



Aquifer Protection Permit P-100329  
LTF 69597  
SIGNIFICANT AMENDMENT  
Pinto Valley Mine

The Arizona Department of Environmental Quality (ADEQ) proposes to issue an amended area-wide 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 Fact Sheet gives pertinent information concerning the issuance of this 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 prevent pollutants from reaching the aquifer or reduce discharge of pollutants to the greatest degree achievable before they reach the aquifer.

## I. FACILITY INFORMATION

### Name and Location

Permittee's Name:	Pinto Valley Mining Corp.
Mailing Address:	P. O. Box 100 Miami, AZ 85539-0100
Facility Name and Location:	2911 N. Forest Service Road 287 Miami, AZ 85539

### Regulatory Status

The following APP-related documents, permits and approvals are associated with the Pinto Valley Mine (PVM):

- Notice of Disposal (NOD) submitted to ADHS in January 1985 and revised in October 1988 for Magma Copper. These NODs were non-transferable during property transactions. Pinto Valley Operations were acquired by BHP in 1995;
- Temporary APP in August of 1994 for the Gold Gulch 1A Pregnant Leach Solution (PLS) Impoundment, also issued by ADEQ to Magma Copper then transferred to BHP;
- Area-wide APP was issued in September of 1996 (P-100329) for the Pinto Valley Operations (PVO) issued by ADEQ to BHP;
- A temporary permit issued by ADEQ in January of 1998 for temporary storage of tailings - issued to BHP;
- An "other" amendment (P-100329) was issued by ADEQ in June of 1999 to BHP covering:

1. Conversion of the permit format to conform with the numerical numbering system used in place of the legal numbering system;
2. A modification of alert levels based on calculations from data collected over a 2-year period;
3. A modification of the list of parameters to be monitored based on a review of data collected over a 2-year period;
- f. An “other” amendment was issued by ADEQ in November of 2002 for BHP including a pilot in-pit leach operation and replacement of Section 6.0 General Conditions and Responsibilities with revised Section 6.0 to reflect rule changes and new citations and the current APP framework;
- g. In September 2006, BHP PVO was granted authorization to discharge under General APP (P-100639) for a vehicle wheel wash for the new Filter Plant and Concentrate Storage Facility This was processed under the expedited permit program with EEC acting as ADEQ’s agent;
- h. An “other” amendment was issued by ADEQ in December of 2006 for the addition of a new outlet spillway for PLS to flow from Gold Gulch No. 1 PLS Pond and the permit was updated to the APP framework to reflect rules and current citation language;
- i. A minor amendment was issued by ADEQ in February of 2007 to correct typographical errors pertaining to columns in monitoring tables that were cut off during the printing of the original permit that was signed by ADEQ WQD Division Director Joan Card.
- j. A significant amendment was issued by ADEQ in September of 2011 to add the wastewater treatment plant and solid waste landfill.
- k. An “other” amendment was issued on September 17, 2012 to upgrade BADCT for the Gold Gulch 1A PLS pond.
- l. Closure and Post Closure Strategy dated August 13, 2013.
- m. A significant amendment was issued on September 30, 2013 to modify permitted facilities, remove/close permitted facilities, revise selected sections of the permit (such as BADCT descriptions and monitoring and reporting frequencies), and make administrative corrections to the permit.
- n. An “other” amendment was issued on October 11, 2013 to transfer ownership to Pinto Valley Mining Corp.
- o. An “other” amendment was issued on June 24, 2014 to replace the financial assurance mechanism. The previous Letter of Credit was replaced by a new Performance Surety Bond.
- p. A significant amendment was issued by the Water Quality Division on October 9, 2015. The amendment was to add several facilities, and remove the East Dump, a facility that was never constructed; update the design for some facilities; remove action levels for monitored constituents lacking numeric AWQS to conform with other mining APPs; and make administrative changes/ corrections to the permit.
- q. A significant amendment was issued on May 19, 2016 to remove the North Dump that was permitted but no longer needed, and include a consolidated waste rock dump (Main Dump)

in place of the previously permitted Gold Gulch East and West Dumps and the New Low-Grade Leach Material is in the process of being permitted.

- r. A significant amendment was issued on July 25, 2016 to consolidate TSF4 Boundary Dams 1 and 2 to a single North Boundary Dam and consolidate Boundary Dams 3 and 4 to a single South Boundary Dam, and update the closure and post-closure cost.
- s. An “other” amendment was issued on March 8, 2017 to remove the permitted, but no longer needed, North Barn Marginal Dump (NBMD) as a discharging facility and remove associated closure costs; establish a compliance schedule to submit a closure plan for the Road Crossing Pond; remove all Alert Levels (ALs) for monitoring constituents lacking numeric Aquifer Water Quality Standards (AWQS) for Alert Level Monitoring Location Spring Gulch 1 (also known as MG1-12b); update the site-wide closure and post-closure costs based on removal of the NBMD; change the name of Cottonwood Canyon Reservoir to Cottonwood Reservoir for consistency with the name used by other permits and authorizations; updated alert level and maximum action leakage rate calculations for the Gold Gulch No. 1A PLS Pond as per the compliance schedule item (CSI); and establish a compliance schedule for the demonstration of Passive Containment Capture Zone (PCCZ).

A monitoring program is in place to ensure that AWQS will not be exceeded at the POC pursuant to Title 49, Chapter 2, Article 3 of the Arizona Revised Statutes (A.R.S.) and the APP permit terms. It is described in greater detail later in this fact sheet. To ensure compliance with AWQS, the permit requires the permittee to monitor downgradient groundwater quality at POCs located at the edge of the area-wide APP Pollutant Management Area (PMA).

### **Facility Description**

Mining at the Pinto Valley Mining District began in 1874. The site was owned and operated by Magma Copper and was purchased by Broken Hill Proprietary Company Ltd (BHP) in January 1996. In April 2013, BHP entered into a purchase agreement with Pinto Valley Mining Corp. to transfer ownership of the Pinto Valley Mine to Pinto Valley Mining Corp., a subsidiary of Capstone Mining Corp. Ownership transferred to Pinto Valley Mining Corp. on October 11, 2013.

Under the original APP issued in 1995, BHP was authorized to operate ore crushing and concentrating operations, dump leaching, solvent extraction and electrowinning (SX/EW) operations, tailings storage facilities, waste dumps, process solution ponds, stormwater runoff ponds, process pipelines, and ancillary maintenance and operation facilities. BHP mined low-grade copper and molybdenum ore at the mine, including millable and leach-grade ore. The millable ore was crushed and concentrated on-site. Copper and molybdenum concentrates were shipped off-site for smelting and refining. Low-grade ore was deposited in the dump leaching area known as Gold Gulch. Raffinate solutions consisting of weak sulfuric acid were sprayed over the low-grade ore and the resulting PLS was collected in a double lined facility with leak detection. The solution was pumped to the SX/EW plant to produce copper cathodes. In February 1998, mining at the PVU was curtailed, leaving the Low-grade Ore leaching Piles and SX/EW as the only active operations. Mining operations resumed in April 2007, were curtailed in January 2009, and again resumed in December 2012. Operations are performed in the same manner as previously described.

## **Geology**

The Pinto Valley deposit is located within the Inspiration structural block. Geologic units ranging in age from Precambrian to Quaternary outcrop in the area. The geologic setting is a Precambrian crystalline basement complex of nested intermediate plutons intruding an older basement schist complex and in turn engulfed by the regional Ruin Granite batholithic complex. This suite, in turn, is cut by the widespread Schultze Granite of Laramide Age. The area was uplifted in the Tertiary, and covered with a thick sequence of deposits, including the Whitetail Conglomerate, Apache Leap Tuff, and Gila Conglomerate. Unconsolidated alluvium occurs along Pinto Creek and some of its tributaries.

The predominant geologic structure is the north-northwest trending quartz monzonite horst block of Porphyry Mountain (the Castle Dome horst block). The Castle Dome horst block is bounded by the north-northwest trending West Branch Gold Gulch Fault to the west and Jewel Hill Fault to the east.

## **Hydrogeology**

Groundwater occurs in two hydrogeologic units, including a surficial, shallow groundwater system present in the alluvium and upper weathered portions of underlying bedrock, and more laterally extensive, discontinuous, deep groundwater system within joints and fractures in the consolidated bedrock. Alluvium is present in major and minor stream channels and drainages. Bedrock is present through the mine and underlies the alluvium. Regional groundwater flows to the north-northwest. Local groundwater flows to the open pit, which acts as a hydrologic sink.

Upward vertical gradients and seeps/springs are present in some areas of the site. Abandoned wells CDX-6, CDX-7, CDX-11 previously located along the southwest side of the Low-grade Ore Leaching Piles flowed at the groundwater surface (artesian) at ranges of 80 to 100 gallons per minute (gpm) prior to abandonment (Hargis, 1995). Upward gradients were used as a part of site characteristics in support of BADCT for the Low-grade Ore Leaching Piles.

Although there is a bedrock aquifer, bedrock at the site exhibits low hydraulic conductivity. Results of testing performed at the site indicate that conductivity ranges from  $1.1 \times 10^{-7}$  to  $1.1 \times 10^{-3}$  centimeters per second (cm/sec). These findings were used in support of BADCT for several APP-regulated facilities that were constructed pre-APP (before 1986).

## **Amendment Description**

ADEQ has reviewed and approved the following changes under this amendment:

- Modified life-of-mine design configuration and footprint for TSF4 and associated BADCT demonstrations in order to increase permitted elevation to 4,250 ft amsl
- Updated closure design for TSF4
- Revised site-wide closure and post-closure cost estimate
- Updated financial assurance demonstration to reflect the modification of the amended facility
- Modified the facility name from Rosa's Pond System to Rosa's Pond
- Modified the facility name from Yasin Impoundment to Yasin Catchment
- Removed the Saddle Dam as a design component of TSF4.

## **II. BEST AVAILABLE DEMONSTRATED CONTROL TECHNOLOGY**

The Pinto Valley Mine relies on engineered controls, operational procedures, and for pre-1986 facilities, water conservation/beneficial use and site characteristics to demonstrate BADCT. BADCT also includes stormwater diversion to protect APP facilities, and stormwater management for the 100-year, 24-hour storm event or the maximum saturation event (MSE).

All APP regulated facilities have been evaluated for compliance with the requirements of A.R.S. § 49-243 and A.A.C. R18-9-A202, and have been determined to meet those requirements.

Inspections and operational monitoring is required to ensure that facilities are maintained in accordance with BADCT and standard engineering practices.

For many of the facilities, site characteristics were considered as part of BADCT.

## **III. COMPLIANCE WITH AQUIFER WATER QUALITY STANDARDS**

### **Monitoring and Reporting Requirements**

For this permit, an area-wide PMA has been designated. Pursuant to A.R.S. § 49-244 (1), a PMA is the limit projected (onto the ground surface) in the horizontal plane of the area on which pollutants are or will be placed. The PMA is shown on Figure 1. The PMA includes horizontal space taken up by any liner, dike or other barrier designed to contain pollutants for all APP regulated facilities. An area-wide PMA is a line circumscribing the APP-regulated facilities. Compliance with AWQS is determined at the edge of the PMA. For this permit, a perimeter monitoring program has been put in place to monitor groundwater in the downgradient direction and protect off-site water uses.

Facility POCs are located at the northern, western and southwestern boundaries of the PMA. No wells are currently located on the eastern property boundary based on direction of groundwater flow, which is generally towards the northwest in the northern portion of the site and southwest in the southern portion of the site.

The permit requires that all monitoring be conducted pursuant to Sections 2.0 and 4.0. A total of 11 hazardous and non-hazardous POCs have been designed for this permit, these include both groundwater monitoring wells and groundwater spring monitoring locations.

The 11 hazardous and non-hazardous POCs listed in Table 4.2-1, Section 4.2 of the permit, will be monitored on a quarterly basis according to the compliance groundwater monitoring requirements in Tables 4.2-2 through 4.2-13 in Section 4.2. Once every 2 years (biennially), the permittee will sample the POC wells for the original analyte list in Tables 2 through 12, Section 4.2.

### **Liner Leakage Monitoring**

The leak collection and recovery system (LCRS) for the PLS impoundments in Gold Gulch will be monitored according to Table 4.1-1, Section 4.1. The contingency plan included in Section

2.6.2.2 & 2.6.2.3 will be activated if monitoring shows that alert levels (ALs) for the LCRS are exceeded.

### **APP Facility Inspections and Operational Monitoring for Performance Standards**

Inspection and operational requirements are included in Table 4.1-4, Section 4.1 for stormwater and process water retention ponds, caisson and seepage collection systems, tailings storage facilities, waste rock dumps, stormwater diversion ditches, monitoring wells, barge pumps, WWTP and the Solid Waste Landfill.

### **Wastewater Treatment Plant**

Initial discharge characterization monitoring was completed for metals, volatile organic and semi-volatile organic compounds. Routine discharge monitoring is required for flow, pathogens and nitrogen. A concentration limit of fecal coliform organisms in 4 of the 7 wastewater samples collected during the week is less than 200 CFU/100 ml and less than a single sample maximum of 800 CFU/100 ml. Table 4.3-1 in the APP includes routine WWTP monitoring requirements.

The WWTP effluent sampling point will be at a point on the effluent line downstream from the chlorination tank, Latitude: 33° 23' 17" N, Longitude: 110° 58' 24" W.

### **Points of Compliance**

The following table lists the hazardous and nonhazardous POC groundwater monitoring locations.

Sampling Point Number	Identifier	ADWR Number	Latitude	Longitude	Facility Monitoring
<b>HAZARDOUS AND NONHAZARDOUS POINTS OF COMPLIANCE</b>					
<b>GROUNDWATER POC MONITORING LOCATIONS</b>					
019	APP-1A	55-543407	33° 27' 25" N	110° 58' 43" W	Tailings Storage Facility No. 4, above fault zone
020	APP-1Br	55-563251	33° 27' 25" N	110° 58' 43" W	Tailings Storage Facility No. 4, below fault zone
021	APP-2	55-543406	33° 27' 16" N	110° 59' 46" W	Tailings Storage Facility No. 4, East Water Canyon
022	APP-3A	55-543404	33° 25' 34" N	110° 59' 59" W	Gold Gulch
023	APP-3B	55-543405	33° 25' 34" N	110° 59' 59" W	Gold Gulch
024	APP-4	55-543403	33° 25' 21" N	111° 00' 03" W	Tailings Storage Facility No. 3
025	APP-5A	55-543402	33° 23' 42" N	110° 59' 07" W	No. 1 Seepage
026	APP-5B	55-553712M	33° 23' 42" N	110° 59' 07" W	No. 1 Seepage



Sampling Point Number	Identifier	ADWR Number	Latitude	Longitude	Facility Monitoring
027	APP-6	55-543401	33° 23' 36" N	110° 58' 57" W	Miller Gulch
<b>SPRING POC MONITORING LOCATIONS</b>					
033	North Draw 1	N/A <sup>1</sup>	33° 25' 38" N	111° 00' 00" W	Baker Pond and North Dump
036	MG1-6b/ Homestead Springs	N/A	33° 24' 54" N	111° 00' 05" W	Tailings Storage Facility No. 3
<b>ALERT LOCATION – GROUNDWATER/SEEP/SPRING MONITORING</b>					
032	APP-7 (Ground-water well)	55-560644	33° 22' 58" N	110° 59' 25" W	Gold Gulch
035	MG1-12b/ Spring Gold Gulch 1	N/A	33° 25' 31" N	110° 59' 43" W	Gold Gulch
034	MG1-7a/ Raffinate Pond Monitor Point (seep)	N/A	33° 23' 33" N	110° 59' 17" W	Raffinate Pond

#### **IV. STORMWATER and SURFACE WATER CONSIDERATIONS**

The nearest surface water body is Pinto Creek. Pinto Creek is protected by a series of catchments and impoundments at the PVM that are designed to capture impacted stormwater and runoff. The stormwater retention facilities are designed to contain runoff from a 100-year, 24-hour storm or the MSE (which is more conservative than the 100-year, 24-hour event) as a part of BADCT. Stormwater diversion structures in place at the site also divert stormwater around key APP-discharging facilities, as a part of BADCT. Pumping equipment and backup power sources are maintained where necessary to control stormwater runoff and recycle it to the process water control system. Stormwater and surface water facilities will be inspected for the duration of the permit to ensure that discharge control components are not impacted by surface water.

#### **V. COMPLIANCE SCHEDULE**

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

#### **VI. OTHER REQUIREMENTS FOR ISSUING THIS PERMIT**

##### **Technical Capability**

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

---

<sup>1</sup> N/A = not applicable

### **Financial Capability**

The estimated closure cost is 97,783,639, and the post-closure cost is \$3,356,618, for a total of \$101,140,257. Pursuant to A.A.C. R18-9-A203.C.2, the current financial assurance mechanism is demonstrated through an Increase Rider to previously submitted Performance Surety Bond totaling \$101,140,257.

### **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