

Aquifer Protection Permit 100193
 Place ID 2512, LTF 67400
 Significant Amendment
 Freeport-McMoRan Morenci, Inc.

The Arizona Department of Environmental Quality (ADEQ) proposes to issue a significant amendment to the Aquifer Protection Permit (APP) for the subject facility that covers the life of the facility, including operational, closure, and post-closure periods unless suspended or revoked pursuant to Arizona Administrative Code (A.A.C.) R18-9-A213. This document gives pertinent information concerning the issuance of the permit. The requirements contained in this permit will allow the permittee to comply with the two key requirements of the Aquifer Protection Program: 1) meet Aquifer Water Quality Standards (AWQS) at the Point of Compliance (POC); and 2) demonstrate Best Available Demonstrated Control Technology (BADCT). BADCT's purpose is to employ engineering controls, processes, operating methods or other alternatives, including site-specific characteristics (i.e., the local subsurface geology), to reduce discharge of pollutants to the greatest degree achievable before they reach the aquifer or to prevent pollutants from reaching the aquifer.

I. FACILITY INFORMATION

Name and Location

Permittee's Name:	Freeport-McMoRan Morenci, Inc
Mailing Address:	4521 U.S. Highway 191 Morenci, Arizona 85540
Facility Name and Location:	Freeport-McMoRan Morenci Operations 4521 U.S. Highway 191 Morenci, Arizona 85540

Amendment Description

The purpose of this amendment is to expand the footprint of the tailing dam complex south of the West/East Tailing Dam Expansion in order to include the Tailing stormwater ponds (TSPs) and Seepage collection ponds (SCPs) within the footprint of the tailing dam complex. The TSPs and SCPs would thus be removed as separate individual facilities and instead listed within the BADCT description of the tailing dam facilities in the APP. Locating facilities within the footprint of the tailings dam complex, allows operational flexibility to the permittee in adding or removing a facility without requesting an amendment to the permit. The permittee may add, or remove TSPs or SCPs that are located within the footprint of the approved tailings impoundment boundary. A list of the TSPs and SCPs shall be maintained in an on-site logbook, and the permittee shall also provide as-built drawings of the added TSPs and SCPs since the last permit amendment as per Section 3 Compliance Schedule of

the APP. The APP will be updated with the added TSPs and SCPs during a future amendment.

A brief discussion of the TSPs and SCPs is provided below:

- The TSPs are located at the northern perimeter of the tailing impoundments at the edge of the tailing impoundment facilities and contain stormwater runoff from the tailing dams and surrounding area; and
- The SCPs are located at the edge of the tailing impoundment facilities and capture tailing seepage water from the tailing dams. Four of the six SCPs were modified to be located within the footprint of a TSRD.

This amendment also includes requests for general modifications updates to the permit, including updates to reflect prior amendment applications. Amendment requests are detailed in Section 2 of the APP Amendment Application (see attachments to this fact sheet).

The following facilities were removed from the APP facilities since they were never constructed and FMMI has no plans of constructing them.

- Tailings Storm water Pond I-2 (Facility No. 129)
- Tailings Storm water Pond I-3 (Facility No. 130)
- Tailings Storm water Pond J-1 (Facility No. 131)
- Tailings Storm water Pond J-2 (Facility No. 132)
- Tailings Storm water Pond K (Facility No. 133)
- Tailings Storm water Pond L (Facility No. 134)

Regulatory Status

Phelps Dodge Corporation submitted an APP application to ADEQ for the Morenci District on March 28, 1996. The application was deemed administratively complete by ADEQ on May 1, 1996. Technical review of the application was completed on July 25, 2000. In April, 2008, the Permittee's name was changed when Phelps Dodge Corporation was taken over by Freeport-McMoRan Copper & Gold, Inc.

The Morenci District APP permits 120 potentially discharging facilities. As requested by ADEQ, Freeport-McMoRan will maintain an on-site list of exempt, general permitted, and non-discharging facilities at the Morenci District.

The Freeport-McMoRan Morenci mine is operating pursuant to the conditions of APP P-100193. ADEQ issued this permit on October 26, 2000. Subsequent permitting actions include:

- (1) An "other" amendment, effective March 12, 2001, which modified tables to reserve Aquifer Quality Limits, corrected typographical errors, and corrected/inserted units of measurement.
- (2) A "minor" amendment, effective May 9, 2001, which modified tables to display alert levels for selected wells.

- (3) An “other” amendment, effective January 31, 2002, which modified the permit for changes in the design of the Horseshoe PLS Sump and Overflow Sump; replaced piezometer MP-2 with monitor well SW-104A, for purposes of measuring water levels in the vicinity of the open pit; and modified the units of measure for coliform reporting to “most probable number,” with detection being considered 2 mpn/100.
- (4) An “other” amendment, effective August 1, 2002, which modified the destination of the wastewater treatment plant effluent to allow, rather than require, that it be pumped to the raffinate tank; added alert levels to monitoring tables for monitoring wells CC-44 and CC-46; modified the compliance schedule for facility No. 43 to change the pilot study, and modify test plan submittal and start-up dates; and changed the destination of and description for Facility 69, Metcalf SX Plant Raffinate Pond, from that of a “single-lined impoundment” to an “unlined impoundment.”
- (5) An “other” amendment, effective July 25, 2003, which added facility 120, Tailing Stormwater Retention Dam 7C, to the list of permitted facilities (Table 1), along with operational requirements (Table 2); removed piezometer MP-5 from the list of groundwater monitoring points for hydrologic sink verification (Table 3); and added alert level and AQL entries for quarterly and biennial groundwater sampling for monitor well RG-7 (Table 5 and 6C).
- (6) An “other” amendment, effective September 26, 2003, which changed the due date for completion of the Horseshoe Sump and Overflow Pond upgrades, allowing a six-month extension to complete the revised construction design; revised the pollutant management area (PMA); inserted alert level and aquifer quality limits for five POC wells (completion of ambient monitoring period); deferred the compliance schedule deadline for submission of closure plans for the Central SX/EW Plant Vehicle Wash and Vehicle Wash-SX Pipeyard to the final closure of the Area-Wide facility; added completion dates to the Compliance Schedule for 22 completed items; and inserted the aquifer quality limit for cyanide of 0.2 mg/L for POC Well SW-42.
- (7) A combined “significant/other” amendment, effective June 28, 2004, which removed nickel and chromium from the list of required analytes for POC Well CC-46; revised the completion dates for the Mine for Leach Crushed Ore Stockpile Relocation Project (Facilities 59-67).
- (8) Two Combined “other” amendments, effective January 23, 2007, that modified the footprint of the King Stockpile (Facility 88), to incorporate an area (Garfield Test Leach Area) to be used as a temporary location for leach testing of selected ores (Shannon Stockpile run-of-mine ore); modified Section 2.6.2 to no longer require the submission of sampling logs and records, lab analytical reports, field notes, and QA/QC procedures with the SMRF forms; clarified Section 2.6.1(5),

- which requires graphs of groundwater monitoring data to be submitted in biennial reports; changed the Compliance Schedule submission date and completion date of a closure plan for the Former Metcalf Concentrate Overflow Ponds; replaced Sections 1, 4, 5, 6, and 7 to conform to the current APP framework; revised the Groundwater Section and subordinate Unit names throughout the permit to conform to the current organizational structure; corrected rules citations to conform to the current APP Rules in Section 2.6.5 and Section 2.9.
- (9) An “other” amendment, effective October 8, 2009, that added to the permit a revised footprint and PMA for the Southwest (Leach) Stockpile, and modified the configuration of eight leach collection facilities in the Southwest Stockpile Collection System.
 - (10) A “significant” amendment, dated April 8, 2010, for which a demonstration that the Hydrologic sink created by the open-pit and other controls has created a passive containment capture zone (PCCZ) within the mine site.
 - (11) An “other” amendment, effective March 30, 2011, which satisfied the compliance schedule requirement to submit an updated financial assurance mechanism for APP P-100193.
 - (12) An “other” amendment, effective February 27, 2012, which included expansion of the PMA to include newly acquired property to the west of the Garfield Pit, and replacement of groundwater level monitor well DW-17 with DW-16, due to expansion of the Garfield Pit.
 - (13) An “other” amendment, effective July 5, 2012, included expansion of the PMA to include newly acquired property to the west of the Garfield Pit, and replacement of groundwater level monitor well DW-40 with DW-38, due to expansion of the Garfield Pit.
 - (14) An “other” amendment, effective February 5, 2014, included an eastward expansion of the PMA at the Lower Chase Creek stockpile boundary; replacement water level POC DW-43 for DW-42; and an update to the financial assurance mechanism.
 - (15) A “minor” amendment (effective June 30, 2015) was initiated to include the Silver Basin Leach Stockpile and Silver Basin PLS Pond 1/2 into the permit. These facilities were previously permitted under significant amendment to the Morenci APP, LTF 47231, but were inadvertently left out of the previous revision.
 - (16) A significant amendment (effective March 22, 2017) was initiated to replace the existing Plantsite Wastewater Treatment Plant (WWTP) and Overflow Pond facility (APP Facility No. 99) with a new Morenci WWTP (APP Facility No. 99A), and expansion of the PMA boundary in the areas of Los Taos, American Mountain (due to mine pit expansion).

- (17) A significant amendment (effective August 8, 2017) was initiated to add Silver Basin NSI 1/2, a single-lined non-stormwater pond, and to remove the POC well SW-60A from the APP, due the proposed expansion of the Silver Basin Stockpile over the area where this POC well is located.

Facility Description

The Morenci District copper mine and associated facilities are located in eastern Arizona, approximately 200 miles east of Phoenix, near the towns of Morenci and Clifton, in Greenlee County. The facility is one of the largest open-pit copper mines in the world. The mine and supporting operations cover an area of approximately 72 square miles. Copper has been actively mined from the Morenci District since 1872. The current Morenci operation includes an open pit with several mining areas, leach operations, and a tailing deposition area. Copper sulfate concentrate and molybdenum concentrate are produced through conventional milling and froth flotation processes. Cathode copper is produced through solvent extraction and electrowinning (SX/EW) processes, and through the concentrate leach process. Gold and silver are also produced as minor components in the copper sulfide concentrate. According to the APP application, submitted in March 1996, approximately 850,000 tons of rock per day are mined from the Morenci open-pit mining areas, and between 2,000 and 2,500 tons of copper concentrate, and about 650 tons of cathode copper, are produced per day.

II. BEST AVAILABLE DEMONSTRATED CONTROL TECHNOLOGY

The Morenci Area-Wide Permit addresses the design, construction, operation, and closure activities for 120 facilities. Information presented in the APP application and subsequent submittals support the identified facilities as meeting BADCT. Table 2 of the permit describes the BADCT for each group of similar facilities; detailed descriptions of BADCT for individual facilities are included in the APP application and subsequent submittals.

A significant component of BADCT employed at the Morenci Mine is the passive containment of groundwater in the vicinity of the open pit mining areas. Those facilities that are located entirely within, and rely in part on the passive containment for BADCT, are noted in Table 2 of the APP.

III. COMPLIANCE WITH AQUIFER WATER QUALITY STANDARDS

At the time of APP issuance, groundwater quality at the points of compliance (POCs) met all AWQS, with the exception of two small areas, Gold Gulch and Rocky Gulch.

Based upon supporting documentation in the APP application, the permittee has demonstrated that the open pit mine will create a passive containment, as described in Arizona Revised Statutes § 49-243(G). The hydrologic sink will therefore provide pollutant capture for those facilities located within the passive containment during operations and after closure. For facilities located outside the passive containment,

the permittee will rely on engineering and operational factors to maintain compliance with AWQS at the POCs.

Monitoring and Reporting Requirements

The APP includes requirements for periodic groundwater and operational monitoring. There are also requirements for monitoring of groundwater levels and quality for the passive containment, and operational monitoring for the Lower Chase Creek interceptor well system. Operational monitoring for the permitted facilities is detailed in Table 2 of the permit. Groundwater monitoring at the POC wells is described in Section 2.6.2. Monitoring of the passive containment is described in Section 2.6.3. Operational monitoring of Lower Chase Creek is described in Section 2.6.4.

Point(s) of Compliance (P.O.C)

There are 20 designated POC wells at the Morenci Mine; all monitor for both hazardous and non-hazardous substances (see Table 4). The APP requires quarterly monitoring at all POC locations. The parameters to be monitored are listed in Table 5 of the APP. In addition, an expanded list of parameters is required to be monitored biennially (See Tables 7.A, 7.B, and 7.C). The ALs and AQLs are listed in Tables 6, 7.A, 7.B, and 7.C. The ALs and AQLs are calculated in accordance with the memorandum “Proposed Approach for the Calculation of Alert Levels” prepared by Dames & Moore, dated May 5, 2000, as allowed in the APP, Section 2.5.2.3.

Two conceptual POC wells were added in relation to the new Morenci WWTP, and the expansion in the Los Taos area.

IV. STORM WATER AND SURFACE WATER CONSIDERATIONS

Stormwater run-off and run-on is considered as a component of BADCT for individual facilities through either diversion or sizing to accommodate the 100-year, 24-hr storm event.

The AZPDES permit for the site, AZ0022705 (Chase Creek), was reissued on April 19, 2005.

V. COMPLIANCE SCHEDULE

The Compliance Schedule is provided in Section 3.0 of the permit.

VI. OTHER REQUIREMENTS FOR ISSUING THIS PERMIT

Technical Capability

Freeport-McMoRan Morenci, Inc. has demonstrated the technical competence necessary to carry out the terms and conditions of the permit in accordance with A.R.S. § 49-243(N) and A.A.C. R18-9-A202(B).

ADEQ requires that appropriate documents be sealed by an Arizona registered geologist or professional engineer. This requirement is a part of an on-going

demonstration of technical capability. The permittee is expected to maintain technical capability throughout the life of the facility.

Financial Capability

The permittee shall maintain financial capability throughout the life of the facility. This amendment did not result in an increase of the closure and post-closure costs.

The permittee previously demonstrated financial capability under A.R.S. § 49-243(N) and A.A.C. R18-9-A203. The estimated closure and post-closure costs are \$144,306,259 and \$18,685,978, respectively. The financial capability was demonstrated through A.A.C. R18-9-A203(C)(1)(b).

Zoning Requirements

Mining activity of greater than five contiguous acres is exempt from zoning requirements pursuant to A.R.S. § 11-812 and A.R.S. § 27-301.

VII. ADMINISTRATIVE INFORMATION

Public Notice (A.A.C. R18-9-108(A))

The public notice is the vehicle for informing all interested parties and members of the general public of the contents of a draft permit or other significant action with respect to a permit or application. The aquifer protection program rules require that permits be public noticed in a newspaper of general circulation within the area affected by the facility or activity and provide a minimum of 30 calendar days for interested parties to respond in writing to ADEQ. The basic intent of this requirement is to ensure that all interested parties have an opportunity to comment on significant actions of the permitting agency with respect to a permit application or permit.

Public Comment Period (A.A.C. R18-9-109(A))

The Department shall accept written comments from the public prior to granting the significant amendment. The written public comment period begins on the publication date of the public notice and extends for 30 calendar days. After the closing of the public comment period, ADEQ is required to respond to all significant comments at the time a final permit decision is reached or at the same time a final permit is actually issued.

Public Hearing (A.A.C. R18-9-109(B))

A public hearing may be requested in writing by any interested party. The request should state the nature of the issues proposed to be raised during the hearing. A public hearing will be held if the Director determines there is a significant amount of interest expressed during the 30-day public comment period, or if significant new issues arise that were not considered during the permitting process.

VIII. ADDITIONAL INFORMATION

Additional information relating to this proposed permit may be obtained from:

Arizona Department of Environmental Quality
Water Quality Division – Groundwater Section
Attn: Vimal Chauhan
1110 W. Washington St., Mail Code: 5415B-3
Phoenix, Arizona 85007
Phone: (602) 771- 4362