

**July 2014  
Air Quality Report  
Site 16 - Linden Ave Site**

Attached is a technical summary of air quality data for July 2014 at the Linden Ave cleanup site submitted by PPG Industries' air monitoring consultant.

This report provides air monitoring information about conditions at the perimeter associated with Site 16 (Linden Ave).

Also, this document notes any deviations from the monitoring plan and work schedule caused by factors beyond the control of cleanup contractors, such as inclement weather and malfunctioning equipment.

# Monthly Air Monitoring Report Site 16 - Linden Ave Site Jersey City, New Jersey

## Reporting Period: July 2014

(This revised version replaces the original report dated August 20, 2014)

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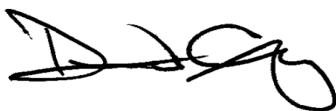
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(This revised version replaces the original report dated August 20, 2014)



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April 3, 2015

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## List of Acronyms

AAC – Acceptable Air Concentration

AMP – Air Monitoring Plan

AMS – Air Monitoring Station

Cr<sup>+6</sup> – Hexavalent Chromium

FAM – Fixed Air Monitoring

LPM – Liters per Minute

ng/m<sup>3</sup> – Nanograms per Cubic Meter of Air

NJDEP – New Jersey Department of Environmental Protection

PM<sub>10</sub> – Particulate Matter 10 Microns or less in Diameter

PPG – PPG Industries, Inc.

ppb – Parts per Billion

ppm – Parts per Million

µg/m<sup>3</sup> – Micrograms per Cubic Meter of Air

## Executive Summary

Air monitoring conducted at the Site 16 - Linden Ave Site was completed in accordance with the Site-Specific Air Monitoring Plan (AMP), and included sampling and analysis for 8-hour integrated hexavalent chromium ( $\text{Cr}^{+6}$ ) and total particulates, as well as real-time monitoring for  $\text{PM}_{10}$  at all air monitoring stations. In addition to the air monitoring conducted in accordance with the AMP, 24-hour  $\text{Cr}^{+6}$  and total particulate sampling with lab analysis was also conducted at one station. This program is designed to measure various aspects of air quality at the Site to ensure that remedial activities at the Site do not have an adverse effect on Site workers and the surrounding community.

Results of the integrated  $\text{Cr}^{+6}$  sampling and analysis indicate that program-to-date average airborne  $\text{Cr}^{+6}$  concentrations are significantly below the Acceptable Air Concentration (AAC) at each of the AMS locations. The results and calculations document continuing compliance with the current AAC set by the New Jersey Department of Environmental Protection (NJDEP), confirm that dust control measures continue to be effective, and indicate that the levels of  $\text{Cr}^{+6}$  in dust generated at the Site do not represent an emission source of  $\text{Cr}^{+6}$  sufficient to create potential offsite exposure to  $\text{Cr}^{+6}$  at or exceeding the AAC.

## 1.0 Introduction

This monthly air monitoring report update includes both tabular information and written discussions summarizing the ambient air quality data collected in accordance with the Air Monitoring Plan (AMP) at the Site 16 - Linden Ave Site (referred herein as Site), in Jersey City, New Jersey.

This monthly report is designed to provide a summary of the air monitoring data collected during the intrusive activities associated with Site 16 through the reporting period. This monthly report includes both monthly and program-to-date summaries of the following:

- Integrated hexavalent chromium analytical results;
- Integrated total particulate analytical results;
- Real-time 15-minute average PM<sub>10</sub> readings; and
- Meteorological conditions.

Results have been evaluated and compared to the Site-specific Acceptable Air Concentration (AAC) and the Action Levels in accordance with the AMP.



## 2.0 Air Monitoring

This report summarizes air monitoring at the Site performed between the baseline period and the end of the reporting period, with a focus on data collected during the recent month of activities. The baseline period includes data measured between June 6 and June 8, 2014.

Remedial activities began in the northern portion of the Site on June 11, 2014. Air monitoring stations provided protection during intrusive work between June 11, 2014 and July 31, 2014. The site contains five ground-level stations which collect 8-hour integrated  $\text{Cr}^{+6}$  and total particulate samples. Additionally, at one of the stations,  $\text{Cr}^{+6}$  and total particulates are collected as 24-hour samples on weekdays and as 72-hour samples over the weekend. **Figure 2-1** provides an overview of the Site and a typical configuration of the AMS for the Site through the end of the reporting period. **Table 2-1** provides an overview of the air monitoring approach.

Air monitoring results to date have confirmed protection of the community, and the overall effectiveness of the program will be evaluated on a continuous basis. Success will ultimately be determined at the end of the remediation program when the average  $\text{Cr}^{+6}$  concentrations at each AMS location are compared to the AAC. This monthly report has been designed to evaluate the program's effectiveness on a monthly basis and a program-to-date basis. The  $\text{Cr}^{+6}$  average concentrations measured at each AMS will continually be compared to the site-specific AAC for  $\text{Cr}^{+6}$  to confirm the effectiveness of the program. Thus, the monthly reports will focus largely on the integrated analytical results collected as part of the  $\text{Cr}^{+6}$  fence-line air monitoring.

Air monitoring data collected at the Site includes:

- 8-hour integrated  $\text{Cr}^{+6}$  and total particulate sample collection and associated laboratory analysis;
- 24-hour and 72-hour integrated  $\text{Cr}^{+6}$  and total particulate samples collection and laboratory analysis; and
- Real-time 15-minute average  $\text{PM}_{10}$ , readings measured at the perimeter.
- Hand-held readings for  $\text{PM}_{10}$  and TVOC measured at the perimeter.

The following sections outline the types of data collected, frequency of collection, and the corresponding locations.

**Table 2-1: Air Monitoring Approach**

Site	Station	Integrated Air Monitoring	Real-Time Air Monitoring
Site 16	AMS1, AMS2, AMS3, AMS4, AMS5	Integrated 8-hour Cr <sup>+6</sup> and total particulate sampling and analysis during work days. 24-hour and 72-hour Cr <sup>+6</sup> sampling and analysis at one station 7 days per week.	15-minute average PM <sub>10</sub> readings measured during a typical work day.

Note: 24-hour and 72-hour Cr<sup>+6</sup> sampling was conducted at station AMS3.

**2.1 Integrated Air Sampling**

Integrated Cr<sup>+6</sup> and total particulate samples are collected at each of the AMS for an 8-hour to 10-hour duration each working day (typically Monday – Friday) at each station. Samples are collected on a pre-weighed polyvinyl chloride 37mm filter cassette for both Cr<sup>+6</sup> and total particulate. Sampling pumps operate at or around 2 liters per minute and are calibrated at the beginning and end of each sampling run.

**Figure 2-1: Site Overview**



### **2.1.1 Integrated Cr<sup>+6</sup> Sampling**

The exposed Cr<sup>+6</sup> filters are shipped to an American Industrial Hygiene Association Industrial Hygiene Laboratory Accreditation Program-certified analytical laboratory for Cr<sup>+6</sup> analysis using Modified OSHA ID 215. The sample weights are provided by the laboratory with a laboratory detection limit of 20.0 ng. The sample weights and flow information are utilized to calculate 8-hour to 10-hour integrated Cr<sup>+6</sup> air concentrations in nanograms per cubic meter of air (ng/m<sup>3</sup>). Filter weights reported as non-detect are included in the concentration calculation at one-half the laboratory detection limit for data reporting purposes.

In addition to sampling performed during working hours, 24-hour and 72-hour Cr<sup>+6</sup> sampling and analysis are also performed at one AMS. These longer duration samples show Cr<sup>+6</sup> concentrations during overnight and weekend periods. The 24-hour samples are typically collected daily from 7AM to 7AM Monday through Thursday, and a single 72-hour sample is collected from 7AM Friday through 7AM Monday.

### **2.1.2 Integrated Total Particulate Sampling**

The exposed total particulate filters are shipped to an American Industrial Hygiene Association Industrial Hygiene Laboratory Accreditation Program-certified analytical laboratory for total particulate analysis using NIOSH Method 0500. The sample weights are provided by the laboratory with a laboratory detection limit of 100 ug. The sample weights and flow information are utilized to calculate 8-hour-to-10-hour integrated total particulate air concentrations in micrograms per cubic meter of air (µg/m<sup>3</sup>). Filter weights reported as non-detect are included in the concentration calculation at one half the laboratory detection limit for data reporting purposes.

## **2.2 Real-Time Air Monitoring**

Real-time air monitoring is divided into two types of monitoring including: perimeter monitoring and meteorological monitoring. Each monitoring type is described in more detail in the following sections.

### **2.2.1 Perimeter**

Perimeter air monitoring consists of stations at the perimeter of the Site. Perimeter monitoring includes the following:

- Real-time 15-minute average PM<sub>10</sub> readings at each AMS location. All AMS operate 8-10 hours during remedial activities, Monday through Friday.

### **2.2.2 Meteorological Measurements**

Meteorological measurements of 15-minute average wind speed and direction, relative humidity, pressure, and temperature are recorded onsite at station AMS-3, 24-hours a day, seven days a week.

### **2.3 Hand-held Air Monitoring**

Hand-held air monitoring consists of two types of monitoring: perimeter PM<sub>10</sub> readings and perimeter TVOC readings. Each type of monitoring is described in more detail in the following sections.

#### **2.3.1 Perimeter PM<sub>10</sub> Hand-held Monitoring**

Hand-held readings will be taken along the downwind perimeter of the Site periodically each day during remedial activities and logged to be reported weekly. The readings will be collected as instantaneous readings and if levels are elevated, 15-minute averages will be recorded for comparison to adjacent perimeter stations.

#### **2.3.2 Perimeter TVOC Hand-held Monitoring**

Hand-held readings will be taken along the downwind perimeter of the Site periodically each day during remedial activities in known VOC areas. Readings will be collected as instantaneous readings and if levels are elevated, 15-minute averages will be recorded and logged to be reported weekly.

### **3.0 Site-Specific Acceptable Air Concentration and Real-Time Action Levels**

Site-specific Acceptable Air Concentration (AAC) and real-time Action Levels have been developed for Cr<sup>+6</sup> and real-time PM<sub>10</sub> concentrations by NJDEP as part of the approved AMP, in compliance with risk assessment procedures. The AAC and real-time Action Levels have been developed to protect off-site receptors from potential adverse health impacts from Cr<sup>+6</sup> and particulates over the duration of the intrusive remediation activities.

Real-time monitoring and integrated results are compared against the AAC and the real-time action levels to alert Site management of the potential need to enhance control of emissions and curtail operations to maintain concentrations at levels below the specified criteria. The AAC and real-time action levels for integrated Cr<sup>+6</sup> concentrations and real-time PM<sub>10</sub> are outlined in the following sections.

#### **3.1 Integrated Cr<sup>+6</sup> Acceptable Air Concentration**

A Site-specific Cr<sup>+6</sup> AAC has been developed by NJDEP to protect off-site receptors from potential adverse health impacts due to potential exposure to Cr<sup>+6</sup> in dust. The AAC for Cr<sup>+6</sup> was developed to represent the maximum allowable average concentration of Cr<sup>+6</sup> in dust at each AMS over the project duration. In accordance with New Jersey regulatory requirements, the AAC represents a maximum level corresponding to a one-in-one-million (1E-06) excess cancer risk to nearby residents due to potential exposure to Cr<sup>+6</sup> emanating from the Site.

The AAC of 487 ng/m<sup>3</sup> is applicable at the perimeter and represents the maximum allowable average concentration measured over the project duration and was developed to ensure the protection of human health. This AAC is also used to evaluate the effectiveness of dust control. PPG has established an operational goal of achieving a project average hexavalent chromium air concentration of 49 ng/m<sup>3</sup> to the extent practicable using best management practices throughout the duration of intrusive remedial activities at the site.

To ensure ongoing compliance with the AAC, shorter duration rolling averages are utilized to provide for the early and regular assessment of performance trends and, if necessary, allow for responsive corrective measures to be implemented to ensure that emissions of Cr<sup>+6</sup> are maintained well below the AAC over the duration of the project, and are minimized to the greatest extent practicable. These shorter duration average concentrations metrics include:

program-to-date, 90-day, 60-day, and 30-day running averages where the average Cr<sup>+6</sup> concentration over the previous 90-day, 60-day, and 30-day periods are calculated for each sample day. Sampling days are considered days where routine sampling was conducted (typically Monday – Friday). The shorter term average concentrations are compared against the list of metrics provided in Table 3-1 which also depicts respective response actions.

**Table 3-1: Running Cr<sup>+6</sup> Metrics**

Metric Observation	Response Action
30-day <sup>1</sup> Cr <sup>+6</sup> average concentration greater than or equal to 45 ng/m <sup>3</sup>	External meeting to review levels, evaluate activities each day when elevated concentrations were observed, and trigger corrective action if required.
60-day <sup>1</sup> Cr <sup>+6</sup> average concentration greater than or equal to 40 ng/m <sup>3</sup>	
90-day <sup>1</sup> Cr <sup>+6</sup> average concentration greater than or equal to 35 ng/m <sup>3</sup>	
<sup>1</sup> Refers to days on which samples were collected, not necessarily calendar days	

### 3.2 Real-Time Alert and Action Levels

Real-time Alert and Action Levels were designed to monitor and assist in control of Site emissions to ensure protection of human health, and represent an important aspect of the remedial program at the Site. The real-time Alert and Action Levels used on Site are shown in Table 3-2.

**Table 3-2: Site-specific Alert and Action Levels**

Parameter	Alert Level (15-min TWA)	Action Level (15-min TWA)
PM <sub>10</sub>	255 µg/m <sup>3</sup>	339 µg/m <sup>3</sup>
TVOC (hand-held monitoring only)	1 ppm	1.3 ppm

## 4.0 Air Sampling and Monitoring Results

Results of air sampling and monitoring conducted between June 11, 2014 and July 31, 2014 are summarized herein. The following sections present both tabular and written discussions of the air sampling and monitoring results for the reporting period including:

- Monthly integrated and real-time results;
- Program-to-date integrated and real-time statistics;
- Evaluation of program success versus the Site-specific AAC and action levels;
- Meteorological results; and
- Hand-held monitoring results

Air sampling and monitoring results are presented in detail in the Appendices of this report. Appendix A includes summary of the air sampling and monitoring results for the reporting period. Appendix B includes program-to-date statistics and monthly comparison of results.

### 4.1 Integrated Air Sampling Results

Results of the integrated  $\text{Cr}^{+6}$  and total particulate sampling and analysis are presented in the following sections.

#### 4.1.1 $\text{Cr}^{+6}$ Sampling Results

Results of the  $\text{Cr}^{+6}$  sampling from the reporting period and a program-to-date evaluation are discussed in the following sections.

#### Reporting Period

Individual integrated 8-hour  $\text{Cr}^{+6}$  concentrations measured during the reporting period are presented in Table A-1. If an individual sample result exceeds 80% of the project duration AAC, additional evaluation and review of relevant Site conditions and activities were performed to potentially modify procedures if necessary to reduce the potential for increasing  $\text{Cr}^{+6}$  concentration trends. Any elevated concentration data during the reporting period are listed and discussed in Table A-3.

#### Program-to-date

Sampling and analytical statistics for integrated 8-hour  $\text{Cr}^{+6}$  results are shown in Table B-1 and include various program-to-date metrics relative to  $\text{Cr}^{+6}$  analytical data. Monthly average 8-hour  $\text{Cr}^{+6}$  concentration results are shown in Table B-2 for each AMS location.

**Table 4-1: Short-Term Average 8-hour Integrated Cr<sup>+6</sup> Metrics**

Running Cr <sup>+6</sup> Metrics <sup>1</sup>		Sites 63/65				
	Metric (ng/m <sup>3</sup> )	AMS-1 ng/m <sup>3</sup>	AMS-2 ng/m <sup>3</sup>	AMS-3 ng/m <sup>3</sup>	AMS-4 ng/m <sup>3</sup>	AMS-5 ng/m <sup>3</sup>
<b>30-day<sup>2</sup></b>	45	7.0	7.0	1.7	7.0	7.0
<b>60-day<sup>2</sup></b>	40	NA	NA	NA	NA	NA
<b>90-day<sup>2</sup></b>	35	NA	NA	NA	NA	NA
<b>PTD<sup>3</sup></b>		6.9	6.9	1.5	6.9	6.9

ng/m<sup>3</sup> – nanograms per cubic meter

- Running Cr<sup>+6</sup> metrics are utilized to provide for the early and regular assessment of performance trends and, if necessary, allow for responsive corrective measures to be implemented ensuring that emissions of Cr<sup>+6</sup> are maintained well below the AAC over the duration of the project, and are minimized to the greatest extent practicable. The running Cr<sup>+6</sup> metrics are designed to evaluate the program success on short duration intervals (monthly) and do not represent the long-term (program) ending success.
- Running Cr<sup>+6</sup> metrics are valid on the last day in the report period and include the previous 30, 60, or 90-days of sample results. 60-day and 90-day metrics were not available due to the short duration of sampling during this phase of the project.
- Program-to-date - Air monitoring conducted from June 11, 2014 through the end of the reporting period.

Stations AMS-1 through AMS-5 started on June 11<sup>th</sup> and do not have 60 and 90 days of data available.



#### **4.1.2 Total Particulate Sampling Results**

Results of the 8-hour integrated total particulate sampling and analysis from the reporting period and program-to-date results are discussed in the following sections.

##### **Reporting Period**

Individual integrated 8-hour total particulate concentrations measured at each station during the reporting period are presented in Table A-2.

##### **Program-to-date**

Sampling and analytical statistics for integrated total particulate are shown in Table B-3 and include various metrics relative to total particulate analytical data. Monthly average total particulate concentration results are shown in Table B-4 for each AMS.

#### **4.1.3 Integrated Air Sampling Results Summary**

There have been 37 sample days between June 11<sup>th</sup> and the end of the reporting period for stations AMS-1 through AMS-5. The results of the sample analysis are summarized in the following sections.

##### **Air Monitoring**

The program through this reporting period shows the 8-hour Cr<sup>+6</sup> average concentrations, based upon lab analytical results at each AMS, were less than 1.42% of the AAC, demonstrating that the dust control measures continue to be effective.

#### **4.2 Real-Time Air Monitoring Results**

Real-time air monitoring for PM<sub>10</sub> is conducted during all remedial activities. The results of the real-time air monitoring are presented in the following sections.

##### **4.2.1 PM<sub>10</sub> Monitoring Results**

Results of the real-time PM<sub>10</sub> sampling for the reporting period and the start of intrusive activities are discussed in the following sections.

### **Reporting Period**

Real-time 15-minute PM<sub>10</sub> averages measured during the reporting period are presented in Figure A-1. Real-time 15-minute PM<sub>10</sub> averages were compared directly to the PM<sub>10</sub> Action Level (339 µg/m<sup>3</sup>) and averages greater than the action level are subject to additional evaluation. If applicable, elevated PM<sub>10</sub> averages are listed and discussed in Table A-4.

### **Program-to-date**

Real-time monthly PM<sub>10</sub> averages are shown in Table B-5 for each AMS. Dust readings measured during the reporting period are similar to those during the baseline period (when no intrusive activities were occurring). This indicates that dust control measures during intrusive activities have been effective.

### **4.3 Meteorological Monitoring Results**

Time series plots for wind speed, temperature, and relative humidity for the reporting period are shown in Figure A-2 through Figure A-4, respectively.

### **4.4 Hand-held Monitoring Results**

Hand-held monitoring results during the reporting period are displayed in Table A-3. Readings were compared directly to the 15-Minute TWA Action Level (1.3 ppm) and averages greater than the action level are subject to additional evaluation. If applicable, elevated TVOC averages are listed and discussed in Table A-4.

### **4.5 Site Activities**

Activities which occurred on the site during the month of July included:

- Excavate and load out chromium-impacted soils;
- Backfill excavation;

### **4.6 Site Map(s)**

Site maps during the reporting period are documented and included in Figure A-5.

## 5.0 Conclusions

Results of the July 2014 reporting period for the Site 16 air sampling and monitoring program indicate that the average Cr<sup>+6</sup> concentrations for each AMS are well below the site safety goal of 49 ng/m<sup>3</sup> and below the AAC of 487 ng/m<sup>3</sup>. The Cr<sup>+6</sup> concentrations and the percent Cr<sup>+6</sup> in dust samples through this period demonstrate that the dust control measures continue to be effective at maintaining concentrations of Cr<sup>+6</sup> in airborne dust at the Site well below the AAC. These results indicate that dust generated at the Site contains very small percentages of Cr<sup>+6</sup> and does not represent an emission source of Cr<sup>+6</sup> sufficient to create potential offsite exposure to Cr<sup>+6</sup> at or exceeding the AAC.

## **Appendix A**

### **Monthly Results Summaries**

- Integrated 8-hour Cr<sup>+6</sup> Concentrations
- Integrated 8-hour Total Particulate Concentrations
- Real-time PM<sup>10</sup> Readings
- Hand-held Readings
- Meteorological Data
- Site Map

**Table A- 1: Daily Integrated 8-hour Cr<sup>+6</sup> Sampling Results**

Date	AMS 1	AMS 2	AMS 3	AMS 4	AMS 5
Tuesday, July 01, 2014	7.0	7.0	2.4	7.0	7.0
Wednesday, July 02, 2014	7.0	7.0	2.4	7.0	7.0
Thursday, July 03, 2014	8.0	8.0	0.6	8.0	8.0
Friday, July 04, 2014			0.6		
Saturday, July 05, 2014			0.6		
Sunday, July 06, 2014			0.6		
Monday, July 07, 2014	6.5	6.5	0.4	6.5	6.5
Tuesday, July 08, 2014	7.0	7.0	2.4	7.0	7.0
Wednesday, July 09, 2014	6.5	6.5	2.4	6.5	6.5
Thursday, July 10, 2014	7.0	7.0	2.4	7.0	7.0
Friday, July 11, 2014	6.5	6.5	0.8	6.5	6.5
Saturday, July 12, 2014			0.8		
Sunday, July 13, 2014			0.8		
Monday, July 14, 2014	7.5	7.5	2.4	7.5	7.5
Tuesday, July 15, 2014	7.0	7.0	1.6	7.0	7.0
Wednesday, July 16, 2014	7.5	7.5	2.4	7.5	7.5
Thursday, July 17, 2014	7.5	7.5	2.4	7.5	7.5
Friday, July 18, 2014	8.0	8.0	0.8	8.0	8.0
Saturday, July 19, 2014			0.8		
Sunday, July 20, 2014			0.8		
Monday, July 21, 2014	6.5	6.5	2.4	6.5	6.5
Tuesday, July 22, 2014	7.0	7.0	2.3	7.0	7.0
Wednesday, July 23, 2014	7.0	7.0	2.4	7.0	7.0
Thursday, July 24, 2014	7.5	7.5	2.4	7.5	7.5
Friday, July 25, 2014	7.0	7.0	2.4	7.0	7.0
Saturday, July 26, 2014			2.4		
Sunday, July 27, 2014			2.4		
Monday, July 28, 2014	6.5	6.5	0.8	6.5	6.5
Tuesday, July 29, 2014	6.5	6.5	2.4	7.0	7.0
Wednesday, July 30, 2014	5.5	5.5	2.4	5.5	5.5
Thursday, July 31, 2014	6.5	6.5	2.4	6.5	6.5

Results in nanograms per cubic meter

Highlighted cells indicate a detectable level of Cr<sup>+6</sup>. All other values are below the laboratory method detection limit (MDL).

Values below the MDL are shown in the table at one-half the MDL for data reporting purposes. This established practice is consistent with PPG's Site 114 reporting of non-detects by AECOM.

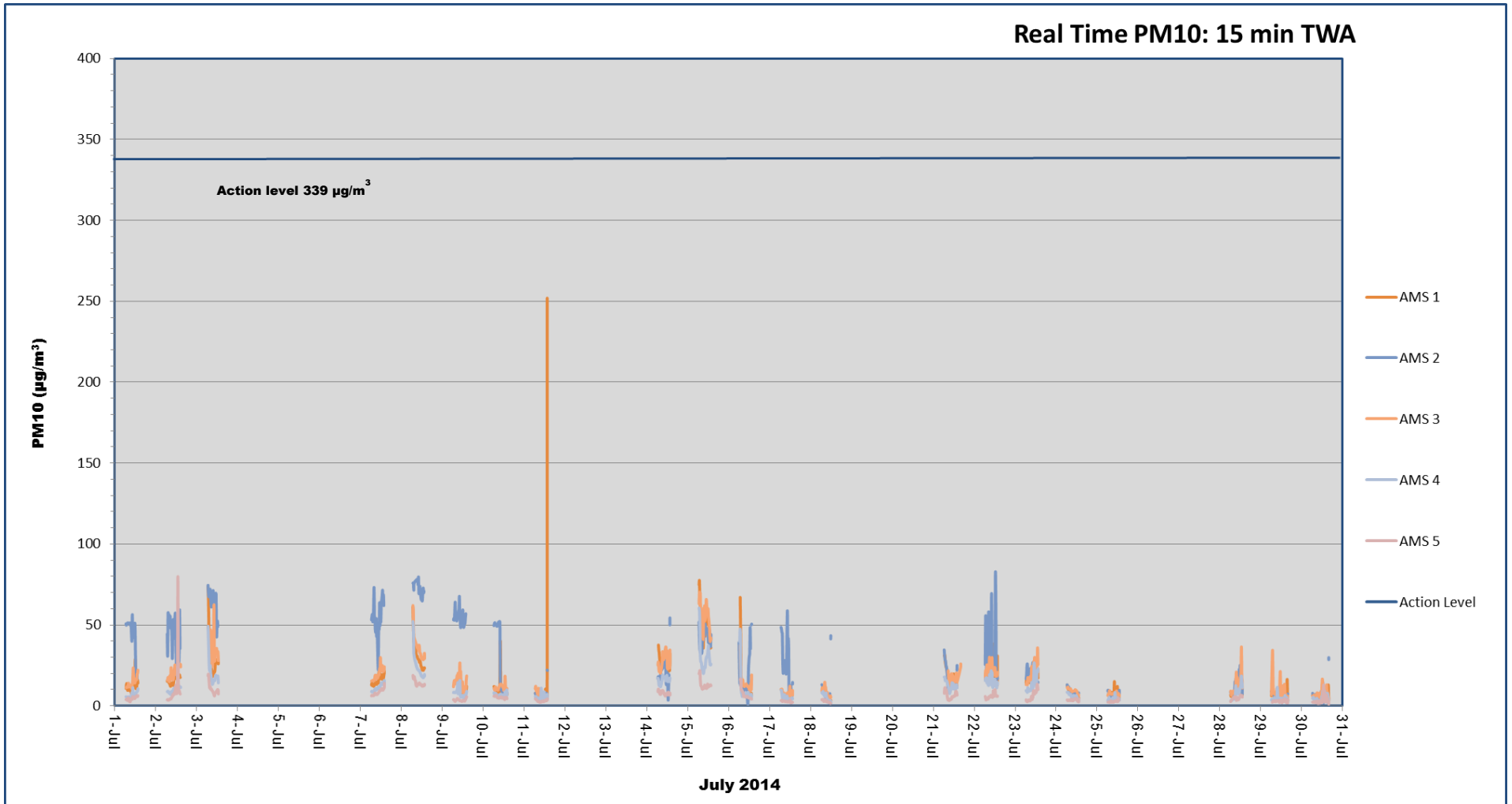
**Table A- 2: Daily Integrated 8-hour Total Particulate Sampling Results**

Date	AMS 1	AMS 2	AMS 3	AMS 4	AMS 5
Tuesday, July 01, 2014	35.0	35.0	60.0	75.0	79.0
Wednesday, July 02, 2014	35.5	35.5	50.0	35.5	150.0
Thursday, July 03, 2014	38.5	38.5	2.9	140.0	89.0
Friday, July 04, 2014	NA	NA	2.9	NA	NA
Saturday, July 05, 2014			2.9		
Sunday, July 06, 2014			2.9		
Monday, July 07, 2014	32.0	32.0	6.2	90.0	32.0
Tuesday, July 08, 2014	33.5	33.5	37.0	33.5	33.5
Wednesday, July 09, 2014	31.0	540.0	170.0	72.0	31.0
Thursday, July 10, 2014	34.5	34.5	100.0	34.5	34.5
Friday, July 11, 2014	32.0	32.0	8.1	32.0	32.0
Saturday, July 12, 2014			8.1		
Sunday, July 13, 2014			8.1		
Monday, July 14, 2014	36.0	36.0	24.0	36.0	36.0
Tuesday, July 15, 2014	35.5	35.0	7.5	35.5	35.0
Wednesday, July 16, 2014	37.0	37.0	11.5	37.0	37.0
Thursday, July 17, 2014	36.0	36.0	11.5	36.5	36.5
Friday, July 18, 2014	39.0	39.0	3.9	39.0	39.0
Saturday, July 19, 2014			3.9		
Sunday, July 20, 2014			3.9		
Monday, July 21, 2014	32.5	32.5	230.0	32.5	70.0
Tuesday, July 22, 2014	34.0	34.0	11.5	960.0	270.0
Wednesday, July 23, 2014	72.0	34.5	60.0	460.0	470.0
Thursday, July 24, 2014	37.0	37.0	11.5	37.0	37.0
Friday, July 25, 2014	34.0	34.0	50.0	34.0	34.0
Saturday, July 26, 2014			50.0		
Sunday, July 27, 2014			50.0		
Monday, July 28, 2014	31.5	31.5	3.9	31.5	31.0
Tuesday, July 29, 2014	33.0	32.0	11.5	34.0	100.0
Wednesday, July 30, 2014	180.0	27.5	93.0	60.0	27.5
Thursday, July 31, 2014	31.0	31.0	100.0	120.0	380.0

Results in micrograms per cubic meter

Highlighted cells indicate a detectable level of total particulate. All other values are below the laboratory method detection limit (MDL). Values below the MDL are shown in the table at one-half the MDL for data reporting purposes. This established practice is consistent with PPG's Site 114 reporting of non-detects by AECOM.

Figure A- 1: Real-Time 15-minute average PM<sub>10</sub> Monitoring Results



**Table A-3: Daily Hand-held Monitoring Instantaneous Results**

Date	Time	Dust Reading ( $\mu\text{g}/\text{m}^3$ )	PID Reading (ppm)	Location
Tuesday, July 01, 2014	11:45	116.0	0.0	DW Perimeter
Wednesday, July 02, 2014	8:50	67.0	0.0	DW Perimeter
Thursday, July 03, 2014	7:45	51.0	0.0	DW Perimeter
Friday, July 04, 2014	NA	NA	NA	NA
Saturday, July 05, 2014	-	-	-	-
Sunday, July 06, 2014	-	-	-	-
Monday, July 07, 2014	9:28	91.0	2.1	UW Perimeter
Tuesday, July 08, 2014	8:30	56.0	0.3	DW Perimeter
Wednesday, July 09, 2014	11:45	104.0	0.1	DW Perimeter
Thursday, July 10, 2014	9:00	60.0	0.3	DW Perimeter
Friday, July 11, 2014	9:36	52.0	0.1	DW Perimeter
Saturday, July 12, 2014	-	-	-	-
Sunday, July 13, 2014	-	-	-	-
Monday, July 14, 2014	10:35	56.0	0.0	DW Perimeter
Tuesday, July 15, 2014	11:48	96.0	0.0	DW Perimeter
Wednesday, July 16, 2014	10:55	114.0	0.0	DW Perimeter
Thursday, July 17, 2014	11:09	78.0	0.0	DW Perimeter
Friday, July 18, 2014	8:30	87.0	0.0	DW Perimeter
Saturday, July 19, 2014	-	-	-	-
Sunday, July 20, 2014	-	-	-	-
Monday, July 21, 2014	9:27	63.0	0.0	DW Perimeter
Tuesday, July 22, 2014	8:30	60.0	0.0	DW Perimeter
Wednesday, July 23, 2014	8:30	69.0	0.0	DW Perimeter
Thursday, July 24, 2014	9:00	86.0	0.0	DW Perimeter
Friday, July 25, 2014	10:00	58.0	0.0	DW Perimeter
Saturday, July 26, 2014	-	-	-	-
Sunday, July 27, 2014	-	-	-	-
Monday, July 28, 2014	10:27	25.0	0.0	DW Perimeter
Tuesday, July 29, 2014	8:15	27.0	0.0	DW Perimeter
Wednesday, July 30, 2014	11:00	43.0	0.0	DW Perimeter
Thursday, July 31, 2014	9:45	50.0	0.0	DW Perimeter

Note: Cells highlighted in green are instantaneous peaks that are values above the TVOC Alert Level (15-minute average of 1 ppm) and TVOC Action Level (15-minute average of 1.4) but were not sustained levels and did not require any corrective actions on the Site.

Blank cells or cells that read NA are days where no hand-held monitoring occurred.

DW Perimeter denotes down-wind perimeter. UW Perimeter denotes up-wind perimeter.



**Table A- 4: Elevated Concentration Summary**

Parameter	Date	Time	Location	Wind Conditions	Elevated Concentration	Explanation
TVOC	7/7/14	9:28	Upwind of Excavation	Light , Steady	2.1 PPM	Reading was recorded up-wind of the excavation. Source of elevated readings located off-site and unrelated to remediation activities.
<p>PM<sub>10</sub> – Respirable Particulate Matter measured in micrograms per cubic meter (µg/m<sup>3</sup>)</p> <p>TVOC—Total Volatile Organic Compounds measured in parts per million (ppm)</p> <p>ng/m<sup>3</sup> – nanograms per cubic meter</p> <p>µg/m<sup>3</sup> – micrograms per cubic meter</p> <p>PPM – Parts per Million</p> <p>NA – Not Applicable</p> <p>ND –No Data</p>						

Figure A-2: Wind Speed

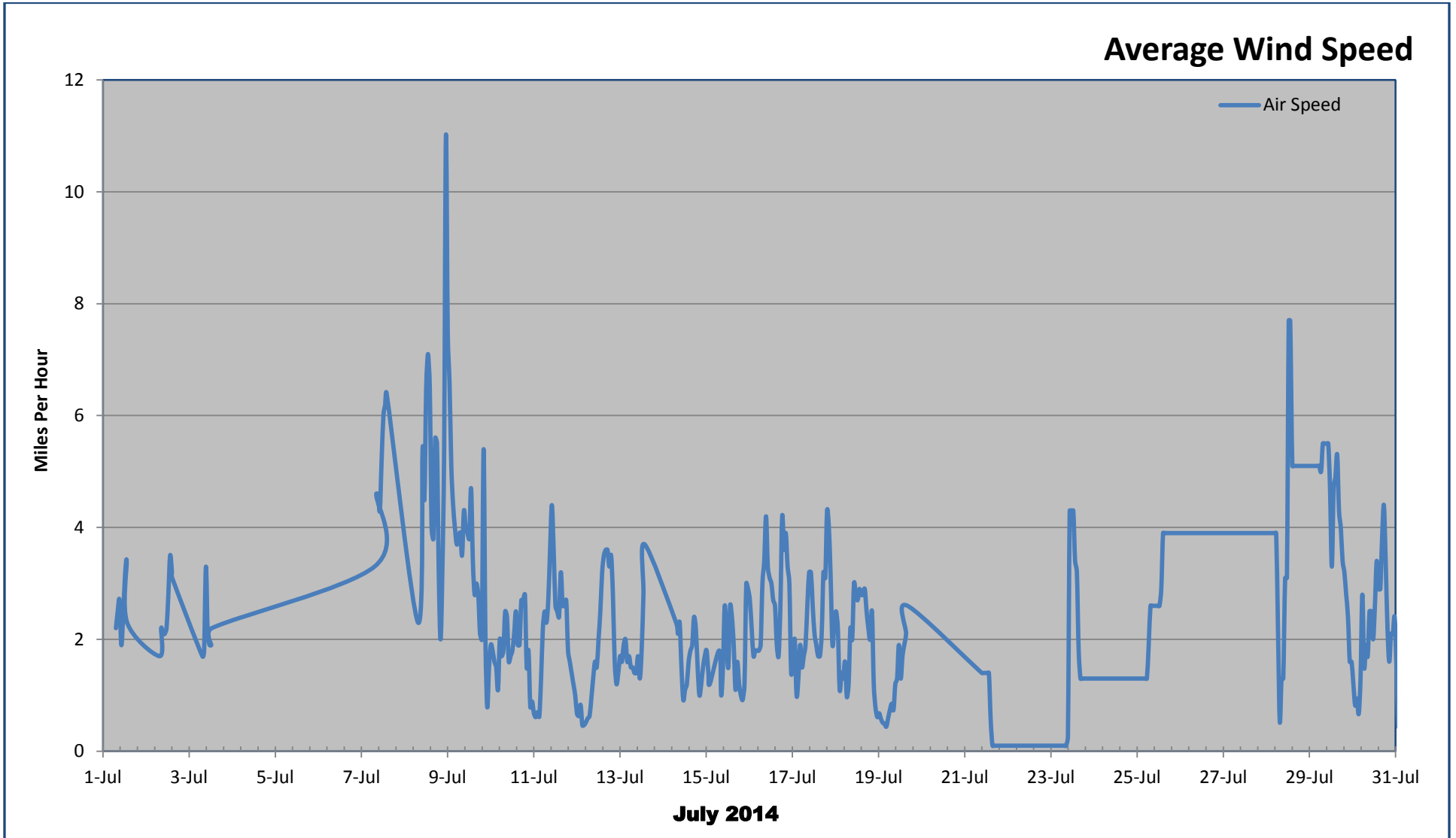


Figure A-3: Temperature

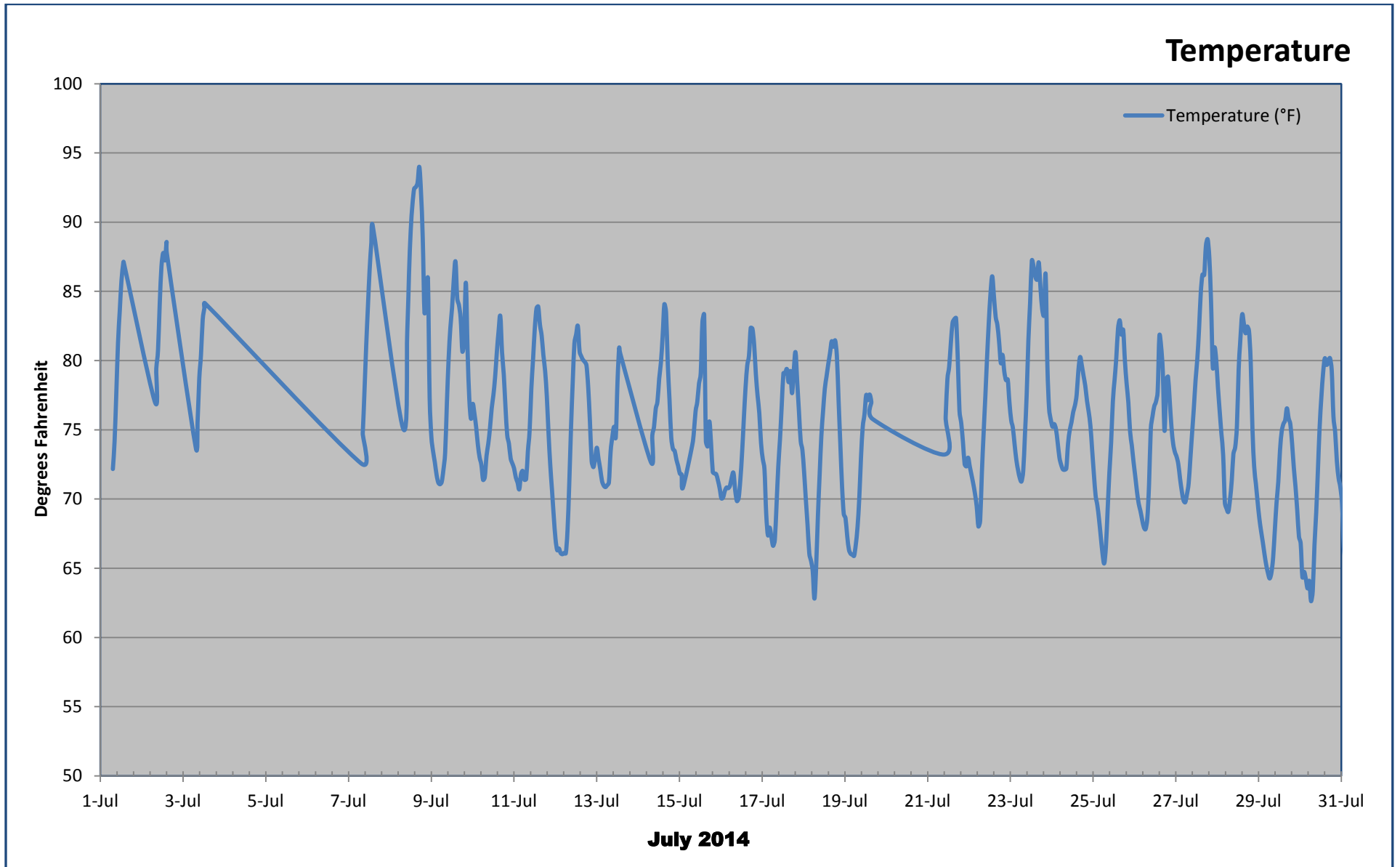


Figure A-4: Relative Humidity

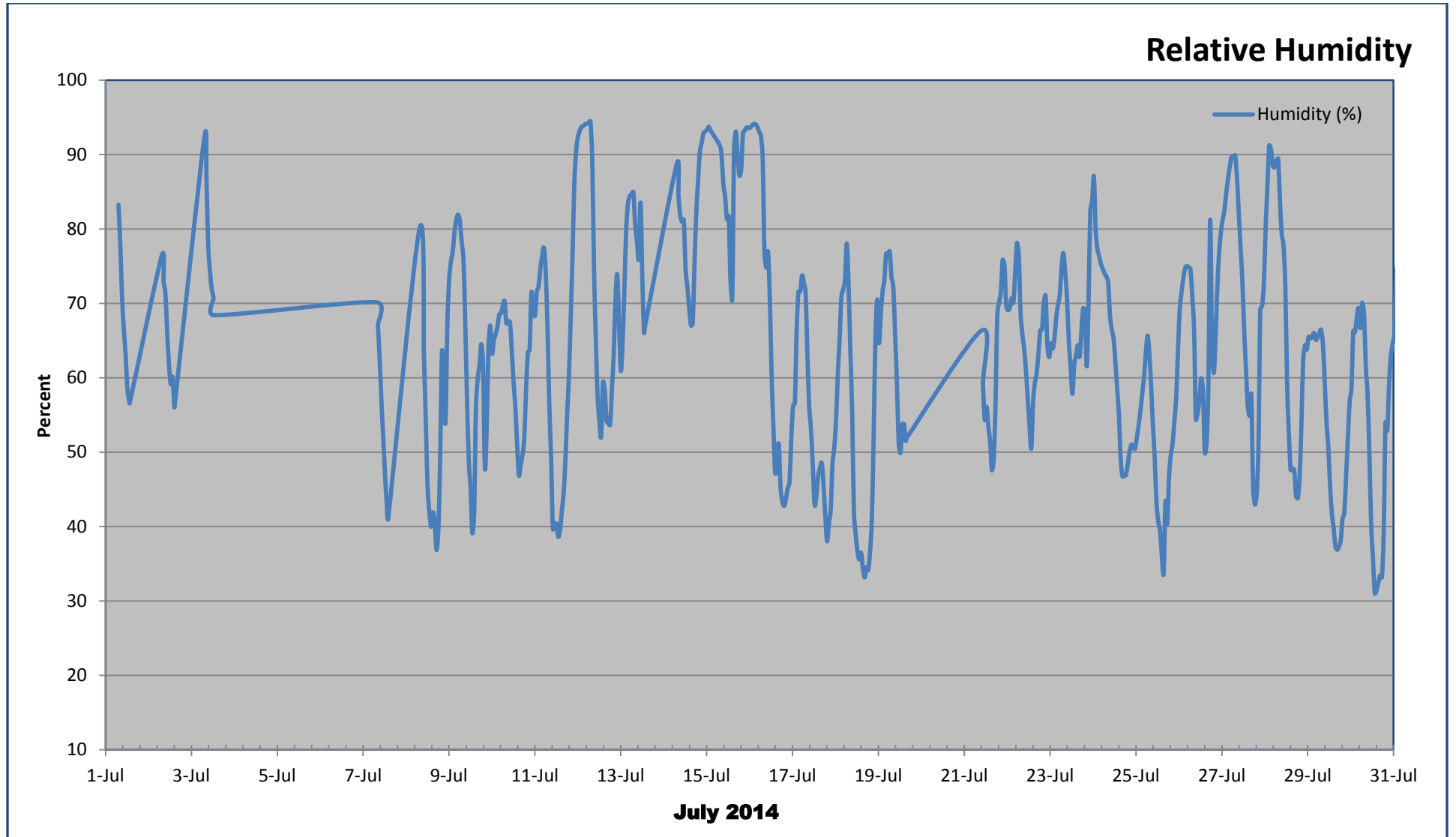


Figure A-5: Site Map Site 16 (06.11.14 – End of Reporting Period)



## **Appendix B**

### **Program-to-date Result Summaries**

- Integrated 8-hour Cr<sup>+6</sup> Concentration Summaries
- Integrated 8-hour Total Particulate Concentration Summaries
- Real-time PM<sup>10</sup> Concentrations Summaries

**Table B- 1: Program-to-date Integrated 8-hour Cr<sup>+6</sup> Sampling Results Statistics**

Statistics <sup>1</sup>	Site 16				
	AMS 1	AMS 2	AMS 3	AMS 4	AMS 5
Total Number of Samples <sup>2</sup>	37	37	37	37	37
Rate of Data Collection	100%	100%	100%	100%	100%
Number of Detected Samples <sup>3</sup>	0	0	0	0	0
% of Cr <sup>+6</sup> Samples Greater than MDL	0.0%	0.0%	0.0%	0.0%	0.0%
Number of Samples Above AAC	0	0	0	0	0
Average % Cr <sup>+6</sup> in Dust	0.020%	0.019%	0.013%	0.015%	0.015%
Maximum % Cr <sup>+6</sup> in Dust	0.021%	0.021%	0.021%	0.021%	0.021%

Results in ng/m<sup>3</sup> – nanograms per cubic meter

<sup>1</sup> Total number of samples collected since June 11, 2014. Variations in the number of samples collected are specifically identified in Table A-1 within the report month of the variation. In general variations are caused by sampler malfunctions, site activities, weather conditions, etc.

<sup>2</sup> Total number of sample results since June 11, 2014 reported above the laboratory reporting limit.

<sup>3</sup> The program-to-date average and maximum percent Cr<sup>+6</sup> in dust was calculated using all the integrated Total Particulate and Cr<sup>+6</sup> sample results collected since June 11, 2014.

**Table B- 2: Monthly Average Integrated 8-hour Cr<sup>+6</sup> Sampling Results**

Statistics	Site 16				
	AMS 1	AMS 2	AMS3	AMS 4	AMS 5
June	6.8	6.8	1.3	6.8	6.8
July	7.0	7.0	1.7	7.0	7.0
Program to Date	6.9	6.9	1.5	6.9	6.9

All readings in ng/m3 – nanograms per cubic meter



**Table B- 3: Program-to-date Integrated Total Particulate 8-hour Sampling Results Statistics**

Statistics	Site 16				
	AMS 1	AMS 2	AMS 3	AMS 4	AMS 5
Total Number of Samples <sup>1</sup>	37	37	37	37	37
Rate of Data Collection	100%	100%	100%	100%	100%
Number of Detected Samples <sup>2</sup>	4	5	22	10	15
% Detection	10.8%	13.5%	59.5%	27.0%	40.5%

Results in ng/m<sup>3</sup> – nanograms per cubic meter

<sup>1</sup> Total number of samples collected since June 11, 2014. Variations in the number of samples collected are specifically identified in Table A-1 within the report month of the variation. In general variations are caused by sampler malfunctions, site activities, weather conditions, etc.

<sup>2</sup> Total number of sample results since June 11, 2014 reported above the laboratory reporting limit.

**Table B- 4: Monthly Average Integrated 8-hour Total Particulate Sampling Results**

Statistics	Site 16				
	AMS 1	AMS 2	AMS 3	AMS 4	AMS 5
June	40.4	52.7	23.3	39.8	60.9
July	42.8	57.2	38.6	112.1	94.7
Program to Date	41.8	55.4	32.6	82.8	81.0
All readings in $\mu\text{g}/\text{m}^3$ – micrograms per cubic meter					

**Table B- 5: Monthly Average Real-Time PM<sub>10</sub> Monitoring Results**

Statistics	Site 16				
	AMS 1	AMS 2	AMS 3	AMS 4	AMS 5
June	13.8	40.2	31.5	16.9	6.8
July	15.4	28.2	21.6	12.4	6.7
Program to Date	14.6	34.2	26.6	14.7	6.8
All readings in µg/m <sup>3</sup> – micrograms per cubic meter					