Rosemont Copper Company

Application for a Class II Permit
Rosemont Copper Project
Southeastern Arizona

Submitted to:
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007

Submitted by:
Rosemont Copper Company
P.O. Box 35130
Tucson, Arizona 85740
Contact: 520.495.3502

Prepared by:
JBR Environmental Consultants, Inc.
1553 W. Elna Rae, Ste. 101
Tempe, Arizona 85281
Contact: 480.829.0457

November 15, 2011

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1. INTRODUCTION

Rosemont Copper Company (RCC), a wholly owned subsidiary of Augusta Resource Corporation, plans to construct and operate an open-pit mining, milling, leaching, and solvent extraction/electrowinning facility, known as the Rosemont Copper Project (RCP). The RCP is located approximately 30 miles southeast of Tucson, west of State Highway 83, within Pima County in southeastern Arizona.

The proven and probable mineral reserves of the RCP include an estimated 546 million tons of sulfide ore and an additional 70 million tons of oxide ore. The production schedule developed from mining sequence plans indicates a project operating life of over 20 years with peak mining rates of up to 376,000 tons per day (tpd) of total material (ore and waste). The proposed Rosemont mine is expected to produce annually 221 million pounds of copper, 4.7 million pounds of molybdenum, 2.4 million ounces of silver and approximately 15,000 ounces of gold as a by-product credit for the over 20 year life of the mine.

This document presents the information necessary for the Arizona Department of Environmental Quality (ADEQ) to process the RCP application and issue a Class II Air Quality Permit as required by Arizona Administrative Code (A.A.C.) R18-2-304.I.1. ADEQ jurisdiction is required by § 36-17(A)(1) of the Arizona State Implementation Plan (SIP) and Rule 112.B.1.a of the Pima County SIP. The information provided in this document includes all applicable information required by A.A.C. R18-2-304. A completeness checklist listing all information required by ADEQ and where it can be located in the application is presented in Table 1.1. A completed Standard Permit Application Form is provided in Appendix A of this application and includes a compliance certification, signed by the responsible official of the RCC.

Table 1.1 Arizona Department of Environmental Quality Air Quality Permit Application Completeness Checklist for Class II Sources

A.A.C. Regulation / Reference	Requirement	Meets Requirement			Section in Application	Table in Application
		Yes	No	N/A		
R18-2-304.E.1 and Filing 12	Has the standard permit application form been completed?	X			Appendix A	--
Application Form	Has the responsible official signed the standard permit application form?	X			Appendix A	--
R18-2-304.E.2 and Filing 8	Has an assessment of the applicability of the requirements of Article 4, Chapter 2, Title 18 of the A.A.C. been completed?	X			Section 4	Table 4.1
R18-2-304.E.3 and Filing 8	Has an assessment of the applicability of the requirements of Article 17, Chapter 2, Title 18 of the A.A.C. been completed?	X			Section 4	Table 4.1
R18-2-304.H	Has a certification of truth, accuracy, and completeness been included?	X			Appendix A	--
Filing 7a and Filing 19	Have the potential to emit calculations been provided and do they include potential emissions of all regulated air pollutants (including fugitives)?	X			Emission Inventory Information and Section 3	Tables H.20 - H.38 and Table 3.2
Filing 10	Have the operating schedules (hours/day, days/year, days/week) been included?	X			Section 5.4	--
Filing 11	Does the application include an equipment list with the type, name, make, model, serial or equipment number, and date of manufacturer?	X			Section 6 and Appendix A	Table 6.1
Filing 17	Has a statement of compliance with all applicable conditions signed by a responsible official been included?	X			Appendix A	--
Filing 7a and Filing 19	Have the calculations on which all information is based been included in the application?	X			Emission Inventory Information	--

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A.A.C. Regulation / Reference	Requirement	Meets Requirement			Section in Application	Table in Application
		Yes	No	N/A		
Filings 1 and 7b	Has a description of each process or emission unit been included?	X			Section 2	--
Filings 2 and 4	Has a product and raw material description been included?	X			Section 2.2 and Section 5.3	Table 5.3
Filing 3	Has a complete description of alternate operating scenarios been included?	X			Section 2.3	--
Filing 5	Has a flow diagram of all processes been provided?	X			Appendix B	--
Filing 6	Has a material balance been included?	X			Section 2.5	--
R18-2-304.E.8 and Filing 9	Have any proposed exemptions and insignificant activities been included? If so, has the applicant provided sufficient evidence?	X			Section 3.2 and Appendix C	--
Filing 10	Have calculations on the fuel type and calculations for the maximum usage (hourly and annual) been included?	X			Section 5.2	Table 5.2
Filing 10	Has the information and calculations on maximum raw material hourly and annual usage been included?	X			Section 5.3	Table 5.3
Filing 10	Have any limitations on operations and work practice standards affecting emissions been included?	X			Section 5.4	--

Table 1.1 Arizona Department of Environmental Quality Air Quality Permit Application Completeness Checklist for Class II Sources

A.A.C. Regulation / Reference	Requirement	Meets Requirement			Section in Application	Table in Application
		Yes	No	N/A		
Filing 13	Does the application include a site diagram which provides: property boundaries, adjacent streets/roads, a directional arrow, elevation, equipment layout, location of emission points, emission areas, and air pollution control equipment, and the closest distance between emissions and property boundaries?	X			Appendix D	--
Filing 14.a	Have the applicable test or monitoring methods for determining compliance been included?	X			Section 4 and Section 8.1	Table 4.1
Filing 14	Does the application include identification, location, and description of pollution controls, including data establishing their rated and operating efficiency?	X			Section 8.2	Table 8.1
Filing 16.a	Does the applicant state compliance with all of the applicable requirements identified in the application?	X			Section 9	--
Filing 16.b	If not, does the application include a compliance schedule that contains remedial measures, including an enforceable sequence of actions with milestones leading to compliance with the noncompliant requirements?			X	--	--

2. PROCESS AND PRODUCT DESCRIPTION

The RCP is primarily a copper mining project with appreciable amounts of molybdenum and silver by-products and lesser quantities of other by-products. The copper mineralization of the Rosemont deposit is primarily sulfide with a cap of oxide copper close to the surface. The sulfide and oxide ore will be mined through conventional open pit mining techniques. Concentrate ore (mostly comprised of sulfide ore) will be processed by crushing, grinding, and flotation to produce a copper concentrate product, which contains copper, silver, and possibly small amounts of gold, and a molybdenum concentrate product. Leach ore (mostly comprised of oxide ore) will be leached and the resulting leach solution processed through a solvent extraction and electrowinning facility to produce a copper cathode product for market.

2.1 PROCESS DESCRIPTION AND FLOW DIAGRAM

Major operations at the RCP include: (a) open-pit mining including drilling, blasting, loading, and hauling of ore and development rock; (b) primary crushing and stacking of crushed ore; (c) stockpile reclaim; (d) milling and flotation; (e) tailings dewatering and placement; (f) concentrate dewatering and preparation for shipment; (g) heap leaching; and (h) solvent extraction/electrowinning (SX/EW). An overall process flow diagram for these processes is presented in Figure B.1 of Appendix B. Descriptions of the major processes, related potential air pollutant emissions from the processes, and the methods that will be used to control emissions are discussed below. In addition, detailed process flow diagrams and a plan view map of the facility showing the process locations are presented in Appendix B and Appendix D, respectively.

Secondary processes that have the potential to emit regulated air pollutants include: (a) fuel burning equipment; (b) reagent systems; (c) storage tanks; (d) organic reagent use; (e) an analytical laboratory; (f) crud treatment and organic recovery; and (g) the use of mobile vehicles at the RCP. Several pieces of fuel burning equipment are integral parts of the major operations at the RCP and are therefore included in the description of the major processes below.

The processes at the RCP have the potential to produce air pollutant emissions including: total suspended particulate matter (TSP), particulate matter (PM), particulate matter less than 10 microns in aerodynamic diameter (PM_{10}), particulate matter less than 2.5 microns in aerodynamic diameter ($PM_{2.5}$), carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO_2), volatile organic compounds (VOCs), sulfuric acid (H_2SO_4), sulfate (SO_4), soot (elemental carbon), hazardous air pollutants (HAPs), and greenhouse gases (GHGs) including carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O).

2.1.1 Open-Pit Mining

Open pit mining will be conducted using large-scale equipment including rotary blasthole drills (diesel and electric powered), a hydraulic percussion track drill, electric mining shovels, front end loaders, off-highway haul trucks, crawler dozers, rubber-tired dozers, motor graders and off-highway water trucks.

Open pit mining is scheduled for 24 hours per day, 7 days per week, and 365 days per year. Peak mining rates are expected to reach 376,000 tpd of total material mined (ore and waste rock). Individual peak mining rates for concentrate and leach ore can reach up to 90,000 tpd and 57,000 tpd, respectively, depending on the ore deposits in the mine, but will not occur simultaneously.

Peak mining rates are presented in this application to allow maximum production flexibility, although it is not anticipated that all peak rates can be achieved simultaneously and rates will naturally decrease with time. Emissions from mining operations are dependent primarily upon the mining rate and haul truck travel, with haul truck travel (vehicles miles traveled) representing over 70% of total particulate related emissions. The highest annual mining rates occur during Year 1 while the highest annual haul truck travel occurs in Year 5. The Year 5 mining rates are 5.1% less than the Year 1 mining rates, but the haul truck travel in Year 5 is 24.7% greater than the haul truck travel in Year 1. Consequently, operations during Year 5 in the life of the mine will produce the highest annual emission rates. The emission information presented in this permit application is based on operations during Year 5.

2.1.2 Drilling and Blasting

Drilling and blasting are performed within the open pit mine. The bulk of production blasthole drilling will be performed by rotary blasthole drills. Ammonium nitrate and fuel oil (ANFO) blasting agents will be used for nearly all rock breakage in dry ground, comprising an estimated 80% to 90% of the total explosive use. Ammonium nitrate emulsions will be employed in wet conditions. Based on an anticipated maximum of 365 blasts per year in Year 1, maximum blasting agent use will average about 18,980 tons per year (tpy), or 0.65 tons of ANFO per hole drilled and 80 holes drilled per blast.

Both drilling and blasting have the potential to emit regulated air pollutants. Drilling has the potential to emit TSP, PM, PM_{10}, and $PM_{2.5}$ emissions while blasting has the additional potential to emit CO, NO_x, SO_2, and GHG emissions. Potential fugitive particulate emissions from drilling may be controlled by the addition of water and by shrouds on an as needed basis in order to inhibit the escape of particulate emissions from the top of the hole during the drilling process. However, when calculating worst case potential emissions from drilling and blasting, no emission controls are applied.

2.1.3 Loading and Hauling

Ore and waste rock are loaded into haul trucks by mobile shovels and hauled to their respective processing locations. Concentrate ore will be transported from the open pit and either dumped directly into the primary crusher dump hopper or unloaded to the run of mine stockpile located close to the primary crusher near the east pit rim. The concentrate ore will be crushed and stockpiled prior to being processed by the mill. Leach ore will be transported from the open pit to the leach pad. This material will not be crushed, but will be dumped in lifts atop a lined pad for subsequent leaching. Waste rock from the open pit will be transported to the waste rock storage areas located to the southeast, east, and northeast of the proposed open pit.

Loading concentrate ore, leach ore, and waste rock into the haul trucks from the open pit mine has the potential to emit TSP, PM, PM_{10}, and $PM_{2.5}$ emissions. Additionally, using the haul trucks to transport the ore and waste rock causes fugitive particulate emissions from the unpaved haul roads.

Fugitive particulate emissions from haul roads and unpaved regularly traveled primary access roads will be controlled by the application of water from water trucks on an as needed basis. Chemical dust suppressants can provide a greater control of fugitive particulate emissions from unpaved roads and may be used where conditions warrant. Potential emissions are calculated assuming the fugitive particulate emissions from hauling are controlled by water application.

2.1.4 Primary Crushing and Coarse Ore Stockpile

A run of mine stockpile, located near the primary crusher, will be used throughout the life of the mine to provide flexibility in handling short-term operating disruptions in the crushing and conveying system. It is estimated that during operations a worst case quantity of 10% of the mined concentrate ore will need to be stockpiled prior to primary crushing. The majority of the ore will be dumped directly into the primary crusher dump hopper. For the ore that is stockpiled, a front end loader will be used to transport and dump it into the crusher dump hopper. At start up, a significant amount of material is expected to be stockpiled prior to crushing due to the mine development schedule.

The crusher dump hopper will directly feed the primary gyratory crusher. Primary crushed ore will be withdrawn from the crusher discharge hopper by a crusher discharge feeder. The feeder will discharge to the stockpile feed conveyor belt that will in turn feed the stockpile tripper conveyor that discharges to the coarse ore stockpile. The stockpile tripper conveyor and coarse ore stockpile are enclosed within the stockpile building. A process flow diagram of the primary crushing and coarse ore stockpiling process is presented in Figure B.2 of Appendix B.

The run of mine stockpile, material transfer to the primary crusher, primary crushing, and material transfers from the primary crusher to the coarse ore stockpile have the potential to emit TSP, PM, PM_{10}, and $PM_{2.5}$ emissions. The crushing area scrubber and stockpile area scrubber will control the particulate matter emissions from the material transfer points between the primary crusher and the coarse ore stockpile. Since emissions from primary crushing are emitted through the exit of the crusher, the crushing area scrubber will also indirectly control primary crushing emissions at the material transfer point from the primary crusher. Water sprays will be used to control particulate matter emissions from the material transfer to the primary crusher at the dump hopper. Water sprays will also be used at the material transfer points to control fugitive emissions not captured by the scrubbers.

2.1.5 Stockpile Reclaim

Primary crushed ore will be stockpiled in a coarse ore stockpile enclosed in the stockpile building. The stockpile will sit directly on the ground and a reclaim tunnel will be installed beneath the stockpile. Ore will be withdrawn from the coarse ore stockpile by apron feeders installed in the reclaim tunnel. The feeders will discharge to two conveyor belts installed in series which will in turn discharge to the semi-autogenous (SAG) grinding mill. A process flow diagram of the stockpile reclaim and transfer to the SAG mill process is presented in Figure B.2 of Appendix B.

The material transfer points from the coarse ore stockpile to the reclaim feeders are located underground and will not produce emissions into the atmosphere. The material transfer points from the reclaim feeders to the SAG have the potential to emit TSP, PM, PM_{10}, and $PM_{2.5}$ emissions.

Particulate matter emissions due to the material transfers from the reclaim feeders to the SAG mill feed conveyor will be controlled by the reclaim tunnel scrubber, the pebble crusher area scrubber, and a water spray. The material transfer point to the SAG mill is controlled by the addition of process water.

2.1.6 Milling and Flotation

Ore will be ground in water to the final product size in a SAG mill primary grinding circuit and a ball mill secondary grinding circuit. The primary grinding SAG mill will operate in closed circuit with a trommel screen, pebble wash screen, and a pebble crusher. Trommel undersize will be the final product from the SAG mill grinding circuit. Trommel and pebble wash screen oversize (hard rock pebbles) will be transported by belt conveyors to the pebble crusher where it will be processed and returned by belt conveyors to the SAG mill.

Secondary grinding and flotation follows processing by the SAG mill to produce the copper and molybdenum mineral concentrate slurries, which are transported to the copper and molybdenum dewatering circuits, respectively. Process flow diagrams of the milling and flotation processes are presented in Figures B.3, B.4, B.5, B.6, and B.7 of Appendix B.

Except for the pebble crushing process, all material processed by the SAG mill primary grinding circuit, the secondary grinding circuit, and the flotation plant contains a sufficient amount of moisture such that no potential particulate emissions are formed. In the SAG mill, the added moisture causes fine particles in the crushed ore to agglomerate and the process water sprays at the screens wash away and control any other fine particles. Therefore, there will be no emissions due to milling, screening, or material transfer points prior to the SAG oversize surge bin.

Pebble conveyor No. 2, which discharges to the SAG oversize surge bin is a long conveyor, such that during the conveying process, the ore may start to dry out. Therefore, the material transfer points from pebble conveyor No. 2 to the pebble crusher feeder, the pebble crushing process, and the material transfer points after pebble crushing have the potential to emit TSP, PM, PM_{10}, and $PM_{2.5}$ emissions. These emissions will be controlled by the pebble crusher area scrubber. The material transfer point from the pebble crusher feeder to the pebble crusher is sealed and enclosed.

Following the SAG mill primary grinding circuit, the process material is in slurry form and will not produce any particulate matter emissions. Hydrogen sulfide formed from the sodium hydrosulfide solution used during molybdenum flotation will be controlled by the molybdenum cleaner area scrubber.

2.1.7 Copper Concentrate and Molybdenum Concentrate Dewatering and Preparation for Shipment

Copper concentrate slurry will be dewatered and thickened in a copper concentrate thickener. Thickener underflow (thickened mineral slurry) will be pumped to copper concentrate filters. Filter cake will discharge to the copper concentrate conveyor and then discharge to a copper concentrate stockpile located in the copper concentrate loadout building. Copper concentrate will be reclaimed by front-end loaders and placed in trucks for shipment to market. A process flow diagram of the copper concentrate dewatering process is presented in Figure B.8 of Appendix B.

The copper concentrate dewatering operation will produce a final product with an approximate moisture content of 10%. TSP, PM, PM_{10}, and $PM_{2.5}$ emissions have the potential to be released during material transfer points following processing by the filters where the moisture content is reduced. The copper concentrate stockpile is enclosed in a building to prevent the release of wind blown fugitives.

Molybdenum concentrate slurry stored in the molybdenum filter feed tank will be pumped to a molybdenum concentrate plate and frame filter. Molybdenum filter cake will then discharge to a dryer heated by the electric hot oil heater. The dried concentrate will be placed in a concentrate storage bin and then conveyed to the molybdenum packaging and weigh system where molybdenum concentrate is placed into supersacks or drums. The molybdenum concentrate supersacks or drums will be loaded onto trucks for shipment to market. A process flow diagram of the molybdenum concentrate dewatering process is presented in Figure B.9 of Appendix B.

The molybdenum concentrate dewatering operation will produce molybdenum concentrate with an approximate moisture content of 10% to 12%. Material transfer points subsequent to processing by the plate and frame filter have the potential to emit TSP, PM, PM_{10}, and $PM_{2.5}$ emissions. The dried molybdenum concentrate material transfers to the molybdenum concentrate bin and the supersacks or drums will be controlled by the molybdenum dust collector. Additionally, the molybdenum drying operation has the potential to produce TSP, PM, PM_{10}, and $PM_{2.5}$ emissions. These emissions will be controlled by the molybdenum scrubber and electrostatic precipitator designed to operate in series.

2.1.8 Tailings Dewatering and Placement

Tailings slurry will be dewatered and thickened in tailings thickeners. Thickener underflow (thickened tailings slurry) will be pumped to tailings plate and frame filters. The filtered tailings cake will be transferred to tailings belt feeders and three fixed tailings conveyors in series before being discharged to the tailings placement system.

The tailings placement system consists of movable and shiftable conveyors and a stacking conveyor system that will be used to deposit the filtered tailings behind large pre-formed containment buttresses constructed from waste rock in the two tailings storage areas. A dozer will be used to spread the filtered tailings in close proximity to the containment buttresses and as needed to provide sufficient compaction for the conveyors and stackers. Process flow diagrams of the tailings dewatering and placement processes are presented in Figures B.10 and B.11 of Appendix B.

The tailings dewatering operation will produce tailings cake with an approximate moisture content of 15% to 18%. Following processing by the tailings plate and frame filters, the filter cake placement process has limited potential to emit particulate emissions from the non-enclosed material transfer points and the tailings storage area. The design of the containment buttresses will break up air flow and reduce exposure of large areas of tailings to windy conditions. Additionally, the tailings will be stacked in such a way as to create an irregular shape to break up air flow patters so particulate matter from the tailings does not become entrained. There are two tailings conveying and placement systems. The primary system (System #1) has one more conveyor than alternate system (System #2). Therefore, emission calculations in this permit application assume all tailings are processed through System #1 as a worst-case emission estimate.

2.1.9 Heap Leaching

Leach ore will be transported from the open pit to the lined leach pad by mine haul trucks via a haul road running along the south and east edges of the pad area. The ore will be stacked on the lined leach pad area and irrigated with an acidified leach solution (raffinate). Crawler dozers will be used to spread the leach ore and cross rip the material to promote leach solution infiltration. Drip emitters located close to the ground will distribute the leach solution to the surface of the ore to minimize evaporation losses.

The leach solution will percolate through the leach pile and put copper ions into solution from the ore before being directed along the impermeable leach pad liner to the solution collection system above the pad liner. The copper-bearing leach solution, or PLS, will flow by gravity from the leach pad to a double-lined collection pond, or PLS pond. A process flow diagram of the heap leaching process is presented in Figure B.12 of Appendix B.

Mining of ore to be leached and placement on the leach pad will be concentrated in the early years of operation, peaking at 57,000 tpd. Unloading the ore onto the leach pads has the potential to emit fugitive TSP, PM, PM_{10}, and $PM_{2.5}$ emissions. Other heap leaching processes do not produce emissions of regulated air pollutants.

2.1.10 Solvent Extraction and Electrowinning (SX/EW)

Copper contained in the aqueous phase PLS will be extracted from the solution with reagents carried in an organic phase solution in the SX circuit. The resulting copper-depleted aqueous solution, or raffinate, will be transferred to a storage pond (raffinate pond) before being reused in the heap leaching process.

Copper transferred to the organic phase will be stripped by an acidic aqueous solution, or lean electrolyte, that will have traveled through the EW circuit. This transfer of copper enriches the electrolyte solution to produce a rich electrolyte. The rich electrolyte will be returned to the EW cells for copper plating onto stainless steel blanks. Prior to transferring to the EW process, the rich electrolyte produced from the PLS is heated using a diesel fired hot water generator and two electrolyte heat exchangers.

The copper plated stainless steel blanks will be harvested from the 30 EW cells. The copper will first be washed in water and then removed from the stainless steel by a cathode stripping machine. Copper plates will be weighed and bundled into 2 to 3 ton packages for shipment by truck to market. Process flow diagrams of the solvent extraction and electrowinning processes are presented in Figures B.12, B.13, and B.14 of Appendix B.

The organic phase solution that will be utilized in the SX process has the potential to emit VOCs and HAPs. The mixers, settlers, and various other tanks used in the SX process that may contain the organic solution will be covered to minimize the evaporative losses. The EW process has the potential to emit H_2SO_4 mist emissions and cobalt compounds entrained in the acid mist. The emissions will be controlled by the use of an acid mist suppressing agent and six electrowinning cell ventilation scrubbers with 99% control efficiencies.

2.1.11 Secondary Processes

The following secondary processes are necessary to support the major operations at the RCP and are capable of producing emissions: (a) fuel burning equipment; (b) reagent systems; (c) storage tanks; (d) organic reagent use; (e) an analytical laboratory; (f) crud treatment and organic recovery; (g) the use of mobile vehicles, and (h) open burning.

There are eight stationary fuel burning equipment that will be used at the RCP, a hot water generator used to heat the electrolyte prior to the EW process (see Section 2.1.10), five emergency generators used during commercial power outages, and two fire water pumps used in emergency situations. Additionally, the RCP uses multiple nonroad engines and on-road vehicles. The EW hot water generator burns diesel fuel and has a heat input rate of 6.0 MMBtu/hr. The emergency generators also use diesel fuel and have outlet capacities ranging from 50 to 1,000 kW. The fire water pumps are both diesel fired with outlet capacities of 400 hp. Regulated air pollutants emitted from the diesel fuel burning equipment include TSP, PM, PM_{10}, $PM_{2.5}$, CO, NO_x, SO_2, VOCs, HAPs, and GHGs. The nonroad engines and on-road vehicles are not regulated by ADEQ.

Reagent systems at the RCP include delivery of reagents to the facility, possible mixing and/or preparation of reagents, storage, and distribution to a process stream. Some of the reagents delivered to the facility are in solid form and will be mixed with water at the facility. Other reagents may be delivered in liquid form or may remain in solid form prior to use in a process. The material transfer points of the solid phase reagents have the potential to emit TSP, PM, PM_{10}, and $PM_{2.5}$ emissions. The liquid phase reagents stored in tanks prior to use may produce VOC and HAP emissions from breathing and working losses depending on the properties of the reagent. The lime and sodium metasilicate systems utilize passive bin vents (considered inherent to the process) to collect and prevent the loss of material during the filling of the storage vessels. The capture and recovery of material using the bin vents also results in the control of particulate matter emissions from the material transfer process. Hydrogen sulfide formed during the sodium hydrosulfide delivery process and storage will be controlled by the molybdenum cleaner area scrubber. Process flow diagrams of the reagent systems are presented in Figures B.16, B.17, and B.18 of Appendix B.

The RCP will include multiple storage tanks containing volatile organic liquids that are either greater than 10,000 gallons with a vapor pressure equal to or greater than gasoline, or greater than 40,000 gallons with a vapor pressure equal to or greater than diesel fuel. Emissions from such tanks will result in the form or breathing and working losses. The RCP will have four tanks that meet these criteria. All other tanks that do not meet these criteria are considered insignificant activities.

Organic reagents are used in various processes at the RCP. Frothers, promoters, flocculants, and xanthates for copper and molybdenum promotion and collection are added during the bulk flotation and molybdenum flotation processes. Antiscalants and flocculants are added to the dewatering processes. The types of reagents and the quantities used are frequently modified to address the changes in ore and processing conditions. All VOC emissions from organic reagent use in the flotation and dewatering processes are fugitives and are negligible due to the dilution of the organic reagents in large quantities of water and the comparatively low vapor pressures of the organics when compared to water.

The analytical laboratory will be a single story pre-engineered building and will consist of a sample preparation area, wet laboratory, metallurgical laboratory, environmental laboratory, reagent storage area, balance rooms, and a facility to collect and manage waste reagents from the laboratory. The sample preparation area will contain sample crushers, pulverizers, splitters, sieve shakers, blenders, and three dust collectors to capture and contain any particulate matter emissions generated from these operations. Fume hoods in the laboratories will be vented to a wet scrubber system where gaseous emissions will be controlled. After processing by the wet scrubber system, emissions are considered negligible. There are no other processes taking place in the analytical laboratory that will produce emissions.

The crud treatment and organic recovery process at the RCP recovers the diluent used in the solvent extraction process (see Figure B.15 of Appendix B). The tanks used for this process may contain organic material, although due to the nature of the process, any VOC or HAP emissions released are considered negligible. Other processes used for crud treatment and organic recovery do not produce regulated air pollutants.

The use of mobile vehicles is an integral part of operations at the RCP. The mobile vehicles include major mine equipment and mining support equipment. The mobile vehicles have the potential to produce particulate matter emissions from traveling on unpaved roads at the facility. The unpaved road emissions from the mobile vehicles are fugitive emissions and are controlled by road watering.

Open burning will periodically need to be performed at the RCP. The RCP will obtain the necessary open burn permits prior to any open burning activities, and proper open burning procedures and requirements will be followed.

2.1.12 Additional Information about Pollution Control Equipment

As described in the individual process description sections, the current design of the RCP includes the use of six wet scrubbers, one cyclone scrubber, one baghouse, and one electrostatic precipitator for controlling particulate matter emissions from the metallic mineral processing equipment. The RCP is investigating the possible replacement of one or more scrubbers with cartridge filter dust collectors or baghouses. Replacement of the scrubbers with dust collectors or baghouses will reduce emissions further because of their better control efficiency.

The information in this application is presented on the basis that the RCP will use scrubbers. The application also includes all applicable information pertaining to baghouses should any scrubber be replaced by a baghouse, except exhaust flow rates. Such information will be provided in a timely manner should there be a change from a scrubber to a cartridge filter or baghouse control device.

2.2 PRODUCT DESCRIPTION

The RCP will produce copper and molybdenum concentrate using a milling and flotation process, and metallic copper in the form of high purity copper cathode plates using a SX/EW process. Some byproducts, such as silver and gold, may be produced based on market conditions. The average annual production rates for these products are presented in Table 2.1. Annual production may be

greater or less than these values during an individual year, but over the life of the mine, it is anticipated that these average production rates will be achieved.

Table 2.1 Production Rate Over the Operating Life of the RCP

Product	Average Annual Production Rate
Copper Concentrate/Copper Cathodes	110,500 tons
Molybdenum Concentrate	2,350 tons
Silver	2.4 million ounces
Gold	15,000 ounces

2.3 ALTERNATE OPERATING SCENARIO AND PRODUCTS

There are no alternate operating scenarios or products proposed. Minor changes in process unit configuration and to process chemicals in order to respond to the evolving ore characteristics are a routine part of the mining process and not subject to alternate operating scenario treatment. These types of changes are encompassed within the estimated emission calculations presented in this application. Changes to the RCP requiring notification or revisions will be properly addressed through the permitting process.

2.4 PROCESS FLOW DIAGRAMS

Process flow diagrams are presented in Appendix B.

2.5 MATERIAL BALANCE

Material balance methods were used to calculate sulfur dioxide (SO_2) emissions from the combustion of diesel fuel by the emergency generators and fire water pumps. This method assumes that all of the sulfur contained in the fuel is converted to SO_2 and released to the atmosphere during combustion. Emission calculations are presented in Section 3.

3. EMISSIONS RELATED INFORMATION

3.1 IDENTIFICATION AND DESCRIPTION OF EMISSION UNITS

A list of the emission units associated with the RCP is presented in Table 3.1. The emission units are classified by a general process description and include the emission species, type of control device, if any, and a non-fugitive or fugitive emission designation. The emission units listed in Table 3.1 do not include processes that do not have the potential to emit any regulated air pollutants, insignificant units and activities, or trivial units or activities.

3.2 INSIGNIFICANT AND TRIVIAL ACTIVITIES

The equipment and activities listed in A.A.C. R18-2-101(57) and P.C.C. Section 17.04.340.A.114, Insignificant Activities, and A.A.C. R18-2-101(119), and P.C.C. Section 17.04.340.A.237, Trivial Activities, are considered to be applicable to the RCP. Consequently, emissions were not calculated for these activities or equipment. A list of insignificant and trivial activities is presented in Appendix C, including the specific insignificant and trivial activities that apply to the RCP.

3.3 CALCULATION OF EMISSIONS

The emission units presented in Table 3.1 will emit TSP, PM, PM_{10}, $PM_{2.5}$, SO_2, CO, NO_x, VOCs, H_2SO_4, HAPs, and GHGs. Emissions from most of the emission units listed in Table 3.1 will depend upon the production rate. In order to ensure that this application is based upon the maximum potential emissions, the inventory is based upon design capacities (for process equipment) or "worst case" process rates (for mining processes) that result in maximum emissions. As discussed in Section 2.1.1, the "worst case" process rates occur in Year 5 of the life of the mine, as annual emissions are expected to be the greatest in this year.

The emission factors that were used to calculate emissions from the units listed in Table 3.1 are presented and described in the Emission Inventory Information, Volume I. Emission factors are primarily from the Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition (AP-42) and voluntarily accepted emission limits (see Table 4.1). Maximum hourly (lb/hr), maximum daily (tpd), and annual (tpy) emissions for Year 5 of the RCP are presented in the Emission Inventory Information, Volumes II.

A summary of the total annual emissions of regulated air pollutants for the RCP in Year 5 is presented in Table 3.2. The PTE of the facility corresponds to the non-fugitive emissions presented in Table 3.2. Because the RCP is not among the "categorical sources" listed in A.A.C. R18-2-101.64.c, nor among the stationary source categories regulated pursuant to Section 111 or 112 of the Act, fugitive emissions are not included in the facility PTE.

Table 3.1 Identification and Description of Emission Units

Emission Unit ID [a]	Description of Emission Unit / Process	Emission Species	Control Device / ID	Non-Fugitive or Fugitive Emissions [b]
Mining				
MN01	Drilling	TSP, PM, PM_{10}, $PM_{2.5}$	--	Fugitive
MN02	Blasting including ANFO Detonation	TSP, PM, PM_{10}, $PM_{2.5}$, CO, NO_x, SO_2, GHGs	--	Fugitive
MN03-MN05	Loading Ore and Waste Rock	TSP, PM, PM_{10}, $PM_{2.5}$	--	Fugitive
MN06-MN08	Haul Road Emissions from Hauling Ore and Waste Rock	TSP, PM, PM_{10}, $PM_{2.5}$	Road Watering	Fugitive
MN09	Unloading Concentrate Ore to Run of Mine Stockpile	TSP, PM, PM_{10}, $PM_{2.5}$	--	Fugitive
MN10	Unloading Leach Ore to Leach Pad	TSP, PM, PM_{10}, $PM_{2.5}$	--	Fugitive
MN11	Unloading Waste Rock to Waste Rock Storage Area	TSP, PM, PM_{10}, $PM_{2.5}$	--	Fugitive
MN12	Bulldozer Use	TSP, PM, PM_{10}, $PM_{2.5}$	--	Fugitive
MN13	Water Truck Use	TSP, PM, PM_{10}, $PM_{2.5}$	Road Watering	Fugitive
MN14	Grader Use	TSP, PM, PM_{10}, $PM_{2.5}$	--	Fugitive
MN15	Support Vehicle Use	TSP, PM, PM_{10}, $PM_{2.5}$	Road Watering	Fugitive

Table 3.1 Identification and Description of Emission Units

Emission Unit ID [a]	Description of Emission Unit / Process	Emission Species	Control Device / ID	Non-Fugitive or Fugitive Emissions [b]
Primary Crushing, Conveying, Coarse Ore Storage, and Reclaim Conveying				
PC01	Wind Erosion of the Run of Mine Stockpile	TSP, PM, PM_{10}, $PM_{2.5}$	--	Fugitive
PC02	Unloading to Primary Crusher Dump Hopper (H-CDp) from Haul Trucks or Run of Mine Stockpile	TSP, PM, PM_{10}, $PM_{2.5}$	Water Sprays	Fugitive
PC03	Primary Crusher (PCr)	TSP, PM, PM_{10}, $PM_{2.5}$	Crushing Area Scrubber / PCL01	Non-Fugitive
PC04	Primary Crusher (PCr) to Crusher Discharge Hopper (H-CDs)	TSP, PM, PM_{10}, $PM_{2.5}$	Enclosed	Non-Fugitive
PC05	Crusher Discharge Hopper (H-CDs) to Crusher Discharge Feeder (F-CD)	TSP, PM, PM_{10}, $PM_{2.5}$	Crushing Area Scrubber / PCL01 [c]	Non-Fugitive
PC06	Crusher Discharge Feeder (F-CD) to Stockpile Feed Conveyor (CV-SF)	TSP, PM, PM_{10}, $PM_{2.5}$	Crushing Area Scrubber / PCL01 [c]	Non-Fugitive
PC07	Stockpile Feed Conveyor (CV-SF) to Stockpile Tripper Conveyor (CV-ST)	TSP, PM, PM_{10}, $PM_{2.5}$	Stockpile Area Scrubber / PCL02 [c,d]	Non-Fugitive
PC08	Stockpile Tripper Conveyor (CV-ST) to Covered Coarse Ore Stockpile	TSP, PM, PM_{10}, $PM_{2.5}$	Stockpile Area Scrubber / PCL02 [d]	Fugitive
PC09	Wind Erosion of the Coarse Ore Stockpile	TSP, PM, PM_{10}, $PM_{2.5}$	Enclosed	Fugitive
PC10	Coarse Ore Stockpile to Reclaim Feeders (F-R1/R4)	TSP, PM, PM_{10}, $PM_{2.5}$	Underground	Non-Fugitive
PC11	Reclaim Feeders (F-R1/R4) to Reclaim Conveyor (CV-R)	TSP, PM, PM_{10}, $PM_{2.5}$	Reclaim Tunnel Scrubber / PCL03	Non-Fugitive
PC12	Reclaim Conveyor (CV-R) to SAG Mill Feed Conveyor (CV-SMF)	TSP, PM, PM_{10}, $PM_{2.5}$	Pebble Crusher Area Scrubber / PCL04 [c]	Non-Fugitive

Table 3.1 Identification and Description of Emission Units

Emission Unit ID [a]	Description of Emission Unit / Process	Emission Species	Control Device / ID	Non-Fugitive or Fugitive Emissions [b]
PC13	Pebble Conveyor No. 3 (CV-Pb3) to SAG Mill Feed Conveyor (CV-SMF)	TSP, PM, PM_{10}, $PM_{2.5}$	Pebble Crusher Area Scrubber / PCL04	Non-Fugitive
PC14	SAG Mill Feed Conveyor (CV-SMF) to SAG Mill (M-SAG)	TSP, PM, PM_{10}, $PM_{2.5}$	Addition of Process Water	Non-Fugitive
Grinding Mill and Flotation				
M01	SAG Mill (M-SAG)	TSP, PM, PM_{10}, $PM_{2.5}$	Wet Process	Non-Fugitive
M02	SAG Mill (M-SAG) to Trommel Screen (Sn-T)	TSP, PM, PM_{10}, $PM_{2.5}$	Enclosed	Non-Fugitive
M03	Trommel Screen (Sn-T)	TSP, PM, PM_{10}, $PM_{2.5}$	Wet Process	Non-Fugitive
M04	Trommel Screen (Sn-T) to Pebble Conveyor No. 1 (CV-Pb1)	TSP, PM, PM_{10}, $PM_{2.5}$	Clean, Wet Ore	Non-Fugitive
M05	Pebble Conveyor No. 1 (CV-Pb1) to Pebble Wash Screen (Sn-PbW)	TSP, PM, PM_{10}, $PM_{2.5}$	Clean, Wet Ore	Non-Fugitive
M06	Pebble Wash Screen (Sn-PbW)	TSP, PM, PM_{10}, $PM_{2.5}$	Wet Process	Non-Fugitive
M07	Pebble Wash Screen (Sn-PbW) to Pebble Conveyor No. 2	TSP, PM, PM_{10}, $PM_{2.5}$	Clean, Wet Ore	Non-Fugitive
M08	Pebble Conveyor No. 2 (CV-Pb2) to SAG Oversize Surge Bin (B-SAGOS)	TSP, PM, PM_{10}, $PM_{2.5}$	Pebble Crusher Area Scrubber / PCL04	Non-Fugitive
M09	SAG Oversize Surge Bin (B-SAGOS) to Pebble Crusher Feeder (F-PbC)	TSP, PM, PM_{10}, $PM_{2.5}$	Pebble Crusher Area Scrubber / PCL04	Non-Fugitive
M10	Pebble Crusher Feeder (F-PbC) to Pebble Crusher (PbC)	TSP, PM, PM_{10}, $PM_{2.5}$	Enclosed	Non-Fugitive

Table 3.1 Identification and Description of Emission Units

Emission Unit ID [a]	Description of Emission Unit / Process	Emission Species	Control Device / ID	Non-Fugitive or Fugitive Emissions [b]
M11	Pebble Crusher (PbC)	TSP, PM, PM_{10}, $PM_{2.5}$	Pebble Crusher Area Scrubber / PCL04	Non-Fugitive
M12	Pebble Crusher (PbC) to Pebble Conveyor No. 3 (CV-Pb3)	TSP, PM, PM_{10}, $PM_{2.5}$	Pebble Crusher Area Scrubber / PCL04	Non-Fugitive
Copper Concentrate Dewatering and Stacking				
CCD01	Copper Concentrate Filters (Ft-CC1/CC4) to Copper Concentrate Conveyor (CV-CC)	TSP, PM, PM_{10}, $PM_{2.5}$	Enclosed	Non-Fugitive
CCD02	Copper Concentrate Conveyor (CV-CC) to Copper Concentrate Loadout Stockpile	TSP, PM, PM_{10}, $PM_{2.5}$	Copper Concentrate Scrubbers / PCL05-06	Fugitive
CCD03	Wind Erosion of Copper Concentrate Loadout Stockpile	TSP, PM, PM_{10}, $PM_{2.5}$	Enclosed	Fugitive
CCD04	Copper Concentrate Loadout Stockpile to Shipment Truck via Front End Loaders	TSP, PM, PM_{10}, $PM_{2.5}$	Copper Concentrate Scrubbers / PCL05-06	Fugitive
Molybdenum Dewatering and Packaging				
MD01	Molybdenum Concentrate Filter (Ft-MC) to Molybdenum Concentrate Dryer (D-MC)	TSP, PM, PM_{10}, $PM_{2.5}$	Enclosed	Non-Fugitive
MD02	Molybdenum Concentrate Dryer	TSP, PM, PM_{10}, $PM_{2.5}$	Molybdenum Scrubber and Electrostatic Precipitator / PCL07	Non-Fugitive
MD03	Molybdenum Concentrate Dryer (D-MC) to Molybdenum Concentrate Bin (B-MC)	TSP, PM, PM_{10}, $PM_{2.5}$	Molybdenum Dust Collector / PCL08	Non-Fugitive
MD04	Molybdenum Concentrate Bin (B-MC) to Molybdenum Concentrate Hopper (H-MC)	TSP, PM, PM_{10}, $PM_{2.5}$	--	Non-Fugitive

Table 3.1 Identification and Description of Emission Units

Emission Unit ID [a]	Description of Emission Unit / Process	Emission Species	Control Device / ID	Non-Fugitive or Fugitive Emissions [b]
MD05	Molybdenum Concentrate Hopper (H-MC) to Molybdenum Concentrate Conveyor (CV-MC)	TSP, PM, PM_{10}, $PM_{2.5}$	Enclosed	Non-Fugitive
MD06	Molybdenum Concentrate Conveyor (CV-MC) to Molybdenum Packaging and Weigh System (MPS)	TSP, PM, PM_{10}, $PM_{2.5}$	Molybdenum Dust Collector / PCL08	Non-Fugitive
Tailings Dewatering and Placement				
TDS01	Tailings Filters (Ft-T1/T14) to Tailings Belt Feeders (F-T1/T14)	TSP, PM, PM_{10}, $PM_{2.5}$	Enclosed	Non-Fugitive
TDS02	Tailings Belt Feeders (F-T1/T14) to Fixed Tailings Conveyor No. 1 (CV-F1)	TSP, PM, PM_{10}, $PM_{2.5}$	Enclosed	Non-Fugitive
TDS03	Fixed Tailings Conveyor No. 1 (CV-F1) to Fixed Tailings Conveyor No. 2 (CV-F2)	TSP, PM, PM_{10}, $PM_{2.5}$	Enclosed	Non-Fugitive
TDS04	Fixed Tailings Conveyor No. 2 (CV-F2) to Fixed Tailings Conveyor No. 3 (CV-F3)	TSP, PM, PM_{10}, $PM_{2.5}$	--	Non-Fugitive
TDS05	Fixed Tailings Conveyor No. 3 (CV-F3) to Relocatable Conveyor (CV-R1)	TSP, PM, PM_{10}, $PM_{2.5}$	--	Fugitive
TDS06	Relocatable Conveyor (CV-R1) to Shiftable Conveyor (CV-S1)	TSP, PM, PM_{10}, $PM_{2.5}$	--	Fugitive
TDS07	Shiftable Conveyor (CV-S1) to Belt Wagon Conveyor (CV-BW1)	TSP, PM, PM_{10}, $PM_{2.5}$	--	Fugitive
TDS08	Belt Wagon Conveyor (CV-BW1) to Spreader Crawler Mounted Conveyor (CV-SP1)	TSP, PM, PM_{10}, $PM_{2.5}$	--	Fugitive
TDS09	Spreader Crawler Mounted Conveyor (CV-SP1) to Tailings Storage	TSP, PM, PM_{10}, $PM_{2.5}$	--	Fugitive
TDS10	Wind Erosion of Tailings Storage	TSP, PM, PM_{10}, $PM_{2.5}$	--	Fugitive

Table 3.1 Identification and Description of Emission Units

Emission Unit ID [a]	Description of Emission Unit / Process	Emission Species	Control Device / ID	Non-Fugitive or Fugitive Emissions [b]
Solvent Extraction and Electrowinning				
SXE01	Solvent Extraction	VOCs, HAPs	--	Fugitive
SXE02	Electrowinning Commercial Cells (EWCC)	H_2SO_4, HAPs	Cell Ventilation Scrubbers	Non-Fugitive
Fuel Burning Equipment				
FB01	Diesel Electrowinning Hot Water Generator (HWG)	TSP, PM, PM_{10}, $PM_{2.5}$, CO, NO_x, SO_2, VOCs, HAPs, GHGs	--	Non-Fugitive
FB02	Thickener Area Emergency Generator (TEG)	TSP, PM, PM_{10}, $PM_{2.5}$, CO, NO_x, SO_2, VOCs, HAPs, GHGs	--	Non-Fugitive
FB03	PLS Pond Area Emergency Generator (PEG)	TSP, PM, PM_{10}, $PM_{2.5}$, CO, NO_x, SO_2, VOCs, HAPs, GHGs	--	Non-Fugitive
FB04	Main Substation Emergency Generator (MEG)	TSP, PM, PM_{10}, $PM_{2.5}$, CO, NO_x, SO_2, VOCs, HAPs, GHGs	--	Non-Fugitive
FB05	Administration Building Emergency Generator (AEG)	TSP, PM, PM_{10}, $PM_{2.5}$, CO, NO_x, SO_2, VOCs, HAPs, GHGs	--	Non-Fugitive
FB06	Electrowinning Building Emergency Generator (EWEG)	TSP, PM, PM_{10}, $PM_{2.5}$, CO, NO_x, SO_2, VOCs, HAPs, GHGs	--	Non-Fugitive

Table 3.1 Identification and Description of Emission Units

Emission Unit ID [a]	Description of Emission Unit / Process	Emission Species	Control Device / ID	Non-Fugitive or Fugitive Emissions [b]
FB07	Primary Crusher Fire Water Pump (PCFWP)	TSP, PM, PM_{10}, $PM_{2.5}$, CO, NO_x, SO_2, VOCs, HAPs, GHGs	--	Non-Fugitive
FB08	SX/EW Fire Water Pump (SXFWP)	TSP, PM, PM_{10}, $PM_{2.5}$, CO, NO_x, SO_2, VOCs, HAPs, GHGs	--	Non-Fugitive
Miscellaneous Sources				
MS01	Transfer of Bulk Pebble Lime to the Bulk Pebble Lime Silo (S-BPL)	TSP, PM, PM_{10}, $PM_{2.5}$	Bulk Pebble Lime Silo Bin Vent	Non-Fugitive
MS02	Bulk Pebble Lime Silo (S-BPL) to Bulk Pebble Lime Silo Screw Conveyor (CV-BPLS)	TSP, PM, PM_{10}, $PM_{2.5}$	Enclosed	Non-Fugitive
MS03	Bulk Pebble Lime Silo Screw Conveyor (CV-BPLS) to SAG Mill Feed Conveyor (CV-SMF)	TSP, PM, PM_{10}, $PM_{2.5}$	--	Non-Fugitive
MS04	Transfer of Lime to the Lime Storage Bin (B-L)	TSP, PM, PM_{10}, $PM_{2.5}$	Lime Storage Bin Vent	Non-Fugitive
MS05	Transfer of Sodium Metasilicate to the Sodium Metasilicate Storage Bin (B-SM)	TSP, PM, PM_{10}, $PM_{2.5}$	Sodium Metasilicate Storage Bin Vent	Non-Fugitive
MS06	Transfer of Flocculant from Supersacks to Flocculant Storage Bins (B-F1/F2)	TSP, PM, PM_{10}, $PM_{2.5}$	--	Non-Fugitive
MS07	Transfer of Guar from Bags to Guar Feeder (F-Gu)	TSP, PM, PM_{10}, $PM_{2.5}$	--	Non-Fugitive
MS08	Transfer of Granular Cobalt Sulfate from Bags to Cobalt Sulfate Feeder (F-CoS)	TSP, PM, PM_{10}, $PM_{2.5}$	--	Non-Fugitive

Table 3.1 Identification and Description of Emission Units

Emission Unit ID [a]	Description of Emission Unit / Process	Emission Species	Control Device / ID	Non-Fugitive or Fugitive Emissions [b]
Tanks				
T01	C7 Distribution Tank (T-C7D)	VOCs	--	Non-Fugitive
T02	MIBC Storage Tank (T-MIBCS)	VOCs	--	Non-Fugitive
T03	Diesel Fuel Storage Tank - Heavy Vehicles 1 (T-DFS-HV1)	VOCs, HAPs	--	Non-Fugitive
T04	Diesel Fuel Storage Tank - Heavy Vehicles 2 (T-DFS-HV2)	VOCs, HAPs	--	Non-Fugitive
Particulate Matter Pollution Control Equipment with Limits				
PCL01	Crushing Area Scrubber (PC-CAS)	TSP, PM, PM_{10}, $PM_{2.5}$	--	Non-Fugitive
PCL02	Stockpile Area Scrubber (PC-SAS)	TSP, PM, PM_{10}, $PM_{2.5}$	--	Non-Fugitive
PCL03	Reclaim Tunnel Scrubber (PC-RTS)	TSP, PM, PM_{10}, $PM_{2.5}$	--	Non-Fugitive
PCL04	Pebble Crusher Area Scrubber (PC-PCAS)	TSP, PM, PM_{10}, $PM_{2.5}$	--	Non-Fugitive
PCL05	Copper Concentrate Scrubber 1 (PC-CCS1)	TSP, PM, PM_{10}, $PM_{2.5}$	--	Non-Fugitive
PCL06	Copper Concentrate Scrubber 2 (PC-CCS2)	TSP, PM, PM_{10}, $PM_{2.5}$	--	Non-Fugitive
PCL07	Molybdenum Scrubber (PC-MS) / Electrostatic Precipitator (PC-EP)	TSP, PM, PM_{10}, $PM_{2.5}$	--	Non-Fugitive

Table 3.1 Identification and Description of Emission Units

Emission Unit ID [a]	Description of Emission Unit / Process	Emission Species	Control Device / ID	Non-Fugitive or Fugitive Emissions [b]
PCL08	Molybdenum Dust Collector (PC-MDC)	TSP, PM, PM_{10}, $PM_{2.5}$	--	Non-Fugitive
PCL09	Laboratory Dust Collector 1 (PC-L1)	TSP, PM, PM_{10}, $PM_{2.5}$	--	Non-Fugitive
PCL10	Laboratory Dust Collector 2 (PC-L2)	TSP, PM, PM_{10}, $PM_{2.5}$	--	Non-Fugitive
PCL11	Laboratory Dust Collector 3 (PC-L3)	TSP, PM, PM_{10}, $PM_{2.5}$	--	Non-Fugitive

[a] If the emission unit is controlled, the control device is listed. If the control device has an emission limit, it is listed as a separate emission unit.

[b] Fugitive emission units for non-HAP species do not contribute to the facility-wide potential to emit.

[c] These emission units have water spray control for fugitive particulate emissions not captured by the scrubbers. Emission calculations in this permit application are based on 100% capture efficiency of the scrubbers.

[d] These emission units are located within the coarse ore stockpile building in addition to being controlled by the scrubbers. Emission calculations in this permit application are based on 100% capture efficiency of the scrubbers.

Table 3.2 Maximum Annual Controlled Emission Summary for the RCP[a]

Emission Type	Category	Annual Emissions (tons)
PM/TSP	Non-Fugitive	72.44
	Fugitive	3,297.90
	Total	3,370.34
PM_{10}	Non-Fugitive	66.81
	Fugitive	894.91
	Total	961.72
$PM_{2.5}$	Non-Fugitive	53.68
	Fugitive	98.84
	Total	152.52
CO	Non-Fugitive	9.00
	Fugitive	606.22
	Total	615.22
NO_x	Non-Fugitive	16.76
	Fugitive	153.82
	Total	170.58
SO_2	Non-Fugitive	0.06
	Fugitive	18.10
	Total	18.15
VOCs	Non-Fugitive	1.51
	Fugitive	3.77
	Total	5.28
H_2SO_4	Non-Fugitive	0.02
	Fugitive	0.00
	Total	0.02
CO_2	Non-Fugitive	6,040.20
	Fugitive	5,125.23
	Total	11,165.44

Table 3.2 Maximum Annual Controlled Emission Summary for the RCP[a]

Emission Type	Category	Annual Emissions (tons)
CH_4	Non-Fugitive	0.25
	Fugitive	0.21
	Total	0.45
N_2O	Non-Fugitive	0.05
	Fugitive	0.04
	Total	0.09
HAPs	Non-Fugitive	0.05
	Fugitive	3.32
	Total	3.37

[a] Emission totals shown are from Year 5 and do not include tailpipe emissions.

4. APPLICABLE REQUIREMENTS AND PROPOSED EXEMPTIONS

4.1 APPLICABLE REQUIREMENTS

Regulatory requirements applicable to the RCP and affected emission units are presented in Table 4.1. This table identifies those requirements of Title 18, Chapter 2 of the A.A.C., Chapter 17.16 Articles III, IV, V, VI, VII, and IX of the P.C.C., 40 CFR Part 60, and 40 CFR 63, which apply to the RCP. All requirements of Title 18, Chapter 2 of the A.A.C., Chapter 17 Articles III, IV, V, VI, VII, and IX of the P.C.C., 40 CFR Part 60, and 40 CFR 63 which are not identified in Table 4.1 do not apply to the RCP.

The current design of the RCP includes the use of six wet scrubbers, one cyclone scrubber, one baghouse, and one electrostatic precipitator for particulate matter control. These are all subject to 40 CFR 60, Subpart LL. The RCP is investigating the use of cartridge filter dust collectors or baghouses as possible replacements for one or more scrubbers. If a cartridge filter dust collector or baghouse replaced a scrubber subject to 40 CFR 60, Subpart LL, it would also be subject to 40 CFR 60, Subpart LL. Therefore, for completeness, the requirements for cartridge filter dust collectors or baghouses are included in Table 4.1 and will become regulatory permit requirements should the RCP decide to switch pollution control devices.

4.2 REQUIREMENTS THAT DO NOT APPLY

The portable generators at the RCP are considered nonroad engines per 40 CFR Section 89. Therefore, R18-2-719 of the A.A.C., Section 17.16.340 of the P.C.C., and 40 CFR Part 60, Subpart IIII for stationary internal combustion engines do not apply. However, the portable generators will comply with the emission standards in 40 CFR 89.112.

4.3 PERMIT SHIELD

By this application, the RCC requests that the permit shield be extended to the RCP to the extent allowed under A.A.C. R18-2-325.A and P.C.C. Section 17.12.310. Additionally, the RCC requests that the requirements identified as not applicable in Section 4.2 be specifically identified as not applicable to the RCP as allowed under A.A.C. R18-2-325.A and P.C.C. Section 17.12.310.

4.4 PROPOSED EXEMPTIONS

RCC is not requesting exemptions to any otherwise applicable requirement.

Table 4.1 Applicable Regulatory Requirements and Methods for Demonstrating Compliance

	Emission Unit	Regulatory Citation for Applicable	Description of Requirements	Methods Used to Demonstrate
1.	RCP	A.A.C. R18-2-310.01 P.C.C. Section 17.12.040	Requirements for reporting excess emissions including but not limited to: (a) telephone or fax notification within 24 hours of first learning of excess emissions, and (b) submittal of a written report within 72 hours of the telephone or fax notification.	Maintenance of records; submittal of timely notifications and reports.
		A.A.C. R18-2-315 P.C.C. Section 17.12.080	Posting of permit or certificate of permit issuance at the equipment site in such a manner as to be clearly visible and accessible, and maintaining a complete copy of the permit on the site.	Posting of permit and maintenance of records.
		A.A.C. R18-2-309.2.a P.C.C. Section 17.12.220	Submittal of annual compliance certification.	Submittal of certification.
		A.A.C. R18-2-327.A P.C.C. Section 17.12.320	Submittal of annual emission inventory survey questionnaires.	Submittal of questionnaire.
		A.A.C. R18-2-326 P.C.C. Section 17.12.520	Payment of applicable fees.	Payment of fees.

Table 4.1 Applicable Regulatory Requirements and Methods for Demonstrating Compliance

	Emission Unit	Regulatory Citation for Applicable	Description of Requirements	Methods Used to Demonstrate
2.	Plant Open Spaces, Roads and Streets, Material Handling Operations, Storage Piles, and Mineral Tailings (except for those subject to Articles 7 or 9 of the A.A.C. or Chapter 17.16, Articles IV or VI of the P.C.C.)	(a) A.A.C. R18-2-604 and P.C.C. Section 17.16.080 (b) A.A.C. R18-2-605 and P.C.C. Section 17.16.090 (c) A.A.C. R18-2-606 and P.C.C. Section 17.16.100 (d) A.A.C. R18-2-607 and P.C.C. Section 17.16.110 (e) A.A.C. R18-2-608 and P.C.C. Section 17.16.120	Implementation of reasonable precautions to prevent excessive amounts of particulate matter from becoming airborne from: (a) open spaces, (b) plant roads and streets, (c) material handling operations, (d) storage piles and (e) mineral tailings	Regular inspection, application of water to regularly traveled unpaved roads, maintenance of roads, application of water as needed on material handling operations and storage piles.
3a.	All non-point sources as defined in A.A.C. R18-2-101(78)	A.A.C. R18-2-614	Opacity ≤ 40%	Arizona Testing Manual Method 9 Test.
3b.	All non-point sources as defined in P.C.C. Section 17.16.055	P.C.C. Section 17.16.050	Opacity ≤ 20%	Performance of EPA Reference Method 9 Test.
4.	All point sources as defined in A.A.C. R-18-2-702.A and P.C.C. Section 17.16.130 unless otherwise specified in this table	A.A.C. R-18-2-702.B.3 and P.C.C. Section 17.16.130	Opacity ≤ 20%	Performance of EPA Reference Method 9 Test.

Table 4.1 Applicable Regulatory Requirements and Methods for Demonstrating Compliance

	Emission Unit	Regulatory Citation for Applicable	Description of Requirements	Methods Used to Demonstrate
5.	Diesel Electrowinning Hot Water Generator (6.0 MMBtu/hr)	A.A.C. R-18-2-724.C and P.C.C. Section 17.16.165.C.1	$PM \leq 1.02\ Q^{0.769}$ (where PM = emission limit in lb/hour, Q = heat input in MMBtu/hour)	Engineering Evaluation.
		A.A.C. R-18-2-724.E and P.C.C. Section 17.16.165.E	$SO_2 \leq 1.0$ lb/MMBtu heat input.	Supplier certification of low sulfur fuel.
		A.A.C. R-18-2-724.J and P.C.C. Section 17.16.165.I.1	Opacity ≤ 15%	Performance of EPA Reference Method 9 Test.
			Reporting to the Control Officer all six-minute periods in which the opacity exceeds 15%.	Submittal of report; maintenance of records.
6.	Equipment Subject to A.A.C. R-18-2-721 and P.C.C. Section 17.16.360 (Table 6.1 presents the complete list of affected facilities for each regulation)	A.A.C. R-18-2-721.B and P.C.C. Section 17.16.360.B	$PM \leq 3.59\ P^{0.62}$, when $P \leq 30$ tph $PM \leq 17.31\ P^{0.16}$, when $P > 30$ tph (where PM = emission limit in lb/hour, P = total process rate in tons-mass/hour)	Performance of EPA Reference Method 5 Test.
		A.A.C. R-18-2-721.F and P.C.C. Section 17.16.360.F	Recording of the daily process rates and hours of operation of all material handling facilities.	Maintenance of records.

Table 4.1 Applicable Regulatory Requirements and Methods for Demonstrating Compliance

	Emission Unit	Regulatory Citation for Applicable	Description of Requirements	Methods Used to Demonstrate
7.	Equipment Subject to A.A.C. R-18-2-730 and P.C.C. Section 17.16.430 (Table 6.1 presents the complete list of affected facilities for each regulation)	A.A.C. R-18-2-730.A.1 and P.C.C. Section 17.16.430.A.1	$PM \leq 3.59\ P^{0.62}$, when $P \leq 30$ tph $PM \leq 17.31\ P^{0.16}$, when $P > 30$ tph (where PM = emission limit in lb/hour, P = total process rate in tons-mass/hour)	Performance of EPA Reference Method 5 Test.
		A.A.C. R-18-2-730.A.2 and P.C.C. Section 17.16.430.A.2	$SO_2 \leq 600$ ppm	Operation of equipment in a manner as to limit air pollution.
		A.A.C. R-18-2-730.A.3 and P.C.C. Section 17.16.430.A.3	$NO_x \leq 500$ ppm	Operation of equipment in a manner as to limit air pollution.
		A.A.C. R-18-2-730.D and P.C.C. Section 17.16.430.D	Operation of equipment, processes, and premises such that gaseous or odorous materials are not emitted in such quantities or concentrations as to cause air pollution.	Maintenance of records of control measures used to limit emissions.

Table 4.1 Applicable Regulatory Requirements and Methods for Demonstrating Compliance

	Emission Unit	Regulatory Citation for Applicable	Description of Requirements	Methods Used to Demonstrate
		A.A.C. R-18-2-730.F and P.C.C. Section 17.16.430.F	Processing, storage, and transportation of solvents or other materials containing volatile organic compounds and acids in such a manner and by such means that the compounds will not evaporate, leak, escape, or otherwise be discharged into the ambient air as to cause or contribute to air pollution; and, where means are available, application of control methods, devices, or equipment to reduce effectively the contribution of these compounds to air pollution.	Use of low vapor pressure diluents (< 1.5 psia) or covers/enclosures on mixer/settler tanks. Use of effective means for controlling sulfuric acid mist emissions (see Section 2).
		A.A.C. R-18-2-730.H and P.C.C. Section 17.16.430.H	$H_2S \leq 0.03$ ppm_v for any averaging period of 30 minutes or more at any occupied place beyond the premises of the RCP.	Operation of Molybdenum Cleaner Area Scrubber.
8.	Off-Road Machinery	A.A.C. R-18-2-802.A and P.C.C. Section 17.16.450.A	No off-road machinery shall emit smoke or dust for any period greater than 10 consecutive seconds, the opacity of which exceeds 40% (except for periods less than 10 consecutive seconds and the first 10 minutes of cold start operation).	Performance of EPA Reference Method 9 Test.

Table 4.1 Applicable Regulatory Requirements and Methods for Demonstrating Compliance

	Emission Unit	Regulatory Citation for Applicable	Description of Requirements	Methods Used to Demonstrate
9.	Roadway and Site Cleaning Machinery	A.A.C. R-18-2-804.A and P.C.C. Section 17.16.470.A	No roadway or site cleaning machinery shall emit smoke or dust for any period greater than 10 consecutive seconds, the opacity of which exceeds 40% (except for periods less than 10 consecutive seconds and the first 10 minutes of cold start operation).	Performance of EPA Reference Method 9 Test.
10.	Equipment Subject to A.A.C. R-18-2-901.43, P.C.C. Sections 17.16.490.A.43 or 17.16.490.A.81 (40 CFR 60 Subparts LL and IIII) (Table 6.1 presents the complete list of affected facilities for each regulation)	40 CFR 60.7(a)(1), A.A.C. R-18-2-901.1 and P.C.C. Section 17.16.490.A.1	Provide notification of the date construction commenced postmarked no later than 30 days after such date.	Maintenance of Records.
		40 CFR 60.7(a)(3), A.A.C. R-18-2-901.1 and P.C.C. Section 17.16.490.A.1	Provide notification of the actual date of initial startup postmarked within 15 days after such date.	Maintenance of Records.
		40 CFR 60.7(b), A.A.C. R-18-2-901.1 and P.C.C. Section 17.16.490.A.1	Maintenance of records of the occurrence and duration of shutdown or malfunction of the emission unit.	Maintenance of Records.
		40 CFR 60.7(f), A.A.C. R-18-2-901.1 and P.C.C. Section 17.16.490.A.1	Maintenance of a file of all measurements, including any performance testing measurements. Retention of the file for at least two years following the date of such measurements.	Maintenance of Records.

Table 4.1 Applicable Regulatory Requirements and Methods for Demonstrating Compliance

	Emission Unit	Regulatory Citation for Applicable	Description of Requirements	Methods Used to Demonstrate
		40 CFR 60.8(a), A.A.C. R-18-2-901.1 and P.C.C. Section 17.16.490.A.1	Completion of performance test in accordance with 40 CFR 60.8 demonstrating compliance with applicable limits within 60 days after achieving the maximum production rate, but no later than 180 days after initial startup. Submittal of written report of the results of the performance tests to the Control Officer and Administrator.	EPA Reference Method 9 in accordance to 40 CFR 60, Appendix A.
		40 CFR 60.8(d), A.A.C. R-18-2-901.1 and P.C.C. Section 17.16.490.A.1	Notification to the Control Officer and Administrator 30 days prior to performance testing.	Maintenance of Records.
		40 CFR 60.11(d), A.A.C. R-18-2-901.1 and P.C.C. Section 17.16.490.A.1	Operation of the equipment, to the extent practicable, in a manner consistent with good air pollution control practices for minimizing emissions.	Maintenance of Records.
11.	Equipment Subject to A.A.C. R18-2-901.43 and P.C.C. Sections 17.16.490.A.43 (40 CFR 60 Subpart LL (Table 6.1 presents the complete list of affected facilities for each regulation)	40 CFR 60.382(a)(1), A.A.C. R-18-2-901.43 and P.C.C. Section 17.16.490.A.43	On or after the date on which the performance test is completed, the stack emissions shall not contain particulate matter greater than 0.05 grams per dry standard cubic meter.	EPA Reference Method 5 or 17 in accordance to 40 CFR 60, Appendix A.

Table 4.1 Applicable Regulatory Requirements and Methods for Demonstrating Compliance

Emission Unit	Regulatory Citation for Applicable	Description of Requirements	Methods Used to Demonstrate
	40 CFR 60.382(a)(2), A.A.C. R-18-2-901.43 and P.C.C. Section 17.16.490.A.43	On or after the date on which the performance test is completed, the stack emissions will not exhibit greater than 7% opacity unless stack emissions are discharged from an affected facility using a wet scrubbing emission control device.	EPA Reference Method 9 in accordance to 40 CFR 60, Appendix A.
	40 CFR 60.382(b), A.A.C. R-18-2-901.43 and P.C.C. Section 17.16.490.A.43	On or after the sixtieth (60^{th}) day after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup, fugitive emissions will not exhibit greater than 10 percent (10%) opacity.	EPA Reference Method 9 in accordance to 40 CFR 60, Appendix A.
	40 CFR 60.384(a), A.A.C. R-18-2-901.43 and P.C.C. Section 17.16.490.A.43	Calibration, maintenance, and operation of continuous monitoring devices to measure: (a) the change in pressure of the gas stream through each scrubber using devices certified by the manufacturer to be accurate within ± 1 inch of water gauge pressure, and (b) the scrubbing liquid flow rate to each wet scrubber using devices certified by the manufacturer to be accurate within ± 5% of the design scrubbing liquid flow rate.	Maintenance of Records.

Table 4.1 Applicable Regulatory Requirements and Methods for Demonstrating Compliance

Emission Unit	Regulatory Citation for Applicable	Description of Requirements	Methods Used to Demonstrate
	40 CFR 60.384(b), A.A.C. R-18-2-901.43 and P.C.C. Section 17.16.490.A.43	Annual calibration of each monitoring device in accordance with the manufacturer's instructions.	Performance of Calibrations and Maintenance of Records.
	40 CFR 60.385(b), A.A.C. R-18-2-901.43 and P.C.C. Section 17.16.490.A.43	Recording of the monitoring device measurements during the initial performance test and at least weekly thereafter.	Maintenance of Records.
	40 CFR 60.385(c),(d), A.A.C. R-18-2-901.43 and P.C.C. Section 17.16.490.A.43	Submittal of semiannual reports (within 30 days following the end of the second and fourth calendar quarters) of occurrences when the monitoring device measurements differ by more than ± 30% from the average obtained during the most recent performance test.	Submittal of report; maintenance of records.

Table 4.1 Applicable Regulatory Requirements and Methods for Demonstrating Compliance

	Emission Unit	Regulatory Citation for Applicable	Description of Requirements	Methods Used to Demonstrate
12.	Thickener Area Emergency Generator (1,000 kW), PLS Pond Area Emergency Generator (1,000 kW), Main Substation Emergency Generator (750 kW), Administration Building Emergency Generator (750 kW), Electrowinning Building Emergency Generator (50 kW), Primary Crusher Fire Water Pump (400 hp), SX/EW Fire Water Pump (400 hp)	40 CFR 60.4206 and P.C.C. Section 17.16.490.A.81	Engines must be operated and maintained to achieve the emission standards of 40 CFR 60.4205(b) according to the manufacturer's written instructions or procedures approved by the manufacturer over the entire life of the engine.	Maintenance of Records.
		40 CFR 60.4207(b) and P.C.C. Section 17.16.490.A.81	Sulfur content of the fuel being fired must have a sulfur content of less than or equal to 15 ppm.	Maintenance of Records.
		40 CFR 60.4209 and P.C.C. Section 17.16.490.A.81	Installation and operation of a non-resettable hour meter prior to start-up.	Maintenance of Records.
		40 CFR 60.4211(c) and P.C.C. Section 17.16.490.A.81	Purchase of an engine certified to the emission standards in §60.4205(b) and installed and configured according to the manufacturer's specifications.	Maintenance of Records.
		40 CFR 60.4211(e) and P.C.C. Section 17.16.490.A.81	Maintenance checks and readiness testing may not exceed 100 hours per year.	Maintenance of Records.

Table 4.1 Applicable Regulatory Requirements and Methods for Demonstrating Compliance

Emission Unit	Regulatory Citation for Applicable	Description of Requirements	Methods Used to Demonstrate
	40 CFR 60.4214(b) and P.C.C. Section 17.16.490.A.81	Initial notification is not required. If the standards applicable to non-emergency engines of the same model year are not met, the time and reason of operation of the engine in emergency and non-emergency service must be recorded.	Maintenance of Records.
	40 CFR 63.6590(c) and P.C.C. Section 17.16.490.A.81	Meet the requirements of 40 CFR 60, Subpart IIII.	Maintenance of Records.

Table 4.1 Applicable Regulatory Requirements and Methods for Demonstrating Compliance

	Emission Unit	Regulatory Citation for Applicable	Description of Requirements	Methods Used to Demonstrate
13.	Thickener Area Emergency Generator (1,000 kW), PLS Pond Area Emergency Generator (1,000 kW), Main Substation Emergency Generator (750 kW), Administration Building Emergency Generator (750 kW), Electrowinning Building Emergency Generator (50 kW)	40 CFR 60.4205(b) and P.C.C. Section 17.16.490.A.81	For engine displacement less than 10 liters per cylinder and rated power between 37 and 75 kW: PM ≤ 0.40 g/kW-hr CO ≤ 5.0 g/kW-hr NO_x + VOC ≤ 4.7 g/kW-hr For engine displacement less than 10 liters per cylinder and rated power greater than 560 kW: PM ≤ 0.20 g/kW-hr CO ≤ 3.5 g/kW-hr NO_x + VOC ≤ 6.4 g/kW-hr Opacity ≤ 20% during the acceleration mode Opacity ≤ 15 during the lugging mode Opacity ≤ 50 during the peaks in either the acceleration or lugging modes	Purchase of certified engine; maintenance of records.

Table 4.1 Applicable Regulatory Requirements and Methods for Demonstrating Compliance

	Emission Unit	Regulatory Citation for Applicable	Description of Requirements	Methods Used to Demonstrate
14.	Primary Crusher Fire Water Pump (400 hp), SX/EW Fire Water Pump (400 hp)	40 CFR 60.4205(c) and P.C.C. Section 17.16.490.A.81	For engine displacement less than 30 liters per cylinder and maximum engine power between 300 and 600 hp: PM ≤ 0.20 g/kW-hr CO ≤ 3.5 g/kW-hr NO_x + VOC ≤ 4.0 g/kW-hr	Purchase of certified engine; maintenance of records.
15.	Crushing Area Scrubber	A.A.C. R-18-2-306.01 and P.C.C. Section 17.12.190	PM_{10} ≤ 1.28 lb/hr	EPA Reference Method 5 or 17 in accordance to 40 CFR 60, Appendix A.
16.	Stockpile Area Scrubber	A.A.C. R-18-2-306.01 and P.C.C. Section 17.12.190	PM_{10} ≤ 2.59 lb/hr	EPA Reference Method 5 or 17 in accordance to 40 CFR 60, Appendix A.
17.	Reclaim Tunnel Scrubber	A.A.C. R-18-2-306.01 and P.C.C. Section 17.12.190	PM_{10} ≤ 1.07 lb/hr	EPA Reference Method 5 or 17 in accordance to 40 CFR 60, Appendix A.
18.	Pebble Crusher Area Scrubber	A.A.C. R-18-2-306.01 and P.C.C. Section 17.12.190	PM_{10} ≤ 1.56 lb/hr	EPA Reference Method 5 or 17 in accordance to 40 CFR 60, Appendix A.
19.	Copper Concentrate Scrubber 1, Copper Concentrate Scrubber 2	A.A.C. R-18-2-306.01 and P.C.C. Section 17.12.190	PM_{10} ≤ 3.55 lb/hr	EPA Reference Method 5 or 17 in accordance to 40 CFR 60, Appendix A.

Table 4.1 Applicable Regulatory Requirements and Methods for Demonstrating Compliance

	Emission Unit	Regulatory Citation for Applicable	Description of Requirements	Methods Used to Demonstrate
20.	Molybdenum Scrubber / Electrostatic Precipitator	A.A.C. R-18-2-306.01 and P.C.C. Section 17.12.190	$PM_{10} \leq 0.014$ lb/hr	EPA Reference Method 5 or 17 in accordance to 40 CFR 60, Appendix A.
21.	Molybdenum Dust Collector	A.A.C. R-18-2-306.01 and P.C.C. Section 17.12.190	$PM_{10} \leq 0.010$ gr/dscf	EPA Reference Method 5 or 17 in accordance to 40 CFR 60, Appendix A.
22.	Laboratory Dust Collector 1, Laboratory Dust Collector 2, Laboratory Dust Collector 3	A.A.C. R-18-2-306.01 and P.C.C. Section 17.12.190	$PM_{10} \leq 0.005$ gr/dscf	EPA Reference Method 5 or 17 in accordance to 40 CFR 60, Appendix A.
23.	Portable Generators (Nonroad Engines)	Not subject to A.A.C. or P.C.C.	Comply with emission standards in 40 CFR 89.112.	Maintenance of Records.
24.	Open Burning	A.A.C. R-18-2-602.D,G and P.C.C. Section 17.12.480.B, D	Receive authority to conduct open burning by obtaining a permit from the control officer or delegated authority. Meet all requirements of the open burning permit.	Apply for Open Burning Permits and Maintenance of Records.

5. PROCESS RATE INFORMATION AND OPERATING SCHEDULES

5.1 PROCESS RATES

Maximum hourly and annual process rates for each major process and piece of process equipment at the RCP are presented in Table 5.1. The mining rates presented in Table 5.1 correspond to Year 5 in the life of the mine. Although some mining rates in Year 5 are less than maximum annual mining rates possible throughout the life of the mine, the Year 5 mining rates when coupled with the greater haul truck travel during this year, produce the greatest annual emissions. The maximum hourly process rates presented in Table 5.1 for equipment at the RCP are for short term use. These process rates are not anticipated to be sustained for long periods of time (i.e. annually).

The process rates presented in Table 5.1 are used to calculate facility wide emissions as presented in the Emission Inventory Information, Volumes I and II.

5.2 FUEL BURNING EQUIPMENT

A summary of all fuel burning equipment at the RCP that requires a permit is presented in Table 5.2. For each piece of fuel burning equipment, the type and quantity of fuels that will be used, the percent that will be used for process heat, the higher heating values of the fuels, and the potential sulfur and ash contents of the fuel are also included in Table 5.2.

5.3 RAW MATERIAL DESCRIPTION AND USAGE RATES

The annual usage rates of raw materials used at the RCP are presented in Table 5.3. Raw materials that will be used by the RCP include sulfide ore and oxide ore, the fuels described in Table 5.2, and chemicals and reagents utilized in the milling, flotation, and SX/EW processes.

5.4 ANTICIPATED OPERATING SCHEDULE AND LIMITATIONS ON SOURCE OPERATIONS AND WORK PRACTICE STANDARDS AFFECTING EMISSIONS

The RCP will be capable of operating continuously (8,760 hours/year, 24 hours/day, 365 days/year, and 7 days/week). Production rates will generally be evenly distributed throughout the year.

There are no voluntary limitations on source operations and work practice standards affecting emissions for the RCP.

The laboratory dust collectors (PC-L1, PC-L2, and PC-L3) will typically be operated for two work shifts per day (16 hours/day). However, calculated particulate emissions from the dust collectors, as presented in this application, are based on 24 hour/day operation.

Table 5.1 Summary of Year 5 Maximum Hourly and Annual Process Rates

Equipment / Activity	Process Rates [a]	
	Maximum Hourly	Annual
Mining		
Drilling	80 holes	27,840 holes
Blasting	1 blast	348 blasts
Loading Concentrate Ore	3,750 tons	27,375,000 tons
Loading Leach Ore	250 tons	1,825,000 tons
Loading Waste Rock	11,000 tons	80,300,000 tons
Hauling Concentrate Ore to Primary Crusher Dump Hopper / Run of Mine Stockpile	81 VMT	589,185 VMT
Hauling Leach Ore to Leach Pad	4 VMT	29,239 VMT
Hauling Waste Rock to Waste Rock Storage Area	298 VMT	2,178,198 VMT
Unloading Concentrate Ore to Run of Mine Stockpile	3,750 tons	2,737,500 tons
Unloading Leach Ore to Leach Pad	250 tons	1,825,000 tons
Unloading Waste Rock to Waste Rock Storage Area	11,000 tons	80,300,000 tons
Bulldozer Use	6 hours	55,170 hours
Water Truck Use	20 VMT	143,000 VMT
Grader Use	10 VMT	87,000 VMT
Support Vehicle Use	237 VMT	1,127,473 VMT

Table 5.1 Summary of Year 5 Maximum Hourly and Annual Process Rates

Equipment / Activity	Process Rates [a]	
	Maximum Hourly	Annual
Primary Crushing, Conveying, Coarse Ore Storage, and Reclaim Conveying		
Run of Mine Stockpile	26 acres	26 acres
Primary Crushing and Conveying	6,950 tons	43,362,000 tons
Primary Crusher; Crusher Discharge Hopper; Crusher Discharge Feeder; Stockpile Feed Conveyor; Stockpile Tripper Conveyor		
Coarse Ore Stockpile	5 acres	5 acres
Stockpile Reclaim	6,950 tons	43,362,000 tons
Reclaim Feeders (total); Reclaim Conveyor		
SAG Mill Feed Conveyor	8,726 tons	49,669,200 tons
Milling		
SAG Mill	8,726 tons	49,669,200 tons
Trommel Screen	8,726 tons	49,669,200 tons
Processing of Trommel Screen Oversize	1,851 tons	10,505,042 tons
Pebble Conveyor No. 1; Pebble Wash Screen		
Processing of Pebble Wash Screen Oversize	1,771 tons	6,269,400 tons
Pebble Conveyor No. 2; SAG Oversize Surge Bin; Pebble Crusher Feeder; Pebble Crusher; Pebble Conveyor No. 3		

Table 5.1 Summary of Year 5 Maximum Hourly and Annual Process Rates

Equipment / Activity	Process Rates [a]	
	Maximum Hourly	Annual
Flotation		
Copper Flotation Process	6,950 tons	43,362,000 tons
Copper Regrind Mills (total)	285 tons	1,778,154 tons
Molybdenum Flotation Process	90 tons	561,522 tons
Molybdenum Regrind Mill	30 tons	187,174 tons
Molybdenum Cleaner Regrind Mill	4 tons	24,957 tons
Dewatering		
Copper Concentrate Dewatering	138 tons	550,936 tons
Copper Concentrate Thickener; Filter Feed Trash Screen; Copper Concentrate Tanks; Copper Concentrate Filters; Copper Concentrate Conveyor		
Copper Concentrate Loadout Stockpile	1.17 acres	1.17 acres
Molybdenum Concentrate Dewatering	1.90 tons	6,377 tons
Molybdenum Filter Feed Tank; Molybdenum Concentrate Filter; Molybdenum Concentrate Dryer; Molybdenum Concentrate Bin; Molybdenum Concentrate Hopper; Molybdenum Concentrate Conveyor; Molybdenum Packaging and Weigh System		
Tailings Dewatering	10,722 tons	42,804,687 tons
Tailings Thickeners; Tailings Filter Feed Tanks; Tailings Filters; Conveyor Feed to Tailings Storage		
Tailings Storage	1,500 acres	1,500 acres

Table 5.1 Summary of Year 5 Maximum Hourly and Annual Process Rates

Equipment / Activity	Process Rates [a]	
	Maximum Hourly	Annual
Solvent Extraction and Electrowinning		
Solvent Extraction (4 systems; surface mixer/settler area)	1 hour 9,132.9 ft^2	8,760 hours 9,132.9 ft^2
Electrowinning (surface cell area)	1 hour 2,640 ft^2	8,760 hours 2,640 ft^2
Fuel Burning Equipment		
Diesel Electrowinning Hot Water Generator	6.0 MMBtu	52,560 MMBtu
Thickener Area Emergency Generator	1,000 kW-hours	500,000 kW-hours
PLS Pond Area Emergency Generator	1,000 kW-hours	500,000 kW-hours
Main Substation Emergency Generator	750 kW-hours	375,000 kW-hours
Administration Building Emergency Generator	750 kW-hours	375,000 kW-hours
Electrowinning Building Emergency Generator	50 kW-hours	25,000 kW-hours
Primary Crusher Fire Water Pump	400 hp-hours	200,000 hp-hours
SX/EW Fire Water Pump	400 hp-hours	200,000 hp-hours

Table 5.1 Summary of Year 5 Maximum Hourly and Annual Process Rates

Equipment / Activity	Process Rates [a]	
	Maximum Hourly	Annual
Miscellaneous Sources		
Bulk Pebble Lime Handling	5.18 tons	37,800 tons
Bulk Pebble Lime Silo; Bulk Pebble Lime Screw Conveyor		
Lime Handling	2.59 tons	18,900 tons
Lime Storage Bin		
Sodium Metasilicate Handling	0.41 tons	3,000 tons
Sodium Metasilicate Storage Bin		
Flocculant Handling	0.15 tons	1,100 tons
Flocculant Storage Bins		
Guar Handling	0.02 tons	150 tons
Guar Feeder		
Cobalt Sulfate Handling	0.0008 tons	6.0 tons
Cobalt Sulfate Feeder		
Tanks		
C7 Distribution Tank	59 gallons	430,733 gallons
MIBC Storage Tank	24 gallons	177,521 gallons

Table 5.1 Summary of Year 5 Maximum Hourly and Annual Process Rates

Equipment / Activity	Process Rates [a]	
	Maximum Hourly	Annual
Diesel Fuel Storage Tank - Heavy Vehicles 1	925 gallons	6,750,000 gallons
Diesel Fuel Storage Tank - Heavy Vehicles 2	925 gallons	6,750,000 gallons
Particulate Matter Pollution Control Equipment with Limits		
Crushing Area Scrubber	1 hour	8,760 hours
Stockpile Area Scrubber	1 hour	8,760 hours
Reclaim Tunnel Scrubber	1 hour	8,760 hours
Pebble Crusher Area Scrubber	1 hour	8,760 hours
Copper Concentrate Scrubber 1	1 hour	8,760 hours
Copper Concentrate Scrubber 2	1 hour	8,760 hours
Molybdenum Scrubber / Electrostatic Precipitator	1 hour	8,760 hours
Molybdenum Dust Collector	74,612 dscf	653,597,276 dscf
Laboratory Dust Collector 1	497,410 dscf	4,357,315,176 dscf
Laboratory Dust Collector 2	497,410 dscf	4,357,315,176 dscf
Laboratory Dust Collector 3	497,410 dscf	4,357,315,176 dscf

[a] VMT = vehicle miles traveled

Table 5.2 Summary of Fuel Burning Equipment and Fuel Usage Rates

Emission Unit ID	Emission Unit Description	Fuel Type	Power Rating	Fuel Rates (gallons)		% Used for Process Heat	Higher Heating Value [c]	Sulfur / Ash Content [d]
				Maximum Hourly	Annual			
FB01	Diesel Electrowinning Hot Water Generator (HWG) [a]	No. 2 Diesel Fuel	6.0 MMBtu/hr	43.8	383,650	100%	137,000 Btu/gallon	0.0015% / neg.
FB02	Thickener Area Emergency Generator (TEG) [b]	No. 2 Diesel Fuel	1,000 kW	68.5	34,260	0%	137,000 Btu/gallon	0.0015% / neg.
FB03	PLS Pond Area Emergency Generator (PEG) [b]	No. 2 Diesel Fuel	1,000 kW	68.5	34,260	0%	137,000 Btu/gallon	0.0015% / neg.
FB04	Main Substation Emergency Generator (MEG) [b]	No. 2 Diesel Fuel	750 kW	51.4	25,695	0%	137,000 Btu/gallon	0.0015% / neg.
FB05	Administration Building Emergency Generator (AEG) [b]	No. 2 Diesel Fuel	750 kW	51.4	25,695	0%	137,000 Btu/gallon	0.0015% / neg.
FB06	Electrowinning Building Emergency Generator (EWEG) [b]	No. 2 Diesel Fuel	50 kW	3.4	1,713	0%	137,000 Btu/gallon	0.0015% / neg.
FB07	Primary Crusher Fire Water Pump (PCFWP) [b]	No. 2 Diesel Fuel	400 hp	20.4	10,219	0%	137,000 Btu/gallon	0.0015% / neg.
FB08	SX/EW Fire Water Pump (SXFWP) [b]	No. 2 Diesel Fuel	400 hp	20.4	10,219	0%	137,000 Btu/gallon	0.0015% / neg.

[a] Annual fuel rates are based on 8,760 hours of operation.

[b] Annual fuel rates are based on 500 hours of operation and a brake-specific fuel consumption value of 7,000 Btu/hp-hr.

[c] From AP-42, Appendix A, page A-3

[d] neg. = negligible

Table 5.3 Chemical and Reagent Usage at the RCP

Main Chemical Name / Group	Purpose / Use	Storage Location	Maximum Hourly Usage [a]	Annual Usage
Mining				
Concentrate Ore [b]	Copper Concentrating	--	6,950 tons	27,375,000 tons
Leach Ore [b]	Leaching and Copper Extraction	--	2,850 tons	20,805,000 tons
Ammonium Nitrate Fuel Oil (ANFO)	Blasting	Mine Shop Area	52 tons	18,980 tons
Blasting Powder	Blasting	Mine Shop Area	0.24 tons	1,755 tons
Concentrate Ore Processing (Milling and Flotation)				
Methyl Isobutyl Carbinol (MIBC)	Frother	Reagent Storage Area	0.08 tons	600 tons
Calcium Oxide - High Calcium Pebble Lime	pH Modifier	Reagent Storage Area	7.77 tons	56,700 tons
Sodium Metasilicate	Dispersant	Reagent Storage Area	0.41 tons	3,000 tons
Sodium Hydrosulfide Solution (NaHS)	Copper Depressant	Reagent Storage Area	0.52 tons	3,780 tons
Sodium Thiophosphate Solution	Copper Depressant	Reagent Storage Area	0.05 tons	360 tons
Nonionic Polyacrylamide	Flocculant	Reagent Storage Area	0.15 tons	1,100 tons
Formulated Thionocarbamate	Promoter	Reagent Storage Area	0.11 tons	822 tons
Diesel Fuel	Collector	Reagent Storage Area	22.3 gallons	162,657 gallons

Table 5.3 Chemical and Reagent Usage at the RCP

Main Chemical Name / Group	Purpose / Use	Storage Location	Maximum Hourly Usage [a]	Annual Usage
C7 - Sodium Akylmonothiophosphate	Collector	Reagent Storage Area	0.28 tons	2,013 tons
Leach Ore Processing (Leaching, Solvent Extraction/Electrowinning)				
Sulfuric Acid (93%)	Leaching and Extraction	Acid Storage Area	21.19 tons	154,656 tons
Kerosene	Diluent for Extractant Reagent	SX Tank Farm	0.001 tons	9.3 tons
Isoalkanes 13-16	Diluent for Extractant Reagent	SX Tank Farm	0.003 tons	21.6 tons
5-Nonyl-2-hydroxy-benzaldoxime and petroleum distillate	Copper Extractant	Main Warehouse	0.0003 tons	2.4 tons
Cobalt Sulfate	Cathode / Anode Surface Modifier	Main Warehouse	0.0008 tons	6.0 tons
Guar Gum	Leveling Agent for EW	Main Warehouse	0.02 tons	150 tons
Acrylate Adduct	Acid Mist Control from EW	Main Warehouse	0.0005 tons	3.8 tons
Diatomaceous Earth	Organic Recovery	Main Warehouse	0.08 tons	600 tons
Clay	Organic Recovery	Main Warehouse	0.08 tons	600 tons

[a] Maximum hourly usage values are calculated based on the annual usage rates divided by 8,760 hours with an added 20% maximum capacity factor (except for the concentrate ore hourly usage rate and the ANFO usage rates). The hourly concentrate ore usage rate is based on the maximum capacity of the primary crusher. The ANFO usage rates are based on a possible 365 blasts/year and one blast/hour. Although 365 blasts are possible in one year, the RCP estimates that 348 blasts will be occur in Year 5.

[b] The annual ore usage rates presented in this table are based on peak mining rates. It is not anticipated that both peak rates can be achieved simultaneously and rates will naturally decrease with time.

6. DESCRIPTION OF PROCESS AND CONTROL EQUIPMENT

Each piece of process and control equipment that will be operated at the RCP and requires a permit is listed in Table 6.1 along with the corresponding size and/or production capacity. Since the RCP will use new equipment, the make, model, serial number and date of manufacture for the equipment are not available at this time. Also included in Table 6.1 are the regulatory citations that apply to each piece of equipment. Some equipment that use wet processes or are in closed buildings (SAG mill, grinding mills, conveyor transfers) do not emit emissions even though they are subject to specific requirements. Equipment that are not sources of emissions are identified in Table 6.1. Further detailed information about the air pollution control equipment is presented in Section 8.

Table 6.1 Descriptions of Process and Control Equipment Required to be Permitted

Equipment	Equipment ID	Manufacturer / Model [a]	Quantity	Size or Capacity	Emission Status / Control Device	Applicable Regulatory Requirements
Primary Crushing, Conveying, Coarse Ore Storage, and Reclaim Conveying						
Crusher Dump Hopper	H-CDp	na	1	680 tons	Fugitive / Water Sprays	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Primary Crusher	PCr	Sandvik	1	6,950 tons/hr	Non-Fugitive / Crushing Area Scrubber	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Crusher Discharge Hopper	H-CDs	na	1	725 tons	No Emissions (Enclosed Process)	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Crusher Discharge Feeder	F-CD	na	1	25' L X 96" W	Non-Fugitive / Crushing Area Scrubber [b]	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Stockpile Feed Conveyor	CV-SF	na	1	2,690' L X 60" W	Non-Fugitive / Crushing Area Scrubber [b]	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Crushing Area Scrubber	PC-CAS	na	1	18,000 acfm	Non-Fugitive	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL

Table 6.1 Descriptions of Process and Control Equipment Required to be Permitted

Equipment	Equipment ID	Manufacturer / Model [a]	Quantity	Size or Capacity	Emission Status / Control Device	Applicable Regulatory Requirements
Stockpile Tripper Conveyor	CV-ST	na	1	343' L X 60" W	Non-Fugitive / Stockpile Area Scrubber [b,c]	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Stockpile Building	BD-S	na	1	390’ L X 228’ W X 104’ H	No Emissions (Enclosed Process)	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Stockpile Area Scrubber	PC-SAS	na	1	36,500 acfm	Non-Fugitive	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Reclaim Feeders	F-R1/R4	na	4	20' L X 48" W	No Emissions (Located Underground)	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Reclaim Conveyor	CV-R	na	1	932' L X 60" W	Non-Fugitive / Reclaim Tunnel Scrubber	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Reclaim Tunnel Scrubber	PC-RTS	na	1	15,000 acfm	Non-Fugitive	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
SAG Mill Feed Conveyor	CV-SMF	na	1	660' L X 60" W	Non-Fugitive / Pebble Crusher Area Scrubber [b]	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL

Table 6.1 Descriptions of Process and Control Equipment Required to be Permitted

Equipment	Equipment ID	Manufacturer / Model [a]	Quantity	Size or Capacity	Emission Status / Control Device	Applicable Regulatory Requirements
Milling						
SAG Mill	M-SAG	Polysius	1	36' D X 17.5' EGL	No Emissions (Wet Process)	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Trommel Screen	Sn-T	Polysius	1	16' L X 16' W	No Emissions (Wet Process)	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Pebble Conveyor No. 1	CV-Pb1	na	1	135.5' L X 60" W	No Emissions (Clean, Wet Ore)	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Pebble Wash Screen	Sn-PbW	na	1	10' L X 20' W	No Emissions (Wet Process)	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Pebble Conveyor No. 2	CV-Pb2	na	1	675' L X 36" W	No Emissions (Clean, Wet Ore)	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
SAG Oversize Surge Bin	B-SAGOS	na	1	500 tons	Non-Fugitive / Pebble Crusher Area Scrubber	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL

Table 6.1 Descriptions of Process and Control Equipment Required to be Permitted

Equipment	Equipment ID	Manufacturer / Model [a]	Quantity	Size or Capacity	Emission Status / Control Device	Applicable Regulatory Requirements
Pebble Crusher Feeder	F-PbC	na	1	31.5' L X 48" W	Non-Fugitive / Pebble Crusher Area Scrubber	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Pebble Crusher	PbC	na	1	1,771 tons/hr	Non-Fugitive / Pebble Crusher Area Scrubber	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Pebble Conveyor No. 3	CV-Pb3	na	1	170.5' X 36" W	Non-Fugitive / Pebble Crusher Area Scrubber	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Pebble Crusher Area Scrubber	PC-PCAS	na	1	22,000 acfm	Non-Fugitive	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Ball Mills	M-B1/B2	na	2	26' D X 40' EGL	No Emissions (Wet Process)	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Flotation, Regrind, and Concentrating						
Copper/Molybdenum/Tailings Flotation and Concentrating Equipment (flotation cells, column cells, thickeners, filters)	various	na	--	8,760 hr/yr	No Emissions (Wet Process)	A.A.C. R18-2-721 and P.C.C. Section 17.16.360

Table 6.1 Descriptions of Process and Control Equipment Required to be Permitted

Equipment	Equipment ID	Manufacturer / Model [a]	Quantity	Size or Capacity	Emission Status / Control Device	Applicable Regulatory Requirements
Copper Regrind Mills	M-CR1/CR2	na	2	11'-8" L X 13'-4" W	No Emissions (Wet Process)	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Molybdenum Regrind Mill	M-MR	na	1	4' L X 4'-4" W	No Emissions (Wet Process)	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Molybdenum Cleaner Regrind Mill	M-MCR	na	1	4 tons/hr	No Emissions (Wet Process)	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Molybdenum Cleaner Area Scrubber	PC-MCAS	na	1	12,500 acfm	Non-Fugitive	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
Copper Concentrate Dewatering and Stacking						
Filter Feed Trash Screen	Sn-FFT	na	1	60" L X 48" W	No Emissions (Wet Process)	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Copper Concentrate Loadout Building	BD-CCL	na	1	175’ L X 101’ W X 60’ H	No Emissions (Enclosed Process)	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Copper Concentrate Conveyor	CV-CC	na	1	330' L X 24" W	No Emissions (Enclosed Process)	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL

Table 6.1 Descriptions of Process and Control Equipment Required to be Permitted

Equipment	Equipment ID	Manufacturer / Model [a]	Quantity	Size or Capacity	Emission Status / Control Device	Applicable Regulatory Requirements
Copper Concentrate Scrubbers	PC-CCS1/ CCS2	na	2	50,000 acfm each	Non-Fugitive	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Molybdenum Dewatering and Packaging						
Molybdenum Concentrate Dryer	D-MC	na	1	na	Non-Fugitive / Molybdenum Scrubber and Electrostatic Precipitator	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Molybdenum Scrubber	PC-MS	na	1	na	Non-Fugitive	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Electrostatic Precipitator	PC-EP	na	1	139 acfm	Non-Fugitive	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Molybdenum Concentrate Bin	B-MC	na	1	20 tons	Non-Fugitive / Molybdenum Dust Collector	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Molybdenum Dust Collector	PC-MDC	na	1	1,500 acfm	Non-Fugitive	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL

Table 6.1 Descriptions of Process and Control Equipment Required to be Permitted

Equipment	Equipment ID	Manufacturer / Model [a]	Quantity	Size or Capacity	Emission Status / Control Device	Applicable Regulatory Requirements
Molybdenum Concentrate Hopper	H-MC	na	1	20 ft^3	Non-Fugitive	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Molybdenum Concentrate Conveyor	CV-MC	na	1	90 tons/hr	No Emissions (Enclosed Process)	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Molybdenum Packaging and Weigh System	MPS	na	1	variable	Non-Fugitive / Molybdenum Dust Collector	A.A.C. R18-2-901.43, P.C.C. Section 17.16.490.A.43, and 40 CFR 60, Subpart LL
Tailings Dewatering and Placement						
Tailings Belt Feeders	F-T1/T14	na	14	na	No Emissions (Enclosed Process)	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
Fixed Tailings Conveyor No. 1	CV-F1	na	1	na	No Emissions (Enclosed Process)	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
Fixed Tailings Conveyor No. 2	CV-F2	na	1	na	No Emissions (Enclosed Process)	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
Fixed Tailings Conveyor No. 3	CV-F3	na	1	na	Non-Fugitive	A.A.C. R18-2-730 and P.C.C. Section 17.16.430

Table 6.1 Descriptions of Process and Control Equipment Required to be Permitted

Equipment	Equipment ID	Manufacturer / Model [a]	Quantity	Size or Capacity	Emission Status / Control Device	Applicable Regulatory Requirements
Relocatable Conveyors	CV-R1/R2	na	2	na	Fugitive	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
Shiftable Conveyors with Cross Conveyor Trippers	CV-S1/S2	na	2	na	Fugitive	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
Belt Wagon Conveyor on Crawlers (movable)	CV-BW1	na	1	na	Fugitive	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
Spreader Crawler Mounted Conveyors (movable)	CV-SP1/SP2	na	2	na	Fugitive	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
Solvent Extraction and Electrowinning						
SX Primary Mix Tanks	T-E1P, E1PP, E2P, S1P	na	4	7.75' D X 9.75' H	Fugitive	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
SX Secondary Mix Tanks	T-E1S, E1PS, E2S, S1S	na	4	9.5' D X 9.75' H	Fugitive	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
SX Tertiary Mix Tanks	T-E1T, E1PT, E2T	na	3	9.5' D X 9.75' H	Fugitive	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
SX Settlers	ES-E1, E1P, E2, SS-S1	na	4	64' L X 33' W X 3.33' H	Fugitive	A.A.C. R18-2-730 and P.C.C. Section 17.16.430

Table 6.1 Descriptions of Process and Control Equipment Required to be Permitted

Equipment	Equipment ID	Manufacturer / Model [a]	Quantity	Size or Capacity	Emission Status / Control Device	Applicable Regulatory Requirements
Electrowinning Commercial Cells	EWCC	na	30	22' L X 4' W X 5' H	Fugitive / Cell Ventilation Wet Scrubbers	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
Cell Ventilation Wet Scrubbers	PC-EWCVS1/ EWCVS6	na	6	5,000 acfm each	Non-Fugitive	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
Fuel Burning Equipment						
Diesel Electrowinning Hot Water Generator	HWG	na	1	6.0 MMBtu/hr	Non-Fugitive	A.A.C. R18-2-703 and P.C.C. Section 17.16.165
Thickener Area Emergency Generator	TEG	na	1	1,000 kW	Non-Fugitive	P.C.C. Section 17.16.490.A.81 and 40 CFR 60, Subpart IIII
PLS Pond Area Emergency Generator	PEG	na	1	1,000 kW	Non-Fugitive	P.C.C. Section 17.16.490.A.81 and 40 CFR 60, Subpart IIII
Main Substation Emergency Generator	MEG	na	1	750 kW	Non-Fugitive	P.C.C. Section 17.16.490.A.81 and 40 CFR 60, Subpart IIII
Administration Building Emergency Generator	AEG	na	1	750 kW	Non-Fugitive	P.C.C. Section 17.16.490.A.81 and 40 CFR 60, Subpart IIII
Electrowinning Building Emergency Generator	EWEG	na	1	50 kW	Non-Fugitive	P.C.C. Section 17.16.490.A.81 and 40 CFR 60, Subpart IIII

Table 6.1 Descriptions of Process and Control Equipment Required to be Permitted

Equipment	Equipment ID	Manufacturer / Model [a]	Quantity	Size or Capacity	Emission Status / Control Device	Applicable Regulatory Requirements
Primary Crusher Fire Water Pump	PCFWP	na	1	400 hp	Non-Fugitive	P.C.C. Section 17.16.490.A.81 and 40 CFR 60, Subpart IIII
SX/EW Fire Water Pump	SXFWP	na	1	400 hp	Non-Fugitive	P.C.C. Section 17.16.490.A.81 and 40 CFR 60, Subpart IIII
Miscellaneous Sources						
Bulk Pebble Lime Silo	S-BPL	na	1	na	Non-Fugitive / Bulk Pebble Lime Silo Bin Vent	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
Bulk Pebble Lime Silo Screw Conveyor	CV-BPLS	na	1	na	No Emissions (Enclosed Process)	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
Bulk Pebble Lime Silo Bin Vent	PC-BPLBV	na	1	750 / 1,750 acfm	Non-Fugitive	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
Lime Storage Bin	B-L	na	1	na	Non-Fugitive / Lime Storage Bin Vent	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
Lime Storage Bin Vent	PC-LSBV	na	1	750 / 1,750 acfm	Non-Fugitive	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
Sodium Metasilicate Storage Bin	B-SM	na	1	na	Non-Fugitive / Sodium Metasilicate Storage Bin Vent	A.A.C. R18-2-730 and P.C.C. Section 17.16.430

Table 6.1 Descriptions of Process and Control Equipment Required to be Permitted

Equipment	Equipment ID	Manufacturer / Model [a]	Quantity	Size or Capacity	Emission Status / Control Device	Applicable Regulatory Requirements
Sodium Metasilicate Storage Bin Vent	PC-SMSBV	na	1	750 / 1,750 acfm	Non-Fugitive	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
Flocculant Storage Bin 1	B-F1	na	1	na	Non-Fugitive	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
Flocculant Storage Bin 2	B-F2	na	1	na	Non-Fugitive	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
Guar Feeder	F-Gu	na	1	na	Non-Fugitive	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
Cobalt Sulfate Feeder	F-CoS	na	1	na	Non-Fugitive	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
Tanks						
C7 Distribution Tank	T-C7D	na	1	11,845 gallons	Non-Fugitive	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
MIBC Storage Tank	T-MIBCS	na	1	11,845 gallons	Non-Fugitive	A.A.C. R18-2-730 and P.C.C. Section 17.16.430
Diesel Fuel Storage Tanks - Heavy Vehicles	T-DFS-HV1/HV2	na	2	100,000 gallons	Non-Fugitive	A.A.C. R18-2-730 and P.C.C. Section 17.16.430

Table 6.1 Descriptions of Process and Control Equipment Required to be Permitted

Equipment	Equipment ID	Manufacturer / Model [a]	Quantity	Size or Capacity	Emission Status / Control Device	Applicable Regulatory Requirements
Other Pollution Control Equipment						
Laboratory Dust Collectors	PC-L1/L3	na	3	10,000 acfm each	Non-Fugitive	A.A.C. R18-2-721 and P.C.C. Section 17.16.360
Laboratory Wet Scrubber	PC-LWS	na	1	9,000 acfm	Non-Fugitive	A.A.C. R18-2-730 and P.C.C. Section 17.16.430

[a] na = not available at this time

[b] This equipment has water spray control for fugitive particulate emissions not captured by the scrubbers. Emission calculations in this permit application are based on 100% capture efficiency of the scrubbers.

[c] This equipment is located within the coarse ore stockpile building in addition to being controlled by the scrubbers. Emission calculations in this permit application are based on 100% capture efficiency of the scrubbers.

7. SITE DIAGRAM

Site diagrams of the RCP showing the process area boundary, locations of major equipment, facility roads, and the surrounding topography is presented in Appendix D. An overall vicinity map showing the facility boundaries is presented in Figure D.1. A plan view showing the planned ultimate configuration of the facility is presented in Figure D.2. A general facilities site plan showing the locations of major equipment and processes is presented in Figure D.3.

8. AIR POLLUTION CONTROL INFORMATION

8.1 DESCRIPTIONS OF METHODS FOR DEMONSTRATING COMPLIANCE

Methods that will be used to demonstrate compliance with applicable regulatory requirements for the RCP are presented in Table 4.1.

8.2 DESCRIPTIONS OF AIR POLLUTION CONTROL EQUIPMENT

The characteristics of the air pollution control used at the RCP are presented in Table 8.1. This table includes: (a) the list of emission points controlled; (b) the control efficiencies; (c) the type of pollutant controlled; (d) the exhaust flow rate; and (e) the PM_{10} discharge grain loading / emission limit (if applicable). All discharge grain loadings and emission limits represent voluntarily accepted limits. The process locations of the air pollution control equipment are described in Section 2 and are presented in the process flow diagrams located in Appendix B.

Water trucks are used on the unpaved roads at the RCP and are assumed to provide a control efficiency of 90%. The RCP will implement a regular dust control program which will include the use of water trucks and good operating practices to provide a control efficiency of 90% to all regularly traveled unpaved plant roads, including haul roads within and outside of the pits. The dust control program is presented in Appendix E.

The current design of the RCP includes the use of six wet scrubbers, one cyclone scrubber, one baghouse, and one electrostatic precipitator for particulate matter control. The RCP is investigating the possible use of cartridge filter dust collectors or baghouses instead of the scrubbers to provide better control efficiency. An updated description of the pollution control equipment will be submitted if the design of pollution control systems at the RCP is modified to replace the scrubbers.

8.3 AMBIENT AIR IMPACT ANALYSIS

A demonstration that emissions from the RCP will not cause exceedance of the national ambient air quality standards (NAAQS) is not required by ADEQ because emissions from the facility are less than those that trigger Major New Source Review. An air impact analysis demonstrating protection of applicable standards will be included in the Environmental Impact Statement that applies to the RCP.

Table 8.1 Air Pollution Control Equipment at the RCP

Emission Unit ID	Air Pollution Control Device	Emission Points Controlled	Pollutants Controlled	PM_{10} Control Efficiency (Rated and Operating)	Exhaust Flow Rate	PM_{10} Grain Loading / Limit
--	Road Watering	Haul Truck Roads	Particulates	90%	--	--
--	Road Watering	Unpaved General Mine Roads	Particulates	90%	--	--
--	Water Sprays	Material Handling Emission Point: • Unloading to Primary Crusher Dump Hopper from Haul Trucks or Run of Mine Stockpile • Crusher Discharge Hopper to Crusher Discharge Feeder • Crusher Discharge Feeder to Stockpile Feed Conveyor • Stockpile Feed Conveyor to Stockpile Tripper Conveyor • Reclaim Conveyor to SAG Mill Feed Conveyor	Particulates	82.5%	--	--
PCL01	Crushing Area Scrubber	Process Equipment: • Primary Crusher Material Handling Emission Points: • Crusher Discharge Hopper to Crusher Discharge Feeder • Crusher Discharge Feeder to Stockpile Feed Conveyor	Particulates	99%	18,000 acfm	1.28 lb/hr

Table 8.1 Air Pollution Control Equipment at the RCP

Emission Unit ID	Air Pollution Control Device	Emission Points Controlled	Pollutants Controlled	PM_{10} Control Efficiency (Rated and Operating)	Exhaust Flow Rate	PM_{10} Grain Loading / Limit
PCL02	Stockpile Area Scrubber	Material Handling Emission Points: • Stockpile Feed Conveyor to Stockpile Tripper Conveyor • Stockpile Tripper Conveyor to Covered Coarse Ore Stockpile General Ventilation of the Stockpile Building	Particulates	99%	36,500 acfm	2.59 lb/hr
PCL03	Reclaim Tunnel Scrubber	Material Handling Emission Points: • Reclaim Feeders to Reclaim Conveyor	Particulates	99%	15,000 acfm	1.07 lb/hr
PCL04	Pebble Crusher Area Scrubber	Process Equipment: • Pebble Crusher Material Handling Emission Points: • Reclaim Conveyor to SAG Mill Feed Conveyor • Pebble Conveyor No. 2 to SAG Oversize Surge Bin • SAG Oversize Surge Bin to Pebble Crusher Feeder • Pebble Crusher to Pebble Conveyor No.3 • Pebble Conveyor No. 3 to SAG Mill Feed Conveyor	Particulates	99%	22,000 acfm	1.56 lb/hr

Table 8.1 Air Pollution Control Equipment at the RCP

Emission Unit ID	Air Pollution Control Device	Emission Points Controlled	Pollutants Controlled	PM_{10} Control Efficiency (Rated and Operating)	Exhaust Flow Rate	PM_{10} Grain Loading / Limit
PCL05	Copper Concentrate Scrubber 1	Material Handling Emission Points: • Copper Concentrate Conveyor to Copper Concentrate Loadout Stockpile • Copper Concentrate Loadout Stockpile to Shipment Truck via Front End Loader General Ventilation of the Copper Concentrate Loadout Building	Particulates	99%	50,000 acfm	3.55 lb/hr
PCL06	Copper Concentrate Scrubber 2	Process Equipment: • Copper Concentrate Conveyor to Copper Concentrate Loadout Stockpile • Copper Concentrate Loadout Stockpile to Shipment Truck via Front End Loader General Ventilation of the Copper Concentrate Loadout Building	Particulates	99%	50,000 acfm	3.55 lb/hr
PCL07	Molybdenum Scrubber	Process Equipment: • Molybdenum Concentrate Dryer	Particulates	99%	Vents to the Electrostatic Precipitator	--
PCL07	Electrostatic Precipitator	Process Equipment: • Molybdenum Concentrate Dryer	Particulates	99.5%	139 acfm	0.014 lb/hr

Table 8.1 Air Pollution Control Equipment at the RCP

Emission Unit ID	Air Pollution Control Device	Emission Points Controlled	Pollutants Controlled	PM_{10} Control Efficiency (Rated and Operating)	Exhaust Flow Rate	PM_{10} Grain Loading / Limit
PCL08	Molybdenum Dust Collector	Material Handling Emission Points: • Molybdenum Concentrate Dryer to Molybdenum Concentrate Bin • Molybdenum Concentrate Conveyor to Molybdenum Packaging and Weigh System	Particulates	99.9%	1,500 acfm	0.010 gr/dscf
PCL09	Laboratory Dust Collector 1	Process Equipment: • Laboratory Equipment (crushers, pulverizers, splitters, sieve shakers, blenders)	Particulates	99%	10,000 acfm	0.005 gr/dscf
PCL10	Laboratory Dust Collector 2	Process Equipment: • Laboratory Equipment (crushers, pulverizers, splitters, sieve shakers, blenders)	Particulates	99%	10,000 acfm	0.005 gr/dscf
PCL11	Laboratory Dust Collector 3	Process Equipment: • Laboratory Equipment (crushers, pulverizers, splitters, sieve shakers, blenders)	Particulates	99%	10,000 acfm	0.005 gr/dscf
--	Bulk Pebble Lime Silo Bin Vent	Material Handling Emission Points: • Transfer of Bulk Pebble Lime to the Bulk Pebble Lime Silo	Particulates	90%	750 / 1,750 acfm [a]	--
--	Lime Storage Bin Vent	Material Handling Emission Points: • Transfer of Lime to the Lime Storage Bin	Particulates	90%	750 / 1,750 acfm [a]	--

Table 8.1 Air Pollution Control Equipment at the RCP

Emission Unit ID	Air Pollution Control Device	Emission Points Controlled	Pollutants Controlled	PM_{10} Control Efficiency (Rated and Operating)	Exhaust Flow Rate	PM_{10} Grain Loading / Limit
--	Sodium Metasilicate Storage Bin Vent	Material Handling Emission Points: • Transfer of Sodium Metasilicate to the Sodium Metasilicate Storage Bin	Particulates	90%	750 / 1,750 acfm [a]	--
--	Molybdenum Cleaner Area Scrubber	Material Handling Emission Points: • Sodium Hydrosulfide Loading Point • Sodium Hydrosulfide Mix Tank • Sodium Hydrosulfide Distribution Tank General Ventilation of the Flotation Building	H_2S	99%	12,500 acfm	--
--	6 EW Cell Ventilation Scrubbers	Process Equipment: • Electrowinning Cells	H_2SO_4, Cobalt Compounds	99%	5,000 acfm each	--
--	Laboratory Scrubber	Laboratory Equipment	Gaseous Emissions from Chemical Fume Hoods	--	9,000 acfm	--

[a] 750 acfm during filing from truck positive displacement blower, 1,750 acfm during bursts as truck empties.

9. COMPLIANCE PLAN

9.1 COMPLIANCE WITH A.C.C. TITLE 18, CHAPTER 2, ARTICLES 6, 7, AND 9 AND CHAPTER 17.16, ARTICLES III, IV, V, AND VI OF THE P.C.C.

Compliance with A.A.C. and P.C.C. will be demonstrated using the methods described in Table 4.1.

9.2 COMPLIANCE WITH A.A.C. TITLE 18, CHAPTER 2, ARTICLE 11 AND CHAPTER 17.16, ARTICLE VII OF THE P.C.C. AND RULES PROMULGATED PURSUANT TO A.R.S. §49-426.03 AND §49-426.06

Compliance with Article 11 of Title 18 of the A.A.C. and Article VII of the P.C.C. and the rules promulgated pursuant to A.R.S. §49-426.03 and A.R.S. §49-426.06 will be demonstrated using the methods described in Table 4.1.

9.3 COMPLIANCE WITH ARIZONA STATE IMPLEMENTATION PLAN

Compliance with the Arizona State Implementation Plan will be demonstrated using the methods described in Appendix F.

9.4 COMPLIANCE WITH VOLUNTARILY ACCEPTED LIMITATIONS

Compliance with P.C.C. Section 17.12.190 will be demonstrated using the methods described in Table 4.1. Table 4.1 demonstrates that the voluntarily accepted emission limitations are as stringent as the emission limitations that would otherwise be applicable, and that the emission limitations and methods used to demonstrate compliance are permanent, quantifiable, and otherwise enforceable as a practical matter.

9.5 COMPLIANCE SCHEDULE

The RCP will comply with all applicable regulatory requirements using the methods listed in Table 4.1. For applicable requirements that become effective during the permit term, the RCP will meet such requirements as required by the regulations in a timely manner.

9.6 COMPLIANCE WITH CONTROL EFFICIENCY FOR FUGITIVE SOURCES

A dust control plan demonstrating 90% control efficiency for fugitive dust emissions from regularly traveled unpaved haul roads at the RCP is presented in Appendix E.

10. COMPLIANCE CERTIFICATION

A certification of compliance with all applicable requirements signed by the responsible official of RCC is presented in Appendix A.

11. ACID RAIN PROGRAM COMPLIANCE AND NEW MAJOR SOURCE REQUIREMENTS

11.1 ACID RAIN COMPLIANCE PLAN

The RCP is not subject to any acid rain requirements. Therefore, an acid rain compliance plan is not required.

11.2 NEW MAJOR SOURCE REQUIREMENTS

The RCP is a not a major source. Therefore, the new major source requirements do not apply.

12. CALCULATIONS

Calculations were used in this application to determine process rates and emission rates. A description of these calculations is presented in the Emission Inventory Information, Volume I.

Full emission calculations are provided in the Emission Inventory Information, Volumes I and II.

APPENDIX A

STANDARD PERMIT APPLICATION FORM

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
Air Quality Division
1110 West Washington • Phoenix, AZ 85007 • Phone: (602) 771-2338

STANDARD PERMIT APPLICATION FORM
(As required by A.R.S. § 49-426, and Chapter 2, Article 3, Arizona Administrative Code)

1. Permit to be issued to: (Business license name of organization that is to receive permit) Rosemont Copper Company

2. Mailing Address: P.O. Box 35130
   City: Tucson State: AZ ZIP: 85740-5130

3. Previous Company Name: (if applicable) N/A

4. Name (or names) of Owners/Principals: Rosemont Copper Company
   Phone: (520) 495-3500 Fax: (520) 495-3540 Email: karnold@rosemontcopper.com

5. Name of Owner's Agent: N/A
   Phone: Fax: Email:

6. Plant/Site Manager/Contact Person and Title: Kathy Arnold, Director of Environmental and Regulatory Affairs
   Phone: (520) 495-3502 Fax: (520) 495-3540 Email: karnold@rosemontcopper.com

7. Plant Site Name: Rosemont Copper Project
   Plant Site Location/Address: 21900 S. Sonoita Highway (physical address is approximate)
   City: Vail County: Pima ZIP: 85641
   Indian Reservation (if applicable, which one): N/A
   Latitude/Longitude, Elevation: approximately 31° 50' N / 110° 45' W / 5000'

8. Equipment Purpose: Copper Mining and Processing
   Equipment List/Description: See Application

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9. Type of Organization:
   ☒ Corporation ☐ Individual Owner
   ☐ Partnership ☐ Government Entity (Government Facility Code:)
   ☐ Other

10. Permit Application Basis: ☒ New Source ☐ Revision ☐ Renewal of Existing Permit
    (Check all that apply.) ☐ Portable Source ☐ General Permit
    For renewal or modification, include existing permit number (and exp. date):
    Date of Commencement of Construction or Modification: Upon issuance of permit.
    Is **any** of the equipment to be leased to another individual or entity? ☐ Yes ☒ No
    Standard Industrial Classification Code: 1021 State Permit Class: Class II

11. Signature of Responsible Official of Organization:
    Official Title of Signer: Vice President, Environmental and Regulatory Affairs

12. Typed or Printed Name of Signer: Katherine Ann Arnold
    Date: Katherine Ann Arnold Telephone Number: (520) 495-3502
    Company Name: Rosemont Copper Company

EMISSION SOURCES

Estimated "Potential to Emit" per R18-2-101.
Review of applications and issuance of permits will be expedited by supplying all necessary information on this Table.

Date 11/15/2011

REGULATED AIR POLLUTANT DATA					EMISSION POINT DISCHARGE PARAMETERS										
EMISSION POINT (1)		CHEMICAL COMPOSITION OF TOTAL STREAM	R. AIR POLLUTANT EMISSION RATE		UTM COORDINATES OF EMISSION PT. (5)			STACK SOURCES (6)					NONPOINT SOURCES (7)	
								HEIGHT ABOVE GROUND	HEIGHT ABOVE STRUC.	EXIT DATA				
NUMBER	NAME	REGULATED AIR POLLUTANT NAME (2)	#/ HR. (3)	TONS/ YEAR (4)	ZONE	EAST (Mtrs)	NORTH (Mtrs)	(feet)	(feet)	DIA. (ft.)	VEL. (fps.)	TEMP. (°F)	LENGTH (ft.)	WIDTH (ft.)
MN01	Drilling	PM/TSP	104.00	18.10	12	522319.9	3521271.1	--	--	--	--	--	*	*
		PM_{10}	34.67	6.03										
		$PM_{2.5}$	6.42	1.12										
MN02	Blasting	PM/TSP	328.26	57.12	12	522753.4	3521978.6	--	--	--	--	--	200	200
		PM_{10}	170.69	29.70										
		$PM_{2.5}$	9.85	1.71										
		CO	3,484.00	606.22										
		NO_x	884.00	153.82										
		SO_2	104.00	18.10										
		CO_2	29,455.36	5,125.23										
		CH_4	1.19	0.21										
		N_2O	0.24	0.04										
MN03	Loading Concentrate Ore	PM/TSP	2.63	9.60	12	522319.9	3521271.1	--	--	--	--	--	*	*
		PM_{10}	1.24	4.54										
		$PM_{2.5}$	0.19	0.69										
MN04	Loading Leach Ore	PM/TSP	0.18	0.64	12	522319.9	3521271.1	--	--	--	--	--	*	*
		PM_{10}	0.08	0.30										
		$PM_{2.5}$	0.01	0.05										
MN05	Loading Waste Rock	PM/TSP	7.72	28.16	12	522319.9	3521271.1	--	--	--	--	--	*	*
		PM_{10}	3.65	13.32										
		$PM_{2.5}$	0.55	2.02										
MN06a	Hauling Concentrate Ore to Primary Crusher Dump Hopper / Run of Mine Stockpile (Inside the Pit)	PM/TSP	108.64	330.28	12	522319.9	3521271.1	--	--	--	--	--	*	*
		PM_{10}	27.92	84.87										
		$PM_{2.5}$	2.79	8.49										
MN06b	Hauling Concentrate Ore to Primary Crusher Dump Hopper / Run of Mine Stockpile (Outside the Pit)	PM/TSP	62.83	191.01	12	523554.6	3520843.0	--	--	--	--	--	53.4	53.4
		PM_{10}	16.15	49.08										
		$PM_{2.5}$	1.61	4.91										
MN07a	Hauling Leach Ore to Leach Pad (Inside the Pit)	PM/TSP	3.21	9.76	12	522319.9	3521271.1	--	--	--	--	--	*	*
		PM_{10}	0.83	2.51										
		$PM_{2.5}$	0.08	0.25										
MN07b	Hauling Leach Ore to Leach Pad (Outside the Pit)	PM/TSP	5.30	16.11	12	523554.6	3520843.0	--	--	--	--	--	53.4	53.4
		PM_{10}	1.36	4.14										
		$PM_{2.5}$	0.14	0.41										
MN08a	Hauling Waste Rock to Waste Rock Storage Area (Inside the Pit)	PM/TSP	228.78	695.51	12	522319.9	3521271.1	--	--	--	--	--	*	*
		PM_{10}	58.79	178.71										
		$PM_{2.5}$	5.88	17.87										

EMISSION SOURCES

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Date 11/15/2011

REGULATED AIR POLLUTANT DATA					EMISSION POINT DISCHARGE PARAMETERS										
EMISSION POINT (1)		CHEMICAL COMPOSITION OF TOTAL STREAM	R. AIR POLLUTANT EMISSION RATE		UTM COORDINATES OF EMISSION PT. (5)			STACK SOURCES (6)					NONPOINT SOURCES (7)	
								HEIGHT ABOVE GROUND	HEIGHT ABOVE STRUC.	EXIT DATA				
NUMBER	NAME	REGULATED AIR POLLUTANT NAME (2)	#/ HR. (3)	TONS/ YEAR (4)	ZONE	EAST (Mtrs)	NORTH (Mtrs)	(feet)	(feet)	DIA. (ft.)	VEL. (fps.)	TEMP. (°F)	LENGTH (ft.)	WIDTH (ft.)
MN08b	Hauling Waste Rock to Waste Rock Storage Area (Outside the Pit)	PM/TSP	405.16	1,231.69	12	523554.6	3520843.0	--	--	--	--	--	53.4	53.4
		PM_{10}	104.11	316.49										
		$PM_{2.5}$	10.41	31.65										
MN09	Unloading Concentrate Ore to Run of Mine Stockpile	PM/TSP	4.46	1.63	12	523945.9	3521709.9	--	--	--	--	--	39	39
		PM_{10}	2.11	0.77										
		$PM_{2.5}$	0.32	0.12										
MN10	Unloading Leach Ore to Leach Pad	PM/TSP	0.30	1.08	12	524255.1	3520716.6	--	--	--	--	--	28.5	28.5
		PM_{10}	0.14	0.51										
		$PM_{2.5}$	0.02	0.08										
MN11	Unloading Waste Rock to Waste Rock Storage Area	PM/TSP	13.07	47.71	12	524028.6	3520056.4	--	--	--	--	--	28.5	28.5
		PM_{10}	6.18	22.57										
		$PM_{2.5}$	0.94	3.42										
MN12	Bulldozer Use	PM/TSP	17.78	77.87	12	522319.9	3521271.1	--	--	--	--	--	*	*
		PM_{10}	2.68	11.74										
		$PM_{2.5}$	1.87	8.18										
MN13a	Water Truck Use (Inside the Pit)	PM/TSP	13.99	42.53	12	522319.9	3521271.1	--	--	--	--	--	*	*
		PM_{10}	3.59	10.93										
		$PM_{2.5}$	0.36	1.09										
MN13b	Water Truck Use (Outside the Pit)	PM/TSP	19.44	59.09	12	523554.6	3520843.0	--	--	--	--	--	53.4	53.4
		PM_{10}	4.99	15.18										
		$PM_{2.5}$	0.50	1.52										
MN14	Grader Use	PM/TSP	19.79	86.69	12	522319.9	3521271.1	--	--	--	--	--	*	*
		PM_{10}	6.93	30.35										
		$PM_{2.5}$	0.61	2.69										
MN15a	Support Vehicle Use (Inside the Pit)	PM/TSP	82.40	170.88	12	522319.9	3521271.1	--	--	--	--	--	*	*
		PM_{10}	21.17	43.91										
		$PM_{2.5}$	2.12	4.39										
MN15b	Support Vehicle Use (Outside the Pit)	PM/TSP	82.40	170.88	12	523554.6	3520843.0	--	--	--	--	--	53.4	53.4
		PM_{10}	21.17	43.91										
		$PM_{2.5}$	2.12	4.39										
PC01	Wind Erosion of the Run of Mine Stockpile	PM/TSP	1.24	5.43	12	523924.1	3521760.1	--	--	--	--	--	1043	1043
		PM_{10}	0.62	2.72										
		$PM_{2.5}$	0.09	0.41										
PC02	Unloading to Primary Crusher Dump Hopper (H-CDp) from Haul Trucks or Run of Mine Stockpile	PM/TSP	1.45	2.85	12	524077.9	3521773.9	--	--	--	--	--	39	39
		PM_{10}	0.68	1.35										
		$PM_{2.5}$	0.10	0.20										

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EMISSION POINT (1)		CHEMICAL COMPOSITION OF TOTAL STREAM	R. AIR POLLUTANT EMISSION RATE		UTM COORDINATES OF EMISSION PT. (5)			STACK SOURCES (6)					NONPOINT SOURCES (7)	
								HEIGHT ABOVE GROUND	HEIGHT ABOVE STRUC.	EXIT DATA				
NUMBER	NAME	REGULATED AIR POLLUTANT NAME (2)	#/ HR. (3)	TONS/ YEAR (4)	ZONE	EAST (Mtrs)	NORTH (Mtrs)	(feet)	(feet)	DIA. (ft.)	VEL. (fps.)	TEMP. (°F)	LENGTH (ft.)	WIDTH (ft.)
MD04	Molybdenum Concentrate Bin (B-MC) to Molybdenum Concentrate Hopper (H-MC)	PM/TSP	0.0006	0.001	12	524033.8	3522982.3	5015	10	--	--	--	--	6.5
		PM_{10}	0.0003	0.0005										
		$PM_{2.5}$	0.00004	0.00008										
TDS04	Fixed Tailings Conveyor No. 2 (CV-F2) to Fixed Tailings Conveyor No. 3 (CV-F3)	PM/TSP	0.26	0.52	12	524603.0	3522350.1	4972	10	--	--	--	--	6.5
		PM_{10}	0.12	0.25										
		$PM_{2.5}$	0.02	0.04										
TDS05	Fixed Tailings Conveyor No. 3 (CV-F3) to Relocatable Conveyor (CV-R1)	PM/TSP	0.26	0.52	12	524801.3	3522465.1	--	--	--	--	--	na	6.5
		PM_{10}	0.12	0.25										
		$PM_{2.5}$	0.02	0.04										
TDS06	Relocatable Conveyor (CV-R1) to Shiftable Conveyor (CV-S1)	PM/TSP	0.26	0.52	12	524824.4	3522475.9	--	--	--	--	--	na	7.5
		PM_{10}	0.12	0.25										
		$PM_{2.5}$	0.02	0.04										
TDS07	Shiftable Conveyor (CV-S1) to Belt Wagon Conveyor (CV-BW1)	PM/TSP	2.00	4.00	12	524903.9	3522511.6	--	--	--	--	--	na	8.5
		PM_{10}	0.95	1.89										
		$PM_{2.5}$	0.14	0.29										
TDS08	Belt Wagon Conveyor (CV-BW1) to Spreader Crawler Mounted Conveyor (CV-SP1)	PM/TSP	2.00	4.00	12	524973.1	3522545.4	--	--	--	--	--	na	9.5
		PM_{10}	0.95	1.89										
		$PM_{2.5}$	0.14	0.29										
TDS09	Spreader Crawler Mounted Conveyor (CV-SP1) to Tailings Storage	PM/TSP	2.00	4.00	12	525053.9	3522581.1	--	--	--	--	--	na	10.5
		PM_{10}	0.95	1.89										
		$PM_{2.5}$	0.14	0.29										
TDS10	Wind Erosion of Tailings Storage	PM/TSP	6.90	30.23	12	525098.2	3522631.3	--	--	--	--	--	5000	4000
		PM_{10}	3.45	15.11										
		$PM_{2.5}$	0.52	2.27										
SXE01	Solvent Extraction	VOC	0.86	3.77	12	na	na	--	--	--	--	--	na	na
		Total HAPs	0.76	3.32										
SXE02	Electrowinning Commercial Cells (EWCC)	H_2SO_4	0.004	0.0182	12	na	na	na	na	na	na	na	--	--
		Total HAPs	0.0000006	0.000003										

EMISSION SOURCES

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Date 11/15/2011

REGULATED AIR POLLUTANT DATA					EMISSION POINT DISCHARGE PARAMETERS									
EMISSION POINT (1)		CHEMICAL COMPOSITION OF TOTAL STREAM	R. AIR POLLUTANT EMISSION RATE		UTM COORDINATES OF EMISSION PT. (5)			STACK SOURCES (6)					NONPOINT SOURCES (7)	
								HEIGHT ABOVE GROUND	HEIGHT ABOVE STRUC.	EXIT DATA				
NUMBER	NAME	REGULATED AIR POLLUTANT NAME (2)	#/ HR. (3)	TONS/ YEAR (4)	ZONE	EAST (Mtrs)	NORTH (Mtrs)	(feet)	(feet)	DIA. (ft.)	VEL. (fps.)	TEMP. (°F)	LENGTH (ft.)	WIDTH (ft.)
FB01	Diesel Electrowinning Hot Water Generator (HWG)	PM/TSP	0.14	0.63	12	524241.0	3522386.3	5011	12	0.3	130.2	1000.4	--	--
		PM_{10}	0.10	0.44										
		$PM_{2.5}$	0.07	0.30										
		CO	0.22	0.96										
		NO_x	0.88	3.84										
		SO_2	0.009	0.04										
		VOC	0.009	0.04										
		CO_2	1,016.78	4,453.51										
		CH_4	0.04	0.18										
		N_2O	0.008	0.04										
		Total HAPs	0.003	0.01										
FB02	Thickener Area Emergency Generator (TEG)	PM/TSP	0.44	0.11	12	524241.5	3522806.6	4966.2	13.0	1.0	82.0	890.0	--	--
		PM_{10}	0.44	0.11										
		$PM_{2.5}$	0.44	0.11										
		CO	7.72	1.93										
		NO_x	13.23	3.31										
		SO_2	0.01	0.004										
		VOC	0.882	0.22										
		CO_2	1,530.61	382.65										
		CH_4	0.06	0.02										
		N_2O	0.01	0.003										
		Total HAPs	0.01	0.004										
FB03	PLS Pond Area Emergency Generator (PEG)	PM/TSP	0.44	0.11	12	524103.3	3522359.1	5057.2	13.0	1.0	82.0	890.0	--	--
		PM_{10}	0.44	0.11										
		$PM_{2.5}$	0.44	0.11										
		CO	7.72	1.93										
		NO_x	13.23	3.31										
		SO_2	0.01	0.004										
		VOC	0.882	0.22										
		CO_2	1,530.61	382.65										
		CH_4	0.06	0.02										
		N_2O	0.01	0.003										
		Total HAPs	0.01	0.004										

EMISSION SOURCES

Estimated "Potential to Emit" per R18-2-101.
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Date 11/15/2011

REGULATED AIR POLLUTANT DATA					EMISSION POINT DISCHARGE PARAMETERS									
EMISSION POINT (1)		CHEMICAL COMPOSITION OF TOTAL STREAM	R. AIR POLLUTANT EMISSION RATE		UTM COORDINATES OF EMISSION PT. (5)			STACK SOURCES (6)					NONPOINT SOURCES (7)	
								HEIGHT ABOVE GROUND	HEIGHT ABOVE STRUC.	EXIT DATA				
NUMBER	NAME	REGULATED AIR POLLUTANT NAME (2)	#/ HR. (3)	TONS/ YEAR (4)	ZONE	EAST (Mtrs)	NORTH (Mtrs)	(feet)	(feet)	DIA. (ft.)	VEL. (fps.)	TEMP. (°F)	LENGTH (ft.)	WIDTH (ft.)
FB04	Main Substation Emergency Generator (MEG)	PM/TSP	0.33	0.08	12	523848.5	3522948.1	5092.9	13.0	1.0	82.0	890.0	--	--
		PM_{10}	0.33	0.08										
		$PM_{2.5}$	0.33	0.08										
		CO	5.79	1.45										
		NO_x	9.92	2.48										
		SO_2	0.01	0.003										
		VOC	0.66	0.17										
		CO_2	1,147.96	286.99										
		CH_4	0.05	0.01										
		N_2O	0.009	0.002										
		Total HAPs	0.01	0.003										
FB05	Administration Building Emergency Generator (AEG)	PM/TSP	0.33	0.08	12	524493.0	3522844.6	4989.8	13.0	1.0	82.0	890.0	--	--
		PM_{10}	0.33	0.08										
		$PM_{2.5}$	0.33	0.08										
		CO	5.79	1.45										
		NO_x	9.92	2.48										
		SO_2	0.01	0.003										
		VOC	0.66	0.17										
		CO_2	1,147.96	286.99										
		CH_4	0.05	0.01										
		N_2O	0.009	0.002										
		Total HAPs	0.01	0.003										
FB06	Electrowinning Building Emergency Generator (EWEG)	PM/TSP	0.04	0.01	12	524242.5	3522366.3	5020.2	12.0	0.3	130.2	1000.0	--	--
		PM_{10}	0.04	0.01										
		$PM_{2.5}$	0.04	0.01										
		CO	0.55	0.14										
		NO_x	0.49	0.12										
		SO_2	0.0007	0.0002										
		VOC	0.03	0.007										
		CO_2	76.53	19.13										
		CH_4	0.003	0.0008										
		N_2O	0.0006	0.0002										
		Total HAPs	0.002	0.0005										

EMISSION SOURCES

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Date 11/15/2011

REGULATED AIR POLLUTANT DATA					EMISSION POINT DISCHARGE PARAMETERS									
EMISSION POINT (1)		CHEMICAL COMPOSITION OF TOTAL STREAM	R. AIR POLLUTANT EMISSION RATE		UTM COORDINATES OF EMISSION PT. (5)			STACK SOURCES (6)					NONPOINT SOURCES (7)	
								HEIGHT ABOVE GROUND	HEIGHT ABOVE STRUC.	EXIT DATA				
NUMBER	NAME	REGULATED AIR POLLUTANT NAME (2)	#/ HR. (3)	TONS/ YEAR (4)	ZONE	EAST (Mtrs)	NORTH (Mtrs)	(feet)	(feet)	DIA. (ft.)	VEL. (fps.)	TEMP. (°F)	LENGTH (ft.)	WIDTH (ft.)
FB07	Primary Crusher Fire Water Pump (PCFWP)	PM/TSP	0.13	0.03	12	524058.3	3521791.6	5044.9	9.0	0.3	338.0	980.0	--	--
		PM_{10}	0.13	0.03										
		$PM_{2.5}$	0.13	0.03										
		CO	2.30	0.58										
		NO_x	2.46	0.61										
		SO_2	0.004	0.001										
		VOC	0.18	0.04										
		CO_2	456.55	114.14										
		CH_4	0.02	0.005										
		N_2O	0.004	0.0009										
		Total HAPs	0.01	0.003										
FB08	SX/EW Fire Water Pump (SXFWP)	PM/TSP	0.13	0.03	12	524105.8	3522396.8	5049.0	9.0	0.3	338.0	980.0	--	--
		PM_{10}	0.13	0.03										
		$PM_{2.5}$	0.13	0.03										
		CO	2.30	0.58										
		NO_x	2.46	0.61										
		SO_2	0.004	0.001										
		VOC	0.18	0.04										
		CO_2	456.55	114.14										
		CH_4	0.02	0.005										
		N_2O	0.004	0.0009										
		Total HAPs	0.01	0.003										
MS01	Transfer of Bulk Pebble Lime to the Bulk Pebble Lime Silo (S-BPL)	PM/TSP	0.32	1.15	12	523891.5	3522885.8	5059.2	9.8	--	--	--	--	6.5
		PM_{10}	0.15	0.55										
		$PM_{2.5}$	0.02	0.08										
MS03	Bulk Pebble Lime Silo Screw Conveyor (CV-BPLS) to SAG Mill Feed Conveyor (CV-SMF)	PM/TSP	0.04	0.16	12	524050.8	3522871.3	5051.0	9.8	--	--	--	--	6.5
		PM_{10}	0.02	0.07										
		$PM_{2.5}$	0.003	0.01										
MS04	Transfer of Lime to the Lime Storage Bin (B-L)	PM/TSP	0.16	0.58	12	524078.7	3522861.6	5033.2	9.8	--	--	--	--	6.5
		PM_{10}	0.07	0.27										
		$PM_{2.5}$	0.01	0.04										
MS05	Transfer of Sodium Metasilicate to the Sodium Metasilicate Storage Bin (B-SM)	PM/TSP	0.0003	0.001	12	524123.4	3522869.4	5022.6	9.8	--	--	--	--	6.5
		PM_{10}	0.0002	0.0006										
		$PM_{2.5}$	0.00002	0.00009										
MS06	Transfer of Flocculant from Supersacks to Flocculant Storage Bins (B-F1/F2)	PM/TSP	0.001	0.005	12	524123.4	3522869.4	5022.6	9.8	--	--	--	--	6.5
		PM_{10}	0.0006	0.002										
		$PM_{2.5}$	0.00009	0.0003										

EMISSION SOURCES

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Date 11/15/2011

REGULATED AIR POLLUTANT DATA					EMISSION POINT DISCHARGE PARAMETERS									
EMISSION POINT (1)		CHEMICAL COMPOSITION OF TOTAL STREAM	R. AIR POLLUTANT EMISSION RATE		UTM COORDINATES OF EMISSION PT. (5)			STACK SOURCES (6)					NONPOINT SOURCES (7)	
								HEIGHT ABOVE GROUND	HEIGHT ABOVE STRUC.	EXIT DATA				
NUMBER	NAME	REGULATED AIR POLLUTANT NAME (2)	#/ HR. (3)	TONS/ YEAR (4)	ZONE	EAST (Mtrs)	NORTH (Mtrs)	(feet)	(feet)	DIA. (ft.)	VEL. (fps.)	TEMP. (°F)	LENGTH (ft.)	WIDTH (ft.)
MS07	Transfer of Guar from Bags to Guar Feeder (F-Gu)	PM/TSP	0.0002	0.0006	12	524198.0	3522368.1	5042.5	9.8	--	--	--	--	6.5
		PM_{10}	0.00008	0.0003										
		$PM_{2.5}$	0.00001	0.00004										
MS08	Transfer of Granular Cobalt Sulfate from Bags to Cobalt Sulfate Feeder (F-CoS)	PM/TSP	0.000007	0.00002	12	524198.0	3522368.1	5042.5	9.8	--	--	--	--	6.5
		PM_{10}	0.000003	0.00001										
		$PM_{2.5}$	0.0000005	0.000002										
T01	C7 Distribution Tank (T-C7D)	VOC	0.11	0.47	12	na	na	na	na	na	na	na	--	--
T02	MIBC Storage Tank (T-MIBCS)	VOC	0.004	0.02	12	na	na	na	na	na	na	na	--	--
T03	Diesel Fuel Storage Tank - Heavy Vehicles 1 (T-DFS-HV1)	VOC	0.01	0.06	12	na	na	na	na	na	na	na	--	--
		Total HAPs	0.002	0.008										
T04	Diesel Fuel Storage Tank - Heavy Vehicles 2 (T-DFS-HV2)	VOC	0.01	0.06	12	na	na	na	na	na	na	na	--	--
		Total HAPs	0.002	0.008										
PCL01	Crushing Area Scrubber (PC-CAS)	PM/TSP	1.29	5.65	12	524076.4	3521780.6	5054.4948	24	5.0	15.3	110.0	--	--
		PM_{10}	1.28	5.61										
		$PM_{2.5}$	1.13	4.94										
PCL02	Stockpile Area Scrubber (PC-SAS)	PM/TSP	2.61	11.45	12	523855.4	3522544.9	5104.9213	20	6.0	21.5	110.0	--	--
		PM_{10}	2.59	11.34										
		$PM_{2.5}$	2.10	9.18										
PCL03	Reclaim Tunnel Scrubber (PC-RTS)	PM/TSP	1.08	4.73	12	523862.1	3522669.4	5084.1207	20	6.0	12.7	110.0	--	--
		PM_{10}	1.07	4.69										
		$PM_{2.5}$	0.87	3.79										
PCL04	Pebble Crusher Area Scrubber (PC-PCAS)	PM/TSP	1.58	6.94	12	523898.7	3522876.4	5062.1719	24	5.0	18.7	110.0	--	--
		PM_{10}	1.56	6.83										
		$PM_{2.5}$	1.31	5.75										
PCL05	Copper Concentrate Scrubber 1 (PC-CCS1)	PM/TSP	3.59	15.71	12	524033.0	3522992.6	5008.4318	24	6.0	29.5	110.0	--	--
		PM_{10}	3.55	15.55										
		$PM_{2.5}$	3.04	13.33										
PCL06	Copper Concentrate Scrubber 2 (PC-CCS2)	PM/TSP	3.59	15.71	12	524043.8	3522990.6	5009.3504	24	6.0	29.5	110.0	--	--
		PM_{10}	3.55	15.55										
		$PM_{2.5}$	3.04	13.33										
PCL07	Molybdenum Scrubber (PC-MS) / Electrostatic Precipitator (PC-EP)	PM/TSP	0.02	0.07	12	524114.0	3522935.8	5054.9869	55	1.0	10.6	500.0	--	--
		PM_{10}	0.01	0.06										
		$PM_{2.5}$	0.01	0.06										
PCL08	Molybdenum Dust Collector (PC-MDC)	PM/TSP	0.23	0.99	12	524034.0	3522999.3	5004.2651	20	1.0	31.9	200.0	--	--
		PM_{10}	0.11	0.47										
		$PM_{2.5}$	0.02	0.07										

EMISSION SOURCES

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Date 11/15/2011

REGULATED AIR POLLUTANT DATA					EMISSION POINT DISCHARGE PARAMETERS									
EMISSION POINT (1)		CHEMICAL COMPOSITION OF TOTAL STREAM	R. AIR POLLUTANT EMISSION RATE		UTM COORDINATES OF EMISSION PT. (5)			STACK SOURCES (6)					NONPOINT SOURCES (7)	
								HEIGHT ABOVE GROUND	HEIGHT ABOVE STRUC.	EXIT DATA				
NUMBER	NAME	REGULATED AIR POLLUTANT NAME (2)	#/ HR. (3)	TONS/ YEAR (4)	ZONE	EAST (Mtrs)	NORTH (Mtrs)	(feet)	(feet)	DIA. (ft.)	VEL. (fps.)	TEMP. (°F)	LENGTH (ft.)	WIDTH (ft.)
PCL09	Laboratory Dust Collector 1 (PC-L1)	PM/TSP	0.58	2.56	12	523991.4	3522567.9	5060.7612	20	1.7	76.1	110.0	--	--
		PM_{10}	0.36	1.56										
		$PM_{2.5}$	0.17	0.76										
PCL10	Laboratory Dust Collector 2 (PC-L2)	PM/TSP	0.58	2.56	12	524009.6	3522566.4	5062.1719	20	1.7	76.1	110.0	--	--
		PM_{10}	0.36	1.56										
		$PM_{2.5}$	0.17	0.76										
PCL11	Laboratory Dust Collector 3 (PC-L3)	PM/TSP	0.58	2.56	12	524029.4	3522565.1	5064.3701	20	1.7	76.1	110.0	--	--
		PM_{10}	0.36	1.56										
		$PM_{2.5}$	0.17	0.76										

GROUND ELEVATION OF FACILITY ABOVE MEAN SEA LEVEL 5,350 feet

ADEQ STANDARD CONDITIONS ARE 293K AND 101.3 KILOPASCALS (A.A.C. R18-2-101)

General Instructions:

1. Identify each emission point with a unique number for this plant site, consistent with emission point identification used on plot plan, previous permits, and Emissions Inventory Questionnaire. Include fugitive emissions. Limit emission point number to eight (8) character spaces. For each emission point use as many lines as necessary to list regulated air pollutant data. Typical emission point names are: heater, vent, boiler, tank, reactor, separator, baghouse, fugitive, etc. Abbreviations are O.K.
2. Components to be listed include regulated air pollutants as defined in R18-2-101. Examples of typical component names are: Carbon Monoxide (CO), Nitrogen Oxides (NO_x), Sulfur Dioxide (SO_2), Volatile Organic Compounds (VOC), particulate matter (PM), particulate less than 10 microns (PM_{10}), etc. Abbreviations are O.K.
3. Pounds per hour (#/HR) is maximum potential emission rate expected by applicant.
4. Tons per year is annual maximum potential emission expected by applicant, which takes into account process operating schedule.
5. As a minimum applicant shall furnish a facility plot plan as described in the filing instructions. UTM coordinates are required only if the source is major source or is required to perform refined modeling for the purposes of demonstrating compliance with ambient air quality guidelines.
6. Supply additional information as follows if appropriate:
   (a) Stack exit configuration other than a round vertical stack. Show length and width for a rectangular stack. Indicate if horizontal discharge with a note.
   (b) Stack's height above supporting or adjacent structures if structure is within 3 "stack height above ground" of stack.
7. Dimensions of nonpoint sources as defined in R18-2-101.

* Emissions were grouped into the Open Pit Source with a length of 3,280 feet and width of 2,297 feet.
na = not available

EQUIPMENT LIST [a]

The following table should include all equipment utilized at the facility and be complete with all data requested. Be sure to notate the units (tons/hour, horsepower, etc.) when recording the Maximum Rated Capacity information. Be sure to notate the Serial Number and/or the Equipment ID Number. The date of manufacture must be included in order to determine if portions of the facility are NSPS applicable. Make additional copies of this form if necessary.

Type of Equipment	Maximum Rated Capacity	Make	Model	Serial Number	Date of Manufacturer	Equipment ID
Crusher Dump Hopper	680 tons	na [b]	na	na	New Source	H-CDp
Primary Crusher	6,950 tons/hr	Sandvik	na	na	New Source	PCr
Crusher Discharge Hopper	725 tons	na	na	na	New Source	H-CDs
Crusher Discharge Feeder	6,950 tons/hr	na	na	na	New Source	F-CD
Stockpile Feed Conveyor	2,690' L X 60" W	na	na	na	New Source	CV-SF
Crushing Area Scrubber	18,000 acfm	na	na	na	New Source	PC-CAS
Stockpile Tripper Conveyor	6,950 tons/hr	na	na	na	New Source	CV-ST
Stockpile Building	390’ L X 228’ W X 104’ H	na	na	na	New Source	BD-S
Stockpile Area Scrubber	36,500 acfm	na	na	na	New Source	PC-SAS
Reclaim Feeders	6,950 tons/hr	na	na	na	New Source	F-R1/R4
Reclaim Conveyor	6,950 tons/hr	na	na	na	New Source	CV-R

Type of Equipment	Maximum Rated Capacity	Make	Model	Serial Number	Date of Manufacturer	Equipment ID
Reclaim Tunnel Scrubber	15,000 acfm	na	na	na	New Source	PC-RTS
SAG Mill Feed Conveyor	8,726 tons/hr	na	na	na	New Source	CV-SMF
SAG Mill	8,726 tons/hr	Polysius	na	na	New Source	M-SAG
Trommel Screen	8,726 tons/hr	Polysius	na	na	New Source	Sn-T
Pebble Conveyor No. 1	1,851 tons/hr	na	na	na	New Source	CV-Pb1
Pebble Wash Screen	1,851 tons/hr	na	na	na	New Source	Sn-PbW
Pebble Conveyor No. 2	1,771 tons/hr	na	na	na	New Source	CV-Pb2
SAG Oversize Surge Bin	500 tons	na	na	na	New Source	B-SAGOS
Pebble Crusher Feeder	1,771 tons/hr	na	na	na	New Source	F-PbC
Pebble Crusher	1,771 tons/hr	na	na	na	New Source	PbC
Pebble Conveyor No. 3	1,771 tons/hr	na	na	na	New Source	CV-Pb3
Pebble Crusher Area Scrubber	22,000 acfm	na	na	na	New Source	PC-PCAS
Ball Mills	26' D X 40' EGL	na	na	na	New Source	M-B1/B2
Copper/Molybdenum/Tailings Flotation and Concentrating Equipment (flotation cells, column cells, thickeners, filters)	8,760 hr/yr	na	na	na	New Source	various

Type of Equipment	Maximum Rated Capacity	Make	Model	Serial Number	Date of Manufacturer	Equipment ID
Copper Regrind Mills	285 tons/hr	na	VTM-150-WB	na	New Source	M-CR1/CR2
Molybdenum Regrind Mill	30 tons/hr	na	VTM-40-WB	na	New Source	M-MR
Molybdenum Cleaner Regrind Mill	4 tons/hr	na	VTM-70-WB	na	New Source	M-MCR
Molybdenum Cleaner Area Scrubber	12,500 acfm	na	na	na	New Source	PC-MCAS
Filter Feed Trash Screen	138 tons/hr	na	na	na	New Source	Sn-FFT
Copper Concentrate Loadout Building	175’ L X 101’ W X 60’ H	na	na	na	New Source	BD-CCL
Copper Concentrate Conveyor	138 tons/hr	na	na	na	New Source	CV-CC
Copper Concentrate Scrubbers	50,000 acfm each	na	na	na	New Source	PC-CCS1/CCS2
Molybdenum Concentrate Dryer	1.90 tons/hr	na	na	na	New Source	D-MC
Molybdenum Scrubber	na	na	na	na	New Source	PC-MS
Electrostatic Precipitator	139 acfm	na	na	na	New Source	PC-EP
Molybdenum Concentrate Bin	20 tons	na	na	na	New Source	B-MC
Molybdenum Dust Collector	1,500 acfm	na	na	na	New Source	PC-MDC
Molybdenum Concentrate Hopper	20 ft^3	na	na	na	New Source	H-MC
Molybdenum Concentrate Conveyor	1.90 tons/hr	na	na	na	New Source	CV-MC

Type of Equipment	Maximum Rated Capacity	Make	Model	Serial Number	Date of Manufacturer	Equipment ID
Molybdenum Packaging and Weigh System	variable	na	na	na	New Source	MPS
Tailings Belt Feeders	10,722 tons/hr	na	na	na	New Source	F-T1/T14
Fixed Tailings Conveyor No. 1	10,722 tons/hr	na	na	na	New Source	CV-F1
Fixed Tailings Conveyor No. 2	10,722 tons/hr	na	na	na	New Source	CV-F2
Fixed Tailings Conveyor No. 3	10,722 tons/hr	na	na	na	New Source	CV-F3
Relocatable Conveyors	10,722 tons/hr	na	na	na	New Source	CV-R1/R2
Shiftable Conveyors with Cross Conveyor Trippers	10,722 tons/hr	na	na	na	New Source	CV-S1/S2
Belt Wagon Conveyor on Crawlers (movable)	10,722 tons/hr	na	na	na	New Source	CV-BW1
Spreader Crawler Mounted Conveyors (movable)	10,722 tons/hr	na	na	na	New Source	CV-SP1/SP2
SX Primary Mix Tanks	7.75' D X 9.75' H	na	na	na	New Source	T-E1P, E1PP, E2P, S1P
SX Secondary Mix Tanks	9.5' D X 9.75' H	na	na	na	New Source	T-E1S, E1PS, E2S, S1S
SX Tertiary Mix Tanks	9.5' D X 9.75' H	na	na	na	New Source	T-E1T, E1PT, E2T
SX Settlers	64' L X 33' W X 3.33' H	na	na	na	New Source	ES-E1, E1P, E2, SS-S1
Electrowinning Commercial Cells	22' L X 4' W X 5' H	na	na	na	New Source	EWCC
Cell Ventilation Wet Scrubbers	5,000 acfm	na	na	na	New Source	PC-EWCVS1/ EWCVS6

Type of Equipment	Maximum Rated Capacity	Make	Model	Serial Number	Date of Manufacturer	Equipment ID
Diesel Electrowinning Hot Water Generator	6.0 MMBtu/hr	na	na	na	New Source	HWG
Thickener Area Emergency Generator	1,000 kW	na	na	na	New Source	TEG
PLS Pond Area Emergency Generator	1,000 kW	na	na	na	New Source	PEG
Main Substation Emergency Generator	750 kW	na	na	na	New Source	MEG
Administration Building Emergency Generator	750 kW	na	na	na	New Source	AEG
Electrowinning Building Emergency Generator	50 kW	na	na	na	New Source	EWEG
Primary Crusher Fire Water Pump	400 hp	na	na	na	New Source	PCFWP
SX/EW Fire Water Pump	400 hp	na	na	na	New Source	SXFWP
Bulk Pebble Lime Silo	na	na	na	na	New Source	S-BPL
Bulk Pebble Lime Silo Screw Conveyor	na	na	na	na	New Source	CV-BPLS
Bulk Pebble Lime Silo Bin Vent	750 / 1,750 acfm	na	na	na	New Source	PC-BPLBV
Lime Storage Bin	na	na	na	na	New Source	B-L
Lime Storage Bin Vent	750 / 1,750 acfm	na	na	na	New Source	PC-LSBV
Sodium Metasilicate Storage Bin	na	na	na	na	New Source	B-SM
Sodium Metasilicate Storage Bin Vent	750 / 1,750 acfm	na	na	na	New Source	PC-SMSBV

Type of Equipment	Maximum Rated Capacity	Make	Model	Serial Number	Date of Manufacturer	Equipment ID
Flocculant Storage Bin 1	na	na	na	na	New Source	B-F1
Flocculant Storage Bin 2	na	na	na	na	New Source	B-F2
Guar Feeder	na	na	na	na	New Source	F-Gu
Cobalt Sulfate Feeder	na	na	na	na	New Source	F-CoS
C7 Distribution Tank	11,845 gallons	na	na	na	New Source	T-C7D
MIBC Storage Tank	11,845 gallons	na	na	na	New Source	T-MIBCS
Diesel Fuel Storage Tanks - Heavy Vehicles	100,000 gallons	na	na	na	New Source	T-DFS-HV1/HV2
Laboratory Dust Collectors	10,000 acfm	na	na	na	New Source	PC-L1/L3
Laboratory Wet Scrubber	9,000 acfm	na	na	na	New Source	PC-LWS

[a] Equipment List includes only affected equipment (i.e. subject to applicable regulations).

[b] na = not available

QUESTIONNAIRE FOR INTERNAL COMBUSTION ENGINES (ICEs) / GENERATORS SUBJECT TO NEW SOURCE PERFORMANCE STANDARDS (NSPS)

Please complete this questionnaire for each generator / internal combustion engine at the facility with year of manufacture 2006 and later. Make additional copies of this form if necessary.

1. What is the serial number / equipment id number of the generator?
   TEG (FB02), PEG (FB03), MEG (FB04), AEG (FB05), EWEG (FB06)

2. What is the date (mm/dd/yy) when the ICE commenced construction / reconstruction?
   New source

3. What is the date (mm/dd/yy) when the ICE was ordered or manufactured?
   New source

4. Is the engine a fire pump engine?

   ☐ Yes ☒ No

   Please proceed to Question 5.

5. Is the engine an emergency engine?

   ☒ Yes ☐ No

   Please proceed to Question 6.

6. Is the engine a pre-2007 model year engine?

   ☐ YES ☒ NO If the answer is NO, provide the model year of the engine.

   Model year of the engine: TBD

   Please proceed to Question 7.

7. Is the engine *certified*? *"Certified"* means covered by a valid United States (US) Environmental Protection Agency (EPA) certificate of conformity for an engine family.

   ☒ YES ☐ NO If the answer is YES, please provide the EPA Tier Certification for the engine.

   Please proceed to Question 8.

8. Is the engine equipped with a diesel particulate filter?

   ☐ Yes ☒ No

   Please proceed to Question 9.

9. What kind of fuel is the source firing in the engine?

   ☒ Diesel ☐ Natural Gas / LPG ☐ Gasoline

   Please proceed to Question 10.

10. What is the displacement of the engine in liters per cylinder?

    ☒ Less than 10 liters per cylinder

    ☐ Greater than 10 and less than 30 liters per cylinder

    ☐ Greater than or equal to 30 liters per cylinder

QUESTIONNAIRE FOR INTERNAL COMBUSTION ENGINES (ICEs) / GENERATORS SUBJECT TO NEW SOURCE PERFORMANCE STANDARDS (NSPS)

Please complete this questionnaire for each generator / internal combustion engine at the facility with year of manufacture 2006 and later. Make additional copies of this form if necessary.

1. What is the serial number / equipment id number of the generator?
   PCFWP (FB07), SXFWP (FB08)

2. What is the date (mm/dd/yy) when the ICE commenced construction / reconstruction?
   New source

3. What is the date (mm/dd/yy) when the ICE was ordered or manufactured?
   New source

4. Is the engine a fire pump engine?

   ☒ Yes ☐ No

   Please proceed to Question 5.

5. Is the engine an emergency engine?

   ☒ Yes ☐ No

   Please proceed to Question 6.

6. Is the engine a pre-2007 model year engine?

   ☐ YES ☒ NO If the answer is NO, provide the model year of the engine.

   Model year of the engine: TBD

   Please proceed to Question 7.

7. Is the engine *certified*? *"Certified"* means covered by a valid United States (US) Environmental Protection Agency (EPA) certificate of conformity for an engine family.

   ☒ YES ☐ NO If the answer is YES, please provide the EPA Tier Certification for the engine.

   Please proceed to Question 8.

8. Is the engine equipped with a diesel particulate filter?

   ☐ Yes ☒ No

   Please proceed to Question 9.

9. What kind of fuel is the source firing in the engine?

   ☒ Diesel ☐ Natural Gas / LPG ☐ Gasoline

   Please proceed to Question 10.

10. What is the displacement of the engine in liters per cylinder?

    ☒ Less than 10 liters per cylinder

    ☐ Greater than 10 and less than 30 liters per cylinder

    ☐ Greater than or equal to 30 liters per cylinder

ADEQ Arizona Department of Environmental Quality

1110 W. Washington St.
Phoenix, Arizona 85007
602-771-2338
1-800-234-5677 ext 7712237

Nonroad Engine Checklist

Complete this form and keep available to document that this engine is a nonroad engine. If your engine qualifies as a nonroad engine, it does not need to be included in an air quality permit, but ADEQ recommends that if your engine is a nonroad engine based on Questions C.iii and D below, that you use the log on the reverse side of this page to track the location of your nonroad engine.

If your internal combustion engine does not qualify as a nonroad engine, it must be included in an air quality permit, unless it is a motor vehicle per Question A. If it is subsequently determined that your engine does not qualify as a nonroad engine and requires a permit, for example, an engine in Question D that remains at one location for longer than 12 months, you may be subject to enforcement action by ADEQ, since in such a case as the example, the engine should have had a permit from the beginning of the 12 month period.

Company Name: Rosemont Copper Company
Company Equipment I.D. No.: various - TBD
Engine Manufacturer: TBD
Engine Model: TBD
Engine Serial No.: TBD
Engine Date of Manufacture: TBD

A. Is the engine used to propel a motor vehicle or a vehicle used solely for competition, or is the engine subject to motor vehicle standards promulgated under section 202 of the Federal Clean Air Act?

- ☐ **YES**, this engine does not qualify as a nonroad engine, **STOP**. Please note that there are no air quality permitting requirements for these types of engines even though they are not nonroad.
- ☒ **NO**, proceed to Question B

B. Is the engine regulated by a federal new source performance standard promulgated under section 111 of the Federal Clean Air Act?

- ☐ **YES**, this engine does not qualify as a nonroad engine, STOP.
- ☒ **NO**, proceed to Question C

C. Does your internal combustion engine meet the definition of nonroad engine as explained below?

i. Is the engine in or on a piece of equipment that is self-propelled or serves a dual purpose by both propelling itself and performing another function (such as garden tractors, off-highway mobile cranes and bulldozers)?

- ☐ **YES**, this engine qualifies as a nonroad engine, **STOP**.
- ☒ **NO**, proceed to Question C.ii

ii. Is the engine in or on a piece of equipment that is intended to be propelled while performing its function (such as lawnmowers and string trimmers)?

- ☐ **YES**, this engine qualifies as a nonroad engine, **STOP**.
- ☒ **NO**, proceed to Question C.iii

iii. Is the engine by itself or in or on a piece of equipment that is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another (indicia of transportability include, but are not limited to: wheels, skids, carrying handles, dolly, trailer, or platform)?

- ☒ **YES**, proceed to Question D
- ☐ **NO**, this engine does not qualify as a nonroad engine, **STOP**.

D. Will this engine, or any replacement engines, remain at one location for more than 12 consecutive months? (*A location is any single site at a building, structure, facility or installation. Please note that any engine that replaces the engine claimed as nonroad at a location and that is intended to perform the same or similar function as the claimed nonroad engine must be included in calculating the consecutive time period.*)

- ☐ **YES**, this engine does not qualify as a nonroad engine, **STOP**.
- ☒ **NO**, proceed to Question E

E. Is the engine located at a seasonal source? A seasonal source is a stationary source that remains in a single location on a permanent basis (at least 2 years) and that operates approximately 3 months (or more) each year.

- ☐ **YES**, proceed to Question F.
- ☒ **NO**, this engine qualifies as a nonroad engine, **STOP**

F. Will the engine remain at the seasonal source during the seasonal source's full annual operating period?

- ☐ **YES**, this engine does not qualify as a nonroad engine, **STOP**.
- ☐ **NO**, this engine qualifies as a nonroad engine, **STOP**

COMPLIANCE CERTIFICATION AND CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS

This certification must be signed by the Responsible Official. Applications without a signed certification will be deemed incomplete.

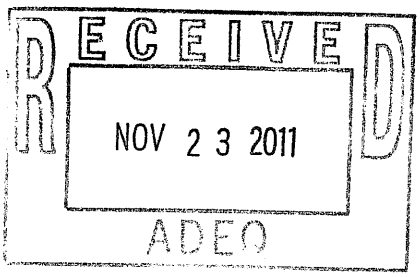
I certify that I have knowledge of the facts herein set forth, that the same are true, accurate and complete to the best of my knowledge and belief, and that all information not identified by me as confidential in nature shall be treated by ADEQ as public record. I also attest that I am in compliance with the applicable requirements of the Permit and will continue to comply with such requirements and any future requirements that become effective during the life of the Permit. I will present a certification of compliance to ADEQ no less than semiannually and more frequently if specified by ADEQ. I further state that I will assume responsibility for the construction, modification, or operation of the source in accordance with Arizona Administrative Code, Title 18, Chapter 2 and any permit issued thereof.

Typed or Printed Company Name: Rosemont Copper Company

Official Title of Signer: Vice President, Environmental and Regulatory Affairs

Typed or Printed Name of Signer: Katherine Ann Arnold

Signature of Responsible Official: Katherine Ann Arnold Date: November 15, 2011



APPENDIX B

PROCESS FLOW DIAGRAMS

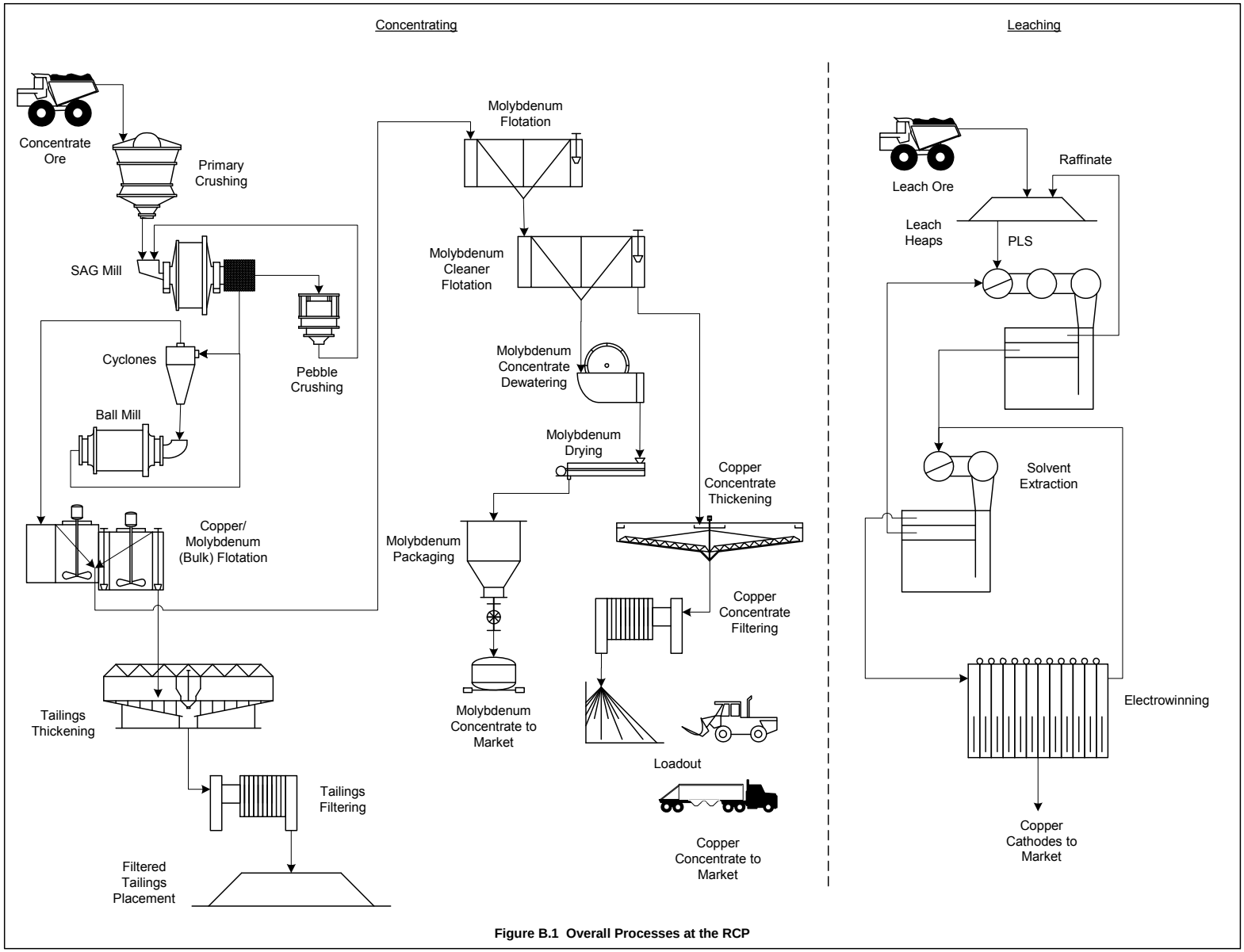


Figure B.1 Overall Processes at the RCP

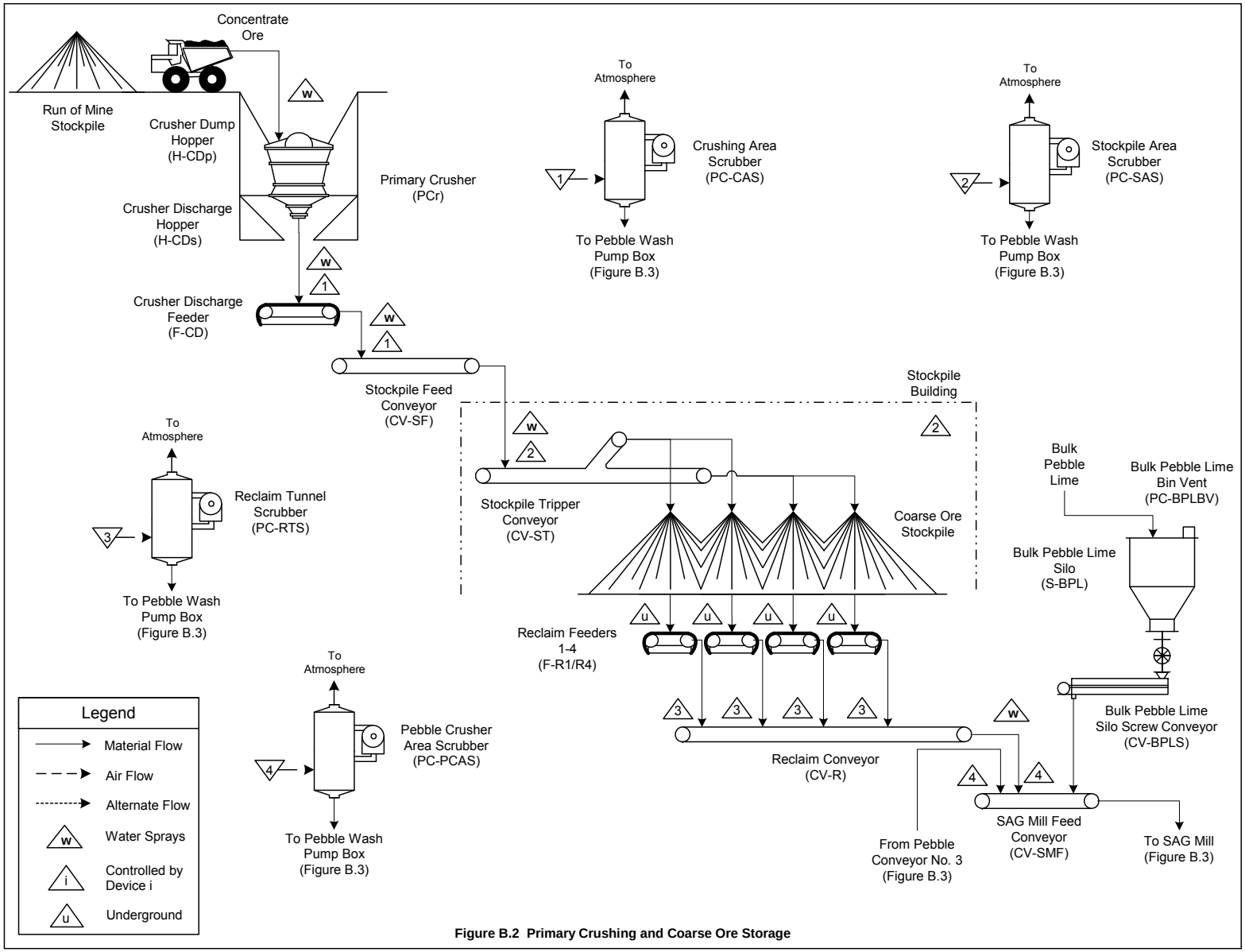


Figure B.2 Primary Crushing and Coarse Ore Storage

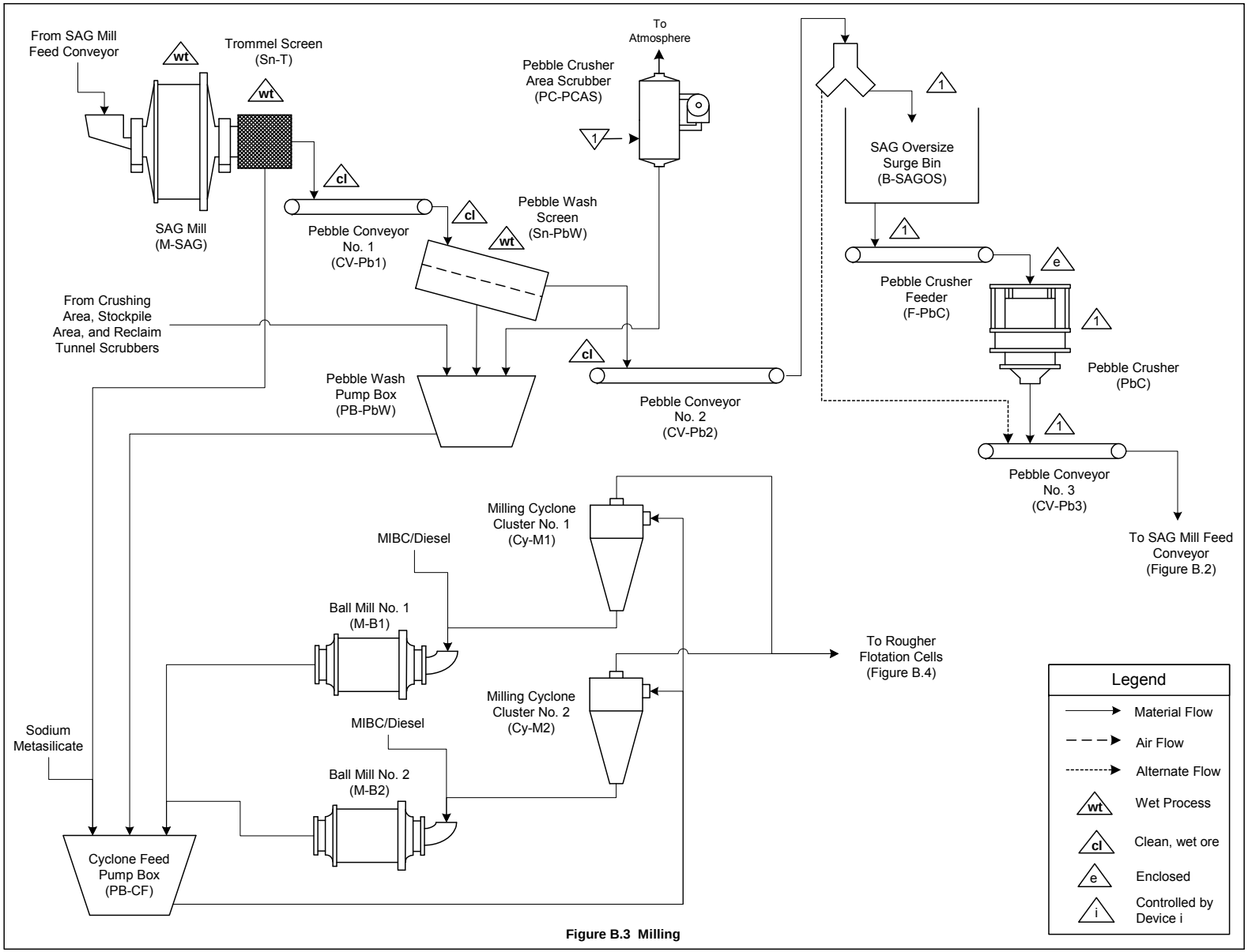


Figure B.3 Milling

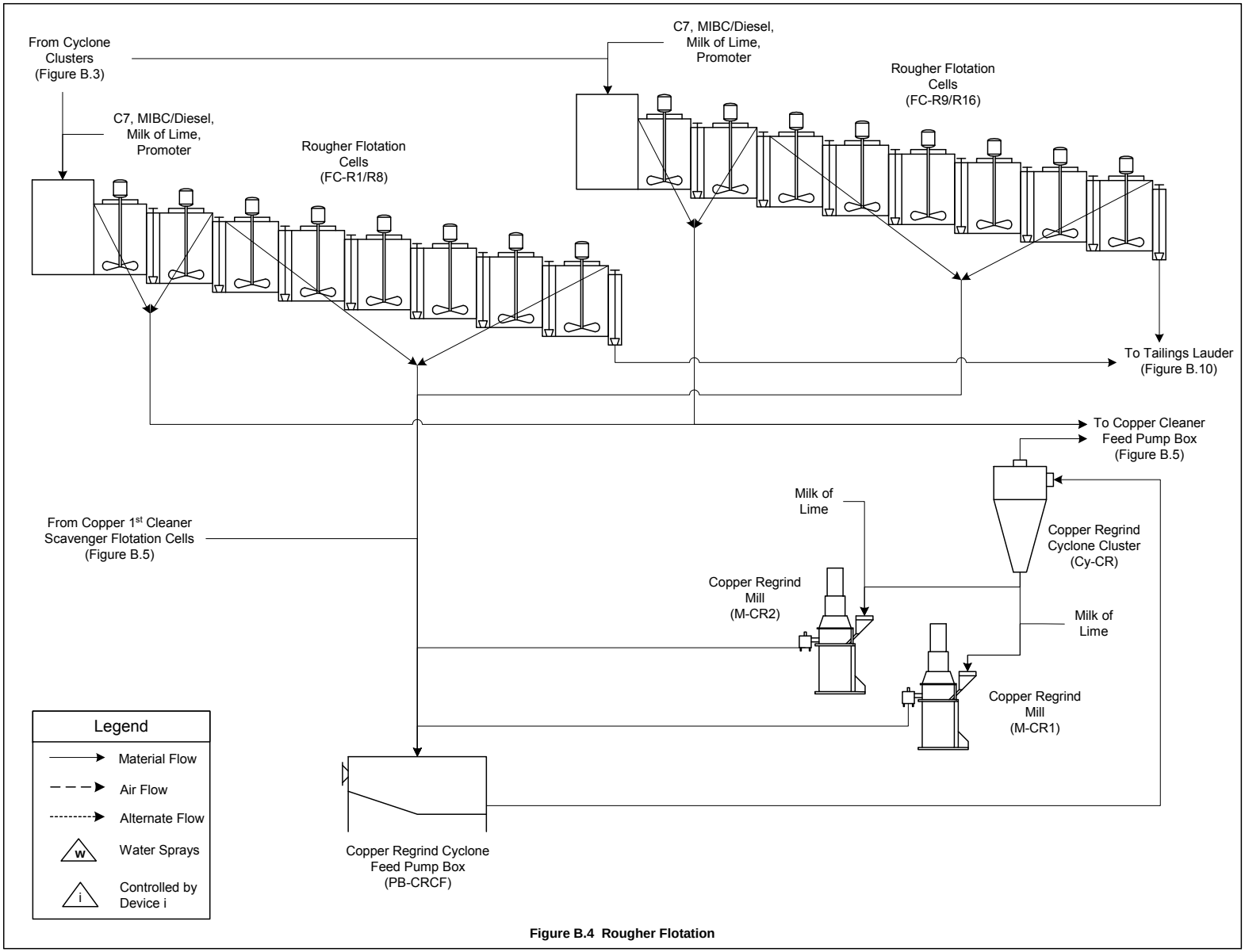


Figure B.4 Rougher Flotation

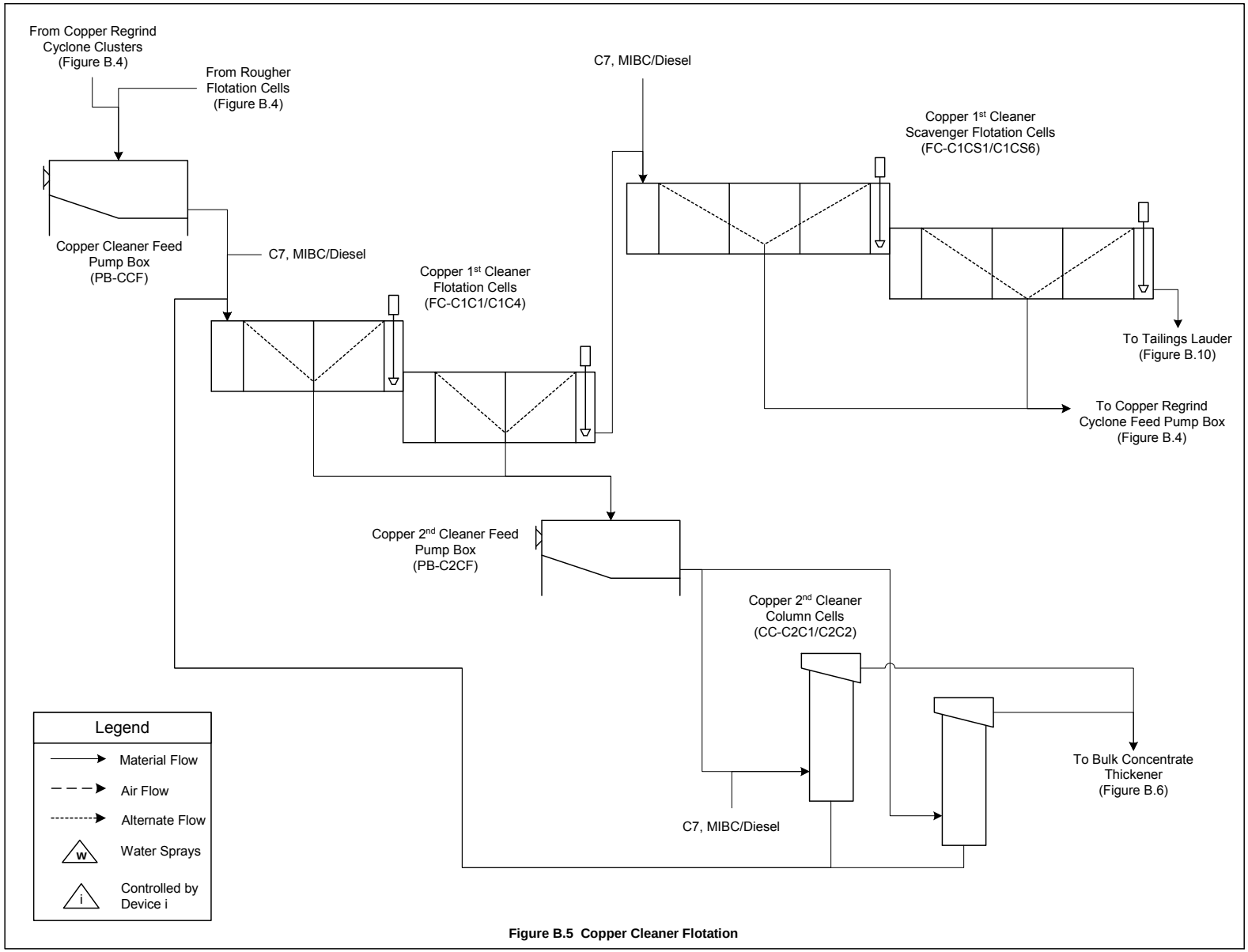


Figure B.5 Copper Cleaner Flotation

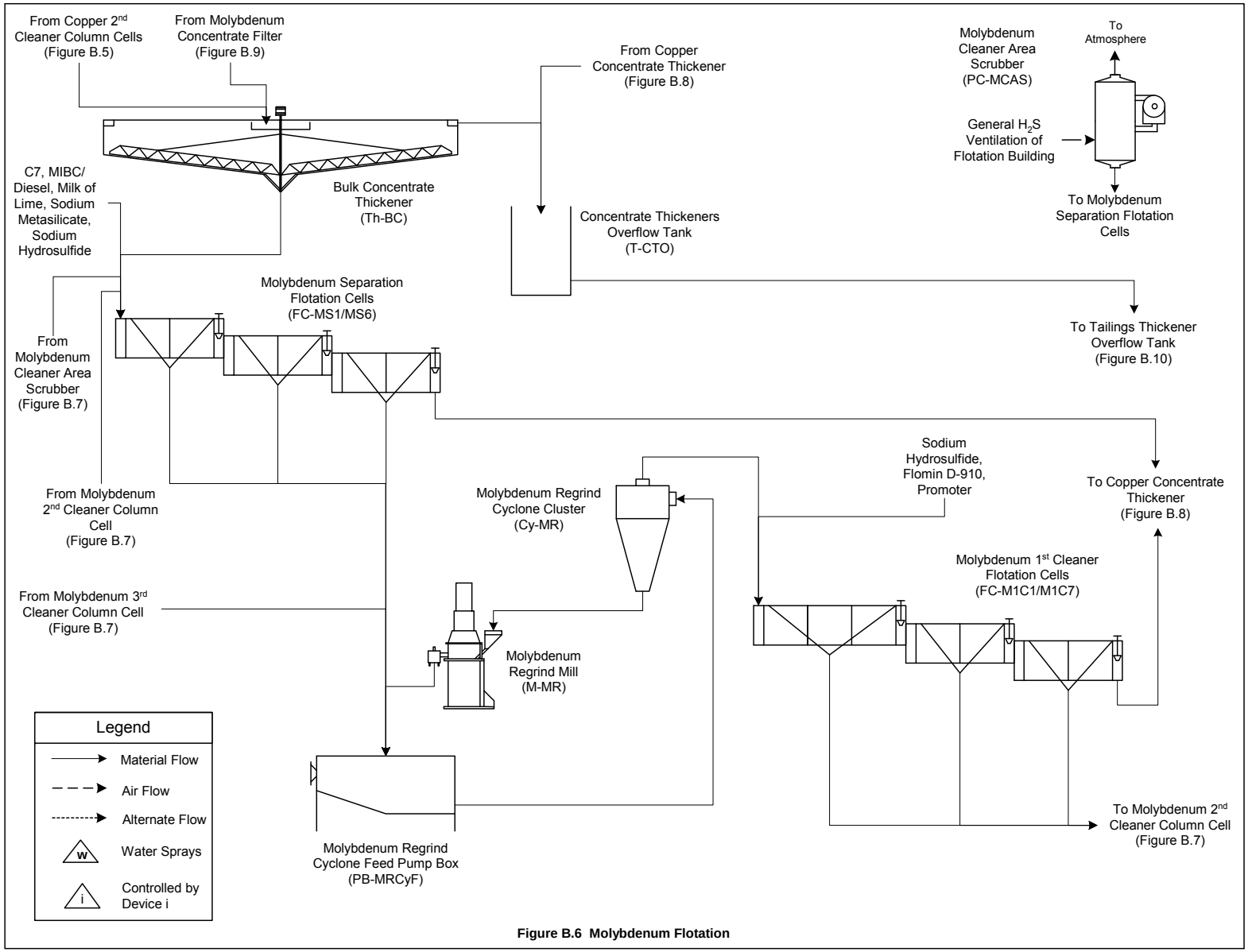


Figure B.6 Molybdenum Flotation

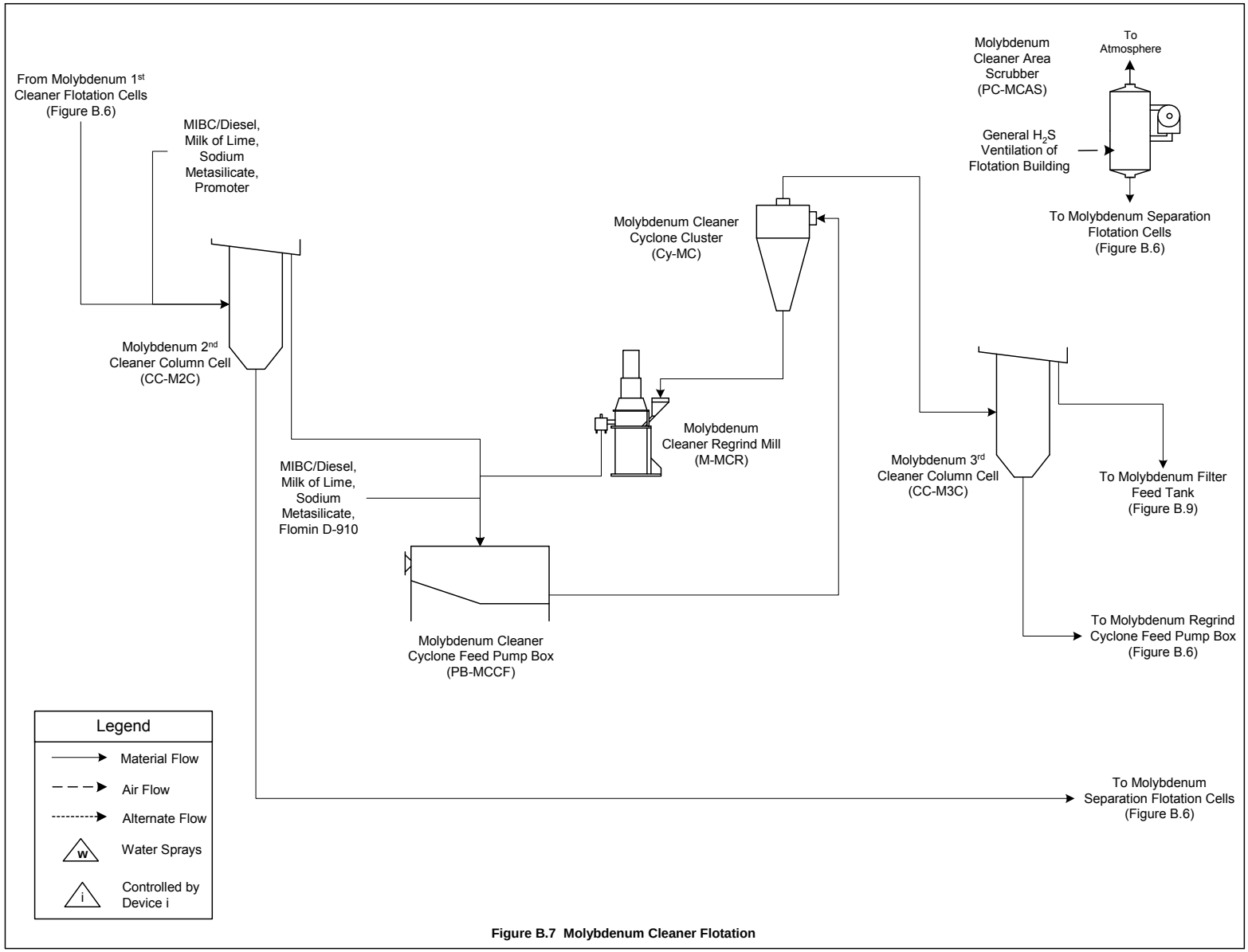


Figure B.7 Molybdenum Cleaner Flotation

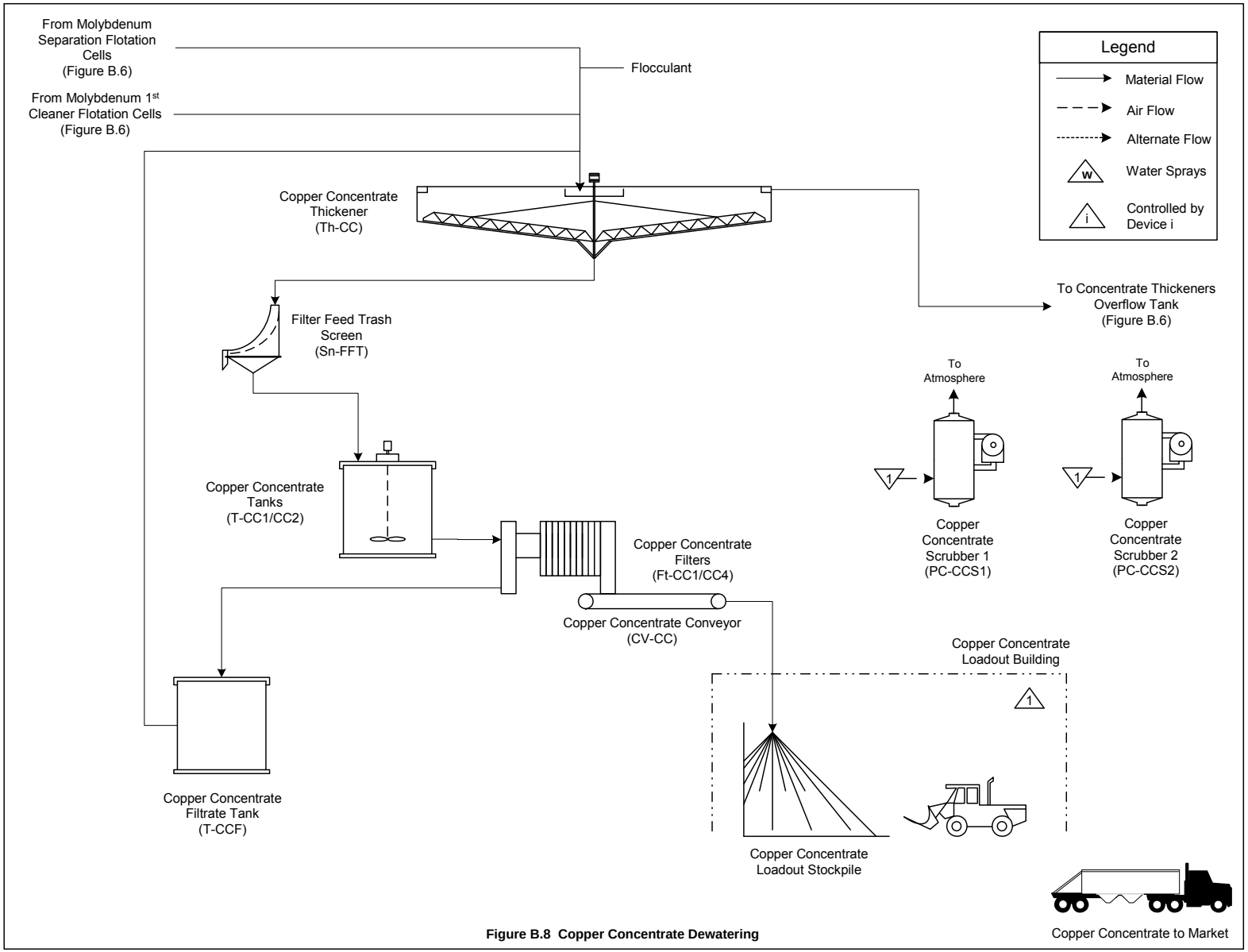


Figure B.8 Copper Concentrate Dewatering

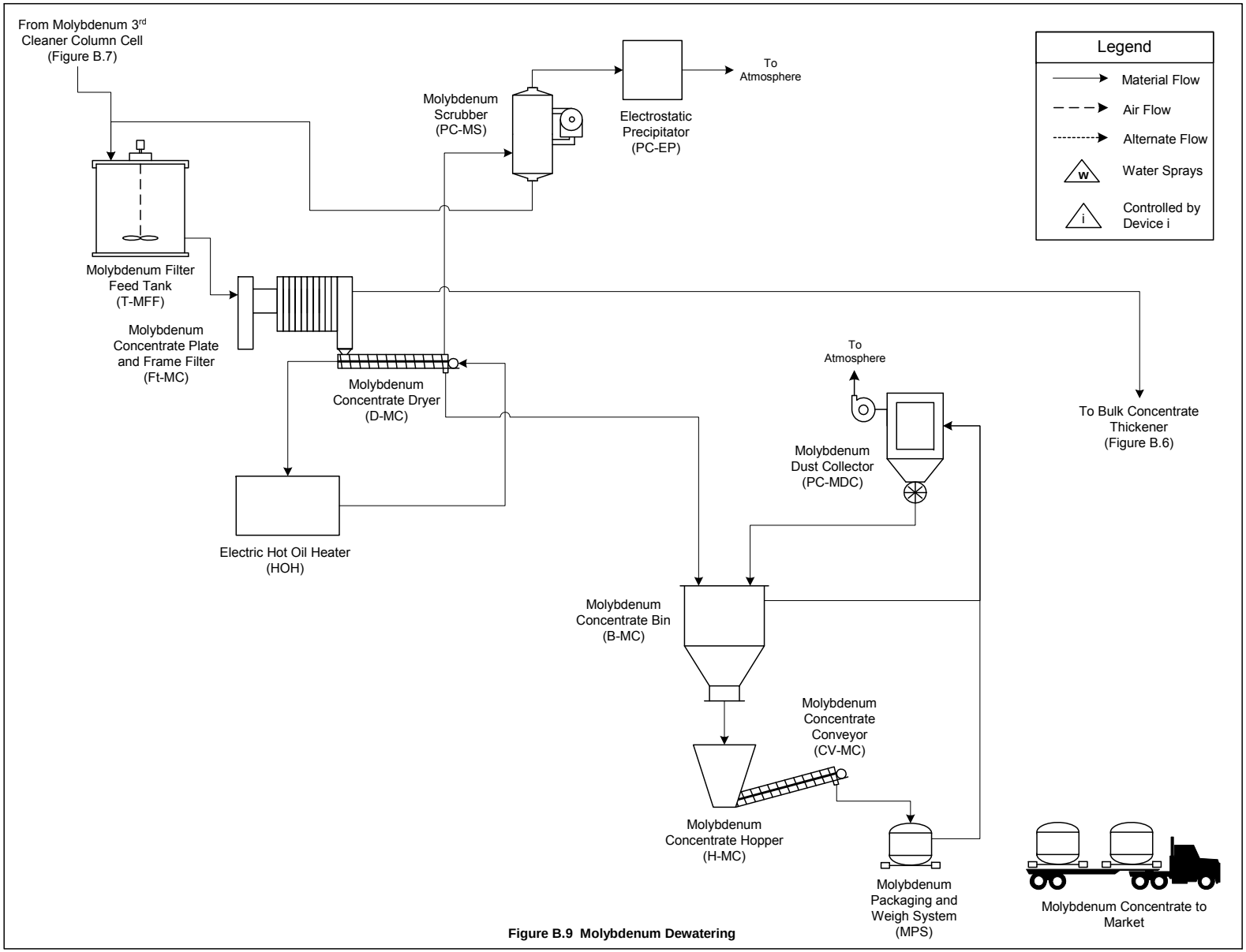


Figure B.9 Molybdenum Dewatering

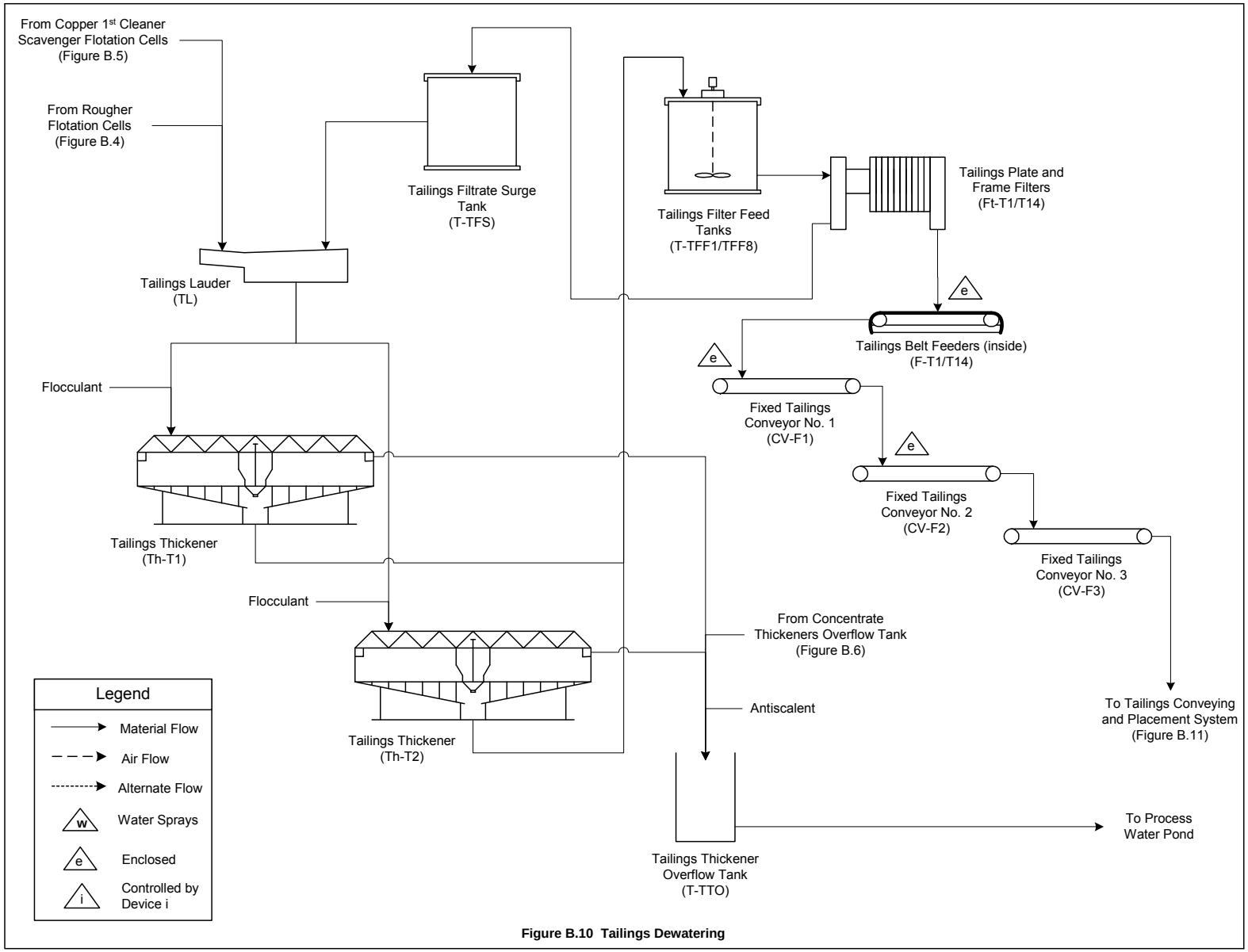


Figure B.10 Tailings Dewatering

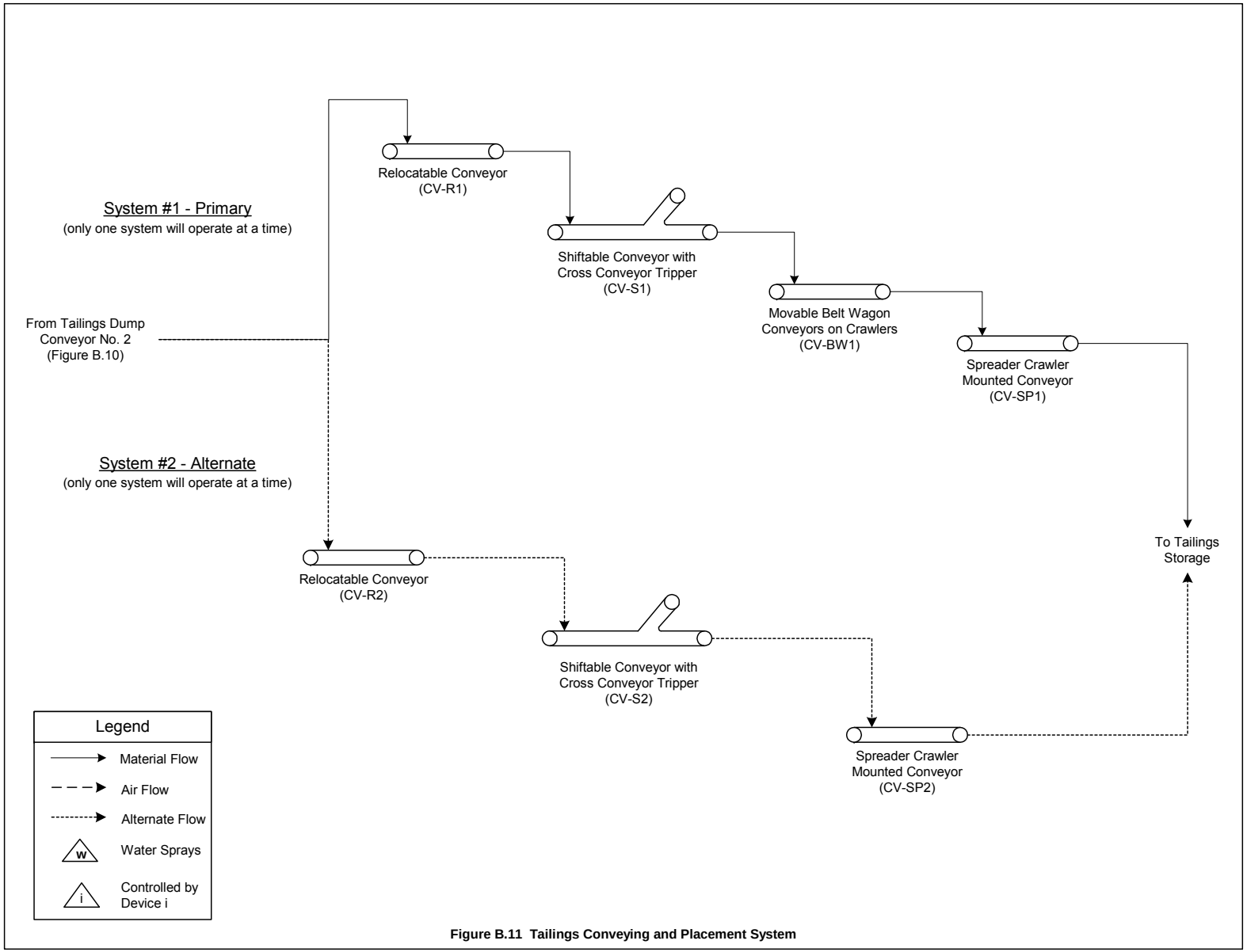


Figure B.11 Tailings Conveying and Placement System

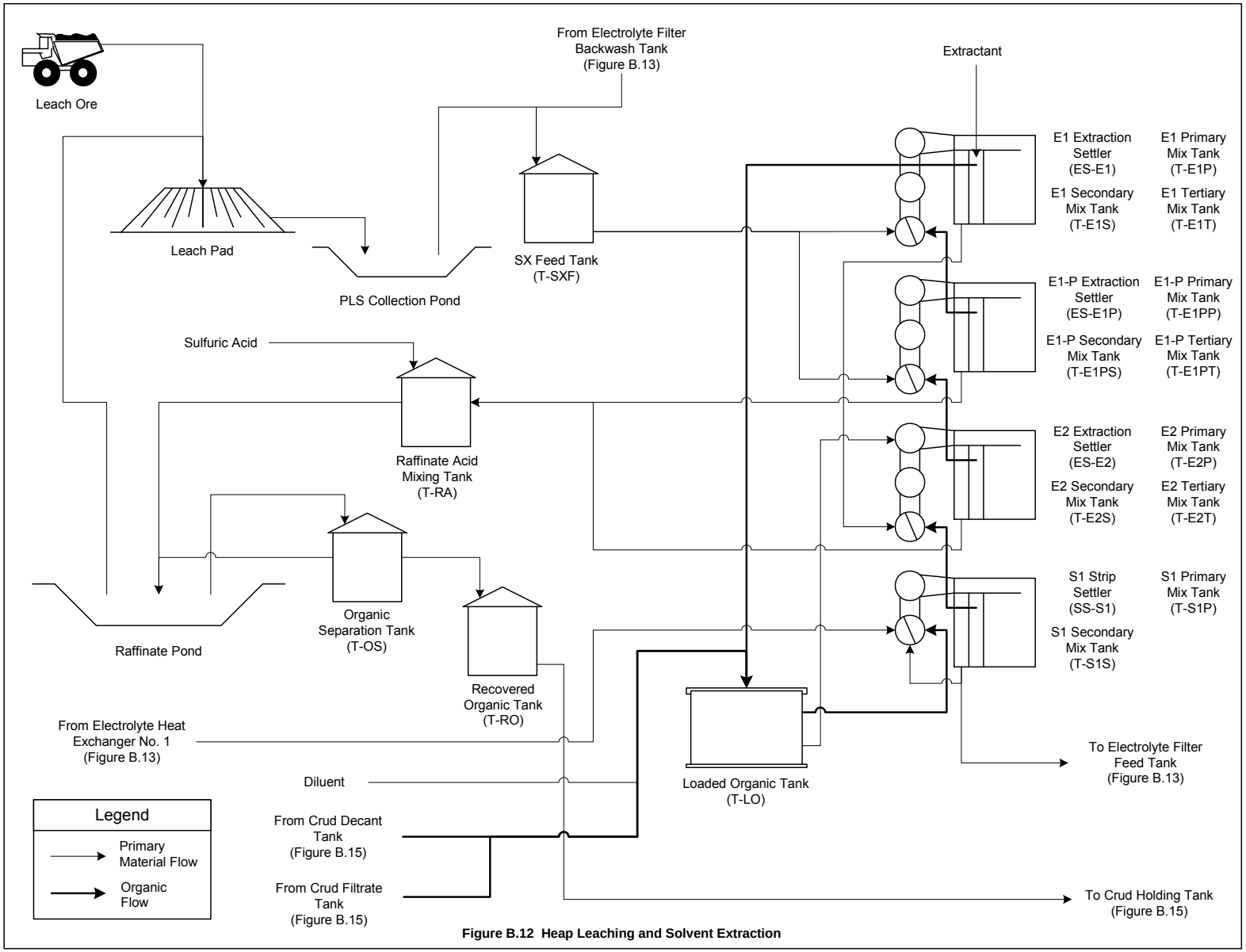


Figure B.12 Heap Leaching and Solvent Extraction

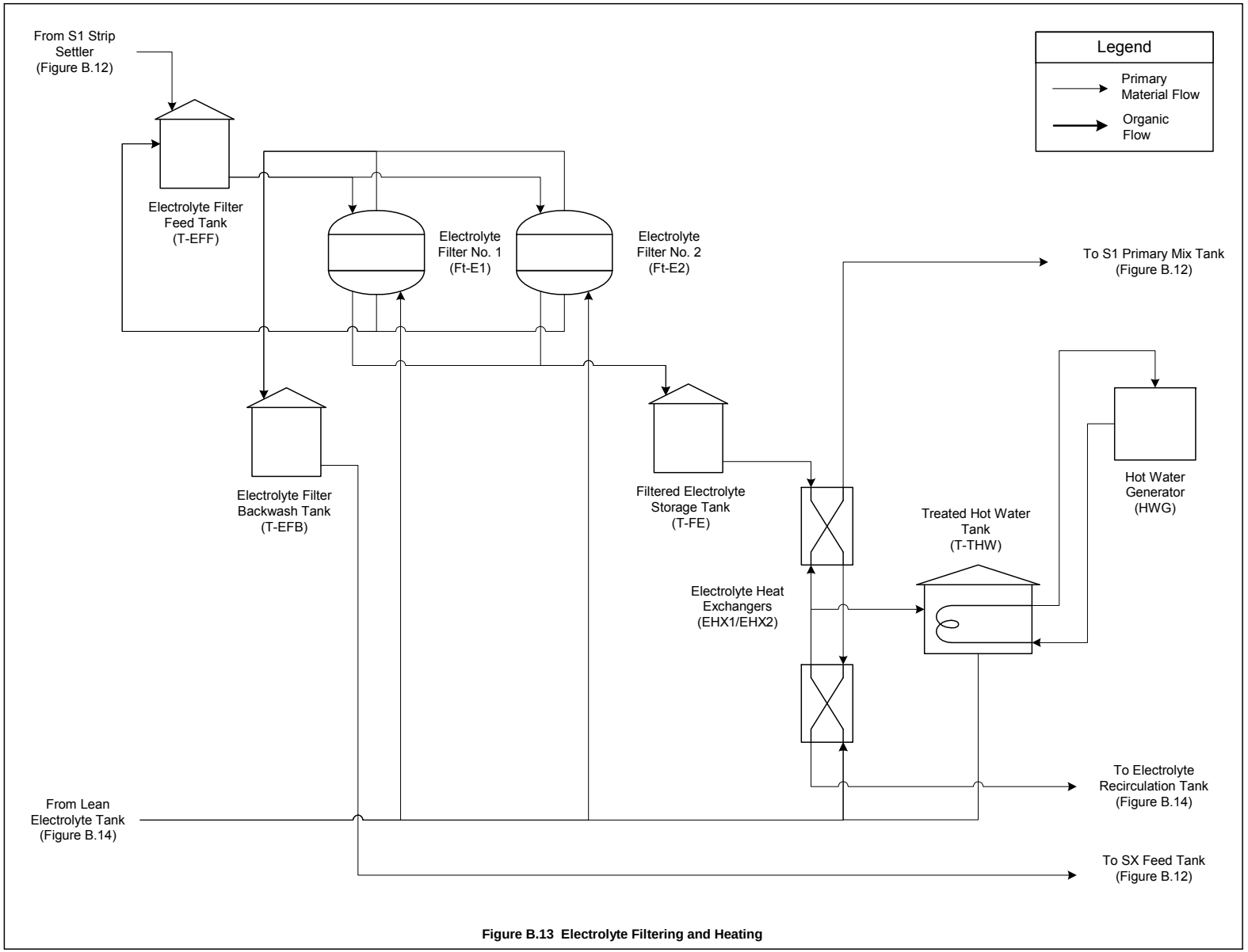


Figure B.13 Electrolyte Filtering and Heating

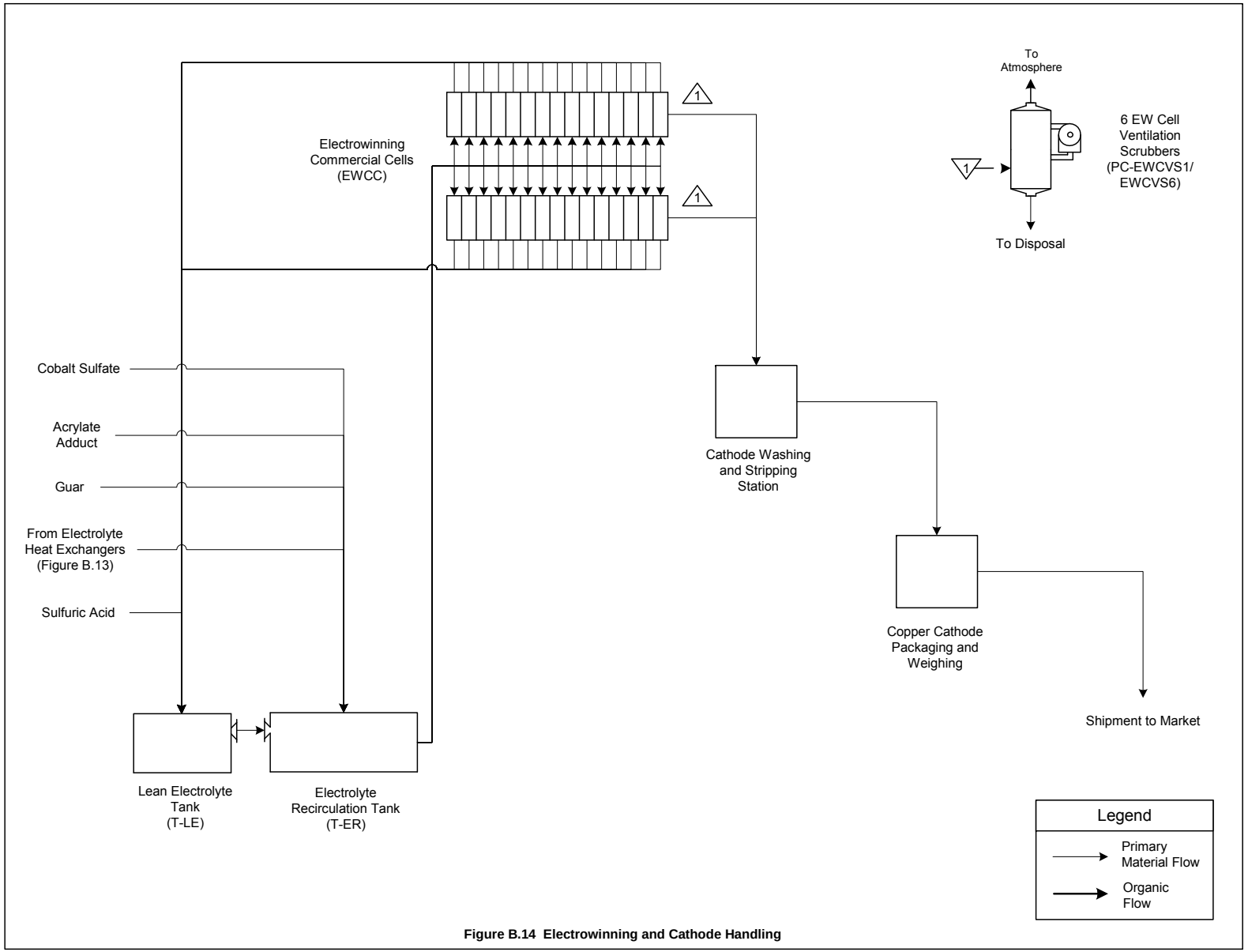


Figure B.14 Electrowinning and Cathode Handling

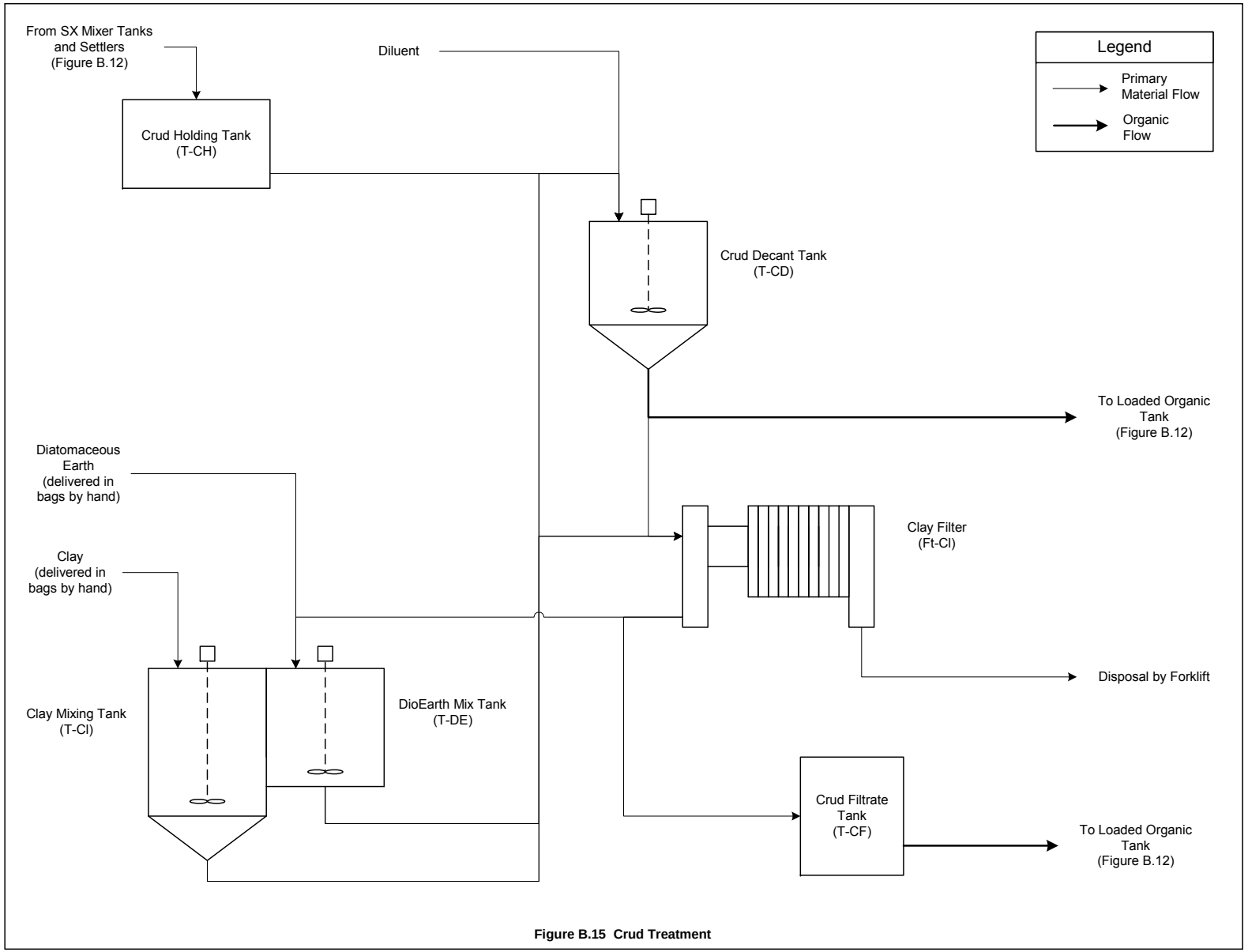


Figure B.15 Crud Treatment

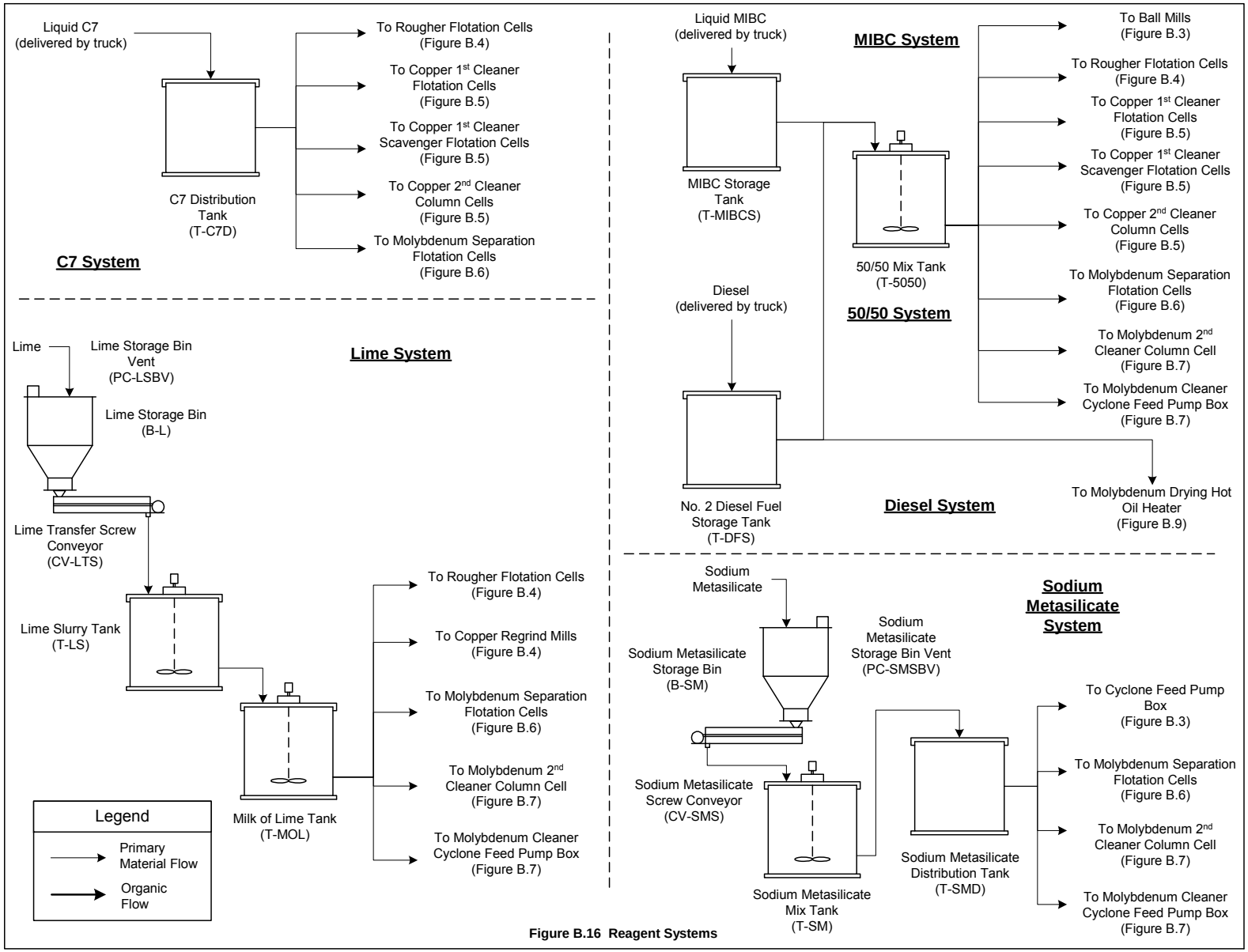


Figure B.16 Reagent Systems

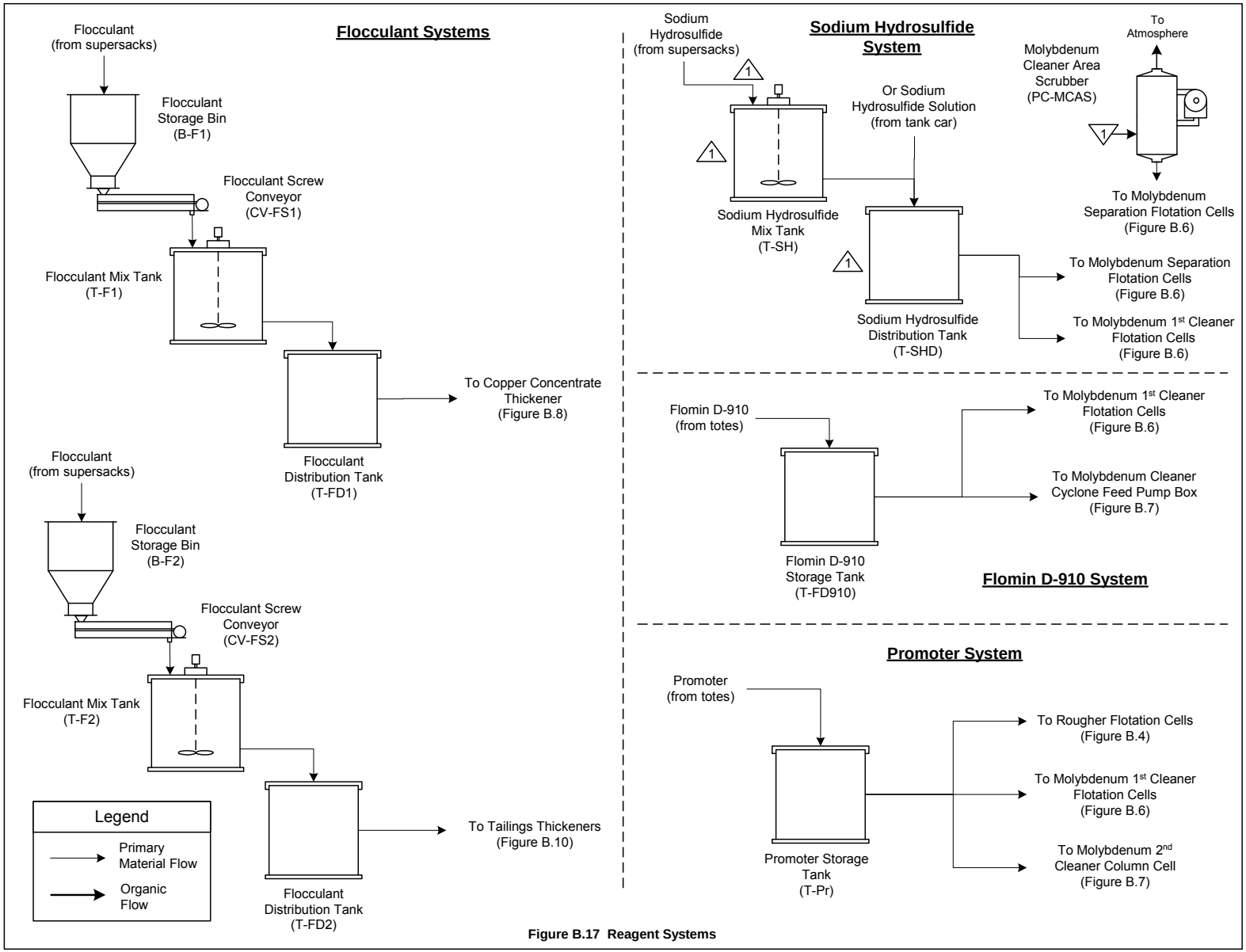


Figure B.17 Reagent Systems

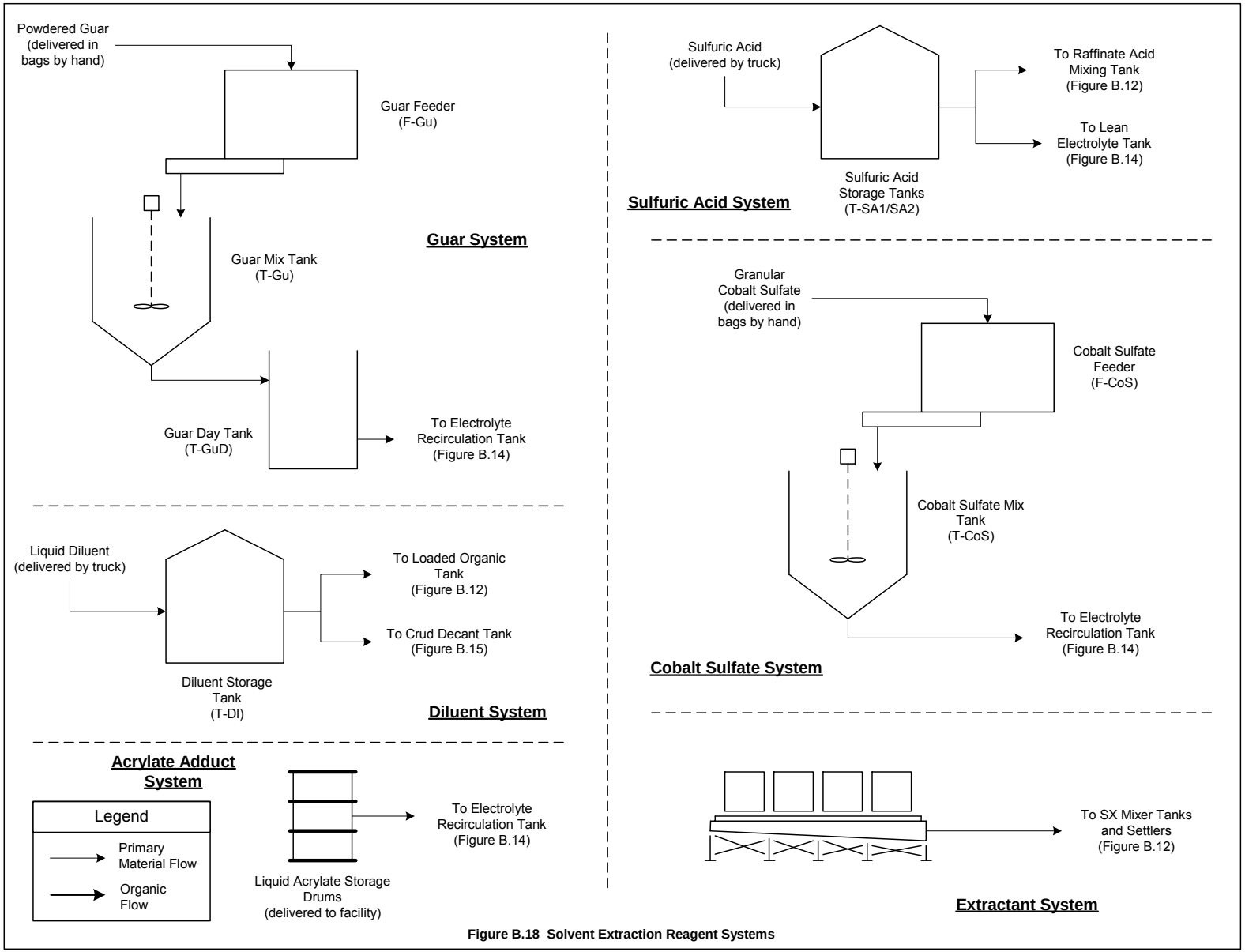


Figure B.18 Solvent Extraction Reagent Systems

APPENDIX C

INSIGNIFICANT AND TRIVIAL ACTIVITIES FOR THE RCP

Insignificant Activities

"Insignificant activity" means an activity in an emissions unit that is not otherwise subject to any applicable requirement and which belongs to one of the following categories. The specific insignificant activities applicable to the RCP are listed for each category.

A. Landscaping, building maintenance, or janitorial activities.

1. Landscaping and site housekeeping activities.
2. Fugitive emissions from landscaping activities.
3. Use of pesticides, fumigants, and herbicides.
4. Grounds keeping activities and products.
5. Internal combustion engines used for landscaping activities.
6. Housekeeping activities and associated products used for cleaning purposes, including the use of fixed vacuum cleaning systems for collecting spilled and accumulated materials at the source.
7. Air conditioning, cooling, heating, or ventilating equipment not designed to remove air contaminants generated from associated or other equipment.
8. General office activities, such as paper shredding, copying, photographic activities, and blueprinting.
9. Consumer use of paper trimmers/binders.
10. Restroom facilities and associated cleanup operations and stacks or vents used to prevent the escape of sewer gases through plumbing traps.
11. Smoking rooms and areas.
12. Use of consumer products, including hazardous substances (as defined in the Federal Hazardous Substances Act, 15 U.S.C. §1261, Section 2(f)) where the product is used in the same manner as normal consumer use.
13. Vacuum cleaning systems used exclusively for industrial or commercial purposes.
14. Laundry activities, except for dry cleaning and steam boilers.

B. Gasoline storage tanks with capacity of ten thousand gallons or less.

1. 10,000 gallon Gasoline Storage Tank
2. Storage tanks with a capacity of 10,000 gallons or less and with a maximum true vapor pressure less than or equal to the maximum true vapor pressure of gasoline at the same storage conditions.
   i. 1,692 gallon 50/50 Mix Tank

C. Diesel and fuel oil storage tanks with capacity of forty thousand gallons or less.

1. 11,000 gallon Diesel Fuel Storage Tank – EW Hot Water Generator
2. 11,845 gallon Diesel Fuel Storage Tank – Concentrate Ore Processing
3. 1,000 gallon Diesel Fuel Storage Tank – Motivator
4. 10,000 gallon Diesel Fuel Storage Tank – Light Vehicles

5. Storage tanks with a capacity of 40,000 gallons or less and with a maximum true vapor pressure less than or equal to the maximum true vapor pressure of diesel at the same storage conditions.
    i. 5,000 gallon Flocculant Mix Tanks
    ii. 5,000 gallon Flocculant Distribution Tanks
    iii. 3,000 gallon Promoter Storage Tank
    iv. 500 gallon Guar Mix Tank
    v. 500 gallon Guar Day Tank
    vi. 9,500 gallon Diluent Storage Tank
    vii. 165 gallon Decant Tank
    viii. 3,000 gallon Automatic Transmission Fluid Storage Tank
    ix. 5,876 gallon Engine Oil Storage Tank
    x. 3,000 gallon Hydraulic Fluid Storage Tank
    xi. 3,000 gallon Gear Oil Storage Tank
    xii. 5,876 gallon Used Oil Storage Tank
    xiii. 275 gallon Automatic Transmission Fluid Day Tank
    xiv. 275 gallon Engine Oil Day Tank
    xv. 275 gallon Hydraulic Fluid Day Tank
    xvi. 275 gallon Gear Oil Day Tank
    xvii. 275 gallon Used Oil Day Tank

6. Constant level process tanks where emissions generated would be less than emissions generated from an equivalent size diesel fuel storage tank being refilled multiple times per year.
    i. 1,650 gallon Organic Separation Tank
    ii. 840 gallon Recovered Organic Tank
    iii. 67,600 gallon Loaded Organic Tank
    iv. 90,000 gallon Crud Holding Tank
    v. 10,000 gallon Crud Decant Tank
    vi. 5,000 gallon Crud Filtrate Tank

D. Batch mixers with rated capacity of five cubic feet or less.

E. Wet sand and gravel production facilities that obtain material from subterranean and subaqueous beds, whose production rate is two hundred tons/hour or less, and whose permanent in-plant roads are paved and cleaned to control dust. This does not include activities in emissions units which are used to crush or grind any nonmetallic minerals.

F. Hand-held or manually operated equipment used for buffing, polishing, carving, cutting, drilling, machining, routing, sanding, sawing, surface grinding, or turning of ceramic art work, precision parts, leather, metals, plastics, fiberboard, masonry, carbon, glass or wood.

G. Powder coating operations.

H. Internal combustion (IC) engine-driven compressors, IC engine-driven electrical generator sets, and IC engine-driven water pumps used only for emergency replacement or standby service.

1. IC engine driven electrical generators not subject to any applicable requirement.
2. IC engine driven compressors, generators, welders, light plants, sump pumps, and compactors used at various operating divisions.
3. Portable Emergency Generators.

I. Lab equipment used exclusively for chemical and physical analyses.

1. Analytical and experimental laboratory equipment which is bench scale in nature, including quality control/quality assurance laboratories that are used as part of mineral evaluations, and research and development laboratories.
   i. Equipment used in the analytical laboratory.
2. Small pilot scale research and development projects, which include, but are not limited to the following.
   i. The testing of water mist/spray controls for dust abatement.
   ii. The testing of roadway surface treatment coating for dust abatement.
   iii. Research involving alternate product forms.
   iv. Geologic and hydrogeologic exploration and drilling activities.
3. Lab equipment used for chemical and physical analysis.
   i. Equipment used in the analytical laboratory.
4. Routine calibration and maintenance of laboratory equipment or other analytical instruments.
5. Equipment used for quality control/assurance or inspection purposes, including sampling equipment used to withdraw materials for analysis.
6. Hydraulic and hydrostatic testing equipment.
7. Environmental chambers not using hazardous air pollutant gasses.

J. Any other activity which the control officer determines is not necessary, because of its emissions due to size or production rate, to be included in an application in order to determine all applicable requirements and to calculate any fee.

1. Fossil fuel burning equipment with an aggregate heat input of less than 500,000 Btu/hour.

Trivial Activities

"Trivial activities" means activities and emissions units, such as the following, that may be omitted from a Class I or Class II permit application. Certain activities from the following list include qualifying statements intended to exclude similar activities:

A. Combustion emissions from propulsion of mobile sources.

1. Tailpipe emissions for all mobile sources.

B. Air-conditioning units used for human comfort that do not have applicable requirements under Title VI of the Act.

C. Ventilating units used for human comfort that do not exhaust air pollutants into the ambient air from any manufacturing, industrial or commercial process.

D. Non-commercial food preparation.

1. Facilities used for preparing food or beverages for consumption at the RCP.

E. Janitorial services and consumer use of janitorial products.

F. Internal combustion engines used for landscaping purposes.

G. Laundry activities, except for dry-cleaning and steam boilers.

H. Bathroom and toilet vent emissions.

I. Emergency or backup electrical generators at residential locations.

J. Tobacco smoking rooms and areas.

K. Blacksmith forges.

L. Plant maintenance and upkeep activities, including grounds-keeping, general repairs, cleaning, painting, welding, plumbing, re-tarring roofs, installing insulation, and paving parking lots, if these activities are not conducted as part of a manufacturing process, are not related to the RCP's primary business activity, and do not otherwise trigger a permit revision. Cleaning and painting activities qualify as trivial activities if they are not subject to VOC or HAP control requirements.

M. Repair or maintenance shop activities not related to the RCP's primary business activity, not including emissions from surface coating, de-greasing, or solvent metal cleaning activities, and not otherwise triggering a permit revision.

N. Portable electrical generators that can be moved by hand from one location to another. "Moved by hand" means capable of being moved without the assistance of any motorized or non-motorized vehicle, conveyance, or device.

O. Hand-held equipment for buffing, polishing, cutting, drilling, sawing, grinding, turning, or machining wood, metal, or plastic.

P. Brazing, soldering, and welding equipment and cutting torches related to manufacturing and construction activities that do not result in emission of HAP metals. Brazing, soldering, and welding equipment, and cutting torches related to manufacturing and construction activities that emit HAP metals are insignificant activities based on size or production level thresholds. Brazing, soldering, and welding equipment, and cutting torches directly related to plant

maintenance and upkeep and repair or maintenance shop activities that emit HAP metals are treated as trivial and listed separately in this definition.

Q. Air compressors and pneumatically operated equipment, including hand tools.

R. Batteries and battery charging stations, except at battery manufacturing plants.

S. Storage tanks, vessels, and containers holding or storing liquid substances that will not emit any VOC or HAP.

1. Water Tanks
2. Copper Concentrate Tanks
3. Copper Concentrate Filtrate Tank
4. Molybdenum Filter Feed Tank
5. Tailings Filtrate Surge Tank
6. Tailings Filter Feed Tanks
7. SX Feed Tank
8. Raffinate Acid Mixing Tank
9. Filtered Electrolyte Storage Tank
10. Electrolyte Filter Backwash Tank
11. Lean Electrolyte Tank
12. Electrolyte Recirculation Tank
13. Clay Mixing Tank
14. DioEarth Mix Tank
15. Lime Slurry Tank
16. Milk of Lime Tank
17. Sodium Metasilicate Mix Tank
18. Sodium Metasilicate Distribution Tank
19. Sodium Hydrosulfide Mix Tank
20. Sodium Hydrosulfide Distribution Tank
21. Sodium Thiophosphate Solution Tank
22. Sulfuric Acid Storage Tanks
23. Cobalt Sulfate Mix Tanks
24. Cathode Wash Tank Stripping Machine (EW Building)

T. Storage tanks, reservoirs, and pumping and handling equipment of any size containing soaps, vegetable oil, grease, animal fat, and nonvolatile aqueous salt solutions, if appropriate lids and covers are used.

U. Equipment used to mix and package soaps, vegetable oil, grease, animal fat, and nonvolatile aqueous salt solutions, if appropriate lids and covers are used.

V. Drop hammers or hydraulic presses for forging or metalworking.

W. Equipment used exclusively to slaughter animals, not including other equipment at slaughterhouses, such as rendering cookers, boilers, heating plants, incinerators, and electrical power generating equipment.

X. Vents from continuous emissions monitors and other analyzers.

Y. Natural gas pressure regulator vents, excluding venting at oil and gas production facilities.

Z. Hand-held applicator equipment for hot melt adhesives with no VOC in the adhesive formulation.

AA. Equipment used for surface coating, painting, dipping, or spraying operations, except those that will emit VOC or HAP.

BB. CO_2 lasers used only on metals and other materials that do not emit HAP in the process.

CC. Electric or steam-heated drying ovens and autoclaves, but not the emissions from the articles or substances being processed in the ovens or autoclaves or the boilers delivering the steam.

1. Electric Hot Oil Heater supplying hot oil to the Molybdenum Concentrate Dryer

DD. Salt baths using nonvolatile salts that do not result in emissions of any regulated air pollutants.

EE. Laser trimmers using dust collection to prevent fugitive emissions.

FF. Bench-scale laboratory equipment used for physical or chemical analysis, but not laboratory fume hoods or vents.

1. Equipment used in the analytical laboratory.

GG. Routine calibration and maintenance of laboratory equipment or other analytical instruments.

HH. Equipment used for quality control, quality assurance, or inspection purposes, including sampling equipment used to withdraw materials for analysis.

II. Hydraulic and hydrostatic testing equipment.

JJ. Environmental chambers not using HAP gases.

KK. Shock chambers.

LL. Humidity chambers.

MM. Solar simulators.

NN. Fugitive emissions related to movement of passenger vehicles, if the emissions are not counted for applicability purposes under 17.04.340(127)(c) and any required fugitive dust control plan or its equivalent is submitted with the application.

1. Employee pickup trucks and vans.

OO. Process water filtration systems and demineralizers.

PP. Demineralized water tanks and demineralizer vents.

QQ. Oxygen scavenging or de-aeration of water.

RR. Ozone generators.

SS. Fire suppression systems.

TT. Emergency road flares.

UU. Steam vents and safety relief valves.

VV. Steam leaks.

WW. Steam cleaning operations and steam sterilizers.

1. Steam Cleaning Machine

Additional Activities Not Otherwise Subject to Any Applicable Requirement

A. Water and Wastewater Treatment (excluding remediation projects and sewage treatment plants subject to 40 CFR 60 Subpart O)

1. Water treatment or storage or cooling systems for process liquids and gases containing no chromium water treatment compounds.
2. The collection, transmission, liquid treatment, and solids treatment processes at domestic type wastewater and sewage treatment works, or treatment facilities, including septic tank systems, which treat only domestic type wastewater and sewage.

B. Burning Activities

1. Firefighting activities and training conducted at the source in preparation for fighting fires (all reporting and permitting requirements that apply to such operations will be followed).
2. Flares used to indicate danger (emergency road flares).
3. Unplanned Fires

C. Roadways

1. Activities associated with the construction, repair of maintenance roads or other paved or open areas, including operation of street sweepers, vacuum trucks, spray trucks and other vehicles related to the control of fugitive emissions of such roads or other areas.
2. Unpaved public and private roadways, except for haul roads located within a stationary source site boundary.
3. Road and lot paving operations at commercial and industrial facilities.
4. Street and parking lot striping.
5. Fugitive dust emissions from the operation of a passenger automobile, station wagon, pickup truck, or van at a stationary source.

D. General Maintenance

1. General cleanup and maintenance operations which include but are not limited to:
   i. Small equipment operations such as bobcats, loaders, backhoes, and other small earth moving activities used as part of facility cleanup and material haulage.
   ii. Ore, rock, tailings and reclamation practices.
   iii. Road surface maintenance and cleaning.
   iv. Tailings dam maintenance
   v. Demolition, renovation, and salvage operations.
   vi. Waste concrete handling.
   vii. Potable waterfield maintenance.
   viii. Drilling and well development.
   ix. Salvage operations.
   x. Cleanup of ditches.
   xi. Stormwater drainage control.
2. Repair or maintenance shop activities not related to the source's primary business activity.

E. Miscellaneous

Based on the size of the equipment, the infrequency of use, and engineering judgment, any emissions from the following activities are considered negligible.

1. Equipment using water, water and soap or detergent, or a suspension of abrasives in water for purposes of cleaning or finishing.
2. Construction and disturbance of surface areas for purposes of land development (water trucks will be used for dust suppression measures where applicable).
3. Activities at a source associated with the maintenance, repair or dismantlement of an emission unit or other equipment installed at the source, including preparation for maintenance, repair or dismantlement and preparation for subsequent startup, including preparation of a shutdown vessel for entry, replacement of insulation, welding and cutting, and purging of a vessel prior to startup; also includes maintenance, repair or dismantlement or buildings, utility lines, pipelines, wells, excavations, earthworks and other structures that do not constitute an emission unit.

4. Containers, reservoirs, or tanks used exclusively in dipping operations to coat objects with oils, waxes or greases.
5. Activities connected with industrial hygiene services.
6. Individual points of emissions or activities.
    i. Individual sampling points, analyzers, and process instrumentation, whose operation may result in emissions.
    ii. Individual features of an emission unit, such as each burner and sootblower in a boiler.
    iii. Individual equipment that is transportable or activities within a facility established for testing for purposes of research or certification.
    iv. Individual flanges, valves, pump seals, pressure relief valves and other individual components that have the potential for leaks.
9. Aerosol can usage.
10. Plastic pipe or liner welding.
11. Acetylene, butane and propane torches.
12. Blast-cleaning equipment using a suspension of abrasive in water or air and any exhaust system or collector serving them exclusively.
13. Surface impoundments, such as evaporation ponds, settling ponds, and storm water ponds.
    i. Reclaim water ponds and reservoirs
    ii. Stormwater catchment basins
18. Pump/motor oil reservoirs, such as gear box lubrication.
19. Transformer vents.
20. Lubricating system reservoirs.
21. Hydraulic system reservoirs.
22. Caulking operations which are not part of a production process.
23. Electric Motors.
24. Cathodic protection systems.
25. High Voltage induced corona.
26. Production of hot/chilled water for on-site use not related to any industrial process.
27. Safety devices, such as fire extinguishers, if associated with a permitted emission source, but not including sources or continuous emissions.
28. CFC recovery equipment.
29. Soil gas sampling.
30. Filter draining.
31. General vehicle maintenance and servicing activities at the source.
32. Circuit Breakers.
33. Station transformers.
34. Gas vent valve (an atmospheric vent, necessary as a safety precaution, anytime that maintenance is performed on a natural gas line).
36. Storage cabinets for flammable materials.
37. Fugitive emissions from landfill operations.
38. Welding, sandblasting, steam cleaning, painting and air compressor venting for line cleanup and startup protection. These activities involve the use of small, hand-held or manually operated equipment that is used only intermittently.

39. There are numerous mobile welders located throughout the property in the various maintenance shops and other welders utilized for field repair.
40. Welding fumes.

APPENDIX D

SITE MAPS

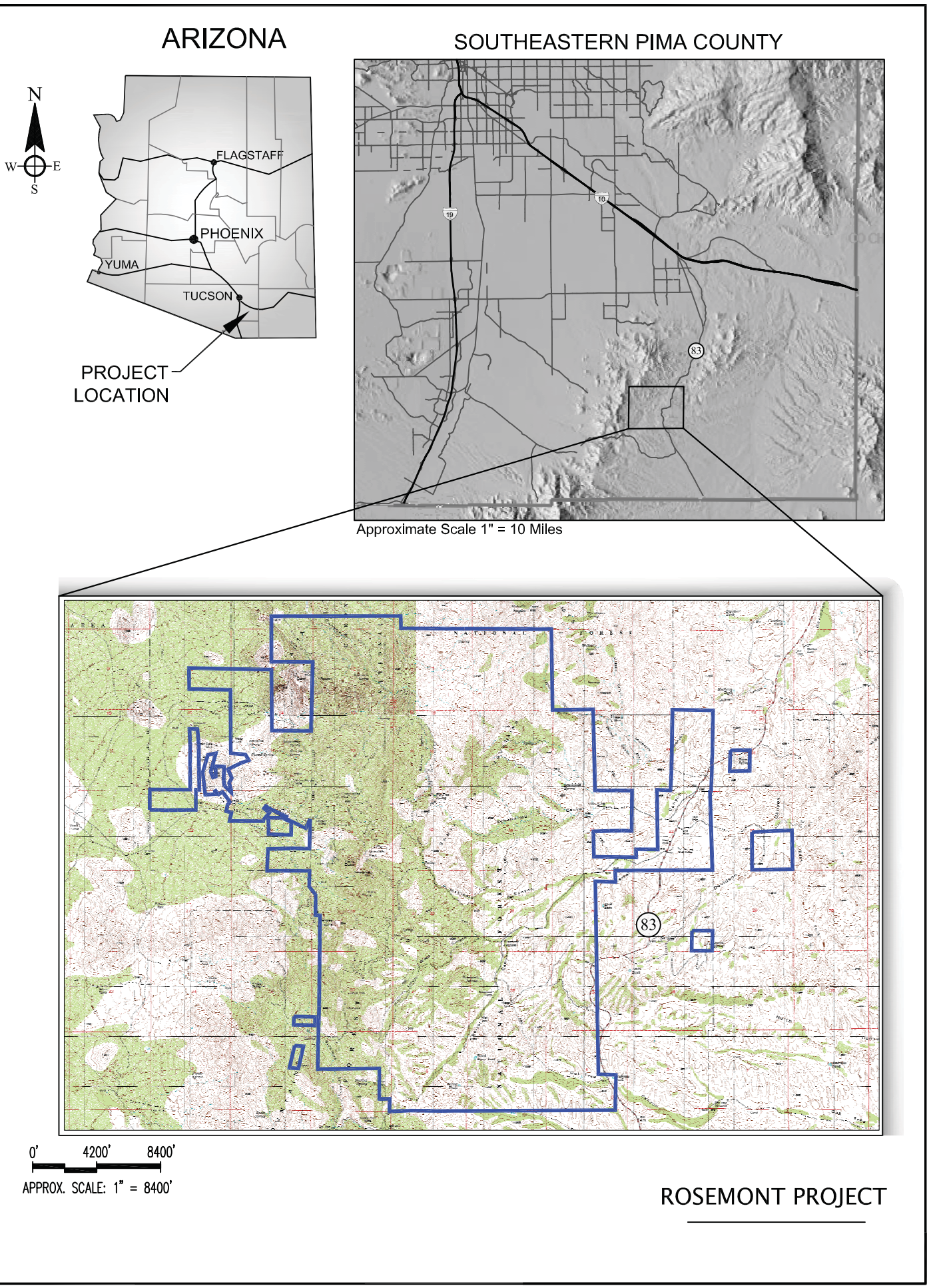


Figure D.1 Vicinity Map of the RCP

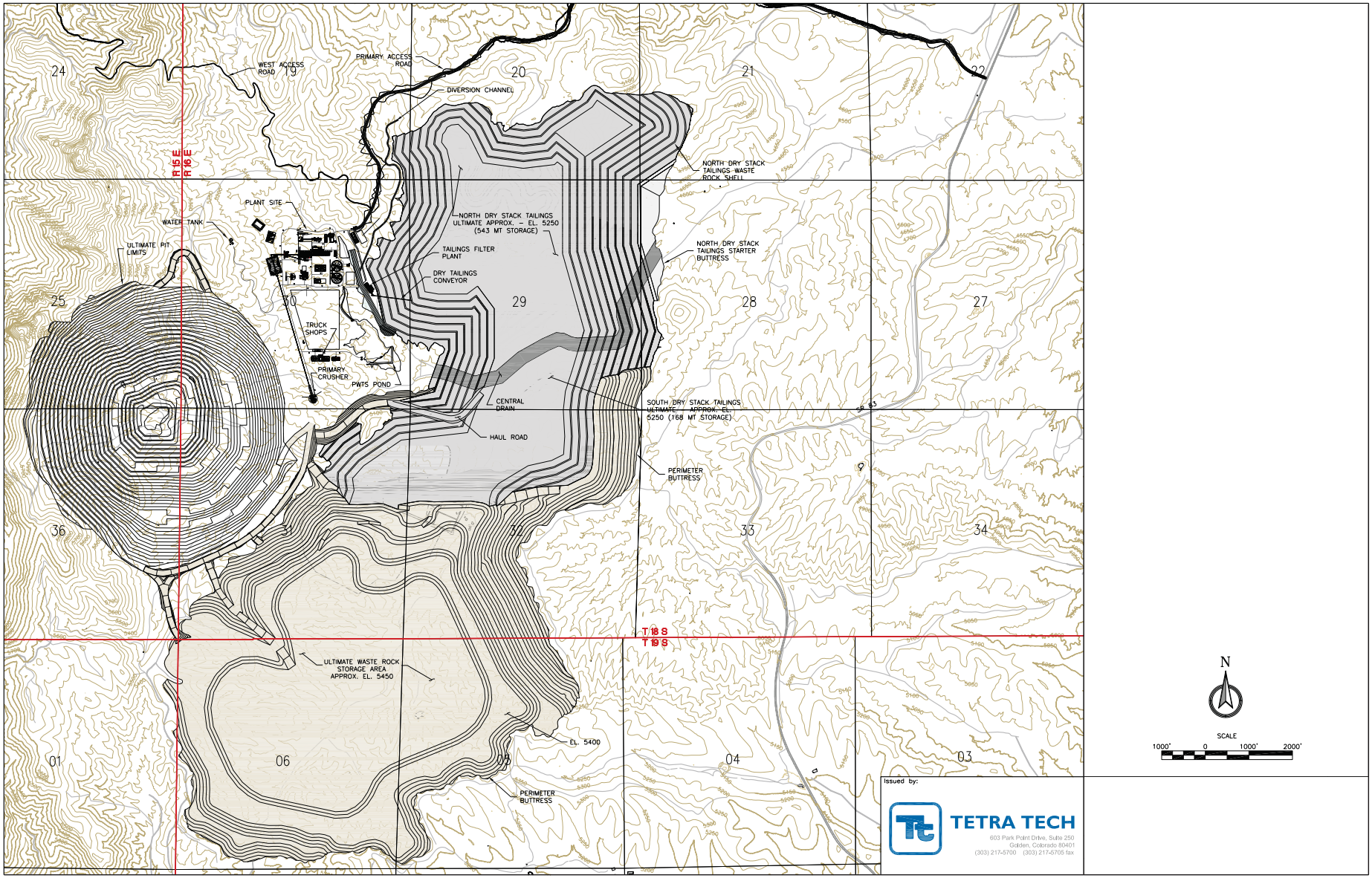


Figure D.2 The Ultimate Configuration of the RCP

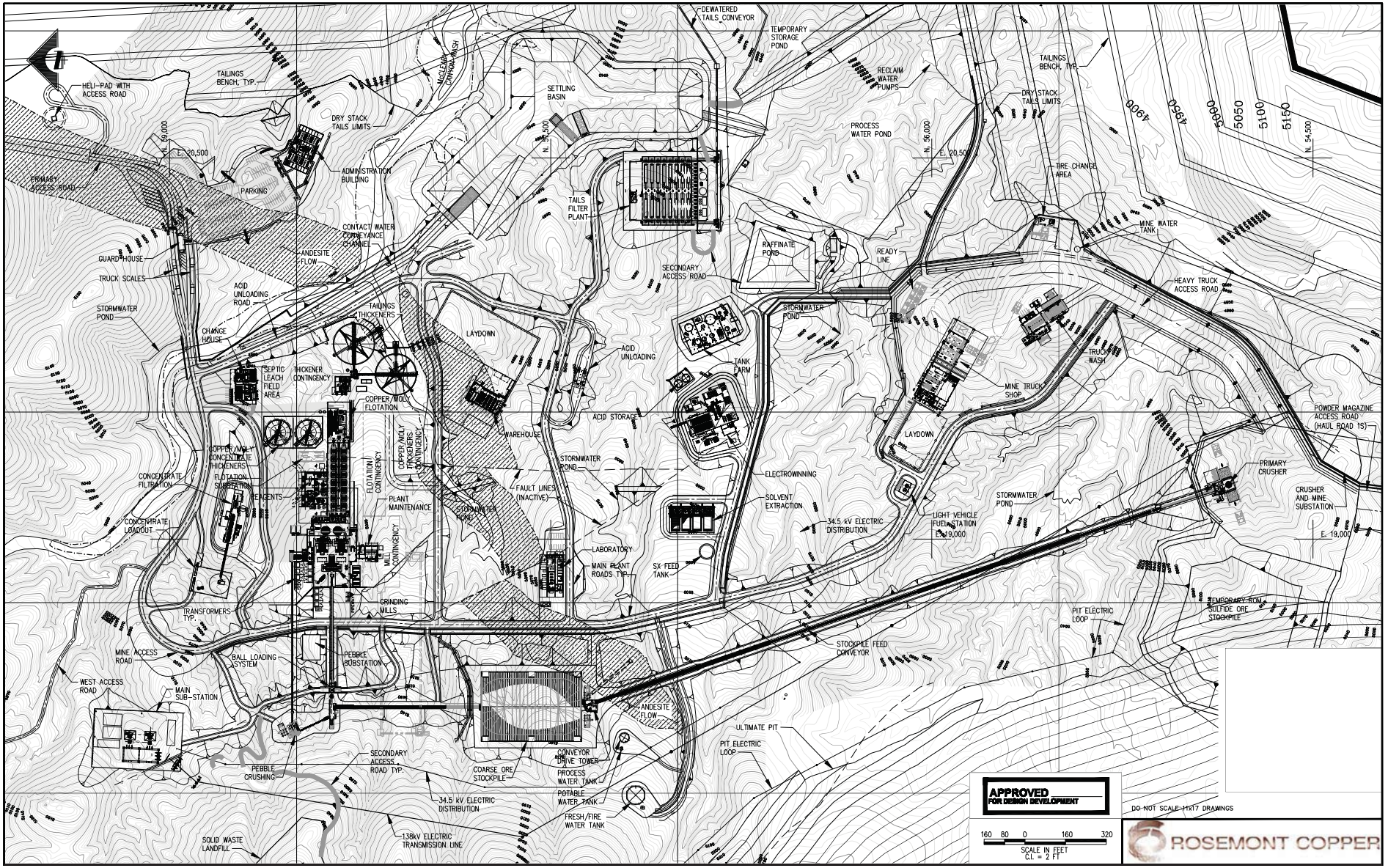


Figure D.3 Site Map Showing Major Processes at the RCP

APPENDIX E

DUST CONTROL PLAN

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E.1 INTRODUCTION

As described in the Calculation Methodology presented in the Emission Inventory Information, Volume I, a 90% control efficiency is utilized during the calculation of fugitive dust emissions from regularly traveled unpaved haul roads servicing the open pit as well as from the general facility roads around the RCP. Additionally, the RCP plans to implement reasonable dust control measures to prevent excessive fugitive emissions from open areas and storage piles created by the mining operations. This document constitutes the RCP's dust control plan for achieving a 90% control of fugitive dust emissions from unpaved roads and preventing excessive fugitive emissions from open areas.

E.2 FUGITIVE DUST EMISSIONS FROM UNPAVED ROADS

E.2.1 Unpaved Road Network

The RCP has a network of unpaved haul roads for transporting concentrating ore, leaching ore, and waste rock from the open pit mine to the primary crushing area, leaching area, and waste rock areas, respectively. Additionally, the RCP has general roads around the facility used by support vehicles. Site diagrams of the RCP are presented in Appendix D. Primary roads include: (a) haul roads located in the pit, (b) haul roads for transporting concentrating ore from the pit to the primary crusher/run of mine stockpile, (c) haul roads for transporting leaching ore from the pit to the leach pad, (d) haul roads for transporting waste rock from the pit to the waste rock storage area, and (e) general facility roads around the RCP for support vehicles.

The RCP dust control plan for unpaved roads includes the use of chemical dust suppressants and/or road watering. The control efficiency achieved by chemical dust suppressants depends upon the strength of the ground inventory, whereas the control efficiency achieved by watering depends upon the amount of water that is used (gallons/yd^2) and the traffic volume. Since the chemical dust suppressant usage does not depend on traffic volumes, the ground inventory value determined for a 90% control efficiency can be applied on a periodic basis to any unpaved road at the facility, regardless of the rate of vehicles traveling on the road. However, because the control efficiency achieved by unpaved road watering depends upon traffic volume, in this dust control plan, the haul trucks traveling on haul roads during Year 5 operations at the RCP (the year when haul road travel rates are greatest) is used as an example in determining the application intensity of water used to control fugitive emissions. Additionally, the road network at the RCP is divided into four categories to account for each road network category having a different maximum traffic volume.

During actual operation, the RCP will evaluate the haul truck traffic rates at different time periods throughout the life of the mine to correctly identify the application intensity needed for road watering to achieve a 90% control efficiency on haul roads. Also, the RCP will evaluate the traffic rate of support vehicles to determine the water application intensity needed to control the general unpaved facility roads to a 90% control efficiency.

The calculation methodology used to estimate traffic volume is presented in Appendix E1. The road network categories and the average hourly haul truck traffic rates at the maximum production, assuming operations of 24 hours per day, are presented below:

a) Roadways that will be used to transport concentrating ore, leaching ore, and waste rock from the mining location inside the pit to the exit point of the pit. These roadways are expected to experience an average traffic rate of 120.0 vehicles per hour;

b) Roadways that will be used to transport concentrating ore from the exit of the pit to the primary crusher dump hopper / run of mine stockpile. These roadways are estimated to experience an average traffic rate of 30.0 vehicles per hour;

c) Roadways that will be used to transport leaching ore from the exit of the pit to the leaching area. These roadways are estimated to experience an average traffic rate of 2.0 vehicles per hour; and

d) Roadways that will be used to transport waste rock from the exit of the pit to the waste rock storage area. These roadways are estimated to experience an average traffic rate of 88.0 vehicles per hour.

E.2.2 Description of Dust Control Plans

Optimal dust control measures depend upon the characteristics of the road network and its use, and upon meteorological considerations. Additionally, dust control measures are continuously evolving with new products becoming available on a regular basis. In order to provide flexibility to change dust control measures while achieving the desired control efficiency, this document proposes three programs, each designed to achieve a 90% control of PM_{10} emissions. The RCP dust control plan includes the flexibility to alternate from one dust control program to another or to use a separate dust control program for an individual roadway system.

The RCP dust control plan ensures that at least a 90% control of PM_{10} emissions is achieved on the unpaved road network. The RCP is also required to maintain no greater than a 40% or 20% opacity for all non-point sources (see Table 4.1). A 90% control efficiency is considered sufficient to ensure that the 40% or 20% opacity limit will be met.

E.2.2.1 Dust Control Program A

Dust Control Program A consists of the application of sufficient chemical dust suppressant to achieve a ground inventory of 0.25 gallons/yard^2 with a reapplication frequency of 1-month (where reapplication frequency refers to the time interval between applications used to maintain a specific ground inventory). The term "ground inventory" represents the residual accumulation of a dust suppressant from previous applications. (For a detailed definition of "ground inventory" see page 3-20 of *Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures*, EPA-450/2-92-004, in Appendix E2). Dust suppressants which could be used for this purpose include, among others, lignosulfonates, petroleum resins, asphalt emulsions, and acrylic cement.

E.2.2.2 Dust Control Program B

Dust Control Program B consists of periodic watering in sufficient amounts to achieve 90% control for PM_{10}. The program will be applied only during days with precipitation of less than 0.01 inches. The water application intensities necessary to achieve a 90% particulate control efficiency during daylight and nighttime hours are presented in Tables E.2.1 and E.2.2, respectively. The roadway network categories are presented in Section E.2.1 and a description on how the application intensities are calculated is presented in Section E.4.2.

Table E.2.1 Average Hourly Watering Requirements During Daylight Hours for Dust Control Program B

Roadway System Category	Average Traffic Volume (vehicles/hour)	Average Hourly Application Intensity During Daylight Hours Required to Achieve a 90% Control Efficiency for Fugitive Dust Emissions [a]	
		liters/meter^2	gallons/yard^2
From Mining Location to Pit Boundary	120.0	4.87	1.08
From Pit Boundary to Primary Crusher Dump Hopper / Run of Mine Stockpile	30.0	1.22	0.27
From Pit Boundary to Leach Pad	2.0	0.08	0.02
From Pit Boundary to Waste Rock Storage Area	88.0	3.57	0.79

[a] The model predicts a 90% control efficiency regardless whether the water application intensity is met with a single hourly application, multiple applications during the 1-hour period, or greater application intensities for less frequent applications.

Table E.2.2 Average Hourly Watering Requirements During Nighttime Hours for Dust Control Program B

Roadway System Category	Average Traffic Volume (vehicles/hour)	Average Hourly Application Intensity During Daylight Hours Required to Achieve a 90% Control Efficiency for Fugitive Dust Emissions [a]	
		liters/meter^2	gallons/yard^2
From Mining Location to Pit Boundary	120.0	2.43	0.54
From Pit Boundary to Primary Crusher Dump Hopper / Run of Mine Stockpile	30.0	0.61	0.13
From Pit Boundary to Leach Pad	2.0	0.04	0.009
From Pit Boundary to Waste Rock Storage Area	88.0	1.79	0.39

[a] The model predicts a 90% control efficiency regardless whether the water application intensity is met with a single hourly application, multiple applications during the 1-hour period, or greater application intensities for less frequent applications.

E.2.2.3 Dust Control Program C

Dust Control Program C consists of the application of sufficient chemical dust suppressant to achieve a ground inventory of 0.05 gallons/yard^2 with a 1-month reapplication frequency (the ground inventory of 0.05 gallons/yard^2 provides a base control efficiency of 62%.) plus periodic watering to increase the base control efficiency achieved by chemical dust suppressants alone to 90%. A summary of the

roadway traffic volume and corresponding annual average watering requirements of Dust Control Program C is presented in Table E.2.3 (Daylight Hours) and Table E.2.4 (Nighttime Hours). If any type of water adhesion enhancing material, such as a surfactant, is used with Dust Control Program C, application intensities will be re-evaluated.

Table E.2.3 Average Hourly Watering Requirements During Daylight Hours for Dust Control Program C

Roadway System Category	Average Traffic Volume (vehicles/hour)	Average Hourly Application Intensity During Daylight Hours Required to Achieve a 90% Control Efficiency for Fugitive Dust Emissions [a]	
		liters/meter^2	gallons/yard^2
From Mining Location to Pit Boundary	120.0	1.85	0.41
From Pit Boundary to Primary Crusher Dump Hopper / Run of Mine Stockpile	30.0	0.46	0.10
From Pit Boundary to Leach Pad	2.0	0.03	0.007
From Pit Boundary to Waste Rock Storage Area	88.0	1.36	0.30

[a] The model predicts a 90% control efficiency regardless whether the water application intensity is met with a single hourly application, multiple applications during the 1-hour period, or greater application intensities for less frequent applications.

Table E.2.4 Average Hourly Watering Requirements During Nighttime Hours for Dust Control Program C

Roadway System Category	Average Traffic Volume (vehicles/hour)	Average Hourly Application Intensity During Daylight Hours Required to Achieve a 90% Control Efficiency for Fugitive Dust Emissions [a]	
		liters/meter^2	gallons/yard^2
From Mining Location to Pit Boundary	120.0	0.93	0.20
From Pit Boundary to Primary Crusher Dump Hopper / Run of Mine Stockpile	30.0	0.23	0.05
From Pit Boundary to Leach Pad	2.0	0.02	0.003
From Pit Boundary to Waste Rock Storage Area	88.0	0.68	0.15

[a] The model predicts a 90% control efficiency regardless whether the water application intensity is met with a single hourly application, multiple applications during the 1-hour period, or greater application intensities for less frequent applications.

E.3 PLAN FOR THE CONTROL OF FUGITIVE DUST EMISSIONS FROM OPEN AREAS AND STORAGE PILES

E.3.1 Open Areas and Storage Piles

Open areas and storage piles include mined areas, overburden storage areas, as well as waste rock storage areas. Open areas and storage areas which are subject to generating fugitive emissions exclude ore, waste rock, and other similar areas because these areas are characterized by a low silt content and therefore, are not dust producing areas. Consequently, dust control measures are not necessary for such areas.

E.3.2 Description of Dust Control Plan

Open areas and storage piles which are in active use and subject to generating fugitive emissions will be controlled by the application of water as required by Title 18, Chapter 2, Article 6 of the A.A.C. and Chapter 17.16, Article III of the P.C.C.. Open areas and storage piles which are not actively used will be controlled by applying the methods required by A.A.C. R18-2-604 and R18-2-607 and P.C.C. Sections 17.16.080 and 17.16.110, respectively. This includes the application of sufficient chemical dust suppressant and/or water to develop and maintain a visible crust. Periodic inspections of the open areas will be performed to evaluate the condition of the visible crust and, if necessary, additional chemical dust suppressant and/or water will be applied. Other means which may be applied include use of an adhesive soil stabilizer, paving covering, landscaping, detouring, or other acceptable means. Access to such areas will also be minimized by the construction of berms or other barriers to prevent re-disturbance of the areas.

E.4 DEMONSTRATION THAT THE DUST CONTROL PLAN WILL PROVIDE A 90% CONTROL EFFICIENCY

E.4.1 Dust Control Program A

The control efficiency of a chemical dust suppressant is dependent upon the ground inventory of the dust suppressant and the frequency between applications. A model developed by EPA, and published in *Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures* (see Appendix E2), provides the relationship between these parameters and PM_{10} control performance for dust suppressants in general. A graph representing this model is presented in Figure E.4.1.

The sufficiency of Dust Control Program A to achieve a control efficiency of 90% for PM_{10} is verified by considering this figure. Using a chemical dust suppressant, a ground inventory of 0.25 gallons/yd^2 with a 1-month reapplication frequency will provide a control efficiency for PM_{10} of 90%. It should be noted that the model for PM_{10} control efficiency of petroleum-based dust suppressants published in the AP-42, Section 13.2.2 (11/06), agrees with the EPA model used to determine the sufficiency of Dust Control Program A.

The control efficiencies in the above mentioned models are averages and not maximums. Therefore, it can be assumed that using a chemical dust suppressant with a ground inventory of 0.25 gallons/yd^2 could result in control efficiencies higher than 90%.

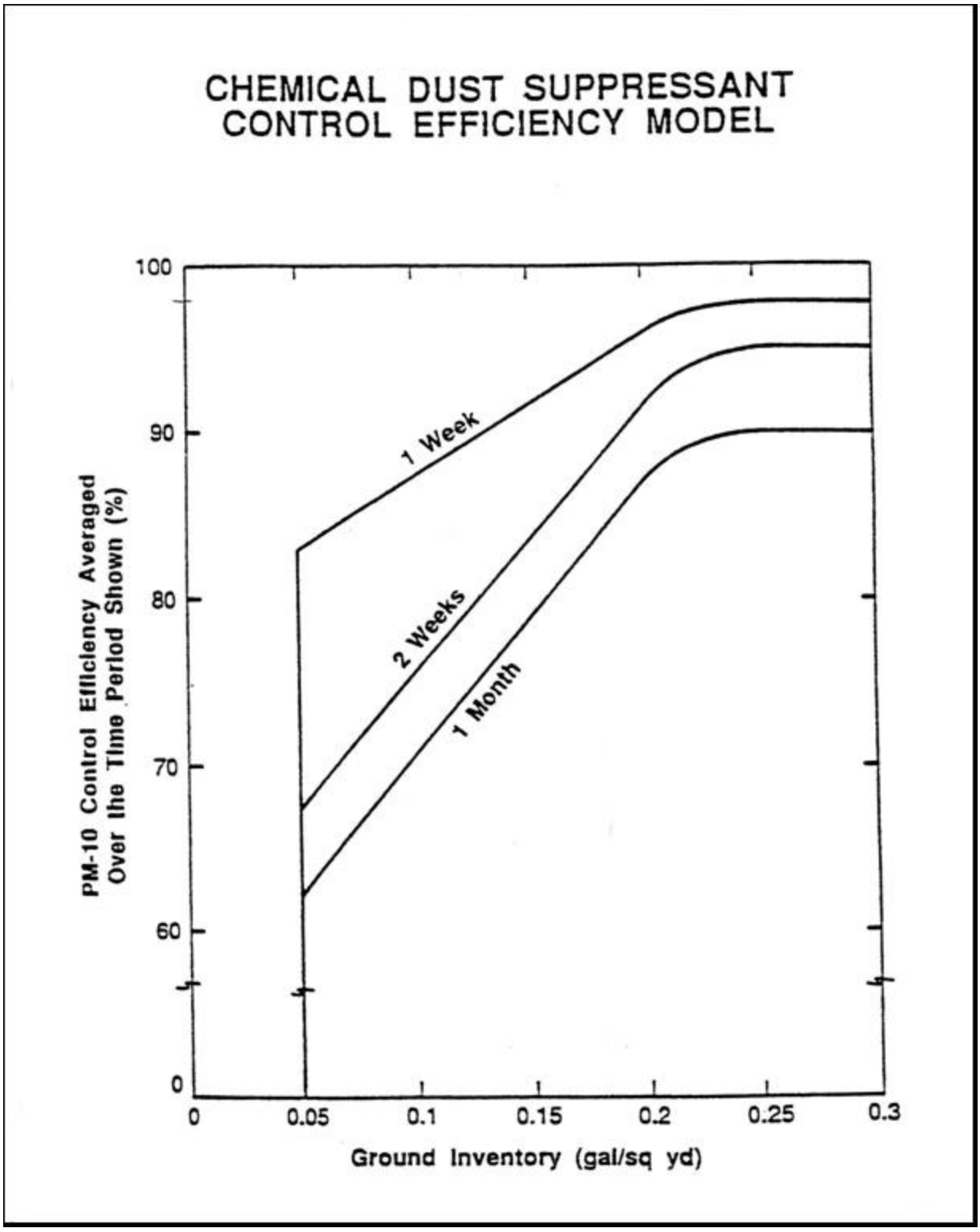

Figure E.4.1 Model for Control Efficiency of PM_{10} when Using Chemical Dust Suppressants.

E.4.2 Dust Control Program B

The application intensity of water during daylight and nighttime hours required to achieve a 90% control efficiency for each road category is calculated using an empirical model developed by EPA (*Control of Open Fugitive Sources*, EPA-U50/3-88-008, September, 1988, presented in Appendix E3). The following equations were derived from this model:

$$i = \frac{0.8 \times p \times d \times t}{(100 - W_c)} \qquad \text{Equation 1}$$

$$p = 0.0049 \times PER \qquad \text{Equation 2}$$

where:

- i = application intensity (liters/m^2);
- p = potential average hourly daytime evaporation rate (mm/hr, 0.507 for Tucson, AZ);
- d = average hourly daytime traffic (vehicles/hr; see Section E.2.1);
- t = time between applications (hours, 1 for hourly applications)
- W_c = average particulate control efficiency (%, 90 in this case); and
- PER = mean annual pan evaporation rate (inches/year, 103.51 for Tucson, AZ from Western Region Climate Center data from 1894-2005).

As shown by Equation 1, the application intensity is dependent upon the pan evaporation rate. Because the pan evaporation rate differs between daytime and nighttime conditions, as well as meteorological conditions, application intensities will also vary with daylight hours and nighttime hours and with meteorological conditions. Nighttime hour application intensities are calculated assuming the average hourly nighttime pan evaporation rate is equal to 50% of the average hourly daytime pan evaporation rate.

The application intensity required to achieve a 90% control efficiency is calculated using Equation 1. However, the application intensities are for illustration purposes due to the varying conditions of evaporation rates and traffic volumes. A summary of the input variables and resulting application intensities during daylight hours and nighttime hours derived from the above equation are presented in Tables E.4.1 and E.4.2, respectively.

The application intensities in Tables E.4.1 and E.4.2 are based upon an hourly frequency of application. The RCP may reduce the frequency of application by increasing the application intensity. A frequency of once every two hours, for example, would require that the application intensities in Tables E.4.1 and E.4.2 to be increased by a factor of 2.

Table E.4.1 Summary of Data Used to Verify Dust Control Program B During Daylight Hours

Roadway System Category	Variables				Average Hourly Water Application Intensity (i) [a]	
	Wc (%)	p (mm/h)	d (vehicles/ hour)	t (hours)	liters/ meter^2	gallons/ yard^2
From Mining Location to Pit Boundary	90	0.507	120.0	1.0	4.87	1.08
From Pit Boundary to Primary Crusher Dump Hopper / Run of Mine Stockpile	90	0.507	30.0	1.0	1.22	0.27
From Pit Boundary to Leach Pad	90	0.507	2.0	1.0	0.08	0.02
From Pit Boundary to Waste Rock Storage Area	90	0.507	88.0	1.0	3.57	0.79

[a] The model predicts a 90% control efficiency regardless whether the water application intensity is met with a single hourly application, multiple applications during the 1-hour period, or greater application intensities for less frequent applications.

Table E.4.2 Summary of Data Used to Verify Dust Control Program B During Nighttime Hours

Roadway System Category	Variables				Average Hourly Water Application Intensity (i) [a]	
	Wc (%)	p (mm/h)	d (vehicles/ hour)	t (hours)	liters/ meter^2	gallons/ yard^2
From Mining Location to Pit Boundary	90	0.254	120.0	1.0	2.43	0.54
From Pit Boundary to Primary Crusher Dump Hopper / Run of Mine Stockpile	90	0.254	30.0	1.0	0.61	0.13
From Pit Boundary to Leach Pad	90	0.254	2.0	1.0	0.04	0.009
From Pit Boundary to Waste Rock Storage Area	90	0.254	88.0	1.0	1.79	0.39

[a] The model predicts a 90% control efficiency regardless whether the water application intensity is met with a single hourly application, multiple applications during the 1-hour period, or greater application intensities for less frequent applications.

It should be noted that the pan evaporation rates used to calculate the application intensities in Tables E.4.1 and E.4.2 represent annual averages which, when used with Equation 1, will result in an application intensity that is too high for winter months and too low for summer months. Actual application intensities will be determined based on actual pan evaporation rates as determined for the different climatological periods of the year. Additionally, the calculated intensities are based on the maximum mine production rates. Lower production rates characterized by lower traffic rates will be characterized by lower application intensities. If any type of water adhesion enhancing material, such as a surfactant, is used with Dust Control Plan B, application intensities will be reevaluated.

E.4.3 Dust Control Program C

The sufficiency of Dust Control Program C to achieve a control efficiency of 90% for fugitive dust emissions is verified by considering Figure E.4.1. Using a chemical dust suppressant, a ground inventory of 0.05 gallons/yard^2 with a 1-month reapplication frequency provides a control efficiency of 62% for PM_{10}. The additional 28% control necessary to increase the control efficiency to 90% will be attained through periodic watering. The control efficiency of the watering program, W_c, necessary to increase the chemical dust suppressant control efficiency, CDS_c, of 62% to a combined dust suppressant/watering control efficiency of 90% is derived from the following equation:

$$W_c = \left(\frac{\text{Additional Control Necessary (\%)}}{(100\% - CDS_c)} \right) \times 100\% \qquad \text{Equation 3}$$

$$W_c = \left(\frac{28\%}{(100\% - 62\%)} \right) \times 100\%$$

$$W_c = 73.7\%$$

This value, 73.7%, is used in conjunction with the model described in Section E.4.2 to determine the average application intensity of watering that is necessary to achieve a 73.7% control efficiency. A summary of the input variables and resulting hourly application intensities during daylight and nighttime hours derived from the model is given in Tables E.4.3 and E.4.4, respectively.

Table E.4.3 Summary of Data Used to Verify Dust Control Program C During Daylight Hours

Roadway System Category	Variables				Average Hourly Water Application Intensity (i) [a]	
	Wc (%)	p (mm/h)	d (vehicles/ hour)	t (hours)	liters/ meter^2	gallons/ yard^2
From Mining Location to Pit Boundary	73.7	0.507	120.0	1.0	1.85	0.41
From Pit Boundary to Primary Crusher Dump Hopper / Run of Mine Stockpile	73.7	0.507	30.0	1.0	0.46	0.10
From Pit Boundary to Leach Pad	73.7	0.507	2.0	1.0	0.03	0.007
From Pit Boundary to Waste Rock Storage Area	73.7	0.507	88.0	1.0	1.36	0.30

[a] The model predicts a 90% control efficiency regardless whether the water application intensity is met with a single hourly application, multiple applications during the 1-hour period, or greater application intensities for less frequent applications.

Table E.4.4 Summary of Data Used to Verify Dust Control Program C During Nighttime Hours

Roadway System Category	Variables				Average Hourly Water Application Intensity (i) [a]	
	Wc (%)	p (mm/h)	d (vehicles/ hour)	t (hours)	liters/ meter^2	gallons/ yard^2
From Mining Location to Pit Boundary	73.7	0.254	120.0	1.0	0.93	0.20
From Pit Boundary to Primary Crusher Dump Hopper / Run of Mine Stockpile	73.7	0.254	30.0	1.0	0.23	0.05
From Pit Boundary to Leach Pad	73.7	0.254	2.0	1.0	0.02	0.003
From Pit Boundary to Waste Rock Storage Area	73.7	0.254	88.0	1.0	0.68	0.15

[a] The model predicts a 90% control efficiency regardless whether the water application intensity is met with a single hourly application, multiple applications during the 1-hour period, or greater application intensities for less frequent applications.

E.5 DEMONSTRATION OF COMPLIANCE WITH THE REQUIREMENTS OF ARTICLE 6 OF THE A.A.C. AND CHAPTER 17.16, ARTICLE III OF THE P.C.C.

Section R18-2-604 of the A.A.C. and Section 17.16.080 of the P.C.C. require, in part, that fugitive dust from open areas be kept to a minimum by good modern practices such as using an approved dust suppressant.

Section E.3 of this document describes the control measures for wind-blown fugitive dust from open areas and storage piles at the RCP. By developing and maintaining a visible crust on the soil in all open areas and applicable storage piles, implementing best management practices (e.g., watering), and minimizing access to these areas, the RCP Dust Control Plan complies with the requirements of Article 6 of the A.A.C and Chapter 17.16, Article III of the P.C.C. for the control of fugitive dust emissions from open areas and storage piles.

E.6 PERIODIC REAPPLICATION

E.6.1 Chemical Dust Suppressants

Dust control programs that utilize chemical dust suppressants require periodic application of the chemical dust suppressant in order to replenish dust suppressants that are removed from the road due to the abrasion of the vehicles on the treated road surface. Each successive application will correspond to:

a) The manufacturer's recommendation if available; or

b) If manufacturer's recommendations are not available, the amount necessary to completely replenish the initial ground inventory every six months.

E.6.2 Road Watering

The frequency of reapplication of water used in Dust Control Programs B and C will depend upon the operational plans of the RCP. The frequency can be hourly, less frequent or more frequent, depending upon the traffic density, meteorological conditions, and operational considerations. The application intensities for water should be treated as annual averages as some days will require a greater water application whereas others will require a lesser water application due to seasonal climatic condition changes. The models introduced in Sections E.4.2 and E.4.3 predict the same control efficiency independent of whether the water is applied during one pass per hour of the water truck or during multiple passes during the 1-hour period. Additionally, watering will not be required for days when natural precipitation equals or exceeds 0.01 inches or when roads are moist due to recent rain, as the control efficiency during such days is assumed to be 100% by AP-42.

E.7 RECORD KEEPING REQUIREMENTS

E.7.1 Records of the Application of Chemical Dust Suppressants

Records will be maintained demonstrating the RCP's compliance with the initial chemical dust suppressant ground inventory required by Dust Control Programs A and C by recording the information necessary to demonstrate a 90% control efficiency.

E.7.2 Records of Reapplication of Chemical Dust Suppressants

Records will be maintained demonstrating the RCP's compliance with the periodic reapplication of dust suppressants to replace losses as identified in Section E.6.1. Records will be maintained concurrently with the records described in Section E.7.1.

E.7.3 Records of Application of Water

Records will be maintained demonstrating the RCP's compliance with the watering requirements of Dust Control Programs B and C by recording the information necessary to demonstrate a 90% control efficiency.

APPENDIX E1

ROADWAY NETWORK TRAFFIC VOLUME CALCULATION METHODOLOGY

E1. ROADWAY SYSTEM TRAFFIC VOLUME CALCULATION METHODOLOGY

Because the control efficiency of unpaved road watering is dependent upon traffic volume, the roadway system at the RCP was divided into four road network categories based on average hourly traffic rates. Traffic volume estimates for the road network categories are calculating by dividing the anticipated hourly amount of material transferred by the haul trucks on each road network category by the average haul truck load (250 tons) and multiplying this number by two to account for the haul trucks returning empty to the mining location. This methodology is shown in the following equation:

$$\text{Traffic Volume}\left(\frac{\text{vehicles}}{\text{hour}}\right) = \left(\text{Material Transferred by Haul Trucks}\left(\frac{\text{tons}}{\text{hour}}\right) \times \frac{1\,\text{trip}}{250\,\text{tons}} \times \frac{2\,\text{passes}}{\text{trip}}\right)$$

The process rates and resulting traffic volume estimates for each roadway system are listed in Table E1.1. The traffic volumes in this table are presented for Year 5 operations at the RCP. However, since process rates vary hourly, daily, and annually, traffic volumes will be monitored on an on-going basis so that accurate water application intensities are determined and a 90% control efficiency will be met.

Table E1.1 Summary of Data Used to Calculate Roadway System Traffic Volume (Year 5)

Roadway System Category	Maximum Process Rate (tons/hour)	Traffic Volume (vehicles/hour)
From Mining Location to Pit Boundary	15,000	120.0
From Pit Boundary to Primary Crusher Dump Hopper / Run of Mine Stockpile	3,750	30.0
From Pit Boundary to Leach Pad	250	2.0
From Pit Boundary to Waste Rock Storage Area	11,000	88.0

APPENDIX E2

EXCERPT FROM
***FUGITIVE DUST BACKGROUND DOCUMENT AND TECHNICAL INFORMATION DOCUMENT FOR BEST AVAILABLE CONTROL MEASURES*, EPA - 450/2-92-004, SEPTEMBER 1992**

United States
Environmental Protection
Agency

Office of Air Quality
Planning and Standards
Research Triangle Park, NC 27711

EPA-450/2-92-004
September 1992

Air

EPA

FUGITIVE DUST BACKGROUND DOCUMENT AND TECHNICAL INFORMATION DOCUMENT FOR BEST AVAILABLE CONTROL MEASURES

Office of Air Quality
Clean Air
OAQPS
Planning and Standards

3.1.2.2 Water Flushing of Roads--

Street flushers remove surface materials from roads and parking lots using high pressure water sprays. Some systems supplement the cleaning with broom sweeping after flushing. Unlike the two sweeping methods, flushing faces some obvious drawbacks in terms of water usage, potential water pollution, and the frequent need to return to the water source. However, flushing generally tends to be more effective in controlling particulate emissions.

Equations to estimate instantaneous control efficiency values are given in Table 3-1. Note that water flushing and flushing followed by broom sweeping represent the two most effective control methods (on the basis of field emission measurements) given in that table.

In the case of winter sanding, dust generation potential can be reduced if the fine materials left on roadways after pavement drying are cleaned up promptly and without further spreading and resuspension. Prompt cleaning also keeps abrasives from being ground into small particles by road traffic or freeze/thawing. Quick cleanup may not be mandated, however, if a new snowstorm is likely. Cleanup using combination water flushing/broom sweeping is recommended as soon as possible after a storm when above-freezing temperatures keep the flushing water from freezing on the roadway. If the road is already wet, flushing may not be required.

3.2 UNPAVED ROADS

There are numerous control options for unpaved travel surfaces, as shown in Table 3-5. Note that the controls fall into the three general categories of source extent reductions, surface improvements, and surface treatment. Each of these is discussed in greater detail in the following sections.

TABLE 3-5. CONTROL TECHNIQUES FOR UNPAVED TRAVEL SURFACES[a]

Source extent reduction:	Speed reduction
	Traffic reduction
Source improvement:	Paving
	Gravel surface
Surface treatment:	Watering
	Chemical stabilization

[a] Table entries reflect EPA draft guidance on urban fugitive dust control.

3.2.1 Source Extent Reductions

These controls either limit the amount of traffic on a road to reduce the PM-10 emission rate or lower speeds to reduce the emission factor value given by Equation (2-6). Examples could include ride share programs, restriction of roads to certain vehicle types, or strict enforcement of speed limits. In any instance, the control afforded by these measures is readily obtained by the application of the equation.

3.2.2 Surface Improvements

These controls alter the road surface. Unlike surface treatments (discussed below), these improvements are largely "one-shot" control methods; that is, periodic retreatments are not normally required.

The most obvious surface improvement is, of course, paving an unpaved road. This option is expensive and is probably most applicable to high volume (more than a few hundred passes per day) public roads and industrial plant roads that are not subject to very heavy vehicles (e.g., slag pot carriers, haul trucks, etc.) or spillage of material in transport. Control efficiency estimates can be obtained by applying the information of Section 3-1.

Other improvement methods cover the road surface material with another material of lower silt content (e.g., covering a dirt road with gravel or slag, or using a "road carpet" under ballast). Because Equation (2-6) shows a linear relationship between the emission factor and the silt content of the road surface, any reduction in the silt value is accompanied by an equivalent reduction in emissions. This type of improvement is initially much less expensive than paving; however, maintenance (such as grading and spot reapplication of the cover material) may be required.

Finally, vegetative cover has been proposed as a surface improvement for very low traffic volume roads (i.e., access roads to agricultural fields). Even though vehicle related emissions from such a road would be quite low, this method will also reduce wind erosion of the road surface.

3.2.3 Surface Treatments

Surface treatment refers to those control techniques which require periodic reapplications. Treatments fall into the two main categories of (1) wet suppression (i.e., watering, possibly with surfactants or other additives), which keeps the surface wet to control emissions, and (2) chemical stabilization, which attempts to change the physical (and, hence, the emissions) characteristics of the roadway. Necessary reapplication frequencies may range from several minutes for plain water under hot, summertime conditions to several weeks (or months) for chemicals.

Water is usually applied to unpaved roads using a truck with a gravity or pressure feed. This is only a temporary measure, and periodic reapplications are necessary to achieve any substantial level of control efficiency. Some increase in overall control efficiency is afforded by wetting agents which reduce surface tension.

Chemical dust suppressants, on the other hand, have much less frequent reapplication requirements. These suppressants are designed to alter the roadway, such as cementing loose material into a fairly impervious surface (thus simulating a paved surface) or forming a surface which attracts and retains moisture (thus simulating wet suppression).

Chemical dust suppressants are generally applied to the road surface as a water solution of the agent. The degree of control achieved is a direct function of the application intensity (volume of solution per area), dilution ratio, and frequency

(number of applications per unit time) of the chemical applied to the surface and also depends on the type and number of vehicles using the road.

3.2.3.1 Watering--

The control efficiency of unpaved road watering depends upon: (a) the amount of water applied per unit area of road surface, (b) the time between reapplications, (c) traffic volume during that period, and (d) prevailing meteorological conditions during the period. All of these factors affect the road surface moisture content. The control efficiency relationship shown in Figure 3-1 is buried in field tests conducted at a coal-fired power plant. Surface moisture grab samples over the daily watering cycle along with the daily traffic flow cycle are needed to determine an average control efficiency using this figure. The low control efficiency for watering of unpaved roads and the need for frequent (almost daily) reapplication preclude the use of watering as possible BACM.

3.2.3.2 Chemical Treatments--

As noted, some chemicals (most notably salts) simulate wet suppression by attracting and retaining moisture on the road surface. These methods are often supplemented by some watering. It is recommended that control efficiency estimates be obtained using Figure 3-1 and enforcement be based on grab sample moisture contents.

The more common chemical dust suppressants form a hard cemented surface. It is this type of suppressant that is considered below.

Besides water, petroleum resins (such as Coherex®) have historically been the products most widely used in industry. However, considerable interest has been shown at both the plant and corporate level in alternative chemical dust suppressants. As a result of this continued interest, several new dust

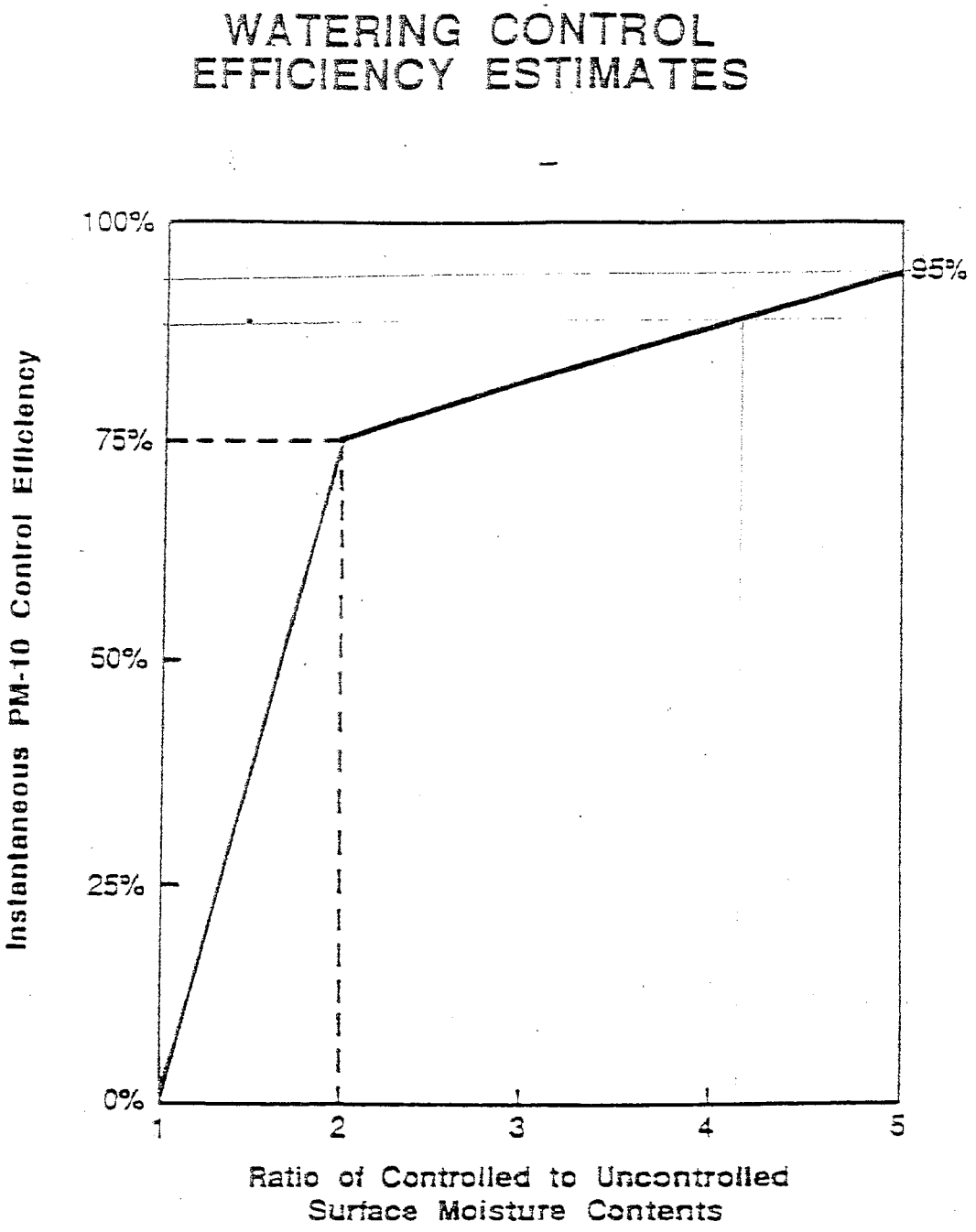

Figure 3-1. Watering Control Effectiveness for Unpaved Travel Surfaces.

suppressants have been introduced. These have included asphalt emulsions, acrylics, and adhesives. In addition, the generic petroleum resin formulations developed at the Mellon Institute with funding from the American Iron and Steel Institute (AISI) have gained considerable attention. These generic suppressants were designed to be produced on-site at iron and steel plants. On-site production of this type of suppressant in quantities commonly used in iron and steel plants has been estimated to reduce chemical costs by approximately 50 percent (Russell and Caruso, 1984).

In an earlier test report, average performance curves were generated for four chemical dust suppressants: (a) a commercially available petroleum resin, (b) a generic petroleum resin for on-site production at an industrial facility, (c) an acrylic cement, and (d) an asphalt emulsion (Muleski and Cowherd, 1987). (Note that at the time of the testing program, these suppressant types accounted for the majority of the market share in the iron and steel industry.) The results of this program were combined with other test results to develop a model to estimate <u>time-averaged</u> PM-10 control performance. This model is illustrated in Figure 3-2. Several items are to be noted:

- The term "ground inventory" is a measure of residual effects from previous applications. Ground inventory is found by adding together the total volume (per unit area) of concentrate (<u>not solution</u>) since the start of the dust control season. An example is provided below.
- Note that no credit for control is assigned until the ground inventory exceeds 0.05 gal/yd^2.
- Because suppressants must be periodically reapplied to unpaved roads, use of the time-average values given in the figure are appropriate. Recommended minimum reapplication frequencies (as well as alternatives) are discussed later in this section.

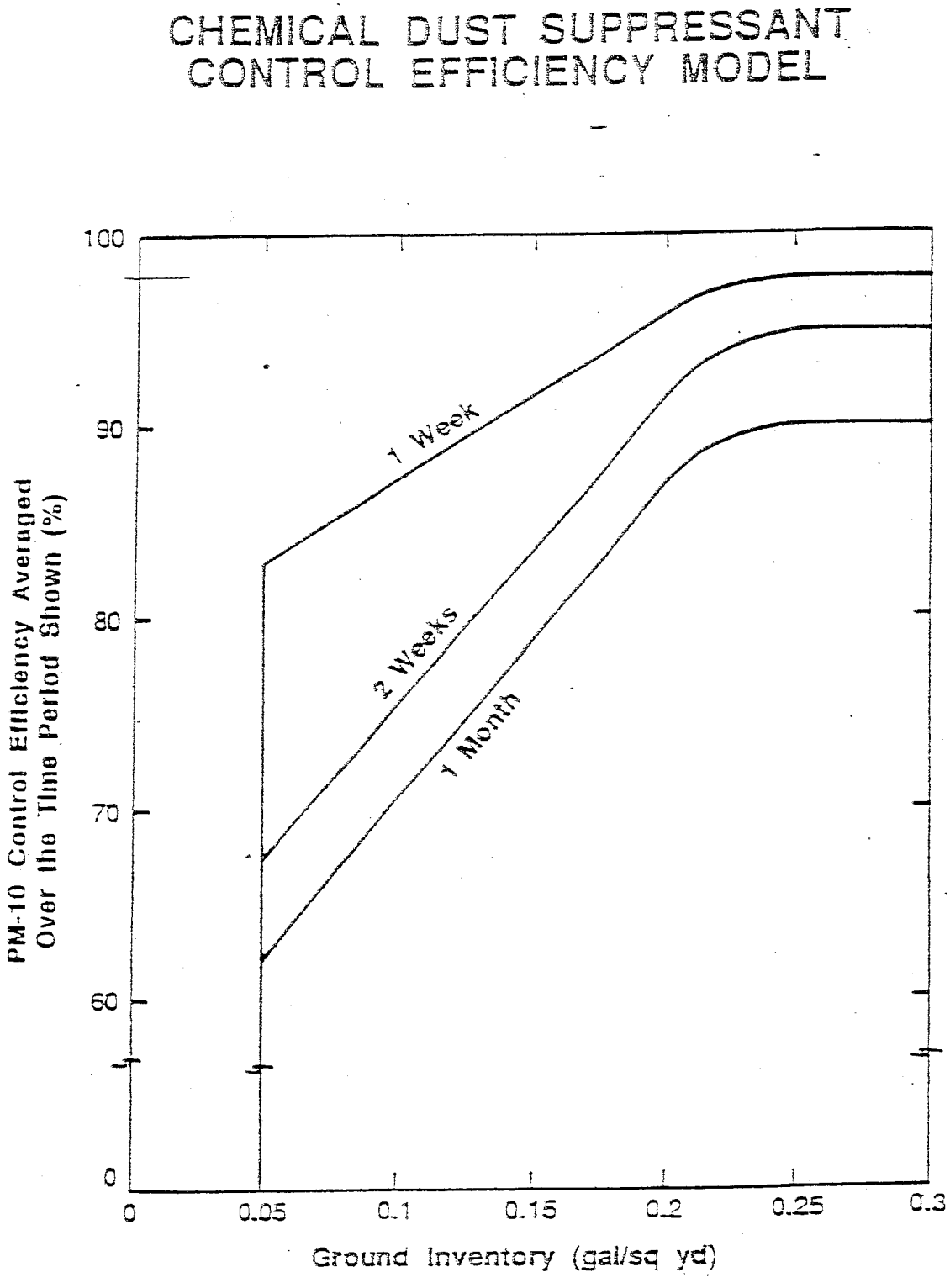

Figure 3-2. Average PM10 control efficiency for chemical suppressants.

. Figure 3-2 represents an average of the four suppressants given above. The basis of the methodology lies in a similar model for petroleum resins only (Muleski and Cowherd, 1987). However, agreement between the control efficiency estimates given by Figure 3-2 and available field measurements is reasonably good.

As an example of the use of Figure 3-2, suppose the Equation (2-6) has been used to estimate a PM-10 emission factor of 2.0 kg/VKT. Further, suppose that starting on May 1, the road is treated with 0.25 gal/yd^2 of a (1 part chemical to 5 parts water) solution on the first of each month until October. In this instance, the following average controlled emission factors are found:

Period	Ground inventory, gal/yd^2	Average control efficiency, percent[a]	Average controlled emission factor, kg/VKT
May	0.042	0	2.0
June	0.083	68	0.64
July	0.12	75	0.50
August	0.17	82	0.36
September	0.21	88	0.24

[a] From Figure 3-1; zero efficiency assigned if ground inventory is less than 0.05 gal/yd^2.

In formulating dust control plans for chemical dust suppressants, additional topics must be considered. These are briefly discussed below.

3.2.3.2.1 Use of Paved Road Controls on Chemically Treated Unpaved Roads--Repeated use of chemical dust suppressants tend, over time, to form fairly impervious surfaces on unpaved roads. The resulting surface may permit the use of paved road cleaning techniques to reduce aggregate loading due to spillage and track-

on. A field program conducted tests on surfaces that had been flushed and vacuumed 3 days earlier (Muleski and Cowherd, 1987). (The surfaces themselves had last been chemically treated 70 days before.) Control efficiency values of 90 percent or more (based on the uncontrolled emission factor of the unpaved roads) were found for each particulate size fraction considered.

The use of paved road techniques for "housekeeping" purposes would appear to have the benefits of both high control (referenced to an uncontrolled unpaved road) and potentially relatively low cost (compared to follow-up chemical applications). Generally, it is recommended that these methods not be employed until the ground inventory exceeds approximately 0.2 gal/yd^2 (0.9 L/m^2). Plant personnel should, of course, first examine the use of paved road techniques on chemically-treated surfaces in limited areas prior to implementing a full-scale program.

3.2.3.2.2 Minimum Reapplication Frequency--Because unpaved roads in industry are often used for the movement of materials and are often surrounded by additional unpaved travel areas, spillage and carryout onto the chemically treated road required periodic "housekeeping" activities. In addition, gradual abrasion of the treated surface by traffic will result in loose material on the surface which should be controlled.

It is recommended that at least dilute reapplications be employed every month to control loose surface material unless paved road control techniques are used (as described above). More frequent reapplications would be required if spillage and track-on pose particular problems for a road.

3.2.3.2.3 Weather Considerations--Roads generally have higher moisture contents during cooler periods due to decreased evaporation. Small increases in surface moisture may result in large increases in control efficiency (as referenced to the dry

summertime conditions inherent in the AP-42 unpaved road predictive equation). In addition, application of chemical dust suppressants during cooler periods of the year may be inadvisable for traffic safety reasons.

Weather-related application schedules should be considered prior to implementing any control program. Responsible parties and regulatory agency personnel should work closely in making this joint determination.

Compared to the other open dust sources discussed in this manual, there is a wealth of cost information available for chemical dust suppressants on unpaved roads. Note that many salt products are delivered and applied by the same truck. For those products, costs are easily obtained by contacting a local distributor.

3.3 STORAGE PILES

The control techniques applicable to storage piles fall into distinct categories as related to materials handling operations (including traffic around piles) and wind erosion. In both cases, the control can be achieved by: (a) source extent reduction, (b) source improvement related to work practices and transfer equipment (load-in and load-out operations), and (c) surface treatment. These control options are summarized in Table 3-6. The efficiency of these controls ties back to the emission factor relationships presented earlier in this section.

In most cases, good work practices which confine freshly exposed material provide substantial opportunities for emission reduction without the need for investment in a control application program. For example, pile activity, loading and unloading, can be confined to leeward (downwind) side of the pile. This statement also applies to areas around the pile as well as the pile itself. In particular, spillage of material caused by pile load-out and maintenance equipment can add a large

APPENDIX E3

EXCERPT FROM
CONTROL OF OPEN FUGITIVE DUST SOURCES,
EPA-U50/3-88-008, SEPTEMBER, 1988

PB89-103691

CONTROL OF OPEN FUGITIVE DUST SOURCES

Midwest Research Institute
Kansas City, MO

Sep 88

U.S. DEPARTMENT OF COMMERCE
National Technical Information Service
NTIS

3.3.3 Surface Treatments

3.3.3.1 Watering. The control efficiency of unpaved road watering depends upon (a) the amount of water applied per unit area of road surface, (b) the time between reapplications, (c) traffic volume during that period, and (d) prevailing meteorological conditions during the period. While several investigations have estimated or studied watering efficiencies, few have specified all the factors listed above.

An empirical model for the performance of watering as a control technique has been developed.[8] The supporting data base consists of 14 tests performed in four states during five different summer and fall months. The model is:

$$C = 100 - \frac{0.8\ p\ d\ t}{i} \qquad (3\text{-}2)$$

where: C = average control efficiency, percent

p = potential average hourly daytime evaporation rate, mm/h

d = average hourly daytime traffic rate, (h^{-1})

i = application intensity, L/m^2

t = time between applications, h

Estimates of the potential average hourly daytime evaporation rate may be obtained from

$$p = \begin{cases} 0.0049 \times (\text{value in Figure 3-2}) \text{ for annual conditions} \\ 0.0065 \times (\text{value in Figure 3-2}) \text{ for summer conditions} \end{cases}$$

An alternative approach (which is potentially suitable for a regulatory format) is shown as Figure 3-3. This figure is adapted from 11 field tests conducted at a coal-fired power plant. Measured control efficiencies did not correlate well with either time or vehicle passes after application. However, this is believed due to reduced evening evaporation (logistics delayed the start of testing until 3 p.m. and testing continued through the early evening). Surface moisture grab samples were taken throughout the testing period, and not surprisingly, these show a strong correlation with control efficiency.

Figure 3-3 shows that between the average uncontrolled moisture content and a value of twice that, a small increase in moisture content results in a large increase in control efficiency. Beyond this point, control efficiency grows slowly with increased moisture content. Although

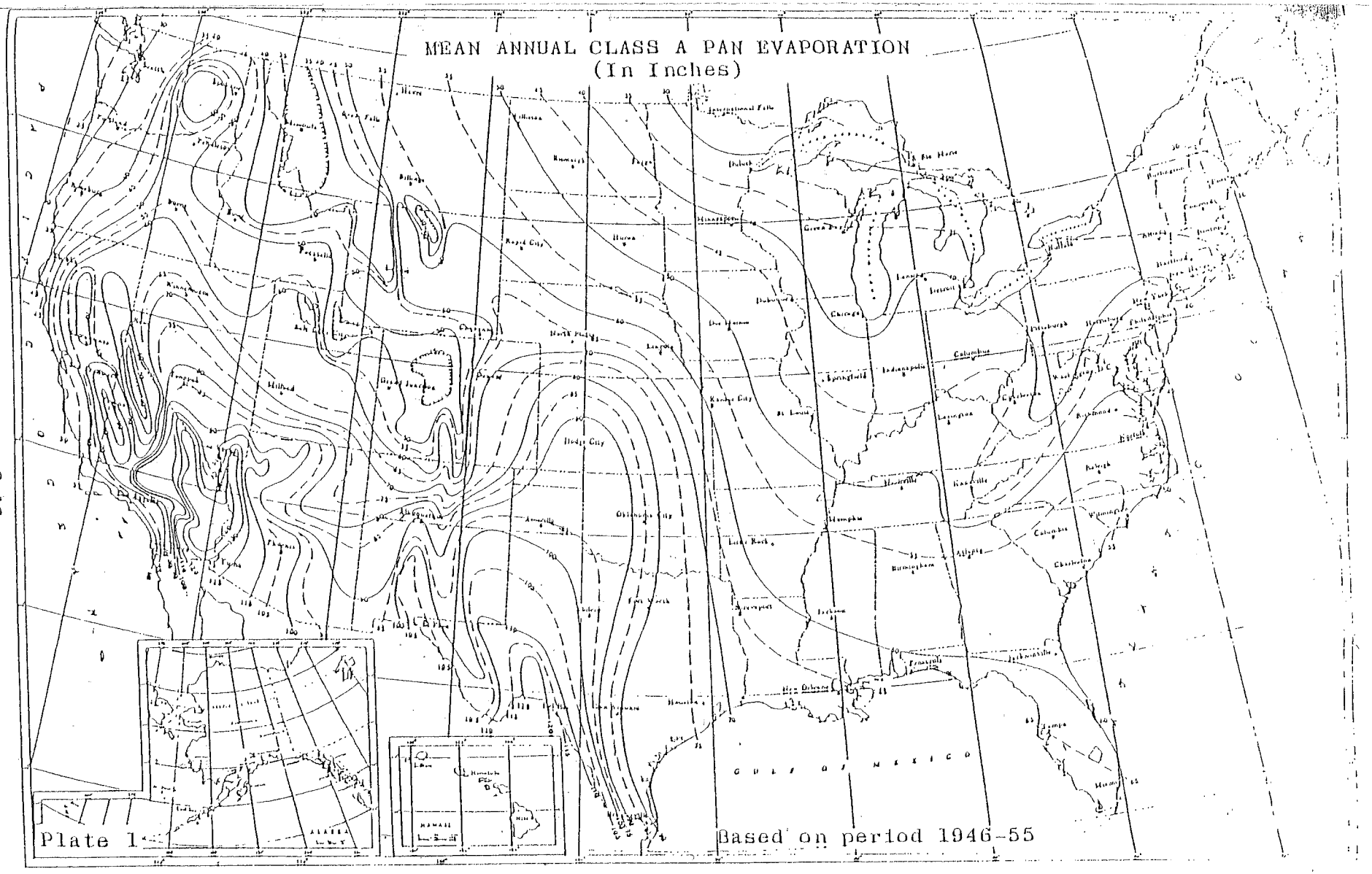

Figure 3-2. Annual evaporation data.[3]

APPENDIX F

ARIZONA SIP REQUIREMENTS AND COMPLIANCE

Arizona SIP Requirements

Rule Number	Title
Article 1. Definitions	
R9-3-101	Definitions
Title 18. Definitions	
R18-2-101 (paragraphs 41 and 111)	Definitions
Article 2. Ambient Air Quality Standards	
R9-3-217	Attainment Areas: Classification & Standards
R9-3-218	Violations
Article 3. Permits	
R9-3-301	Installation Permits: General
R9-3-304	Installation Permits in Attainment Areas
R9-3-305	Air Quality Analysis and Monitoring Requirements
R9-3-306	Operating Permits
R9-3-307	Replacement
R9-3-308	Permit Conditions
R9-3-310	AZ Testing Manual for Air Pollutant Emissions
R9-3-311	Air Quality Models
R9-3-312	Performance Tests
R9-3-313	Existing Source Emission
R9-3-314	Excess Emissions Reporting
R9-3-315	Posting of Permits
R9-3-316	Notice by Building Permit Agencies
R9-3-317	Permit Non-transferrable; Exception
R9-3-318	Denial or Revocation of an Installation or Operating Permit
R9-3-319	Permit Fees
R9-3-322	Temporary Conditional Permits
R18-2-310.01	Reporting Requirements

Arizona SIP Requirements

Rule Number	Title
R18-2-310	Affirmative Defenses for Excess Emissions Due to Malfunctions, Startup and Shutdown
Article 4. Emissions From Existing And New Non-Point Sources	
R9-3-401	General
R18-2-602	Unlawful Open Burning
R9-3-404	Open Areas, Dry Washes or Riverbeds
R9-3-405	Roadways and Streets
R9-3-406	Material Handling
R9-3-407	Storage Piles
R9-3-408	Mineral Tailings
R9-3-410	Evaluation of Non-point Sources Emissions
Article 7. Existing Stationary Source Performance Standards	
R18-2-702	General Provisions
R9-3-501	Visible Emissions: General
R9-3-502	Unclassified Sources
R9-3-503	Standards of Performance for Existing Fossil-fuel Fired Steam Generators and General Fuel
R9-3-504	Standards of Performance for Existing Fossil-fuel Fired Steam Generators and General Fuel
R9-3-519	Standards of Performance for Existing Stationary Rotating Machinery
R9-3-521	Standards of Performance for Existing Nonferrous Metals Industry Sources
R9-3-524	Standards of Performance for Existing Fossil-Fuel Fired Industrial and Commercial Equipment
R18-2-701	Definitions
R18-2-710	Standards of Performance for Existing Storage Vessels for Petroleum Liquids
Article 8. Emissions From Mobile Point Sources (New And Existing)	
R18-2-801	Classification of Mobile Sources
R18-2-802	Off-road Machinery
R18-2-803	Heater-planer Units

Arizona SIP Requirements

Rule Number	Title
R18-2-804	Roadway and Site Cleaning Machinery
Article 11. Jurisdiction And Authority	
R9-3-1101	Jurisdiction
R9-3-1102	Special Inspection Warrants
1.0 Arizona Testing Manual For Air Pollutants Emissions	
1	Arizona Source Test Policy
1.1	Source Test Qualification
1.2	Source Test Planning and Approval
1.3	Quality Assurance Provisions
1.4	Data Collection, Reporting, and Evaluation
3.0 Environmental Protection Agency Reference Test Methods (40 CFR 60 Appendix A)	
Appendices	
Appendix 11	Allowable Particulate Emissions Computations
Title 36 - Public Health And Safety	
36-0770	Declaration of Policy
36-0771	Definitions
36-0775	Powers and Duties
36-0779	Rules & Regulations; Hearing; Limitations
36-0779.01	Permits; Exceptions; Applications; Fees
36-0779.02	Grant or Denial of Applications
36-0779.03	Appeals to Hearing Board
36-0779.04	Permit Non-transferable
36-0779.05	Expiration of Permit
36-0779.06	Posting of Permit
36-0779.07	Notice by Building Permit Agencies
36-0780	Classification and Reporting; Production of Records; Confidentiality of Records; Violation; Penalty

Arizona SIP Requirements

Rule Number	Title
36-0780.01	Special Inspection Warrant
36-0789	Unlawful Open Burning; Exceptions; Violation Penalty
36-0789.01	Misdemeanor; Penalty
36-0789.02	Defenses
36-0790	Limitations
36-0791	Preservation of Rights
36-1700	Declaration of Policy
36-1701	Definitions
36-1702	Powers
36-1704	Hearing Board
36-1705	Duties of Department
36-1706	State and County Control
36-1707	Rules and Regulations; Hearing; Limitations
36-1707.01	Permits; Exceptions; Applications; Fees
36-1707.02	Grant or Denial of Applications
36-1707.03	Appeals to Hearing Board
36-1707.04	Permit Non-transferable; Exception
36-1707.05	Posting of Permit
36-1707.06	Notice by Building Permit Agencies
36-1708	Classification and Reporting; Production Records; Confidentiality of Records; Violation; Penalty
36-1708.01	Special Inspection Warrant
36-1717	Motor Vehicle and Combustion Engine Emission; Control Devices
36-1718	Limitations
36-1718.01	Preservation of Rights
36-1719	Air Pollution Emergency
36-1720	Misdemeanor; Penalty
36-1720.01	Defenses

Arizona SIP Requirements

Rule Number	Title
Title 49 - The Environment	
49-401.01	Definitions
49-402	State and County Control
49-550	Violation; Classification; Civil Penalty
49-593	Violations; Civil Penalties