCP	28'	CRUM CREEK
9-98C JUNCT. BO	460	15-1C JUNCT BOX	8-8 C JUNCT. BOX	8-13 C JUNCT BO	1965	60" RCP	200'	CRUM CREEK
9-99C TYPE M. IN	427	9-100C TYPE M. I	8-54 C TYPE M. IN	8-55 C TYPE M. IN	1983	12" CORRI. UD.	145'	CRUM CREEK

FORM H (Front)

PROPOSED FLOOD CONTROL PROJECT FORM H.

SHEET 1 OF 1

WATERSHED	FORM COMPLETED BY	INSTRUCTIONS
Name: Crum Creek	Name: Joseph Mastronardo	On the map for proposed storm water collection systems, diagram each proposed system. Indicate a map point to show changes in system elements, pipe size, pipe direction and connections to existing systems. For proposed additions to existing systems, diagram only the additions and their connection point into the existing system. Complete a separate form for each proposed, new system and one for each existing system having one or more proposed additions. Identify the points within a system consecutively (ex. H-1, H-2, H-3). Start the first point in each additional system 20 numbers higher (if H-3 ends one system, begin the next with H-23). Be sure to show the point where proposed additions connect into existing systems, using the map point number from the existing system form and map. See Sample Diagrams and Form on Reverse.
Municipality: Springfield Twp	Telephone: (215) 222-3000	
County: Delaware Cty	Date: 7/18/2005	

Map I.D. No.		System's Elements (x)			Measurements *				Material	Map I.D. Nos.**	Proposed Const. Dates		Design Data	Contact Person Name and	Name of Final Ownership and
					Pipe	Open Channel / Swale									
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth		Form A	Start	End	Avail.	Phone	Maintenance Responsibility
H-1		Sewer							As Noted						Willow Bay Subdivision Springfield Township
H-															
H-															
H-															
H-															
H-															
H-															
H-															
H-															
H-															
H-															

* See measurement key on reverse side. ** Enter the storm water problem areas' Map I.D. Nos., if proposed project will solve or reduce any / all of the drainage problems.

FORM I

PRESENT & PROJECTED DEVELOPMENT IN THE FLOOD HAZARD AREA (FORM 1)

SHEET _____ OF _____

WATERSHED		FORM COMPLETED BY	
Name:	Crum Creek	Name:	Joseph Mastronardo
Municipality:	Springfield Twp	Telephone:	(215) 222-3000
County:	Delaware Cty	Date:	7/18/2005
For County Use:			

DEFINITION

FLOOD HAZARD AREA:

A NORMALLY DRY LAND AREA THAT HAS BEEN OR IS SUSCEPTABLE TO BEING INUNDATED BY THE 100-YEAR FLOOD.

Map ID No.	TYPE OF DEVELOPMENT	Year Built	Contact Person Name, Address and Phone	Comments
I -				
I -				
I -				
I -				
I -				
I -				
I -				

NOT APPLICABLE

Form J

WATER QUALITY PROBLEM AREAS FORM J. SHEET 1 OF 1

WATERSHED					FORM COMPLETED BY									
Name:	Crum Creek				Name:		Joseph Mastronardo							
Municipality:	Springfield Township				Telephone:		(215) 222-3000							
County:	Delaware County				Date:		7/18/2005							
SITE		J-1	J-2	J-	J-	J-	J-	J-	J-	J-	J-	J-	J-	
Types of Water Quality Problems														
High Community Tolerence														
High Temperature														
High Turbidity														
Hydrocarbon Pollution														
Low Community Diversity														
Low Dissolved Oxygen														
Low pH														
Nutrient Enrichment														
Poor Habitat														
Other/Explanation Line No.														
Potential Cause(s)														
Agriculture														
Construction Site		X	X											
Erosion														
Lake Discharge														
STP Outfall														
Other/Explanation Line No.														
Frequency														
Year Most Recent Occurence														
Year First Known Occurence														
Source of Information														
County Water Quality Study														
Driveby														
Other/Explanation Line No.														

EXPLANATION LINES

1	Willow Bay Subdivision
2	AQUA Pennsylvania
3	
4	
5	
6	
7	
8	
9	
10	

Form O - Outfall Data

Person : Joe Rodo Date : 7/28/2005 Time since Last Rain was >= 72 Hours :

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days since Last Rain :

Municipality : Springfield Township Name of receiving water : Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No/ Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (inches)	Channel Depth (feet)	Channel Bottom Width (feet)	Channel side slopes (H:V)	Flow Obsrved (Yes or No)	Water Color/Odor (specify if floatalbes, algae or sediment present	Descrive land use of upstream drainage area	Rating (0-2)
M1	1	Yes		44	8	10	25	2:1	Yes	Good	Ins	0
M2	2	Yes		8	0	12	15	Vertical	Yes	Good	Ins	0
a	3	Yes		8	0	N/A	35	2:1	Yes	Good	Rec	0
b	4	Yes		swale	0	1	35	4:1	Yes	Good	Rec	0
M3	5	Yes		24	0	N/A	35	1:2	Yes	Good	Rec	0
C1	6	Yes		swale	0	0.5	15	7:1	No	Good	aqua	0
d	7	Yes		swale	0	1	10	1:3	No	Good	aqua	0
C2	8	Yes		24	0	5	5	2:1	No	Good	R	0
B2	10	Yes		18 (at inlet)	0	3	10	2:2	Yes	Collapsed	R	2
B5	11/12	Yes		18	trickle	6	5	1:1	Yes	Orange in color	R	2
B8	13	Yes		24	0	2	5	1:1	Yes	Good	R	0
B9	14	Yes		24	1	7	5-10	2:1	Yes	Good	R	0
B6	17	Yes		30	0	4	10	1:1	Yes	Good	R	0
B3	18	Yes		30	1	3	8	1:5	Yes	Some algae	Rec	1
B1	19	Yes		24	0	4	8	2:1	Yes	Good	R	0
B4	21/22/23/24	Yes		18	0	N/A	15	1:1	Yes	Detatched	R	2
A23	25	Yes		30	trickle	3	7	Vertical	Yes	Brownish	R	1

Rating System :

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)
1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition
2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment deposition, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain
H/V = Horizontal to vertical ratio

Notes:

M2 - Cluster of approx 7 - 8" pipes along 50 stretch of retaining wall.
a - Baltimore Pike overpass, 8-12" roof drains.
M3 - No access, bad picture, approx. 24".
M4 - Possible location directly behind batting cage in park. Dense cover and cliff, Rip-Rap visible only.
B2 - Collapsed Outlet. Data collected from inlet.
B5 - orange deposit clearly visible on riprap and outlet, no apparent odor.
B7 - No one home / no access.
B4 - Heavily damaged pipe/tree down / pictures 21-24 / 4 feet from pipe totally disconnected.
A23 - Brownish deposits on pipe.

Person : Joe Rodo Date : 7/28/05 & 8/23/05 Time since Last Rain was >= 72 Hours : ____

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days since Last Rain : ____

Municipality : Springfield Township Name of receiving water : Crum Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No/ Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (inches)	Channel Depth (feet)	Channel Bottom Width (feet)	Channel side slopes (H:V)	Flow Obsrved (Yes or No)	Water Color/Odor (specify if floatalbes, algae or sediment present	Descrive land use of upstream drainage area	Rating (0-2)
A22	26	Yes		24	trickle	10	10	1:4	Yes	Brownish	R	1
A21	27	Yes		18	0	5	6	Vertical	Yes	Good	R	0
A20	28	Yes		60	2	6	10	1:3	Yes	Good	Funeral Home	0
A19	29	stone channel		48" wide	1	4	4	Vertical	Yes	Good	R	0
d	30	Yes		15	0	3	6	1:3	Yes	Good	R	0
A18	31	Yes		N/A	N/A	2	N/A	N/A	N/A	N/A	N/A	N/A
A17	N/A	Yes		24	0	N/A	10	Vertical	Yes	Good	R	0
A14	32	Yes		24	0	10	10-20	1:10	Yes	Good	R	0
A15	33	Yes		48	0	12	15	1:3	No	Good	Rec	0
A7	34	Yes		N/A	N/A	5	N/A	N/A	N/A	N/A	N/A	N/A
A16	35	Yes		15	0	N/A	N/A	N/A	No	Good	School	0
A10	36	Yes	8/23	24	1	10	10	1:1	No	Debris	R	0
A6	37	Yes	8/23	24	trickle	15	25	1:1	No	Algae Present	R	0
A13	38	Yes	8/23	48	1	5	15	stone wall	Yes	Good	R	0
A12	39/40	Yes	8/23	24	1	3	2	stone wall	Yes	Orange on Rip-Rap	R	1
A11	41	Yes	8/23	18	0	4	10	2:1	No	3/4 blocked w/ rocks	R	1
A9	42	Yes	8/23	swale	0	3	10	3:1	No	Good	R	0

Rating System :

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment deposition, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain

H/V = Horizontal to vertical ratio

Notes:

A22 - Brownish and orange deposits on pipe.

B1 - Pipe slightly disconnected / skewed 4-5 feet from opening.

A8 - inaccessible (fences/overgrowth)

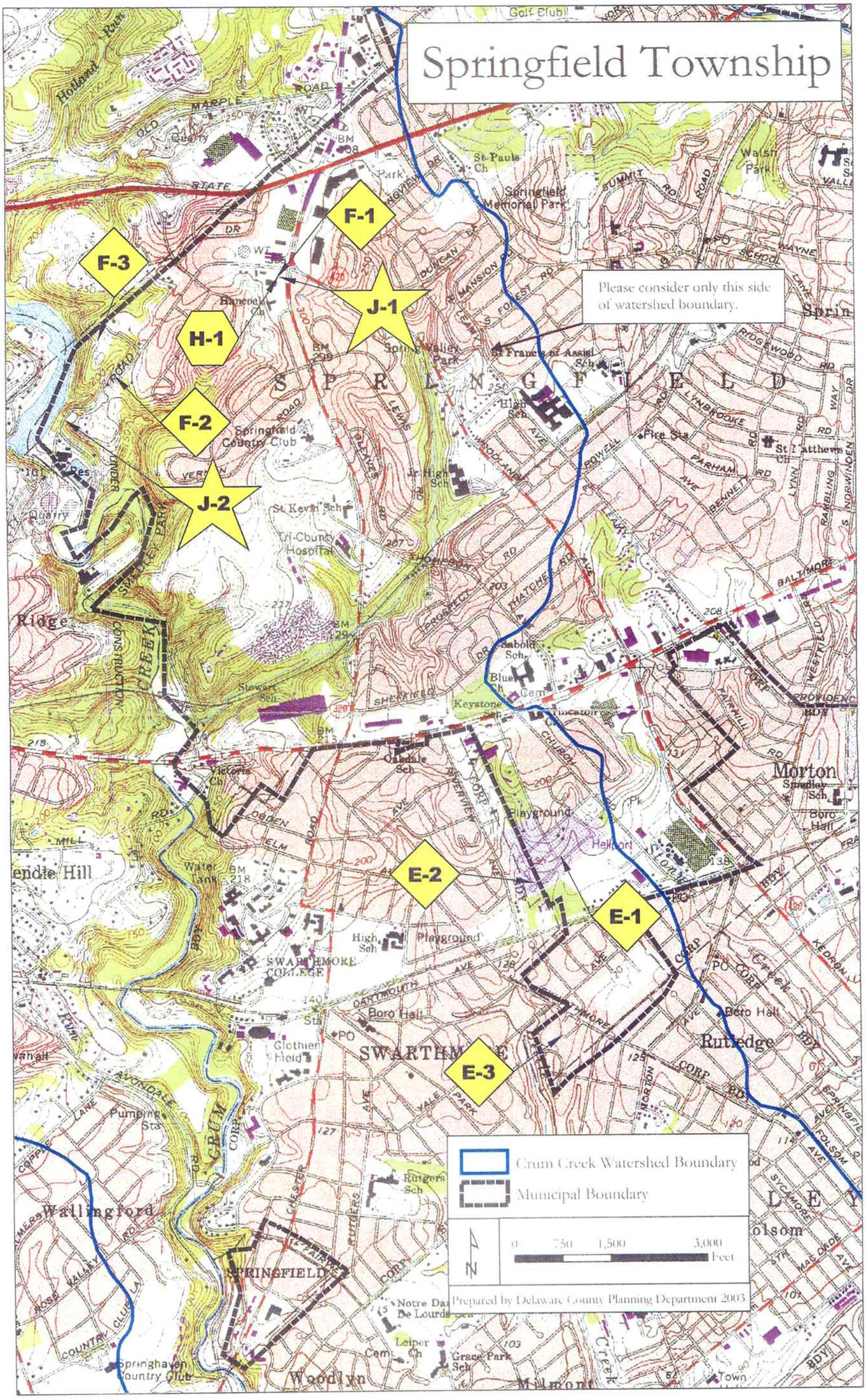
A5 - inaccessible (white fence along entire back PL of Country Club Houses)

A2 - inaccessible (overgrowth/steep ravine)

A3 - inaccessible (overgrowth/steep ravine)

A4 - inaccessible (overgrowth)

A9 - Outlet structure unable to be located. Swale is defined as a result of the outfall, but overgrowth prevents finding the outfall.


Springfield Township
F-1
F-3
J-1
H-1
F-2
J-2
E-2
E-1
E-3
Please consider only this side of watershed boundary.
Crum Creek Watershed Boundary
Municipal Boundary
0 750 1,500 3,000
Feet
Prepared by Delaware County Planning Department 2003
SPRINGFIELD
SWARTHMORE
Ridley Creek
Crum Creek
Morton
Rutledge
Wallingford
Woodlyn
Springfield Memorial Park
Springfield Country Club
Tri-County Hospital
SWARTHMORE COLLEGE

3

4

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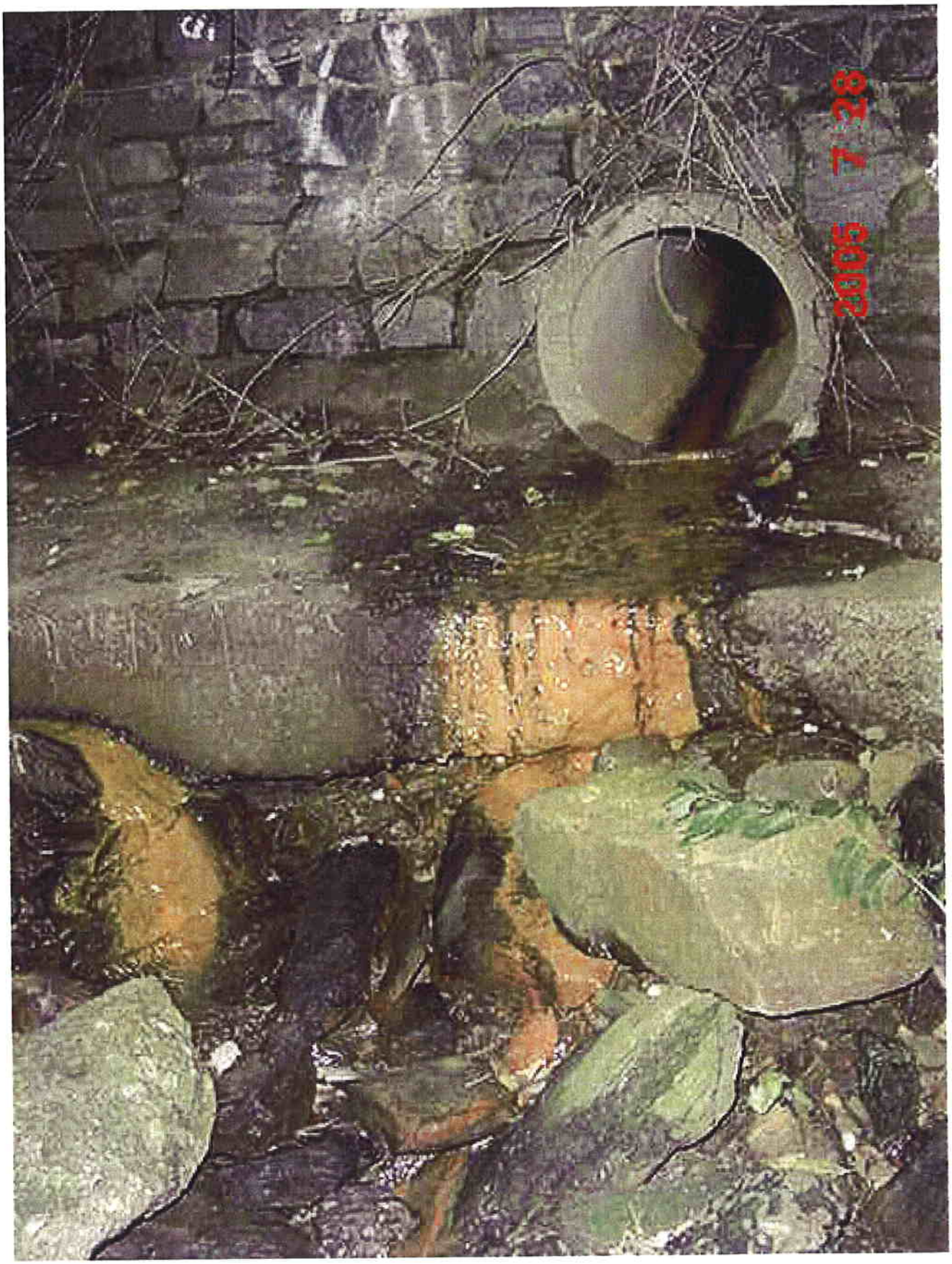
2005 7 28

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BLUE SPRING

23

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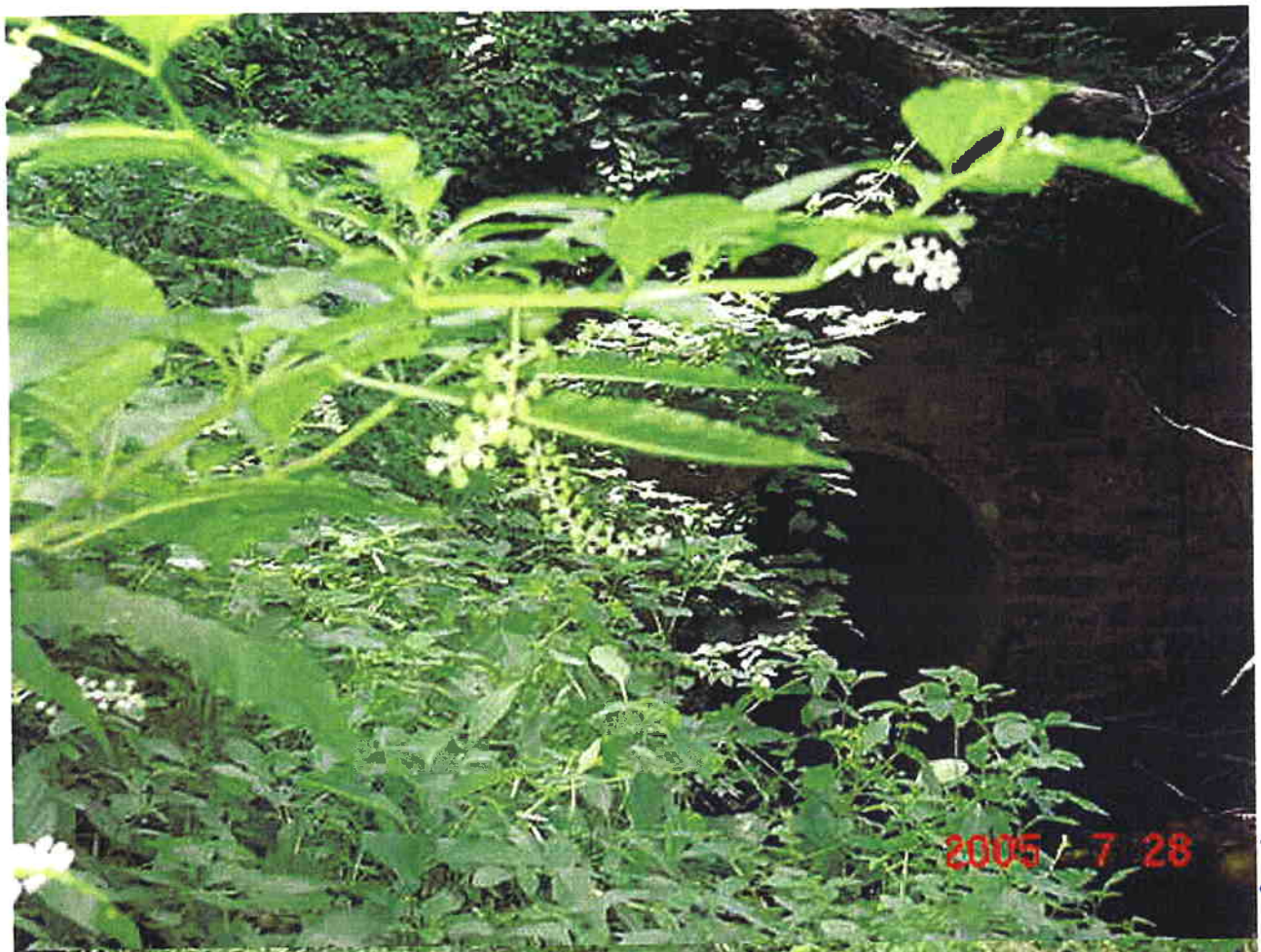

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SWARTHMORE TOWNSHIP

Cover Page

User:	NSmith
Document:	municipalities.pdf
Server:	Z5400
Time:	09/09/05 14:10:38
Pages requested:	100
Page size:	Letter
Status:	OK

Group Name:

Notes:

Instructions:

Swathmor (SWA)

FORM B - OBSTRUCTION DATA COLLECTION

SHEET 9 OF 15

Municipal Stream Obstruction Data

Records completed by: [illegible]

Watershed: Crum Creek

Field work personnel: _____

Municipality/County: Swarthmore / Delaware

Date(s): 12/1 - 12/20/04

T= Amount of fill	Material	Inlet Conditions
D= Diameter	mary = Stone Masonry Structure	HW = Headwall
HT = Height	CMP = Corrugated Metal Pipe	WW = Wingwall
W = Width	CPP = Corrugated Polyethylene Pipe	SW = Sidewall
PW = Pier Width	BCCMP = Bituminous Coated CMP	
	RCP = Reinforced Concrete Pipe	
	SP = Steel Pipe	

Map ID.	Owner or Address Of Obstruction	Capacity (CFS)	Nos. of?	Opening Type: Part of Bridge?	Opening Type: Culvert Purpose	Opening Shape (✓): Culvert □	Culvert ○	Culvert ⬭	Bridge ∩	Bridge ⊓	Measurements: T (ft)	D (ft)	HT (ft)	W (ft)	PW (ft)	skew angle	MATERIAL / INLET CONDITION	NOTES
SWA 1	Swarthmore Av / Wellesley		3	✓					3		3	–	*	*	*	70	MSM / HW	See Diagram
SWA 2	Clothier Rd		1	✓					✓		4.5	–	*	5	–	90	MSM / NW	
SWA 3	Chester Rd		1				✓				3	1.8	–	–	–	90	RCP	
SWA 4	Fairview Ave		1	✓						✓	1.5	–	3	9	–	90	MSM	
SWA 5	Abandoned West End		1	✓						✓	7	–	4	5	–	90	MSM	
SWA 6	RR tracks, downstream		3				3				19	*	–	5	*	90	Brick SP / RCP	2-no Diagram
SWA 7	Dartmouth Ave		1	✓						✓	3	–	3	9	–	90	MSM / NW	
SWA 8	Amherst Ave / Little Crum		1	✓						✓	2.2	–	5.2	9	–	90	MSM	
SWA 9	Harvard Ln / " "		1			✓					1.5	–	4	20	–	45	Concrete / HW, WW	
SWA 10	Elm Ln / " "		1	✓						✓	3	–	9.5	10	–	90	Concrete / SW, NW	
SWA 11	[illegible]		1	✓						✓	2.5	–	4.5	2.5	–	40	Steel / Wood	
SWA 12	RR tracks, overcrossing																	2-no Diagrams

#8
#5 PHOTO BROKEN PIPE

Form O - Outfall Data

Person: O'BRIEN/CUZZY Date: 3/23/04 Time Since Last Rain was ≥ 72 Hours: Yes ✓

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 4

Municipality: SWARTHMORE Name of receiving water: LITTLE CRUM CREEK

Pipe Swale	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)	Headwall Yes/No
BEGINNING OF CREEK													
PIPES NOT TOTALLY RUNS UNDER STREET 13	1, 2, 3	YES	8 40 AM	APPROX 15"	1/2"	6"	1'	FLAT	MINIMAL	CLEAR	RESID	1	NO
14	4	"	"	30"	1/2"	1'	8	1:2	YES	CLEAR	"	0	YES
15	6	"	"	15" 15"	0	5' 1'	8'	1:2	0	N/A	"	0	YES
16	7	"	"	18"	0	2'	8'	1:2	0	N/A	"	0	YES
17	9	"	9 00 AM	18"	0	3'	6'	1:2	0	N/A	"	0	NO
COMES IN UNDER STREET 18 & 19	10	"	9 20 AM	15" 18"	0	6'	8'	1:1.5	0	N/A	"	0	YES UNDER STREET
19	DISK 2 1	"	9 30 AM	48"	0	1'	6'	1:1.5	MINIMAL	CLEAR	"	0	YES
20	2	"	9 40 AM	PROBABLY 12"	0	1'	4'	1:1.5	"	"	"	1	NO
21	3	"	9 50	15"	0	6"	8'	1:2	0	NA	"	0	NO

UNDER WATER

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Form O - Outfall Data

Person: O'BRIEN/CUZZY Date: 3/23/04 Time Since Last Rain was ≥ 72 Hours: Yes_____

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain _____

Municipality: SWARTHMORE Name of receiving water: LITTLE CRUM

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet).	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (II:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)	H.W.
22	4	YES	10/AM	30''	1''	6'	12'	1:2	YES	CLEAR	RESID	0	YES
PIPE DISCONNECTED 23	5	YES	10/AM	8''	0	0	N/A	N/A	NO	0	"	2	NO
24	6	YES	10 04 AM	48''	3''	3'	8'	1/2	YES	CLEAR	"	0	YES
3 INLETS INSIDE 25	7 8	YES	10 11 AM	SQUARE 4'X10'	2''	3'	10'	1:2	0	"	"	0	YES
26	9	YES	10 20 AM	18''	1''	2'	10'	1:2	YES	CLEAR	"	0	NO
2 INLETS INSIDE 27	10	YES	10 30 AM	SQUARE 4'X10'	N/A	3'	8'	1:2	0	"	"	0	YES
28	DIGR 3 1	YES	10 40 AM	15''	0	1'	5'	1:1.5	0	N/A	"	1 BLOCKAGE	YES
2 INLETS INSIDE 29	2	YES	10 45 AM	18''	0	2'	10'	1:2	0	N/A	"	0	YES
30	3	STREET OVERPASS	11 00 AM	2 INLETS DUMP INTO FROM ST	N/A	1'	8'	1:2	0	CLEAR	"	0	YES

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

II/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Form O - Outfall Data

Person: O'BRIEN & CUZZY Date: 3/23/04 Time Since Last Rain was ≥ 72 Hours: Yes_____

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain _____

Municipality: SWARTHMORE Name of receiving water: _____

HW

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (II:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)	
2 INLETS ABOVE	31	DISK 3 4	STREAM RUNS UNDER ST.	10 55 AM	SQUARE 3'X6' 2 INLETS ABOVE RUN INTO STREAM	N/A	4'	4'	1:2	0	~~N/A~~ CLEAR	RES	0	YES
2 PIPES	32	5	YES	11 00 AM	15" 18" HALF SUBM WATER	0	1'	8'	1:2	0	N/A	"	"	YES
	33	6	YES	11 05	15"	0	3'	8'	1:1:5	0	N/A	"	0	YES
UNDER STREET	34	7	YES	11 20 AM	18"	0	2'	1'	INTO STREAM	0	N/A	"	0	YES
	35	8	YES	11 20 AM	12"	0	6'	6'	INTO STREAM	0	N/A	"	0	YES
	36	9	YES	11 25 AM	18"	0	8'	8'	1:2	0	N/A	"	0	YES
	37	10	YES	11 30	15"	0	3'	5'	1:1.5	0	N/A	"	0	YES
	38	DISK 4 1	YES	11 35	5' X 5' SQUARE	2"	3'	20'	1:2	YES	CLEAR	"	0	YES
3 12" PIPES FROM ST. ABOVE	39	2 3	YES (3)	11 40	10' x 10' SQUARE STREAM RUNS THRU (3 12" PIPES)	0	1'	10'	1:2	NO	N/A	"	0	YES

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

II/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Form O - Outfall Data

Person: O'RIEN / COZZY Date: _____ Time Since Last Rain was ≥ 72 Hours: Yes_____

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain _____

Municipality: SWARTHMORE Name of receiving water: _____

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (II:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)	
40	DSK 4	YES	11 50 AM	24"	0	STREAM 6'	STREAM 8'	1:1.5	0	N/A	RES	1	HD WALL
41	5	YES	12 00 PM	18"	0	1'	INTO STREAM 8'	1:1.5	0	N/A	41	0	PIPE SEPERATED YES
42	6	YES	12 20 PM	24"	TRICKLE	-6"	6'	1:1:5	TRICKLE	CLEAR	RES	0	YES
43	7	YES	12 30	24'	12"	1'	6'	1:1:5	YES	CLEAR	RES	1	NO
44	8	YES	12 40 PM	18"	0	6"	6'	1:1.5	NO	N/A	RES	0	NO HALF UNDER WATER
45	9	YES ANT IN SCHOOL	12 45 PM	15"	0	6"	6'	1:1.5	NO	N/A	RES	2	NO ?
46	10	YES	12 47 PM	30"	TRICKLE	6"	7'	1:1.5	TRICKLE	TRICKLE	RES	0	PIPE BROKEN OFF FROM H.W.
47	DSK 5 1	YES	12 50 PM	30"	NO	1'	7'	1:1.5	NO	N/A	11	0	YES
48	2	YES	1 00 PM	15" 15"	NO	6" INTO STREAM	15'	1:1.5	NO	N/A	RES	0	NO YES (UNDER ROAD)

RIDLEY TWNSHP (2) 15" PIPES UNDER ROAD

9' X 15' SQUARE

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

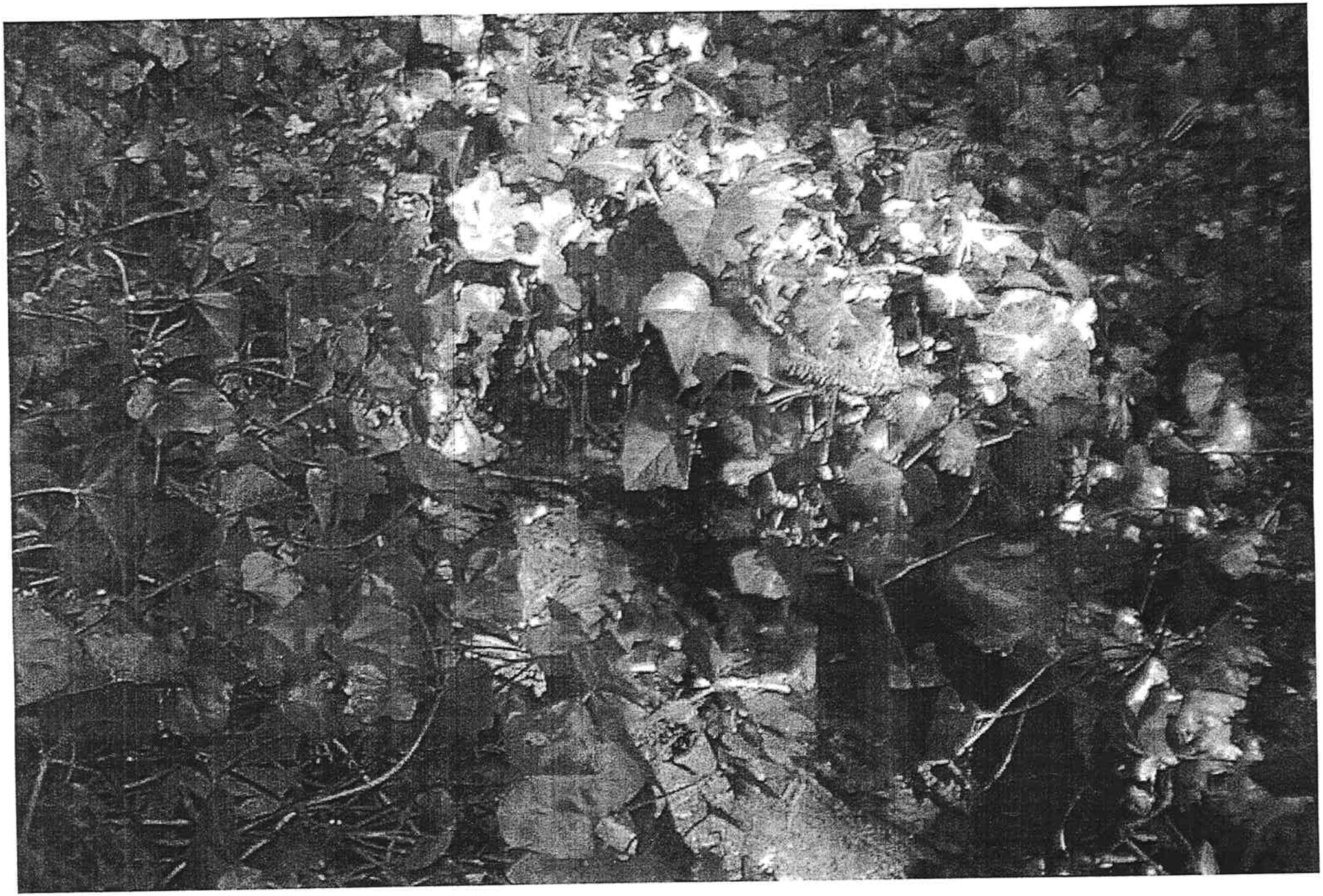
2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

II/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

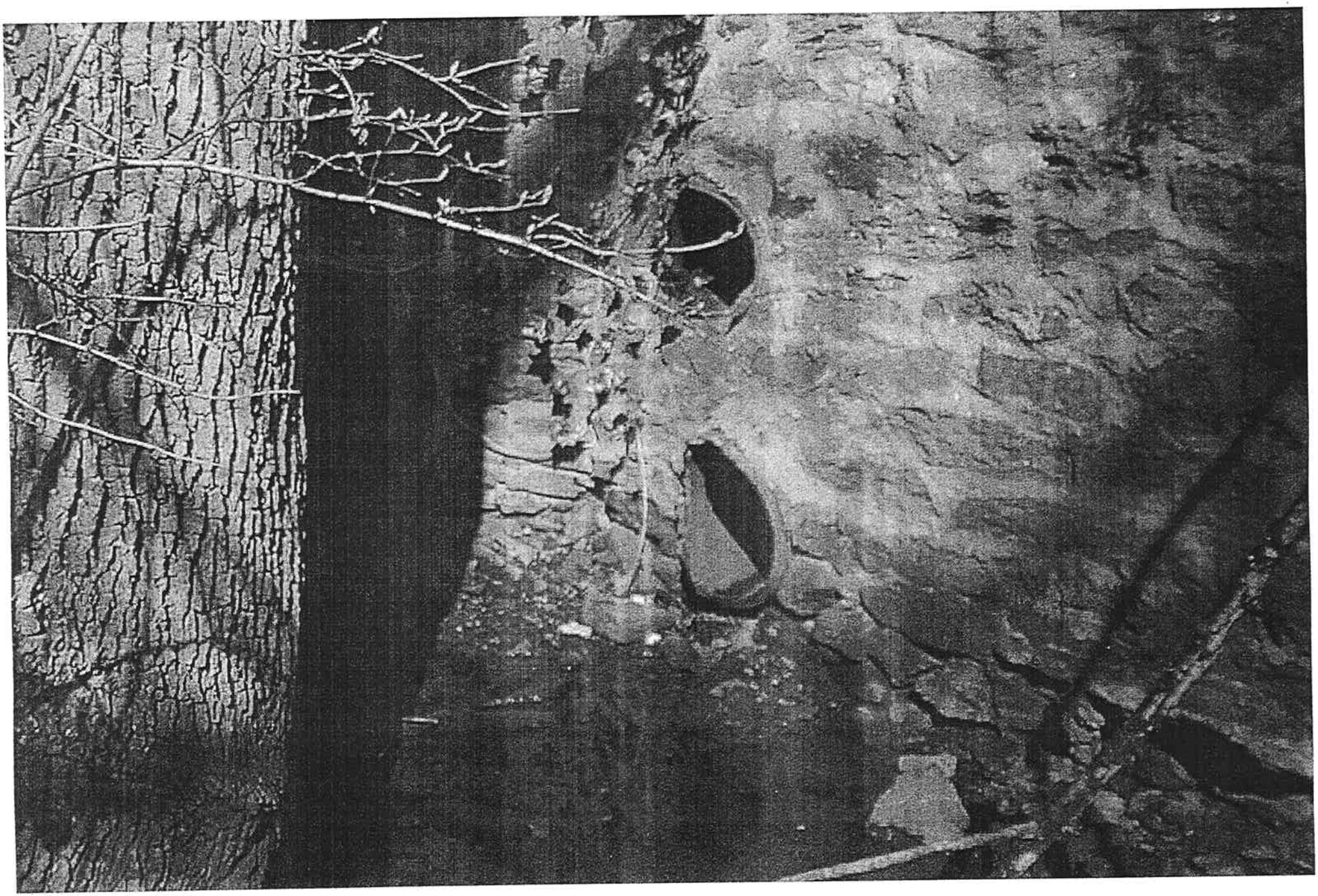
PIPE SWALE #13 LITTLE CRUM CREEK PHOTO #2



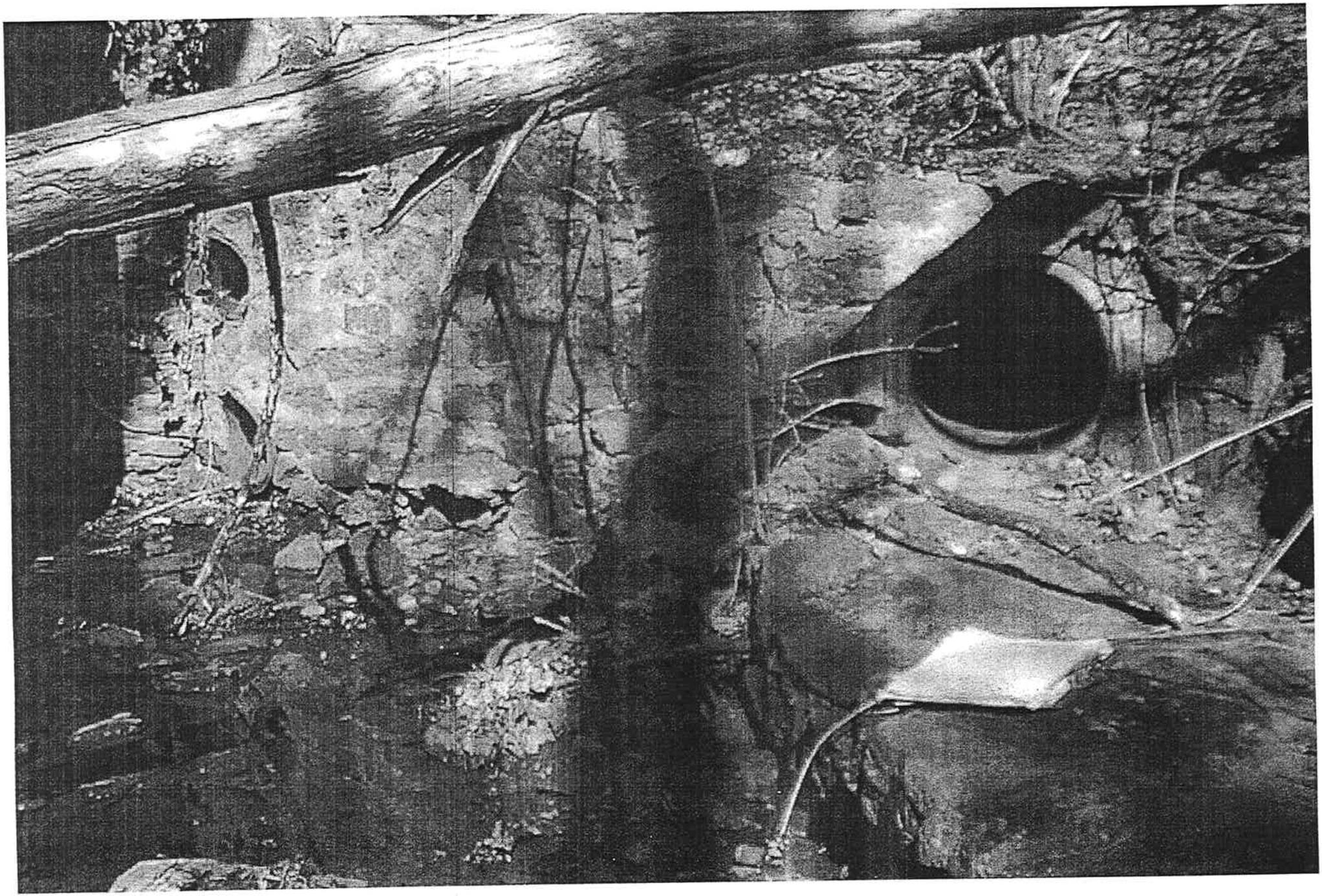
PIPE SWALE #13 LITTLE CRUM CREEK PHOTO #3

PIPE SWALE #14 LITTLE CRUM CREEK PHOTO #4

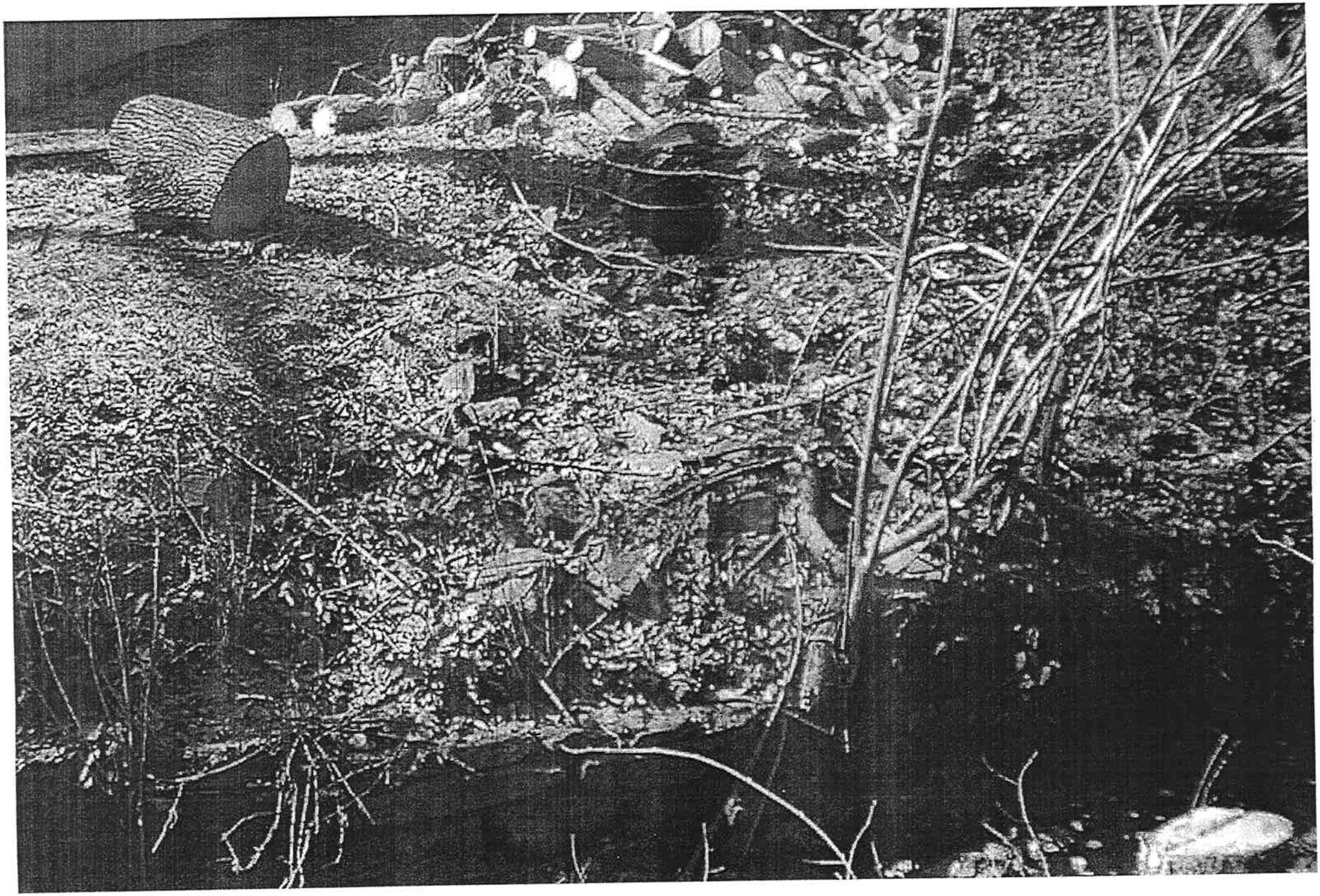
PIPE SWALE #15 LITTLE CRUM CREEK PHOTO #6



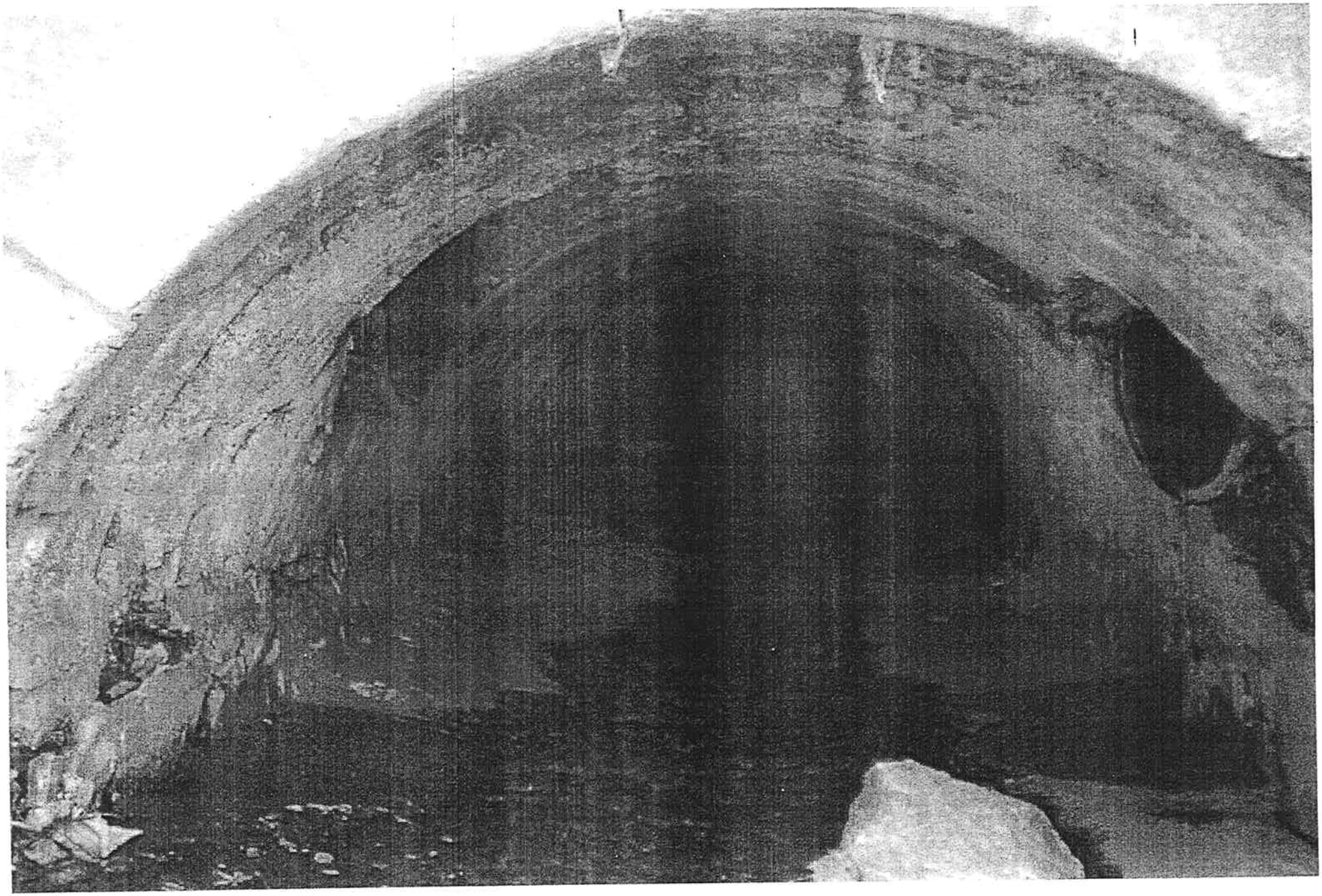
Pipe Swale #16 Little Crum Creek Photo #7



Pipe Swale #17 Little Cedar Creek Photo #9

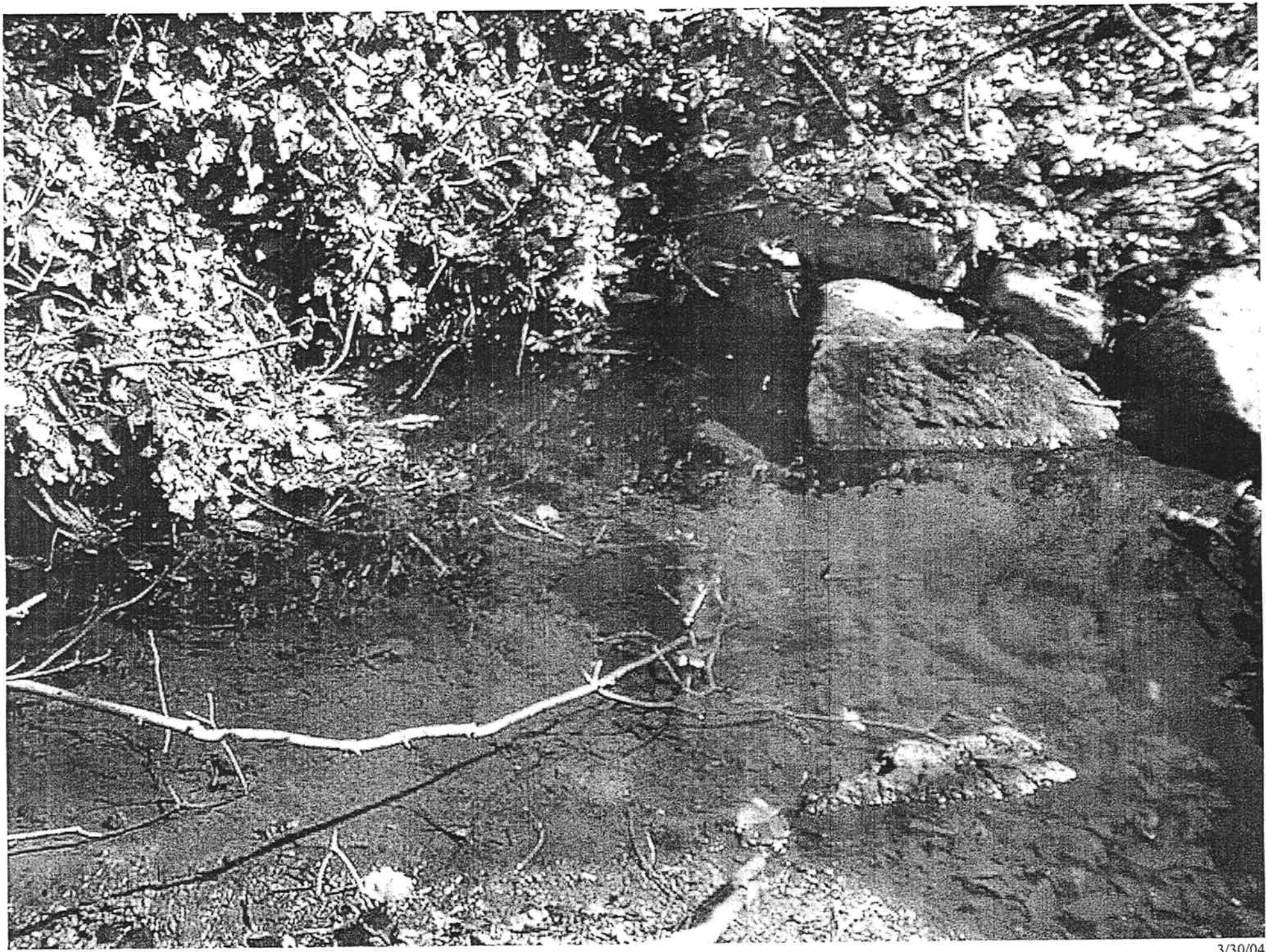


PIPE SWALE #18 LITTLE CHUM CREEK PHOTO #10



PIPE SUMMIT #17 LITTLE CRUM CREEK DISK 2 – PHOTO #1

Pipe Swale #20 - Swarthmore, Little Crum Creek Disk #2 - Photo #2



3/30/04

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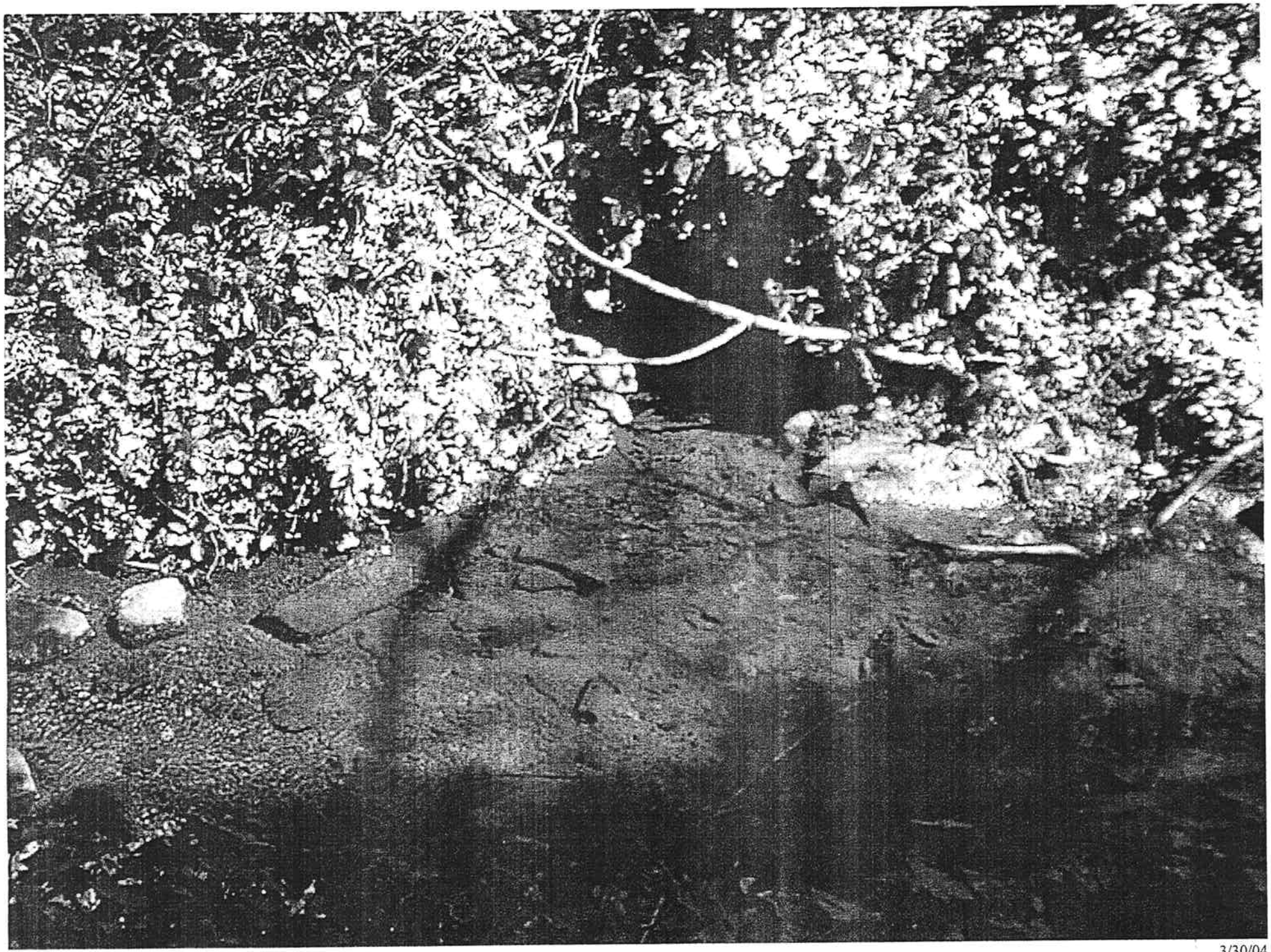
Pipe Swale #21 - Swarthmore, Little Crum Creek Disk #2 - Photo #3



3/30/04

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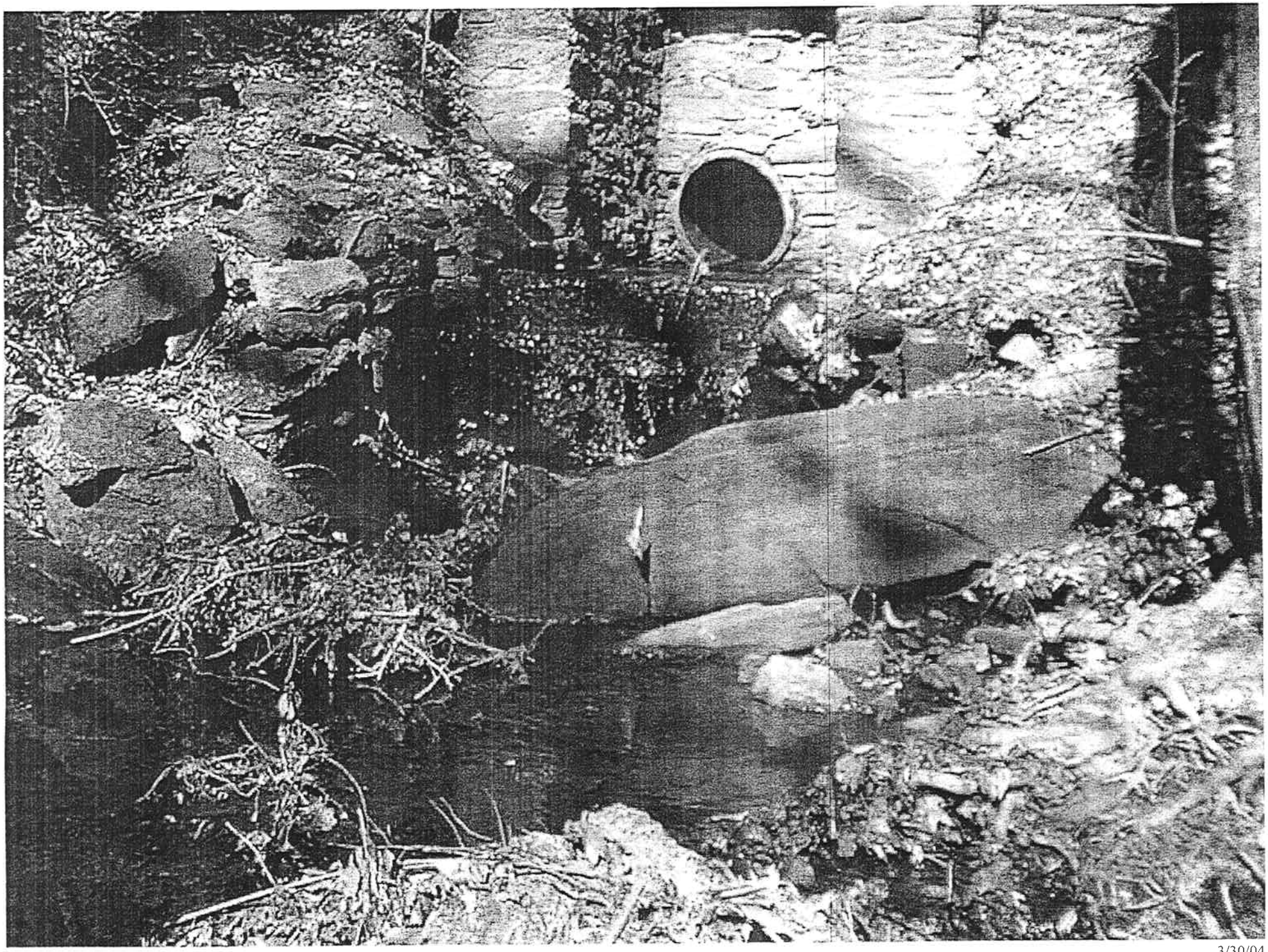

Pipe Swale #23 - Swarthmore, Little Crum Creek Disk #2 - Photo #5

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3/30/04

Pipe Swale #24 - Swarthmore, Little Crum Creek Disk #2 - Photo #6

3/30/04

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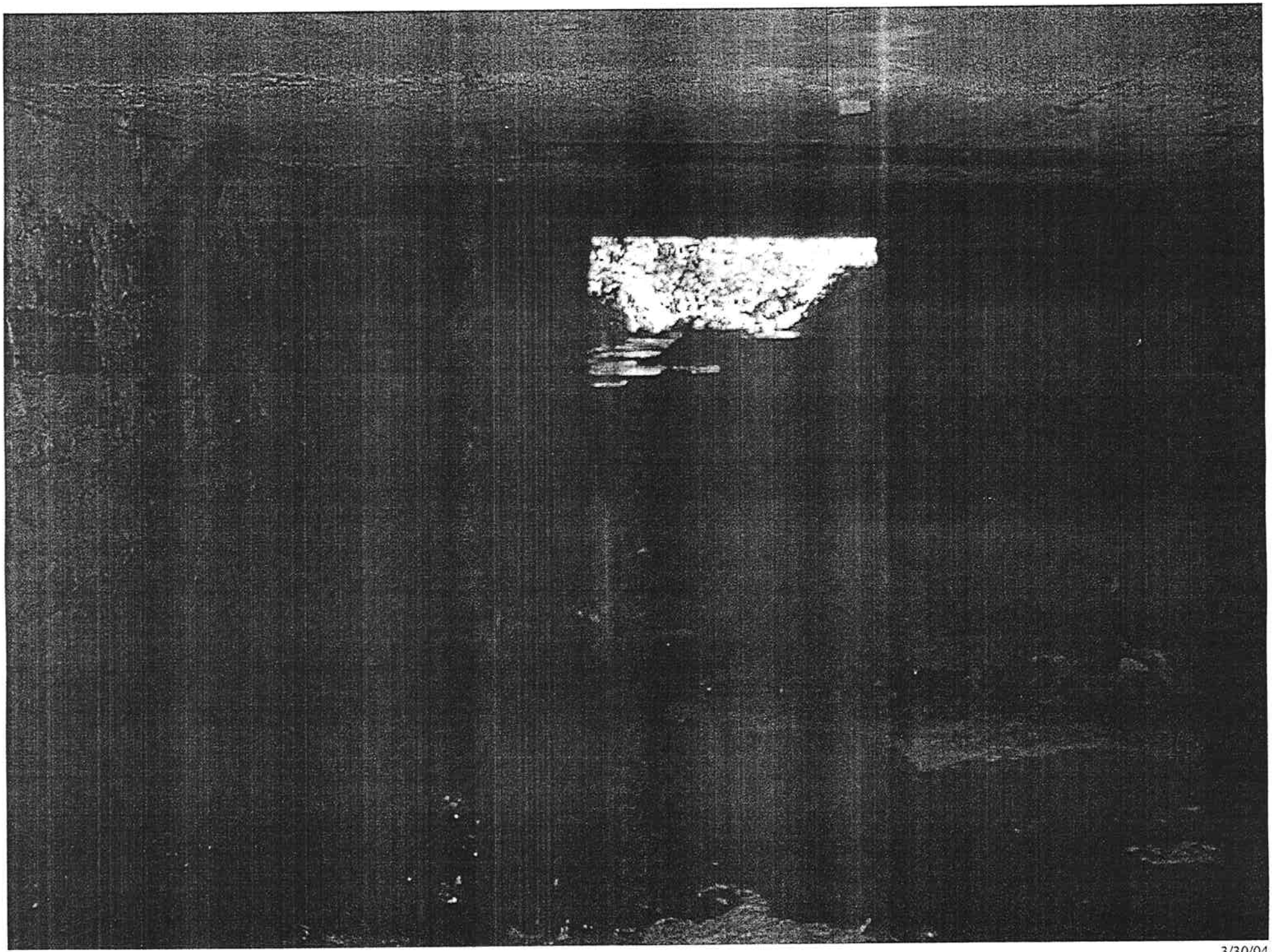
Pipe Swale #25 - Swarthmore, Little Crum Creek Disk #2 - Photo #7



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3/30/04

Pipe Swale #25 - Swarthmore, Little Crum Creek Disk #2 - Photo #8

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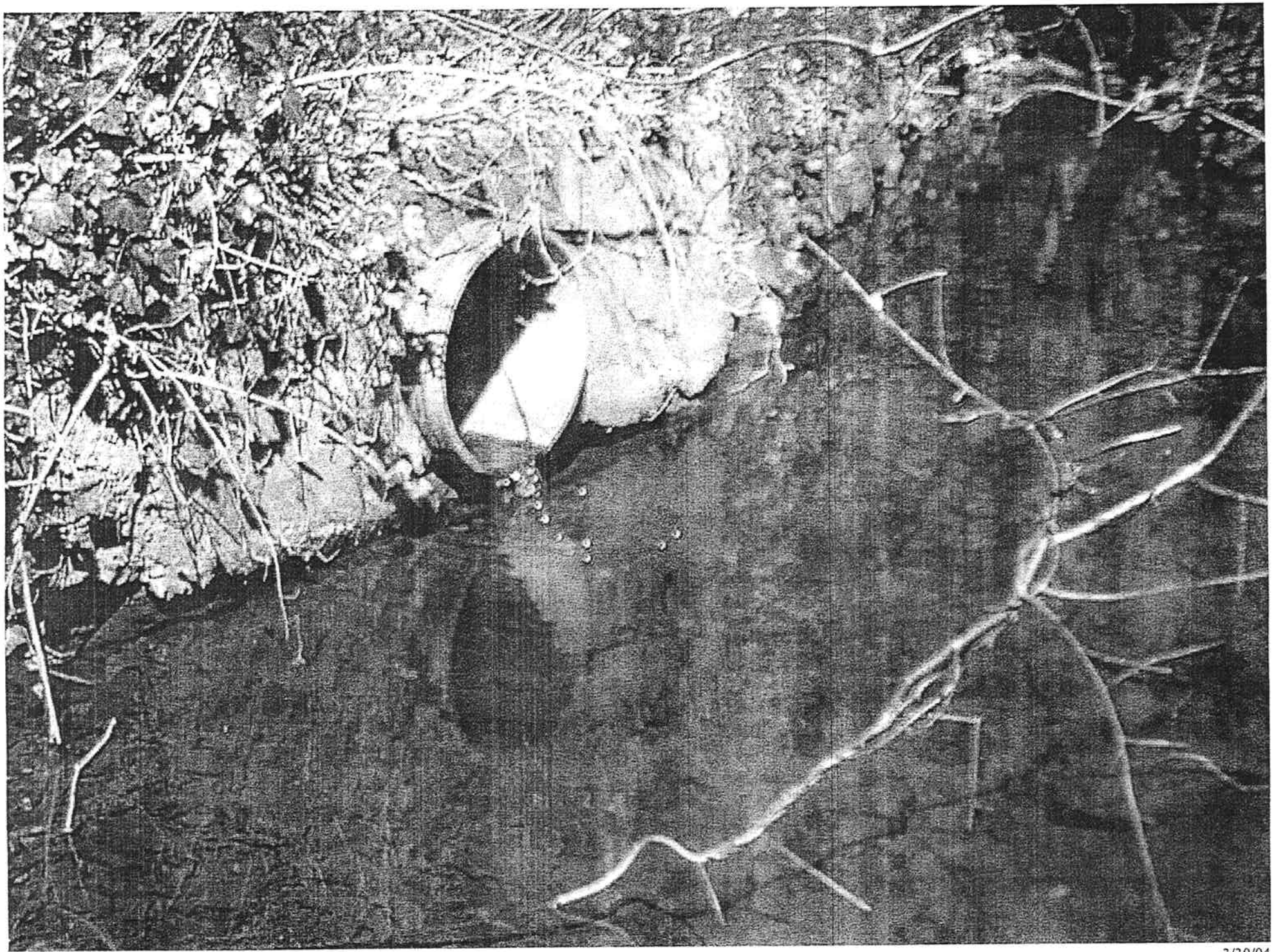
3/30/04



Pipe Swale #27 - Swarthmore, Little Crum Creek Disk #2 - Photo #10

3/30/04

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Pipe Swale #28 - Swarthmore, Little Crum Creek Disk #3 - Photo #1

3/30/04

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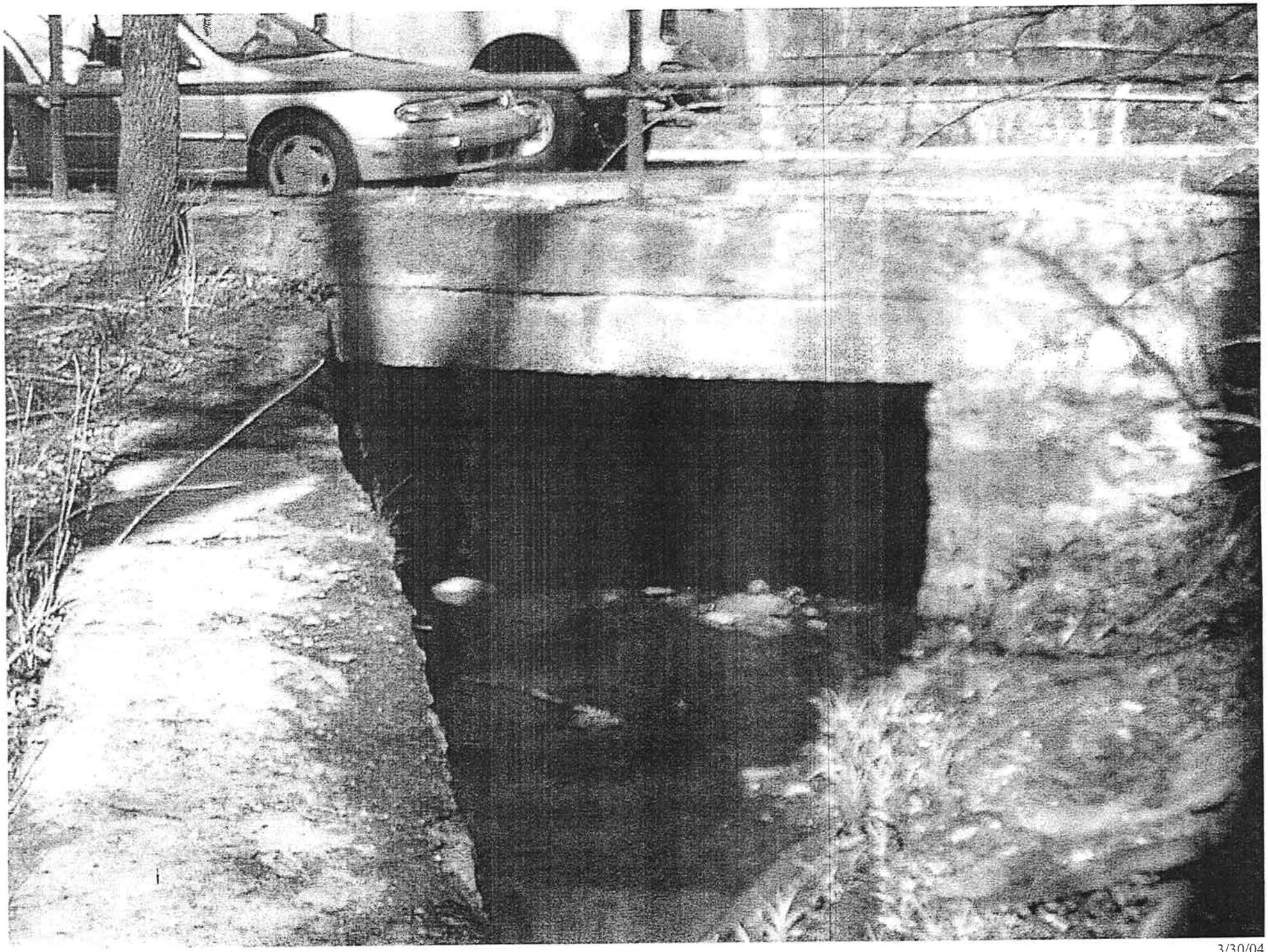
Pipe Swale #29 - Swarthmore, Little Crum Creek Disk #3 - Photo #2

file://A:\MVC-002F.JPG

3/30/04



Pipe Swale #31 - Swarthmore, Little Crum Creek Disk #3 - Photo #4

3/30/04

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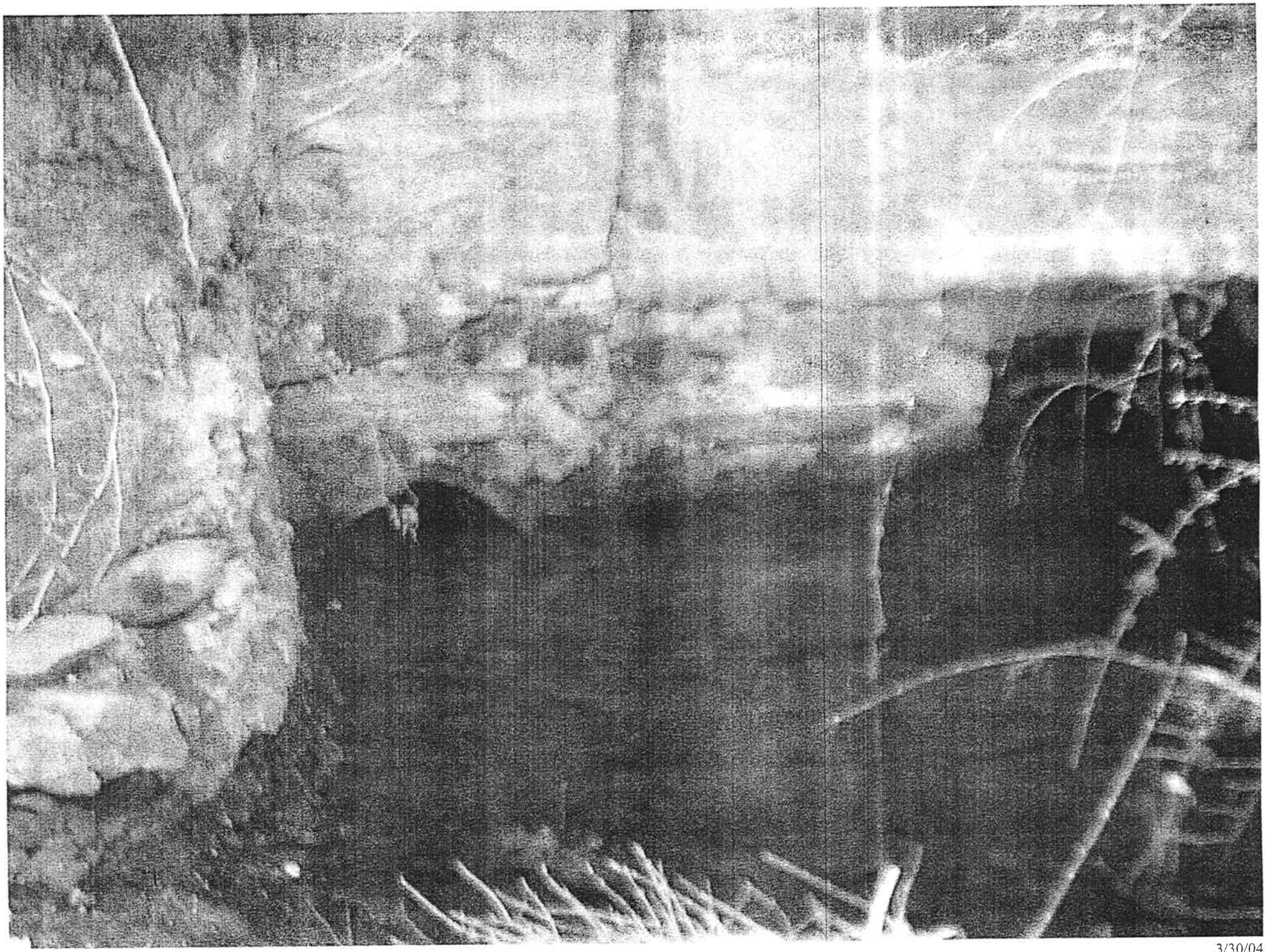

3/30/04

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Pipe Swale #35 - Swarthmore, Little Crum Creek Disk #3 - Photo #8

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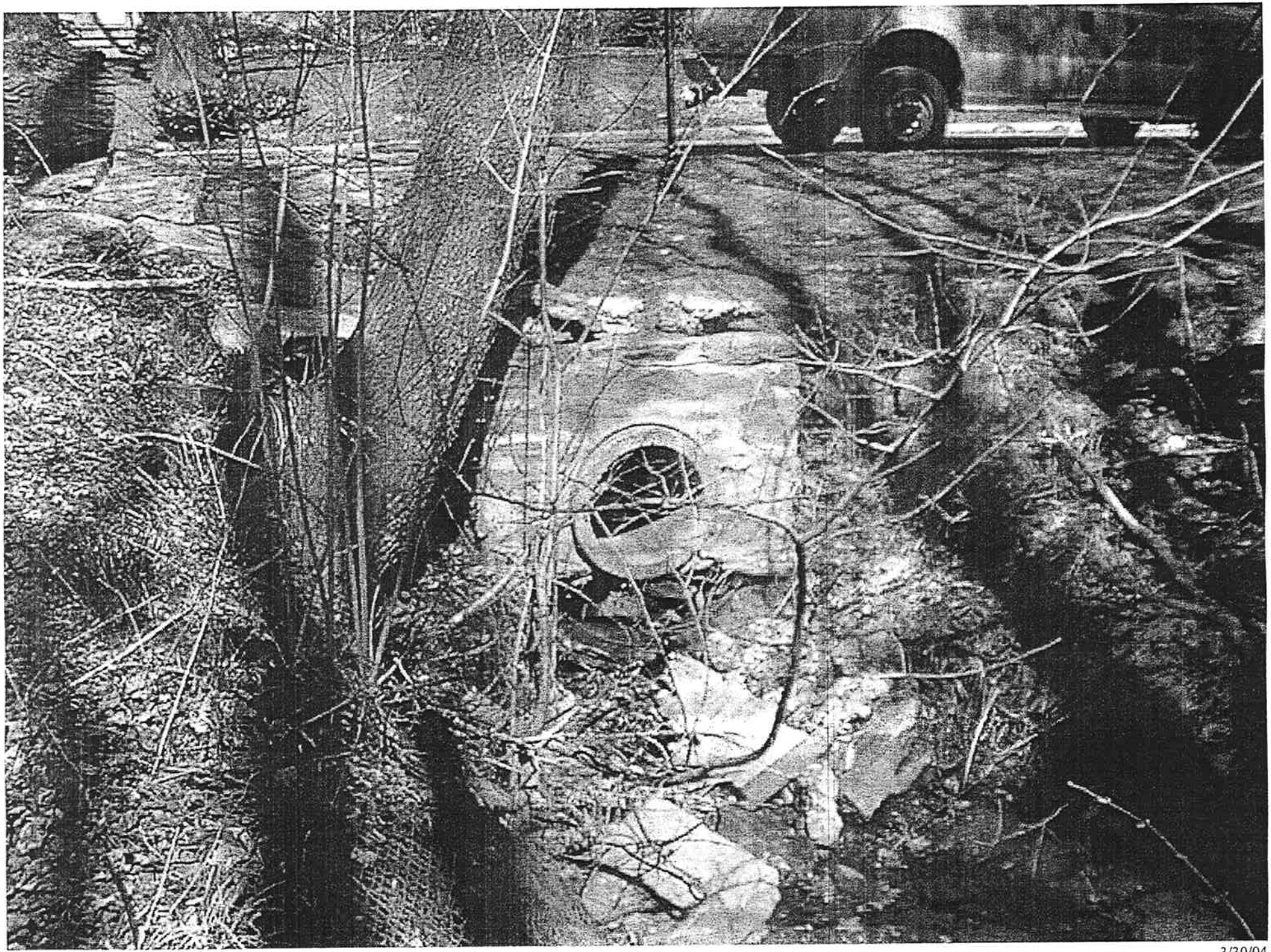
3/30/04



Pipe Swale #38 - Swarthmore, Little Crum Creek Disk #4 - Photo #1

3/30/04

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Pipe Swale #39 - Swarthmore, Little Crum Creek Disk #4 - Photo #2

3/30/04

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Pipe Swale #39 - Swarthmore, Little Crum Creek Disk #4 - Photo #3

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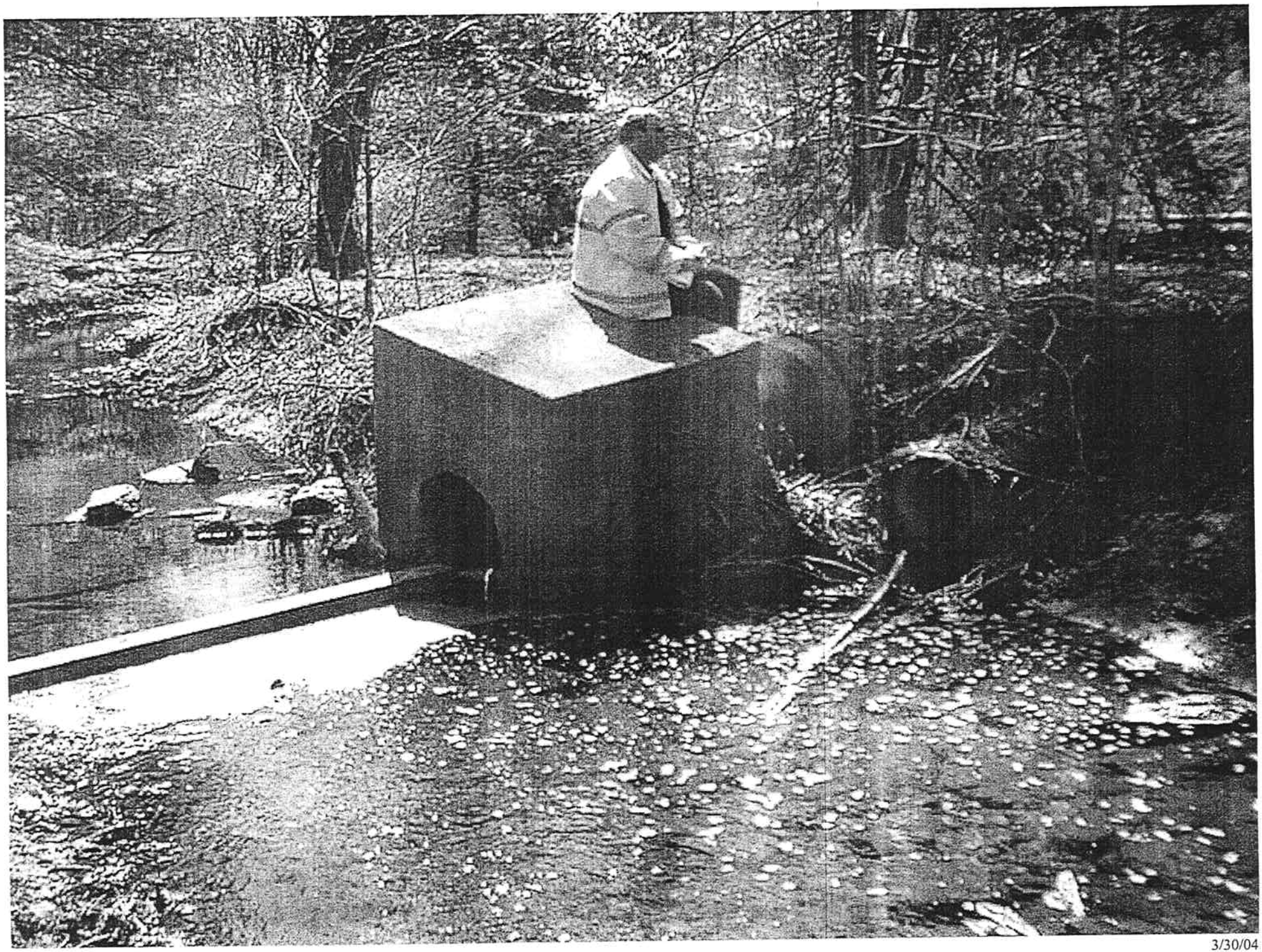
3/30/04

Pipe Swale #40 - Swarthmore, Little Crum Creek Disk #4 - Photo #4



3/30/04

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Pipe Swale #41 - Swarthmore, Little Crum Creek Disk #4 - Photo #5

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3/30/04

Pipe Swale #42 - Swarthmore, Little Crum Creek Disk #4 - Photo #6

3/30/04

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Pipe Swale #43 - Swarthmore, Little Crum Creek Disk #4 - Photo #7

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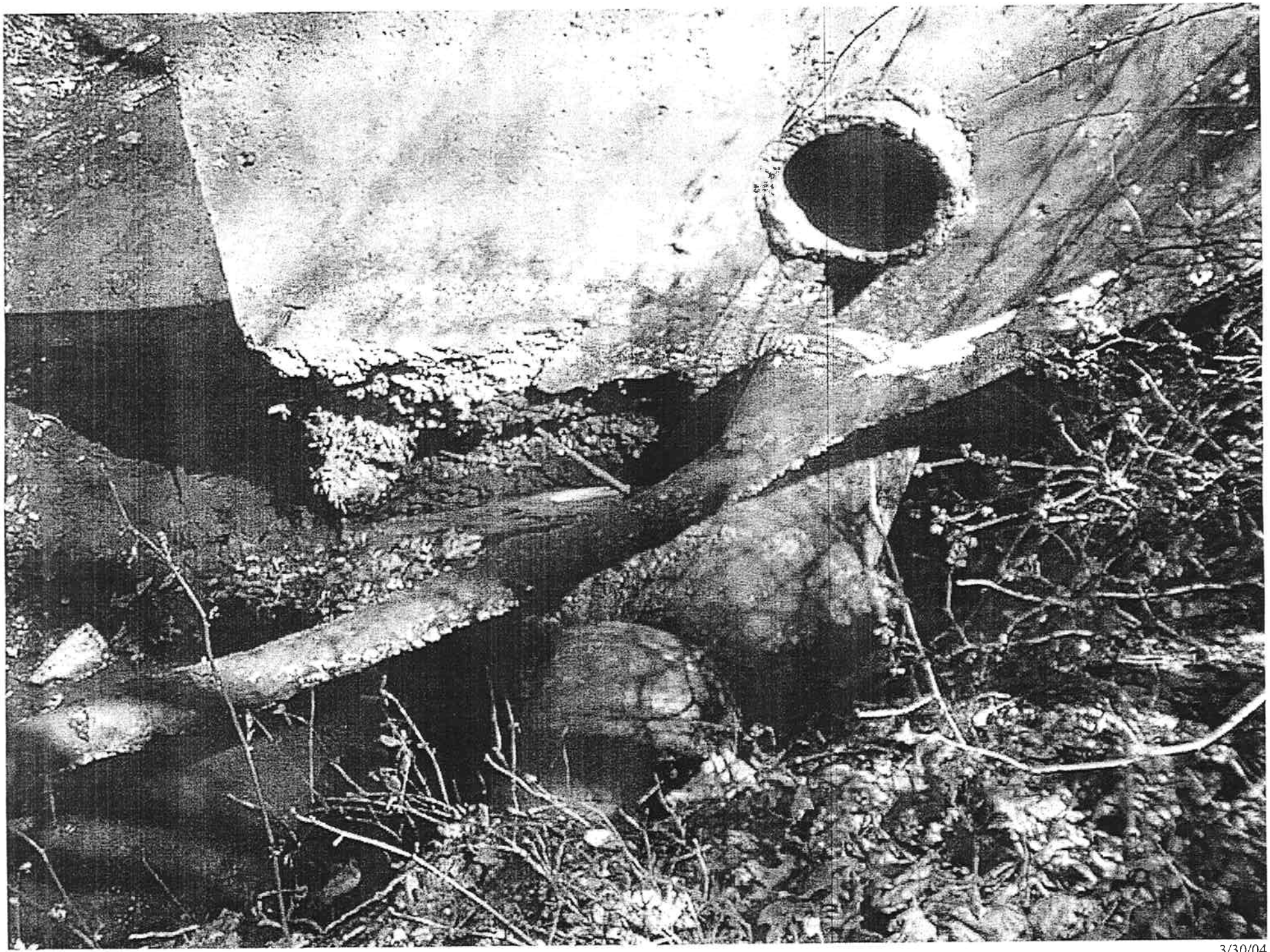
3/30/04

Pipe Swale #45 - Swarthmore, Little Crum Creek Disk #4 - Photo #9



3/30/04

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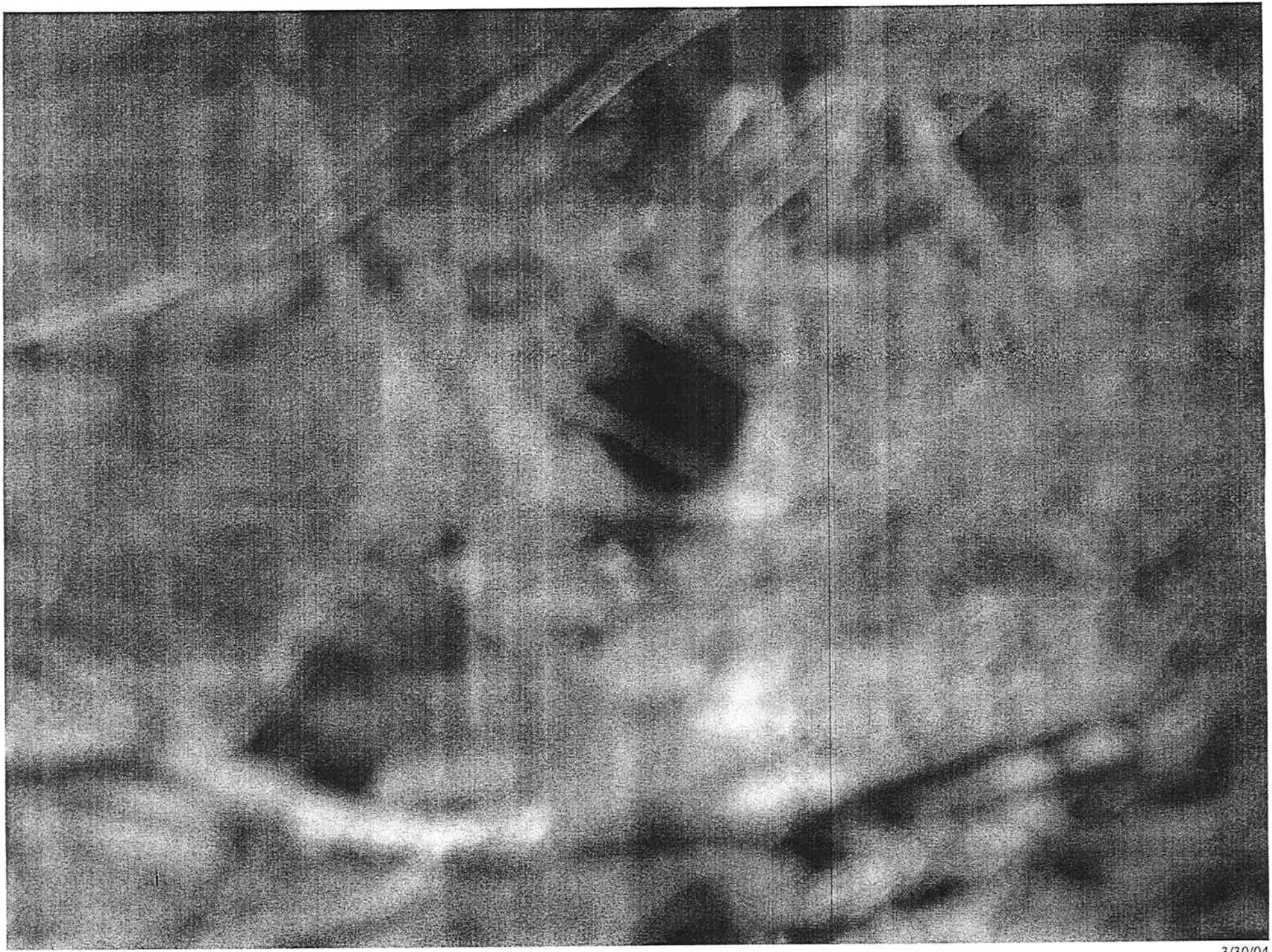

Pipe Swale #47 - Swarthmore, Little Crum Creek Disk #5 - Photo #1

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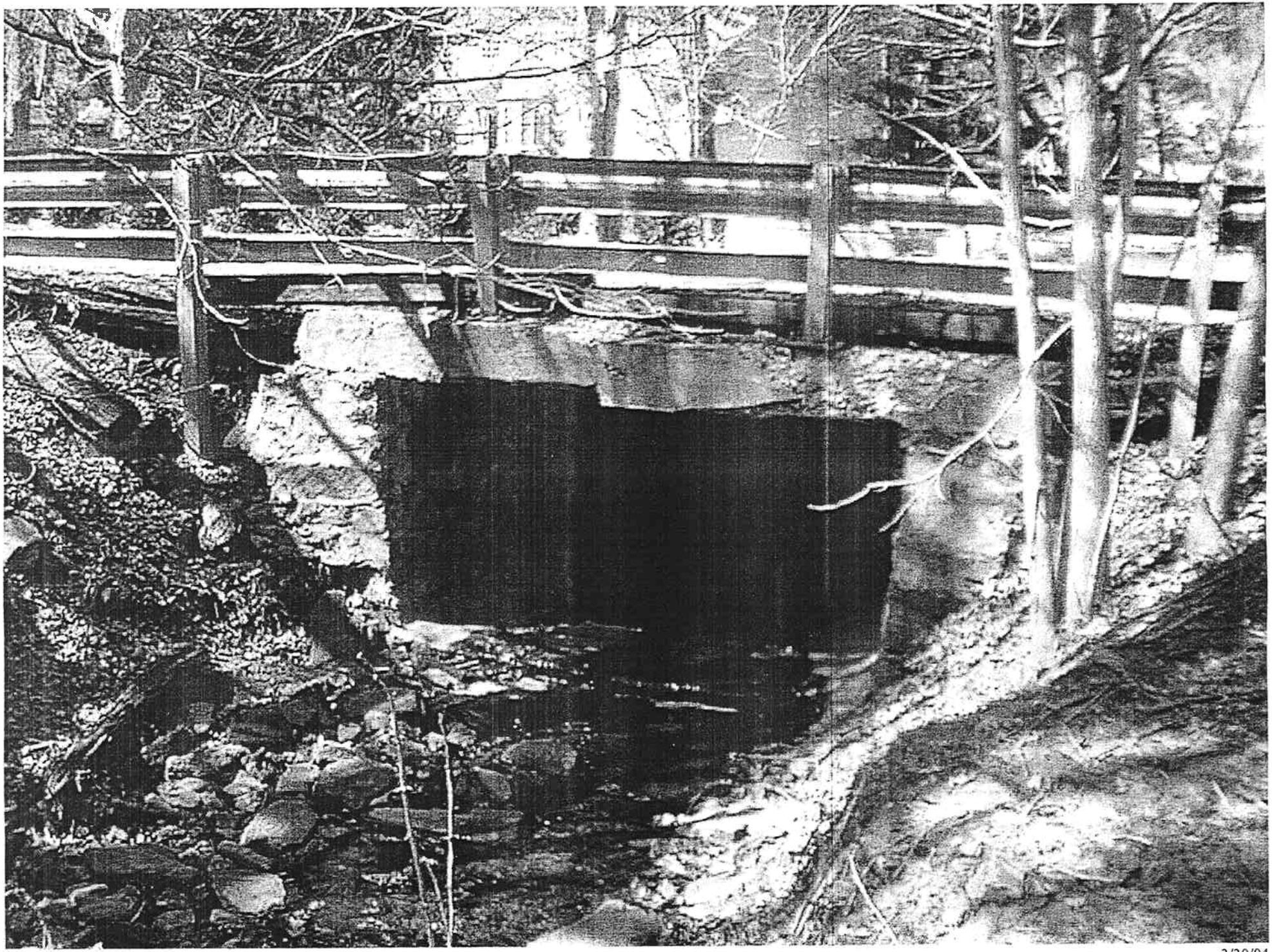
3/30/04

Pipe Swale #48 - Swarthmore, Little Crum Creek Disk #5 - Photo #2



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3/30/04

Form O - Outfall Data

Person: O'BRIEN/CUZZY Date: 3/9/04 Time Since Last Rain was ≥ 72 Hours: Yes_____

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 3/9/04 (½ DAY)

Municipality: SWARTHMORE Name of receiving water: CRUM CREEK

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)	Headwall Yes/No
1	1	YES	8:45 AM	24" 36"	0 1/2"	5' 1'	5' 5'	1:2 1:2	NO YES	~~CLAY~~ CLEAR	RESIDENTIAL	0	TIMBER TIMBER
2	2&3	"	"	BURIED DEBRIS AS	0	1'	20'	1:2	NO	N/A	"	2	YES
3	3&4	"	9:15 AM	24"	3"	DUMPS INTO STREAM	N/A	N/A	YES	CLEAR	"	PIPE SEDIMENT	NO
4	5	"	9:30 AM	18"	0	N/A	N/A	1:1	NO	LEAVES	"	0	NO
5	6	"	9:45 AM	48"	1"	7'	5'	1:2	YES	CLEAR	"	0	NO
6	7	"	10:00 AM	15"	0	2'	4'	1:1.5	NO	N/A	"	0	NO
7	8	YES	10:20 AM	30" 48"	1" 1"	~~2~~ 1 FT	10'	1:2	YES	CLEAR	"	0	YES
8	9	YES	10:25 AM		0	.2 FT	~~1'~~ 1'10"	1:1	NO	N/A	"	0	YES
9	10	YES	10:45	12"	0	N/A	N/A	N/A	NO	N/A	"	LEAVES	NO

3 IS REVERSE

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Form O - Outfall Data

Person: O'BRIEN/CUZZY Date: 3/9/04 Time Since Last Rain was ≥ 72 Hours: Yes_____

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain _____

Municipality: SWARTHMORE Name of receiving water: CRUM CREEK

3 PIPES INSIDE HD WALL

Pipe Swale #	Photo # DISK2	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)	Headwall Yes/No
10	1	YES	11:00 AM	8" 18" 8"	8"	2'	9'	1:1.5	NO YES	CLEAR	COLLEGE	0	YES
11	2	YES	11:05 AM	15"	0	1'	12'	1:1.5	NO	N/A	RESID	0	YES STONE
12	3	YES	11:20 AM	18"	0	1'	12'	1:2	NO	CLEAR	"	0	

3 PIPES 18" 18" 15"

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Swarthmore - Pipe swale 1 - Disk 1 - Photo 1 CRUM CREEK

3/9/04

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Swarthmore - Pipe swale 2 - Disk 1 - Photo 2 CRUM CREEK

file://A:\MVC-002F.JPG 3/9/04

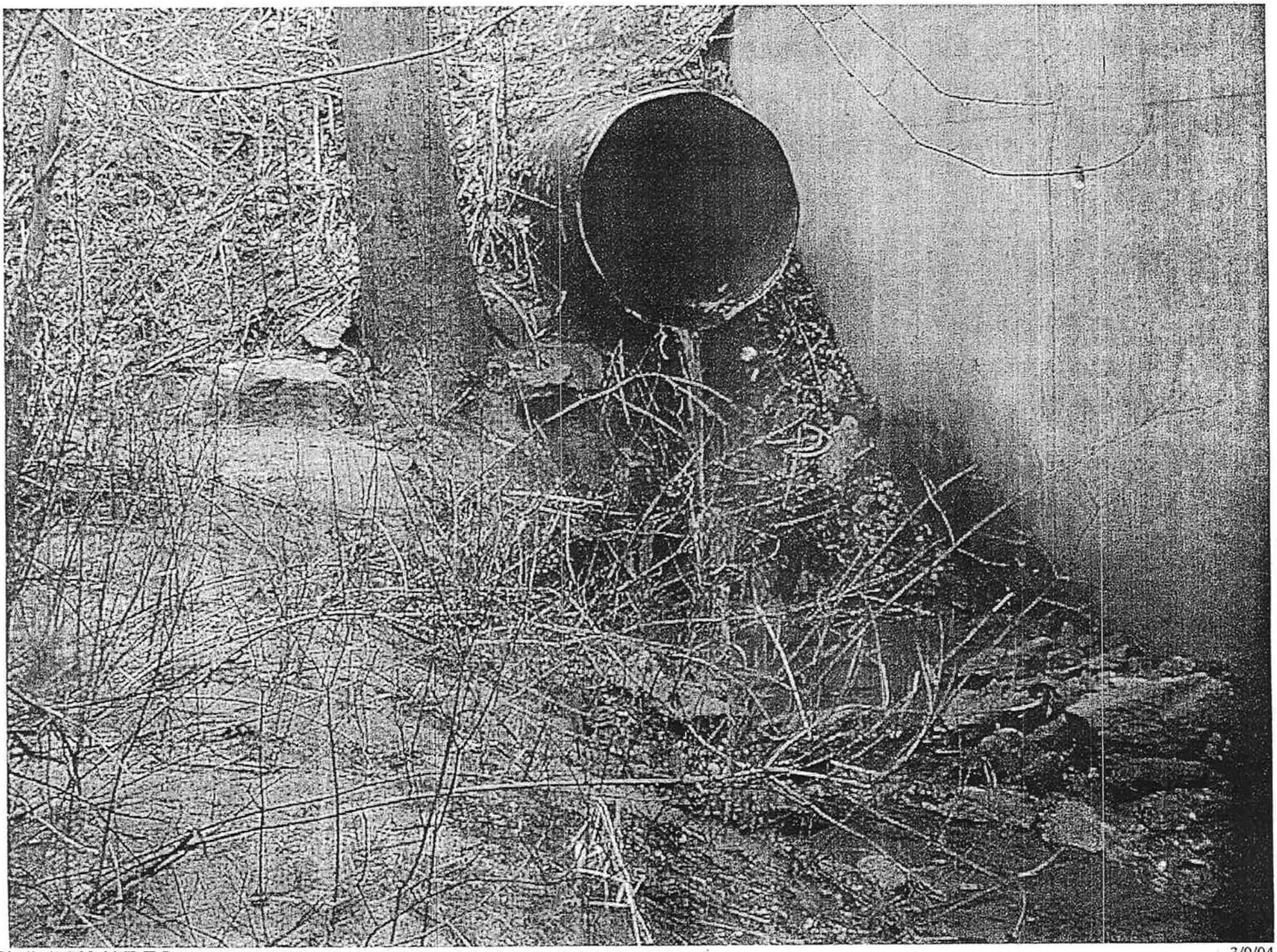
Swarthmore - Pipe swale 2 - Disk 1 - Photo 3 CRUM CREEK

file://A:\MVC-003F.JPG 3/9/04

Swarthmore - Pipe swale 3 - Disk 1 - Photo 4 CRUM CREEK

Swarthmore - Pipe swale 4 - Disk 1 - Photo 5 CRUM CREEK

Swarthmore - Pipe swale 5 - Disk 1 - Photo 6 CRUM CREEK



file://A:\MVC-006F.JPG 3/9/04

Swarthmore - Pipe swale 6 - Disk 1 - Photo 7 CROW CREEK

file://A:\MVC-007F.JPG 3/9/04

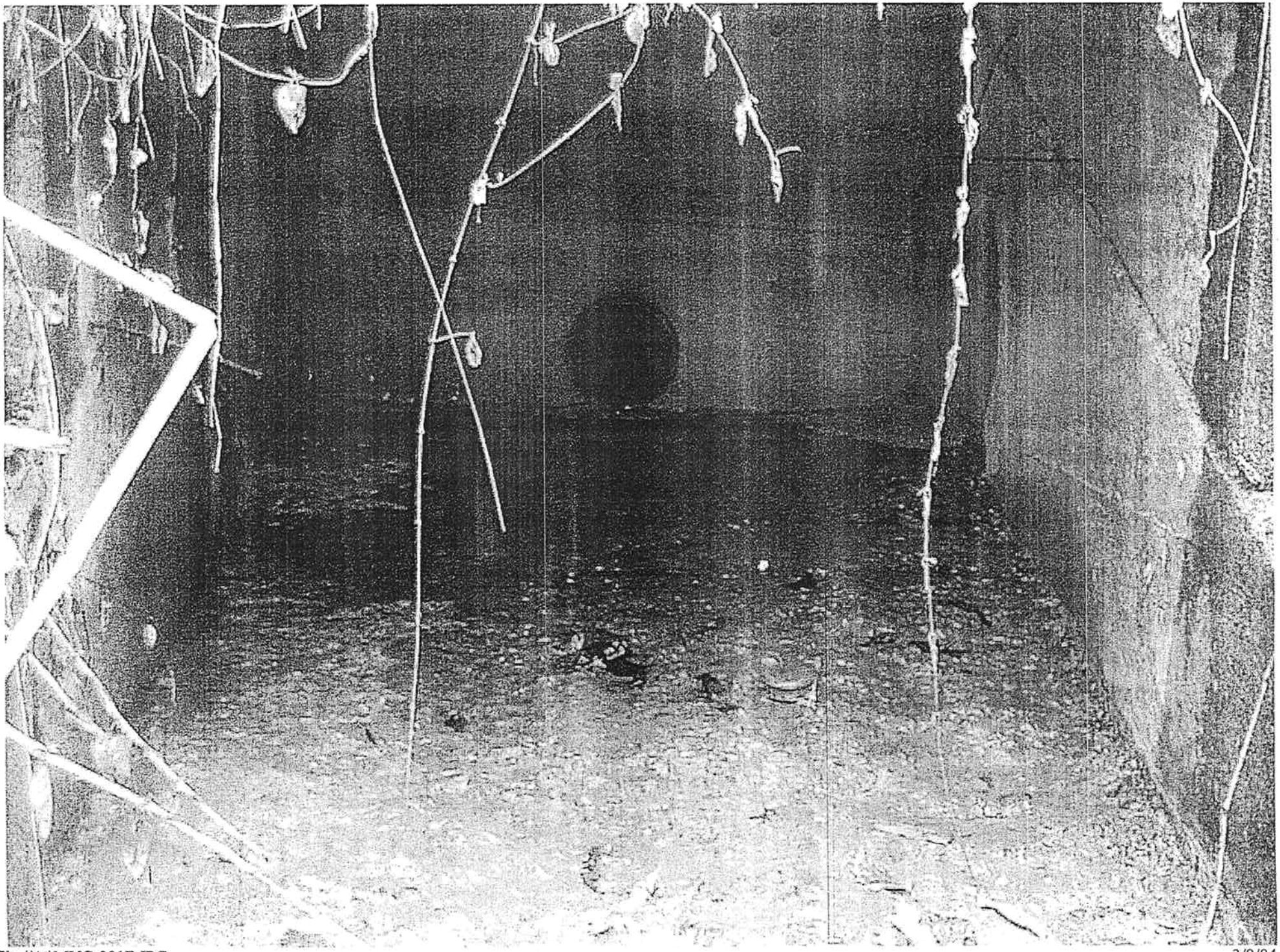
Swarthmore - Pipe swale 7 - Disk 1 - Photo 8 CRUM CREEK

Swarthmore - Pipe swale 8- Disk 1 - Photo 9 CRUM CREEK

file://A:\MVC-009F.JPG

3/9/04

Swarthmore - Pipe swale 10 - Disk 2 - Photo 1 CHUM CREEK



file://A:\MVC-001F.JPG 3/9/04

Swarthmore - Pipe swale 10 - Disk 2 - Photo 3 CRUM CREEK

12

file://A:\MVC-003F.JPG

3/9/04

TREDDYFFRIN TOWNSHIP

THE COUNTY OF CHESTER

COMMISSIONERS:
Colin A. Hanna, Chairman
Karen L. Martynick
Andrew E. Dinniman

WILLIAM H. FULTON, AICP
Executive Director

PLANNING COMMISSION
Government Services Center, Suite 270
601 Westtown Road
P.O. Box 2747
West Chester, PA 19380-0990
(610) 344-6285
FAX: (610) 344-6515

BORTON LAWSON LEHIGH VALLEY OFFICE
SRB
PAD
MJW
WSB
PAR
ADMIN
JUL 2 9 2003
CORRESPONDENCE
AGREEMENT
CONTRACT
PROJECT NO. 2003-1371-00

MEMORANDUM

JULY 28, 2003

TO: Paul DeBarry, Borton Lawson Engineering

FROM: Christina Duff CD

RE: Crum Creek Act 167 Outfall Mapping

Enclosed please find the outfall mapping for Tredyffrin Township. The Township has provided both a hard copy of the map and the electronic files on CD-Rom. They have not yet completed the Form O; it appears this information will follow later.

Today I spoke with the consultant from Yerkes who is working with Willistown Township to complete their outfall mapping. They are just beginning the process and will not have it completed by July 31st, 2003. Willistown is going to try to complete it as quickly as possible, but does not anticipate being done for at least another month. I have yet to hear from Easttown Township, or Malvern Borough. If we receive any additional mapping or information, we will pass it along to you.

Thanks!

CD/kp
Enclosure

610-644-1400
- STEVE NORCINI -
- PUBLIC WORKS DIRECTOR -

Bill, 7/31/03

Will be receiving data for the Crum Creek Phase II - Since Phase I is now over, Please just make a spreadsheet on munis (from phase I report) and what data we received (from cover letter) then put in Red file for future reference. No need to put on GIS or server yet.

Thanks
Paul

PAUL-
THERE IS NOTHING ON THIS CD-ROM EXCEPT AN EMPTY APR CALLED 'STORMWATER_FACILITIES.APR'
THEY FORGOT ALL THE DATA...
Bill

I HAVE CALL IN TO TROYMAIN TO RESOLVE

BOARD OF SUPERVISORS
TREDYFFRIN TOWNSHIP

CHESTER COUNTY
1100 DuPortail Road
Berwyn, PA 19312-1079

(610) 644-1400 FAX (610) 993-9186
Email: *tredyffrin@tredyffrin.org*
Website: *www.tredyffrin.org*

Agreement

Under the Township's licensing agreement with Chester County, the Township may provide a third party consultant with layers from its Geographic Information System (GIS), with the express condition that all data given to the Consultant is returned to the Township and purged from the Consultant's systems at the completion of the project.

On this day, the _____ day of _____, 2004, Delaware County Planning Commission received one CD containing the following six Tredyffrin Township GIS layers:

- Tax Parcels
- Township Boundaries
- Watershed Boundaries
- Stormwater Systems
- Stormwater Pipes
- Streams

I understand and agree to the terms and conditions for using Tredyffrin Township's GIS layers and agree to return the CD and purge the information from all of my equipment and systems at the conclusion of the project.

_____

Delaware County Planning Commission

_____
Stephen F. Norcini
Director of Authority Operations/Asst. Director of Public Works

On this day, the _____ day of _____, 2004, Delaware County Planning Commission returned Tredyffrin Township's GIS information and affirm that all data has been purged from its systems.

_____

Delaware County Planning Commission

_____
Stephen F. Norcini
Director of Authority Operations/Asst. Director of Public Works

CRUM CREEK WATERSHED
ACT 167 STORMWATER MANAGEMENT PLAN

MUNICIPALITY QUESTIONNAIRE

Please fill out the following questionnaire and return it to Karen Holm at the Delaware County Planning Department, Court House and Government Center Building, 201 West Front St. Media, PA 19063 as soon as possible. If you have any questions or comments, or if you would like these forms in digital format, please call Karen at 610-891-5213 or e-mail her at holmk@co.delaware.pa.us.

PART I - GENERAL INFORMATION

Municipality: Tredyffrin Township

Contact Person: Stephen F. Norcini

WPAC Designee: Stephen F. Norcini

Title: Director of Municipal Authority Operations

Address: 1100 DuPortail Road
Berwyn Pa 19312

Phone: 610 408 3612

Fax: 610-993-9186 e-mail snorcini@tredyffrin.org

Person Completing form (if different from Contact Person):

Name: _____

Address: _____

_____

Phone: _____

Fax: _____

E-mail: _____

PART II - REGULATORY ACTIVITIES

A. Please indicate the regulations you currently use to manage development.

REGULATION	MUNICIPAL ORDINANCE	COUNTY ORDINANCE
Zoning Ordinance	✓	
Subdivision/Land Development Ordinance	✓	
Separate Stormwater Ordinance		
Separate Floodplain Ordinance		

B. Please indicate the agencies/individuals who review and approve land development plans and zoning variance/waiver requests.

ENTITY	LAND DEVELOPMENT PLANS		ZONING VARIANCE/WAIVER REQUESTS	
	REVIEW	APPROVE	REVIEW	APPROVE
Supervisors				
Municipal Engineering Department	✓			
Municipal Planning Department	✓	✓	✓	
County Planning Department	✓	-		
County Conservation District	✓	✓		
Zoning Hearing Board			✓	✓
Consulting Engineer	✓			
Others (List Below				

C. Please provide **copies** of your zoning, subdivision/land development, and separate stormwater management and floodplain ordinances and your current zoning map when you return this questionnaire. Please list these documents below.

CD of existing drainage structures
Subdivision and Land Development - Chapter 181 } From the code of the Township of Tredyffrin
Zoning, Chapter 208
Zoning map

PART III - MUNICIPAL AND LOCAL PLANNING ACTIVITIES

Please indicate below whether your community has approved the following plans and maps and the date of the most recent update.

ITEM	APPROVED/DATE	IN PROGRESS	PLANNED WITHIN NEXT YEAR
PA Act 537 Sewage Facilities Plan	✓ 5/93	update	
Comprehensive Land Use Plan			
Existing Land Use Maps	✓		
Proposed Land Use Maps			
Zoning Maps	✓		

PART IV - FLOOD INSURANCE PROGRAM AND COMPREHENSIVE LAND USE PLAN

Please indicate below whether your community participates in the National Flood Insurance Program:

ITEM	PARTICIPATES (Y/N)
Flood Hazard Boundary Map (FHBM)	
Participates in FEMA Emergency Program	
Participates in FEMA Regular Program	

PART V - EXISTING STORMWATER RELATED PROBLEMS AND STRUCTURES

Please complete the matrices on the following pages (Forms A and C-J) to describe any significant stormwater-related problems (Form A), Existing or Proposed Flood Control Projects (Forms C & D), Existing or Proposed Storm Water Control Facilities (Forms E and F), Existing or Proposed Stormwater Collection Systems (Forms G & H), Present and Projected Development in the Flood Hazard Area (Form I), and Water Quality Problem Areas (Form J) that you are aware of in your municipality.

What we would like to ask of you is that you complete as much of the attached data collection forms as possible. There is a different form for each item of information as summarized in the attached "FORM DESCRIPTION SUMMARY. The process would be as follows starting with the problem areas (Form A):

- Place the location of the problem area on the map as shown in the attached example map.
- Draw a box on the map with the problem area identifier starting with A-1 with an arrow leading from the problem area identifier to the problem area.
- Place an A-1 in the first column of FORM A.
- Put a check in each box in the A-1 column that represents the problems associated with that particular problem area.
- Repeat with the next problem area (A-2) and so on.

- Repeat for existing flood control projects (FORM C) placing a triangle on the maps and starting the labeling with C-1.
- Repeat for all forms.

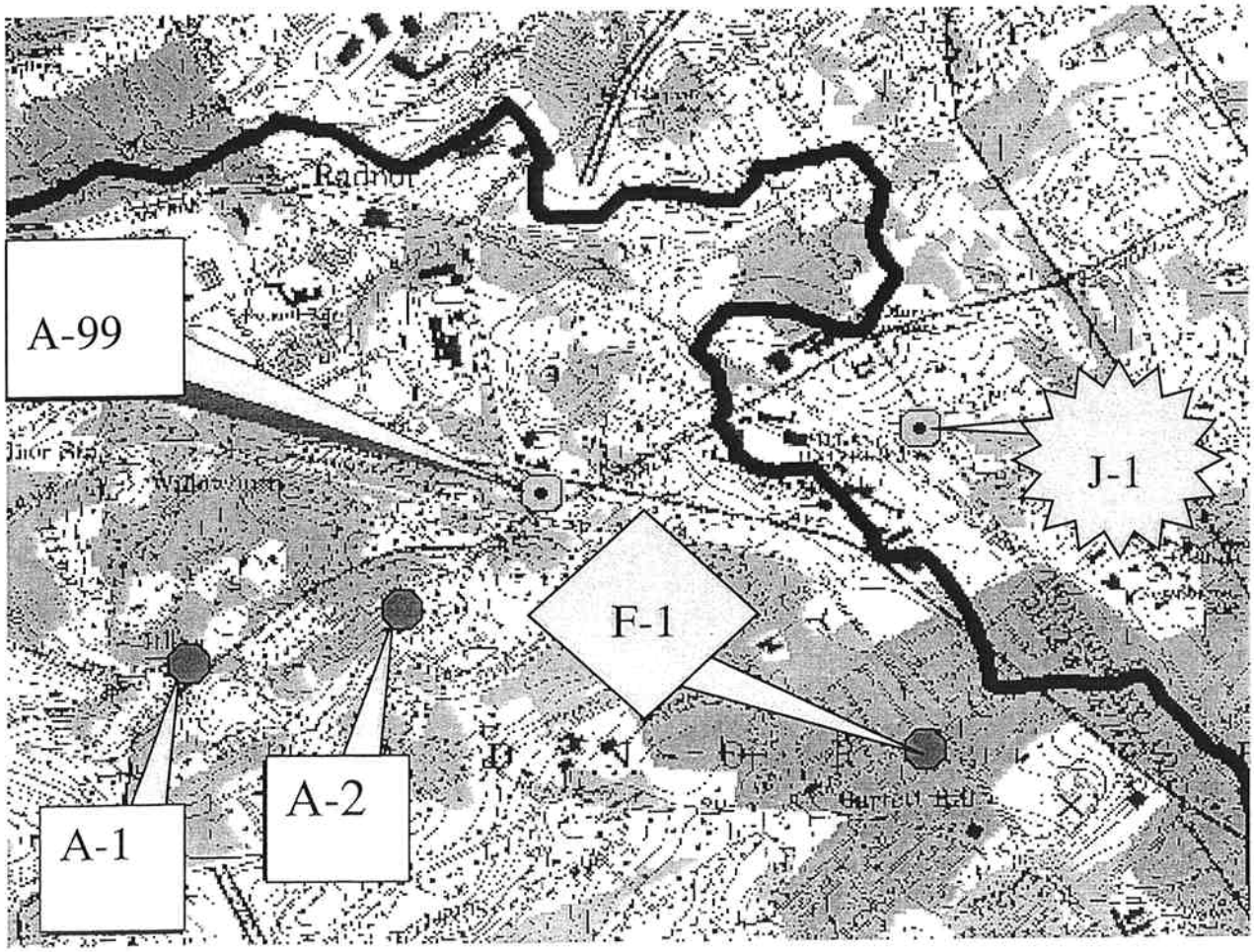
The sample map attached shows three problem areas (A99- A1 and A-2), one proposed flood control project (F-1) and one water quality problem (J1).

Use additional paper to provide detailed descriptions of your most serious problems and attach a map to show the location of the problem. Attach photographs, if available.

If you have any storm or combined sewers, please provide maps showing the collection system and overflow discharge locations and an estimate of the average annual discharge at each overflow point.

The more detail you provide, the better we will be able to evaluate the situation for your municipality. We appreciate your help.

Sample Location of Information from Data Collection Forms on the Municipal Map



STORM WATER PROBLEM AREAS - FORM A sheet 1 of 1

WATERSHED Crum Creek
Name:
Municipality: Tredyffrin Twp
County: Chester

FORM COMPLETED BY
Name: Stephen F. Norcini
Telephone: 610 408 3627
Date: 9/1/04

MAP NO.	sample A-99	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-
Types of Storm Water Problems													
Flooding	x												
Accelerated Erosion	x												
Sedimentation													
Landslide													
Groundwater													
Water Pollution	x												
Other (Explain)													
Explanation Line No.(s)													
Cause(s)													
Storm Water Volume	x												
Storm Water Velocity	x												
Storm Water Direction	x												
Water Obstruction	x												
Other (Explain)													
Explanation Line No.(s)													
Frequency													
Year Most Recent Occurred													
Year First Known to Occur													
Regularity													
More Than 1/Year	x												
Less Than 1/Year													
Only During Agnes or Floyd													
Duration (If Applicable)													
Less Than One Day	x												
One Day + (Enter Days)													
Property Damages													
Loss of Life / Vital Services													
Private													
More Than One Owner													
Types of Properties													
Undeveloped													
Agricultural													
Residential													
Commercial	x												
Industrial													
Number of Properties													
1													
2-10	x												
11+													
Public (List Types)													
Explanation Line No.(s)													
Solutions													
Suggested													
Explanation Line No.(s)	1												
Formally Proposed													
Explanation Line No.(s)													

EXPLANATION LINES

1 I am unaware of any SWM issues in this basin (i.e. flooding,
2
3 erosion, etc.) other than during Floyd.
4

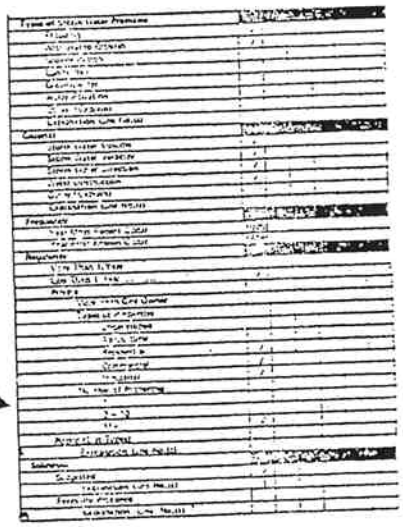
INSTRUCTIONS

Begin with A.1 as the first map number to identify the first storm water problem area. Illustrate the defined problem on the watershed map provided, and identify it with its map number.

For each storm water problem area within your municipality, enter the map identification number at the head of the column. Describe the problem by placing a check (4 in the appropriate blocks of the column under this map identification number.

When an additional explanation is required, write the line number(s) used in the column marked "Explanation Line No. (s)".Example 1, 2-3, etc.

f storm water problem occurred during and after Agnes, describe the frequency of the problem after Agnes.



Use the explanation lines to list the types of public property damages e.g.roadways, hospitals, etc.

Enter the line no. (s) used to list the map ID no. (s) for the proposed facilities.

Definitions

Storm Water Problem Area
An area that defines the farthest extent of a storm water problem, including any area that experiences property damage, inundation, accelerated erosion, surface water pollution, groundwater pollution, landslides, or any other problem as a result of storm water runoff.

Groundwater
Water in the ground below the water table.

Accelerated Erosion
The removal of the surface of the land through the combined action of man's activities and the natural processes at a rate greater than would occur because of the natural process alone.

Sedimentation
The process by which soil or other surface materials, transported by surface water, is deposited on stream bottoms.

Water Obstruction
Any dike, bridge, culvert, wall, wingwall, fill, pier, wharf, embankment, abutment, or other structure located in, along, across, or projecting into any watercourse, floodway, or body of water.

EXPLANATION LINES (continued)

FORM E

EXISTING STORM WATER CONTROL FACILITIES FORM E. SHEET _____ OF _____

WATERSHED	FORM COMPLETED BY	DEFINITION
Name: Stone Marsh Municipality: Tredyffrin County: Chester	Name: Telephone: SAME Date: 9/6/07	Storm Water Control Facility A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.
For County Use:		

Map ID No.	Type of Storm Water Control Facility	Year Built	Contact Person Name, Address and Phone	Comments
E-	Please see attached GIS map.			
E-				
E-				
E-				
E-				
E-				
E-				
E-				

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

Detention / Retention Basin

Natural Pond or Wetland

Parking Lot Pondling

Roof-Top Storage

Semi-Pervious Paving

Infiltration Device (Seepage /

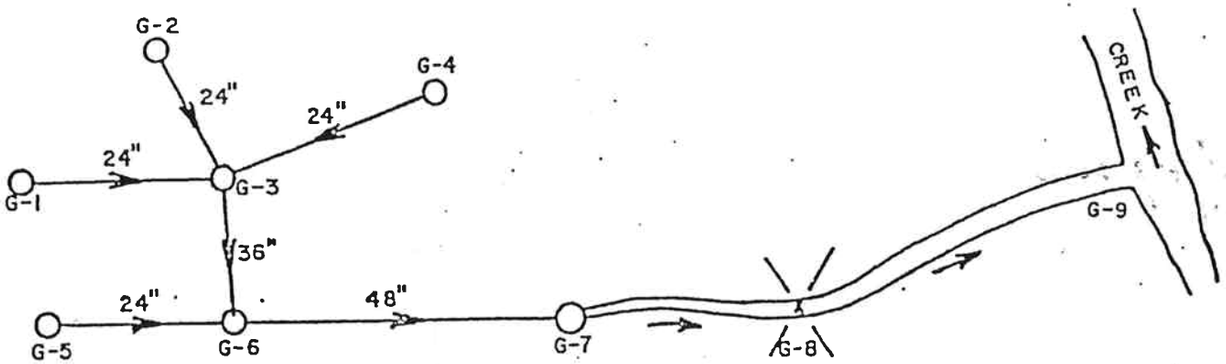
EXISTING STORM WATER COLLECTION FACILITIES FORM G. SHEET _____ OF _____

WATERSHED	FORM COMPLETED BY	INSTRUCTIONS
		Diagram each system on the appropriate map. Establish map points to show changes in system elements,
Name: Steve Norcini	Name: Same	pipe size, or pipe direction. (If unknown, outline the system extent.) Complete this form only where specific
Municipality: TT	Telephone: 610 408 3623	information on construction is available. Use a separate form for each system. Identify the points within a
County: Chester	Date: 8/1/04	system consecutively (ex. G-1,G-2,G-3). Start the first point in each additional system 20 numbers higher.
		For example, G-3 ends one system, so G-23 begins the next. See Sample Diagrams & Form on Reverse.

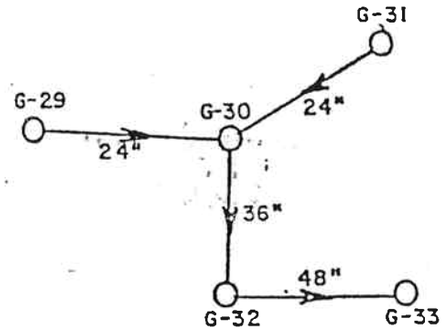
Map I.D. No.		System's Elements (x)			Measurements *				Material	Year Constr.	Design Data Available	Contact Person Name and Phone	Name of Final Ownership and Maintenance Responsibility
					Pipe	Channel / Swale							
From	To	Pipe	Open Channel	Swale	D	TW	B	Depth					
G-	G-												
G-	G-	Please see attached GIS map											
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												
G-	G-												

* See measurement key on reverse side.

Measurement Key
D = Diameter
TW = Top Width
B = Bottom Width

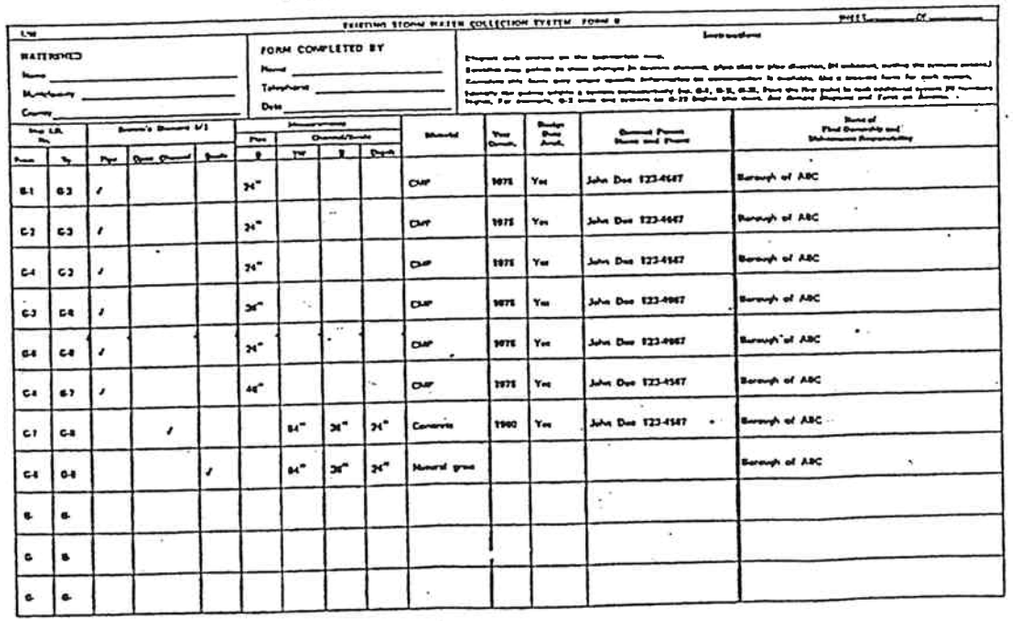


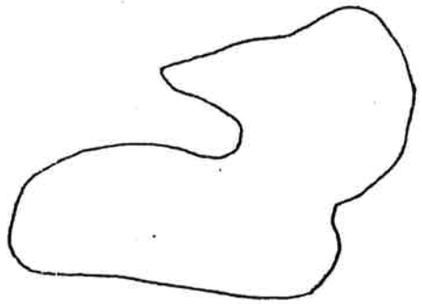
SAMPLE DIAGRAM FOR SYSTEM ONE



SAMPLE DIAGRAM FOR SYSTEM TWO

SAMPLE FORM (System One Only)





Outline known areas where construction exists but construction data is unavailable.

WATER QUALITY PROBLEM AREAS (FORM J)

Watershed
Name: Crum Creek
Municipality: Tredyffrin
County: Chester

Form Completed By
Name: Stephen F. Norsini
Telephone: 610 408 3623
Date: 9/1/09

Site:	J- 1	J-	J-	J-	J-	J-	J-	J-
Types of Water Quality Problems								
High Community Tolerance								
High Temperature								
High Turbidity								
Hydrocarbon Pollution								
Low Community Diversity								
Low Dissolved Oxygen								
Low pH								
Nutrient Enrichment								
Poor Habitat								
Other / Explanation Line No.	✓							
Potential Causes(s)								
Agriculture								
Construction Site								
Erosion								
Lake Discharge								
STP Outfall								
Other / Explanation Line No.								
Frequency								
Year Most Recent Occurrence								
Year First Known Occurrence								
Source of Information								
Streamwatch								
County Water Quality Study								
Driveby								
CCD Complaint Investigation								
Other / Explanation Line No.	✓							

Explanation Lines
1. Resident complaint - "foam" in creek - DEP + CCCD notified.
2.
3.

UPPER PROVIDENCE TOWNSHIP

DCPD

DELAWARE COUNTY PLANNING DEPARTMENT

Court House/ Government Center , 201 W. Front St., Media, PA 19063
Office Location: Toal Building, 2nd & Orange Sts., Media, PA 19063
Phone: (610) 891-5200 FAX: (610) 891-5203
E-mail: planning_department@co.delaware.pa.us

TO: Bill Brokaw

FROM: Christopher Gallagher

DATE: 11/1/05

RE: Crum Creek Stormwater Management Plan
Upper Providence and Nether Providence Forms

Bill,

Please find attached Forms A and C and map from Upper Providence Township and Form O and Storm Sewer Map from Nether Providence Township.

If you require any additional information, please do not hesitate to contact me at (610)-891-5130.

Form A

STORM WATER PROBLEM AREAS FORM A. SHEET 1 OF _____

WATERSHED		FORM COMPLETED BY		Before Filling Out Form, See Instructions On Back
Name:	Crum Creek	Name:	Anthony Hommey	
Municipality:	Upper Providence	Telephone:	610-565-4944	For County Use:
County:	Delaware	Date:	6/15/05	

MAP NO. *	A-1	A-2	A-3	A-	A-	A-	A-	A-	A-	A-	A-	A-
Types of Storm Water Problems												
Flooding	✓	✓	✓									
Accelerated Erosion		✓										
Sedimentation												
Landslide												
Groundwater												
Water Pollution												
Other (Explain)												
Explanation Line No. (On Back)												
Cause (s)												
Storm Water Volume	✓	✓	✓									
Storm Water Velocity												
Storm Water Direction												
Water Obstruction		✓										
Other (Explain)												
Explanation Line No. (On Back)												
Frequency												
Year Most Recent Occurred	2005	2005	2005									
Year First Known Occurred	?	?										
Regularity												
More Than 1 Year	✓	✓	✓									
Less Than 1 Year												
Only During Agnes												
Duration (If Applicable)												
Less Than 1 Day	✓											
1 Day + (Enter Days)		✓	✓									
Property Damage												
Loss of Life/Vital Services												
Private	✓	✓	✓									
More Than One Owner		✓										
Types of Properties		✓										
Number of Properties		3										
Public (List Types)	✓	✓	✓									
Explanation Line No. (On Back)												
Solutions												
Suggested												
Explanation Line No. (On Back)												
Formally Proposed		✓										
Explanation Line No. (On Back)												

* Include Map ID No. if found on any other form listing proposed facilities.

INSTRUCTIONS

Begin with A.1 as the first map number to identify the first' storm water problem area. Illustrate the defined problem on the watershed map provided, and identify it with its map number.

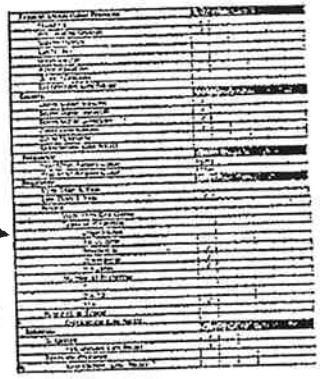
For each storm water problem area within your municipality, enter the map identification number at the head of the column. Describe the problem by placing a check (4 in the appropriate blocks of the column under this map identification number.

When an additional explanation is required, write the line number(s) used in the column marked "Explanation Line No. (s)".Example 1, 2-3, etc.

If storm water problem occurred during and after Agnes, describe the frequency of the problem after Agnes.

Use the explanation lines to list the types of public property damages ,e.g.roadways, hospitals, etc.

Enter the line no. (s) used to list the map ID no. (s) for the proposed facilities.



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Water in the ground below the water table.

Accelerated Erosion
The removal of the surface of the land through the combined action of man's activities and the natural processes at a rate greater than would occur because of the natural process alone.

Sedimentation
The process by which soil or other surface materials, transported by surface water, is deposited on stream bottoms.

Water Obstruction
Any dike, bridge, culvert, wall, wingwall, fill, pier, wharf, embankment, abutment, or other structure located in, along, across, or projecting into any watercourse, floodway, or body of water.

EXPLANATION LINES (continued)

Upper Providence (UPP)

FORM B - OBSTRUCTION DATA COLLECTION

Municipal Stream Obstruction Data

Watershed: Crum Creek

Municipality/County: Upper Providence / Chester

Records completed by: Brian Bruno

Field work personnel: "

Date(s): 12/1 - 12/20/04

T= Amount of fill
D= Diameter
HT = Height
W = Width
PW = Pier Width

Material
msry = Stone Masonry Structure
CMP = Corrugated Metal Pipe
CPP = Corrugated Polyethylene Pipe
BCCMP = Bituminous Coated CMP
RCP = Reinforced Concrete Pipe
SP = Steel Pipe

Inlet Conditions
HW = Headwall
WW = Wingwall
SW = Sidewall

Map ID.	Owner or Address Of Obstruction	Capacity (CFS)	Nos. of?	Opening Type: Part of Bridge?	Opening Type: Culvert Purpose	Shape (✓): Culvert □	Shape (✓): Culvert ○	Shape (✓): Culvert ⬭	Shape (✓): Bridge ⌒	Shape (✓): Bridge ⊓	T (ft)	D (ft)	HT (ft)	W (ft)	PW (ft)	skew angle	MATERIAL / INLET CONDITION	NOTES
UPP1	Providence Rd / Pineville Dr		1				✓				2.3	2.5	-	-	-	90	RCP / HW	GPS NEW 27
UPP2	Willow Woods Rd		1				✓				1.5	4	-	-		90	RCP / HW, WW	GPS NEW 28
UPP3	115 ↑		1				✓				2.3	4	-	-		90	CMP	Driveway GPS NEW 29
UPP4	111 ↑		1				✓				2.5	4	-	-		90	CMP	" GPS NEW 30
UPP5	Providence Rd / Bishop Hollow		1				✓				3	1.5	-	-		90	" HW	GPS NEW 31
UPP6	Horse Shoe Ln		1				✓				5	3.5	-	-		90	CMP	Inlet Severely Clogg[ed]
UPP7	Trolle Way		1					✓			12	-	5	6.5		90	CMP / HW, WW	GPS NEW 33
UPP8	Crum Ck Rd / Rose Tree Rd		1							✓		-	4.3	6	-	90	[illegible]	
UPP9	Crum Ck Rd / Slide Rd		1	✓				✓			4.5	-	2.5	5.5	-	90	CMP / HW	
UPP10	Slide Rd over Crum		1	✓						✓	6	-	14	349	3			Waters width (estimated)
UPP11	Paxon Hollow over Crum		1							✓	3	-	10	70	-	90	MSRY	
UPP12	Paxon Hollow		2				✓				3	4	-	-	-	90	BCCMP / HW, WW	See diagram
UPP13	1180 " " Driveway						2				2.5	4	-	-	-	90	CP / HW	
UPP14	Quite Hollow Rd / Dog		1				✓				2	3	-	-		70	RCP / HW	
UPP15	Dog Kennel Rd		1				✓				1.3	3	-	-		70	RCP / HW	See diagram
UPP16	" "		1				2				0.2	4	-	-	-	90	RCP	
UPP17							✓				2.5	3	-	-	-	90	RCP / HW	
UPP18	Farnum Rd		1				✓				2.5	3	-	-	-	90	BCCMP / HW, SW	
UPP19	Backyard Bridge off Farnum		1	✓					✓		0.3	-	7.3	10	-	90	Wood	
UPP20	Meetinghouse Ln		1				✓				4.5	3	-	-	-	90	CMP / HW, WW	
UPP21	310 Crum Ck Rd		1				✓				15	-	5	7	-	90	BCCMP / HW, WW	
UPP22	Crum Ck Rd Duck Pond		3				✓				1.2	1.5	-	-	-	90	CPP / HW	See diagram in
UPP23	Crum Ck Rd Near RT1		1	✓			3				1	2	-	-		90	concrete / HW	No obstruction
UPP24	RT1 over Crum Ck																	

MAR 26 '07

*UPP 12, UPP 13 were in Marple - UPP 14 - UPP 24 were relabeled to UPP 12 - UPP 22

FORM C

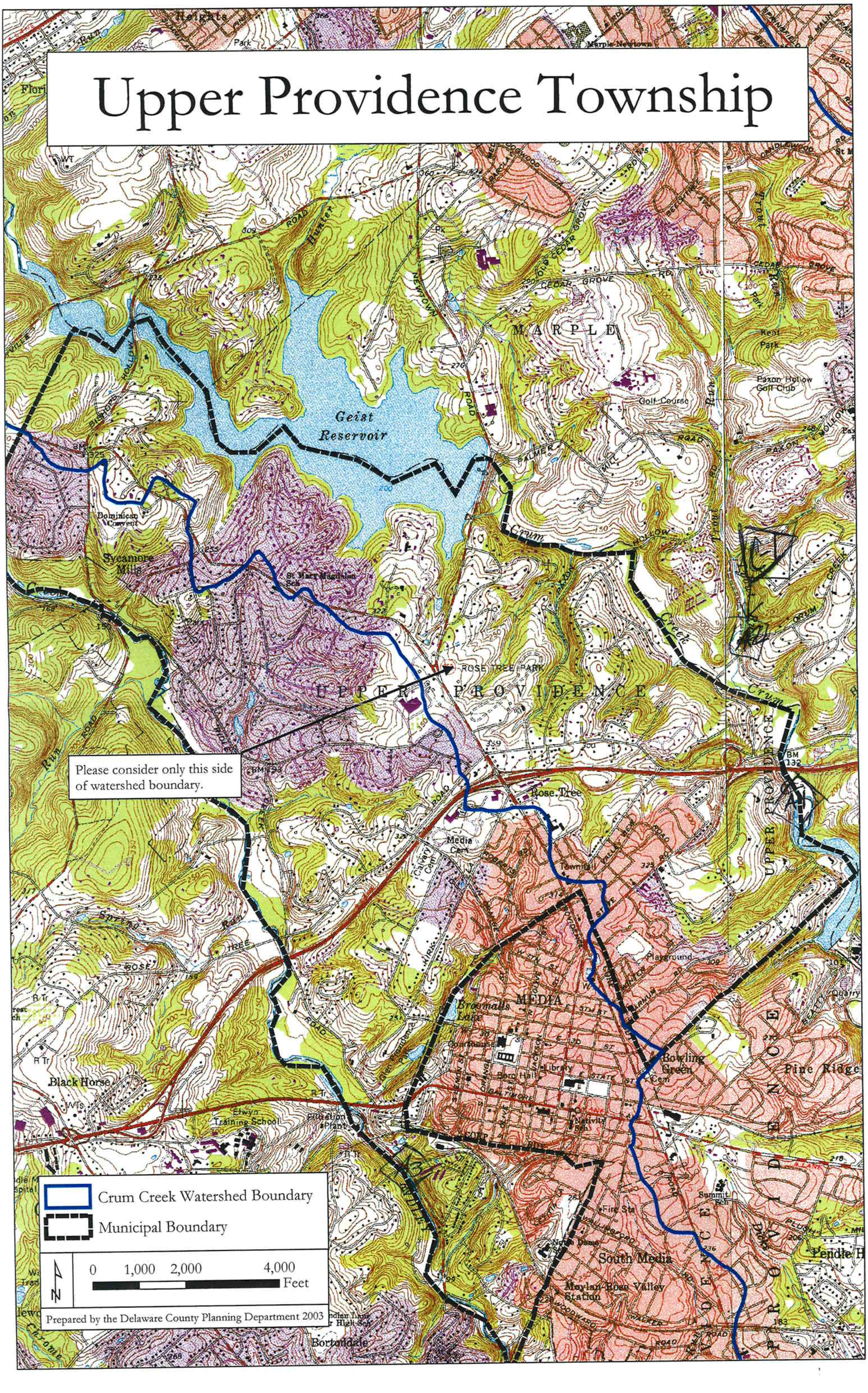
EXISTING FLOOD CONTROL PROJECT FORM C. SHEET 1 OF 1

WATERSHED	FORM COMPLETED BY	TYPICAL TYPES OF FLOOD CONTROL PROJECTS		
Name: CRUM CREEK	Name: ANTHONY HAMADAY	Channel Excavation / Widening	Levee	Dams
Municipality: UPPER PROVIDENCE	Telephone:	Channel Realignment	Gabions	Floodwall
County: DELAWARE	Date:	Rock Riprap	Pipe Channel	Concrete Lining

For County Use:

Map ID No.	Type of Flood Control Project	Year Constr Built	Expected Life Yrs.	Design Flood Frequency Yrs.	Design Flood Discharge C.F.S. (if known)	Owner Name, Address, and Phone
C- 1	HANSER BRIDGE RECONSTRUCTION	?	?	?		DELAWARE COUNTY
C-						
C-						
C-						
C-						

Upper Providence Township



WILLISTOWN TOWNSHIP

Willistown

FORM B - OBSTRUCTION DATA COLLECTION

Municipal Stream Obstruction Data

Watershed: Crum Creek

Municipality/County: Willistown / Chester

Records completed by: Brian Bruno

Field work personnel: " "

Date(s): 12/1 - 12/20/04

T= Amount of fill
D= Diameter
HT = Height
W = Width
PW = Pier Width

Material
msry = Stone Masonry Structure
CMP = Corrugated Metal Pipe
CPP = Corrugated Polyethylene Pipe
BCCMP = Bituminous Coated CMP
RCP = Reinforced Concrete Pipe
SP = Steel Pipe

Inlet Conditions
HW = Headwall
WW = Wingwall
SW = Sidewall

Map ID.	Owner or Address Of Obstruction	Capacity (CFS)	Nos. of?	Opening Type: Part of Bridge?	Opening Type: Culvert Purpose	Shape (✓) Culvert □	Shape (✓) Culvert o	Shape (✓) Culvert O	Shape (✓) Bridge ⌒	Shape (✓) Bridge ⊓	Measurements T (ft)	D (ft)	HT (ft)	W (ft)	PW (ft)	skew angle	MATERIAL / INLET CONDITION	NOTES
~~W-1~~	~~Rt 30~~		1				✓				18	3.3				90	~~SD / HW~~	
W-2	Devon Rd near Blvd		1					✓			2.5	—	4	6	—	90	BCCMP / HW, WW	Erosion on out side
W-3	[illegible]		1	✓					✓		2.5	—	*				MSry /	see back
W-4	Devon Rd / Warren Av		1			✓					2.5	—	3.25	7.3	—	90	MSry / HW	
W-5	Eisenhower Dr / Vernon Ln		1				✓				6	5	—	—	—	90	RCP / HW, WW	Clogged
W-6	Eisenhower Dr		1				✓				1	4	—	—	—	90	RCP / HW, ½ WW	
W-7	Marlin Dr		1					✓			1	—	3.5	5	—	90	RCP / HW, WW	
W-8	Devon Rd Near Paoli		1				✓				1	4	—	—	—	90	CMP	
W-9	Devon Rd Near School		1				✓				2	5	—	—	—	90	RCP / HW, WW	
W-10	Abby Rd		1			✓					.3	—	3	6	—	90	MSry / HW, WW	
W-11	Grub Rd S		1	✓						✓	1.5	—	4	10	—	90	MSry / HW	
W-12	Grub Rd N .5 mi		1	✓						✓	.75	—	4	8	—	90	MSry / HW, 3 WW	
W-13	Colonial Way		1					✓			2		3	4.5	—	90	CMP / HW, WW	
W-14	30 ft upstream ↑		1	✓						✓	.25	—	3.75	3.5	—	90	MSry / HW	small footbridge
W-15	Paoli PK		1	✓						✓	2.3	—	3.5	5.1	—	90	MSry / HW	
W-16	Malvern Prep School		1					✓			2	—	4.5	6	—	90	BCCMP / HW, WW	
W-17	~~Malvern Prep [illegible]~~																	No obstruction
W-18	Warren Rd		1			✓					.7	—	4	10	—	90	MSry / HW, WW	
W-19	Eisenhower Rd #3		1				✓				0	5	—	—	—	90	RCP /	
W-20	" " #4		1				✓				0	5				90	RCP	
W-21	Long Lane		1					✓			.7	—	3	5	—	90	RCP / HW	
W-22	Forest Lane		2					✓			1.5	—	2.3	4	—	90	CMP / HW	2 Pipes
W-23	Strathmore Lane S		1				✓				4.3	4.5	—	—	—	90	RCP / HW, WW	
W-24	S Salisbury Lane		1				✓				2.5	3.5	—	—	—	90	RCP / HW, WW	
W-25	Remington Rd		1			✓					3	—	3	10	—	90	M Sry / HW, WW	
W-26	Brampton Chase Dr		1					✓			.7	—	3.75	4.75	—	90	CMP / HW, WW	
W-27	Sugartown Rd		1					✓			1.5	—	3	4.5	—	90	CMP /	Bank Erosion around Pipe
W-28	[illegible] way [illegible]		1				✓				1.5	.75	—	—	—	90	RCP	Grassy Channel
W-29	Spring Rd		1				✓				2.75	3	—	—	—	90	CMP	
W-30	Spring Rd		2					✓			5	—	3.5	5	—	90	CMP's	2 pipes, lots of debris
W-31	Laurel Circle Big		2					✓			.5	—	4	6	—	90	CMP	1 main pipe, 1 overflow
	Little pipe						✓				1.5	2	—		—	90	CMP	
W-32	Laurel Circle (Big)		2					✓			.5	—	4	6	—	90	CMP	Main pipe
	Little						✓				1	2	—	—	—	90	CMP	overflow
W-	Gallery Rd		1	✓					✓		2	—	*	16.5	—	90	MSRY	

* WIL 1 was skipped, WIL 2-76 were relabeled to WIL 1-75

Willistown (WIL)

FORM B - OBSTRUCTION DATA COLLECTION

SHEET 1 OF 15

Municipal Stream Obstruction Data

Watershed: Crum Creek

Municipality/County: Willistown/Chester

Records completed by: Brian Bruno

Field work personnel: ______

Date(s): 12/1 - 12/20/04

T= Amount of fill
D= Diameter
HT = Height
W = Width
PW = Pier Width

Material
msry = Stone Masonry Structure
CMP = Corrugated Metal Pipe
CPP = Corrugated Polyethylene Pipe
BCCMP = Bituminous Coated CMP
RCP = Reinforced Concrete Pipe
SP = Steel Pipe

Inlet Conditions
HW = Headwall
WW = Wingwall
SW = Sidewall

Map ID.	Owner or Address Of Obstruction	Capacity (CFS)	Nos. of?	Opening: Type: Part of Bridge?	Culvert Purpose	Shape (✓): Culvert □	Culvert O	Culvert ⬭	Bridge ⌒	Bridge ⊓	Measurements: T (ft)	D (ft)	HT (ft)	W (ft)	PW (ft)	skew angle	MATERIAL / INLET CONDITION	NOTES
WIL 34	Andrews Rd downstream		1					✓			.25	–	4	6	–	100	BCCMP / HW	
WIL 35	Driveway 100 ft down		1	✓						✓	1.75	–	3.3	15	–	90	MSRY / WW	
WIL 36	Andrews Rd / Harvest Dr		1					✓			1.3	–	3.5	5.25	–	90	BCCMP / HW	
WIL 37	Devon Rd Vocket Sugartown		3			✓		2			1.2		*			90	MSRY / HW	
WIL 38	Peters Nursery		3					3			0		2.3	3.6		90	BCCMP	See Diagram
WIL 39	Pond across from A–		1				✓				0	2	–	–	–	90	RCP	overflow nothing to happen
WIL 40	Warren Rd (637)		1					✓			.5	–	2	3	–	90	SP	(corroded)
WIL 41	Unknown Rd off Warren		1					✓			0	–	4	6	–	90	SP	
WIL 42	Warren Ave South		1	✓						✓	2.5	–	5.5	23	–	90	Concrete	
WIL 43	Little Valley Farm		1	✓						✓								NO OBSTRUCTION
WIL 44	10 Huntclub lane		1					✓			1	–	4	6	–	90	CMP	
WIL 45	9 Huntclub lane		1				✓				1.5	2	–	–	–	100	BCCMP	
WIL 46	Barr Rd WEST		1					✓			1.2	–	2.5	4	–	90	CMP	
WIL 47	Stillmeadow Farm		1	✓					✓		2	–	*	5.1	–	90	MSRY	
WIL 48	Hillview Rd		1	✓						✓	.8	–	7	57	2	90	MSRY	1 pier in center
BNL 49	Hillview Rd		1			✓					1.3	–	1.4	2	–	90	Stone	water dropped from culvert
WIL 50	" " 150' from [illegible]		1					✓			.5	–	4.5	3		80	CMP	2 pipes
WIL 51	730 Hillview Rd		1				✓				1.5	2	–	–	–	90	SP	
WIL 52	732 Hillview Rd		1														Can't see pipe / leaves blocking [illegible]	
WIL 53	Whitehorse (bet. [illegible]) Rd		1	✓					✓		0	–	*	24	–	90	MSRY / WW	
WIL 54	Davis Rd		1	✓						✓	0	–	9.5	30	–	90	Concrete / WW	
WIL 55	Davis Rd		1				✓				1	2	–	–	–	90	CMP	
WIL 56	5 Brooke Ln		1					✓			.5	–	6	7	–	90	CMP / HW, WW	
WIL 57	13 Brooke Ln		1				✓				1	2.5	–	–	–	90	Concrete	
WIL 58	Duff[illegible]		1	✓					✓		.5	–	x	12	–	90	MSRY / HW, WW	
WIL 59	[illegible] farm bridge			✓						✓	1	–	4	8	–	90	Wood	
WIL 60	[illegible] Mill Rd		1				✓				1	2	–	–	–	90	CMP	
WIL 61	Whitehorse Rd			✓						✓	2.7	–	4.5	31	2	90	Concrete / HW / WW	1 Pier
WIL 62	140 [illegible] Rd		1				✓				2.8	2	–	–	–	90	CMP	
WIL 63	[illegible] Rd		1	✓						✓	1.5	–	4.5	8	–	90	MSRY / SW	
WIL 64	[illegible] Mills / [illegible]		1	✓						✓	0	–	10	40	–	90	Concrete / HW, WW	
WIL 65	[illegible] Rd							✓			2		2.5	4.5	–	90	CMP	
WIL 66	[illegible] Rd culvert		1			✓					2	–	3	5.5	–	90	MSRY	very clogged
WIL 67	" " Bridge		1	✓						✓	.5	–	6	23	–	90	Concrete	
WIL 68	[illegible] Creek Rd Bridge		1	✓						✓	2.2	–	10	40	–	90	Metal / concrete / WW	
WIL 69	[illegible] Horse		1				✓				1.4	1.5	–	–	–	90	CPP	

WIL

FORM B - OBSTRUCTION DATA COLLECTION

SHEET 13 OF ______

Municipal Stream Obstruction Data

Watershed: Crum Creek

Municipality/County: Willistown / Chester

Records completed by: Brian Bruno

Field work personnel: ______

Date(s): 12/1 - 12/20/04

T = Amount of fill
D = Diameter
HT = Height
W = Width
PW = Pier Width

Material
mary = Stone Masonry Structure
CMP = Corrugated Metal Pipe
CPP = Corrugated Polyethylene Pipe
BCCMP = Bituminous Coated CMP
RCP = Reinforced Concrete Pipe
SP = Steel Pipe

Inlet Conditions
HW = Headwall
WW = Wingwall
SW = Sidewall

				Opening: Type		Opening: Shape (✓)					Measurements							
						Culvert			Bridge									
Map ID.	Owner or Address Of Obstruction	Capacity (CFS)	Nos. of?	Part of Bridge?	Culvert Purpose	□	○	⬭	⌒	⊓	T (ft)	D (ft)	HT (ft)	W (ft)	PW (ft)	skew angle	MATERIAL / INLET CONDITION	NOTES
WIL 70	White Horse Rd		1				✓				1	2	—	—	—	90	CMP / HW	
WIL 71	675 White Horse		1				✓				0	1.2	—	—	—	90	CBD	NO Channel
WIL 72	Marborough Rd		1				✓				1.2	2	—	—	—	90	BCCMP / SW	
WIL 73	Goshen Rd						✓				2	4	—	—	—	90	RCP / HW, WW	
WIL 74	Goshen Rd Camelia Lane		1	✓						✓	4.5	—	8	6	—	90	Concrete / WW	
WIL 75	" " covered bridge		1	✓						✓	4.5	—	8	6	—	90	Wood	
WIL 76	Goshen Rd		1				✓				2.8	2.6	—	—	—	90	CMP	Rd work
WIL 77																		

Form O - Outfall Data

Person: Dave Edge Date: 12-22-03 Time Since Last Rain was ≥ 72 Hours: Yes ✓

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 4

Municipality: Willistown Twp Name of receiving water: Crum

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
1	1	yes	9:45	18	0	52	65		NO	NO	Res	0
2	2	yes	10:00	61	7½	40	72		yes	NO	Res	0
3	3	yes	10:15	18	0	31	36		yes	NO	Res	0
4	4	yes	10:30	18	0	24	42		NO	NO	Res	0
5 5	5	yes	10:30	Swale	0	48	84		NO	NO	Res	0
5 6	6	yes	10:30	Swale	0	36	30		NO	NO	Res	0
7	7	yes	10:35	12	0	20	48		NO	NO	Res	0
8	8	yes	10:45	14x24	0	72	84		NO	NO	Res	0
9	9	yes	10:50	18	0	36	48		NO	NO	Res	0

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Form O - Outfall Data

Person: Dave Edger Date: 12-22-03 Time Since Last Rain was ≥ 72 Hours: Yes ✓

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 4

Municipality: Willistown Twp. Name of receiving water: Crum

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area. R	Rating (0-2)
10	10	yes	11:00	38x21	0	72	108		NO	0	Res	0
10	11	yes	11:00	38x21	0	72	108		NO	0	Res	0
11	12	yes	11:15	Swale	0	6	36		NO	0	Res	1
11	13	yes	11:15	Swale	0	6	36		NO	0	Res	1
12	14	yes	11:20	Swale	0	6	36		NO	0	Res	0
12	15	yes	11:20	Swale	0	6	36		NO	0	Res	0
13	16	yes	11:30	20x15					NO	0	Res	0
	17	yes	11:30	Swale		10	36		NO	0	Res	0
	18	yes	11:30	Swale		10	36		NO	0	Res	0

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Form O - Outfall Data

Person: Dave Edger Date: 12-22-03 Time Since Last Rain was ≥ 72 Hours: Yes ✓

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 4

Municipality: Wallstown Twp Name of receiving water: Creek

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
13	19	yes	11:30	18x21	0	—			0	0	Res	0
14	20	yes	11:40	19x20	0	—			0	0	Res	0
	21	yes	11:40	19x20	0	—			0	0	Res	0
				Swale	0	—	24x6		0	0	Res	0
				Swale	0	—	24x6		0	0	Res	0
15	22		11:45	10x24								
	23		11:45	Swale			24x6					
	24		11:45	10x24								
	25		11:45	Swale			24x6					

↑ ?

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Form O - Outfall Data

Person: Dave Edge Date: 12-22-03 Time Since Last Rain was ≥ 72 Hours: Yes V

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 4

Municipality: Willis Town Twp Name of receiving water: Crum

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)	
16	26	Yes	1:10	9x24	0	—	120		NO	0	Res	0	
	27	Yes	1:10	12x24	0	—	120		NO	0	Res	0	
17	[redacted]	Yes	1:15	10	2	12	48		yes	0	Res	0	1?
18	28	Yes	1:30	2/15	6	72	84		yes	0	Res	0	1?
19	30	Yes	1:35	15	9	32	66		yes	0	Res	0	1?
20	~~32~~	Yes	1:45	24x34	2	48	84		yes	0	FARM	0	1?
21	31 ~~32~~	Yes	1:50		20	48	84		yes	0	Res	2	1
22	33	Yes	2:00	15	0	39	—	—	NO	0	Res	0	
23	34	Yes	2:05	15	0	30'	50'		NO	0	Res	0	

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Form O - Outfall Data

Person: Dave Edge Date: 12-22-03 Time Since Last Rain was ≥ 72 Hours: Yes ✓

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 4

Municipality: Willistown Twp Name of receiving water: Crum

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
24	35	yes	2:10	Swale	0	8	48		NO	0	FARM	0
25	36	yes	2:15	Swale	0	—	—		NO	0	FARM	0
26	37	yes	2:25	15x19	0	44	—		NO	0	FARM	0
27	38	yes	2:30	16	0	28	64		NO	0	Res	0
	39	yes	2:30	Swale	0	30	72		NO	0	Res	0
28	40	yes	2:50	19x36	1	50	108		yes	0	Res	0

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Form O - Outfall Data

Person: Dave Edge Date: 12-22-03 Time Since Last Rain was ≥ 72 Hours: Yes ✓

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 4

Municipality: Willistown Twp Name of receiving water: Crum

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
1	1	yes	9:45	18	0	52	65		NO	NO	Res	0
2	2	Yes	10:00	61	7½	40	72		yes	NO	Res	0
3	3	yes	10:15	18	0	31	36		yes	NO	Res	0
4	4	yes	10:30	18	0	24	42		NO	NO	Res	0
5 5	5	yes	10:30	Swale	0	48	84		NO	NO	Res	0
5 6	6	yes	10:30	Swale	0	36	30		NO	NO	Res	0
7	7	Yes	10:35	12	0	20	48		NO	NO	Res	0
8	8	Yes	10:45	14x24	0	72	84		NO	NO	Res	0
9	9	yes	10:50	18	0	36	48		NO	NO	Res	0

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Form O - Outfall Data

Person: Dave Edger Date: 12-22-03 Time Since Last Rain was ≥ 72 Hours: Yes ✓

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 4

Municipality: Willistown Twp Name of receiving water: Crum

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area. A	Rating (0-2)
10	10	yes	11:00	38x21	0	72	108		NO	0	Res	0
10	11	yes	11:00	38x21	0	72	108		NO	0	Res	0
11	12	yes	11:15	Swale	0	6	36		NO	0	Res	1
11	13	yes	11:15	Swale	0	6	36		NO	0	Res	1
12	14	yes	11:20	Swale	0	6	36		NO	0	Res	0
12	15	yes	11:20	Swale	0	6	36		NO	0	Res	0
13	16	yes	11:30	20x15					NO	0	Res	0
	17	yes	11:30	Swale		10	36		NO	0	Res	0
	18	yes	11:30	Swale		10	36		NO	0	Res	0

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Form O - Outfall Data

Person: Dave Edger Date: 12-22-03 Time Since Last Rain was ≥ 72 Hours: Yes ✓

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 4

Municipality: Wallstown Twp Name of receiving water: Coon

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
13	19	yes	11:30	18x21	0	—			0	0	Res	0
14	20	yes	11:40	19x20	0	—			0	0	Res	0
	21	yes	11:40	19x20	0	—			0	0	Res	0
				Swale	0	—	24x6		0	0	Res	0
				Swale	0	—	24x6		0	0	Res	0
15	22		11:45	10x24								
	23		11:45	Swale			24x6					
	24		11:45	10x24								
	25		11:45	Swale			24x6					

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Form O - Outfall Data

Person: Dave Edge Date: 12-22-03 Time Since Last Rain was ≥ 72 Hours: Yes V

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 4

Municipality: Willis Town Twp Name of receiving water: CBUM

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
16	26	Yes	1:10	9x24	0	—	120		NO	0	Res	0
	27	Yes	1:10	12x24	0	—	120		NO	0	Res	0
17	28	Yes	1:15	10	2	12	48		yes	0	Res	0
18	29	Yes	1:30	2/15	6	72	84		yes	0	Res	0
19	30	Yes	1:35	15	9	32	66		yes	0	Res	0
20	31	Yes	1:45	24x34	2	48	84		yes	0	FARM	0
21	32	Yes	1:50		20	48	84		yes	0	Res	2
22	33	Yes	2:00	15	0	39	—	—	NO	0	Res	0
23	34	Yes	2:05	15	0	30'	50'		NO	0	Res	0

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

2=Impairment - needs investigation (flow exhibiting odors, foam, solids, turbidity or oil sheen, considerable sediment depositoin, algae or debris, pipe collapsed or crumbling, blocked catch basins or drain)

H/V = Horizontal to vertical ratio

*1:1 = Vertical - rectangular channel

NOTES:

Form O - Outfall Data

Person: Dave Edge Date: 12-22-03 Time Since Last Rain was ≥ 72 Hours: Yes ✓

Quantity of Last Rain: < 0.1 inches: > 0.1 inches Days Since Last Rain 4

Municipality: Willistown Twp Name of receiving water: CREEK

Pipe Swale #	Photo #	Storm Drain? Yes/No Not sure	Time (00:00) am/pm	Pipe Diameter (inches)	Depth of flow in pipe (feet)	Channel Depth	Channel Bottom Width (feet)	Channel Side Slopes* (H:V)	Flow Observed (Yes or no)	Water Color/Odor (specify if floatables, algae or sediment present)	Describe land use of upstream drainage area.	Rating (0-2)
24	35	yes	2:10	Swale	0	8	48		NO	0	FARM	0
25	36	yes	2:15	Swale	0	—	—		NO	0	FARM	0
26	37	yes	2:25	15x19	0	44	—		NO	0	FARM	0
27	38	yes	2:30	16	0	28	64		NO	0	Res	0
	39	yes	2:30	Swale	0	30	72		NO	0	Res	0
28	40	yes	2:50	19x36	1	50	108		yes	0	Res	0

Rating System:

0=No observed impairment (No dry weather flow, no solids, floatables or debris, no erosion or sediment, pipe in good repair)

1=Needs rechecking (some dry weather flow, moderate scouring or sediment deposition, some floatables or debris, odor, algae, pipe in poor condition)

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H/V = Horizontal to vertical ratio

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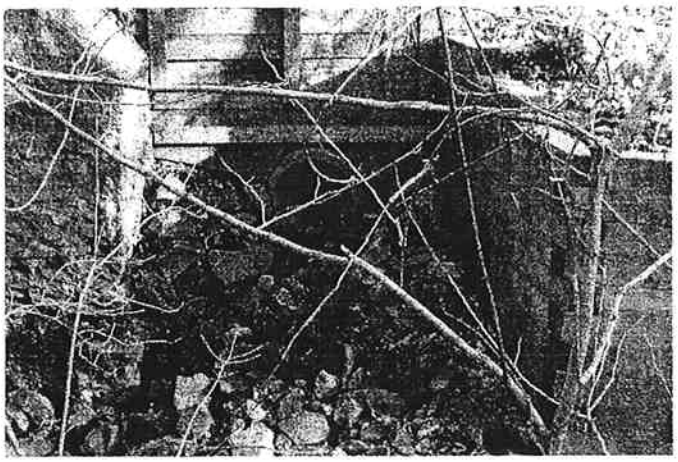

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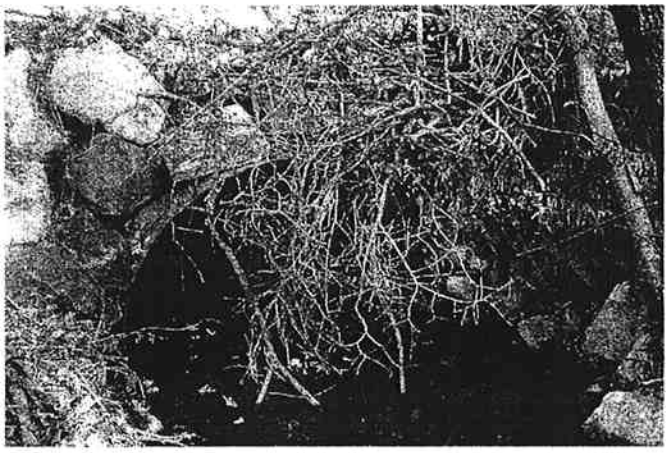

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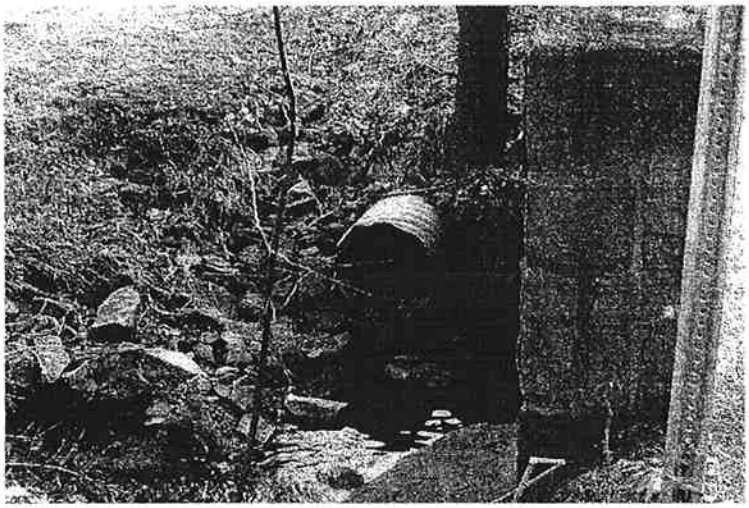

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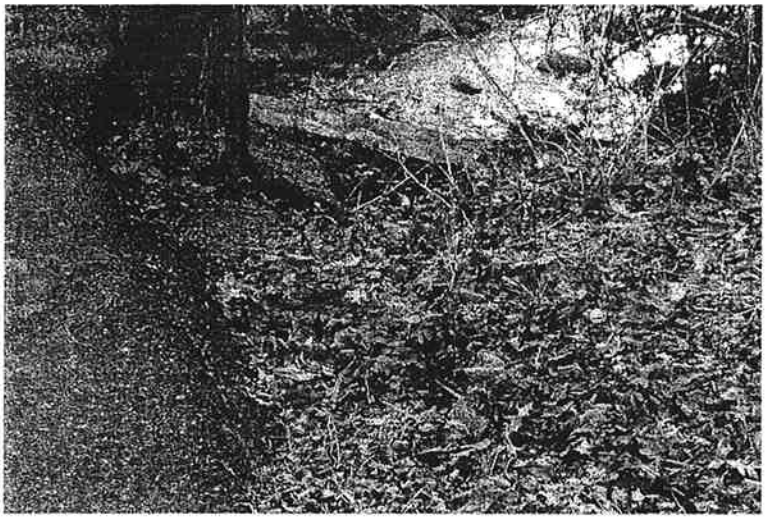

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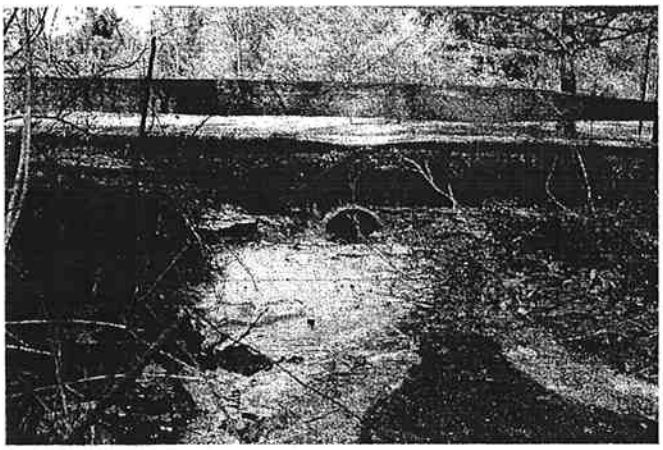

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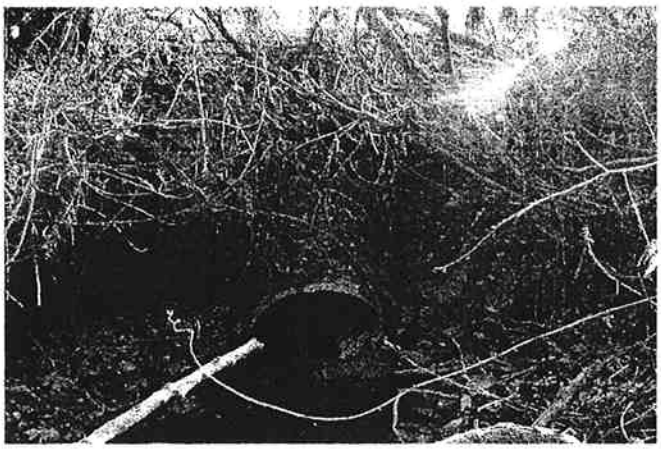

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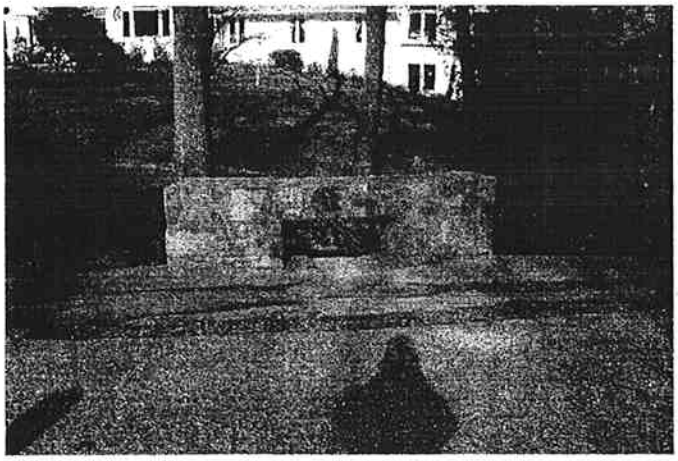

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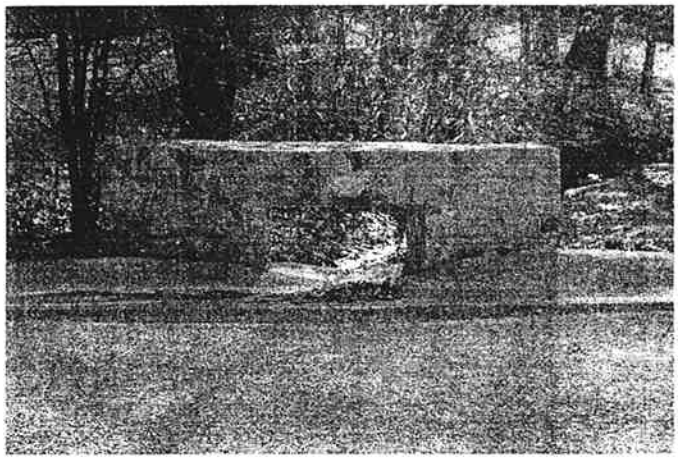

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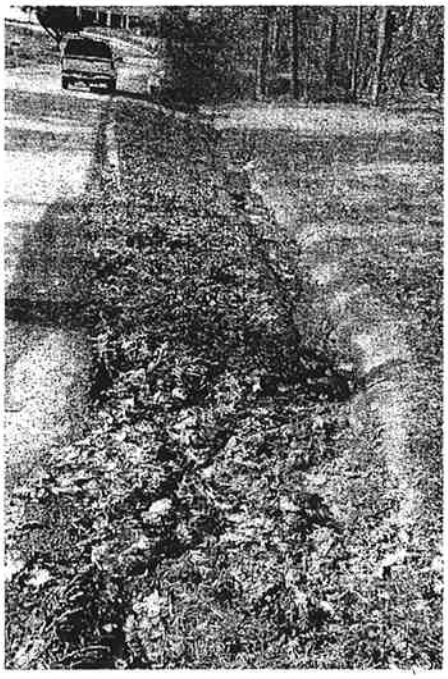

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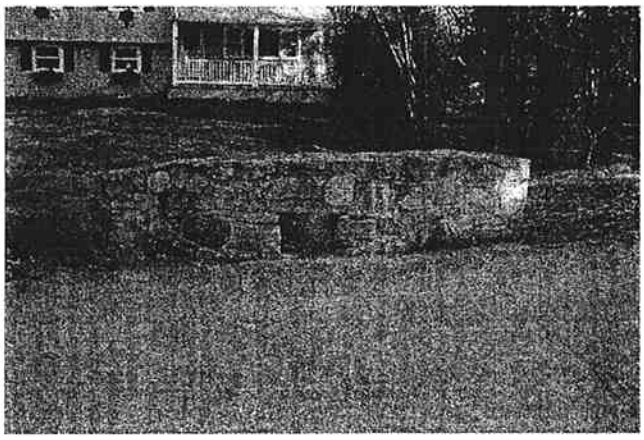

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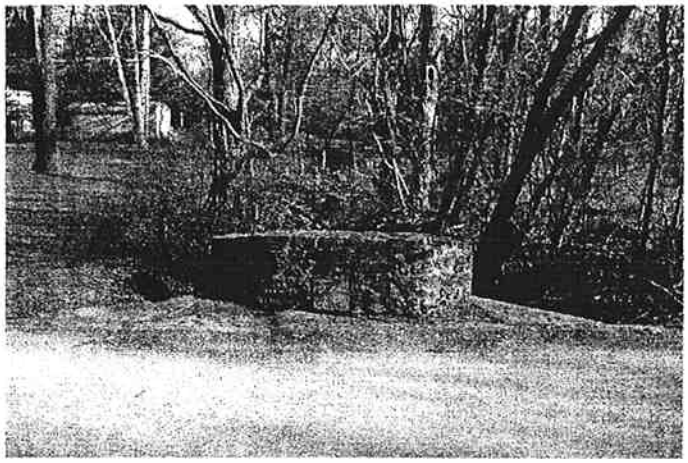

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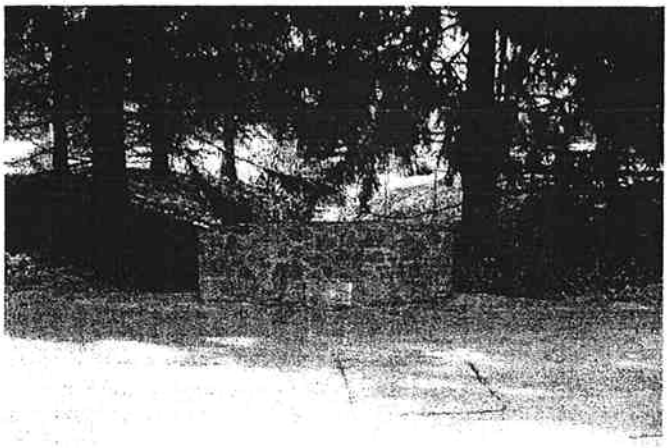

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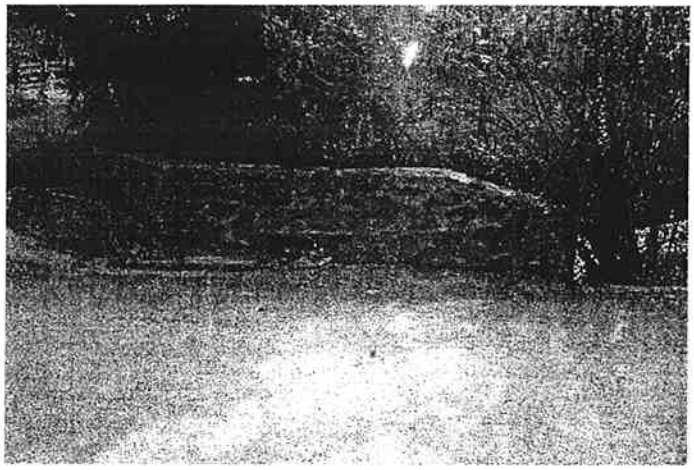

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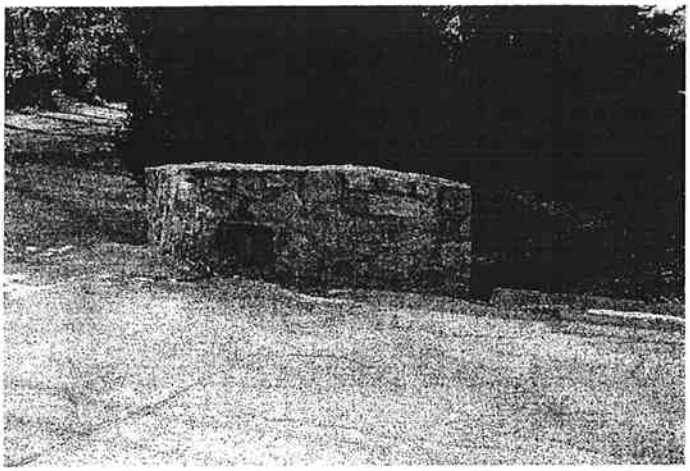

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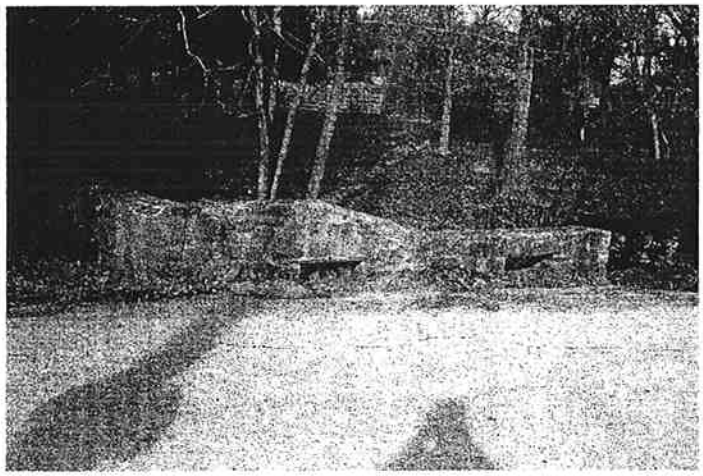

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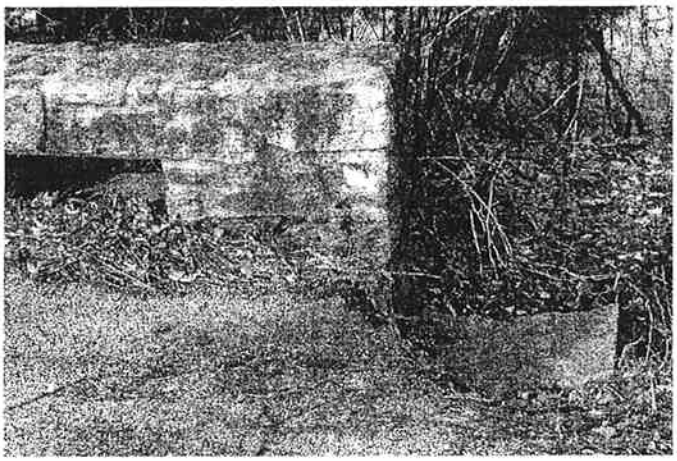

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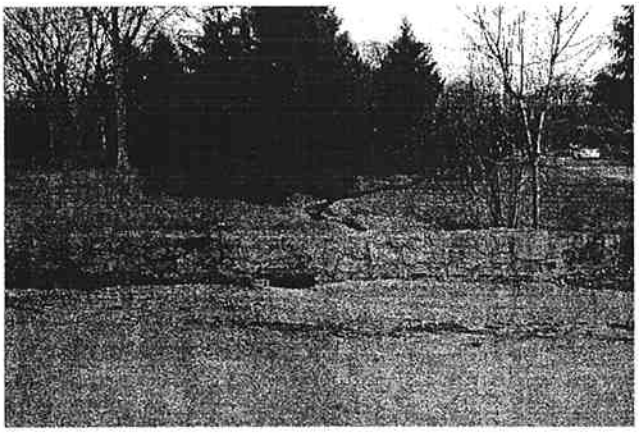

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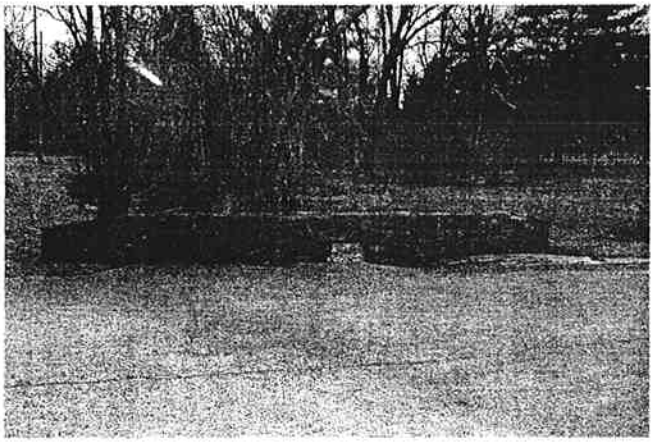

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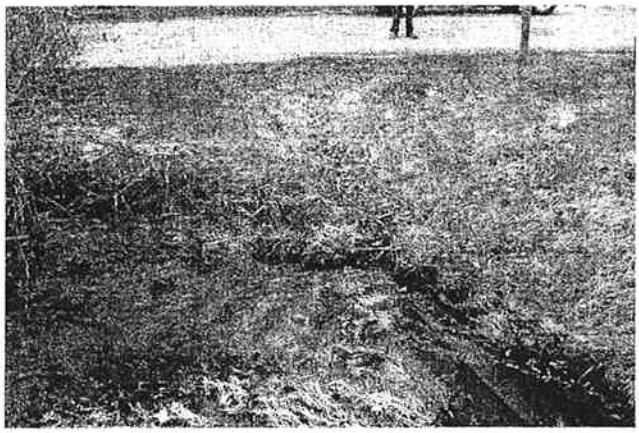

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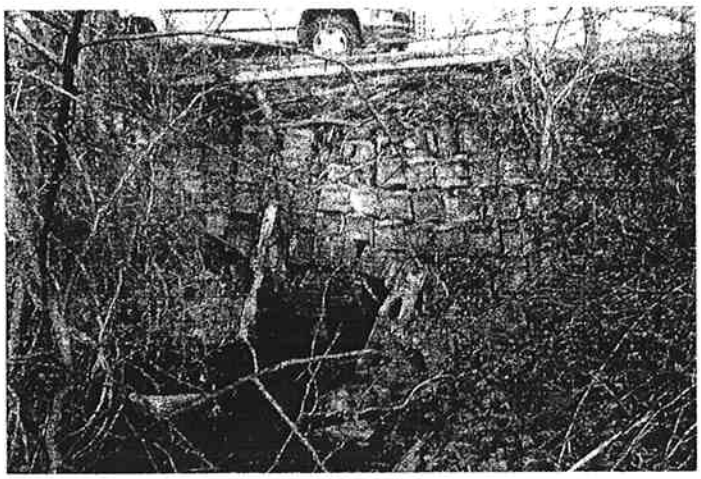

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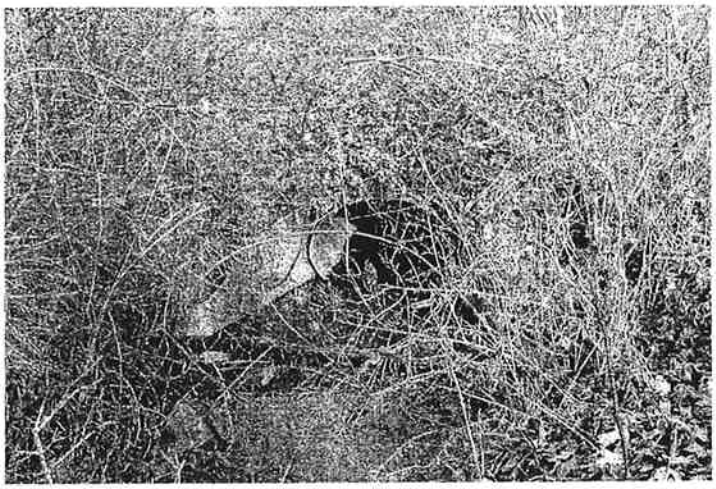

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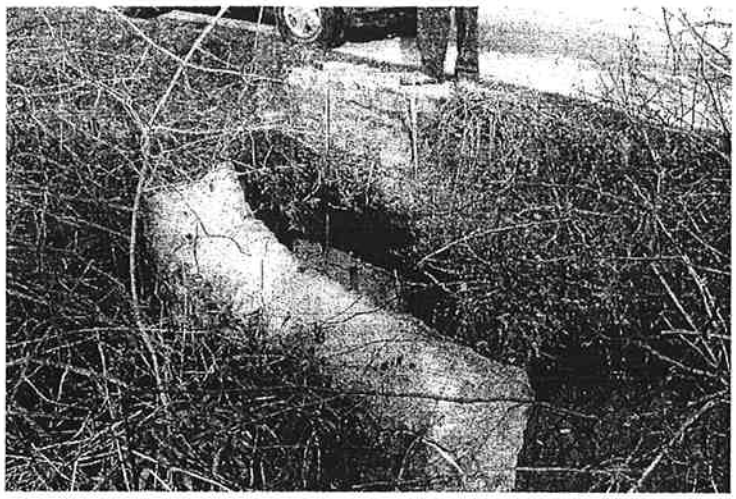

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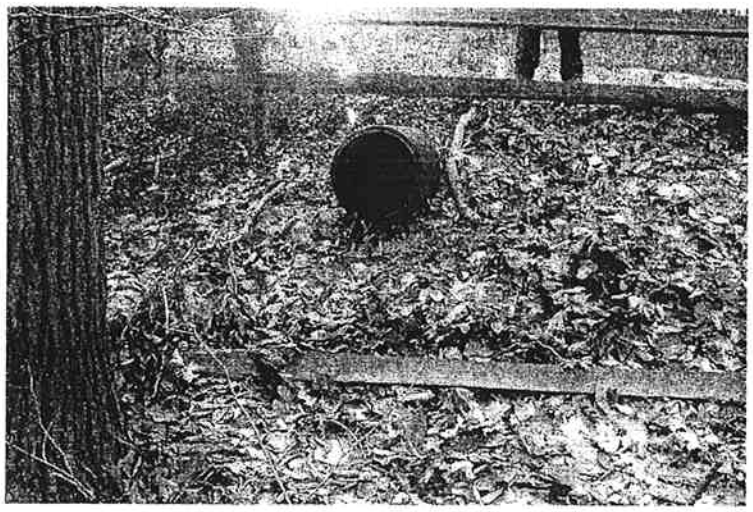

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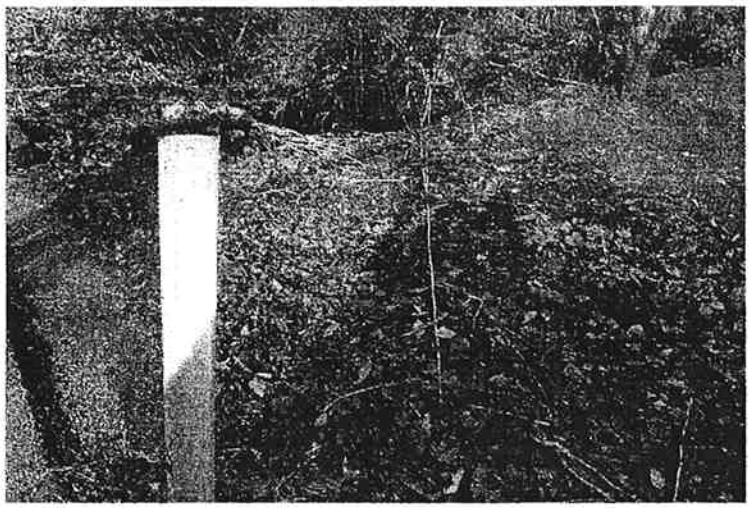

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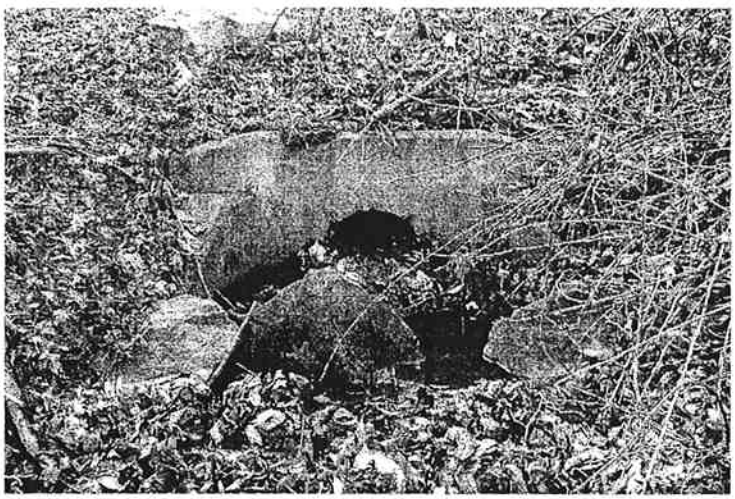

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FORM E - EXISTING STORM WATER CONTROL FACILITIES

SHEET 1 OF 1

WATERSHED	FORM COMPLETED BY	Definition of Storm Water Control Facility
Name: Crum Creek	Name: Brian Bruno	A natural / man-made device or structure specifically designed and / or utilized to reduce the rate and / or volume of storm water runoff from a site or sites.
Municipality:	Telephone:	
County: Delaware / Chester	Date: 12/1/04 - 12/20/04	

For County Use:

	Map ID No.	Type of Storm Water Control Facility	Year Built	Contact Person	Address and Phone	Comments
MAR001	E- 1	Detention Pond	2003	(MARPLE)	Spring lake Village	
TRE002	E- 2	Detention Pond	Newer lookin	(TREDYFFRIN)	Kaimen Communities	Condos on Terraced Hill
WIL001	E- 3	Detention Pond	" "	(WILLISTOWN)	Meadowbrook Farm	Small upscale housing development
WIL002	E- 4	Detention Pond	" "	(WILLISTOWN)	The village of Penn Wyck	Housing off Sugartown Rd
EAS001	E- 5	" "	" "	(EASTTOWN)	The Greens @ Waynesborough / Inverness Ln	Development off Grubb Mills Rd
NEW005	E- 6	" "	" "	(NEWTOWN)	Winding Way off 252 Near rt 3	
NEW004	E- 7	" "	" "	(NEWTOWN)	Sharon Brook Lane	Springton Point Estates
EDG001	E- 8	" "	" "	(EDGEMONT)	Ridleway / Saddle Run	
UPP001	E- 9	" "	" "	(UPPER PROVIDENCE)	Courtyard Rd off Bishop Hollow	Indian Springs Estates
NET001	E- 10	" "	?	(NETHER PROVIDENCE)	MTP. along Dicks Run - NP	
NEW008	E- 11	" "	Newer lookin	NEWTOWN	Dunwoody Complex off RT 3	
NEW	E- 12	Detention / Sedimentation basin	2004 ?	(NEWTOWN)	Excaliber Drive / Troop Farm Rd off 252	New Development / Several Basins
NEW007	E- 13	" " basin	100% NEW	(NEWTOWN)	Camelot Lane off 252	" "
MAR002	E- 14	Detention Pond	" "	(MARPLE)	Back Hill Rd / Harvest Ln	" "
SPR001	E- 15	" "	" "	(SPRINGFIELD)	Country Club Rd off 320	Near Hospital
	E-					
	E-					
	E-					
	E-					
	E-					
	E-					
	E-					

TYPICAL TYPES OF STORM WATER CONTROL FACILITIES

Detention / Retention Basin	Roof-Top Storage
Natural Pond or Wetland	Semi-Pervious Paving
Parking Lot Pondling	Infiltration Device (Seepage /Recharge Basin or Underground Tank)

MARPLE (2) EASTTOWN (1) EDGEMONT (1) NETHER PROVIDENCE (1) NEWTOWN (5) WILLISTOWN (2)
UPPER PROVIDENCE (1) TREDYFFRIN (1) SPRINGFIELD (1)

E. INFILL - REDEVELOPMENT CRITERIA

APPENDIX E

INFILL - REDEVELOPMENT CRITERIA

Table of Contents

I. INTRODUCTION

The following is an investigation into methods employed by various municipalities across the nation to address the issue of stormwater management in areas of redevelopment or infill. Ordinances were reviewed from the states of Maryland and Georgia as well as ordinances from the cities of Seattle, WA and Portland, OR and the Chester Creek Watershed in Delaware County, PA. These ordinances were reviewed to determine if there is a consensus on how stormwater runoff from redeveloping areas should be addressed from a water quantity and quality perspective.

II. SUMMARY

The five ordinances reviewed varied significantly in the way stormwater issues were addressed. A brief summary of the stormwater quantity and quality criteria from each ordinance is included in the paragraphs below.

1. Maryland

Runoff Quantity Controls

There are no specific criteria to be met within the ordinance to address recharge, channel protection storage volumes or overbank flood protection volumes unless specified by the approving agency.

Runoff Quality Controls

In areas of redevelopment, there are three options to address stormwater runoff quality:

Reduce existing site impervious areas by 20%

If site conditions prevent a reduction in impervious areas, provide water quality control for at least 20% of the sites impervious area.

A combinations of 1 & 2 can be employed for impervious reductions between 0% and 20%. The combination of impervious area reduction and area control by a stormwater management practice must equal or exceed 20%.

Notes: No explanation is provided as to where the 20% impervious area reduction was determined.

2. City of Seattle, WA

Runoff Quantity Controls

For redevelopment sites less than 9,000 sq. feet, the peak discharge rate from pervious and impervious surfaces shall not exceed 0.2 cfs per acre under the 25- year design storm. For redevelopment sites greater than 9,000 sq. feet, the peak discharge rate from pervious and impervious surface shall not exceed 0.15 cfs per acres under the 2- year design storm AND shall not exceed 0.2 cfs per acre under the 25- year design storm.

Runoff Quality Controls

No specific criteria is sited for runoff quality control, however is required to "control the sources of sediment and other contaminants and pollutants that could enter drainage water" by use of temporary and permanent best management practices.

Notes: No explanation is provided as to where the 9,000 sq. foot area limit was determined, or where peak allowable flow rates were developed.

3. City of Portland, OR

Runoff Quantity Controls

Control of on site flows to maintain peak flows at the pre- development (defined as a site's ground cover prior to development, "i.e. Lewis & Clark days") for the 2-, 5-, and 10- year storm events.

Runoff Quality Controls

Criteria requires a 70% reduction of TSS from runoff generated by a design storm up to and including 0.83 inches of rainfall over a 24- hour period.

4. Georgia

Minimum standards for redevelopment sites are same as standards for new development, as follows:

Runoff Quantity Controls

24- hour extended detention of the 1- year, 24- hour storm event; post development to pre development rate control for the 25- year, 24- hour storm event.

Runoff Quality Controls

Stormwater management systems must be designed to remove 80% of the average post-development TSS load. If facility is designed to capture and treat the water quality volume (defined as the first 1.2 inches of rainfall from a site), the facility is considered adequate.
Notes

"Pre- development conditions" is not defined in the case of redevelopment, therefore it could not be determined if existing impervious areas are included in the runoff calculations.

5. Chester Creek

Runoff Quantity Controls

Runoff quantity control is accomplished by determining the pre-development RCN value or Rational "C" value from a provided chart to reflect existing conditions less restrictive than "meadow on B

class soils" (Chester Creek soils are primarily HSG 'B') based on the percentage of exiting impervious cover. Post- development runoff must then meet pre- development rates based upon the given release rate criteria for the site.

Runoff Quality Controls

Water quality must be addressed using the following:

a. Infiltration
b. Extended detention
c. Implementation of additional design control

Riparian buffers are required where applicable (404.A.2).

Notes: Chart developed for "Adjusted" RCN or C values is based on the composite value of the impervious and pervious sections as follows:

for RCN Method: %imperv * 98 + %perv * 58 (meadow "B" soils)
for Rational Method: %imperv * 0.95 + %perv * 0.12 (Lawn, sandy soil, avg slope)

III. CONCLUSIONS

An ordinance which addresses development in an area where redevelopment is encouraged should provide the developer with some credit to consider on site exiting impervious conditions when determining the amount of stormwater runoff which should be stored or treated. If no credit is given, and the developer must design to meet pre- existing (i.e. no impervious cover) rates, the standards may discourage the use of redevelopment sites. However, this must be balanced with the desire to improve existing conditions as it relates to improving water quality and reducing potential flood damages to downstream areas.

Of the five ordinances reviewed, the Portland, OR criteria appears to present the most stringent standards to meet by requiring onsite flows for redevelopment sites to be limited to pre-existing (i.e. undeveloped) rates and no credit is given for existing on site impervious cover. The Seattle, WA criteria specifies target flow values which are site independent and again do not consider existing impervious cover. Both of these ordinances are considered to be strict criteria which may discourage redevelopment projects in areas where the developer has an option to use undeveloped sites. In areas where there are little undeveloped available lands and development pressures are high, these ordinances may be considered to reduce downstream flooding and water quality impacts.

Of the remaining ordinances, Georgia, Maryland & Chester Creek, the Georgia and Maryland criteria were not specific enough to determine if existing impervious cover was considered to be part of the pre- development conditions. However, the Chester Creek ordinance clearly considers existing impervious cover in the determination of pre development conditions. The charts developed for the Chester Creek ordinance are based upon assuming that the pre development site is underlain by "B" soils, which is somewhat conservative when determining the storage / treatment volumes for post development runoff, if the site were actually underlain by a "C" or "D" soil. The Chester Creek

ordinance also requires that water quality issues be addressed in the form of TSS reductions and groundwater recharge. The approach of this ordinance is more suitable for areas where developer have the option of choosing undeveloped sites for development, rather than redevelopment sites. The water quantity criteria coupled with then currently promoted water quality criteria should both encourage redevelopment projects while improving existing water quality concerns and flooding concerns, to a lesser degree. In areas where downstream flooding is a current problem, additional credits (i.e. exemption from water quantity criteria as in the MD ordinance) may be given to the developer is a reduction in total impervious area can be attained.

APPENDIX

1. Maryland

A. Definition

"Redevelopment" means any construction, alteration, or improvement exceeding 5,000 square feet of land disturbance performed on sites where existing land use is commercial, industrial, institutional, or multifamily residential.

B. When Stormwater Management Is Required

Redevelopment

1. An approving agency shall require that stormwater management be addressed for redevelopment. Proposed redevelopment project designs shall include:
   a. A reduction in impervious area;
   b. The implementation of stormwater management practices; or
   c. A combination of both §D (1) (a) and (b) of this regulation to result in an improvement to water quality.

2. Unless otherwise specified by watershed management plans developed according to §E of this regulation, all redevelopment projects shall reduce existing site impervious area by at least 20 percent.

3. Where site conditions prevent the reduction of impervious area, stormwater management practices shall be implemented to provide water quality control for at least 20 percent of the site's impervious area.

4. When a combination of impervious area reduction and stormwater management practice implementation is used for redevelopment projects, the combination of impervious area reduction and the area controlled by a stormwater management practice shall equal or exceed 20 percent.

5. An approval authority may allow practical alternatives where conditions prevent impervious area reduction or on-site stormwater management. Practical alternatives include, but are not limited to:
   a. Fees paid in an amount specified by the approving agency;
   b. Off-site BMP implementation for a drainage area comparable in size and percent imperviousness to that of the project;
   c. Watershed or stream restoration;
   d. Retrofitting; or
   e. Other practices approved by the appropriate authority.

6. The recharge, channel protection storage volume, and overbank flood protection volume requirements specified in the Design Manual do not apply to redevelopment projects unless specified by the approving agency.

7. On-site or off-site channel protection storage volume requirements as specified in the Design Manual may be imposed if watershed management plans developed according to §E of this regulation indicate that downstream flooding or erosion need to be addressed.

8. Variations of this redevelopment policy shall be approved by the Administration.

C. Redevelopment Provisions That Different From Requirement

An approving agency may develop quantitative waiver and redevelopment provisions for stormwater management that differ from the requirements of this chapter. These provisions shall be developed only as part of an overall watershed management plan. Watershed management plans developed for the purposes of implementing different stormwater management policies for waivers and redevelopment shall:

1. Include detailed hydrologic and hydraulic analyses to determine hydrograph timing;
2. Evaluate both quantity and quality management;
3. Include cumulative impact assessment of watershed development;
4. Identify existing flooding and receiving stream channel conditions;
5. Be conducted at a scale determined by the approving agency; and
6. Specify where on-site or off-site quantitative and qualitative stormwater management practices are to be implemented.

D. References

Title 26 DEPARTMENT OF THE ENVIRONMENT. Subtitle 17 WATER MANAGEMENT. Chapter 02 Stormwater Management. Authority: Environment Article, §4-203, Annotated Code of Maryland. 26.17.02.00.

E. URLs

https://constmail.gov.state.md.us/comar/dsd_web/comar_web/subtitle_chapters/26_Chapters.htm#Subtitle17

2. City of Seattle

A. Definition

All land disturbing activities or addition or replacement of impervious surface are required to comply with this section, even where drainage control review is not required. Exception: Maintenance, repair, or installation of underground or overhead utility facilities, such as, but not limited to, pipes, conduits and vaults, is not required to comply with the provisions of this section.

"Replaced impervious surface" or "replacement of impervious surface" means impervious surface that is removed down to earth material and a new impervious surface is installed.

"New development" means any of the following activities: Structural development, including construction of a new building or other structure; Expansion or alteration of an existing structure that results in an increase in the footprint of the building or structure; Land disturbing activities; Creation or expansion of impervious surface; Demolition; Subdivision and short subdivision of land as defined in RCW58.17.020.

B. When Compliance Is Required

Redevelopment

The portion of the site being redeveloped shall at least comply with the minimum requirements below. Projects exceeding 9,000 square feet of developmental coverage must also comply with the additional requirements. Compliance is required regardless of the type of redevelopment, and regardless of whether or not a permit is required. However, only those projects meeting the review thresholds set forth in Subsection B below must prepare and submit the required plans.

C. Minimum Requirements for All Projects

All projects must comply with the requirements of this subsection. Projects with more than 9,000 square feet of developmental coverage shall also comply with the requirements of additional requirement for larger project below. The Director of Construction and Land Use may also require projects with 9,000 square feet or less of developmental coverage to comply with the requirements set forth in additional requirement for larger project when necessary to accomplish the purposes of this Subtitle. In making this determination, the Director of Construction and Land Use may consider, but not be limited to, the following attributes of the site: location within an Environmentally Critical Area; proximity and tributary to an Environmentally Critical Area; proximity and tributary to an area with known erosion or flooding problems.

1. Discharge Point: The discharge point for drainage water from each site shall be selected as set forth in rules promulgated jointly by the Director of Seattle Public Utilities and the Director of Construction and Land specifying criteria, guidelines and standards for determining drainage discharge points to meet the purposes of this Subtitle. The criteria

shall include, but not be limited to, preservation of natural drainage patterns and whether the capacity of the drainage control system is adequate for the additional volume. For those projects meeting the review threshold, the proposed discharge point shall be identified in the drainage control plan required by paragraph C4 below, for review and approval or disapproval by the Director of Construction and Land Use.

2. Discharge Rate. To the extent practical, the peak drainage water discharge rate from pervious and impervious surfaces on the site shall not exceed 0.2 cubic feet per second per acre under design storm conditions. The Director of Construction and Land Use and the Director of Seattle Public Utilities may jointly promulgate rules modifying the discharge rate requirement for projects which will result in less than 2,000 square feet of new impervious surface. The Director of Construction and Land Use and the Director of Seattle Public Utilities may jointly promulgate rules allowing exceptions to the permissible peak discharge rate for property which discharges water directly to a designated receiving water or directly to a public storm drain which the Director of Seattle Public Utilities determines has sufficient capacity to carry existing and anticipated loads from the point of connection to a receiving water. The design storm used to determine detention volume necessary to obtain the required discharge rate shall be a storm with a statistical probability of occurrence of one in 25 in any given year. If the project is within an environmentally critical area, the design storm requirements of SMC Chapter 25.09, Regulations for Environmentally Critical Areas, shall be applied. The Director of Seattle Public Utilities and the Director of Construction and Land Use shall jointly adopt rules specifying the methods of calculation to determine the discharge rate. Where laws or regulations of the federal government or the State of Washington impose a more stringent requirement, the more stringent requirement shall apply.

3. Control Measures. During new development, redevelopment and land-disturbing activities, best management practices, as further specific din rules promulgated jointly by the Director of Seattle Public Utilities and the Director of Construction and Land Use, shall be used to accomplish the following:

   a. Control erosion and the transport of sediment from the site through measures such as mulching, matting, covering, silt fences, sediment traps and catch basins, settling ponds and protective berms;

   b. Permanently stabilize exposed soils that are not being actively worked, through such methods as the installation of permanent vegetative cover and installation of slope protective materials; and

   c. Control the introduction of contaminants and pollutants into, and reduce and treat contaminants in drainage water, drainage control facilities, surface water and groundwater, and the public drainage control system by methods such as covering of material stockpiles; proper disposal of hazardous materials; regular cleaning of catch basins, gravel truck loading and heavy equipment areas; spill control for fueling operations; sweeping; and maintaining erosion control protective features described above.

4. Drainage Control Plan. For those projects meeting the review thresholds set forth in Subsection B above and which are less than 9,000 square feet, the applicant shall submit a drainage control plan as set forth in rules promulgated jointly by the Director of Seattle Public Utilities and the Director of Construction and Land Use. Standard designs for drainage control facilities as set forth in the rules may be used. Projects exceeding 9,000 square feet must submit a comprehensive drainage control plan as set forth in Subsection D below. The Director of Construction and Land Use may impose additional requirements, including a comprehensive drainage control plan prepared by a licensed civil engineer, when the project has complex or unusual drainage, or when additional requirements are otherwise necessary to accomplish the purposes of this Subtitle.

5. Memorandum of Drainage Control. The owner(s) of the site shall sign a "memorandum of drainage control" that has been prepared by the Director of Seattle Public Utilities. Completion of the memorandum shall be a condition precedent to issuance of any permit or approval for which a drainage control plan is required. The memorandum shall not be required when the drainage control facility will be owned and operated by the City. A memorandum of drainage control shall include:

   a. The legal description of the site;

   b. A summary of the terms of the drainage control plan, including any known limitations of the drainage control facilities, and an agreement by the owners to implement those terms;

   c. An agreement that the owner(s) shall inform future purchasers and other successors and assignees of the existence of the drainage control facilities and other elements of the drainage control plan, the limitations of the drainage control facilities, and of the requirements for continued inspection and maintenance of the drainage control facilities;

   d. The side sewer permit number and the date and name of the permit or approval for which the drainage control plan is required;

   e. Permission for the City to enter the property for inspection, monitoring, correction, and abatement purposes;

   f. An acknowledgment by the owner(s) that the City is not responsible for the adequacy or performance of the drainage control plan, and a waiver of any and all claims against the City for any harm, loss, or damage related to the plan, or to drainage or erosion on the property, except for claims arising from the City's sole negligence; and

   g. The owner(s)' signatures acknowledged by a notary public. The applicant shall file the memorandum of drainage control with the King County Department of Records and Elections so as to become part of the King County real property

records. The applicant shall give the Director of Seattle Public Utilities proof of filing of the memorandum.

6. Flood-Prone Areas. Sites within flood prone areas must employ measures to minimize the potential for flooding on the site and for the project to increase the risk of floods on adjacent or nearby properties. Flood control measures shall include those set forth in other titles of the Seattle Municipal Code and rules promulgated there under, including but not limited to, SMC Chapter 25.06 (Floodplain Development) and Chapter 25.09 (Environmentally Critical Areas), and in rules promulgated jointly by the Director of Seattle Public Utilities and the Director of Construction and Land Use to meet the purposes of this subsection.

7. Natural Drainage Patterns. Natural drainage patterns shall be maintained.

8. Obstruction of Watercourses. Watercourses shall not be obstructed.

D. Additional Requirements for Large Projects

All projects exceeding 9,000 square feet of developmental coverage and those small projects identified by the Director according to subsection C above must comply with the requirements set forth in this subsection. These requirements are in addition to the requirements set forth in Subsection C above. When the Directors develop rules prescribing best management practices for particular purposes, whether or not those rules are adopted by ordinance, BMPs prescribed in the rules shall be the BMPs required for compliance with this Subsection. Best management practices shall include, but not be limited to: maintenance and housekeeping practices such as proper storage of oil barrels and other contaminant sources, covering material stockpiles, proper use and storage of hazardous materials, as well as constructed facilities such as detention tanks, wet ponds, extended detention dry ponds, infiltration, vegetated streambank stabilization, structural stabilization, catch basins, oil/water separators, grassed swales, and constructed wetlands.

1. In addition to detaining a 25-year storm to a release rate of 0.2 cubic feet per second per acre, the peak drainage water discharge rate from projects of more than 9,000 square feet of developmental coverage shall not exceed 0.15 cubic feet per second per acre in a two-year storm;

2. Control the sources of sediment and other contaminants and pollutants that could enter drainage water, including the selection, design and maintenance of temporary and permanent best management practices;

3. Minimize streambank erosion and effects on water quality in streams, including the selection, design and maintenance of temporary and permanent best management practices, where stormwater is discharged directly to a stream or to a conveyance system that discharges to a stream;

4. Minimize the introduction of sediment, heat and other pollutants and contaminants into wetlands, including the selection, design and maintenance of temporary and permanent best management practices, where stormwater discharges directly to a wetland or to a conveyance system that discharges into a wetland;

5. Analyze impacts to off-site water quality resulting from the project. The analysis shall comply with this Subsection and rules promulgated pursuant to this Subsection. The analysis shall provide for mitigation of all surface water quality or sediment quality impacts. The impacts to be evaluated and mitigated shall include at least the following:

   a. Amount of sedimentation;
   b. Streambank erosion;
   c. Discharges to groundwater contributing to recharge zones;
   d. Violations of state or federal surface water, groundwater, or sediment quality standards; and
   e. Spills and other accidental illicit discharges;

6. A schedule shall be provided for inspection and maintenance of proposed temporary and permanent drainage control facilities and other best management practices. The schedule shall meet the requirements of this Subtitle and rules promulgated under this Subtitle.

7. In addition to the requirements described above, for land- disturbing activities and demolition of structures, an erosion/sediment control plan designed to comply with the requirements and purposes of this Subtitle and rules promulgated hereunder shall be submitted and implemented. The erosion/sediment control plan shall be designed to accomplish the following:

   a. Stabilization of exposed soils and sediment trapping;
   b. Delineation of limits on clearing and easements;
   c. Protection of adjacent property;
   d. Appropriate timing and stabilization of sediment trapping measures;
   e. Minimization of erosion on cut-and-fill slopes;
   f. Control of off-site erosion;
   g. Stabilization of temporary conveyance channels and outlets;
   h. Protection of storm drain inlets;
   i. Minimization of transport of sediment by construction vehicles;
   j. Appropriate timing for removal of temporary best management practices;
   k. Control of discharges from construction site dewatering devices to minimize contamination of drainage water; and
   l. Inspection and maintenance of best management practices for erosion/sediment control to insure functioning at design capacity.

8. Comprehensive Drainage Control Plan. A comprehensive drainage control plan to comply with the requirements of this Subtitle and rules promulgated hereunder and to accomplish the purposes of this Subtitle shall be submitted with the permit application. It

shall be prepared by a licensed civil engineer in accordance with standards adopted by the Director of Construction and Land Use.

E. References

Seattle Municipal Code (SMC) SMC 22.800.010- Stormwater, Grading and Drainage Control Code

An ordinance Relating to the Stormwater, Grading, and Drainage Control Code, as adopted by Ordinance 116425 and amended by Ordinances 117432, 117697, 117789, and 118396; amending Chapter 22.800, entitled "Title, Purpose, Scope, and Authority"; amending Chapter 22.801, entitled "Definitions"; amending Chapter 22.802, entitled "Stormwater, Drainage, and Erosion Control"; amending Chapter 22.804, entitled "Grading"; and amending Chapter 22.808, entitled "Administration and Enforcement."

F. URLs

http://clerk.ci.seattle.wa.us/~scripts/nph-brs.exe?s1=22.800&s2=&S3=&Sect4=AND&l=20&Sect1=IMAGE&Sect3=PLURON&Sect5=CODE1&d=CODE&p=1&u=/~public/code1.htm&r=1&Sect6=HITOFF&f=G

http://clerk.ci.seattle.wa.us/~scripts/nph-brs.exe?d=CBOR&s1=119965.ordn.&Sect6=HITOFF&l=20&p=1&u=/~public/cbor2.htm&r=1&f=G

3. City of Portland

G. Definition

Redevelopment: Any development that requires demolition or complete removal of existing structures or impervious surfaces at a site and replacement with new impervious surfaces. Maintenance activities such as top-layer grinding and re-paving are not considered to be redevelopment. Interior remodeling projects and tenant improvements are also not considered to be redevelopment. Utility trenches in streets are not considered redevelopment unless more than 50% of the street width is removed and re-paved.

H. Requirements

Pollution Reduction Requirements

The City of Portland has a citywide pollution reduction requirement for all new development projects with over 500 square feet of impervious development footprint area, and all redevelopment projects redeveloping over 500 square feet of impervious surface. This requirement is 70 percent removal of total suspended solids (TSS) from runoff generated by a design storm up to and including 0.83 inches of rainfall over a 24-hour period (NRCS Type 1A distribution). Appendix B provides a more detailed definition of "70 percent removal of TSS", which is actually a function of influent TSS concentration.

Flow Control Requirements

Flow control requirements are intended to maintain post-development peak flows at their pre-development levels and to maintain peak flows within the capacity of the conveyance system for most storm events. Specifically, on-site flow control shall be sufficient to maintain peak flows at their pre-development levels for the 2-year, 5-year, and 10-year runoff events. (Note that for redevelopment projects, pre-development conditions are defined as undeveloped land- See definition in Section 1.3). Surface retention facilities are required to the maximum extent practicable to control stormwater volumes (see exceptions in Section 1.6).

I. Parking Lots

Surface Parking Lot Requirements

Parking and Loading describes dimensions, landscaping and other requirements for parking lots. Title 33.248: Landscaping and Screening describes planting requirements for parking lots and other site uses. (Also see Chapter 5.0 for a list of approved parking lot trees.) Any new parking lot that creates more than 500 square feet of impervious surface, or any redeveloped parking lot (see definition of redevelopment in Section 1.3) that redevelops more than 500 square feet of impervious surface, must use the landscape area required by the zoning code to manage stormwater from the new or redeveloped area. Existing parking lots required to meet the non-conforming use landscaping requirements under Title 33.258.070, must use simplified

approaches where practicable in the newly required landscaped areas. Where it is not practical for runoff to flow into landscaped areas this requirement does not apply. The following exceptions and/or conditions to these requirements may apply. If an exception is claimed, the applicant must still fulfill all other relevant requirements of Chapters 1.0 through 7.0 of this manual.

1. The parking lot or a portion of it is designated as a high-use (see Chapter 4.0, Section 4.11) and is subject to requirements that may conflict with the use of landscaping for stormwater management.

2. Contaminated soil conditions on the site preclude the use of landscape infiltration. In this situation, landscape facilities may be used for stormwater management, but must be lined to prevent infiltration.

3. The parking lot has been approved without landscaping, or has landscaping conditions that conflict with the use of the landscaping for stormwater management. (For example, if landscaping is required in a location that cannot receive stormwater as gravity flow, that portion of the landscaping would not have to be used for stormwater management.) The following simplified approaches from this chapter may be used to meet these requirements:

    a. Vegetated swales
    b. Grassy swales
    c. Vegetated filters
    d. Planter boxes
    e. Vegetated infiltration basins
    f. Sand filters
    g. Soakage trenches (if site soil conditions support their use, and the surface of the trench is not paved over).The appropriate sizing requirements shown on Form SIM shall be used to calculate the area needed for the applied measures. If the landscaped area(s) within the parking lot are not adequately sized to meet the requirements of this chapter, the applicant has the following options:
    h. Increase the landscaped area(s) within the parking lot to accommodate the required stormwater facility size, or
    i. Use additional stormwater management facilities (which can include non-landscaped approaches) to obtain the required level of management.
    j. Additional disposal measures (e.g., drywells, soakage trenches, off-site storm sewers, drainage ways, or ditches) may be required through building and plumbing codes, as approved by BES and OPDR.

Tips for Parking Lot Design

1. Design the grading to direct stormwater runoff into landscape areas. Depress the landscape areas adjacent to the parking surfaces to allow runoff to enter. See the vegetated swale detail in this chapter for a typical cross-section.

2. Maximize sheet flow opportunities and, if possible, avoid piping that drives the water level down, making it difficult to manage in surface facilities.

3. Provide numerous curb cuts (one every 10 feet) or use tire stops or other means to protect the landscape areas and allow maximum dispersal of the flows.

4. Consider design elements such as berms or trench drains.

5. When possible, situate buildings or fill areas on the high elevations of the site.

6. Make certain the design includes overflow and appropriate disposal methods. Overflow routes must show a safe escape route for the 100-year storm event.

7. Note that the parking lot tree standard is 3 caliper inches, unless the tree is chosen from the approved parking lot tree list, when it can be 2 caliper inches.

J. References

2002 Stormwater Management Manual, Adopted July 1, 1999, Revised September 1, 2002, Environmental Services, City of Portland Clean River Works.

K. URLs

http://www.cleanrivers-pdx.org/tech_resources/2002_swmm.htm

4. Georgia

A. Definitions

Redevelopment is defined as structural development (construction, installation or expansion of a building or other structure), creation or addition of impervious surfaces (creating an additional 5,000 s.f. of impervious area), replacement of impervious surface not part of routine maintenance, and land disturbing activities associated with structural or impervious development. Redevelopment does not include such activities as exterior remodeling.

B. Stormwater Management for Area of New Development and Redevelopment

The focus of this Manual is how to effectively deal with the impacts of urban stormwater runoff through effective and comprehensive stormwater management. Stormwater management involves both the prevention and mitigation of stormwater runoff quantity and quality impacts as described in this chapter through a variety of methods and mechanisms. Volume 2 of this Manual deals with ways that developers in Georgia can effectively implement stormwater management to address the impacts of new development and redevelopment, and both prevent and mitigate problems associated with stormwater runoff. This is accomplished by:

1. Developing land in a way that minimizes its impact on a watershed, and reduces both the amount of runoff and pollutants generated

2. Using the most current and effective erosion and sedimentation control practices during the construction phase of development

3. Controlling stormwater runoff peaks, volumes and velocities to prevent both downstream flooding and streambank channel erosion

4. Treating post-construction stormwater runoff before it is discharged to a waterway Implementing pollution prevention practices to prevent stormwater from becoming contaminated in the first place

5. Using various techniques to maintain groundwater recharge

The goal of a set of minimum stormwater management standards for areas of new development and significant redevelopment is to reduce the impact of post-construction stormwater runoff on the watershed. This can be achieved by (1) maximizing the use of site design and nonstructural methods to reduce the generation of runoff and pollutants; (2) managing and treating stormwater runoff though the use of structural stormwater controls; and (3) implementing pollution prevention practices to limit potential stormwater contaminants.

It should be noted that the standards presented here are recommended for all communities in Georgia. They may be adopted by local jurisdictions as stormwater management development requirements and/or may be modified to meet local or watershed-specific stormwater

management goals and objectives. Please consult your local review authority for more information.

The minimum standards for development are designed to assist local governments in complying with regulatory and programmatic requirements for various state and Federal programs including the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit program and the National Flood Insurance Program under FEMA.

C. Additional Requirements

New development or redevelopment in critical or sensitive areas, or as identified through a watershed study or plan, may be subject to additional performance and/or regulatory criteria. Furthermore, these sites may need to utilize or restrict certain structural controls in order to protect a special resource or address certain water quality or drainage problems identified for a drainage area.

D. Georgia Stormwater Management Manual Volume 2 (Technical Handbook)

The following standards are the recommended minimum stormwater management performance requirements for new development or redevelopment sites falling under the applicability criteria in subsection 1.2.2.1. (The word "shall" in brackets is provided for local jurisdictions that wish to adopt these standards as part of their stormwater management ordinances) A more detailed explanation of each minimum standard is provided in the next subsection.

Minimum Standard #1 – Use of Better Site Design Practices for Stormwater Management
Site designs should preserve the natural drainage and treatment systems and reduce the generation of additional stormwater runoff and pollutants to the fullest extent practicable.

Minimum Standard #2 – Stormwater Runoff Quality
All stormwater runoff generated from a site should [shall] be adequately treated before discharge. Stormwater management systems (which can include both structural stormwater controls and better site design practices) should [must] be designed to remove 80% of the average annual post-development total suspended solids (TSS) load and be able to meet any other additional watershed- or site-specific water quality requirements.

It is presumed that a stormwater management system complies with this performance standard if: It is sized to capture and treat the prescribed water quality treatment volume, which is defined as the runoff volume resulting from the first 1.2 inches of rainfall from a site; and appropriate structural stormwater controls are selected, designed, constructed, and maintained according to the specific criteria in this Manual. Runoff from hotspot land uses and activities is adequately treated and addressed through the use of appropriate structural stormwater controls and pollution prevention practices.

Minimum Standard #3 – Stream Channel Protection

Stream channel protection should [shall] be provided by using all of the following three approaches: 24-hour extended detention storage of the 1-year, 24-hour return frequency storm event; erosion prevention measures such as energy dissipation and velocity control; and preservation of the applicable stream buffer.

Minimum Standard #4 – Overbank Flood Protection

Downstream overbank flood protection should [shall] be provided by controlling the post-development peak discharge rate to the predevelopment rate for the 25-year, 24-hour return frequency storm event. If control of the 1-year, 24-hour storm (Minimum Standard #3) is exempted, then overbank flood protection should [shall] be provided by controlling the post-development peak discharge rate to the predevelopment rate for the 2-year through the 25- year return frequency storm events.

Minimum Standard #5 – Extreme Flood Protection

Extreme flood protection should [shall] be provided by controlling and/or safely conveying the 100-year, 24-hour return frequency storm event such that flooding is not exacerbated. Existing and future floodplain areas should be preserved as possible.

Minimum Standard #6 – Downstream Analysis

A downstream hydrologic analysis should [shall] be performed to determine if there are any additional impacts in terms of peak flow increase or downstream flooding while meeting Minimum Standards #1 through 5. This analysis should [shall] be performed at the outlet(s) of the site, and downstream at each tributary junction to the point(s) in the conveyance system where the area of the portion of the site draining into the system is less than or equal to 10% of the total drainage area above that point.

Minimum Standard #7 – Groundwater Recharge

Annual groundwater recharge rates should be maintained to the extent practicable through the use of nonstructural methods.

Minimum Standard #8 – Construction Erosion and Sedimentation Control

Erosion and sedimentation control practices shall be utilized during the construction phase or during any land disturbing activities.

Minimum Standard #9 – Stormwater Management System Operation and Maintenance

The stormwater management system, including all structural stormwater controls and conveyances, should [shall] have an operation and maintenance plan to ensure that it continues to function as designed.

Minimum Standard #10 – Pollution Prevention

To the maximum extent practicable, the development project should [shall] implement pollutant prevention practices and have a stormwater pollution prevention plan.

Minimum Standard #11 – Stormwater Management Site Plan

The development project should [shall] prepare a stormwater management site plan for local government review that addresses Minimum Standards #1 through 10.

E. Better Site Design Practice

Reduce the Parking Footprint- Reduction of Impervious Cover

Description: Reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, parking decks, and using porous paver surfaces or porous concrete in overflow parking areas where feasible and possible.

Key Benefits
Reduces the amount of impervious cover and associated runoff and pollutants generated

Using this practice
Reduce the number of parking spaces
Minimize stall dimensions
Consider parking structures and shared parking
Use alternative porous surface for overflow areas

Discussion
Setting maximums for parking spaces, minimizing stall dimensions, using structured parking, encouraging shared parking and using alternative porous surfaces can all reduce the overall parking footprint and site imperviousness.
Many parking lot designs result in far more spaces than actually required. This problem is exacerbated by a common practice of setting parking ratios to accommodate the highest hourly parking during the peak season. By determining average parking demand instead, a lower maximum number of parking spaces can be set to accommodate most of the demand. Table 1.4.2-2 provides examples of conventional parking requirements and compares them to average parking demand.

TABLE CONVENTIONAL MINIMUM PARKING RATIOS (SOURCE: ITE, 1987; SMITH, 1984; WELLS, 1994)			
Land Use	**Parking Requirement**		**Actual Average Parking Demand**
	Parking Ratio	**Typical Range**	
Single family homes	2 spaces per dwelling unit	1.5–2.5	1.11 spaces per dwelling unit
Shopping center	5 spaces per 1000 ft^2 GFA	4.0–6.5	3.97 per 1000 ft 2 GFA
Convenience store	3.3 spaces per 1000 ft^2 GFA	2.0–10.0	--
Industrial	1 space per 1000 ft^2 GFA	0.5–2.0	1.48 per 1000 ft 2 GFA
Medical/ dental office	5.7 spaces per 1000 t^2 GFA	4.5–10.0	4.11 per 1000 ft^2 GFA
GFA = Gross floor area of a building without storage or utility spaces.			

Another technique to reduce the parking footprint is to minimize the dimensions of the parking spaces. This can be accomplished by reducing both the length and width of the parking stall.

Parking stall dimensions can be further reduced if compact spaces are provided. While the trend toward larger sport utility vehicles (SUVs) is often cited as a barrier to implementing stall minimization techniques, stall width requirements in most local parking codes are much larger than the widest SUV structured parking decks are one method to significantly reduce the overall parking footprint by minimizing surface parking. Figure 1.4.2-20 shows a parking deck used for a commercial development.

Shared parking in mixed-use areas and structured parking are techniques that can further reduce the conversion of land to impervious cover. A shared parking arrangement could include usage of the same parking lot by an office space that experiences peak parking demand during the weekday with a church that experiences parking demands during the weekends and evenings.

Utilizing alternative surfaces such as porous pavers or porous concert is an effective way to reduce the amount of runoff generated by parking lots. They can replace conventional asphalt or concrete in both new developments and redevelopment projects. However, porous pavement surfaces generally require proper installation and more maintenance than conventional asphalt or concrete.

F. References

Georgia Stormwater Management Manual Volume 1: Stormwater Policy guidebook First Edition August 2001, Atlanta Regional Commission

G. URLs

http://www.georgiastormwater.com

5. Center for Watershed Protection (CWP)

H. Definition

"Redevelopment" is the process in which an existing developed area is adaptively reused, rehabilitated, renovated or expanded.

"Infill" is development that occurs on smaller parcels that remain undeveloped but are within or very close to existing urban areas.

I. What Are The Best Incentives To Encourage Redevelopment?

1. Resolving the transportation problems, particularly for suburban commuters.
2. Waterfront development.
3. Shortening/ simplifying the approval process.
4. Unifying codes and ordinances.

J. Other Suggestions

1. Don't forget the temporal scale, e.g. over time redevelopment is very beneficial at the site level.
2. Don't forget the neighborhood based framework. Don't forget environmentally sensitive techniques inside the building.
3. Make it applicable to all areas of different climate, politics and technical expertise.
4. Use a word other than principle.

K. Tools and Techniques for Redevelopment and Infill

Practice Oriented

1. Maintain natural features as part of the landscape at a site and encourage tree planting and other revegetation practices.
2. Manage rooftop runoff through storage, reuse, and/or redirection to pervious surfaces for stormwater management.
3. Use alternative paving materials for parking and other pathways whenever possible and feasible.
4. Provide long term management plans for natural areas, public spaces, stormwater management facilities and lighting.

Program Oriented

1. Promote the rehabilitation of urban streams and the creation and restoration of aquatic corridors.
2. Encourage the use of green parking techniques by providing incentives whenever possible.

3. Monitor and eliminate illicit or unmanaged discharges into streams, lakes and estuaries and foster operation and maintenance practices that prevent or reduce pollutants entering the municipal or natural drainage system.
4. Promote environmental stewardship through outreach and education for the present and the future.
5. Encourage pollution prevention practices for businesses and municipalities to reduce pollutant loads and foster an environmental ethic.

Shared Principles

1. Use appropriate, effective, and economical stormwater management where possible.*
2. Encourage the incorporation of natural features as part of the streetscape.*
3. Master plan redevelopment areas to promote planting practices and provide green spaces (trees, urban parks, and community gardens) in the urban environment.*
4. Encourage the use of open space designs, including reduction of building footprints, preservation of natural areas, and innovative building techniques to reduce the amount of new impervious cover created.*
5. Encourage development designs that integrate new paths, open spaces, and architecture with the existing community.*

*Indicates principles that can be organized under both the Practice and Program.

L. URLs

http://www.cwp.org/index.html

6. Green Roofs for Healthy Cities

Water Benefit (other benefits are not list here)

In summer, green roofs retain 70-100% of the precipitation that falls on them; in winter they retain between 40-50%. A grass roof with a 4-20 cm layer of substrate can hold between 10-15 cm of water.

A. Stormwater Retention

Water is stored by the substrate and then taken up by the plants from where it is returned to the atmosphere through transpiration and evaporation.

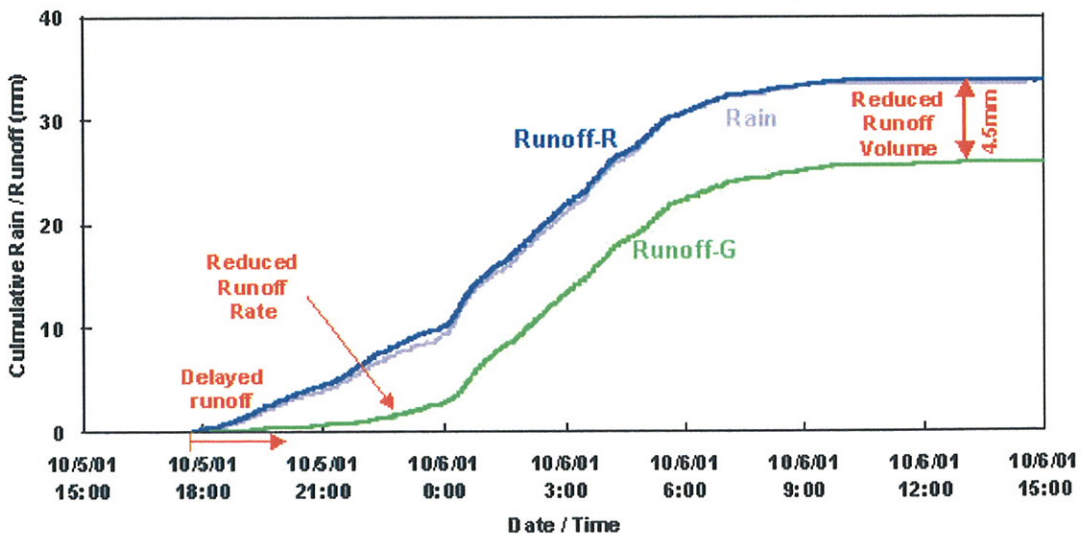
In summer, depending on the plants and growing medium, green roofs retain 70-80% of the precipitation that falls on them; in winter they retain between 25-40%. For example, a grass roof with a 4-20 cm (1.6 - 7.9 inches) layer of growing medium can hold 10-15 cm (3.9 - 5.9 inches) of water.

B. Water Filtration

Green roofs not only retain the rainwater, but also moderate the temperature of the water and act as natural filters for any of the water that happens to run off.

C. Temporal Delay of Stormwater Runoff and Reduced Runoff Volume

Green roofs reduce the amount of stormwater runoff and also delay the time at which runoff occurs, resulting in decreased stress on sewer systems at peak flow periods.



Source: National Research Council's Institute for Research in Construction

The graph above records the cumulative rainfall and runoff from the Green Roof and the Reference Roof during a 34mm (1.3 inches) rain event over a 15h period in October 2001. The green roof delayed runoff and reduced the runoff rate and volume. For more details on this research conducted by the National Research Council's Institute for Research in Construction, see the article on page 7 of the Winter 2002 issue of the Green Roof Infrastructure Monitor.

D. Regulatory/Policy Initiatives

The U.S. Clean Water Act promises to become an important regulatory driver of green roof implementation in the United States. The **Clean Water Act, Section 319 Grant**, addresses non-point source pollution and can provide a source of funding for green roofs.
To inquire about receiving Section 319 grant funding for green roof projects contact your **state nonpoint source coordinator**. Green roofs can be funded as demonstration projects throughout most states and can be used to mitigate the impacts of stormwater and combined sewer overflows in developed areas.
Two projects funded by this grant include:
Maryland: Montgomery Park, Grant Award: $92, 000.00

Arizona: Riverfront Residence, Grant Award: $33, 875.00

The **City of Seattle** requires that all new municipal buildings be LEED™ certified and green roofs provide an opportunity to gain as many as 5 points under this system. A number of LEED™ certified buildings have green roofs.
The City of Toronto's "Environmental Plan" and draft "Official Plan" both contain policies that encourage the implementation of green roof infrastructure
The City of Chicago passed an **Energy Conservation Ordinance** on June 3, 2001 requiring all new and replaced roofs to meet minimum standards of solar reflectance and emissivity using ASTM testing methods. This requirement, which is being phased in, can be met by installing a green roof system.

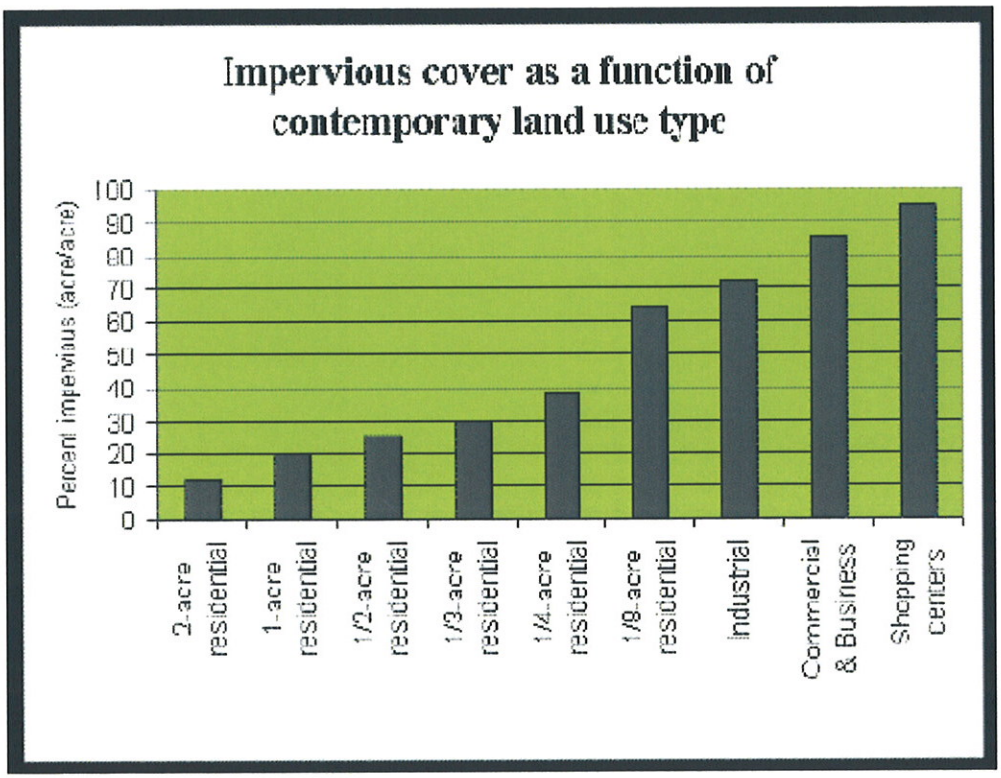
E. GreenRoof

Greenroofs reduce the volume of stormwater flowing into streams and drainage channels, resulting in the control of sediment transport and overall soil erosion. According to an article in the November/December 1998 issue of Erosion Control Magazine, the natural carpets provided by greenroofs protect both roofs and the soil below. Nitrogen, phosphorus and toxins can enter a vegetated stream as dissolved substances. Greenroofs' vegetated cover properties of friction, root absorption, clay, and soil organic matter can control these substances from entering a stream corridor (Dramstad, et al, 1996). In February of 1999, the International Erosion Control Association's Conference & Trade Exposition was held in Nashville, TN, and featured a training workshop and special section regarding the benefits and applications of roof greening systems. Thomas Roess of Strodthoff and Behrens GMBH of Germany presented on this subject, and is a frequent lecturer worldwide on greenroof technology.

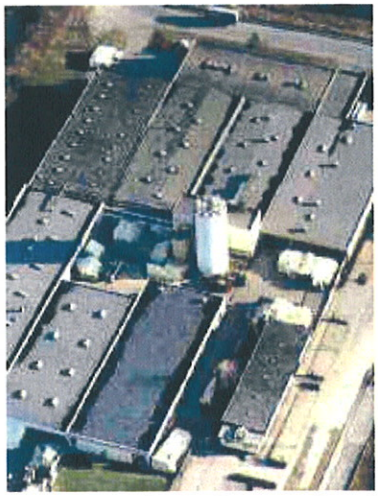
Vegetation absorbs pollutants from rainwater, and greenroofs provide this same amenity. Heavy metals and nutrients found in stormwater are bound in the soil instead of being discharged into

the groundwater or streams or rivers. Over 95% of cadmium, copper and lead and 16% of zinc can be taken out of rainwater. Nitrogen levels can also substantially fall (The London Ecology Unit, 1993).

Perhaps the greatest ecological function a greenroof can provide is its stormwater management capacity. Impervious cover has become a function of contemporary land uses. As a result of new land use practices, cities across the nation have developed over-stressed sewer systems with urgent stormwater management problems. According to analysis of Lansat Satellite data by NASA climate scientists, University of Georgia researchers and others, metro Atlanta is losing 50 acres of tree cover per day. From 1988 to 1998 the 13-county metro area lost approximately 190,000 acres of tree cover to development (Charles Seabrook, 1999). Lost green space is then a by-product of the proverbial asphalt jungle, and the inherent natural processes associated with natural areas are also lost. The chart below from Bruce Ferguson's *Introduction to Stormwater: Concept, Purpose, Design* (1998), shows the amount of impervious cover that development and the new impervious pavements produce.



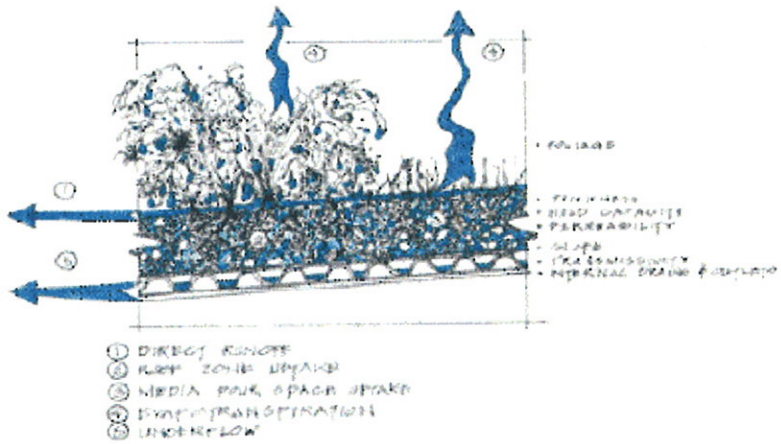
"We are obligated to restore the mechanisms of the earth's self-maintaining balance. Runoff must be moderated, treated, and returned to its restorative path in the soil," (Ferguson, 1998).



Source: ZinCo International 3/98 Brochure

On-site stormwater retention and runoff control from expansive roof surface areas of buildings can be accomplished through greenroofs. According to civil engineer Charlie Miller, Principal, of Roofscapes, Inc., "Vegetated roof covers may offer the only practical 'at-source' technique for controlling runoff in areas that already are highly urbanized." The reversal of damage caused by uncontrolled storm water runoff and non-point source pollution is possible within our urbanized watersheds. He believes that the intelligent use of best management practices (BMPs) can result in significant improvements, as well as long-term savings to individuals and municipalities (**www.roofmeadow.com**).

Depending on rain intensity and greenroof soil depths, runoff can be absorbed between 15 to 90 %, thereby considerably reducing runoff and potential pollutants from traditional impervious roofing surfaces. Plants intercept and delay rainfall runoff and the peak flow rate, alleviating combined sewer overflows, and eventually return water to the surrounding atmosphere by evaporation and transpiration. Average runoff absorption rates are between 50 to 60% (**www.roofmeadow.com**).



Courtesy of Roofscapes, Inc.; **www.roofmeadow.com**

The control of stormwater runoff is achieved by mimicking natural processes by intercepting and delaying rainfall runoff. Greater grass & plant diversity provides better plant uptake and simple friction, which creates less erosion, and more water is retained on the greenroof surface. Stormwater Natural Processes Detail from **www.roofmeadow.com**.

According to Charlie Miller, the installation of greenroofs is "a potential technique for relieving nuisance flooding and reducing hydraulic loads on combined storm sewer systems." He contends that, "In addition to providing immediate relief for overburdened stormwater management facilities, the deployment of vegetated roof covers can help reduce the overall costs of infrastructure rehabilitation in our older cities."

Possible impervious coverage restrictions may be reduced for developers who incorporate greenroofs into their site plan. Depending on local ordinances, greenroofs may be installed in

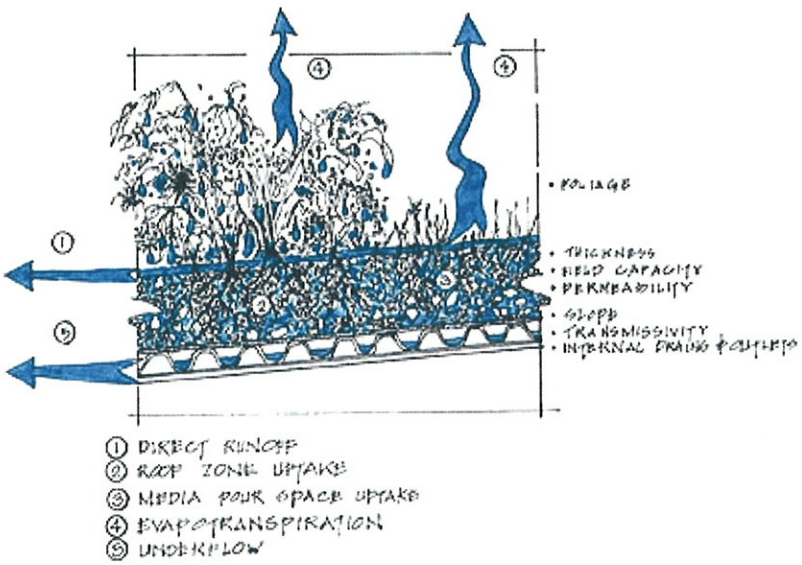
lieu of conventional stormwater practices. They can significantly reduce the size, or even completely eliminate the necessity for unsightly, space-wasting, and expensive detention ponds or underground galleries (Roofscapes, Inc., 1998). Although hard to quantify, there is also potential for downstream stormwater treatment savings.

Water Benefit

Control of stormwater runoff is achieved by mimicking the processes that occur in nature, intercepting and delaying rainfall runoff by:

- Capturing and holding precipitation in the plant foliage
- Absorbing water in the root zone
- Slowing the velocity of direct runoff as it infiltrates through the layers of vegetated cover

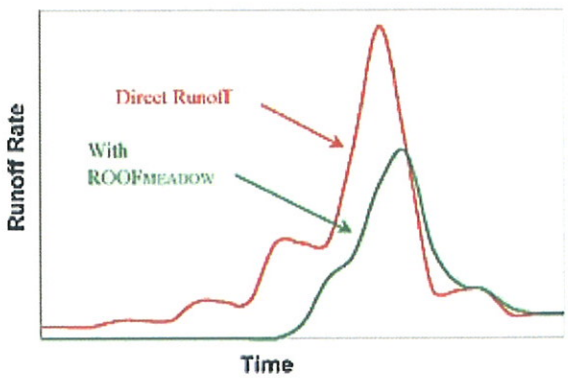
For small rainfall events, little runoff will occur and most of the precipitation will eventually return to the atmosphere by evaporation and transpiration. For larger storms, vegetated roof covers can significantly delay and attenuate the discharge of runoff from roofs.



Vegetated roof covers are effective methods of retarding runoff from roof surfaces during storms:

Compared to many other stormwater management practices, vegetated roof covers are unobtrusive, low maintenance, and reliable management systems. Vegetated roof covers are particularly effective when applied to extensive roofs, such as those that typify commercial and institutional buildings. They can be designed to achieve specified levels of stormwater runoff control, including reductions in:

Total annual runoff volume (reductions of **50 to 60 percent** are common place for vegetated roof covers) Peak runoff rates for selected design storm events



Stormwater runoff for a 3.35-inch, 24-hour rainfall event. This Roofmeadow incorporated a 3-inch deep layer of growth media.

F. URLs

http://peck.ca/grhcc/
http://greenroofs.com/
http://roofscapes.com

7. Chester

A. Definition (ordinance language)

Redevelopment (in Article II)

Reconstruction of an existing improved, developed property, as of the data of adoption of this Ordinance. This includes all projects creating over 2,000 s.f. of additional impervious cover.

B. Water Quality and Quantity Control Drainage Plan preparation Procedure (Ordinance language)

1. Applicant determines if development meet definition of "Redevelopment" per Article II.
2. If yes, applicant adjust pre-development RCN or C value based on curves present in Section 401 C and Appendix B.

C. Section 401 C (ordinance language)

The Chester Creek Stormwater Management Plan requires water quality and water quantity controls as illustrated on the flow chart shown in Figure 4-I and detailed in Section 404. The flow chart illustrates a three-step hierarchical process.

1. Infiltration
2. Extended detention
3. Implementation of additional design control

Must evaluate the outcome of each step before processing to next.
Riparian buffers are required where applicable (404.A.2).

D. Appendix B (report)

Figure B-3 Redevelopment project runoff criteria adjustment for pre-development conditions

Concern was expressed that imposing the release rate criteria on redevelopment projects might serve as a disincentive for developers. Therefore, an approach was proposed that would reduce the level of control required on redevelopment projects. This was accomplished by developing a chart which allows modification of pre-development conditions for which the stormwater management plan would be prepared. This chart adjusts the pre-development RCN value or "C" value to reflect conditions less restrictive than "meadow on B class soils" based on the percentage of exiting impervious cover.

Comment: The figure development is ok. But the goal of "Back to the natural condition" will not be reached.

E. Section 403 C (ordinance language)

Redevelopment projects shall meet peak discharge requirements based on the adjusted runoff control number (RCN) or "C" value illustrated by Figure B-3 in Appendix B.

F. Section 405 B (ordinance language)

For the purpose of pre-development flow rate determination, undeveloped land shall be considered as "meadow" good condition, type "B" soils, (RCN=58, Rational "C"=0.12) unless the natural ground cover generates a lower curve number or Rational "C" value (i.e., forest). If a proposed development meets the definition of redevelopment as defined in Article II of this Ordinance, the applicant may adjust the pre-development RCN or "C" value based on the curves presented in Figure B-3.