

**Freeport-McMoRan Bagdad Mine**  
Aquifer Protection Permit No. 105258  
Place ID No. 1390, LTF No. 77735  
**SIGNIFICANT AMENDMENT**

**Introduction:**

The Arizona Department of Environmental Quality (ADEQ) proposes to issue an 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. 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.

**Facility Location:**

The Bagdad Mine is located near Bagdad, Arizona, in Yavapai County.

**Facility Description:**

The Bagdad Mine is an open pit copper mine and mineral concentration operation located in Yavapai County and adjacent to the unincorporated town of Bagdad, Arizona. Bagdad lies approximately 40 miles west of the town of Prescott, Arizona and 100 miles northwest of Phoenix, Arizona. The mine is owned and operated by Freeport-McMoRan Bagdad Mine (FMBI). Mining of copper from the Bagdad porphyry copper deposit began in 1928. The active mining and ore processing operations are located within Township 14 North, Range 9 West and 10 West, and Township 15 North, Range 9 West and 10 West of the Gila and Salt River Base Line and Meridian. 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.”

**Amendment Description:**

The purpose of this amendment is to make the following changes (more information can be found in the BADCT section below):

1. Permit a new Sycamore Tailings Storage Facility (STSF) (Facility # D-30) and the related facilities: Sycamore Seepage Collection Pond (A) (Facility # D-31); and Sycamore Seepage Collection Pond (B) (Facility # D-32).
2. Add a data continuity wells section (section 2.4.1) that adds nine existing wells as monitoring wells.

3. Add a well abandonment section (2.7.4.2) that requires a well abandonment report to update ADEQ of the abandoned wells.
4. Add biennial tailings impoundment reporting requirement for the new-proposed STSF.

### **Rationale for Amendment Category:**

The request to build a new facility is a significant amendment per the following rule:

*R18-9-A211(B)(9): Material and substantial alterations or additions to a permitted facility, including a change in disposal method, justify a change in permit conditions.*

### **Regulatory Status**

The Facility was found to be in compliance during the most recent inspection that was conducted on March 13, 2019.

### **Best Available Demonstrated Control Technology (BADCT):**

Section 4.1, Table 9 of the permit describes BADCT for the new discharging facilities added to the permit: (1) Sycamore Tailings Storage Facility (STSF) (Facility # D-30); (2) Sycamore Seepage Collection Pond (A) (Facility # D-31); and (3) Sycamore Seepage Collection Pond (B) (Facility # D-32).

### **Facility/Site Description**

The following description was added the facility/site description section:

“The Bagdad Mine is an open pit copper mine and mineral concentration operation located in Yavapai County and adjacent to the unincorporated town of Bagdad, Arizona. Bagdad lies approximately 40 miles west of the town of Prescott, Arizona and 100 miles northwest of Phoenix, Arizona. The mine is owned and operated by Freeport-McMoRan Bagdad Mine (FMBI). Mining of copper from the Bagdad porphyry copper deposit began in 1928. The active mining and ore processing operations are located within Township 14 North, Range 9 West and 10 West, and Township 15 North, Range 9 West and 10 West of the Gila and Salt River Base Line and Meridian. 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.”

**Discharging Facilities**

Three new discharging facilities were added to the permit as part of the STSF addition. These facilities include Sycamore Tailings Storage Impoundment (D-30), Seepage Collection Pond A (D-31) and Seepage Collection Pond B (D-32).

**Data Continuity Wells (DCW)**

A DCW section (Section 2.4.1) containing nine wells was added to the permit. These are the existing monitoring wells that may be buried during the construction of the STSF. These wells provide additional information on the groundwater conditions.

POC Location (Well Number)	ADWR Registration Number	Latitude	Longitude
MW-SC-01	229103	34° 35' 56.5" N	113° 06' 43.87" W
MW-SC-02	229504	34° 35' 54.5" N	113° 05' 37.77" W
MW-SC-03	229104	34° 35' 8.8" N	113° 03' 41.15" W
MW-SC-04	229498	34° 35' 11" N	113° 06' 19.35" W
MW-SC-05	229498	34° 35' 16.7" N	113° 05' 22.12" W
MW-SC-06	229501	34° 34' 39.7" N	113° 04' 11.22" W
MW-SC-07	229105	34° 34' 5.15" N	113° 03' 35.65" W
MW-SC-08	229508	34° 34' 16.96" N	113° 05' 23.28" W
MW-SC-09	229507	34° 33' 44.71" N	113° 04' 18.7" W

**Tailings Impoundments Reporting**

One section was added to this permit that requires a biennial technical report to be submitted to ADEQ that is prepared, signed and sealed by the Engineer of Record. The report will be provided in accordance with section 2.7.4.1.2. Tailings Impoundment Reporting of the permit.

**Compliance with Aquifer Water Quality Standards (AWQS):**

The STSF will require new POC wells. The following POC wells were added to the POC wells List: SYC-1, SYC-2, SYC-3, and SYC-4. As documented in the amendment application, the quantity and characteristics of the potential discharge from the STSF, the methods of disposal, site conditions, the hydrogeologic characterization and DIA evaluation (including a groundwater model), and proposed monitoring supports the demonstration that the STSF will not cause or contribute to a violation of AWQS at the applicable points of compliance. Compliance with AWQS will continue to be monitored at the existing POCs and the new proposed POC wells.