

Aquifer Protection Permit No. P-105258
 Place ID 1390, LTF 59787
 Significant Amendment
 Freeport-McMoRan Bagdad Mine

The Arizona Department of Environmental Quality (ADEQ) proposes to issue a significant amendment to an aquifer protection permit 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). The purpose of BADCT 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

Name of Permittee:	Freeport-McMoRan Bagdad Inc. (FMBI)
Mailing Address:	P.O. Box 245 Bagdad, Arizona 86321
Facility Name and Location:	Freeport-McMoRan Bagdad Inc. Bagdad, Arizona 86321

Regulatory Status

The original Aquifer Protection Permit (APP) application was received on July 7, 1993 for the area-wide APP (P-105258). An APP for the South Waste Rock Dump, and the Mammoth Tailings Pond (P-101353) was issued on July 3, 1996 (these facilities were not part of the initial area-wide permit). The Bagdad Wastewater Treatment Plant is separately permitted under inventory number 101740. Several amendments have been issued for both the area-wide and the Mammoth Tailings Pond APPs. In April, 2008, the name of the permittee was changed from Phelps Dodge Bagdad, Inc. to Freeport-McMoRan Bagdad Inc. Pursuant to A.A.C. R18-9-107, ADEQ consolidated APP (P-101353) and APP (P-105258).

Facility Description

Mining of copper from the Bagdad porphyry copper deposit began in 1928. The deposit is currently mined using open pit methods, with truck and conveyor haulage.

The operations produce a combined total of 200,000 tons per day of sulfide ore, leach rock, and waste rock. Sulfide ores are processed in the flotation concentrator, and sent to off-site smelters. Oxide ore is processed through the leach dump and solution extraction/electrowinning (SX/EW) method. The mine includes an open pit, a concentrator, ore and concentrate stockpiles, an SX/EW plant, active and inactive leach dumps, waste rock dumps, active and inactive tailings impoundments, pregnant leach solution impoundments, raffinate impoundments, and stormwater diversion ditches and detention basins.

The site includes the following permitted discharging facilities:

Facility	Latitude	Longitude
Copper Creek PLS Pond System (pond and conveyance channel) (D-10)	34° 36' 12" N	113° 13' 46" W
Boulder Flood Basin (D-11)	34° 36' 19" N	113° 13' 48" W
Raffinate Pond (D-13)	34° 36' 05" N	113° 13' 00" W
PLS Surge Pond (D-14)	34° 36' 04" N	113° 12' 58" W
Strong PLS Pond (D-20)	34° 35' 46" N	113° 14' 03" W
Upper Niagara Leach Dump (D-6)	34° 35' 04" N	113° 13' 53" W
Plan IX Leach Dump (D-15)	34° 34' 36" N	113° 13' 30" W
Mineral Creek Leach Dump (D-18)	34° 34' 30" N	113° 12' 52" W
Copper Creek Leach Dump (D-7)	34° 35' 56" N	113° 13' 31" W
Crystal Mountain Leach Dump (D-19)	34° 35' 48" N	113° 13' 42" W
Mulholland Tailings Pond (D-1)	34° 35' 34" N	113° 15' 11" W
Mulholland Seepage Collection Pond (D-2)	34° 35' 51" N	113° 15' 26" W
Last Chance Pond (D-3)	34° 35' 39" N	113° 14' 20" W
Mammoth Tailings Impoundment (D-23)	34° 35' 04" N	113° 16' 11" W
Upper Mammoth Tailings Impoundment (D-24)	34° 34' 10" N	113° 14' 41" W
Mammoth Tailings Seepage Collection Pond (D-25)	34° 35' 19" N	113° 17' 50" W
South Waste Rock Disposal Facility (D-26)	34° 34' 07" N	113° 12' 10" W
Catchments within the PCCZ (D-27)	See Table 4.1.1	See Table 4.1.1

Amendment Description

ADEQ has reviewed and approved the following changes under this amendment: extension of the facility boundary of the Plan IX Leach Dump (facility D-15) southward, and extension of the facility boundary of the South Waste Rock Disposal (facility D-26) southward.

II. BEST AVAILABLE DEMONSTRATED CONTROL TECHNOLOGY

All of the discharging facilities listed in Table 2.1 employ the BADCT requirements as set forth in Arizona Revised Statutes (A.R.S.) § 49-243.B.1. All permitted facilities shall be constructed, operated, and maintained in accordance with BADCT requirements, as outlined in the application and permit Section 4.0, Table 4.1.1. The operational requirements for BADCT are presented in Table 4.2.1. The mine open pit passive containment capture zone (PCCZ) shall be evaluated every five (5) years in accordance with permit Section 2.5.3.6.

III. COMPLIANCE WITH AQUIFER WATER QUALITY STANDARDS

Hydrogeologic Setting

The Bagdad Mine site is located in the transition zone physiographic province of central Arizona. The site is characterized by lava-topped mesas, with narrow deeply incised canyons in the northern part, mountains to the east and south, and low rolling hills over most of the site. The site is drained by the Boulder Creek/Copper Creek/Burro Creek drainages to the north and west. The elevation in the area ranges from about 2,300 feet amsl at Burro Creek to 5,100 feet amsl in the mountains south of the mine.

Monitoring and Reporting Requirements

Groundwater at the Bagdad Mine occurs in weathered and fractured bedrock, in permeable faults, in poorly to moderately consolidated Quaternary basin-fill sediments, in recent alluvium and in mass wasting debris. The depth to bedrock ranges from surface exposures up to several hundreds of feet below ground surface (bgs) on Black Mesa. Depth to water ranges from less than ten (10) feet bgs to over 100 feet bgs on Black Mesa. Overall groundwater flow direction is from east to west.

There are no nearby groundwater points of use downgradient of the mine.

The parameters to be monitored quarterly in the POC wells are:

Depth to water, water level elevation, field pH, field specific conductance, field temperature, sulfate, total dissolved solids, nitrate + nitrite, fluoride, arsenic, cadmium, chromium, copper, nickel, selenium, and zinc.

The extended list of parameters to be monitored biennially in the POC wells are:

Depth to water, water level elevation, field pH, field specific conductance, field temperature, total dissolved solids, total alkalinity, bicarbonate, carbonate, hydroxide, chloride, sulfate, sodium, potassium, calcium, magnesium, nitrate + nitrite, fluoride, aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, iron, lead, mercury, nickel, selenium, thallium, copper, cobalt, manganese, molybdenum, zinc, adjusted gross alpha activity, radium 226+228, uranium, carbon disulfide, TPH, benzene, toluene, ethylbenzene, total xylenes, and free cyanide.

Points of Compliance

Well Number	Latitude	Longitude	ADWR Number
CMW-609	34° 36' 25" N	113° 13' 57" W	55-537609
CMW-610	34° 36' 25" N	113° 13' 56" W	55-537610
CMW-611	34° 35' 51" N	113° 15' 26" W	55-906854
020R (A01HB)	34° 35' 47" N	113° 16' 57" W	55-916349
803 (AH13HB)	34° 35' 41" N	113° 17' 08" W	55-543803
283	34° 35' 36" N	113° 17' 57" W	55-588283
613 (A22HB)	34° 35' 17" N	113° 17' 30" W	55-546613
810 (A10HB)	34° 34' 55" N	113° 17' 31" W	55-5433810

IV. STORM WATER AND SURFACE WATER CONSIDERATIONS

The mine areas in this permit are contained within ephemeral streams comprising the Copper Creek Drainage Basin. The drainage flows into Burro Creek approximately three miles west of the mine site. There are no nearby surface water bodies. All drainages in the vicinity are ephemeral. The main surface water drainages through the permitted area are Boulder Creek and Copper Creek. Stormwater from upgradient areas is diverted around permitted facilities, as appropriate. The permitted facilities are sized to incorporate the 100-year, 24-hour storm event, while maintaining appropriate freeboard.

V. OTHER REQUIREMENTS FOR ISSUING THIS PERMIT

Technical Capability

Freeport-McMoRan Bagdad 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

Freeport-McMoRan Bagdad Inc. has demonstrated financial capability under A.R.S. § 49-243(N) and A.A.C. R18-9-A203. The permittee shall maintain financial capability throughout the life of the facility. The financial assurance mechanism was demonstrated through A.A.C. R18-9-A203(C)(8) using a corporate guarantee in the amount of \$68,844,193 to cover the financial assurance obligations of APPs P-105258 (consolidated with P-101353 [\$67,650,193]), P-102896 (\$746,000), and P50007300A (\$448,000) at the Bagdad mine site.

The permittee has a reclamation bond of \$10,172,100 with the United States Bureau of Land Management (BLM) and reclamation guarantee of \$13,012,532 with the Arizona State Mine Inspectors Office (ASMI) which will cover the costs associated with the “additional” requirements of A.R.S. 49-243(G)(2). This double-bonding more than covers these costs, as outlined in the BLM and ASMI reclamation plans, which includes but was not limited to regrading (topographic contouring and benching), crown-chaining, capping (up to two (2) feet) with compaction, stormwater diversions (channels), and revegetation as controls measures to minimize the potential for leachate discharge to groundwater. The cost for neutralizing the PILD, if necessary, has also been provided for in the ASMI guarantee amount. Post-closure maintenance and monitoring is required for a 30-year period and those costs are also covered under BLM and ASMI.

Zoning Requirements

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

VI. 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.

VII. ADDITIONAL INFORMATION

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

Arizona Department of Environmental Quality
Groundwater Section, Mining Unit
Attn: Marcy Mullins
1110 W. Washington St., Mail Code 5415B-3
Phoenix, Arizona 85007
Phone: (602) 771- 4464