Summer 2013 K-5 School Construction
Estabrook O&M Plan Update

School Committee
August 27, 2013

Department of Public Facilities
Pat Goddard

Estabrook Library

Estabrook Gymnasium

Estabrook Classroom Framing

Estabrook East Elevation

Estabrook West Elevation

Estabrook South Elevation

Bridge & Bowman Classrooms

Bridge Library

Boiler Room Conversion

Estabrook O&M Plan Compliance

Estabrook O&M Implementation Schedule 2011 - 2012

		Training			Material Sampling			System Tests			Hazmat	
		Estabrook Training	DPF Training	HAZMAT Training	Air Sampling	Surface Dust	Caulk Surface	Daily Checks	Monthly Checks	Controls PM	Hazmat Response	Project Plans
		EH&E	EH&E	DPF	EH&E	EH&E	EH&E	DPF	DPF	DPF	DPF	DPF
July	3							8-Jul				
	10				July 13-14			15-Jul				
	17							22-Jul				
	24		28-Jul					29-Jul	8-Jul			
August	1							5-Aug		5-Aug		
	8							12-Aug				01, 02
	15					15-Aug	15-Aug	19-Aug				03
	22							26-Aug				
	29				EH&E Memo			2-Sep	29-Aug			
September	5							9-Sep				
	12	15-Sep			EH&E Memo			16-Sep				
	19							23-Sep	21-Sep			
	26							30-Sep				
October	3				7-Oct			7-Oct				
	10				EH&E Memo			14-Oct				
	17							21-Oct	17-Oct			
	24				EH&E Memo			28-Oct				
	31							4-Nov				04
November	7							11-Nov				
	14							18-Nov		18-Nov		
	21							25-Nov	21-Nov			
	28							2-Dec				
December	5							9-Dec				
	12							16-Dec				
	19							23-Dec				
	26				29-Dec	29-Dec	29-Dec	30-Dec	21-Dec	29-Dec		
January	2							6-Jan				
	9							13-Jan				
	16							20-Jan				
	23							27-Jan	31-Jan			05, 06
	30							3-Feb				
February	6							10-Feb				
	13							17-Feb				
	20							24-Feb	21-Feb			
	27							2-Mar				
March	5							9-Mar				
	12							16-Mar				
	19							23-Mar	28-Mar			
	26							30-Mar				
April	2							5-Apr				
	9			13-Apr				13-Apr	13-Apr			
	16				17-Apr			20-Apr		20-Apr		
	23							27-Apr				
	30							4-May				
May	7							11-May				
	14							18-May				
	21							25-May				
	28							1-Jun	29-May			
June	4							8-Jun				
	11							15-Jun				
	18							22-Jun				
	25				27-Jun	27-Jun	27-Jun	29-Jun	26-Jun			

Legend: Planned — Date — Actual

Estabrook O&M Implementation Schedule 2012 - 2013

		Training			Material Sampling			System Tests			Hazmat	
		Estabrook Training	DPF Training	HAZMAT Training	Air Sampling	Surface Dust	Caulk Surface	Daily Checks	Monthly Checks	Controls PM	Hazmat Response	Project Plans
		EH&E	EH&E	DPF	EH&E	EH&E	EH&E	DPF	DPF	DPF	DPF	DPF
July	8							13-Jul				
	15							20-Jul				19-Jul
	22							27-Jul				
	29							3-Aug	30-Jul			
August	6							10-Aug				
	13							17-Aug				
	20							24-Aug				
	27							31-Aug	30-Aug	28-Aug		
September	3	6-Sep						7-Sep				
	10							14-Sep				
	17							21-Sep				
	24							28-Sep	28-Sep			
October	1							5-Oct				
	8							12-Oct				
	15				21-Oct	21-Oct	21-Oct	19-Oct	17-Oct			
	22							26-Oct				
	29							2-Nov		26-Oct		31-Oct
November	5							9-Nov				
	12							16-Nov				
	19							21-Nov	19-Nov			
	26							30-Nov				
December	3							7-Dec				3-Dec
	10							14-Dec				
	17							21-Dec				
	24				27-Dec	27-Dec	27-Dec	28-Dec	24-Dec			
	31							4-Jan				
January	7		10-Jan					11-Jan		7-Jan	7-Jan	
	14							18-Jan				
	21							25-Jan				
	28							1-Feb	31-Jan			
February	4							8-Feb				
	11							15-Feb				
	18							22-Feb	22-Feb			20-Feb
	25							28-Feb		25-Feb		
March	4							8-Mar				
	11							15-Mar				16-Mar
	18							22-Mar				
	25							29-Mar	26-Mar			
April	1							5-Apr				1-Apr
	8							12-Apr				
	15				19-Apr			19-Apr				
	22							26-Apr	26-Apr			
	29							3-May		30-Apr		
May	6							10-May				
	13							17-May				
	20							24-May				
	27							31-May	31-May			
June	3							7-Jun				
	10							14-Jun				
	17			19-Jun				21-Jun				
	24				27-Jun	27-Jun	27-Jun	28-Jun	24-Jun			

Legend: Planned — Date — Actual

EH&E Report from June 27

The plot in Figure 1 demonstrates the relationship between PCB concentrations in indoor air of Estabrook and ambient temperature for the period of November 4, 2010 – June 27, 2013. The average value for June 27, 2013, is plotted in red. These observations suggest that with mitigation measures in place and standardized ventilation rates, variation in temperature appears to be an important determinant of PCB concentrations in indoor air of Estabrook. Additional air sampling data collected will be used to further evaluate the relationship between temperature and airborne PCB concentrations in the building.

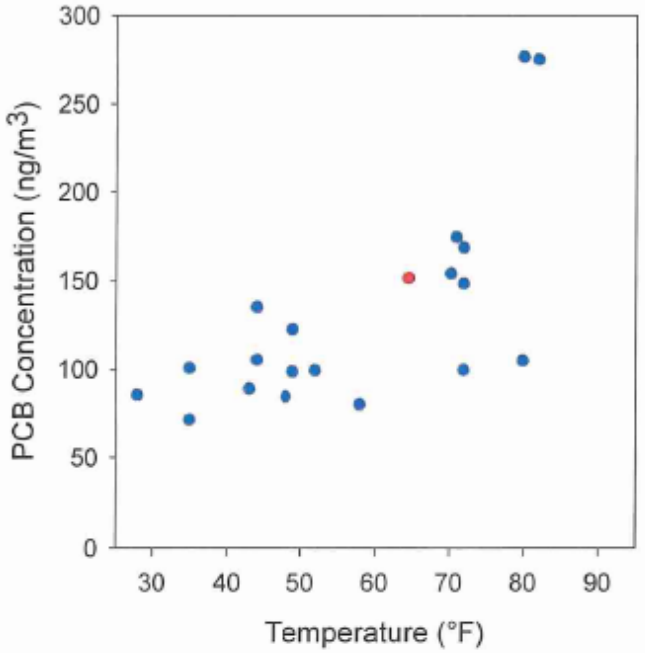

Figure 1 Average Indoor Air PCB Concentrations at Estabrook Elementary School Compared to Average Ambient Temperature during the Sampling Period (November 4, 2010 – June 27, 2013)

Estabrook 2014 O&M Plan

Estabrook O&M Implementation Schedule 2013 - 2014

		Training			Material Sampling			System Tests			Hazmat	
		Estabrook Training	DPF Training	HAZMAT Training	Air Sampling	Surface Dust	Caulk Surface	Daily Checks	Monthly Checks	Controls PM	Hazmat Response	Project Plans
		EH&E	EH&E	DPF	EH&E	EH&E	EH&E	DPF	DPF	DPF	DPF	DPF
July	5							5-Jul				
	12							12-Jul	12-Jul			
	19							19-Jul				
	26							26-Jul				
August	2				1-Aug			2-Aug				
	9							9-Aug		3-Aug		
	16							16-Aug				
	23											
	30											
September	6											
	13											
	20											
	27											
October	4											
	11											
	18											
	25											
November	1											
	8											
	15											
	22											
	29											
December	6											
	13											
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January	3											
	10											
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	24											
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February	7											
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March	7											
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April	4											
	11											
	18											
	25											
May	2											
	9											
	16											
	23											
	30											
June	6											
	13											
	20											
	27											

Legend: Planned | Date | Actual

EH&E Conclusion from August 1

Table 1 Air Sample Results for Total Polychlorinated Biphenyls in Room 4, Estabrook Elementary School, 117 Grove Street, Lexington, Massachusetts, November 4, 2010 – August 1, 2013

School Year	Sample Date	Temperature (°F)	PCB Concentration (ng/m³)
2010-2011	11/04/2010	48.5	105
	05/21/2011	71.1	217
	06/09/2011	78.9	152
2011-2012	10/07/2011	57.5	114
	04/17/2012	80.0	120
2012-2013	10/20/2012	72.3	212
	12/27/2012	44.0	150
	04/19/2013	70.3	257
	06/27/2013	68.6	348
	08/01/2013	77.9	252*
	08/01/2013	77.9	178**

ng/m³ nanograms per cubic meter
°F degrees Fahrenheit

* Average of sample and duplicate
** Measured in the back of the room near the wall along the corridor

SCHOOL YEAR AVERAGE CONCENTRATION

As stated in the operation and maintenance (O&M) plan, the temperature set-point for the classrooms was 68 degrees Fahrenheit (°F) during school year 2012-2013. The school year average concentration for room 4 was calculated as the time-weighted average concentration fo the cooling and heating periods. In room 4, four samples were collected when the outdoor average temperature was above 68 °F (cooling mode) and averaged 267 ng/m^3. One sample was collected when the outdoor average temperature was below 68 °F (heating mode) and the concentration was 150 ng/m^3. During the 2012-2013 school year, 17% of the days were above 68 °F and in cooling mode and the temperature on 83% of the days correspond to the heating mode. Based on these measurements, the school year average indoor air PCB concentration in room 4 was 170 ng/m^3.