

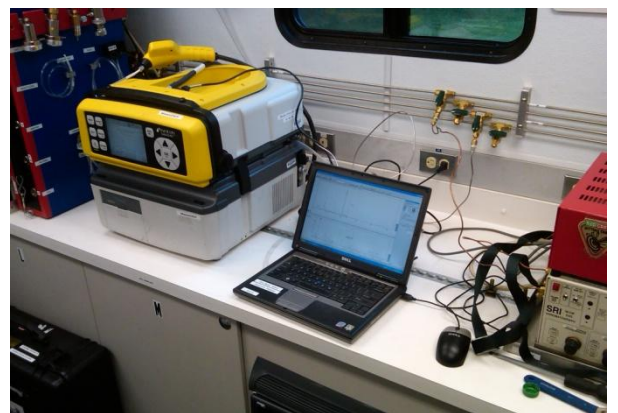
MassDEP Field Assessment and Support Team

After Incident Report

RTN 4-23914

Seekonk – Abandoned Mill Fire

May 2012

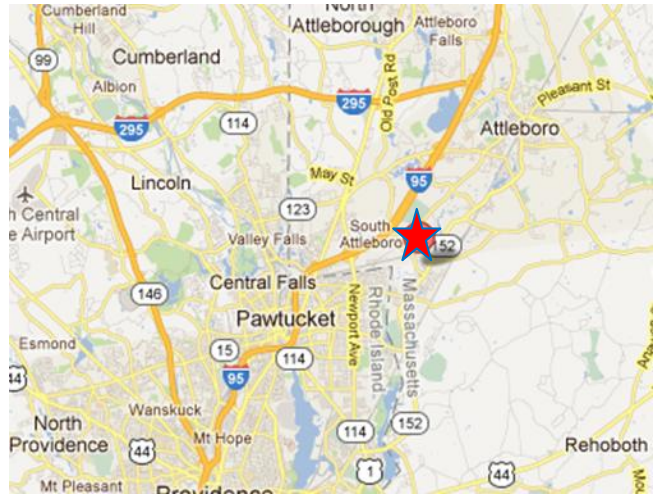


BACKGROUND

At about 4:30 AM on May 1, 2012, a suspicious fire broke out at the former Attleboro Dyeing and Finishing Company mill at 35 Maple Avenue in Seekonk. Reportedly, this 105,000-square foot industrial complex has been vacant for a number of years.

FAST assistance was requested by SERO ER at approximately 9 AM. The FAST mobile lab vehicle arrived at the site at approximately 11:30 AM, and set up in a parking lot behind a church south of the site. At that time, and throughout the day, the fire continued to smolder and emit a smoke plume.

Little information was available on what oils or hazardous materials may have been present at this facility. However, concern existed over the possible presence of toxic constituents in the smoke plume, as well as firefighting runoff. As such, FAST staff activated the on-board weather station, to monitor wind direction and speed, and two on-board gas chromatographs, to analyze smoke, air, and water samples for volatile organic compounds (VOCs).



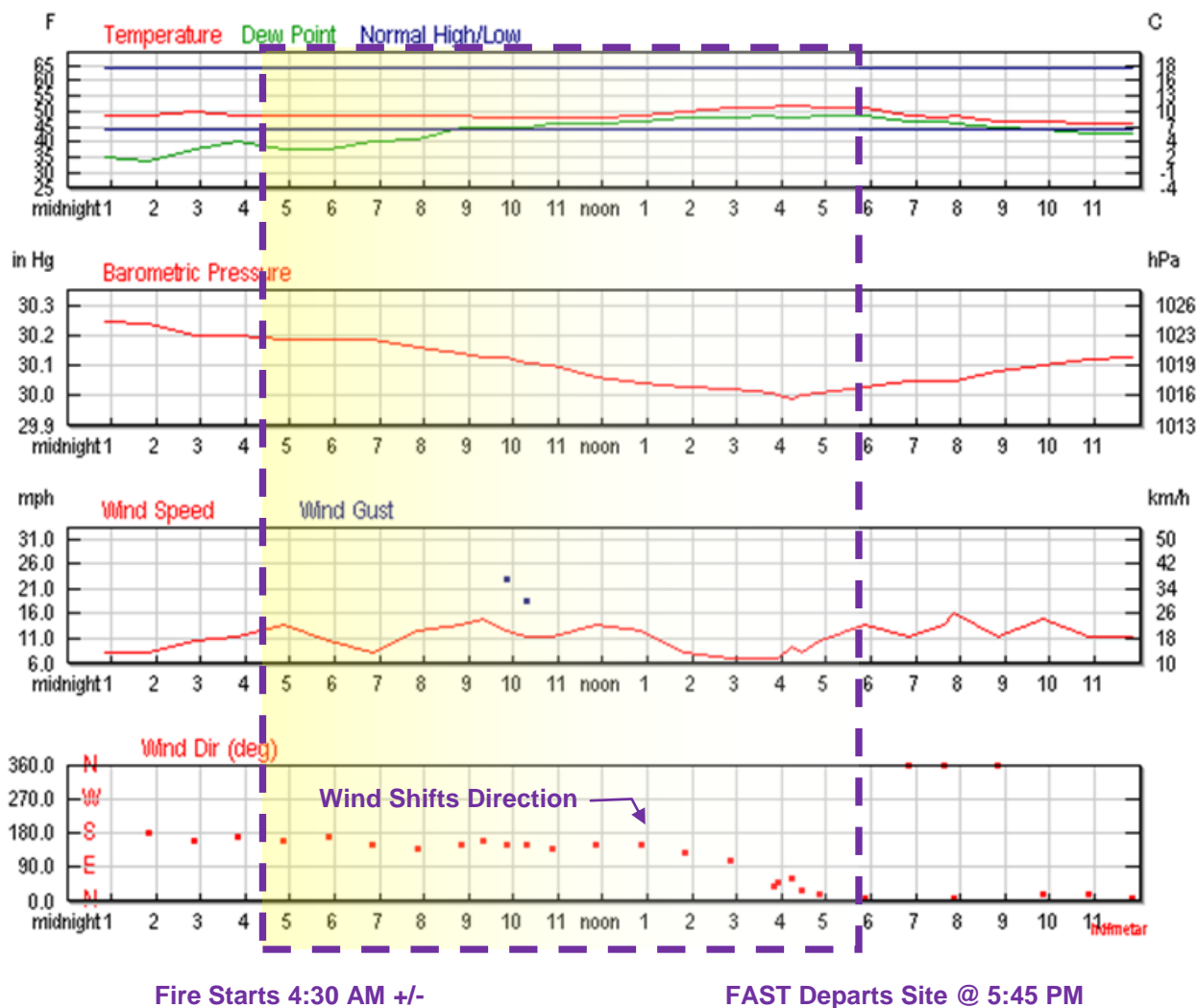
Locus Map



Mill Building and Surrounding Area

WINDS

Upon arrival at the site, the on-board FAST weather station recorded winds from the south/southeast, at about 2 to 5 MPH. However, the wind direction gradually began to shift in the afternoon, changing direction by 180° by 3:30 PM, at which time winds were from the north. This observation is consistent with records available on-line for Seekonk via the Weather Underground (<http://www.wunderground.com/>), as depicted below, which indicates this change of direction coincided with a drop in barometric pressure:



Weather Data for Seekonk on May 1, 2012 (Weather Underground)

This would indicate that plume impacts from the fire would have been most pronounced in areas north of the site, until late afternoon, when the still-smoldering site would have emitted airborne pollutants in a southerly direction.

RECEPTORS

The mill complex is somewhat isolated, with commercial buildings located about 800 feet due north of the facility, though residential areas are closer to the northeast. As the wind shifted in the afternoon, the smoke plume began to travel to the west, a wooded area with no residences within several thousand feet. Finally, by late afternoon when winds were from the north, plume

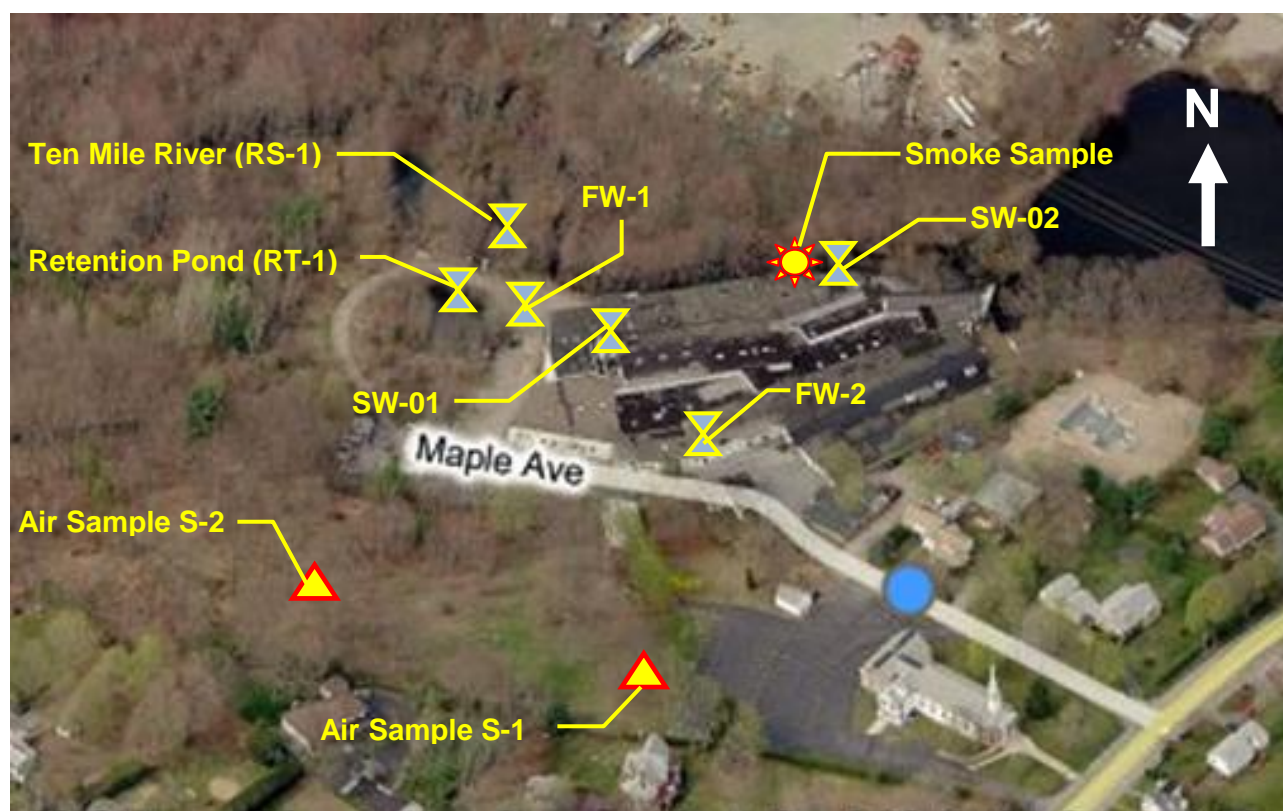
movement was to the south, where a few scattered homes and commercial/church buildings are located. This was also where the FAST vehicle was stationed, and a smoky haze and odor were apparent at that time.

According to MassDEP GIS maps and data, there is a Zone II (drinking water) area about 500 feet easterly of the site, though groundwater flow is likely to the west. There are no other identified sensitive receptors, except for the Ten Mile River, which abuts the site.

SAMPLING

Air samples were collected in 1 Liter bags. Initially, a sample of the smoke at the facility was obtained by fire department personnel in Level B protective gear, to provide a “worst case” characterization of the plume at the time of sampling (about 12:45 PM). Subsequent air samples were obtained by FAST staff in areas downwind of the smoldering complex (Air-1 and Air-2).

Firefighting runoff water from the site was sampled by EPA contractors (SW-01 and SW-02), as well as SERO ER staff (FW-1 and FW-2). Additional surface water samples were obtained by FAST personnel from a retention pond and from the Ten Mile River. The locations of these samples are provided below:



Sample Locations

SAMPLE ANALYSIS

Air samples were analyzed on a HAPSITE Gas Chromatograph with a Mass Spectrometer Detector (GC/MS), using a “TO-14” type method with 35 calibrated volatile organic compounds (VOCs). While reporting limits for most target analytes were in the range of 1 to 5 ppbV, detection limits were generally in the 0.2 to 1 ppbV range. Moreover, in addition to the 35 Target Analyte

VOCs, this method is also able to tentatively identify thousands of organic compounds, based upon mass spectra.

Water samples were analyzed on the HAPSITE GC/MS and an SRI Gas Chromatograph with in-series photoionization and electrolytic conductivity detectors (GC/PID/ELCD). The GC/PID/ELCD is calibrated for 15 common contaminants. Aqueous concentrations in µg/L were estimated by analyzing the headspace above these samples, and using Henry's Law to calculate the value in water corresponding to the level in the headspace, assuming a 90% partitioning condition. MassDEP has used this technique for more than a decade, and in almost all cases such data is comparable (+/- 30%) to EPA Method 8260 data.

RESULTS

Data sheets for each analyzed sample are provided at the end of this report.

The highest concentration VOC contaminant in the smoke (at the time of sampling), and the most toxic component, was benzene, at 330 ppbV (0.33 ppmV). This level is still well below the 8 hour EPA "AEGL-1" value for exposures to the general public, which is 9 ppmV. There were lower and less problematic levels of other hydrocarbons, including Toluene, Ethylbenzene, and Xylenes. There were only trace levels of a few chlorinated compounds, i.e., Bromomethane and Chlorobenzene (see table below)

VOCs in Mill Fire Smoke (12:45 PM)								
Air Contaminant	Conc. in ppmV	Safe Levels ¹ (below conc for given time period) - ppmV						
		1 hr	8 hr	5 yrs	30 yrs	Odors	Worker	µg/m ³ /ppb
Bromomethane	0.032	1	0.2	0.013	0.001	10	20	3.89
Benzene	0.3309	52	9	0.07	0.001	0.8	0.1	3.19
Toluene	0.1079	200	200	13.3	1.35	4	100	3.76
Chlorobenzene	0.0031	10	10	0.043	<0.001	0.11	75	4.62
Ethylbenzene	0.0736	33	33	2.3	0.23	0.23	100	4.34
p/m-Xylene (see note)	0.0056	5	0.8	0.23	0.023	0.005	100	4.34
Styrene	0.0445	20	20	0.059	0.01	0.16	50	4.25
o-Xylene	0.0099	5	0.8	0.23	0.023	0.005	100	4.34
1,2,4-Trimethylbenzene	0.001	140	45	NA	NA	0.4	25	4.91
¹ Safe Levels: 1 hr = 1 hr EPA AEGL-1 or 1 hr California REL or (DOE TEEL-0)/2; 8 hr = 8 hr EPA AEGL-1 or (California REL1hr)/5, or (DOE TEEL-0)/10; 5 yr and 30 year exposure levels per MassDEP MCP; Worker = lower of OSHA PEL or NIOSH REL for 8 hrs.								

Many of these same compounds were found in ambient air samples S-1 and S-2, but at much lower concentrations, in the 1 ppbV to 20 ppbV range, well below levels of short-term-exposure concern. There were no significant unidentified chromatographic peaks on any of the sample chromatograms, negating the need to search for Tentatively Identified Compounds (TICs).

The firefighting runoff water (SW-01 and SW-02; FW-1 and FW-2) similarly contained only low levels of these hydrocarbons (generally less than 10 µg/L). No contaminants were detected in a retention pond downstream of the mill complex. Only trace levels of a few VOCs were detected in the Ten Mile River sample.

CONCLUSIONS

It does not appear that significant quantities of volatile hazardous chemicals were present in the mill complex, and firefighting runoff did not appear to significantly impact downstream areas or the Ten Mile River.

At the time of sampling (i.e., afternoon hours), the still smoldering fire did not appear to be significantly impacting downwind areas with volatile organic compounds.

MassDEP Field Assessment and Support Team (FAST)				AIR SCREENING DATA			RTN: 4-23914	
City or Town:	Seekonk		Address:	Mill Fire - Maple Avde				Location:
Date Sampled:	5/1/12	Time:	12:45PM	Field ID:	Smoke	Collector:	Seekonk FD	Smoke plume @ building
Date Analyzed:	5/1/12	Time:	1:32 AM	Lab ID:	003	Analyst:	Fitzgerald	
Method Analytes	Concentration		Reporting Limit		Peak Fit	Peak Purity	Synonym	
	ppbV	µg/m ³	ppbV	µg/m ³				
Vinyl Chloride	N.D.	N.D.	5	13	0.644	0.028	Chloroethene	
Bromomethane	32.5	144.9	5	22	0.999	0.327	Methyl Bromide	
Chloroethane	N.D.	N.D.	5	23	0.912	0.08	Ethyl Chloride	
Trichloromonofluoromethane	N.D.	N.D.	30	210	0.972	0.007	Freon 11	
1,1-Dichloroethene	N.D.	N.D.	1	4	0.591	0.106	Vinylidene Chloride	
Methylene Chloride	N.D.	N.D.	1	3.5	0.931	0.048	Dichloromethane	
1,1,2-Trichlorotrifluoroethane	N.D.	N.D.	1	7.7	0.628	0.005	Freon 113	
1,1-Dichloroethane	N.D.	N.D.	1	4.1	0.58	0.028		
Cis 1,2-Dichloroethylene	N.D.	N.D.	1	4	0	0	cis-1,2-Dichloroethene	
Chloroform	N.D.	N.D.	1	4.9	0.627	0.01	Trichloromethane	
1,2-Dichloroethane	N.D.	N.D.	5	20	0.546	0.016	Ethylene Dichloride	
1,1,1-Trichloroethane	N.D.	N.D.	1	5.5	0	0	Methyl Chloroform	
Benzene	330.9	1058.9	1	3.2	0.993	0.669		
Carbon Tetrachloride	N.D.	N.D.	1	6.3	0.892	0.016	Tetrachloromethane	
1,2-Dichloropropane	N.D.	N.D.	1	4.6	0.19	0.05	Propylene Dichloride	
Trichloroethylene	N.D.	N.D.	1	5.4	0.777	0.052	Trichloroethene	
cis-1,3-Dichloropropene	N.D.	N.D.	1	4.5	0	0		
trans-1,3-Dichloropropene	N.D.	N.D.	1	4.5	0.651	0.006		
1,1,2-Trichloroethane	N.D.	N.D.	1	5.5	0.377	0.287		
Toluene	107.9	406.8	1	3.8	0.999	0.753		
1,2-Dibromoethane	N.D.	N.D.	1	7.7	0.835	0.035	Ethylene Dibromide	
Tetrachloroethylene	N.D.	N.D.	1	6.8	0.389	0.25	Perchloroethylene	
Chlorobenzene	3.1	14.1	1	4.6	1	0.584		
Ethylbenzene	73.6	319.3	1	4.3	1	0.649		
p/m-Xylene (see note)	5.6	24.2	1	4.3	0.997	0.622		
Styrene	44.5	189.7	1	4.3	1	0.68	Vinyl benzene	
o-Xylene	9.9	43.1	1	4.3	0.892	0.779		
1,1,2,2-Tetrachloroethane	N.D.	N.D.	5	34	0.855	0.119		
1,3,5-Trimethylbenzene	N.D.	N.D.	5	25	0.968	0.167	Mesitylene	
1,2,4-Trimethylbenzene	1.4	6.8	5	25	0.999	0.485		
1,3-Dichlorobenzene (meta)	N.D.	N.D.	5	30	0.87	0.545	m- Dichlorobenzene	
1,2-Dichlorobenzene (ortho)	N.D.	N.D.	5	30	0.882	0.541	o – Dichlorobenzene	
1,4-Dichlorobenzene (para)	N.D.	N.D.	5	30	0.879	0.401	p – Dichlorobenzene	
1,2,4-Trichlorobenzene	N.D.	N.D.	5	37	0	0		
HexachloroButadiene	N.D.	N.D.	5	53	0	0		
¹ Concentration for combined p- & m- Xylenes could be up to twice the listed value, due to co-elution conditions.								
Instrument: HAPSITE Smart Plus GC/MS			Quality Control: 3-6 point cal w/ %RSD<30, Internal Stds, daily blank, daily cal check					
N.D. = Not Detected Italicized = estimated “J” value (concentration is less than Reporting Limit).							Last Calibration: 3/31/11	
Peak Fit=agreement w/ spectral database; Peak Purity=interference from coeluting compounds. Fit >0.5 likely, >0.85 very likely match								
COMMENTS:								

MassDEP Field Assessment and Support Team (FAST)				AIR SCREENING DATA			RTN:	
City or Town:	Seekonk		Address:	Mill Fire - Maple Ave				Location:
Date Sampled:	5/1/12	Time:	3:00 PM	Field ID:	Air-1	Collector:	Clark	Ambient Air South of fire
Date Analyzed:	5/1/12	Time:	3:31 PM	Lab ID:	006	Analyst:	Fitzgerald	
Method Analytes	Concentration		Reporting Limit		Peak Fit	Peak Purity	Synonym	
	ppbV	µg/m³	ppbV	µg/m³				
Vinyl Chloride	N.D.	N.D.	5	13	0	0	Chloroethene	
Bromomethane	N.D.	N.D.	5	22	0	0	Methyl Bromide	
Chloroethane	4.1	10.8	5	23	0.937	0.205	Ethyl Chloride	
Trichloromonofluoromethane	N.D.	N.D.	30	210	0.992	0.184	Freon 11	
1,1-Dichloroethene	N.D.	N.D.	1	4	0	0	Vinylidene Chloride	
Methylene Chloride	N.D.	N.D.	1	3.5	0	0	Dichloromethane	
1,1,2-Trichlorotrifluoroethane	N.D.	N.D.	1	7.7	0.621	0.114	Freon 113	
1,1-Dichloroethane	N.D.	N.D.	1	4.1	0	0		
Cis-1,2-Dichloroethylene	N.D.	N.D.	1	4	0	0	cis-1,2-Dichloroethene	
Chloroform	N.D.	N.D.	1	4.9	0	0	Trichloromethane	
1,2-Dichloroethane	N.D.	N.D.	5	20	0	0	Ethylene Dichloride	
1,1,1-Trichloroethane	N.D.	N.D.	1	5.5	0	0	Methyl Chloroform	
Benzene	3.6	11.6	1	3.2	0.993	0.664		
Carbon Tetrachloride	N.D.	N.D.	1	6.3	0.916	0.159	Tetrachloromethane	
1,2-Dichloropropane	N.D.	N.D.	1	4.6	0	0	Propylene Dichloride	
Trichloroethylene	N.D.	N.D.	1	5.4	0.961	0.458	Trichloroethene	
cis-1,3-Dichloropropene	N.D.	N.D.	1	4.5	0	0		
trans-1,3-Dichloropropene	N.D.	N.D.	1	4.5	0	0		
1,1,2-Trichloroethane	N.D.	N.D.	1	5.5	0	0		
Toluene	1.0	3.7	1	3.8	0.999	0.747		
1,2-Dibromoethane	N.D.	N.D.	1	7.7	0	0	Ethylene Dibromide	
Tetrachloroethylene	N.D.	N.D.	1	6.8	0	0	Perchloroethylene	
Chlorobenzene	N.D.	N.D.	1	4.6	0	0		
Ethylbenzene	0.5	2.0	1	4.3	0.999	0.666		
p/m-Xylene (see note)	N.D.	N.D.	1	4.3	0.998	0.528		
Styrene	0.6	2.4	1	4.3	0.999	0.677	Vinyl benzene	
o-Xylene	N.D.	N.D.	1	4.3	0.967	0.576		
1,1,2,2-Tetrachloroethane	N.D.	N.D.	5	34	0	0		
1,3,5-Trimethylbenzene	N.D.	N.D.	5	25	0.913	0.45	Mesitylene	
1,2,4-Trimethylbenzene	N.D.	N.D.	5	25	1	0.395		
1,3-Dichlorobenzene (meta)	N.D.	N.D.	5	30	0	0	m– Dichlorobenzene	
1,2-Dichlorobenzene (ortho)	N.D.	N.D.	5	30	0	0	o – Dichlorobenzene	
1,4-Dichlorobenzene (para)	N.D.	N.D.	5	30	0	0	p – Dichlorobenzene	
1,2,4-Trichlorobenzene	N.D.	N.D.	5	37	0	0		
HexachloroButadiene	N.D.	N.D.	5	53	0	0		
¹ Concentration for combined p- & m- Xylenes could be up to twice the listed value, due to co-elution conditions.								
Instrument: HAPSITE Smart Plus GC/MS		Quality Control: 3-6 point cal w/ %RSD<30, Int Stds, daily blank, daily cal check						
N.D. = Not Detected Italicized = estimated "J" value (concentration is less than Reporting Limit).							Last Calibration: 3/31/11	
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COMMENTS:								

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Date Analyzed:	5/1/12	Time:	4:04 PM	Lab ID:	007	Analyst:	Fitzgerald
Method Analytes	Concentration		Reporting Limit		Peak Fit	Peak Purity	Synonym
	ppbV	µg/m ³	ppbV	µg/m ³			
Vinyl Chloride	N.D.	N.D.	5	13	0.89	0.013	Chloroethene
Bromomethane	N.D.	N.D.	5	22	0	0	Methyl Bromide
Chloroethane	4.4	11.7	5	23	0.944	0.179	Ethyl Chloride
Trichloromonofluoromethane	N.D.	N.D.	30	210	0.97	0.186	Freon 11
1,1-Dichloroethene	N.D.	N.D.	1	4	0	0	Vinylidene Chloride
Methylene Chloride	N.D.	N.D.	1	3.5	0	0	Dichloromethane
1,1,2-Trichlorotrifluoroethane	N.D.	N.D.	1	7.7	0.614	0.118	Freon 113
1,1-Dichloroethane	N.D.	N.D.	1	4.1	0	0	
Cis 1,2-Dichloroethylene	N.D.	N.D.	1	4	0	0	cis-1,2-Dichloroethene
Chloroform	N.D.	N.D.	1	4.9	0	0	Trichloromethane
1,2-Dichloroethane	N.D.	N.D.	5	20	0.608	0.009	Ethylene Dichloride
1,1,1-Trichloroethane	N.D.	N.D.	1	5.5	0	0	Methyl Chloroform
Benzene	6.2	19.8	1	3.2	0.991	0.661	
Carbon Tetrachloride	N.D.	N.D.	1	6.3	0.914	0.161	Tetrachloromethane
1,2-Dichloropropane	N.D.	N.D.	1	4.6	0	0	Propylene Dichloride
Trichloroethylene	N.D.	N.D.	1	5.4	0	0	Trichloroethene
cis-1,3-Dichloropropene	N.D.	N.D.	1	4.5	0	0	
trans-1,3-Dichloropropene	N.D.	N.D.	1	4.5	0	0	
1,1,2-Trichloroethane	N.D.	N.D.	1	5.5	0	0	
Toluene	1.4	5.1	1	3.8	0.996	0.758	
1,2-Dibromoethane	N.D.	N.D.	1	7.7	0	0	Ethylene Dibromide
Tetrachloroethylene	N.D.	N.D.	1	6.8	0	0	Perchloroethylene
Chlorobenzene	N.D.	N.D.	1	4.6	0	0	
Ethylbenzene	0.3	1.1	1	4.3	1	0.647	
p/m-Xylene (see note)	N.D.	N.D.	1	4.3	0.999	0.539	
Styrene	0.6	2.6	1	4.3	0.999	0.664	Vinyl benzene
o-Xylene	N.D.	N.D.	1	4.3	0.963	0.459	
1,1,2,2-Tetrachloroethane	N.D.	N.D.	5	34	0	0	
1,3,5-Trimethylbenzene	N.D.	N.D.	5	25	0.932	0.189	Mesitylene
1,2,4-Trimethylbenzene	N.D.	N.D.	5	25	1	0.342	
1,3-Dichlorobenzene (meta)	N.D.	N.D.	5	30	0	0	m- Dichlorobenzene
1,2-Dichlorobenzene (ortho)	N.D.	N.D.	5	30	0	0	o - Dichlorobenzene
1,4-Dichlorobenzene (para)	N.D.	N.D.	5	30	0	0	p - Dichlorobenzene
1,2,4-Trichlorobenzene	N.D.	N.D.	5	37	0	0	
HexachloroButadiene	N.D.	N.D.	5	53	0	0	
¹ Concentration for combined p- & m- Xylenes could be up to twice the listed value, due to co-elution conditions.							
Instrument: HAPSITE Smart Plus GC/MS				Quality Control: 3-6 point cal w/ %RSD<30, Internal Stds, daily blank, daily cal check			
N.D. = Not Detected Italicized = estimated "J" value (concentration is less than Reporting Limit).							Last Calibration: 3/31/11
Peak Fit=agreement w/ spectral database; Peak Purity=interference from coeluting compounds. Fit >0.5 likely, >0.85 very likely match							
COMMENTS:							

Name of Site	Address	Sample Collected By
SEEKONK FIRE	MAPLE AVENUE	FAST

Sample Location	Field ID	Lab ID	Date Sampled	Date Analyzed
FIRE WATER	FW-1	P6945 / E6945	5/1/12	5/1/12
FIRE WATER	FW-2	P6946 / E6946	5/1/12	5/1/12
RETENTION POND	RT-1	P6947 / E6947	5/1/12	5/1/12
10 MILE RIVER	RS-1	P6948 / E6948	5/1/12	5/1/12

SAMPLE RESULTS

Estimated Aqueous Concentration

Headspace Screening Technique

		Sample Identifier				
		Est	FW-1	FW-2	RT-1	RS-1
		RL	Estimated	Estimated	Estimated	Estimated
ANALYTE	Detector	ug/L	Water Conc ug/L	Water Conc ug/L	Water Conc ug/L	Water Conc ug/L
methyl(t)butylether	PID	22	ND	ND	ND	ND
benzene	PID	1.0	ND	TR (<1.0)	ND	ND
toluene	PID	1.0	TR (<1.0)	1.1	ND	TR (<1.0)
ethylbenzene	PID	1.0	ND	TR (<1.0)	ND	ND
total xylenes	PID	1.3	ND	TR (<1.3)	ND	ND
(1,2,4)-trimethylbenzene	PID	1.7	ND	TR (<1.7)	ND	ND
naphthalene	PID	33	9.2	18	ND	ND
TPH adjusted	PID	*	ND	ND	ND	ND
Total unk. non-chloro (PID	1.3	ND	ND	ND	ND
methylene chloride	ELCD	4.8	ND	ND	ND	ND
(1,1)-dichloroethane	ELCD	2.1	ND	ND	ND	ND
cis(1,2)-dichloroethene	ELCD	4.0	TR (<4.0)	TR (<4.0)	ND	TR (<4.0)
(1,1,1)-trichloroethane	ELCD	1.0	ND	ND	ND	ND
(1,2)-dichloroethane	ELCD	11.5	ND	ND	ND	ND
trichloroethene (TCE)	ELCD	1.0	TR (<1.0)	ND	ND	TR (<1.0)
tetrachloroethene	ELCD	1.0	ND	ND	ND	TR (<1.0)
chlorobenzene	ELCD	3.6	ND	ND	ND	ND
unk chloro VOC	ELCD	1.0	ND	ND	ND	ND
unk chloro VOC	ELCD	1.0	ND	ND	ND	ND
unk chloro VOC	ELCD	1.0	ND	ND	ND	ND

COMMENTS

1. ND means a compound was not detected. 2. (TR) means that a target compound was found at a trace level - less than it's reportable level "RL", but above it's method detection limit (MDL).

Sampling Method: NERO Lab

Instrumentation: SRI

Analytical Method: NERO

MassDEP Field Assessment and Support Team (FAST)			
Water Sample GC/MS Data by Headspace Screening Technique - µg/L			
Method Analytes	SW-01	SW-02	
Vinyl Chloride	ND	ND	
Bromomethane	ND	ND	
Chloroethane	ND	ND	
Trichloromonofluoromethane	ND	ND	
1,1-Dichloroethene	ND	ND	
Methylene Chloride	ND	ND	
1,1,2-Trichlorotrifluoroethane	ND	ND	
1,1-Dichloroethane	ND	ND	
Cis 1,2-Dichloroethylene	ND	ND	
Chloroform	ND	ND	
1,2-Dichloroethane	ND	ND	
1,1,1-Trichloroethane	ND	ND	
Benzene	3	3	
Carbon Tetrachloride	ND	ND	
1,2-Dichloropropane	ND	ND	
Trichloroethylene	ND	ND	
cis-1,3-Dichloropropene	ND	ND	
trans-1,3-Dichloropropene	ND	ND	
1,1,2-Trichloroethane	ND	ND	
Toluene	Trace (<1)	1	
1,2-Dibromoethane	ND	ND	
Tetrachloroethylene	ND	ND	
Chlorobenzene	ND	ND	
Ethylbenzene	Trace (<1)	Trace (<1)	
p/m-Xylene (double listed conc)	Trace (<1)	Trace (<1)	
Styrene	6	3	
o-Xylene	Trace (<1)	Trace (<1)	
1,1,2,2-Tetrachloroethane	ND	ND	
1,3,5-Trimethylbenzene	ND	ND	
1,2,4-Trimethylbenzene	2	Trace (<1)	
1,3-Dichlorobenzene (meta)	ND	ND	
1,2-Dichlorobenzene (ortho)	ND	ND	
1,4-Dichlorobenzene (para)	ND	ND	
1,2,4-Trichlorobenzene	ND	ND	
HexachloroButadiene	ND	ND	