

CONSTRUCTION AIR MONITORING SUMMARY REPORT

SEPTEMBER 1-30, 2016

**VIRGINIA AVENUE TUNNEL RECONSTRUCTION PROJECT
WASHINGTON, DC**

**Prepared for:
CSX Transportation**

**Prepared by:
GHD, Inc.**

September 2016

VIRGINIA AVENUE TUNNEL RECONSTRUCTION

Air Monitoring Summary – September 2016

Summary: Air monitoring continued during the month of September 2016, according to the commitments of the FEIS and ROD and the procedures established in the approved monitoring plan. Potential project-related emissions for compounds of interest associated with excavation and engine exhaust (nitrogen dioxide, sulfur dioxide and volatile organic compounds) were well below the criteria established by the FEIS and ROD. Elevated background levels of particulate matter in the general project area continue to exceed the established approach criteria; however, no measurable contributions are attributed to the project-related activities.

The Project Team has prepared this monitoring summary in order to meet the commitments introduced in the Virginia Avenue Tunnel Reconstruction Final Environmental Impact Statement (FEIS) and Section 4(f) Evaluation (May, 2014) and further detailed in the Record of Decision (ROD), October, 2014. The project sponsor has agreed to a number of environmental commitments as mitigation for environmental impacts that will result from the Virginia Avenue Tunnel Reconstruction Project. The commitments are divided between those related to construction of the Project and those related to the restoration of affected areas upon project completion of the Selected Alternative. These environmental commitment measures are mitigations which avoid the impact altogether by not taking a certain action or parts of an action; minimize impacts by limiting the degree or magnitude of the action and its implementation; rectify the impact by repairing, rehabilitating, or restoring the affected environment; reduce or eliminating the impact over time by preservation and maintenance operations during the life of the action; or compensate for the impact by replacing or providing substitute resources or environments. This monthly air monitoring summary report is intended to fulfill aspects of the air quality commitments contained in the ROD for the Virginia Avenue Tunnel reconstruction.

The purpose of this report is to provide a summary of the air monitoring and sampling activities, results, and observations recorded at the Virginia Avenue Tunnel reconstruction during the month of September, 2016. The purpose of the monitoring conducted during September 2016 was to measure ambient air concentrations of compounds of interest (COI) during the continuation of tunnel reconstruction activities. GHD Services, Inc. (GHD) performed real-time air monitoring at multiple locations during the month of September using four mobile air monitoring stations capable of detecting site COI. The four monitoring stations were placed in the immediate vicinity of construction activities at all times during which those activities were taking place. Upwind and downwind readings were obtained throughout the work activities, as verified by on-site meteorological monitoring which was established during the month of September. Real-time air monitoring equipment was used to determine air levels of Volatile Organic Compounds (VOCs), Sulfur Dioxide (SO₂), Nitrogen Dioxide (NO₂) and airborne particulate matter (PM₁₀ and PM_{2.5}). Figure 1 shows the locations of the monitors during the month of September.

Figure 1. Air Monitoring Locations



Each monitoring station was equipped with a RAE Systems MultiRAE Plus Photoionization detector (PID) capable of detecting VOCs, and equipped with electrochemical sensors specific for sulfur dioxide (SO₂) and nitrogen dioxide (NO₂). Additionally, each monitoring station was equipped with TSI inc. DustTRAK model DRX. The MultiRAE and DustTRAK monitors wirelessly transmitted real-time data from the station to a secured server where data were archived and reviewed remotely. Table 1 includes a summary of the perimeter monitoring data.

The air monitoring and sampling data collected during September 2016 indicate that air levels of all COI were consistent with the levels reported in the Final Environmental Impact Statement (FEIS) document. Particles smaller than 2.5 microns in diameter (PM_{2.5}) were detected on the monitors at an average level of 0.0160 mg/m³, as compared with the Approach Criterion of 0.012 mg/m³. These levels appear to be due to background levels in the area, as well as other sources of activity, as documented each week. A primary piece of evidence for this is that the monitor downwind of the site often shows less PM_{2.5} than the monitor located upwind of site activities. This indicates a source present upwind of site activities. The background sources nearby that have been documented as having contributed to PM_{2.5} levels observed on site include, but are not limited to: traffic, equipment, and environmental conditions. The Project Team has continued to closely monitor particulate matter levels, and has implemented control measures as agreed upon in the FEIS and ROD. On occasions where VAT project activities contributed to particulate matter emissions, site personnel were notified, and the mitigation strategies outlined in the ROD were implemented.

The Project Team is also collecting data on a Federal Reference Method (FRM) monitor for particulate matter near the project work trailer. The FRM monitor reports data on an hourly basis, and it is used for documentation of levels of PM_{2.5} and PM₁₀ in the area. The FRM monitor data are summarized in Table 2. The FRM monitor operates during nighttime hours as well, when particulate matter levels are lower; thus, the measured levels of particulate matter are below applicable Approach Criteria.

All data for the monitored parameters indicated site air levels of COI were below relevant Approach Criteria, with the exception of PM_{2.5}, for the reasons noted above.

Table 1. Perimeter Monitoring Data Summary

<i>Monitoring Period</i>	<i>Monitoring Station</i>	<i>Analyte</i>	<i>Number of Readings</i>	<i>Number of Detections¹</i>	<i>Maximum Detection</i>	<i>Average of Detections</i>	<i>Exceedance (Yes/No)</i>	<i>Comments</i>
September 1-30, 2016	Mobile Monitoring Stations 1, 2, 3, & 4 – located in immediate vicinity of construction activities each day	VOC	13539	114	0.040 ppm	0.000 ppm	No	All data below Approach Criterion of 1 ppm as a 1-hour average
		NO ₂	11987	15	0.100 ppm	0.000 ppm	No	All data below Approach Criterion of 54 ppb as a 1-hour average
		SO ₂	14959	9	0.600 ppm	0.001 ppm	No	All data below Approach Criterion of 147 ppb as a 1-hour average
		PM ₁₀	22078	18	0.594 mg/m ³	0.018 mg/m ³	No	Data were below Approach Criterion of 0.150 mg/m ³ as a 1-hr average
		PM _{2.5}	22079	12,702	0.534 mg/m ³	0.016 mg/m ³	No ²	1-minute average data were periodically above Approach Criterion of 0.012 mg/m ³ as a monthly average [see text for description of elevated background levels]

¹ For VOC, NO₂, and SO₂, indicates the total number of positive readings by the instrument; difference from Number of Readings represents non-detectible readings. For PM₁₀ and PM_{2.5}, indicates the total number of 1-minute average readings above the Approach Criteria thresholds. These do not indicate Approach Criteria exceedances, which are based on 1-hour and 30-day averages, respectively.

² Exceedance Criterion for PM_{2.5} is 0.012 mg/m³ as an annual average.

Table 2. FRM Monitoring Data Summary

<i>Monitoring Period</i>	<i>Monitoring Station</i>	<i>Analyte</i>	<i>Number of Readings</i>	<i>Number of Detections above Approach Criterion</i>	<i>Maximum Detection</i>	<i>Average of Detections</i>	<i>Exceedance (Yes/No)</i>	<i>Comments</i>
September 1-30, 2016	FRM Monitor – located near Project trailer at the west end of the work area	PM ₁₀	720	3	0.2380 mg/m ³	0.0246 mg/m ³	No	Data indicated 3 occurrences of an Approach where the PM ₁₀ concentration exceeded 0.150 mg/m ³ as a 1-hr average
		PM _{2.5}	720	169	0.2950 mg/m ³	0.0090 mg/m ³	No ¹	Data indicated 169 occurrences of an Approach where the PM _{2.5} concentration exceeded 0.012 mg/m ³ as a 1-hr average - attributed to elevated background levels with no measureable contribution from project-related activities. Exceedance criteria are based on annual average.

¹ Exceedance Criterion for PM_{2.5} is 0.012 mg/m³ as an annual average.