ALLEGHENY COUNTY HEALTH DEPARTMENT
Air Quality Program

December 8, 2010

Highlands High School
Natrona, PA

Metals Results / TSP 24 hour samples
Samples collected on the roof of the school (Outdoor Samples)

Data Summary (12/13/2008 to 08/30/2010)

	Cr (total) (ng/m3)	Mn (ng/m3)	Ni (ng/m3)	Pb (ng/m3)
Total Average	28.82	61.33	20.25	109.99
3 Month Avg (03/09 thru 05/09)				157.91
3 Month Avg (10/09 thru 12/09)				171.64
3 Month Avg (01/10 thru 03/10)				64.66
3 Month Avg (04/10 thru 06/10)				62.28
3 Month Avg (06/10 thru 08/10)				42.56
Max	266.33	453.54	158.57	2204.15

I.R.I.S Rfc (Chronic Inhalation)		50		
NAAQS (3 month average)				150
Occupational (8 hour LOAEL)		50,000		

Sampling was performed every six days in accordance with the official EPA particulate sampling schedule. The sampler is a high volume TSP sampler as required by the EPA federal reference method for ambient lead sampling. High purity quartz filters are used at a flow rate of 50 cfm over a 24 hour period. Exposed filters are analyzed by atomic absorbance spectrometry by the Allegheny County Environmental Laboratory. All samples are corrected for metals concentrations in blank filters from each filter batch. This data report contains a total of 98 valid sample events.

Chromium VI
Ambient Air Monitoring Results (Outdoor Samples)

DATE	Cr VI ng/m³
7/18/2009	**0.000**
7/24/2009	**0.046**
7/30/2009	**0.061**
8/5/2009	**0.000**
8/11/2009	**0.134**
8/17/2009	**0.152**
8/23/2009	**0.026**
8/29/2009	**0.083**
9/4/2009	**0.130**
9/10/2009	**0.164**

Avg	**0.0796 (ng/m3)**
Max	**0.152 (ng/m3)**
Min	**0.000 (ng/m3)**

I.R.I.S Rfc (Chronic Inhalation)	**100 (ng/m3)**
I.R.I.S. Cancer Risk (Inhalation)	
1 in 10,000	**8 (ng/m3)**
1 in 100,000	**0.8 (ng/m3)**
1 in 1,000,000	**0.08 (ng/m3)**

Chromium VI was sampled in the ambient air using a modified PM2.5 federal reference method sampler operating at a flow rate of 15 lpm. Each sample was collected over a 24 hour period. Samples were collected according to the EPA's every six day particulate sampling schedule.

Eastern Research Group was contracted by the Department to supply sample media and analysis. This laboratory is currently the EPA contract laboratory for the National School Air Toxics Initiative. The analytical method follows the EPA-modified CARB 039.

Metals Samples Results
Indoor Air

Date	Location	Cr (ng/m3)	Mn (ng/m3)	Ni (ng/m3)	Pb (ng/m3)
2/4/2009	B-201	0.00	2.08	20.63	4.07
2/5/2009	B-201	0.00	9.22	5.36	9.43
2/6/2009	B-201	0.00	0.00	35.83	8.18
Average	**B-201**	**0.00**	**3.77**	**20.61**	**7.22**
Maximum	**B-201**	**0.00**	**9.22**	**35.83**	**9.43**

Date	Location	Cr (ng/m3)	Mn (ng/m3)	Ni (ng/m3)	Pb (ng/m3)
2/4/2009	Library	10.89	0.00	31.15	7.97
2/5/2009	Library	91.15	23.75	113.54	9.90
2/6/2009	Library	0.00	0.00	14.95	14.38
Average	**Library**	**34.01**	**7.92**	**53.21**	**10.75**
Maximum	**Library**	**91.15**	**23.77**	**113.54**	**14.38**

I.R.I.S Rfc (Chronic Inhalation)		**50.00**		
Annual NAAQS				**150**
Occupational (8 hour LOAEL)		**50,000**		

Indoor metals samples were gathered using small personal pumps. Flows were maintained at 4 slpm for 8 hours during normal operating school days. Samples were gathered around 4 to 5 feet from the floor. Filters were 37mm membrane type and were installed in clean cassettes. Exposed filters are analyzed by atomic absorbance spectrometry by the Allegheny County Environmental Laboratory. All samples are corrected for metals concentrations in blank filters from each filter batch.

Results Discussion

Two indoor locations were selected for sampling. Site B-201 was an actively used classroom. The common library was the second sampling site and was also in use at the time of sampling.

Two of the library samples showed consistently higher concentrations of metals than the other samples that were taken during the three day sampling period. Since this is a heavily used area, it may be assumed that foot traffic may have caused re-entrainment of fine dust particles from the floor.

Library Samples

- Total chromium was measured at 1.9 times greater than the highest outdoor sample
- Nickel was measured at 2.3 times greater than the highest outside sample
- Manganese and lead were measured as less than the average outdoor concentrations

Risk Estimation:

Risk concentrations are provided for reference. Various risk categories are presented. Not all metals are covered by each category.

- **I.R.I.S. Rfc (Chronic Inhalation)** - Limit for lifetime exposure regarding all acute and/or chronic health effects excluding cancer effects.
- **Annual NAAQS**- National ambient air quality standard for criteria pollutants. Of the above metals, only Pb (lead) is a criteria pollutant as of this date.
- **Occupational LOAEL**- I.R.I.S database listed value for daily 8 hour occupational limits for adults.
- **I.R.I.S. Cancer Risk (Inhalation)**- Excess cancer in a population over a lifetime exposure to a pollutant.

Chromium VI

By direct measurement, the outdoor average chromium VI concentration over nine samples does not exceed I.R.I.S. lifetime exposure cancer risk concentrations of 1 in 1 million. No individual samples exceed the I.R.I.S Rfc lifetime exposure standard for chromium VI.

Manganese

Average outdoor manganese results exceed the I.R.I.S. Rfc lifetime exposure standard. Individual and average sample results are much lower than the I.R.I.S. LOAEL 8 hour occupational standard for manganese. Indoor manganese results reveal levels that are well below the I.R.I.S. Rfc lifetime exposure standard.

Nickel

Inhalation risk concentrations for nickel compounds are not available.

Lead

The average outdoor manganese results exceed the NAAQS three month average concentration for the three month period of March through May 2009 and again during the three month period of October through December 2009. Although the new lead standard was not in effect until Jan 1, 2010, EPA mandated sampling closer to lead

sources was started in January 2010 to determine local air-borne lead contributions. If a lead monitor located near a lead source exceeds the NAAQS, the source will undergo mandatory remediation to lower lead output to below allowable levels. Indoor lead concentrations were found to be lower than the outdoor concentrations.

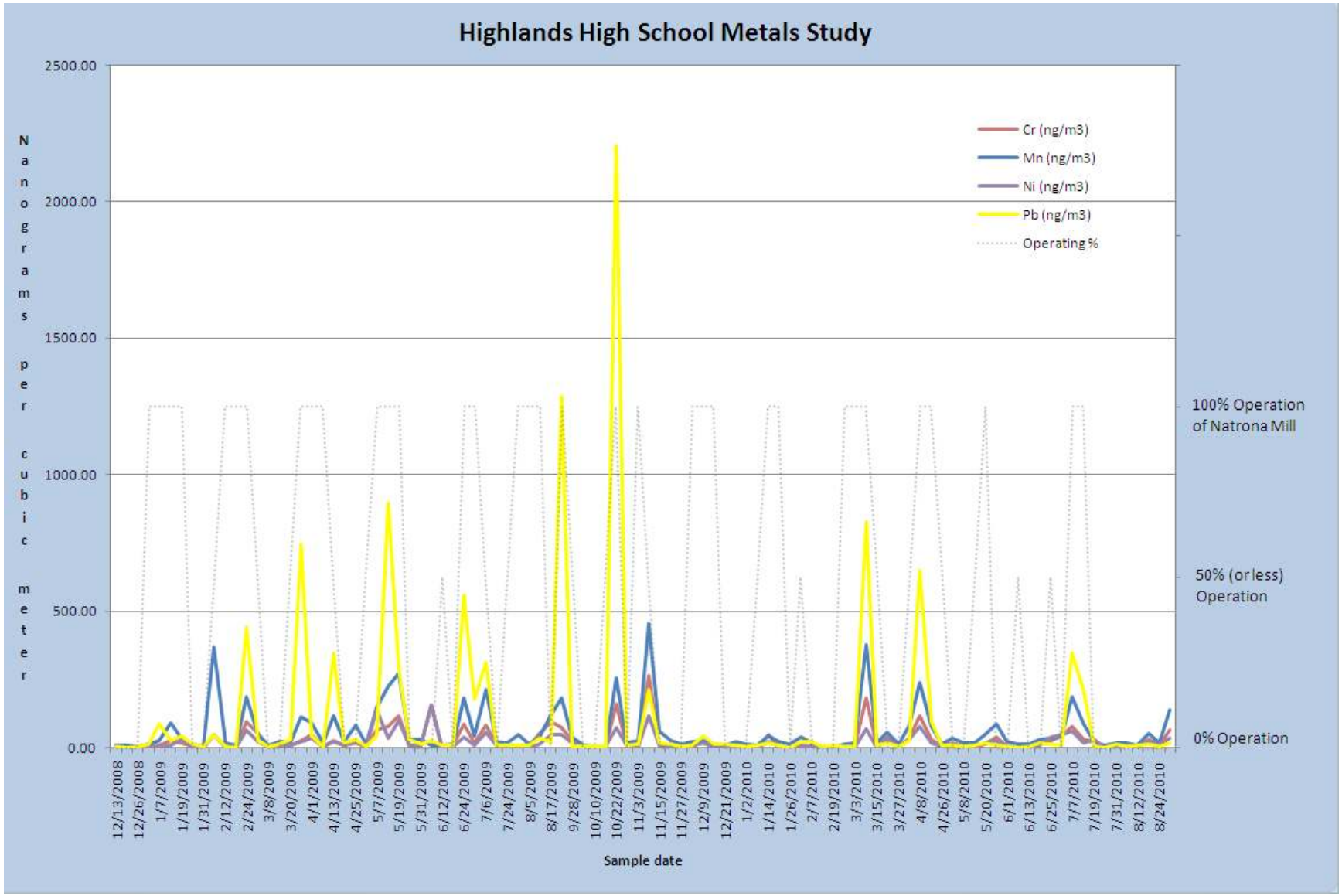
Local Source Impact

Allegheny Technologies Incorporated operated a melt shop located in the valley approximately 0.5 miles to the east of the monitor at Highlands High School. The melt shop is a known source of the metals discussed in this report. Operational information was collected from the melt shop and an attempt was made to correlate sampling results with times when the melt shop was reported to be operating. Sampling was conducted for around 18 months and a total of 98 individual 24 hour samples were collected. Out of that number, 53 of the samples were collected while the melt shop was reported to be operating. The following table shows average and maximum concentrations for each metal grouped into two categories; for times when the melt shop was operational, and when it was not operating.

	Melt Shop Status	Cr (ng/m3)	Mn (ng/m3)	Ni (ng/m3)	Pb (ng/m3)
Average	Operating	39.20	89.88	26.04	194.29
Maximum	Operating	266.33	453.54	138.04	2204.15
Average	Not Operating	16.60	27.70	13.43	10.70
Maximum	Not Operating	154.88	141.38	158.57	32.50

Results of this analysis show that high metals concentrations are strongly correlated with times when the melt shop is operational. During these times, the average manganese concentration exceeds the I.R.I.S Rfc (Chronic Inhalation) limit by 78% and the average lead concentration exceeds the NAAQS limit by nearly 30%. Conversely, during times when the melt shop is not operational the average concentrations of both of these metals is dramatically lower, with average manganese and lead results both being well below their respective limits.

The figure on the following page shows a graphic representation of the sampling results plotted on a time verses concentration scale. A separate line shows the operational status of the melt shop. It should be noted that there is a noticeable reduction in metals concentrations during the latter portion of the sampling period. The Natrona melt shop was permanently shut down as of July 18, 2010, which should lead to much lower lead and manganese concentrations at Highlands High School in the future.


Highlands High School Metals Study
Nanograms per cubic meter
2500.00
2000.00
1500.00
1000.00
500.00
0.00
Cr (ng/m3)
Mn (ng/m3)
Ni (ng/m3)
Pb (ng/m3)
Operating %
100% Operation of Natrona Mill
50% (or less) Operation
0% Operation
12/13/2008
12/26/2008
1/7/2009
1/19/2009
1/31/2009
2/12/2009
2/24/2009
3/8/2009
3/20/2009
4/1/2009
4/13/2009
4/25/2009
5/7/2009
5/19/2009
5/31/2009
6/12/2009
6/24/2009
7/6/2009
7/24/2009
8/5/2009
8/17/2009
9/28/2009
10/10/2009
10/22/2009
11/3/2009
11/15/2009
11/27/2009
12/9/2009
12/21/2009
1/2/2010
1/14/2010
1/26/2010
2/7/2010
2/19/2010
3/3/2010
3/15/2010
3/27/2010
4/8/2010
4/26/2010
5/8/2010
5/20/2010
6/1/2010
6/13/2010
6/25/2010
7/7/2010
7/19/2010
7/31/2010
8/12/2010
8/24/2010
Sample date

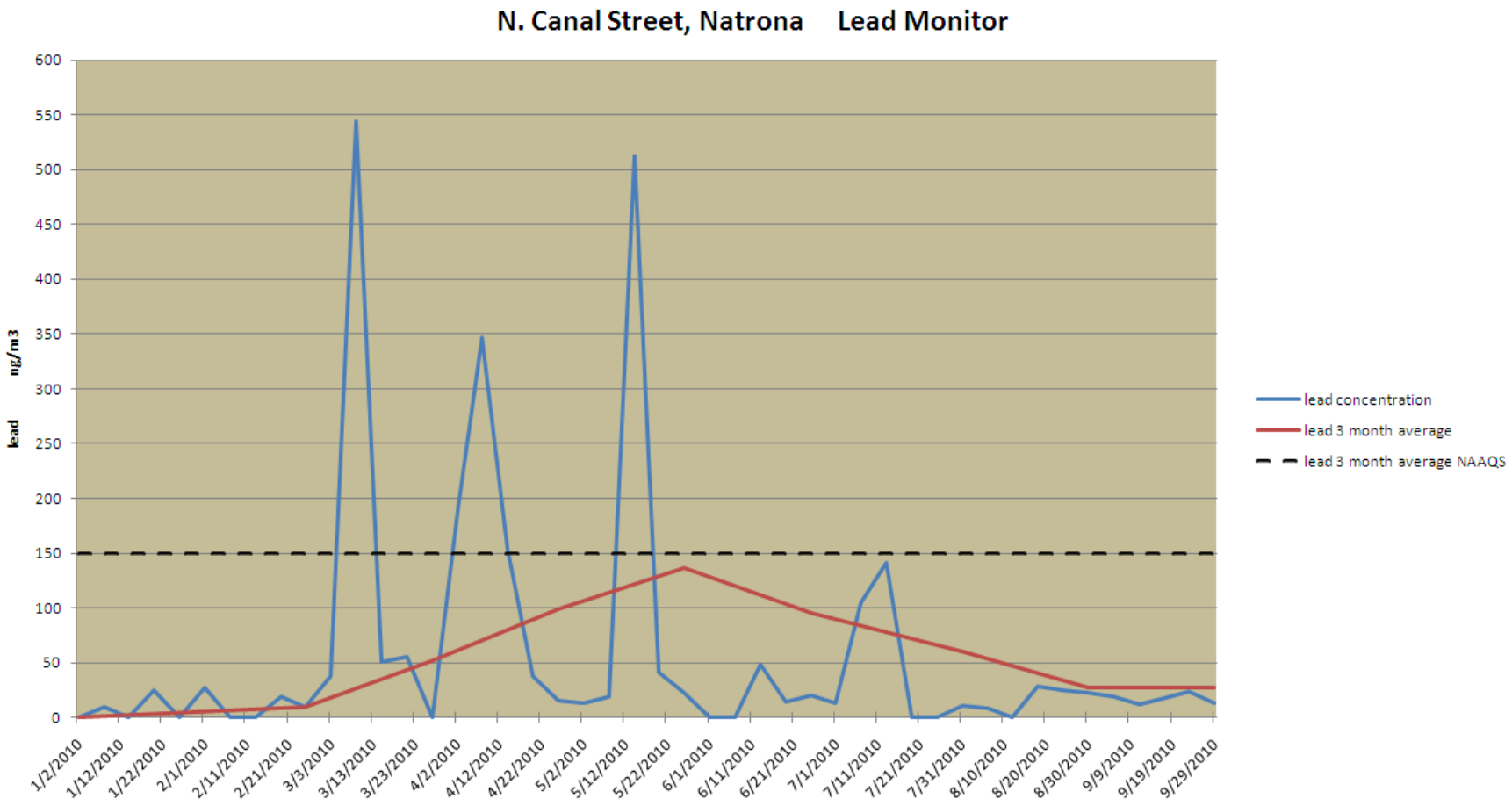
Natrona Lead Monitoring Site

A new lead monitoring site was installed on North Canal Street in close proximity to the Natrona melt shop. This monitor was required as part of new EPA lead monitoring regulations that require source oriented monitors near all sources that emit 1 ton of lead or greater per year. This sampling and analysis is done according to the EPA reference method for ambient lead analysis with a frequency of every six days and for duration of 24 hours. Results received to date are included in the table below.

Lead Sampling Data
North Canal Street, Natrona
Sampling Date – 01/02/2010 thru 09/29/2010

Total Average	59 ng/m3
Maximum	544 ng/m3
3 Month Average Ending 02/25/10	9 ng/m3
3 Month Average Ending 03/27/10	52 ng/m3
3 Month Average Ending 04/26/10	99 ng/m3
3 month Average Ending 05/26/10	136 ng/m3
3 month Average Ending 06/25/10	96 ng/m3
3 month Average Ending 07/31/10	60 ng/m3
3 month Average Ending 08/30/10	27 ng/m3
3 month Average Ending 09/29/10	28 ng/m3

While some elevated lead samples have appeared at this site, the lead NAAQS (150 ng/m3 three month rolling average) has not been exceeded, and the highest maximum individual lead sample was less than one fourth of the maximum concentration seen at Highlands High School during fall of 2009. It is hoped that with the permanent shutdown of the melt shop, future sampling will show progressively lower concentrations of lead at the Natrona monitor. The monitor will be operated for a total of at least three years to demonstrate attainment with the NAAQS for lead. A graphical summary of the lead results from the Natrona lead monitor is included on the next page.


N. Canal Street, Natrona Lead Monitor
lead ng/m3
600
550
500
450
400
350
300
250
200
150
100
50
0
1/2/2010
1/12/2010
1/22/2010
2/1/2010
2/11/2010
2/21/2010
3/3/2010
3/13/2010
3/23/2010
4/2/2010
4/12/2010
4/22/2010
5/2/2010
5/12/2010
5/22/2010
6/1/2010
6/11/2010
6/21/2010
7/1/2010
7/11/2010
7/21/2010
7/31/2010
8/10/2010
8/20/2010
8/30/2010
9/9/2010
9/19/2010
9/29/2010
lead concentration
lead 3 month average
lead 3 month average NAAQS

Correlated Lead Monitor Results

This chart shows both lead monitors plotted together. The monitors correlated well with each other when they operated concurrently. Both monitors produced much lower lead results after the melt shop was shut down.