

**ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY**

**AIR QUALITY DIVISION**

**RESPONSIVENESS SUMMARY  
TO PUBLIC COMMENTS AND QUESTIONS**

**Rosemont Copper Company - Rosemont Copper Project**

**April 24, 2018**

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## **I. DECISION**

This permitting action is for the issuance of a Class II air quality renewal permit for the construction and operation of the Rosemont Copper Project, an open pit copper mine, to be located at 21900 S Sonoita Highway, Vail, Arizona 85641. The facility is 30 miles southeast of Tucson, west of State Highway 83, in Pima County, Arizona.

## **II. BACKGROUND**

On July 25, 2017, the Arizona Department of Environmental Quality ("Department") received a Class II renewal application from Rosemont Copper Company for the construction and operation of an open pit copper mine to be located at 21900 S Sonoita Highway, Vail, Arizona 85641. Air Quality Permit #67001 is issued in accordance with A.R.S 49-426, Arizona Administrative Code (A.A.C.) Title 18, Chapter 2, Article 304, and with an assertion of jurisdiction pursuant to Arizona Revised Statutes (A.R.S) 49-402 and is processed in accordance with A.R.S. 49-426. The permit contains requirements from the A.A.C., Pima County Code Title 17, Code of Federal Regulations (CFR) and State Implementation Plan (SIP).

## **III. COMMENT PERIOD AND PUBLIC HEARING**

A public notice for the proposed permit was published in the Arizona Republic and the Arizona Daily Star on January 19, 2018 and January 26, 2018. A public hearing was held at Corona Foothills Middle School located at 21900 S Sonoita Highway, Vail, Arizona 85641 on February 20, 2018.

Oral and written comments were received during the public comment period. This document presents the Department's responses to the issues raised during the public comment period.

#### IV. GENERAL COMMENTS AND MISCELLANEOUS

Comment 1: A commenter hopes that ADEQ has looked carefully and thoughtfully at the proposed air quality control permit for Rosemont's copper mine. The commenter noted the destruction of the Santa Rita mountains and the drastic drawdown of water as well as noting "there is nothing good in air quality issues that can happen from this; the only plus of this would be employment for 20 years for some thousand plus laborers." The commenter also noted that when the mine leaves, it will leave a huge environmental scar on the landscape and a depleted aquifer. The commenter asked if ADEQ believes citizens of Arizona are more important than the mine.

Response: The primary mission of ADEQ is to protect and enhance public health and the environment in Arizona. ADEQ has gone through a thorough review of the renewal permit application and the associated air dispersion modeling report for the Rosemont Project and has included all applicable requirements in the permit. The Class II air quality permit does not regulate nor enforce any requirements for water drawdown or aquifer depletion. The comments are noted.

Comment 2: A commenter noted that the proposed facility will drain the water of homeowners for miles around the facility.

Response: The Class II air quality permit does not regulate nor enforce any requirements for water drawdown or aquifer depletion. The comments are noted.

Comment 3: A commenter expressed that ADEQ, Hudbay, Arizona politicians and others are working together to ensure that the Rosemont copper project will be constructed.

Response: ADEQ disagrees with this comment. ADEQ has completed a structured review of the renewal application and is confident that it is issuing an environmentally-protective and legally-defensible permit. The comment is noted.

Comment 4: A commenter noted that Rosemont has an advantage by Arizona regulations concerning their calculations when Rosemont is challenged by Arizona citizens utilizing the court system. The commenter added that the Arizona Attorney General's office sends legal representation that supports Rosemont attorneys while defending the ADEQ.

Response: ADEQ disagrees with this comment. Any representation by the Attorney General's office in any appeal or litigation process is on behalf of the client which, for the purposes of this air permit, would be ADEQ. The comment is noted.

Comment 5: A commenter noted that the Environmental Protection Agency, Pima County Board of Supervisors, Army Corp of Engineers (regional), and Pima County (PDEQ) are opposed to granting approval of this permit.

Response: ADEQ's decision to issue the Air Quality Control Permit No. 67001 is driven by regulatory considerations prescribed in state and federal laws. ADEQ is responding to all comments received during the public notice period before taking final action regarding Permit No. 67001.

Comment 6: A commenter noted that the Tucson city limits are 14 miles away, rather than 30 miles away as noted by Rosemont.

Response: ADEQ's reference of 30 miles is based on distance from the center of the city (Tucson) to the location of the mine.

Comment 7: A commenter stated that the permit should be denied because the facility emits the following air contaminants: particulate matter, nitrogen oxides, carbon monoxide, sulfur dioxide, volatile organic compounds, sulfuric acid, greenhouse gases and hazardous air pollutants.

Response: Particulate matter, nitrogen oxides, carbon monoxide, sulfur dioxide, volatile organic compounds, sulfuric acid, greenhouse gases and hazardous air pollutants are all gases regulated by the Clean Air Act. ADEQ's air quality permit suitably addresses all applicable requirements for the aforementioned pollutants.

Comment 8: A commenter made a statement regarding the primary responsibility of ADEQ to protect the public health of Arizona's citizens, specifically focusing on the health and wellbeing of children. The commenter noted that here is a great deal of scientific data concerning the public health hazards posed by the impairment of air and water quality, including particulate pollution that will result from the proposed Rosemont Mine, and that these data have been and will continue to be made available to the ADEQ through extensive research and testimony by environmental scientists. The commenter encouraged ADEQ to take a long view of public health, to resist pressure for quick decisions on proposals that will seriously impact public health in Arizona, and to remember the children of our state in every conversation and every decision.

Response: ADEQ's primary mission is to protect and enhance public health and the environment in Arizona. This mission is echoed throughout all permitting processes. The Air Quality Division of ADEQ considers the state's sensitive populations through a rigorous review of incoming permit applications as operations relate to the applicable federal and state requirements. Additionally, ADEQ ensures that the National Ambient Air Quality Standards (NAAQS) are protected. The NAAQS primary standards provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. As discussed in the draft permit and TSD, the emissions from the proposed Rosemont project will not interfere with attainment or maintenance of the NAAQS.

## V. ASSERTION OF JURISDICTION

Comment 9: A commenter noted that the previous Air Quality Division Director, Henry Darwin, did not follow procedure in asserting jurisdiction over the Pima County Department of Environmental Quality (PDEQ). The agency ran concurrent permit applications. Pima County had authority on certification for Title V projects. PDEQ denied the permit once EPA determined that all SIPs would have to be utilized. Rosemont threatened to sue PDEQ if they were not granted a permit.

Response: ADEQ's decision to assert legal jurisdiction over the permitting of the Rosemont Copper Project (RCP) was based on a thorough analysis of the issues. First, there was ambiguity in the permitting rules regarding jurisdiction and the applicability of Pima SIP Rule 504. The other compelling reason was the Superior Court's ruling (Case No. C20120242; Rosemont Copper Company vs. PCAQD) that deemed Pima County Air Quality District's (PCAQD) denial of Rosemont Copper Company's (RCC) air permit application as "arbitrary and capricious, and an abuse of discretion, under A.R.S §12-910(E)".

The regulatory ambiguity is shown in Pima County's SIP that stipulates facilities with uncontrolled emissions in excess of 75 tons per day to obtain an installation permit from ADEQ, while the Pima County Rules requires RCC to obtain an operating permit from PCAQD. Therefore, to address this regulatory uncertainty that has been created by PCAQD and the possible need for duplicative permits based on Pima County SIP, ADEQ decided to assert jurisdiction over the air permitting of the RCP facility. ADEQ followed the appropriate regulatory process prescribed in Arizona Revised Statutes (A.R.S) 49-402(B) and Arizona SIP R9-3-1101 to assert air quality jurisdiction over the facility.

## VI. PERMITTING CLASSIFICATION AND PROCESS

Comment 10: A commenter cited an article by the attorney for Rosemont Copper that the use of a synthetic minor category is plagued with the possibility of being punished if used untruthfully. As the commenter stated, the proposed Rosemont mine should never have been classified as a synthetic minor because "incident after incident have occurred due to the attempt use a class II synthetic minor definition".

Response: ADEQ is unclear what the commenter referred to regarding "incident after incident" occurring due to the Class II Synthetic Minor Definition. Per the definition in the Arizona Administrative Code (A.A.C.) R18-2-301.24, "Synthetic minor" means a source with a permit that contains voluntarily accepted emissions limitations, controls, or other requirements (for example, a cap on production rates or hours of operation, or limits on the type of fuel) under R18-2-306.01 to reduce the potential to emit to a level below the major source threshold." For example, the dust collectors listed in Table 1 of Draft Permit 67001 have PM<sub>10</sub> emissions limits. These are considered voluntary accepted emission limitations and are subject to performance testing. If the facility exceeds the emission limitation, it would be violating their permit conditions and would need to advise ADEQ of such an

exceedance. ADEQ can use informal and formal enforcement processes to return facilities back to compliance for such violations. ADEQ has successfully issued and enforced synthetic minor permits for a wide variety of sources and has done so over several years.

Comment 11: A commenter noted that the old permit [Permit No. 55223] allowed the Permittee to operate an electrowinning and leaching process. Does that grandfather in from the 2013 permit to the 2018 proposed permit?

Response: The renewal permit does not include a solvent extraction/electrowinning (SX/EW) process. If the Permittee decides to include this process within their operations, they will have to submit a permit revision application for ADEQ to process.

Comment 12: A commenter asked why are the contaminants sulfuric acid and sulfur dioxide and volatile organic compounds listed in the public notice if this permit is not applicable to leaching.

Response: Sulfuric acid should have been removed in the draft renewal permit and technical support document (TSD). The commenter is correct in that the solvent extraction/electrowinning (SX/EW) process was the only source of sulfuric acid emissions. The TSD notes a value of 0.00 for sulfuric acid emissions. The draft permit and TSD have emissions for sulfur dioxide because there are other sources within the facility with the potential to emit these pollutants such as the emergency generators and blasting operations. Similarly, volatile organic compounds, or VOCs, are also emitted through the use of the emergency generators and tanks.

## VII. EMISSIONS CALCULATIONS

Comment 13: A commenter noted that the difference in emission factors between high-moisture ore and low-moisture is almost a factor of 10. Rosemont used a high moisture content of 4% but the commenter could not validate this number based on the manual reference furnished by Rosemont. A senior representative from the National Forest Service noted that the deficiency of the moisture content could be taken care of by sprayers.

Response: The different emission factors the commenter noted are located in AP-42 Section 11.24 (Metallic Minerals Processing). Table 11.24-1 shows that for primary crushing of low moisture ore, the emission factor is 0.5 lb PM/ton material processed, while the emission factor for primary crushing of high moisture ore is 0.02 lb/ton material processed. However, the appropriate emission factor used by Rosemont for loading and material transfer (where 4% is utilized in the application) is calculated in Equation (1) of AP-42 Section 13.2.4 (Aggregate Handling and Storage Piles). Additionally, AP-42 indicates that 4% is the threshold between high moisture content and low moisture content. The text states, "Ore defined as high-moisture at the primary crusher is presumed to be high-moisture ore at any subsequent operation for which high-moisture factors are provided unless a drying



operation precedes the operation under consideration.” Rosemont is not implementing a drying operation preceding their primary crushers and pebble crushing operations. Furthermore, Rosemont provided a site-specific Geotechnical Study Report (Table G.1) published in 2007 which demonstrated a moisture content range of 3.4 to 9.7% for borehole samples, of which the average moisture content of samples exceeded 4 percent.

Comment 14: A commenter noted that absent a make, model, manufacturer, and performance parameters for cartridge filter, the manufacturer's guarantee of 99.99% control is invalid. As the commenter stated, Rosemont/ADEQ's reticence to disclose this information was deeply troubling since Rosemont has no problem to provide documentation for the Caterpillar 793F, Tier 4 haul truck in this renewal application supporting their NOx emission claim. Based on the commenter's calculations, the pollution control equipment will be exhausting contaminated air into the ambient atmosphere, hundreds of times in excess of the NAAQS maximum threshold values for PM<sub>10</sub> and PM<sub>2.5</sub>, and also massively above the reported ambient air PM<sub>10</sub> measurements recorded by Rosemont from 2006-2009. The commenter asks what ADEQ's 99.99% control mean regarding the manufacturer's guarantee for the proposed dust collectors and requests the manufacturer's data sheet with measured performance parameters per A.S.H.R.A.E Standard 52.2 2012, as well as a containment/hazardous waste disposal plan submittal.

Response: The control efficiency is the percentage of the pollutant that is removed by the dust collectors. To clarify, the emission inventory for the Rosemont Project conservatively uses a control efficiency of 99%, not 99.99%. The emissions guarantee is in Attachment A- ADEQ has significant experience in permitting the use of cartridge filter dust collectors in other mining operations. ADEQ has also overseen stack testing on these cartridge filters and it has been determined that the grain loading rates proposed in this application are consistent with historical test results on other comparable units.

The comment also compared the concentration of air pollutants in the exhaust gas to those in the ambient air (NAAQS and ambient air monitoring by Rosemont). This is not appropriate. The exhaust gas is discharged into the atmosphere through stacks and the concentrations of pollutants are rapidly diluted by dispersion as the plume is transported in the atmosphere. Ambient air represent portion of the atmosphere to which the general public has access. The exhaust gas or air directly adjacent to the stacks should not be treated as ambient air.

Comment 15: A commenter has a question regarding the capacity of the dust collectors for the facility. The commenter noted that the pollution control equipment calculations for hourly and annual air movement identified in cubic feet disagree by a factor of 16% in the Rosemont permit application. The commenter suggested that the discrepancy has the net effect of invalidating one or the other data set and invalidating the emission calculations.

Response: The daily output used for the calculations takes into account the conversion between cartridge ventilation rate at standard conditions and actual conditions using temperature and pressure. The daily output volume of 14,558,588 ft cubed is calculated from 10,110 dry standard cubic meters per minute (dscfm). The daily output on page 172 of the permit application is based on the physical parameters of the control device at maximum capacity.

Comment 16: A commenter expressed confusion over grain measurement and requests justification for change from ton per hour in Table 1 of Permit No. 55223 to grains per dry standard cubic foot in Draft Permit No. 67001.

Response: Table 1 of Permit No. 55223 identified process equipment and the corresponding PM<sub>10</sub> emission limit. The unit of measurement used in Table 1 of Permit No. 55223 was in pounds per hour. This unit of measurement is a mass flow rate. Table 1 of Permit No. 67001 identifies process equipment and the corresponding PM<sub>10</sub> emission limit. The unit of measurement used in Table 1 of Permit No. 67001 is in grains per dry standard cubic feet. This unit is a loading rate, commonly referred to as the grain loading (of a device). The conversion between pounds and grains is 7000 grains per pound, which demonstrates why the rates in Table 1 appear significantly lower than the original permit. The grain loading unit measurement is used for the process rates in Table 1 as a better way to validate the efficiency of the dust collectors during testing since the sampling volume of each run is in standard cubic feet (at least 60 dscf).

Comment 17: A commenter noted that Rosemont used an average wind speed of 6.1 mph for calculating wind erosion of the ROM Stockpile. However, AP-42 Section 13.2.5.2 indicates that estimated emissions should be related to “the gusts of highest magnitude.”

Response: Rosemont did not use AP-42 Section 13.2.5 for calculating the emissions due to wind erosion of the Run-of-mine (ROM) Stockpile. Instead, Rosemont estimated the wind erosion based on the MRI equation from the American Mining Congress Report, Fugitive Dust Emission Factors for the Mining Industry (FDEMI). According to FDEFM, Rosemont estimated the percentage of time that wind speeds exceed 12 mph based on hourly data collected at the Rosemont site from April 2006 through May 2009. The percentage parameter, in combination with other parameters such as silt content as listed in Table 13.2.4-1, was then used to obtain the emission factor of wind erosion for ROM Stockpile. This method has long been used in the mining industry and is determined to be acceptable by ADEQ.

## VIII. IN-STOCK RATIO

Comment 18: One commenter stated that the in-stack ratio for mobile sources used in the Rosemont modeling was unacceptable. The commenter stated that the literature review provided by Rosemont supported the use of a higher in-stack ratio, specifically Caterpillar (5-15%), the EPA’s study (10%) and another report (30%).

The commenter stated that the in-stack ratio of 2-6% reported in the literature review came from an unpublished, non-peer reviewed, unscientific white paper. Citing the disclaimers from Caterpillar, the commenter stated that an in-stack ratio of 1% obtained under the lab conditions should not be construed as the absolute value. The commenter stated that the use of an appropriate in-stack ratio would result in the NAAQS violation.

**Response:** As discussed in the TSD Draft, NO<sub>2</sub>/NO<sub>x</sub> in-stack ratio (ISR) for mobile sources must be representative of exhaust gases before leaving the tail pipe and before any mixing or oxidation by ambient air has occurred. To determine representative NO<sub>2</sub>/NO<sub>x</sub> ISR, the data must be sampled by either direct in-pipe measurement methods or by methods designed for mitigating oxidation from ambient ozone (such as measuring NO<sub>2</sub> and NO<sub>x</sub> inside of tunnels). The NO<sub>2</sub>/NO<sub>x</sub> ratio measured in open-air will overestimate the NO<sub>2</sub>/NO<sub>x</sub> ISR due to secondary reactions (reactions with ozone).

In a letter provided by Caterpillar dated on April 27, 2011, Caterpillar stated that engine-out NO<sub>2</sub>/NO<sub>x</sub> could range from 5% to 15%. However, Caterpillar further stated that, "Engines certified for non-road use in the United State do not require a measurement split of NO<sub>x</sub> emissions between NO and NO<sub>2</sub>. Therefore, Caterpillar does not have this type of emissions data recorded". Since Caterpillar did not measure the NO<sub>2</sub>/NO<sub>x</sub> ISR at that time, ADEQ was unable to review and validate the ratio of 5-15%. In the risk and exposure studies for Philadelphia and Atlanta, EPA used a NO<sub>2</sub>/NO<sub>x</sub> ISR of 10% for off-road vehicles. However, EPA stated that the ratio of 10% was conservative and the NO<sub>2</sub>/NO<sub>x</sub> ISR could be less than 10%. A NO<sub>2</sub>/NO<sub>x</sub> ratio of 30% was originally from a paper in which the air samples were taken from ambient air rather than in tailpipe. Therefore, the ratio of 30% reflected an ambient NO<sub>2</sub>/NO<sub>x</sub> ratio rather than an actual NO<sub>2</sub>/NO<sub>x</sub> ISR.

In a letter provided by Caterpillar dated on April 23, 2015, Caterpillar estimated an NO<sub>2</sub>/NO<sub>x</sub> ISR of 1% for the Tier 4 Final 793F machine model based on the measurements under lab conditions. Although the ratio of 1% may not reflect operating conditions as well as environmental conditions, it provides very useful information about the magnitude of the NO<sub>2</sub>/NO<sub>x</sub> ISR for the Tier 4 engines used in the Rosemont project. It should be addressed that Rosemont did not directly apply the ratio of 1% for modeling. Instead, Rosemont used a ratio of 5%, five times as high as the ratio obtained from the laboratory testing. ADEQ believes that a ratio of 5% provides a sufficient margin of safety for modeling purposes with considerations of field conditions.

The use of the ratio of 5% was also supported by the studies with direct in-pipe measurement methods or tunnel sampling methods as reported in the literature review. A study conducted by Society of Automotive Engineer reported a maximum ratio of NO<sub>2</sub>/NO<sub>x</sub> of 5.3% in tail-pipe diesel exhaust for a Caterpillar mining diesel engine. Moreover, a tunnel study reported ratios of NO<sub>2</sub>/NO<sub>x</sub> ranging from 2% to 6% which were measured near the center of tunnels. This tunnel study was published in Atmospheric Chemistry and Physics Discussions

(ACPD), which is ISSN-registered, permanently archived, and fully citable. The Google Scholar indicates that this paper has been cited by 32 times by researchers across the world. EPA also cited this paper in Risk and Exposure Assessment to Support the Review of the NO<sub>2</sub> Primary National Ambient Air Quality Standard.

Based on the processing data discussion, ADEQ concludes that a NO<sub>2</sub>/NO<sub>x</sub> ratio of 5% is reasonable and appropriate for modeling compliance with the 1-hour NO<sub>2</sub> NAAQS. As shown in the TSD, the ambient impact for 1-hour NO<sub>2</sub> (modeled concentration plus representative background concentration) was 153.8 µg/m<sup>3</sup>, below the NAAQS of 188.8 µg/m<sup>3</sup>. Therefore, emissions from the Rosemont project will not cause or contribute to a violation of the NAAQS for 1-hour NO<sub>2</sub>.

Comment 19: A commenter notes that engine manufacturer Caterpillar stated that NO/NO<sub>2</sub> data from air pollution control technology emissions are “relative magnitudes” and not absolute values. The commenter requests an explanation of the rationale for issuing a Class II renewal vs. a Class I permit.

Response: The commenter assumed that a discrepancy in the selection of NO<sub>2</sub>/NO<sub>x</sub> ratio would result in re-classification of the permit from Class II to Class I. This is inaccurate. The type of permit (Class I permit or Class II permit) is dependent on the amount of regulated air pollutants that the facility has the Potential-to-Emit (PTE) given its physical or operational design, and considering certain controls and limitations. Firstly, an in-stack NO<sub>2</sub>/NO<sub>x</sub> ratio, reflecting the relative percentage of NO<sub>2</sub> in NO<sub>x</sub> (including NO<sub>2</sub> and NO), does not affect the PTE estimation for NO<sub>x</sub>. Secondly, emissions associated with the in-stack ratio are considered fugitive emissions from mobile sources. The facility is not a categorical source, therefore fugitive emissions are not evaluated within the facility's PTE for permit classification determination. A Class II permit is the appropriate permit type given the facility type and emission estimation.

## **IX. PROCESS BOUNDARY**

Comment 20: A commenter stated that Rosemont didn't follow the rules or guidelines on the selection of the process area boundary. The commenter noted that there was a procedure to restrict the boundary to within a couple hundred yards of the process itself. The commenter stated that Rosemont expanded the process area and thus resulted in a less ambient impact than it would if Rosemont had held the process area boundary down to the original size.

Response: Permittees are required to demonstrate modeled compliance with Ambient Air Quality Standards (NAAQS) at receptors spaced along and outside the ambient air boundary. To be consistent with the EPA's ambient air boundary policy, ADEQ has incorporated the EPA's ambient air policy into ADEQ Modeling Guidance for modeling purposes. See [http://static.azdeq.gov/aqd/modeling\\_guidance.pdf](http://static.azdeq.gov/aqd/modeling_guidance.pdf) Section 3.4.

For modeling purposes, the ambient air is “the air everywhere outside of contiguous plant property to which public access is precluded by a fence or other effective physical barrier”. Ownership and/or control of the property and public access are the keys to ambient air boundary determination. The Permittee must demonstrate that they own and/or control the property and the proposed ambient air boundary can effectively preclude public access by using fences, or other physical barriers (including natural barriers), or a combination of fences and other physical barriers. Rosemont is required to build fences or use other physical barriers to effectively preclude the public access. Therefore, Rosemont used the fenceline as the ambient air boundary for modeling purposes, which was consistent with the federal and ADEQ guidelines.

According to the ADEQ modeling guideline, the process area policy only applies to the circumstances in which the facility does not have a fence or other physical barriers to preclude general public access. Again, Rosemont is required to build fences or use other physical barriers to effectively preclude the public access. Therefore, the process area policy does not apply for the Rosemont case.

## **X. PROTECTION OF NAAQS**

Comment 21: A commenter stated that PM<sub>10</sub> emissions [concentrations] in Tucson routinely reach 98 percent of National Ambient Air Quality standards, and background ozone is at 99 percent of Federal standards. The commenter added that Pima County will very likely become a non-attainment area for National Ambient Air Quality once Rosemont becomes operational.

Response: In accordance with state law, the applicant has two options to demonstrate that emissions from the new source or modification will not interfere with attainment or maintenance of the NAAQS: (i) The emissions from the source or minor modification will have an ambient impact below the significant levels (SILs); or (ii) The ambient concentrations resulting from the source or modification combined with representative background concentrations of pollutants will not interfere with attainment or maintenance of a NAAQS.

### (1) PM<sub>10</sub>

As discussed in the TSD, Rosemont conducted 3-year PM<sub>10</sub> monitoring in the vicinity of the project site from June 2006 to June 2009. Rosemont calculated the 24-hour PM<sub>10</sub> background concentration based on the average of the highest 24-hour concentrations recorded for each year, which was 47.7 µg/m<sup>3</sup>. This background concentrations was added to the modeled concentration resulting from the Rosemont emission sources (97.7 µg/m<sup>3</sup>), yielding the total concentration of 145.5 µg/m<sup>3</sup>, which was below the NAAQS of 150 µg/m<sup>3</sup>. Therefore, it is appropriate to conclude that the emissions from Rosemont will not interfere with attainment and maintenance of the NAAQS for PM<sub>10</sub>.

Since the emission sources from Rosemont are ground sources or near ground sources, the maximum modeled concentration for PM<sub>10</sub> occurred at the facility fence line and decreased significantly with increased distance from the facility. The ambient impact of PM<sub>10</sub> from Rosemont was expected to be insignificant at the Tucson area. ADEQ could not validate that “PM<sub>10</sub> concentrations in Tucson routinely reach 98 percent of National Ambient Air Quality standards”. ADEQ has reviewed the most recent three-years of PM<sub>10</sub> monitoring data in the Tucson area. As shown the table below, the average of the highest yearly values for most recent 3 years ranged from 49 µg/m<sup>3</sup> (32.7% of NAAQS ) to 87 µg/m<sup>3</sup> (58.0% of NAAQS).

Site ID	Address	First Max (ug/m3)				Percent of NAAQS
		2015	2016	2017	Average	
40190008	22000 S Houghton Rd, Corona De Tucson	59	45	43	49.0	32.7%
40190011	3401 W Orange Grove Rd, Tucson	70	86	105	87.0	58.0%
40191001	1601 S 6th Ave, South Tucson	62	80	83	75.0	50.0%
40191018	12101 N Camino De Oeste, Tucson	47	54	49	50.0	33.3%
40191026	6910 South Santa Clara Ave, Tucson	55	53	58	55.3	36.9%
40191030	601 North La Canada Drive, Green Valley	32	63	55	50.0	33.3%
40191113	2498 N. Geronimo, Tucson	57	99	95	83.7	55.8%

(2) Ozone

For the 8-hour ozone NAAQS, the EPA recommends a SIL value of 1.0 parts per billion (ppb), which is based on the 4th highest daily maximum 8-hour concentration, averaged over 3 years.

Per Appendix W Section 5.3.2 and Section 5.4.2, the EPA recommends a two-tiered demonstration approach for addressing single-source impacts on ozone. The first tier involves use of technically credible relationships between precursor emissions and a source’s impacts that may be published in the peer-reviewed literature; developed from modeling that was previously conducted for an area by a source, a governmental agency, or some other entity and that is deemed sufficient; or generated by a peer-reviewed reduced form model. As discussed in the TSD, Rosemont used the first-tier approach to demonstrate that the 8-hour ozone impacts due to the emissions from the Rosemont project would be below the SIL of 1.0 ppb. Therefore, it is appropriate to conclude that the emissions from Rosemont will not interfere with attainment and maintenance of the NAAQS for ozone.

**XI. AMBIENT AIR AND METEOROLOGICAL MONITORING**

Comment 22: One commenter expressed concern about the proximity of residence to the proposed facility and requests an additional air monitoring station to cover the northbound affected areas of Vail and Tucson. The commenter also suggested that ADEQ place

an air monitoring station on their personal property due to concerns of dry tailings stabilization.

**Response:** Based on the prevailing winds (from west to east) and the modeled results of PM<sub>10</sub>, the Permittee is required to install a PM<sub>10</sub> monitor and a meteorological monitor at the physical location as listed in the permit. The co-located monitors at the east side of the facility are expected to capture the worst-case conditions and therefore the potential highest ambient impacts of PM<sub>10</sub>. The monitors will comply with specific permit monitoring and reporting requirements. Since the PM<sub>10</sub> ambient impacts at the north bound of the facility or other personal properties are expected to be lower than those at the proposed monitor, ADEQ has no plans to add any additional monitors at this time.

**Comment 23:** One commenter stated that Rosemont moved their meteorological station from hills to another location and added 10 feet to the meteorological tower after all meteorological data were collected. The commenter asserted that the meteorological tower used for collecting the meteorological data during the permit application period must have been too short. The commenter expressed his upsets about changing the hardware of the meteorological tower.

**Response:** Rosemont initiated site-specific meteorological monitoring in April 2006. A 10-meter meteorological tower was installed at the center of the proposed open-pit. The height and siting of the meteorological tower met the requirements as specified in the EPA's Meteorological Monitoring Guidance for Regulatory Modeling Applications. Data collected from this meteorological tower during time period before the initial permit application was verified for quality assurance/quality control during the dispersion modeling review for permit no. 55223 and again when the permit application was submitted for renewal Permit No. 67001. Basically, the meteorological data used in the initial permit application still served as the basis for evaluating the ambient impacts for the renewal permit.

In the renewal Permit, Rosemont indicated that they moved the meteorological station to a new location in 2015 due to maintenance and security concerns. They also stated that the meteorological data collected from the new location did not meet auditing or data quality objectives for use in dispersion modeling. ADEQ is unable to validate if Rosemont added 10 feet to a meteorological tower. Since the meteorological data collected from the new location have never been used in the renewal permit, whether the hardware of the meteorological tower was changed or not was irrelevant to the processing of the renewal permit.

**Comment 24:** One commenter requested ADEQ provide a reason why the permit did not include a PM<sub>2.5</sub> monitor in addition to the PM<sub>10</sub> monitor required since an aerosol monitor is readily available and easily affordable. The commenter stated that EPA compliant equipment is available for long-term use and can simultaneously measure PM<sub>10</sub>, PM<sub>2.5</sub> and total fractions. The commenter stated that this equipment requires very little hands on attention and can be easily connected to a computer or data logger to assure that Rosemont is in compliance with ADEQ's monitoring

protocol. The commenter stated that the equipment will also firmly establish that the monitoring is being accomplished in a professional, scientific manner, while establishing a data base for future reference.

Response: The installation of the PM<sub>10</sub> monitor was selected due to the potential high ambient impact of PM<sub>10</sub> due to the emissions from Rosemont. The PM<sub>10</sub> monitor will also measure the efficacy of the Dust Control Plan and the Visual Observation Plan. Due to the nature of operations at a typical mine site, the significant impact of PM<sub>10</sub> is of greater concern than the impact of PM<sub>2.5</sub>. This applies to the Rosemont Project as well. As shown in the TSD Table 4, the modeled concentration plus a representative background for PM<sub>10</sub> was close to the NAAQS. Comparatively, the modeled concentration plus a representative background for PM<sub>2.5</sub> was slightly above 50% of the NAAQS. Therefore, ADEQ does not intend to include the installation of a PM<sub>2.5</sub> monitor at this time.

Comment 25: The commenter notes a need for third-party monitoring, whether it be using ADEQ's monitors themselves, and personnel, to provide the reliability of where [the public] doesn't have to worry about people being concerned about figures of production.

Response: ADEQ does not agree that third-party monitoring will be necessary for the site. The proposed PM<sub>10</sub> and ambient monitors have recordkeeping and reporting requirements that will validate continuous monitoring at the site. ADEQ has imposed a concentration threshold which, if exceeded, will be addressed appropriately, independent of operational obligations by Rosemont.

## **XII. DRY STACK TAILINGS MANAGEMENT**

Comment 26: A commenter had a question regarding height of dry stack tailings and referred to a 700 ft. limit from the previous permit. Another commented suggested that the height of the tailings changed from 700 to 850 feet.

Response: ADEQ is unclear of the basis of this question and the location of the tailings height reference. ADEQ assumes that the height of tailings the commenters are referring to come from an external source. The estimation of fugitive emissions from tailings is based on engineering-based estimates of wind erosion of the tailing stockpiles.

Comment 27: A commenter noted that Rosemont Copper [staff] have background in the Australian mines but those mines are iron ore; and the toxicity of the agents that [Australian mines] use is very minimal, whereas in the copper hard rock mining, it's an extremely different situation.

Response: The open-pit mining and ore processing for iron ore and copper ore share a similar operating process as well as similar emission sources. Additionally, the proposed Rosemont project does not include heap leaching and SX/EW operations so the chemical agents used are limited.



Comment 28: A commenter noted that this permit needs to be withdrawn until a more stringent and comprehensive tailings management plan is included in the draft and, again, for public review and comment.

Response: The Department conducted a rigorous review of the renewal permit application, including the Tailings Management Plan and determined that the plan was comprehensive.

### **XIII. FUGITIVE DUST**

Comment 29: A commenter expressed concern regarding fugitive emissions as a result of wind direction and intensity. The commenter noted that wind from the south is 40% of the time and 50% from the north, which may counter the observations from the weather station placed and operated by Rosemont. The commenter further stated that the complex topography causes wind to swirl in unpredictable directions. The commenter noted that the west-bound wind would cause 7-10 miles per hour (mph) winds from the south in the valley.

Response: ADEQ acknowledges that the project site is located in a complex terrain. Following the EPA's modeling guidance, ADEQ determined that the site-specific meteorological data Rosemont collected were representative of transport and dispersion conditions between the sources of concern and areas where maximum design concentrations are anticipated to occur (the perimeter fence line of the facility). The majority of the facility emission sources are located within 2 miles of the Rosemont's meteorological station and the entirety of the facility boundary is within 3.5 miles of the station. ADEQ also reviewed the meteorological data collected from the nearby Empire Remote Automatic Weather Station (RAWS). The wind rose plots from both the Rosemont station and the Empire station show that winds are predominantly from the west to the east.

It should be addressed that the AERMOD modeling analysis takes all collected wind direction/speed data into account. Since the Rosemont's meteorological dataset includes southern winds, the southern winds were considered in the modeling analysis.

Comment 30: A commenter is concerned that Method 9 monitoring will not prevent wind driven dust blowing southbound or northbound on a regular basis during daytime and nighttime operation. The commenter noted that self-reporting and method 9 EPA reporting and monitoring of exceedance of the dust are not enough to protect the health and welfare of the residents of the Hilton Ranch community. The commenter also expressed that it is impossible to stop the emissions in a timely matter even with impartial motivated observers as outlined in the permit.

Response: ADEQ disagrees with this comment. Per the Visual Observation Plan and Dust Control Plan, Rosemont has robust methodologies in place to effectively conduct visual observations at multiple viewpoints set at various frequencies as well as the implementation of multiple programs to achieve a 90% control efficiency of fugitive emissions.

Comment 31: A commenter states that the permit should be denied because 135 260-ton trucks would drive over dirt roads from the pit to the drop off points 24/7, 365 days per year, for over 20 years.

Response: The comment is noted. This statement is slightly incorrect. At the height of operations, from an air quality perspective, Rosemont will operate 34 260-ton haul trucks. The remaining vehicles will include dozers, graders, water trucks and support vehicles.

Comment 32: A commenter expressed concerns of high winds/high wind speeds resulting in undesirable ambient conditions for surrounding residents and affecting air quality. One commenter stated that the proposed dry tailings will be subjected to unusually high winds in the area during dry spring months and during the pre-monsoon winds of summer, releasing large quantities of dust and particulate matter into the outlying areas. The commenter also stated that averaged wind speeds throughout the year used in air quality modeling were at three miles per hour, which significantly understates higher wind velocities that frequent the Santa Rita Mountains. As the commenters stated, BLM and forest service stations observe wind speeds that routinely reach 50 miles per hour throughout the year.

Another commenter also made a similar statement that that Rosemont's highest recorded wind gust was 25 miles per hour and the number of days that winds exceeded 15mph were significantly lower than other weather stations in the area. As the commenter stated, the Empire RAWS site and TIA both recorded wind gusts in excess of 65 mph.

Response: The AERMOD modeling package used in this analysis evaluates air quality impacts in one hour average intervals. Based on hourly average meteorological data, AERMOD predicts the ambient air impacts for each hour and then calculates 24-hour average concentrations for PM<sub>10</sub>, which is compared against the NAAQS for 24-hour average PM<sub>10</sub>. Hourly average wind speeds used in the modeling ranged from calm to a maximum hourly average of 21 miles per hour. The average wind speed over the modeled years was 6.2 miles per hour (not 3 miles per hour as the commenter stated).

Caution should be taken when comparing hourly average wind speed to short-term wind gusts (the duration of a gust is usually less than 20 seconds). While the maximum wind gust can be as high as 50 mile per hour (mph) in this area, it is very unlikely that an hourly average wind speed can reach 50 mph. ADEQ has reviewed the most recent years of wind speed data (2015-2017) collected from Empire Station in Remote Automatic Weather Stations (RAWS) network operated by

National Interagency Fire Center (NIFC). The RAWS database reports both maximum wind gust and hourly average wind speed. ADEQ found that, during the three-year period, there were 7 hours having a maximum wind gust of 50 mph or above at Empire Station. The maximum hourly average wind speed and the average wind speed over the three-year period were 29 miles per hour and 6.1 miles per hours, respectively, which were comparable to the Rosemont site-specific wind speed data.

In summary, the primary time interval in AERMOD is one-hour, which is sufficient to address the NAAQS for 24-hour average PM<sub>10</sub>. AERMOD does not have a capability to model a very short-term time period (such as a few seconds). Potential wind gust episodes and associated wind-blown emissions from the facility are addressed through Dust Control Plan and Dry Tailings Management Plan in the air quality permit. ADEQ also requires Rosemont to install and operate a PM<sub>10</sub> monitor in the area, providing additional assurances that the project's operations are protective of NAAQS and public health.

Comment 33: A commenter represents one of 50 families living within 1-3 miles of proposed project. The commenter has grave concerns over air quality in the area. Westerly winds would gradually blanket the air and soil with the toxins from this mine. The commenter also noted that ADEQ has not considered the cumulative effects of the existing mines and the proposed Rosemont Project to the area residents.

Response: As discussed in TSD draft, the ambient air impact analysis demonstrated that the emissions from the proposed Rosemont project will not interfere with attainment and maintenance of the National Ambient Air Quality Standards (NAAQS). ADEQ also requires Rosemont to install and operate a PM<sub>10</sub> monitor in the area, providing additional assurances that the project's operations are protective of NAAQS and public health. The ambient air impact analysis considered the prevailing westerly winds and the modeling domain covered all potentially impacted residential properties. The ambient impact analysis considered both the existing air quality (represented by background concentrations) and the ambient impacts due to the emissions from the proposed project (output from a dispersion modeling). Background concentrations, relying on ambient monitoring data, take into account the ambient contributions from natural sources, other unidentified sources in the vicinity of the project, and regional transport contributions from more distant sources (such as existing mines).

Comment 34: A commenter notes that Rosemont proposes water and/or chemicals which will inadequately control the dust and particulates, with specific concern for the airborne particulates would include arsenic, chromium, nickel, and cadmium, which are carcinogenic. Others would include selenium, thallium, antimony, and lead. The commenter also included that many of the toxins in particulate matter are enhanced by ozone created on site by nitrogen oxide emissions from all the equipment on site.

Response: ADEQ disagrees that dust control suppression is inadequately addressed, whether through water sprays or chemical suppression. The airborne particulates mentioned in the comment were addressed in the emission calculation inventory and resulted in insignificant emissions. The resulting emissions are shown below.

<b>Pollutant</b>	<b>HAP Emissions (tpy)</b>
Lead	0.1274
Arsenic	0.0292
Chromium	0.1292
Nickel	0.0131
Antimony	0.0071
Cadmium	0.0017
Selenium	0.0249
Beryllium	0.0033
Manganese	1.8644
Total	2.2003

**XIV. PUBLIC ACCESS**

Comment 35: A commenter noted that Rosemont initially agreed with the forest service to allow access for the remaining national Forest and added that Rosemont (Hudbay) now has blocked access to Helvetia Road and most of the national Forest.

Response: The Department is not involved in restricting access to public roads. Any agreement made by Rosemont with the Forest Service is independent of the air permitting process.

Comment 36: A commenter noted that at least 90 days prior to beginning construction of the mine, the Permittee shall submit to the Director a Public Access Restriction Plan. Rosemont has been restricting public access over the past two years, has the Director already approved such a plan? Additionally, another commenter noted that the process area boundary should be defined prior to modeling being conducted for the project and Rosemont didn't send this information in the application.

Response: The agency has not approved a Public Access Restriction Plan yet. The plan, as written in Attachment "B", Section XI Public Access Restrictions, is required to be submitted 90 days prior to construction and precludes public access to the Rosemont Project site through the use of fencing, natural topographic barriers, signage, security patrols, and access restrictions to adjacent private property. ADEQ is assuming that the process area boundary referred to in the comment is the ambient air boundary for the facility. In its review of the plan, ADEQ will ensure that the public access restrictions will comport with the assumptions made to define "ambient air" to drive the air dispersion modeling process.

**XV. PUBLIC NOTICE EXTENSION**



Comment 37: A commenter requested a 60-day extension of the comment period because of the significant public health threat this proposed mine would cause to Pima County.

Response: The Department has determined that a 30-day comment period is adequate for this air renewal action.



**ATTACHMENT A**

## Cartridge Filter Media Emission Statement

Camfil Air Pollution Control offers a wide variety of filtration media to meet our customers air filtration requirements. The experience used to arrive at these values include in-house lab testing, third party testing, and in-field stack tests on a variety of dust types. Air filtration requirements vary by country, state, county, application or company standards. Guaranteed emission levels as discussed here are particles released after passing through a dust collection systems primary filter cartridge. Cartridge filters should be allowed to build a dust cake for 100 hours of normal operation before stack emission levels are measured.

Media Grades	Emission Level	
Standard media -Green, Carbon Impregnated, Flame Retardant	.005 gr/dscf	11.4 mg/m <sup>3</sup>
Extreme Media -Green, Carbon Impregnated, Flame Retardant	.001 gr/dscf	2.3 mg/m <sup>3</sup>
Spunbond Media -Standard, Aluminized, Oleophobic	.005 gr/dscf	11.4 mg/m <sup>3</sup>
Specialty Media -Flame retardant/PTFE	.00005 gr/dscf	.114 mg/m <sup>3</sup>
Spunbond Media -PTFE	.00005 gr/dscf	.114 mg/m <sup>3</sup>
Meltblown Media -High Efficiency	.001 gr/dscf	2.3 mg/m <sup>3</sup>

Factors affecting this standard statement above are particle size, loading levels, and pulse cleaning intervals.

To discuss media grade selection, establishing lower emission levels than stated above or adding secondary filtration please contact your Camfil representative.



Rick Kreczmer

Director of Aftermarket