

Phase II Storm Water Sampling  
Invista Waynesboro Plant

South River Science Team Meeting  
February 10, 2004

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# Phase I Storm Sampling Results

Sample Location 1	Base Flow <sup>2</sup>		First Flush <sup>3</sup>		Flow Weight Composite <sup>4</sup>			
	Mercury Concentration (ug/l) <sup>5</sup>	Flow Rate (ft <sup>3</sup> /s)	Mercury Concentration (ug/l) <sup>5</sup>	Flow Rate (ft <sup>3</sup> /s)	Mercury Concentration (ug/l) <sup>5</sup>	Average Flow Rate (ft <sup>3</sup> /s)	Estimated Loading Rate (lbs/hr.) <sup>6</sup>	Estimated Loading Rate (lbs/day) <sup>6</sup>
001 *	<0.16	7.24	< 0.16	5.24	< 0.16	7.73	< 0.00014	< 0.00333
001A	<0.16	1.23	< 0.16	1.82	<b>2.5</b>	2.52	<b>0.00141</b>	<b>0.03394</b>
001B	<0.16	0.21	< 0.16	0.23	<b>19.1</b>	0.39	<b>0.00167</b>	<b>0.04018</b>
001C	<b>0.2</b>	0.06	< 0.16	0.15	< 0.16	0.45	< 0.00001	< 0.00019
001D	<0.16	4.01	< 0.16	4.56	<b>0.22</b>	5.93	<b>0.00029</b>	<b>0.00702</b>
FPBS *	<0.16	22.74	not sampled	--	--	--	--	--
003 *	<0.16	0.59	< 0.16	no flow data	< 0.16	no flow data	--	--
004 *	<0.16	0.02	< 0.16	0.03	<b>0.19</b>	0.44	<b>0.00002</b>	<b>0.00045</b>
005 *	<0.16	0.01	not sampled	--	not sampled	--	--	--
008 *	<0.16	0.63	< 0.16	0.36	<b>0.22</b>	8.91	<b>0.00044</b>	<b>0.01056</b>
008A	<0.16	0.09	< 0.16	0.27	<b>0.20</b>	2.45	<b>0.00011</b>	<b>0.00264</b>
008B	dry	--	<b>0.27</b>	0.34	< 0.16	2.81	< 0.00005	< 0.00121
008C	<0.16	0.36	< 0.16	0.17	< 0.16	3.79	< 0.00007	< 0.00163
010 *	<0.16	0.08	< 0.16	0.00	<b>0.24</b>	3.67	<b>0.00020</b>	<b>0.00474</b>
011 *	<0.16	0.06	< 0.16	0.15	<b>1.7</b>	1.13	<b>0.00043</b>	<b>0.01032</b>
101	<0.16	1.23	< 0.16	1.82	< 0.16	2.58	< 0.00005	< 0.00111
101A	<0.16	0.004	< 0.16	0.03	< 0.16	1.11	< 0.00002	< 0.00048
WWTPI	<0.16	0.38	not sampled	--	not sampled	--	--	--
<b>Total Estimated Loading to the South River<sup>7</sup></b>							<b>0.00494</b>	<b>0.11858</b>

# Phase I Storm Sampling Conclusions

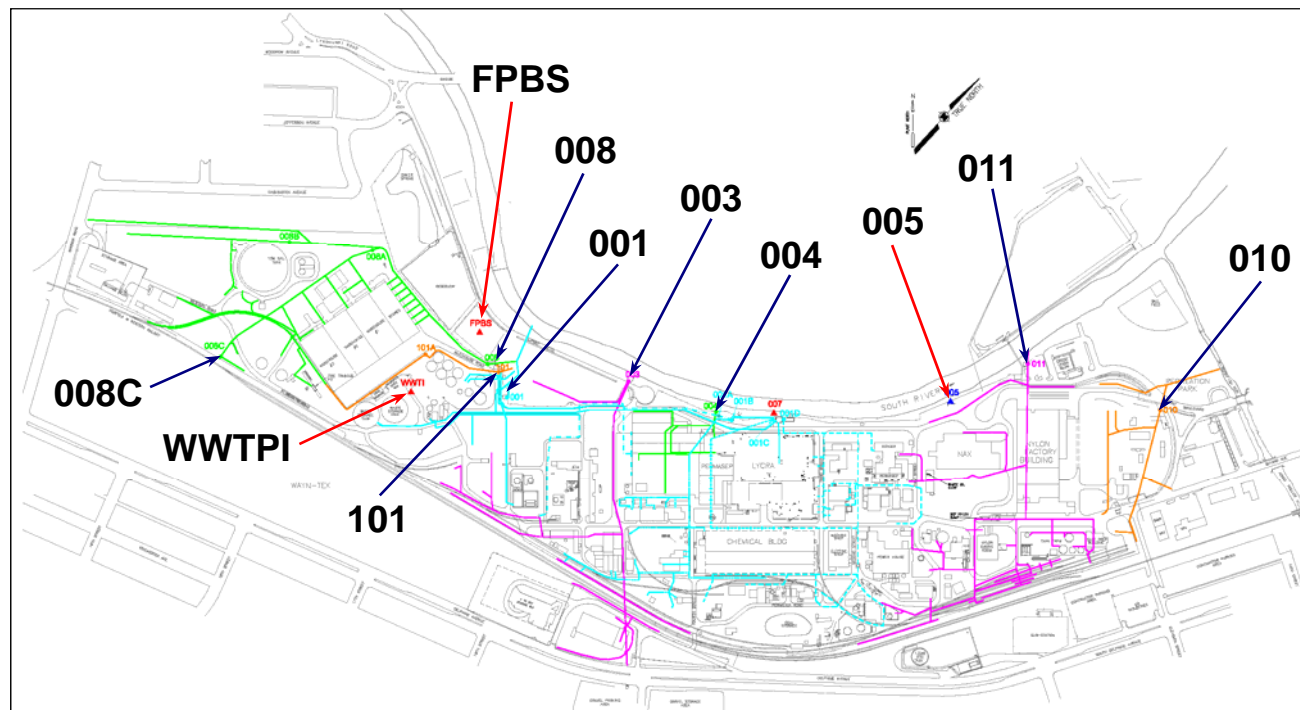
- Loading Rates are low relative to mass in the South River.
- Need to understand concentrations of the dissolved fraction (as surrogate for bio-availability) to determine if loading is significant with respect to fish
- Need to determine how loading changes with changing storm conditions and with changes in base flow over time.

# Phase II Storm Sampling Objectives

- Primary - determine if the mercury identified in the site's storm water system is bio-available.
  - Additional base flow and storm flow sampling
  - Use dissolved Hg as surrogate for bio-available Hg (conservative assumption)
- Secondary - further characterize the up-stream portions of the affected storm water systems at the site.
  - Survey of sediment and water quality within the storm water system

# Sampling Locations

Sampling Location	Type	Description
001	Outfall	Main plant outfall, discharges to the South River
003	Outfall	Discharges to the South River
004	Outfall	Discharges to the South River
005	Outfall	Discharges to the South River
008	Outfall	Discharges to the South River
008C	Up-stream location	Off-site contribution to 008 outfall
010	Outfall	Discharges to the South River
011	Outfall	Discharges to the South River
101	Up-stream location	Discharge from plant WWTP, contributes flow to 001 outfall
FPBS	Outfall	Frew Pond (Baker Spring) overflow, discharges to the South River
WWTPI	Up-stream location	Input to plant WWTP, contributes to flow to 001 outfall



# Base Flow Sampling

- Samples will be collected under various base flow conditions such that the range of typical plant operational conditions is represented in the data set.
- Multiple base flow sampling events will be completed
  - A minimum of three and a maximum of six events will be completed
  - The number and frequency of the sampling events will be determined on the basis of plant operations and previously recorded flows in the target outfalls.
  - During each event, a single grab sample will be collected from each of the 11 sampling locations.
  - Flow rates will be measured at each location at the time of sample collection.
- Base flow sample analyses
  - Total and dissolved mercury using low detection limit method (1631)
  - Total suspended solids (TSS)
  - Samples for dissolved mercury will be filtered in the field as they are collected.

# Storm Flow Sampling

- Samples will be collected during multiple storm events such that the range of typical storm events is represented in the resulting data set.
- Multiple storm flow sampling events will be completed.
  - At least two additional storm flow sampling events - one lower than average and one average (already did higher than average) - more than 2 if needed
  - During each sampling event, first flush and flow-weighted storm flow samples will be collected from 8 of the 11 sampling locations (not 005, FPBS, or WWTP1)
  - Flow rates will be measured at the time of sample collection.
  - Turbidity and flow will be continuously monitored at 1 or 2 outfalls and will continue over entire storm event
- Storm flow sample analyses
  - Total and dissolved mercury using low detection limit method (1631)
  - Total suspended solids (TSS)
  - Samples for dissolved mercury will be filtered in the lab. One split sample (first flush) will be field filtered for comparison.

# Storm Selection

- Focus on changes in actual flows in the outfalls rather than precipitation amounts
- Normal base flow rates will be established at one or more of the site outfalls on the basis of flow data from 2001 and 2002.
- Base flow sampling will be performed only when there has been no precipitation at the site for 72 hours prior to the sampling event.
- Prior to storm flow sampling, the flow rates at one or more of the metered outfalls will be checked to insure that they are within the normal observed range of base flow.



# Sediment and Water Quality Survey

- Aim is to identify potential source areas of mercury within the storm water sewer system at the site
- Survey will be conducted under base flow conditions on several of the potentially impacted portions of the storm water sewer system based on Phase I results (001A, 001B, 001D, 008, 011)
- Accessible junction boxes will be visually inspected
- Water and sediment (if present) samples will be collected
- Water samples will be collected for total and dissolved mercury and TSS.
- Samples for dissolved mercury will be filtered during collection
- Mercury analyses using low detection limit method (1631)