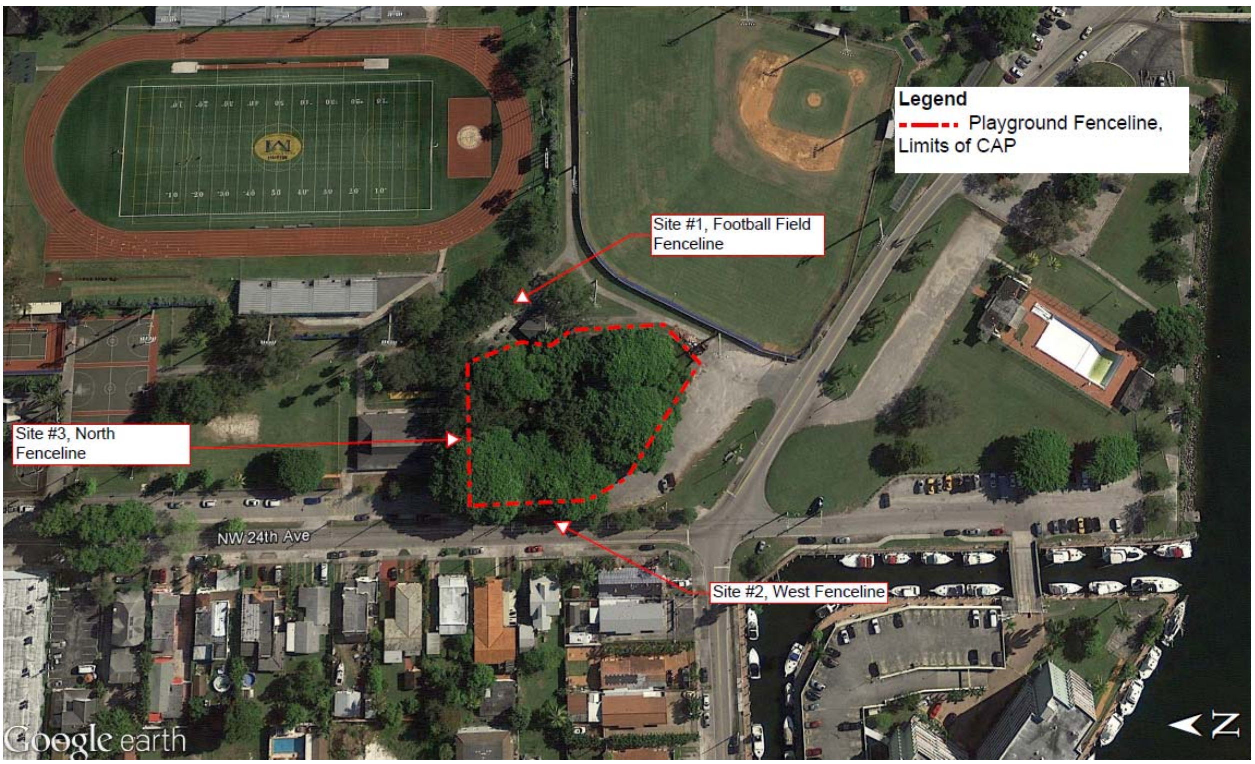
LETTER REPORT FORM:

This Air Monitoring Plan (AMP), which supplements the General Air Monitoring Plan (GAMP) provided as **Attachment A**, submitted by SCS Engineers on June 5, 2015, provides the Air Sampling Locations and the Lowest Correlating Total-Dust Concentration Calculation for Curtis Park within the playground area.

SITE-SPECIFIC AIR SAMPLING LOCATIONS

Three (3) air monitoring sampling locations are selected for Curtis Park. The sample locations are at the perimeter of the site with potential receptors (e.g., residences, community building, parking lot). Figure 1 below depicts the air sampling locations that were selected for Curtis Park.

Figure 1: Air Sampling Locations



Lowest Correlating Total Dust Concentration Calculation

Due to the duration of applicable construction activist (8 weeks), real-time measurement of Total-Dust will be relied upon to evaluate the contractor's dust control measures.

Using the highest soil concentrations reported in the top two feet available, total-dust concentrations correlating to benchmark levels were calculated for each COC. Only the results from the top two feet were considered because proposed excavation is limited to less than two feet. A safety factor (SF) of 10 was applied to the calculated level to account for variations of airborne concentration of specific compounds which may vary dependent on the particle size, density of the metal and environmental conditions such as temperature, humidity, barometric pressure, and wind velocity. The calculations are summarized in Table 1 below:

Table 1: COC Correlating Total-Dust Concentrations

COC	Highest Soil Concentration in Top 2' (mg/kg)	Soil Sample ID	Benchmark Air Concentration (mg/m^3)	Correlating Total-Dust Concentration (mg/m^3)
Antimony (Sb)	64.0	SB-32 (0.5-1)	0.5	781
Arsenic (As)	50.0	SB-35 (1.5-2)	0.01	20
Barium (Ba)	2900.0	SB-36 (1-2)	0.5	17.2
Copper (Cu)	2300.0	SB-38 (1-2)	0.1	4.35
Iron (Fe)	140000.0	SB-38 (1-2)	10	7.1
Lead (Pb)	5900.0	SB-35 (1.5-2)	0.05	0.847

An example calculation is provided below:

$$Total - Dust\ Concentration = \frac{Benchmark\ Air\ Concentration\ \frac{mg}{m^3}}{\left(Highest\ Soil\ Concentration\ \frac{mg}{kg}\right)\left(10^{-6}\ \frac{kg}{mg}\right)(\,10\ SF)}$$

Lead was calculated to be the compound with the lowest correlating Total-Dust concentration (0.85 mg/m3 with a safety factor of 10). Accordingly, and also considering background dust concentrations and National Ambient Air Quality Standards (NAAQS) for PM10, the action limits proposed for real-time dust measurements are provided in Table 2 below.

TOTAL DUST ACTION LIMITS

Table 2: Total-Dust Action Limits

Concentration	Action
150% of background concentration	Advise contractor to enhance dust control measures
200% of background or 0.150 mg/m^3 (NAAQS for PM10) over a 5 minute period or Downwind > 0.50 mg/m^3 Upwind Concentrations	Advise contractor to suspend dust generating activity until such time as corrective actions are implemented to reduce particulate emissions below the action level.
0.847 mg/m^3	Advise contractor to suspend work. If wind related, wait for winds to subside to continue work. If not wind related, notify DERM and submit plan to address condition.

ATTACHMENT A

GENERAL AIR MONITORING PLAN

SCS ENGINEERS







General Air Monitoring Plan

City of Miami Parks Remediation Projects
Miami, Florida

Prepared For:

City of Miami

Miami Riverside Center
444 Southwest 2nd Avenue, 8th Floor
Miami, Florida 33130

Prepared by:

SCS Engineers
7700 North Kendall Drive, Suite 300
Miami, FL 33156
(305) 412-8185

June 5, 2015

General Air Monitoring Plan

City of Miami Parks Remediation Projects
Miami, Florida

Prepared For:

City of Miami
Miami Riverside Center
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Prepared by:

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June 5, 2015

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LIMITATIONS/DISCLAIMER

This General Air Monitoring Plan (GAMP) has been prepared by SCS Engineers (SCS) on behalf of the City of Miami (City), with specific application to remedial excavations at the City park sites including Curtis Park, Douglas Park, Bayfront Park and Southside Park.

Changes in site use and conditions may occur due to nature, manmade changes, or variations in environmental or other factors. Additional information which was not available to SCS Engineers at the time this GAMP was prepared or changes which may occur at the site or in the surrounding area may result in modification of this GAMP. This GAMP is not a legal opinion.

This GAMP dated June 5, 2015 has been prepared and reviewed by the following:

6-5-15

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SCS ENGINEERS

Lisa L. Smith
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SCS ENGINEERS

1 PURPOSE AND BACKGROUND

The intent of this General Air Monitoring Plan (GAMP) is to set forth the air monitoring methods, sampling frequencies, sampling equipment, project benchmarks and reporting requirements that will be followed during planned future remedial excavations at the City park sites, specifically including Curtis Park, Douglas Park, Bayfront Park and Southside Park. Site-specific information, specifically the Site-Specific Air Monitoring Location Map (see **Section 4**) and Lowest Correlating Total-Dust Concentration Calculation (see **Section 5.2**), will be submitted for DERM approval prior to commencement of corrective actions at the specific City parks.

This GAMP has been prepared in accordance with and modified per comments received from the Department of Regulatory and Economic Resources, Division of Environmental Resources Management (DERM) and is supported by air monitoring results obtained during remedial efforts at Merrie Christmas Park and Blanche Park. The following provides a brief summary of the relevant findings from the Merrie Christmas Park and Blanche Park remediations:

- Total-dust concentrations at the above referenced parks remained below the National Ambient Air Quality Standard (NAAQS) for particulate matter with an effective size of 10 microns or less (PM10) of 0.15 mg/m^3 over a 5 minute period throughout remedial activities for the stationary downwind unit. The roving unit concentrations were generally higher as the location of readings was typically in the immediate vicinity of remedial activities. The roving unit was used to direct the contractor to utilize additional water to suppress dust generation when measurements approached or briefly surpassed the 0.15 mg/m^3 action level.

- Analytical concentrations of contaminants of concern (COCs), specifically antimony, arsenic, barium, cadmium, copper, iron, lead and total dioxins, were reported below their air monitoring benchmarks in all perimeter samples collected during the duration of remedial activities.

- Total Suspended Particulate (TSP) concentrations were reported above the benchmark in several samples collected during remedial activities. It is important to note that the NAAQS for PM10 of 0.15 mg/m^3, was established as the project-specific benchmark for TSP. This benchmark is very conservative given that,

    - TSP includes not only PM10 particles, but also particles in the air that have larger effective sizes,

    - the NAAQS PM10 standard was not established for short duration construction activities, and

    - the NAAQS PM10 standard is a 24-hour rolling average; samples collected during this project were generally 8-hour samples during periods of high activity.

The proposed general air monitoring plan set forth in the subsequent sections has been developed considering these results.

2 AIR MONITORING METHODS AND FREQUENCIES

The U.S. Environmental Protection Agency (EPA) has developed numerous test methods for a variety of pollutants. The following is a summary of the methods that will be used in this program for the collection of time averaged pollutant data.

- PM_{10} (U.S. EPA Reference Method: RFPS-1298-124)
- TSP Method (40 CFR Part 50, Appendix B)
- Metals: Antimony, Arsenic, Barium, Copper, Iron, and Lead (EPA Method 12)

Method 12 is written specifically for lead. However, the same test method can be used for other Metals. For other Metals it is generally referred to as "Modified Method 12". Additionally, compendium Method IO-3.1, "Selection, Preparation and Extraction of Filter Material", from the Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air, U.S. EPA, 06/99, will be used by the laboratory for the metal analysis.

In addition to these methods, continuous measurements of Total-Dust will be measured to assess the effectiveness of dust control measures in real-time. This will allow for identification of work practices that have the potential to generate off-site impacts, assess the relative effectiveness of dust control measures, and allow for the application of resources to the areas of greatest need.

The following table provides the proposed sampling frequencies according to test method and operational scenario. Two days of background sampling will be completed and samples will be collected for Metals, TSP, PM10, and real-time Total-Dust. During excavation PM10 will be taken every day and TSP and Metal samples will be taken twice a week for the first week and once per week thereafter using the same PUF sampler.

Table 2-1: Sampling Frequencies

Test Scenario	Pollutant of Concern	Analytical Method	Frequency
Background Sampling	TSP	40 CFR Part 50, Appendix B	Two days (6 samples)
	PM10	U.S. EPA Reference Method: RFPS-1298-124	Two days (6 samples)
	Metals	EPA Method 12	Two Days (6 samples)
General Excavation	TSP	40 CFR Part 50, Appendix B	Daily the first week; Every other day thereafter*
	PM10	U.S. EPA Reference Method: RFPS-1298-124	Daily
	Metals	EPA Method 12	Daily the first week; Every other day thereafter*

** If air monitoring exceeds 1 month in duration, then an alternate sampling frequency will be proposed, as appropriate based upon the sampling results.*

During days of operation and excavation a DataRAM dust monitor will be placed in the field for the purpose of qualitatively assessing the relative effectiveness of dust control measures. The monitor will be utilized for evaluating the effectiveness of the dust suppression and mitigation methods and to confirm that excavation activities are not creating dust impacts downwind of the project site. The DataRAM will be setup at a stationary downwind location; however, this stationary location may be relocated based on wind direction. Additionally, the unit may periodically be removed from its stationary mounting and used as roving unit to measure upwind concentrations or concentrations directly adjacent to work activities.

During the first week of sampling, samples will be submitted to the analytical laboratory with rush turnaround-times (TATs) requested.

3 SAMPLING AND MONITORING EQUIPMENT

Sampling equipment will be calibrated in accordance with equipment or test method requirements. Proposed sampling devices are described below; however, other equivalent equipment may be used.

3.1 HIGH-MEDIUM VOLUME SAMPLERS

High and medium-volume samplers will provide means for drawing an air sample downward through a filter at a uniform face velocity. This will provide a quantifiable flow rate and sample volume given an accurate sampling time. Sampling time will be monitored through the use of an elapsed time meter. Flow rates of high-volume samplers range from 36 to 44 cubic feet per minute (cfm) with medium volume (PUF) samplers operated at a flow rate of 5 to 12 cfm. The samplers function similarly for the types of analytes discussed in previous sections. However, the flow rates and inlet heads differ for the TSP and PUF samplers.

Figure 3-1: Example High Volume Sampler Installation

PUF Samplers will be TISCH, TE-1000PUF, or equivalent. HI-VOL TSP Samplers will be TISCH, TE-5170-V, or equivalent.

3.2 PM10: PQ-167 SAMPLERS

The sampler of choice for this project is the BGI PQ-167 (U.S. EPA Reference Method: RFPS-1298-124). The sampler can be easily converted from a PM_{10} sampler to a TSP sampler simply by changing the sampler inlet head. This sampler provides several advantages to other commercially available PM_{10}/TSP samplers. First, the sampler is able to operate on either 12 Volts DC, or 110 Volt AC supplied power. For this project, the locations of the samplers can be several hundred meters from the nearest power source. These locations make it cost prohibitive to supply 110V AC to the samplers. Second, the samplers are relatively portable. This will allow for easy transport and installation of the sampler if it is determined that a sampling location should be moved. Another advantage of the PQ-167 sampler is that it is highly reliable and easy to calibrate. Finally, the PQ-167 sampler continuously monitors flow rate and adjusts the pump speed to maintain a consistent flow rate of 16.7 lpm. This flow rate is critical for the separation of PM_{10} from particulates of greater aerodynamic diameter. The PQ-167 stores all of the valid sampling run parameters and calculates the total volume for each sampling event.

The PQ 167 sampler utilizes 47 mm Teflon® sampling media for PM_{10}/TSP monitoring. The filters are brought to constant humidity and weighed before sampling. The process is repeated on samples returned from the field. The measured difference in the filter mass is divided by the total volume of air sampled. The result is particulate loading in units of mass per cubic meter ($\mu g/m^3$).

Figure 3-2: Example High Volume Sampler Installation

3.3 THERMO ELECTRON MIE DATARAM: PDR-1000AN

Total-Dust will be measured through the use of the Thermo Electron Corporation personal DataRAM Series pDR-1000AN passive air sampler. This monitor measures the mass concentration of dust, smoke, mists, and fumes in real time. The unit is also capable of sounding an audible alarm whenever a user defined level is exceeded. For the City park projects, the alarm level will be programed to 0.150 mg/m^3. Data logging will also be set so that the instrument tags and time stamps all collect data on a 15-minute time averaged basis. The DataRAM has an operational range of 0.001 mg/m^3 to 400 mg/m^3.

Figure 3-3: DataRAM Series pDR-1000AN

3.4 METEOROLOGICAL DATA ACQUISITION SYSTEM

The meteorological system used for data acquisition will be a Wireless Vantage Pro2. This system monitors, and records temperature, barometric pressure, wind direction, and wind speed. The system uses software to store, view, export and print weather data collected by the system. The meteorological system will be located on the project site. The Wireless Vantage Pro2 is designed to give accurate readings. The errors associated with each parameter of the recorded meteorological data have been provided by the manufacturers of the system and are as follows:

- Wind Speed: ± 5%
- Barometric Pressure: ± 0.03"Hg
- Outside Temperature: ± 1 degree F

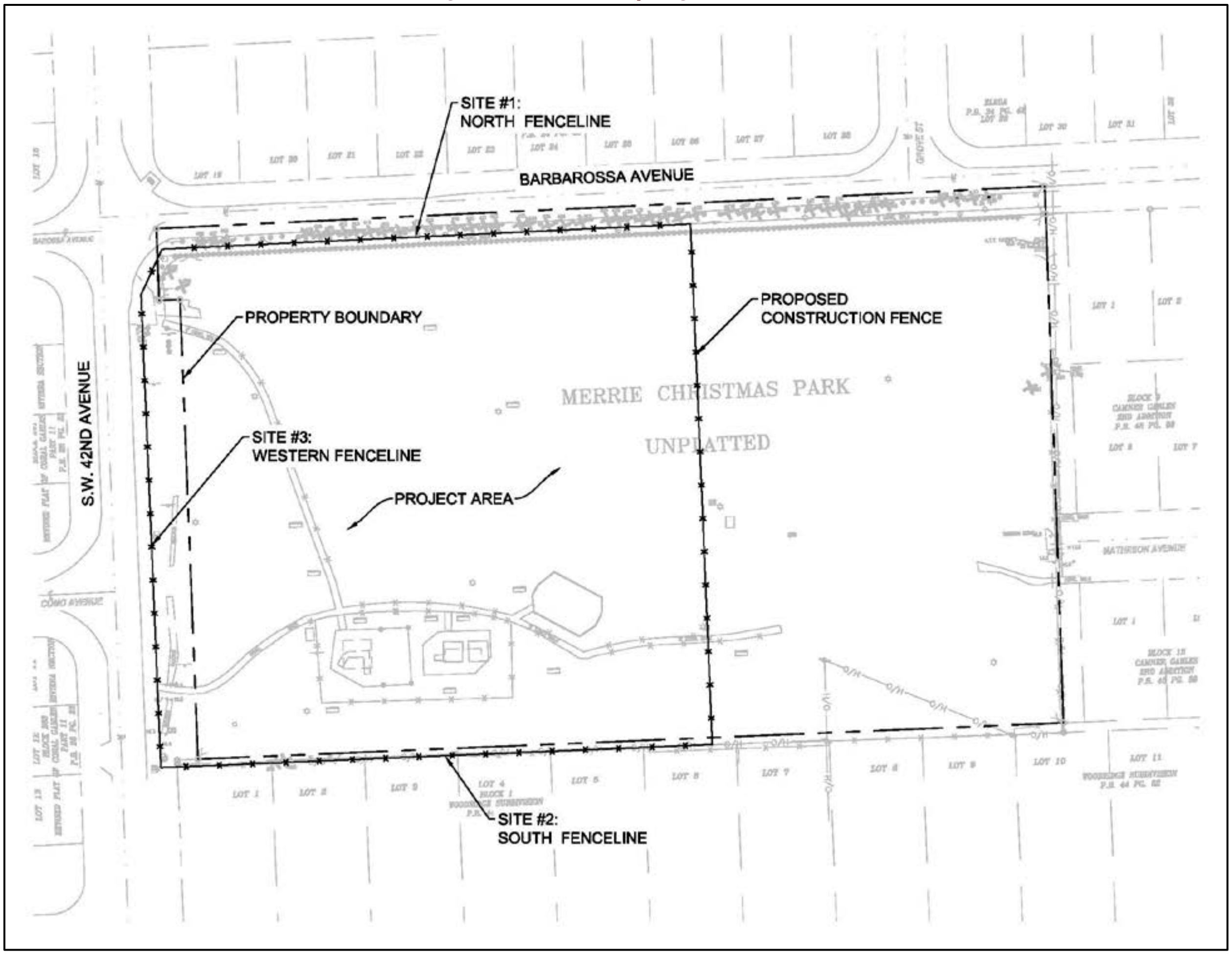
Figure 3-4: Weather Monitor

Figure 3-5: Data Logger and Display

4 SAMPLING LOCATIONS

Figure 4-1 depicts the air sampling locations that were selected for Merrie Christmas Park as an example. Site-Specific Air Sampling Location Maps, which will be submitted for DERM approval prior to commencement of remedial excavations, will include a minimum of three sampling locations placed at the perimeter of the site and will consider pertinent factors such as the location of potential receptors (e.g., residences).

Figure 4-1: Air Sampling Locations



5 PROJECT BENCHMARKS AND ACTION LEVELS

Real-time measurement of Total-Dust will be relied upon to evaluate the contractor's dust control measures. Laboratory sample results will be compared to appropriate benchmarks for additional evaluation.

5.1 BENCHMARKS

This section identifies benchmark concentrations for the measured parameters. Comparison levels are conservative and the selected levels constitute goals to be monitored against during intrusive field activities. The concentrations are presented in **Table 5-1** below.

Table 5-1: Benchmarks by Parameter

Parameter	Benchmarks	Reference
Antimony (Sb)	0.5 mg/m^3	NIOSH REL, OSHA PEL
Arsenic (As)	0.010 mg/m^3	OSHA PEL
Barium (Ba)	0.5 mg/m^3	OSHA PEL
Copper (Cu)	0.1 mg/m^3	NIOSH REL, OSHA PEL
Iron (Fe)	10 mg/m^3	NIOSH REL, OSHA PEL
Lead	0.050 mg/m^3	NIOSH REL, OSHA PEL
TSP	15 mg/m^3	OSHA PEL
PM10	0.15 mg/m^3	24-hour NAAQS

** If both a NIOSH and OSHA standard were available the stricter standard (i.e. lower concentration) was used for the benchmark.*

Typically the OSHA Permissible Exposure Levels (PELs) and NIOSH Recommended Exposure Limits (RELs) will be used for the project benchmarks. Generally, NIOSH RELs and OSHA PELs have been established as safe or acceptable exposure levels for typical 8-hour work days, 40 hour work weeks; therefore, these are appropriate benchmarks for these projects. The NAAQS will be used for PM_{10}; however, it should be noted that this level is meant to evaluate long duration, chronic exposure, which is not representative of episodic remedial events. For this reason, if the PM_{10} benchmark is exceeded, the result will be converted to a 24-hour time weighted average using the background concentration.

5.2 ACTION LIMITS

Due to the short-term duration of applicable construction activities, real-time measurement of Total-Dust will be relied upon to evaluate the contractor's dust control measures.

Total-dust concentrations correlating to benchmark levels will be calculated for each COC using the highest soil concentrations reported in samples that are representative of soil that will be disturbed during remedial activities. A safety factor (SF) of 10 will be applied to the calculated level to account for variations of airborne concentration of specific compounds which may vary dependent on the particle size, density of the metal and environmental conditions such as temperature, humidity, barometric pressure, and wind velocity. The following equation will be used to calculate the correlating total-dust concentrations for each COC:

$$Total - Dust\ Concentration\ = \frac{Benchmark\ Air\ Concentration\ \frac{mg}{m^3}}{\left(Highest\ Soil\ Concentration\ \frac{mg}{kg}\right)\left(10^{-6}\ \frac{kg}{mg}\right)(\ 10\ SF)}$$

The Total-Dust Action Levels will be based on the COC with the lowest correlating Total-Dust concentration. Accordingly, and also considering background dust concentrations and NAAQS for PM_{10}, the action limits proposed for real-time dust measurements are provided in **Table 5-2** below.

Table 5-2: Total-Dust Action Limits

Concentration	Action
150% of background concentration	Advise contractor to enhance dust control measures
200% of background or 0.150 mg/m^3 (NAAQS for PM10) over a 5 minute period or Downwind > 0.50 mg/m^3 Upwind Concentrations	Advise contractor to suspend dust generating activity until such time as corrective actions are implemented to reduce particulate emissions below the action level.
Lowest Correlating Total-Dust Concentration*	Advise contractor to suspend work. If wind related, wait for winds to subside to continue work. If not wind related, notify DERM and submit plan to address condition.

** To be provided in the Site-Specific Air Monitoring Plans*

Both real-time dust measurements and laboratory results for TSP/PM_{10} will be used in evaluating compliance with these established action levels.

6 REPORTING

Once validated, air monitoring data will be immediately available to the owner and DERM upon request. Following completion of the project, an Air Monitoring Report will be submitted to the City of Miami, which will include the following information:

- Sampling and air monitoring field logs
- Analytical data reports
- Summary of calculated time weighted average concentrations per measured parameter
- Sampler calibration forms
- Comparisons to project benchmarks
- A general assessment of the effectiveness of dust control measures on site and potential of offsite impacts

This report will be provided within one-week of receipt of the complete analytical data from the subcontracted laboratory.

Appendix A

Air Monitoring Forms

Daily Monitoring Log

Environmental Health and Safety

Month/Year		Site	
Client		Operator	

				DataRam Concentration		
Day	Time	WS	WD	Upwind	Downwind	Comments

Air Monitoring Sampling Log

Sampling Date		Site ID		Operator	

Sample Type	TSP/Metals	Sample ID		Comments:
Filter #				
Start Time		Stop Time		
Start Ps		Stop Ps		
Start ETI		Stop ETI		
Sample Type	PM10	Sample ID		Comments:
Start Time		Stop Time		
Start Flow		End Flow		
Avg. Flow		Total Vol		
Sample Type	TSP/Metals	Sample ID		Comments:
Filter #				
Start Time		Stop Time		
Start Ps		Stop Ps		
Start ETI		Stop ETI		
Sample Type	PM10	Sample ID		Comments:
Start Time		Stop Time		
Start Flow		End Flow		
Avg. Flow		Total Vol		
Sample Type	TSP/Metals	Sample ID		Comments:
Filter #				
Start Time		Stop Time		
Start Ps		Stop Ps		
Start ETI		Stop ETI		
Sample Type	PM10	Sample ID		Comments:
Start Time		Stop Time		
Start Flow		End Flow		
Avg. Flow		Total Vol		

Initial Ambient Pressure:		Final Ambient Pressure:	
Initial Ambient Temperature:		nal Ambient Temperature:	