

**TECHNICAL REVIEW AND EVALUATION
OF APPLICATION FOR
AIR QUALITY PERMIT No. 113015**

I. INTRODUCTION

This Class II air quality permit renewal is issued for the continued operation of BHP Copper Inc.'s, BHP Miami Unit, a solvent extraction and electrowinning facility. The facility is located at East 200 Live Oak Street, Miami, AZ 85539 in Gila County. This permit renews and supersedes Permit No. 87750.

In this renewal, no changes are being proposed. The facility has the potential to emit (PTE) criteria pollutants below major source thresholds, but above permitting exemption thresholds for volatile organic compounds (VOCs). Therefore, a Class II permit is required per Arizona Administrative Code (A.A.C.) R18-2-302.B.2.a

A. Company Information

Facility Name: BHP Copper Inc. – Miami Unit

Mailing Address: PO Box 790
Miami, AZ 85539

Facility Location: 200 E. Line Oak Street
Miami, AZ 85539

B. Attainment Classification

The facility is located in Gila County in a nonattainment area for particulate matter with a diameter of less than 10 microns (PM₁₀), a maintenance area for sulfur dioxide (SO₂), and in an attainment area for all other criteria air pollutants.

II. PROCESS DESCRIPTION

A. Process Equipment

The facility operates a solvent extraction and electrowinning (SX/EW) plant. The SX/EW plant recovers acid-soluble copper from pregnant leach solution (PLS). The solvent extraction portion of the process contains a train of mixer-settlers, some of which are extractor cells and some of which are stripper cells. In the extractor cells, the copper is removed from the PLS by mixing it with a kerosene diluent containing an organic extraction reagent. The blended organic loaded with copper is separated from the aqueous portion of the PLS by gravity with the barren aqueous portion, now referred to as raffinate, returning to the leach process or separate waste process, and the copper-laden blended organic moving to the stripper cells.

In the stripper cells, copper is stripped from the loaded organic by mixing it with barren or lean aqueous electrolyte from the electrowinning process. The high acid content of the barren electrolyte causes the stripping action. In the stripper cells, the now copper-laden, or pregnant electrolyte, is routed to the electrowinning process in the tank house while the barren organic is returned to the extractor cells for reuse.

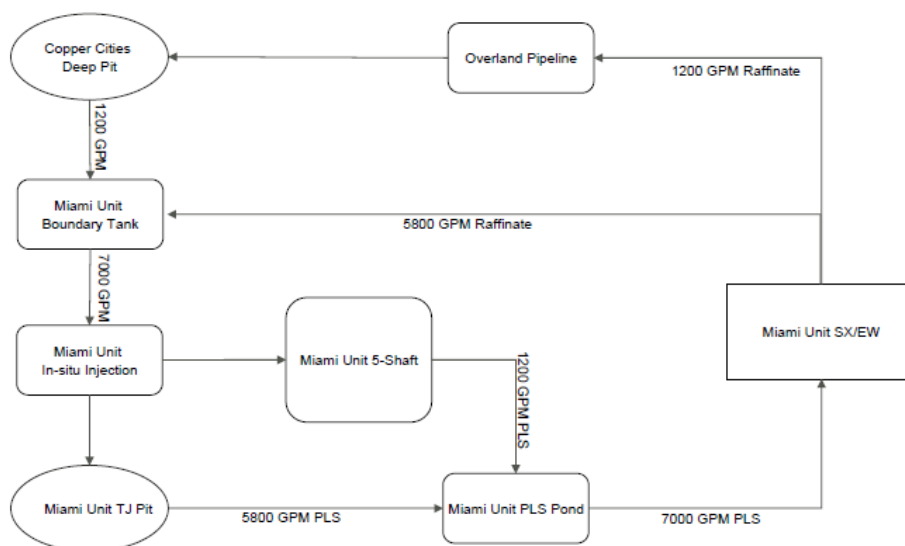
During the electrowinning process, electrical current is passed through the pregnant electrolyte in the tank house cells. Within the cells, the pure copper is plated onto cathodes as the copper gains electrons from the current. In order to balance the electron flow, hydrogen ions and oxygen gas are freed at the anode. The hydrogen combines with free sulfates forming more acid in the lean electrolyte. The lean electrolyte is then returned to the stripper cells as described previously. The facility utilizes a 10.46 MMBtu/hr natural gas-fired boiler and an emergency combustion diesel engine to support the SX/EW plant.

B. Control Devices

The facility is required to use low vapor pressure solvents, or any other effective means of controlling emissions approved by the Director in the SX plant. In addition, the facility is required to control sulfuric acid emissions by using blankets, surfactants, thermal retention balls or any other effective means of controlling emissions approved by the Director in the EW tank house.

C. Process Flow Diagram(s)

Generalized Miami Unit Solution Distribution



III. COMPLIANCE HISTORY

During the last permit term, the facility has submitted six (6) annual compliance certifications to ADEQ certifying compliance with the permit. In addition to this, the facility has also submitted one (1) permit deviation report due to a late submittal of the emission inventory. No other deficiencies have been noted in these reports.

Since the issuance of Permit, the facility is in compliance with the applicable permit conditions. No air quality cases or violations were issued during the permit term.

IV. EMISSIONS

The facility's potential to emit (PTE) was calculated using AP-42 emission factors for boilers, emergency internal combustion engines and facility emission factors as approved by ADEQ based on other mining air permits:

Table 1: PTE (tpy)

Pollutant	Previous PTE	Change in PTE	Current PTE	Permitting Exemption Threshold	Major/Minor NSR Triggered?
PM ₁₀	0.41	0.00	0.41	7.5	No
PM _{2.5}	0.41	0.00	0.41	5	No
NO _x	5.82	0.00	5.82	20	No
SO ₂	0.38	0.00	0.38	20	No
VOCs	27.10	+0.04	27.14	20	No
CO	1.26	0.00	1.26	50	No
HAPs	4.22	0.00	4.22	N/A	No
H ₂ SO ₄	4.22	0.00	4.22	N/A	N/A

V. MINOR NSR REVIEW

Minor new source review (NSR) is required if a facility's emissions have the potential to emit any regulated air pollutant at an amount greater than or equal to its permitting exemption threshold (PET) as shown above in Table 1. This permit renewal does not consist of any changes, but the facility's PTE has been updated to reflect revised methodologies for existing emission sources. As a result, minor NSR does not apply.

VI. VOLUNTARILY ACCEPTED EMISSION LIMITATION AND STANDARD

The permit contains the following voluntary emission limitation and standard:

Sulfuric Acid Mist

The facility performed an air quality impact analysis to demonstrate compliance with the Arizona Ambient Air Quality Guideline (AAAQG) for sulfuric acid mist. On August 21, 2006, the facility voluntarily accepted to not operate more than 60 electrowinning cells at any one time. In addition, it also voluntarily accepted to not operate the electrowinning plant with more than 17 amps per square foot (A/ft²).

The facility is not expected to exceed the AAAQG threshold for sulfuric acid mist.

VII. APPLICABLE REGULATIONS

Table 2 identifies applicable regulations along with verifications as to why each standard applies:

Table 2: Applicable Regulations

Unit (Year)	Control Device	Rule	Discussion
SX/EW Circuits (1976/1989)	N/A	A.A.C. R18-2-730	The SX/EW circuits identified in Attachment "C" of the permit are subject to the requirements for unclassified sources under A.A.C. R 18-2-730.
Boiler (1991)	N/A	40 CFR 60.48c(g)(1); 40 CFR 60.48c(i)	The boiler identified in Attachment "C" of the permit is subject to 40 CFR 60 Subpart Dc for Small Industrial-Commercial-Institutional Steam Generating Units.
Emergency ICE (2014)	N/A	40 CFR 60 Subpart IIII	The emergency ICE identified in Attachment "C" of the permit is subject to 40 CFR 60 Subpart IIII for Stationary Compression Ignition Internal Combustion Engines.
Mobile Sources	N/A	A.A.C. R18-2-801	These standards are applicable to all mobile sources at the facility.
Fugitive Dust	Water Trucks, Dust Suppressants	A.A.C. R18-2-Article 6 A.A.C. R18-2-702	These standards are applicable to all fugitive dust sources at the facility.

Unit (Year)	Control Device	Rule	Discussion
Abrasive Blasting	Wet Blasting; Dust Collecting Equipment; Other Approved Methods	A.A.C. R-18-2-702 A.A.C. R-18-2-726	These standards are applicable to any abrasive blasting operations.
Spray Painting	Enclosures	A.A.C. R18-2-702 A.A.C. R-18-2-727	These standards are applicable to any spray painting operation.
Demolition/Renovation	N/A	A.A.C.R18-2-1101.A.12	This standard is applicable to any asbestos related demolitions or renovations.

VIII. PREVIOUS PERMIT REVISIONS AND CONDITIONS

A. Previous Permit Revisions

No permit revisions were made during the previous permit term to Permit No. 87750.

B. Changes to Current Renewal

Table 3 addresses the changes that were made to the sections and conditions from Permit No. 87750:

Table 3: Previous Permit Conditions

Section No.	Determination			Comments
	Added	Revised	Deleted	
Att. "A"		X		General Provisions – Revised to reflect the most recent template language.
Att. "B", Section I		X		Facility-Wide Requirements: Revised to represent the most recent template language related to opacity monitoring requirements.
Att. "B", Section II		X		Solvent Extraction/Electrowinning Process (SX/EW) – Revised title and added an applicability statement.
Att. "B", Section III		X		Boiler – Revised section to clarify fuel limitation requirements citation.

Section No.	Determination			Comments
	Added	Revised	Deleted	
Att. "B", Section IV		X		Emergency Internal Combustion Engine (ICE) Subject to New Source Performance Standards – Revised to reflect current applicability.
Att. "B", Section V			X	Mobile Source Requirements – Deleted to reflect the most recent template language.
Att. "B", Section VI		X		Fugitive Dust Requirements – Revised to reflect the most recent template language
Att. "B", Section VI		X		Other Periodic Activities – Revised to reflect the most recent template language
Att. "C"		X		Equipment List – Added new columns to the equipment list.

IX. MONITORING, RECORDKEEPING, AND REPORTING REQUIREMENTS

Table 4 contains an inclusive but not an exhaustive list of the monitoring, recordkeeping and reporting requirements prescribed by the air quality permit. The table below is intended to provide insight to the public for how the facility is required to demonstrate compliance with Permit No. 113015.

Table 4: Permit No. 113015

Emission Unit	Pollutant	Emission Limit	Monitoring Requirements	Recordkeeping Requirements	Reporting Requirements
SX/EW Circuits	VOCs	< 60 of 105 electrowinning cells at any one time; Must not operate EW plant with more than 17 amps per square foot		Maintain records on a daily basis of electrowinning cells in operation and the electric current density.	Records shall be made available to ADEQ upon request.
				Maintain records of the control measures used to limit emissions from the SX/EW process.	
Boiler	PM	Natural Gas Only		Record and maintain records of the amount of fuel combusted during each operating day for a period of two (2) years following the date of such record.	

Emergency ICE	SO ₂	Maximum sulfur content of 15 ppm; Minimum cetane index of 40 or maximum aromatic content of 35 volume percent		Keep records of diesel supplier certification: name of supplier, sulfur content, method used to determine the sulfur content and the cetane index or aromatic content.	
				Keep records of the operation of the emergency ICE in emergency and non-emergency service that are recorded through the non-resettable hour meter. Record the time of operation of the engine and the reason the engine was in operation during that time.	Submit an annual report. Annual reports for each calendar year must be submitted no later than March 31 of the following calendar year.
Mobile Sources	PM	40% Opacity		Keep a record of all emissions related maintenance activities performed on mobile sources as per manufacturer's specifications.	
Fugitive Dust	PM	40% Opacity	Conduct a monthly survey of visible emissions.	Record the dates and types of dust control measures employed. Maintain records of the monthly survey of visible emissions.	

Abrasive Blasting	PM	20% Opacity		Record the date, duration and pollution control measures of any abrasive blasting project.	
Spray Painting	VOCs	20% Opacity; Control 96% of Overspray		Maintain records of the date, duration, quantity of paint used, any applicable SDS, and pollution control measures of any spray painting project.	
Demolition/ Renovation	Asbestos			Maintain records of all asbestos related demolitions or renovations including the "NESHAP Notification for Renovation and Demolition Activities" form and all supporting documents.	

X. LEARNING SITE EVALUATION

In accordance with ADEQ's Environmental Permits and Approvals near Learning Sites Policy, the Department is required to conduct an evaluation to determine if any nearby learning sites would be adversely impacted by the facility. Learning sites consist of all existing public schools, charter schools and private schools in the K-12 level, and all planned sites for schools approved by the Arizona School Facilities Board. The learning sites policy was established to ensure that the protection of children at learning sites is considered before a permit approval is issued by ADEQ.

This permit renewal does not increase emissions and thus, it is exempt from a learning site evaluation.

XI. LIST OF ABBREVIATIONS

A.A.C.	Arizona Administrative Code
ADEQ	Arizona Department of Environmental Quality
A.R.S.	Arizona Revised Statutes
CFR	Code of Federal Regulations
CO	Carbon Monoxide
EPA	Environmental Protection Agency
HAPs	Hazardous Air Pollutants
ICE	Internal Combustion Engine
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO _x	Nitrogen Oxides
PM	Particulate Matter
PM ₁₀	Particulate Matter less than 10 µm Nominal Aerodynamic Diameter
PM _{2.5}	Particulate Matter less than 2.5 µm Nominal Aerodynamic Diameter
PTE	Potential to Emit
SO ₂	Sulfur Dioxide
tpy	Tons per Year
VOCs	Volatile Organic Compounds
yr	Year