

Floodplain Soil Sampling

Earlier Available Data - Dick

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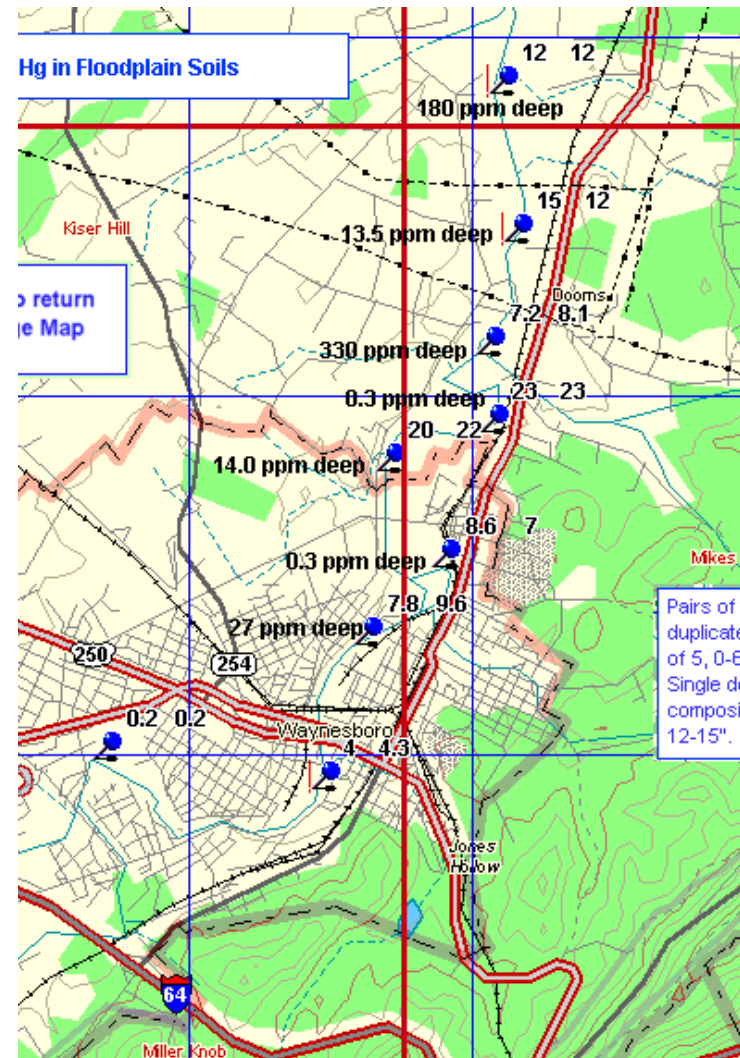
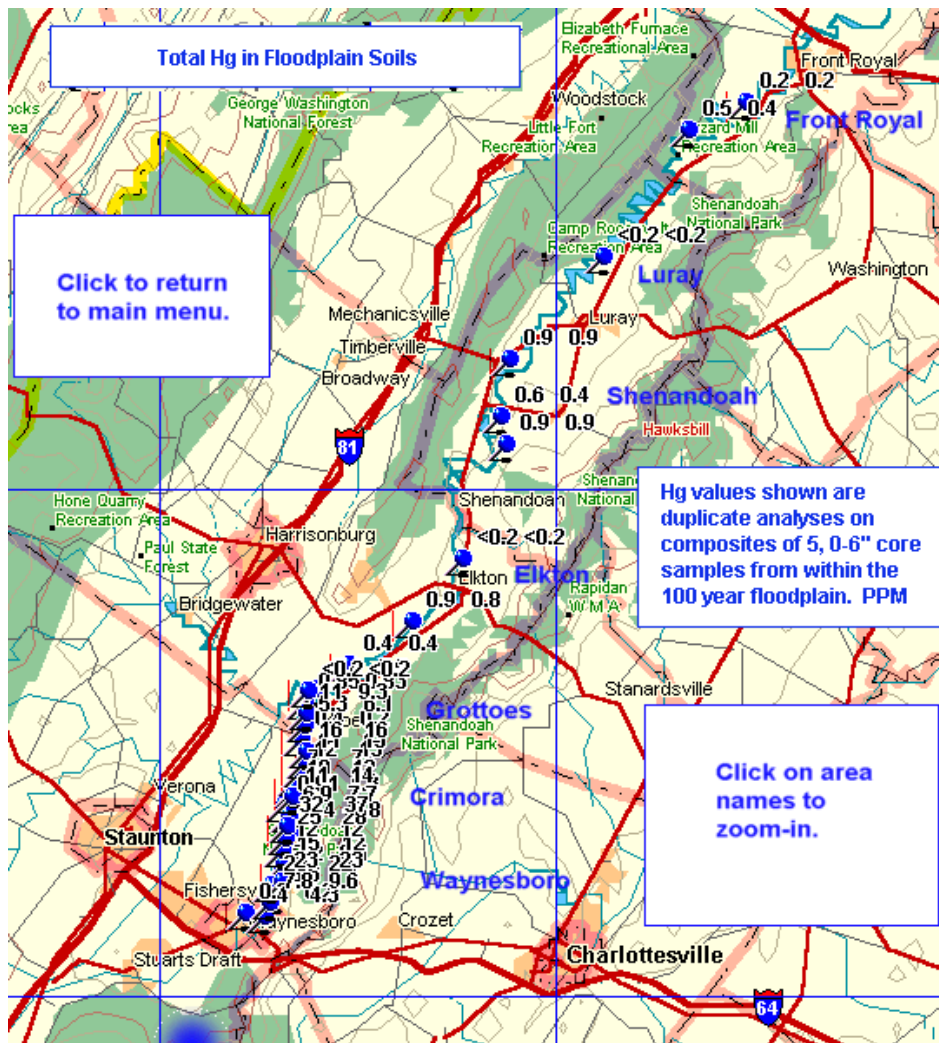
June 2004 Sampling - Annette

Available Floodplain Soil Data

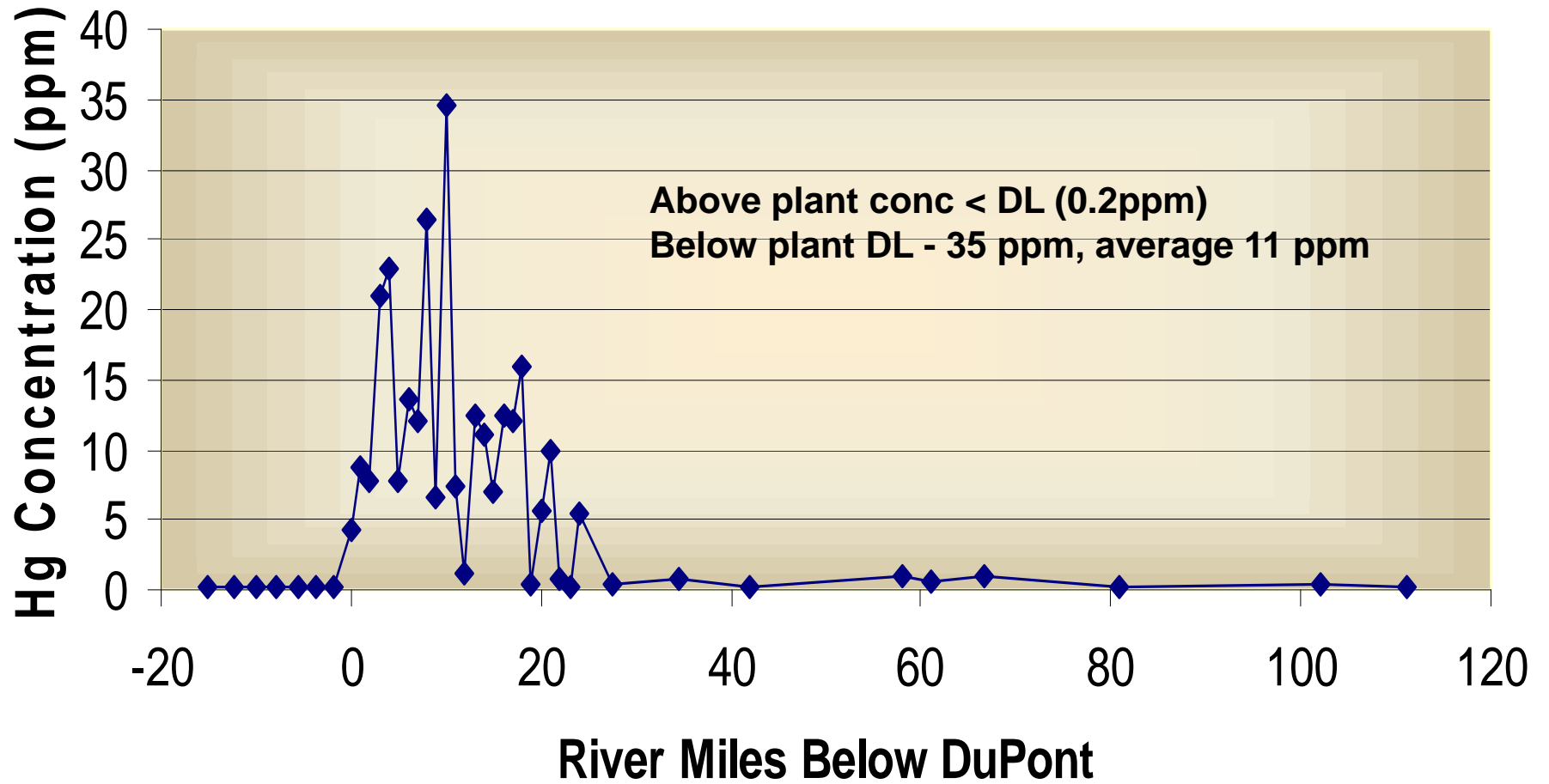
- Hendricks Survey - 1980
- Deep Core in Wetland - 2002
- Forestry Station Survey - 2003
- Greenway Sampling - 2003
- Floodplain Soil Sampling - 2004

Hendricks Survey - 1980

Extracted from Floodplain CD-ROM



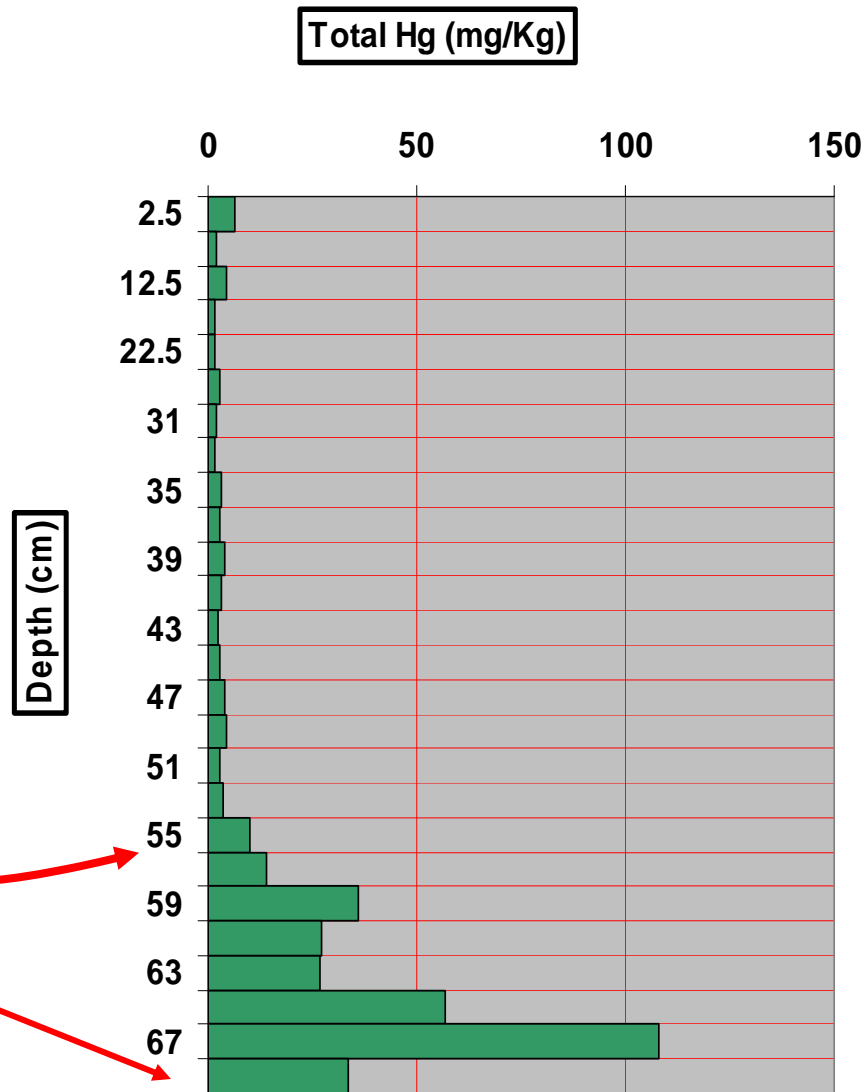
Hg Concentration in Floodplain Soils Summer 1980



Deep Core in Wetland

Just downstream of Dooms

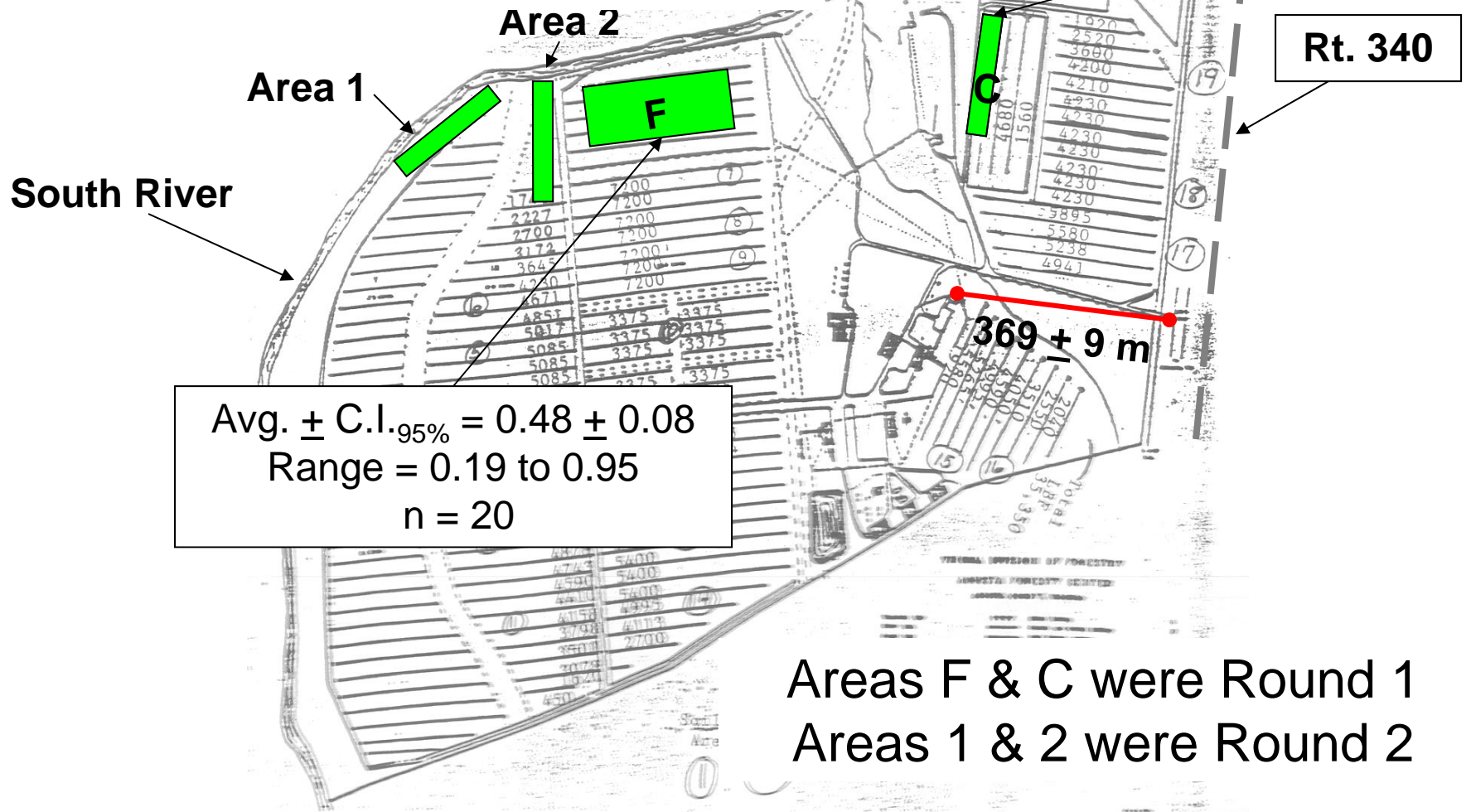
- **Surface soils are dry and covered with vegetation**
- **Core collected by driving with mallet**
- **Note significant decrease in Hg total above ~ 59 cm**
- **Refusal**



Forestry Samples - 2003

- Seeking location for test gardens - Round 1
- Seeking location for test gardens - Round 2
- Adding several deeper core samples and an eroded bank sampling

Locations of Areas Sampled April 14-15 & May 26-27, 2000 0-6 Inches



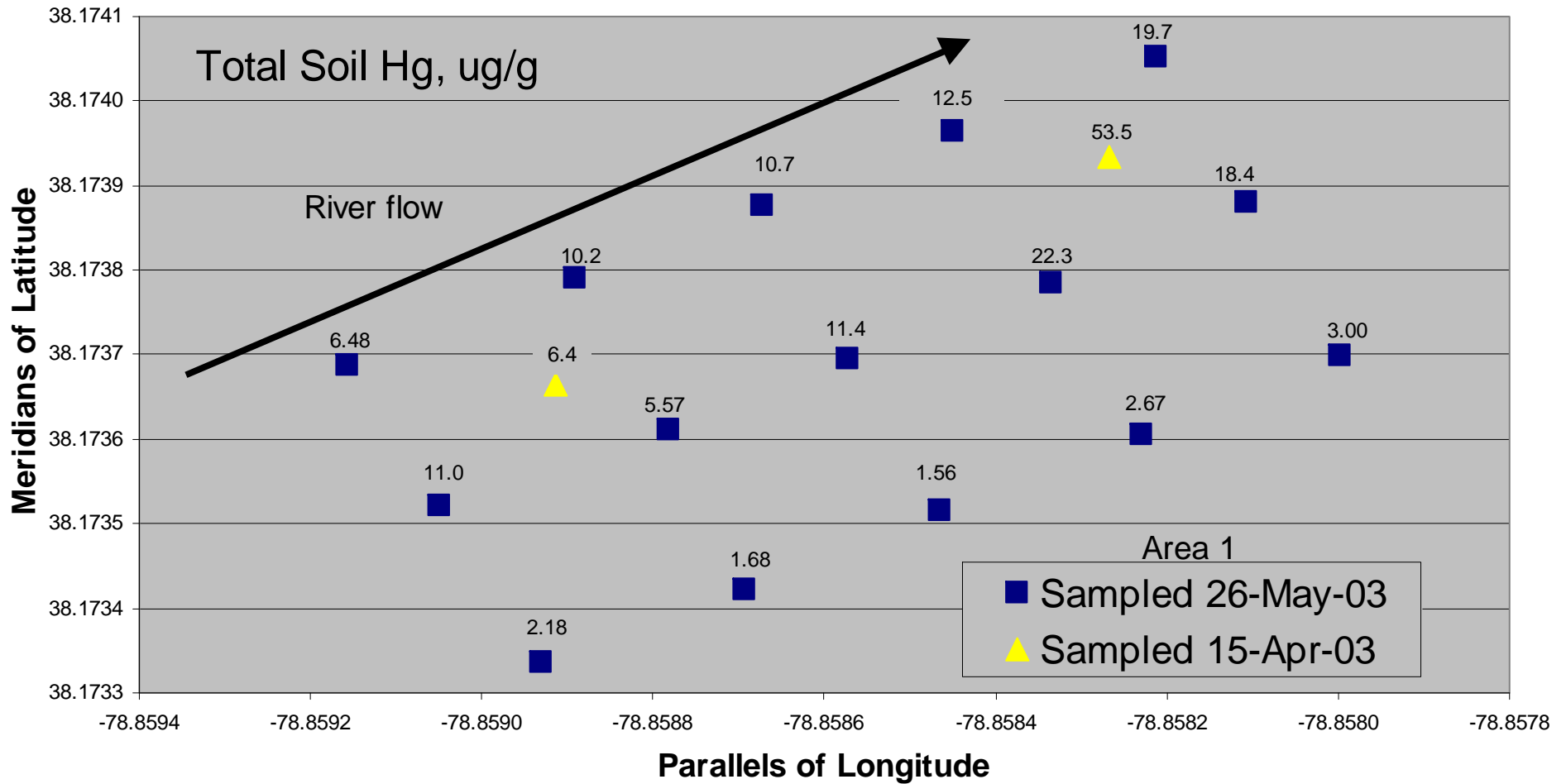
Avg. \pm C.I._{.95%} = 0.027 ± 0.003
 Range = 0.020 to 0.032
 n = 8

Avg. \pm C.I._{.95%} = 0.48 ± 0.08
 Range = 0.19 to 0.95
 n = 20

Areas F & C were Round 1
 Areas 1 & 2 were Round 2

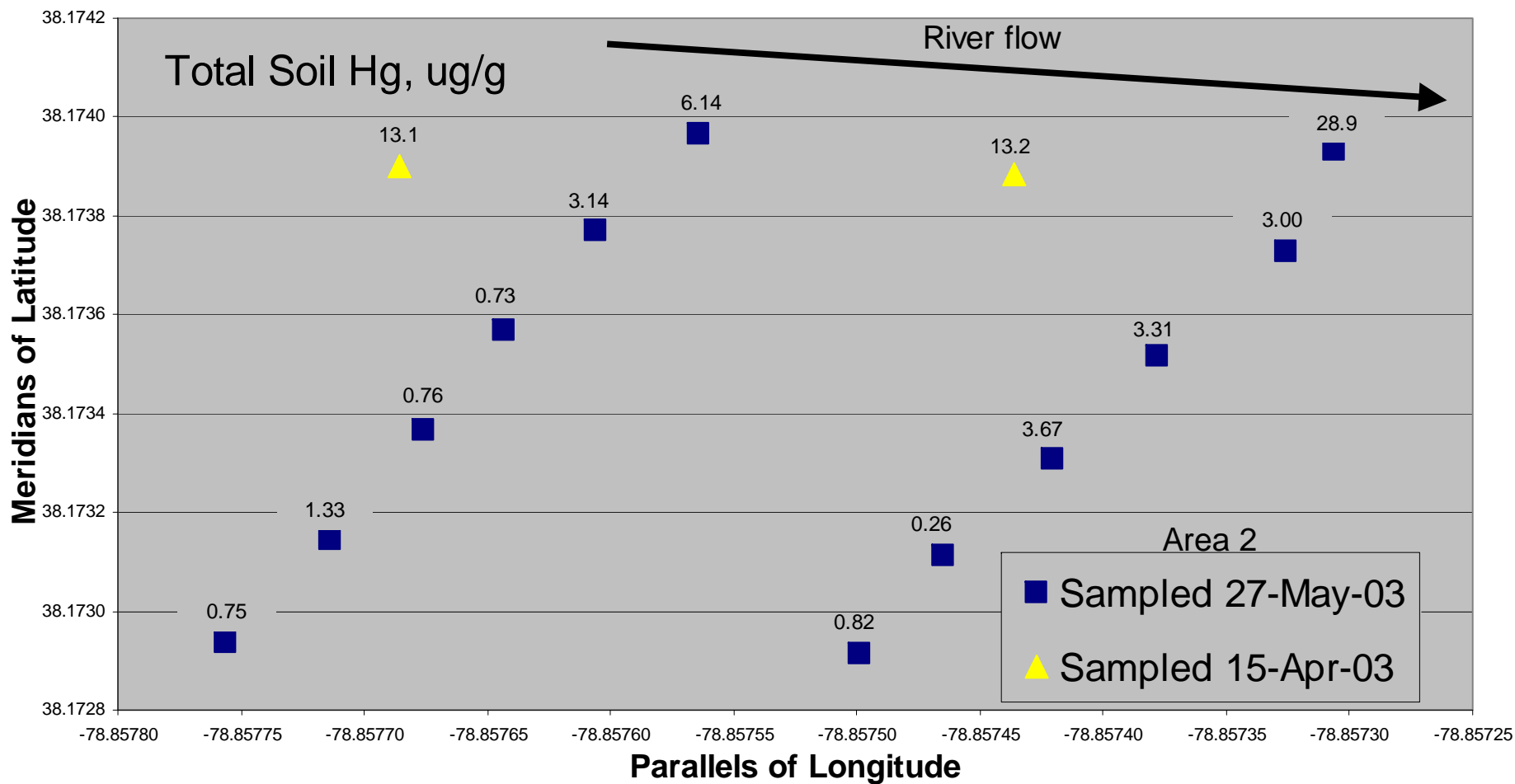
Area 1 Sampled May 26, 2003 - Round 2

0-6 Inches



Area 2 Sampled May 27, 2003 - Round 2

0-6 Inches



Adding a Few Cores in Garden Area

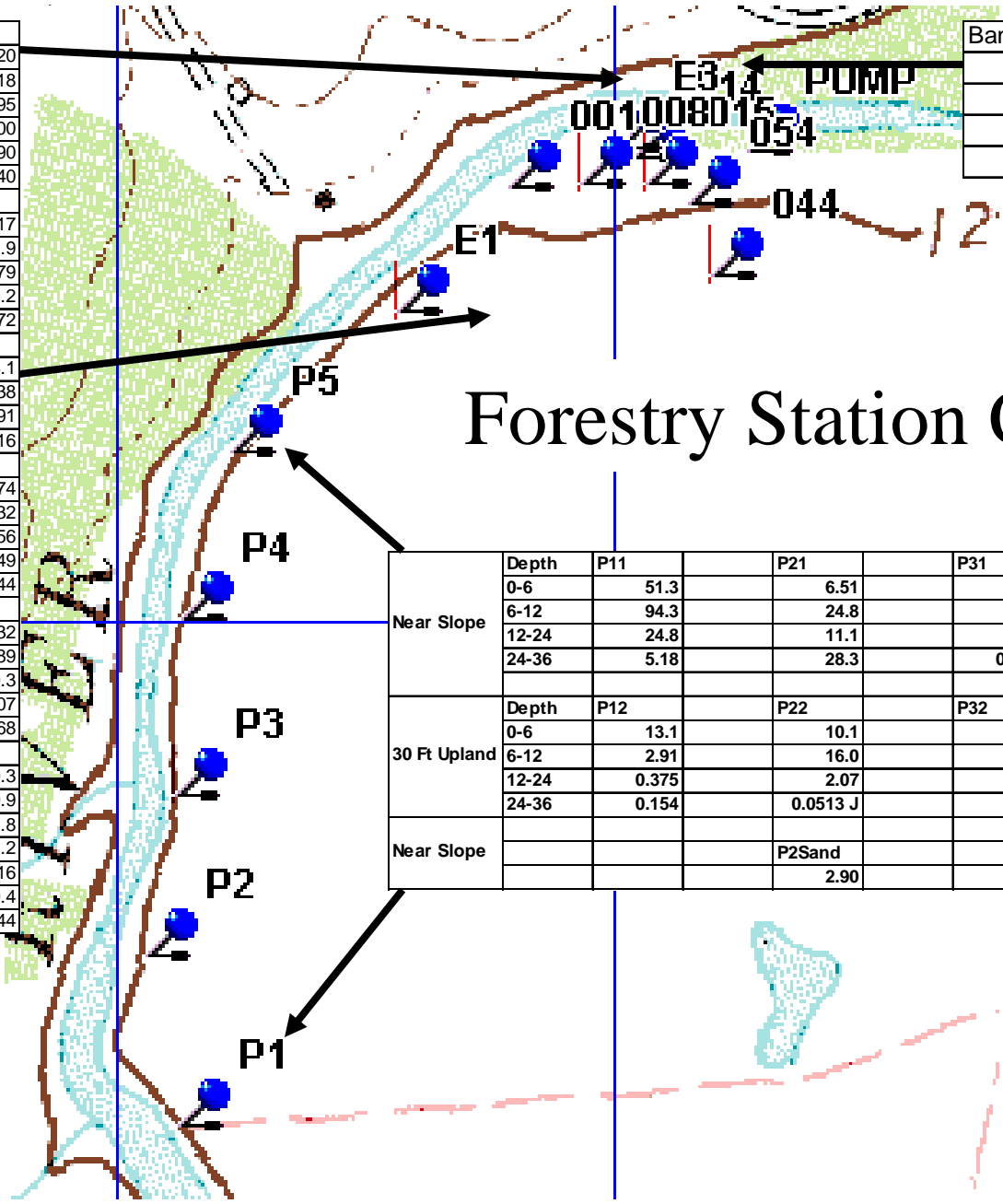


	Depth	PPM
54/55	0-3	1.20
	3-6	0.18
	6-8	0.95
	8-11	14.00
	11-14	14.90
	14-16	14.40
	Depth	PPM
8	0-3	17
	3-6	15.9
	6-9	3.79
	9-12	1.2
	12-17	0.972
	Depth	PPM
15	0-3	4.1
	3-6	4.38
	6-9	4.91
	9-12	0.916
	Depth	PPM
1	0-3	6.74
	3-6	6.32
	6-9	1.56
	9-12	0.749
	12-15	0.244
	Depth	PPM
14	0-3	0.32
	3-6	0.289
	6-9	0.3
	9-12	0.307
	12-16	0.0668
	Depth	PPM
E3	0-3	50.3
	3-6	60.9
	6-9	49.8
	9-12	11.2
	12-15	1.16
	15-18	0.4
	18-21	0.144

Bank	1, Water's Edge	6.67
	2	4.72
	3	10.5
	4	14.7
	5, Bank Top	5.04

Forestry Station Core Samples

	Depth	P11	P21	P31	P41	P51
Near Slope	0-6	51.3	6.51	11.5	8.44	13.5
	6-12	94.3	24.8	57.9	26.2	39.6
	12-24	24.8	11.1	13.5	67.6	53.8
	24-36	5.18	28.3	0.646	17.3	
	Depth	P12	P22	P32	P42	P52
30 Ft Upland	0-6	13.1	10.1	6.24	5.84	4.65
	6-12	2.91	16.0			0.0801 J
	12-24	0.375	2.07			0.0164 J
	24-36	0.154	0.0513 J			0.743
			P2Sand			
Near Slope			2.90			



Greenway Sampling - 10/03

- Samples on river bank opposite plant in Waynesboro - DuPont property only.
 - Constitution Park
 - Parking lot
 - Loath Spring
- Selected samples in plant recreation area on plant side of river.

Greenway and Recreation Cores

All values in PPM dry

Constitution Park

Near Slope	Depth	1	3	5	7
	0-6	1.08	15.2	10.7	18.6
	18-24	5.12	5.57	1.36	2.16
	30-36	0.814	4.14	1.81	5.32
15 Ft Upland	Depth	2	4	6	8
	0-6	4.47	1.89	22.0	16.8
	18-24	6.93		2.88	0.579
	30-36	20.9	0.369		

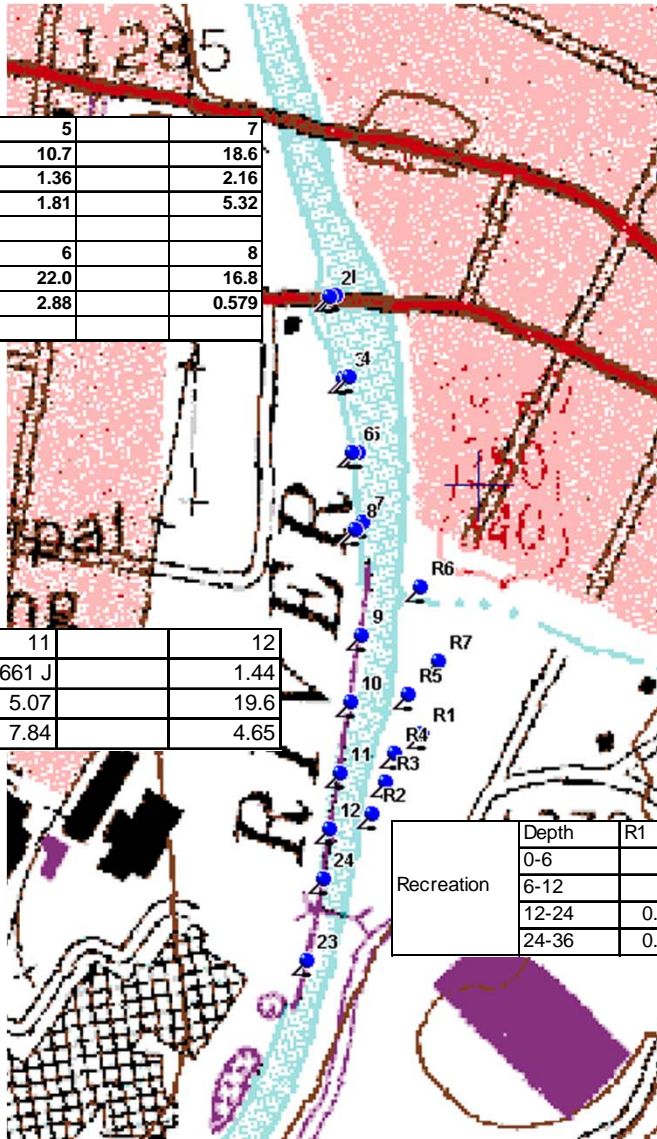
Parking Lot

	9	10	11	12
0-6	0.0192 J	0.613	0.0661 J	1.44
18-24	2.44	65.0	5.07	19.6
30-36	1.59	9.93	7.84	4.65

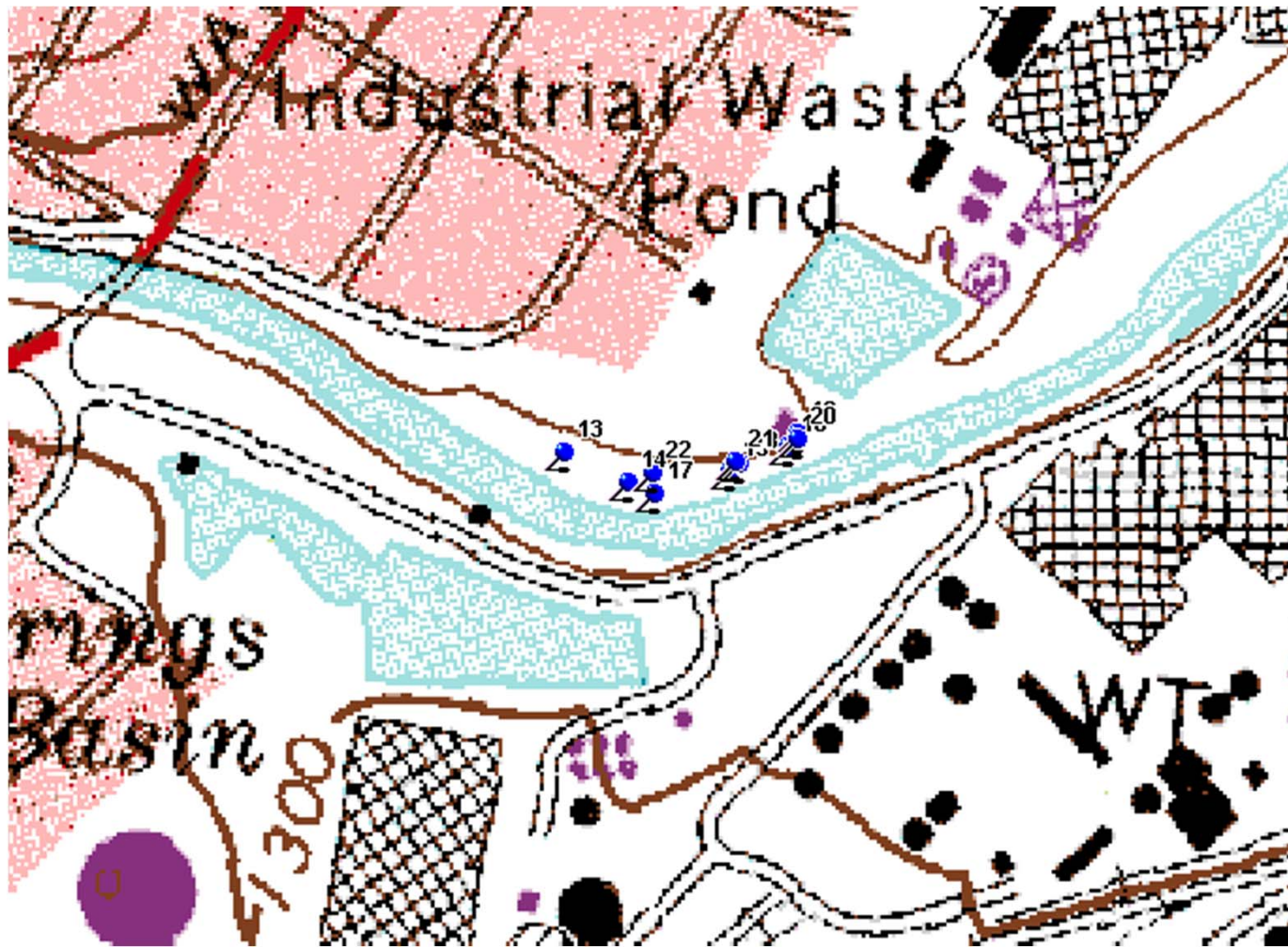
Depth	23	24
0-6	12.7	3.47
18-24	3.06	2.43
30-36	6.62	1.04

Recreation Area

Recreation	Depth	R1	R2	R3	R4	R5	R7
	0-6	2.15	17.7	25.9	122.	55.0	4.13
	6-12	0.396	15.6	39.7	55.1	52.6	1.52
	12-24	0.0375 J	29.4	37.1	20.3	46	0.118
	24-36	0.0317 J	9.77	19.9	26.2	51.5	0.0304 J



Loath Spring Cores & Flood Deposits

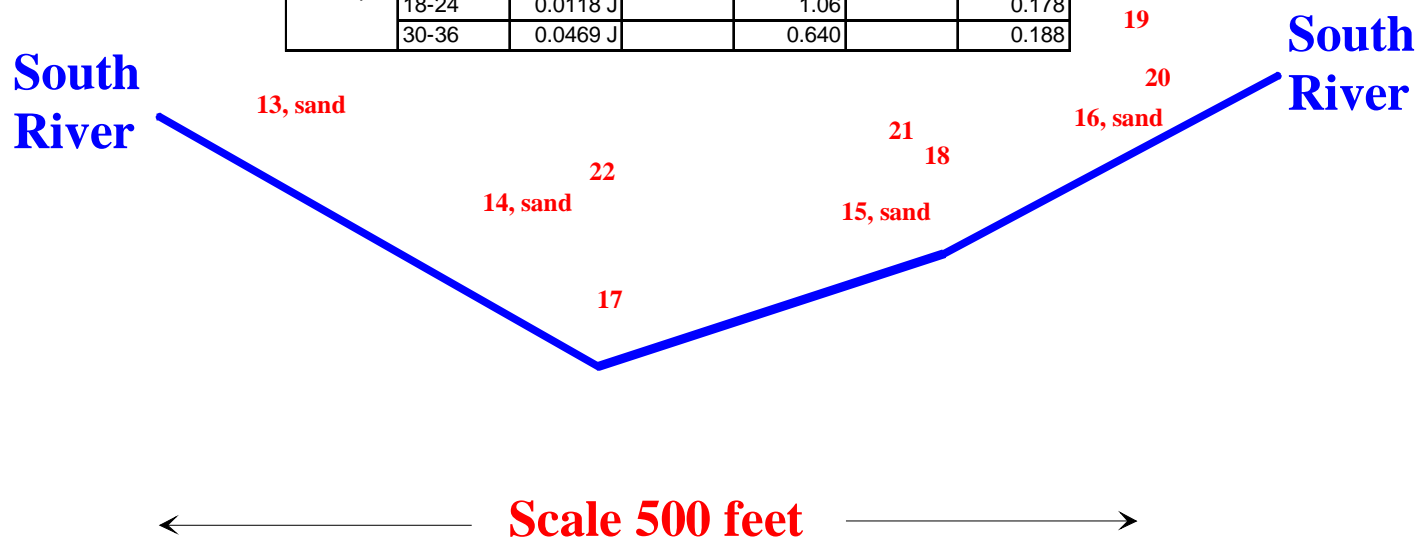


Loath Spring Cores & Flood Deposits

All values in PPM dry

Core Samples

Near Slope	Depth	17	18	19
	0-6	0.0427 J	0.388	0.231
	18-24	0.0710 J	0.585	0.177
	30-36	0.0769 J	0.355	0.262
15 Ft Upland	Depth	22	21	20
	0-6	0.0154 J	0.350	0.328
	18-24	0.0118 J	1.06	0.178
	30-36	0.0469 J	0.640	0.188



Sand Deposits from "Isabel"

Sand Deposit	13	14	15	16
	0.0141 J	0.0143 J	0.0899 J	0.242

Floodplain Soil Sampling

Recent Data

2004

Phased Approach

- Phase 1: Sampling for crop study in 2003
- Phase 2: June 2004
- The objectives of Phase 2 sampling were
 - To determine general "representative" levels of mercury in floodplain soils relative to data currently available and
 - To leverage this activity with data gathering for helping to refine the conceptual site model including potentially defining continuing sources.

Site Along River	Approximate River Mile	Objective	No of Sample Locations	Specific Sites	Depth	No of Samples	Comments
1. Constitution Park	0						Leverage samples taken previously
2. DuPont Credit Union	0.25						Leverage samples taken previously
3. North Park	1.25	Representative	3	Berm & Playground	0-6'; 12- 18'	6	1 composite sample at each depth
4. Waynesboro Shops (Sewer)	1.75	Conceptual Model	8	Random	0-6"; 6-12"; 12-18"	24	Individual sample at each depth
4. Waynesboro Shops (Sewer)	1.75	Conceptual Model	3	Sandbars	0-6";	3	Individual sample at each depth
5. Allied Readymix (Ox Bow)	1.75	Representative	3	0, 40, 100	0-6"; 12-18"	6	1 composite sample at each depth
5. Allied Readymix (Ox Bow)	1.75	Conceptual Model	6	Random	0-6"; 6-12"; 12-18"	18	Individual sample at each depth
5. Allied Readymix (Ox Bow)	1.75	Conceptual Model	3	Sediment	0-6";	3	Individual sample at each depth
6. Basic Park	2	Representative	3	0, 40, 100	0-6"; 12-18"	6	1 composite sample at each depth
7. Waynesboro property by Hopeman	2.75	Representative	3	0, 20, 40, 100	0-6"; 12-18"	6	1 composite sample at each depth
7. Waynesboro property by Hopeman	2.75	Conceptual Model	5	0, 20, 40, 60, 100	0-6"; 6-12"; 12-18"	15	2 Transects; Individual sample at each depth
7. Waynesboro property by Hopeman	2.75	Conceptual Model	10	Bank near Sycamore tree	varies	10	Bank Profiling; Individual sample at each depth
8. Genicom Property	3						No samples proposed; Contiguous with Waynesboro City Property at Hopeman
9. Augusta Park at Crimora	10.5	Representative	3	0, 40, 60	0-6"; 12-18"	6	1 composite sample at each depth
10. Augusta Park at Crimora	10.5	Conceptual Model	12	0, 20, 40, 60, 100	0-6"; 6-12" 12-18"	36	3 Transects (2 perpendicular; 1 parallel)
11. Forestry Center	12						Individual samples at each depth
12. Park at Grand Caverns	20.5	Representative	3	0, 40, 100	0-6"; 12-18"	6	Leverage samples taken previously
13. Park at Grand Caverns	20.5	Conceptual Model	5	0, 20, 40, 60, 100	0-6"; 12-18"	10	1 composite sample at each depth
14. Alcoa Plant (Reynolds)	20.5	Representative	3	0, 40, 100	0-6"; 12-18"	6	Individual sample at each depth
15. Grottoes Town Park	23	Representative	3	0, 40, 100	0-6"; 12-18"	6	1 composite sample at each depth
16. G&IF Launch at Port Republic	25	Representative	3	0, 40, 100	0-6"; 12-18"	6	1 composite sample at each depth

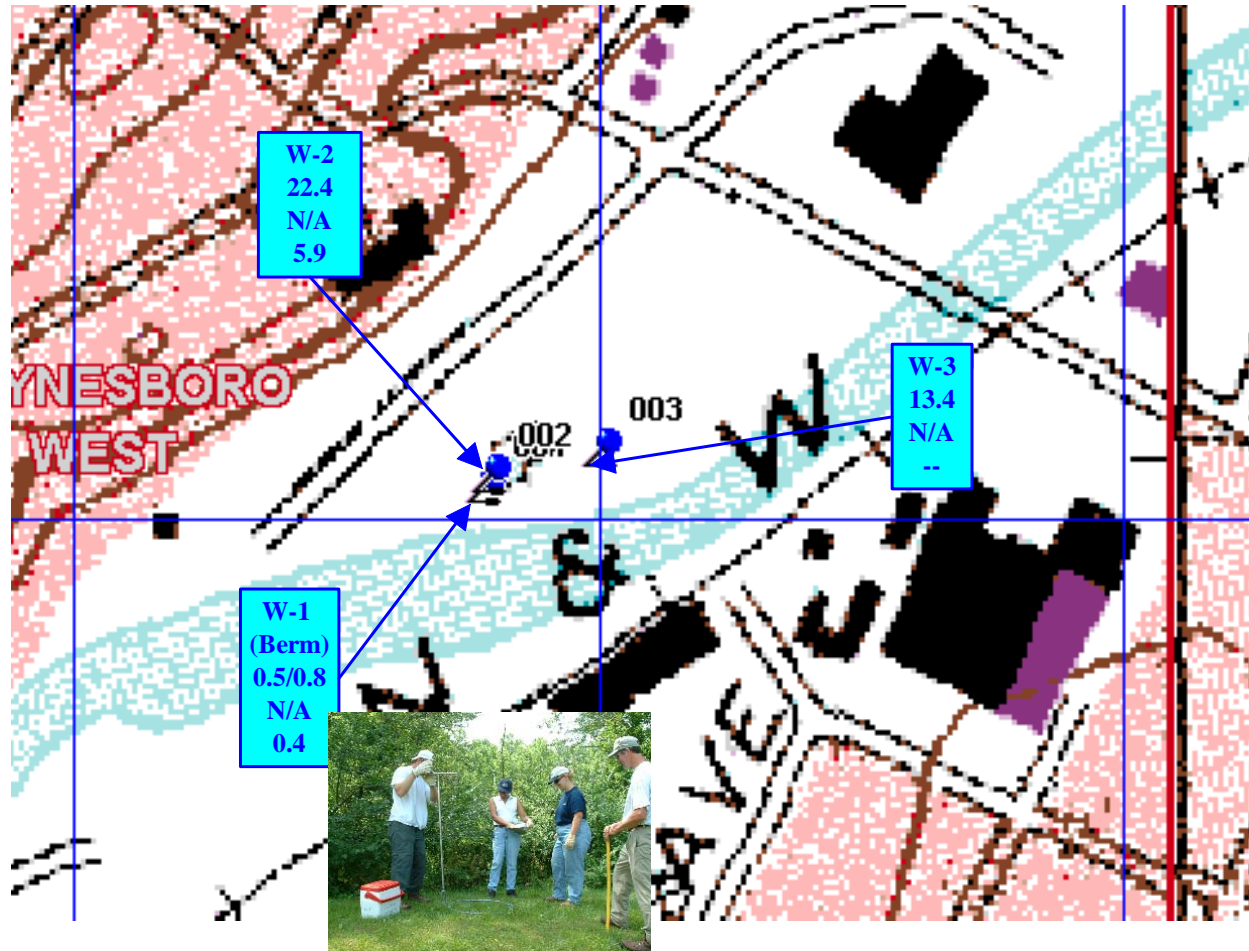
Eroded
Bank



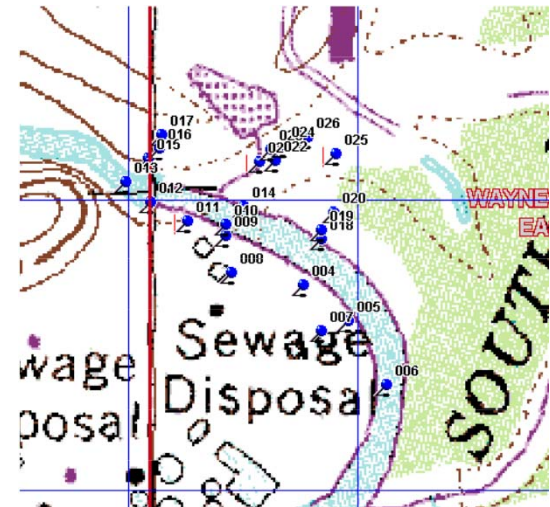
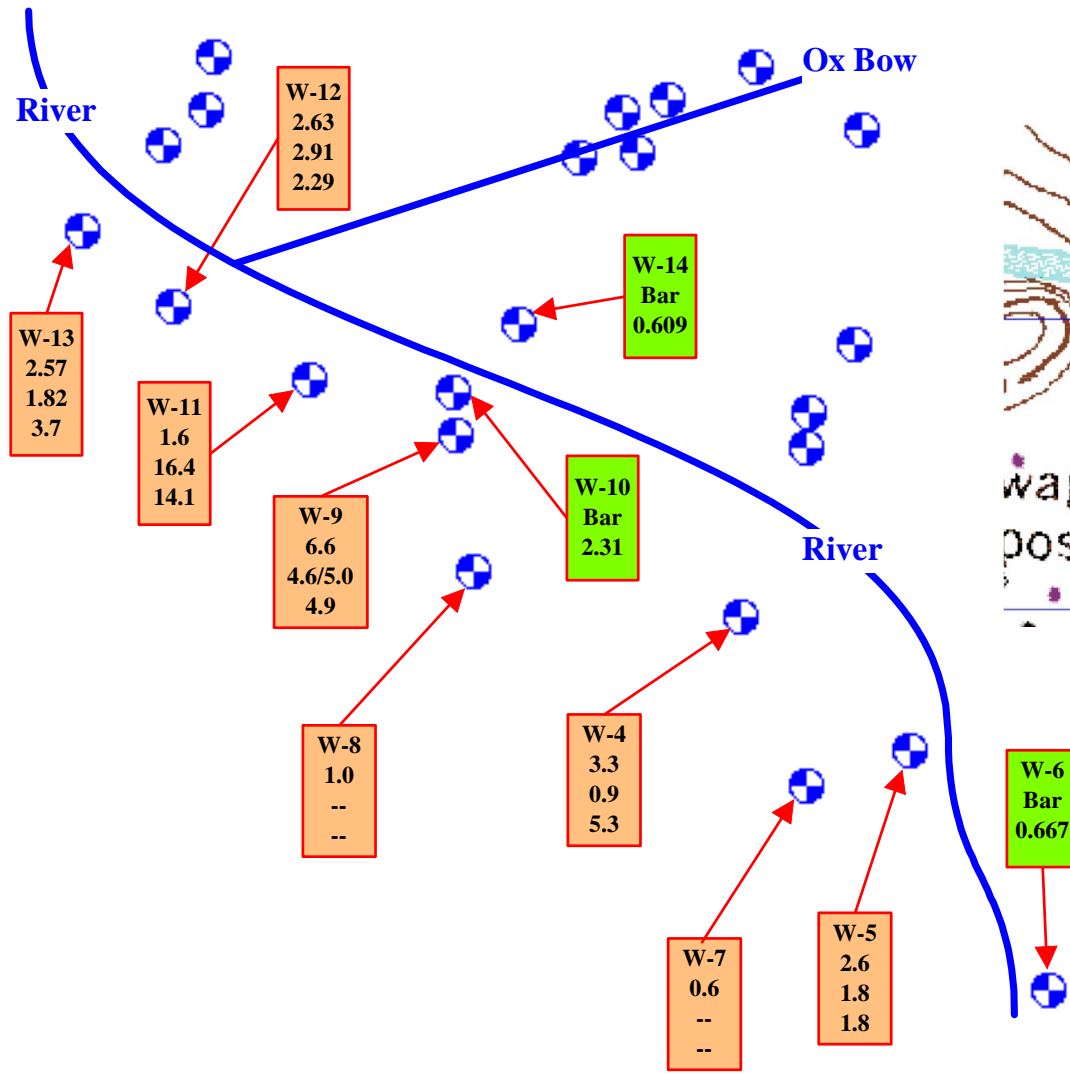
W -54
Bank
8.5
9.4
8.8
9.1
8.6
4.3
4.3
8.5
10.1
8.3

North Park - Waynesboro

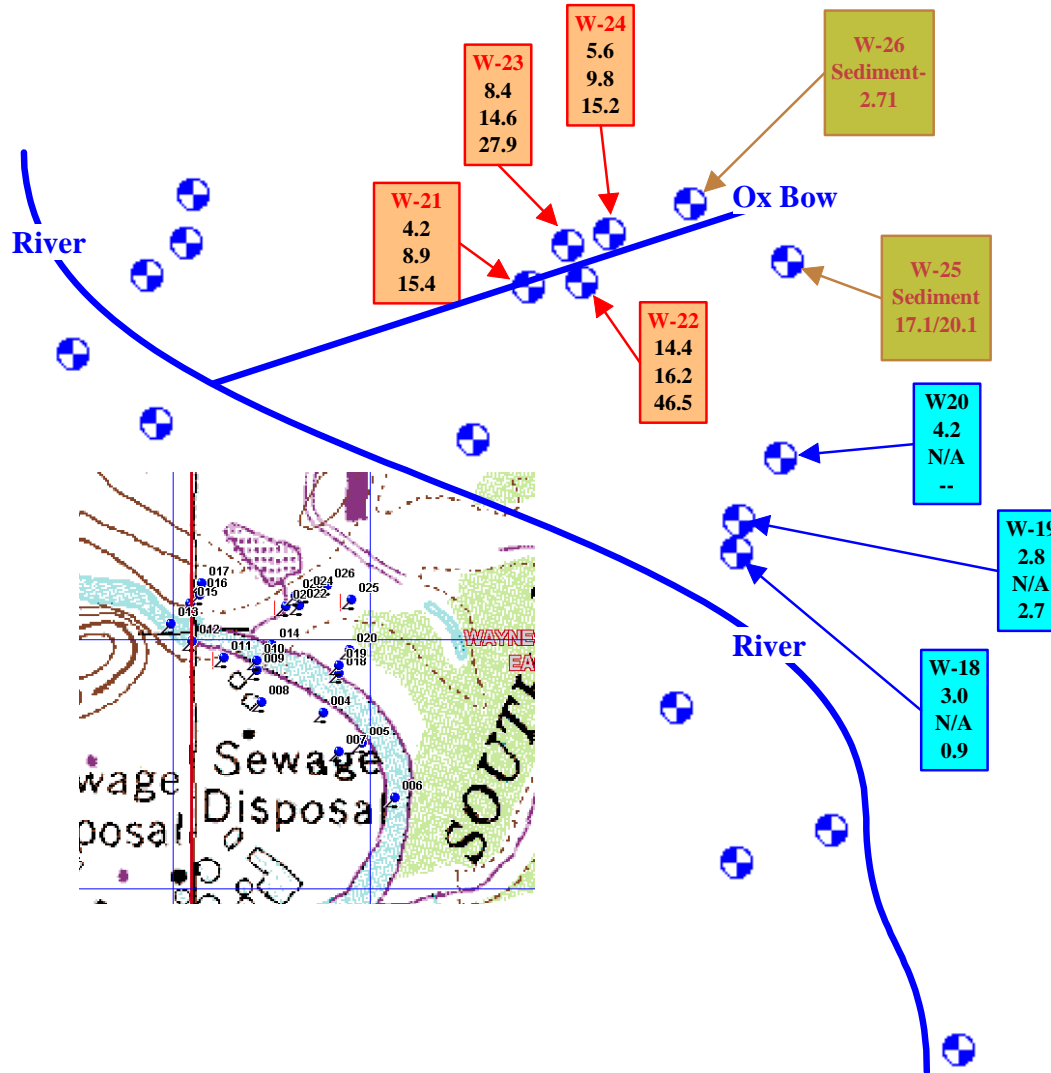
Representative Samples



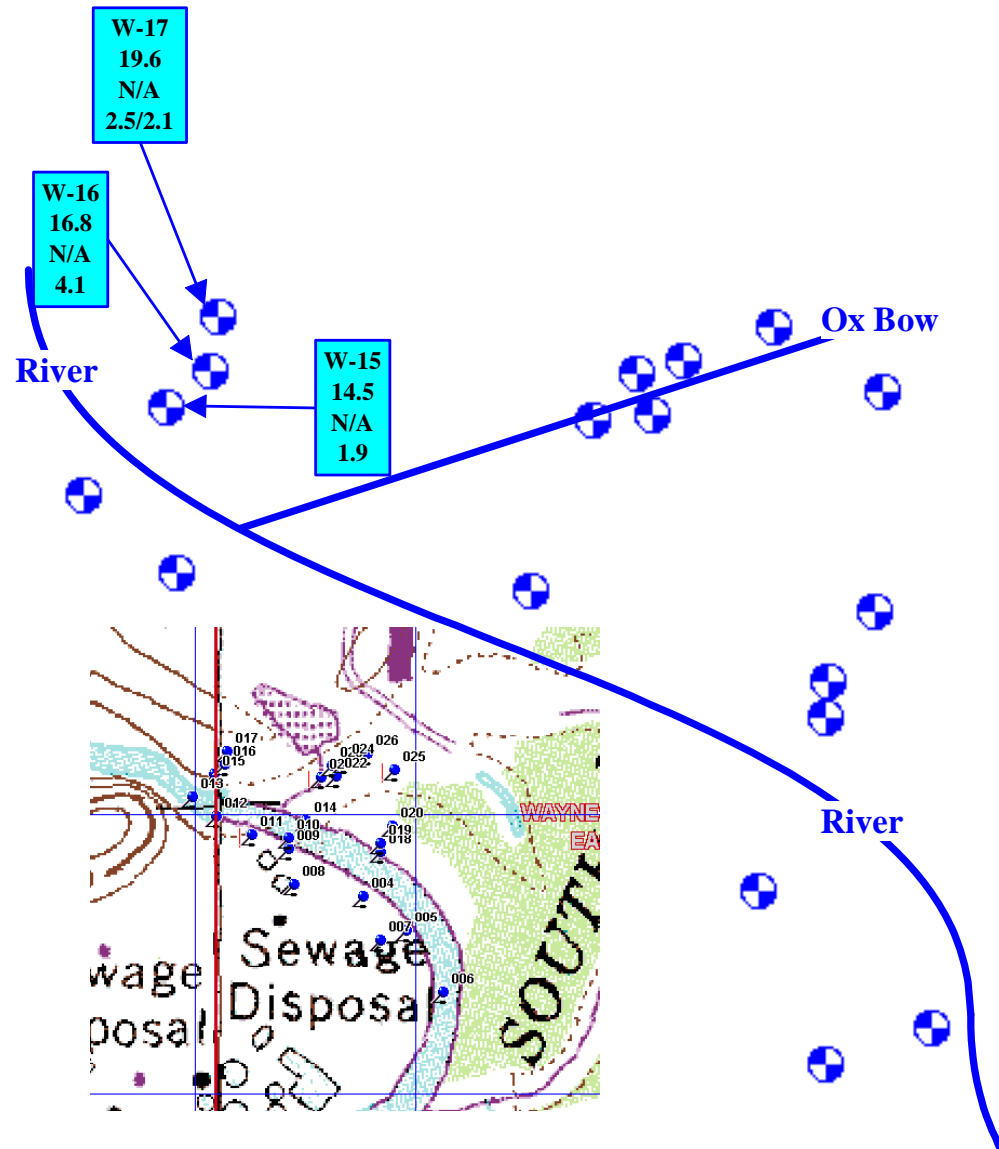
Waynesboro Shops



Allied Ready Mix

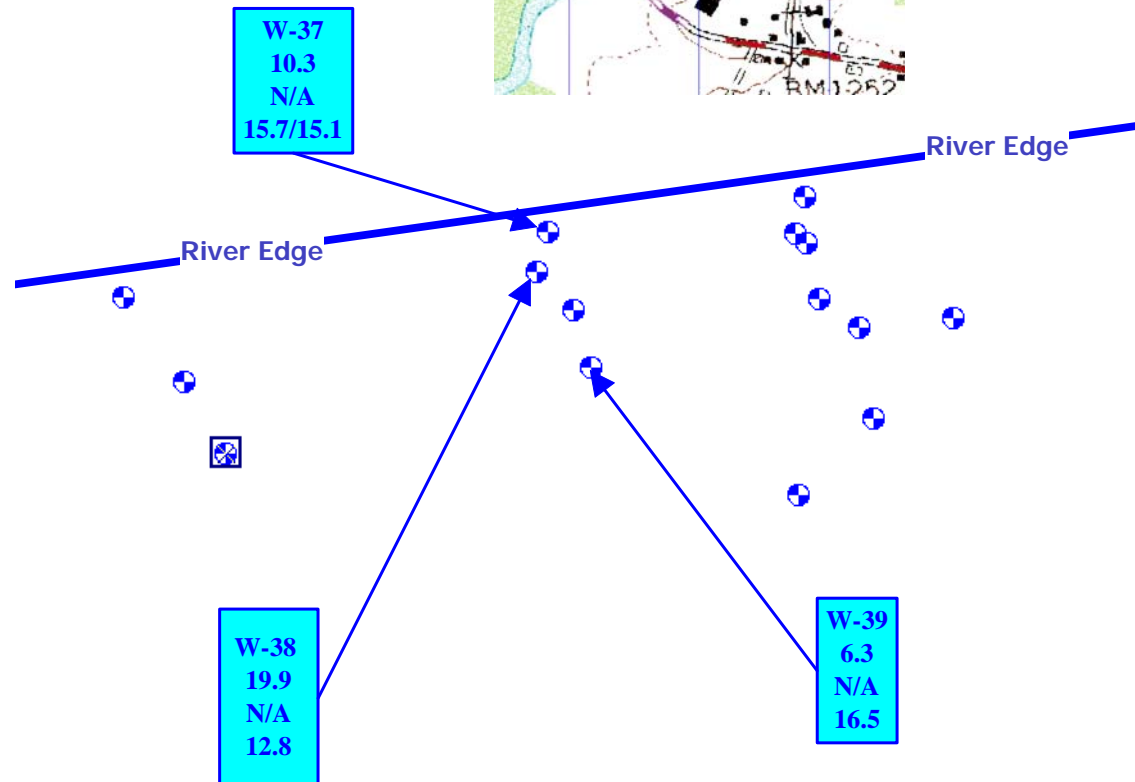


Basic Park

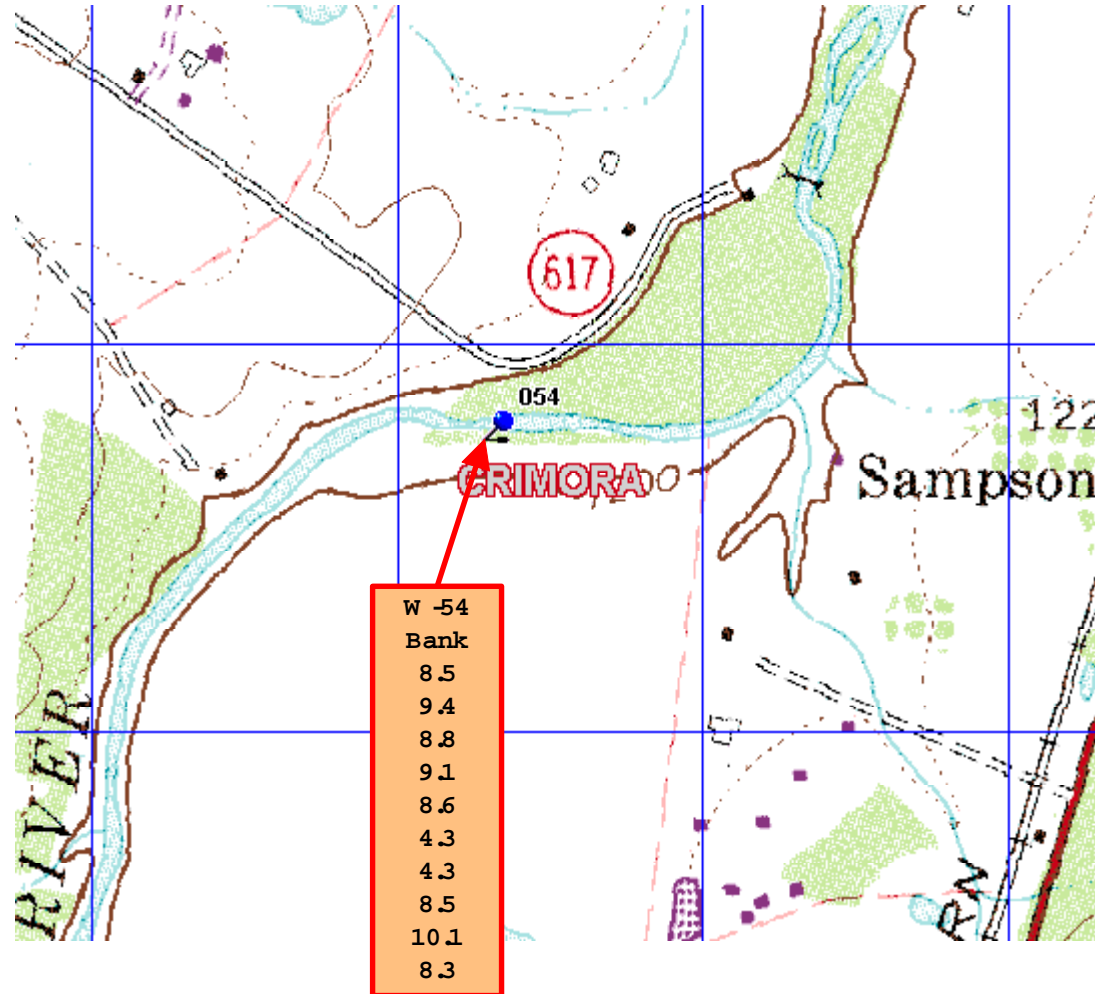


Augusta Park - Crimora

Representative Samples

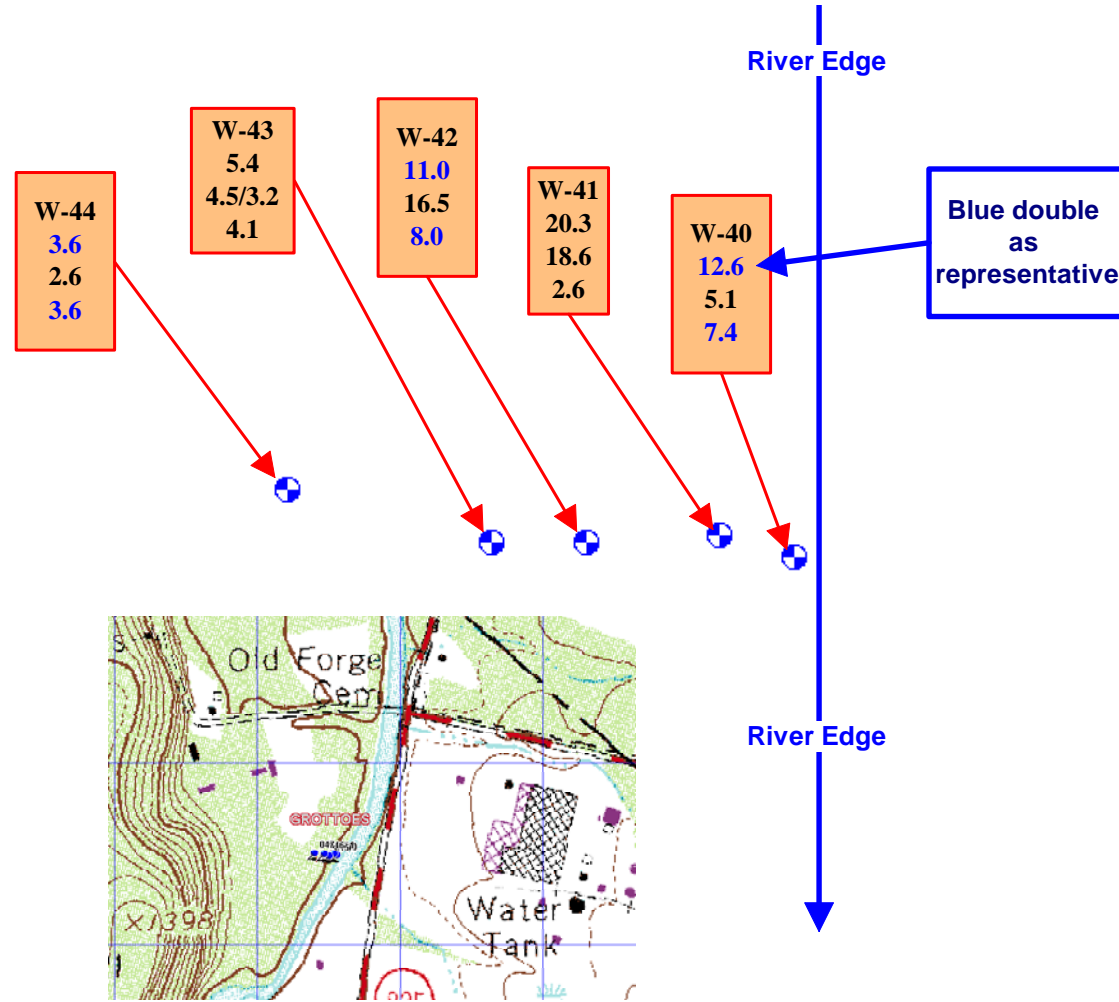


Forestry Station Eroded Bank



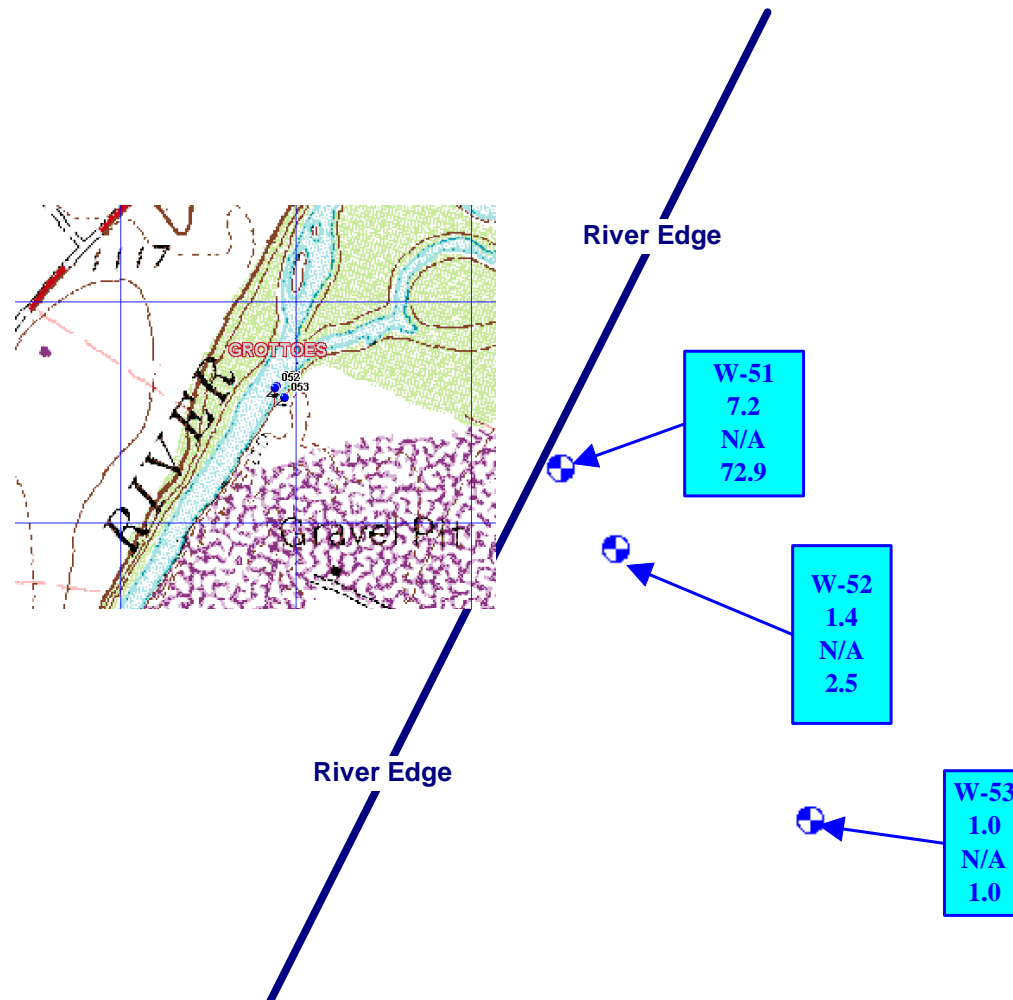
Grand Caverns

Representative & Conceptual Model Samples



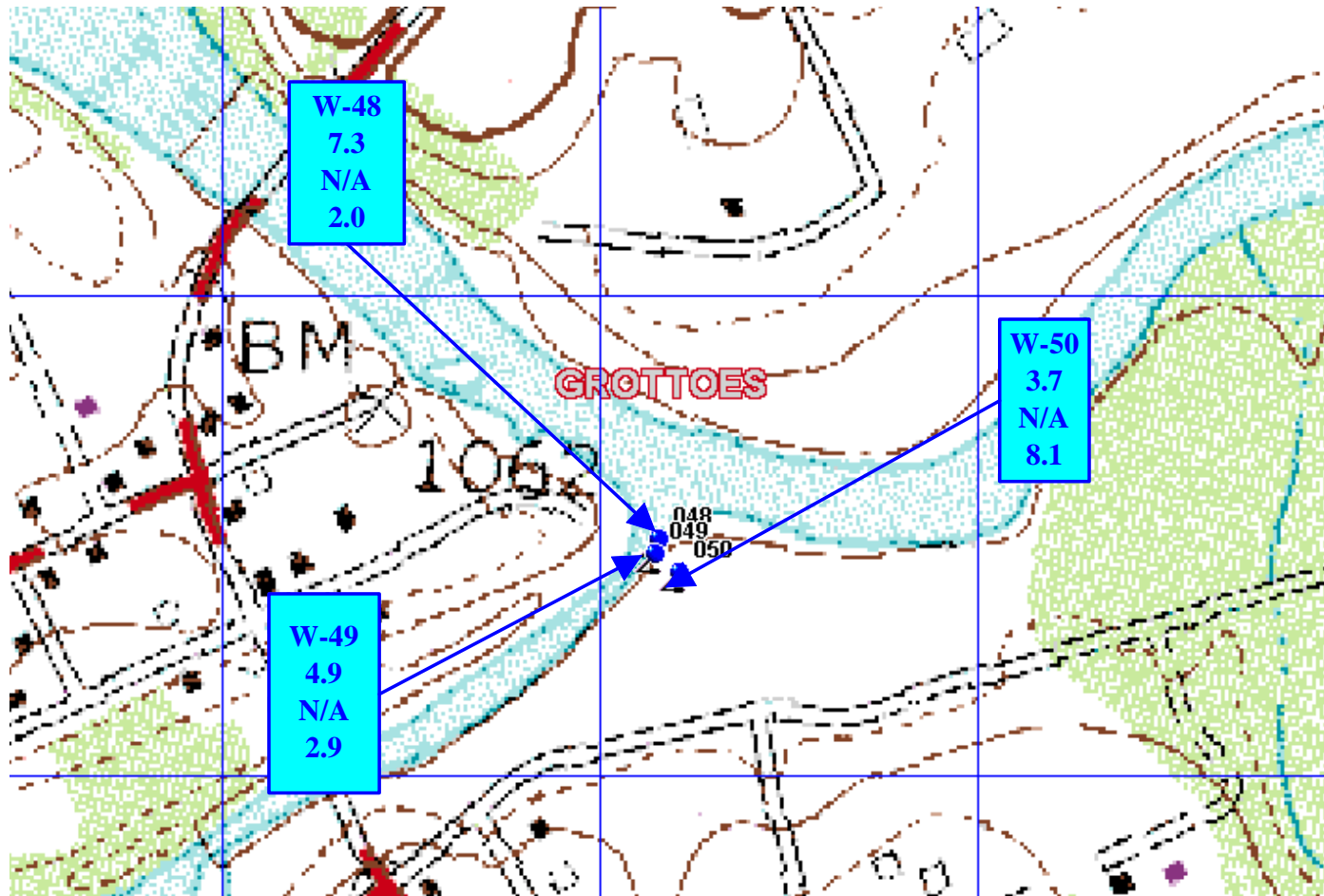
Grottoes Town Park

Representative Samples



Port Republic

Representative Samples



Floodplain Soil Sampling

Initial Observations

- Observations are consistent with 1980 findings.
- Hg concentrations in soils to Port Republic are (on average) order-of-magnitude 10 ppm dry wt.
- Depth profiles indicate higher concentrations with depth, but not always. Deposition history variable?
- Based on limited sampling, no high concentration bank outcrops have been found.

Next Steps

- Complete Sampling Plan
 - Waynesboro property near Hopeman, Ox-Bow
- Review data for CSM - consult with Pizzuto
- Statistical analysis by John Green
- Prepare report