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TECHNICAL MEMORANDUM

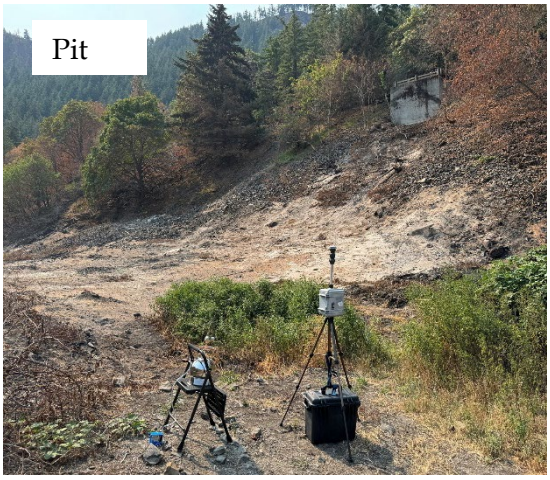
AMBIENT AIR QUALITY MONITORING ALONG THE HISTORIC COLUMBIA RIVER HIGHWAY STATE TRAIL

PREPARED FOR: United States Department of Agriculture Forest Service

PREPARED BY: Katheryn Kolesar, PhD Air Sciences Inc.

DATE: October 8, 2024

The Microwave Tower Fire (OR95S) started on July 22, 2024, about 5 miles west of Mosier, Oregon. Some of the burn was along the Historic Columbia River Highway State Trail, which is a popular recreation destination. On September 1, 2024, the United States Department of Agriculture (USDA) Fire Service contracted with Air Sciences Inc. (Air Sciences) to conduct ambient air quality (AQ) monitoring near a hot spot consisting of an abandoned disposal site (Pit) and along the trail above it (Trail). The two sampling locations are shown in the photos below.



The purpose of the ambient AQ monitoring was to determine if potential inhalation hazards existed at any phase to protect the health of workers and public trail users. This information was used to inform worker safety precautions and trail usage decisions.

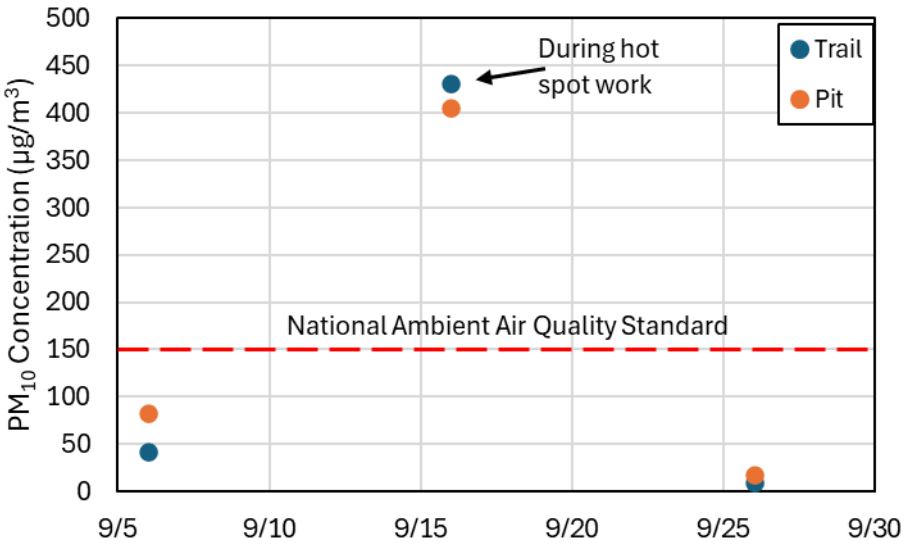
Ambient AQ sampling was conducted before work began to extinguish the hot spot (9/6/2024), during work to extinguish the hot spot (9/16/2024), and after the hot spot was extinguished (9/26/2024 and 10/2/2024). Samples were taken of the ambient air at the two locations to determine the average concentration of: particulate matter (PM) with aerodynamic diameter less than 10 micrometers (PM_{10}), PM_{10}-bound metals, and volatile organic compounds (VOCs). The results of the AQ sampling are summarized in the following tables and figure. Acute reference exposure levels (REL; California Office of Environmental Health and Hazard Assessment) and National Ambient Air Quality Standards (NAAQS) are given for comparison.

Concentration of PM_{10}-bound Metals at the Trail Sampling Location

Metal	Before hot spot work (9/5)	During hot spot work (9/16)	After hot spot work (9/26)	Acute REL (µg/m³)	NAAQS
Arsenic	Below LOD	Below LOD	Below LOD	0.2	N/A
Chromium (III and VI)	0.0033	0.0301	Below LOD	0.48 (CrIII)	N/A
Copper	Below LOD	0.1686	Below LOD	100	N/A
Mercury	Below LOD	Below LOD	Below LOD	0.6	N/A
Nickel	Below LOD	Below LOD	Below LOD	0.2	N/A
Lead	Below LOD	0.4002	Below LOD	N/A	0.15 µg/m³ (3-month rolling average)

Concentration of PM_{10}-bound Metals at the Pit Sampling Location

Metal	Before hot spot work (9/5)	During hot spot work (9/16)	After hot spot work (9/26)	Acute REL (µg/m³)	NAAQS
Arsenic	Below LOD	Below LOD	Below LOD	0.2	N/A
Chromium (III and VI)	Below LOD	0.0254	Below LOD	0.48 (CrIII)	N/A
Copper	Below LOD	0.1422	Below LOD	100	N/A
Mercury	Below LOD	Below LOD	Below LOD	0.6	N/A
Nickel	Below LOD	Below LOD	Below LOD	0.2	N/A
Lead	Below LOD	0.2985	Below LOD	N/A	0.15 µg/m³ (3-month rolling average)



Average PM_{10} concentration before, during, and after hot spot work

Measured concentrations (in μg/m³) of VOC species with acute reference exposure levels

VOC	Pit Location		Trail Location		Inhalation Acute Reference Exposure Level (μg/m³)
	Before hot spot work (9/6)	After hot spot work (10/2)	Before hot spot work (9/6)	After hot spot work (10/2)	
1,2,4-Trimethylbenzene	0.88	Below LOD	Below LOD	Below LOD	2,400
2-Butanone	17.40	Below LOD	4.72	Below LOD	13,000
Acrolein	5.73	Below LOD	1.86	Below LOD	3
Benzene	76.67	5.1	1.18	3.8	27
1,3-Butadiene	2.65	Below LOD	Below LOD	Below LOD	660
Carbon disulfide	0.5	0.12	0.16	0.16	6,200
Carbon tetrachloride	0.45	Below LOD	0.43	Below LOD	1,900
Chloroform	0.07	Below LOD	0.07	Below LOD	150
Methylene Chloride	1.39	Below LOD	1.53	Below LOD	14,000
Xylenes	3.00	0	0.19	0.35	22,000
Styrene	2.94	Below LOD	Below LOD	Below LOD	21,000
Toluene	25.63	1.4	0.75	1.36	5,000

Ambient AQ monitoring was used to collect and measure samples of ambient air pollutants and evaluate the status of the atmosphere next to the hot spot (Pit) and the trail (Trail). The concentration of pollutants measured at each location depends on local and regional emissions as well as wind direction, speed, and other meteorological factors. The results of the ambient AQ monitoring indicate that:

- The concentrations of acrolein and benzene were above the acute REL at the Pit sampling location before the hot spot was extinguished, and below the acute REL after the hot spot was extinguished.

- The four-hour average concentrations of PM_{10} at both the Pit and Trail sampling locations were above the 24-hour PM_{10} NAAQS during hot spot work. This comparison is for informational purposes only and does not suggest an exceedance of the NAAQS.

- The four-hour average concentration of PM_{10}-bound lead was above the NAAQS reference concentration of 0.15 μg/m³ for a three-month rolling period at both the Pit and Trail locations during hot spot work. This comparison is for informational purposes only and does not suggest an exceedance of the NAAQS.

- Ambient pollutant concentrations for all other sampling locations and dates are below any known health exposure limits.

- The ambient pollutant concentrations were the lowest after the hot spot was extinguished, suggesting that the work to extinguish the hot spot was successful in improving the ambient air quality at both locations.