

**REVIEW OF VULCAN MATERIALS WESTERN DIVISION
AB2588 HEALTH RISK ASSESSMENT (HRA)**

February 22, 2022

Emissions Inventory Facility ID: 6306

Toxics Emissions Inventory Year: 2017

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A Health Risk Assessment (HRA) was performed for Vulcan Materials Western Division (Vulcan), 10051 Black Mountain Road, San Diego, California 92126, by Taylor Environmental Services, Inc. for emissions in calendar year 2017 and submitted to the District for review on March 1, 2021 (Submittal HRA). The District provided District's comments on the HRA along with comments provided from the Office of Environmental Health Hazard Assessment (OEHHA) to Vulcan on August 18, 2021. Vulcan submitted a revised HRA (Revised HRA) to the District on December 2, 2021. Subsequently, the District completed a modified health risk assessment (District Modified HRA) on February 22, 2022.

The following are the District's comments on the Revised HRA and, in addition, the results of the District Modified HRA.

Approved HRA Results

Maximum Individual Excess Cancer Risk (PMI)	145.00 in a million
Maximum Residential Excess Cancer Risk	8.63 in a million
Maximum Occupational Excess Cancer Risk	1.15 in a million
Maximum Chronic Non-Cancer Health Hazard Index (PMI)	9.08
Maximum Residential Chronic Non-Cancer Health Hazard Index	0.53
Maximum Occupational Chronic Non-Cancer Health Hazard Index	1.20
Maximum 8-Hour Occupational Non-Cancer Health Hazard Index	0.27
Maximum Acute Health Hazard Index (PMI)	2.63
Maximum Residential Acute Health Hazard Index	0.72
Maximum Occupational Acute Health Hazard Index	2.63
Population Excess Cancer Burden	0.06
Sub-Chronic Lead Exposure Risk	<0.12 ug/m ³

The 30-day lead concentration at the Maximum Offsite Concentration (MOC), using EPA's AERMOD model, is estimated to be 0.00023 $\mu\text{g}/\text{m}^3$, which is below the High Exposure Scenario approval level of 0.12 $\mu\text{g}/\text{m}^3$ in the ARB Risk Management Guidelines for Lead, 2001. Lead emissions were estimated based on annual emissions being emitted in a 30-day period.

Major Pollutant and Source Contributions for Selected Risks

Maximum Worker Non-Cancer Chronic Health Hazard Index

Pollutant	Contribution
Arsenic	85%
Silica	11%

Source	Contribution
Aggregate Plant	68%
Haul Roads	15%
Storage Piles	14%

Maximum Non-Cancer Acute Health Hazard Index

Pollutant	Contribution
Nickel	99%

Source	Contribution
Rock Plant	76%
Haul Roads	10%
Storage Piles	5%

The District Revised HRA concludes that the worker non-cancer chronic health hazard index and the worker acute health hazard index do exceed the public notification levels specified in District Rule 1210.

Summary of Changes in District Modified HRA

Air Dispersion Modeling

1. For the District Modified HRA, refined air dispersion modeling was conducted using EPA's AERMOD model (Lakes AERMOD, Version 19191), AERMET (Version 19191)
2. A Cartesian receptor grid with 15-meter spacing was added in the AERMOD model over worker properties to the south.
3. Volume sources D1233A, D1233B, D1233C were modified to have a length of side of 25 meters from >200m to better align emissions to the source.

Risk Assessment Calculations

1. The total emissions for Device 1233 (aggregate plant) were divided by 3 and distributed evenly over volume sources D1233A, D1233B, D1233C in the Revised HRA. In AERMOD, the emissions rate for these 3 volume sources was set to 0.3333g/s. Since the emission rate in AERMOD and emissions inventory in HARP were adjusted by 1/3, only 1/3 of the actual emissions for this device were included in the risk calculation. The District assigned the full emissions for device 1233 to each volume source in HARP and kept the 0.3333g/s emission rate in AERMOD. This shows that the total emissions were properly distributed to each device for this emission unit.
2. The District used the RMP using the Derived Method for cancer evaluations instead of the OEHHA Derived Method which uses the LongTerm24HR breathing rate.
3. A deposition velocity of 0.02 m/s was used for all sources except D11V, D1233A, D1233B, D1233C, D27, D28, D20V which remained at 0.05 m/s
4. Population Excess Cancer Burden and Sub-chronic lead risks were not recalculated as it would not significantly impact the results of the HRA.

Locations of Receptors at Maximum Exposure Points

Receptor - Cancer Risk	Risk (1 in 1 million)	x (m)	y (m)
Point of Maximum Impact Cancer Risk (PMI)	145.00	487706.00	3640017.00
Maximum Exposed Individual Resident Cancer Risk (MEIR)	8.63	487679.00	3640424.00
Maximum Exposed Individual Worker Cancer Risk (MEIW)	1.15	487718.42	3639982.23

Receptor - Non-Cancer Chronic Health Hazard Index	Health Hazard Index	x (m)	y (m)
Maximum Non-Cancer Chronic Health Hazard Index (PMI)	9.08	487706.00	3640017.00
Maximum Residential Non-Cancer Chronic Health Hazard Index (MEIR)	0.53	487679.00	3640424.00
Maximum Worker Non-Cancer Chronic Health Hazard Index (MEIW)	1.20	487673.42	3639982.23
Maximum Worker 8-Hour Non-Cancer Chronic Health Hazard Index (MEIW)	0.27	487688.42	3639982.23

Receptor - Acute Health Hazard Index	Health Hazard Index	x (m)	y (m)
Maximum Acute Health Hazard Index (PMI)	2.63	487781.00	3640017.00
Maximum Residential Acute Health Hazard Index (MEIR)	0.72	487677.40	3640417.00
Maximum Worker Acute Health Hazard Index (MEIW)	2.63	487781.00	3640017.00

The geographic coordinate system for the locations is the North American Datum of 1983.

Contours for Selected Risk and Health Hazard Index Calculations

Isopleths at notification thresholds for selected risk calculations are on the following pages.

1. Occupational non-cancer chronic health hazard index
2. Acute non-cancer chronic health hazard index