



# Traffic Impact Statement

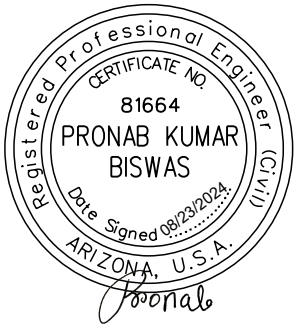
Ore Town Solar Project

Solar Photovoltaic Power Generating and Battery Energy Storage System Facility

*HDR Project #10408558*

San Manuel, Arizona

August 23, 2024




Pinal County Case #A-PA-029-24

# EXECUTIVE SUMMARY

This Traffic Impact Statement has been created to assess the potential transportation impacts of the construction and operation of the Ore Town Solar Project (Project). The Project entails a solar photovoltaic power generation and battery energy storage system facility spanning approximately 1,200 gross acres. The project location is in Pinal county near San Manuel, Arizona along South Veterans Memorial Boulevard, which is approximately 5 miles to the south from State Route 77 (SR 77).

The following conclusions have been documented in this statement:

- Unlike traditional developments, the Institute of Transportation Engineers (ITE) *Trip Generation Manual* does not provide any guidance to estimate trip generation for this type of facility and thus conversations with and information provided by the developer and their contactors were used to estimate trip generation.

  The construction period will generate the most traffic for this site. After discussion with the Project developer the trip generation for this site was assumed and approximate number of workers and expected deliveries were used to estimate the potential trip generation for this site.

  The construction period is expected to last up to 16 months (February 2026 to May 2027). It is anticipated that a maximum of 275 to 325 workers will be present on-site each day during peak construction period. For a conservative analysis, 325 persons were used for calculating trip generation. Additionally, there will approximately 30 to 60 truck trips per day for equipment, materials, watering, etc., with 15 to 30 trips during the morning peak hour and 15 to 30 trips during the evening peak hour. While it is unlikely that all construction workers will drive themselves to and from the site daily, approximately 680 to 710 vehicle trips can be anticipated daily. However, this maximum number is not expected to occur every day since many workers are likely to arrive before the typical morning peak hour and leave before the typical evening peak hour. Therefore, these workers are not included in the peak hour trip calculations.

- During regular operations i.e., once the construction is completed, the Project would employ up to two full-time remote workers during operation. However, site visits might require for any unexpected situations. The site visits would be on an infrequent and as needed basis and would not consistently affect daily traffic patterns in the vicinity. However, for a conservative analysis, it is estimated that a maximum of 6 personnel might be at the site during such infrequent events, and thus 12 trips per day on that day, with 6 entering in the morning peak hour and 6 departing in the evening peak hour, can be expected. It is noted that no outgoing trips during the AM peak hour, and incoming trips during the PM peak hour is estimated.
- The following two intersections are proposed as site access points:
  - South Veterans Memorial Boulevard and Republic Road
  - South Veterans Memorial Boulevard and South McNab Parkway

- South Veterans Memorial Boulevard is relatively flat with little vertical inflection and is virtually straight with very little horizontal deflection for 0.5 mile to the north and south of the site access points. From the American Association of State Highway and Transportation Officials (AASHTO) Greenbook, the stopping sight distances were calculated. The stopping sight distance for a 45-mph roadway is 360 feet and the intersection sight distance needed to maneuver from Republic Road to South Veterans Memorial Boulevard is 530 feet looking to the left and 530 feet looking to the right and the intersection sight distance needed to maneuver from South McNab Parkway to South Veterans Memorial Boulevard is 530 feet looking to the left and 565 feet looking to the right. The available sight distance exceeds the needs given the flatness and little horizontal deflection of South Veterans Memorial Boulevard.
- It is also recommended that during construction, advanced warning signs are placed on South Veterans Memorial Boulevard approaching Republic Road and South McNab Parkway to warn the traveling public the temporary increase in traffic at Republic Road and South McNab Parkway and of vehicles turning to/from South Veterans Memorial Boulevard. These advanced warning signs could include “Slow Traffic Ahead” (W23-1) or “Trucks Entering and Leaving Highway” and should be placed a minimum of 775 feet in advance of Republic Road and South McNab Parkway on both directions on South Veterans Memorial Boulevard.

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# 1. Introduction

This Traffic Impact Statement has been prepared on behalf of 310SM 8me LLC for the proposed Ore Town Solar Project (Project) to evaluate the potential transportation impacts resulting from the construction, operation, and maintenance of the Project. The Project will consist of a solar photovoltaic (PV) generating facility up to 145-megawatt (MWac) and a battery energy storage system (BESS) up to 145 MWac encompassing approximately an area of 1,200 gross acres. The Project location is in Pinal County near San Manuel, Arizona along South Veterans Memorial Boulevard, approximately 5 miles south of State Route 77 (SR 77). A vicinity map of the site is included in ***Figure 1***.

# 2. Existing Condition

The Project is sited on previously distributed, now reclaimed lands on a portion of the decommissioned San Manuel Copper Mine. The surrounding area consists of residential neighborhoods and undeveloped land. A portion of the Project area was previously used for ore processing; however not historically mined. The project area lies behind a security fence. The land area is currently undeveloped. ***Figure 2*** shows the existing site land condition.

The functional classifications of roads near the proposed project vicinity were obtained from the Pinal County Transportation Planning Viewer, according to which South Veterans Memorial Boulevard is a major collector, South McNab Parkway is a minor collector, and Republic Road is a local road (PINAL COUNTY Transportation Planning Viewer (arcgis.com). According to Arizona Department of Transportation (ADOT) Traffic Count Database System (TCDS), the Average Annual Daily Traffic (AADT) count in 2023 is approximately 2,951 vehicles per day to the north of the intersection of South Veterans Memorial Boulevard and Republic Road and 3,355 vehicles per day to the south of the intersection of South Veterans Memorial Boulevard and Republic Road (https://adot.public.ms2soft.com/tcds/tsearch.asp?loc=Adot&mod=TCDS). Refer to ***Appendix A*** for the existing volumes.

South Veterans Memorial Boulevard, South McNab Parkway, and Republic Road are paved with asphalt, and each has one lane in each direction. The pavement width of South Veterans Memorial Boulevard, South McNab Parkway and Republic Road are 42 feet, 67 feet and 22 feet, respectively. At the intersection of South Veterans Memorial Boulevard and Republic Road, there are one right turn deceleration lane and one left turn deceleration lane on South Veterans Memorial Boulevard and one channelized right turn lane and one left turn lane on Republic Road. South Veterans Memorial Boulevard is free flowing at the intersection with Republic Road. The left lane on the Republic Road approach is stop-controlled, while the channelized right-turn lane is yield-controlled (Refer to ***Figures 3 and 4***). ***Figures 5 and 6*** show the left turn and right turn lanes on South Veterans Memorial Boulevard at the intersection of South Veterans Memorial Boulevard and Republic Road. At the intersection of South Veterans Memorial Boulevard and South McNab Parkway there are one right turn deceleration lane and one left turn deceleration lane on South Veterans Memorial Boulevard in both directions and one channelized right turn lane and one shared through and left turn lane on the east side of South McNab Parkway. South Veterans Memorial Boulevard is free flowing at the intersection with South McNab Parkway. The shared through and left lane on the east side of South McNab Parkway approach is stop-controlled, while the channelized right-turn lane is yield-controlled (Refer to ***Figure 7***). ***Figures 8***

***and 9*** show the left turn and right turn lanes on South Veterans Memorial Boulevard in each direction at the intersection of South Veterans Memorial Boulevard and South McNab Parkway.

## 3. Proposed Development

As previously mentioned, the Project is expected to utilize approximately 1,200 acres of private undeveloped land under the jurisdiction of the Pinal County for the purposes of a solar power generation and storage facility. Refer to ***Figure 10*** for an overall plan view of the project area.

Based on conversations with the Project developer, it is understood that most of the traffic associated with this project will occur during the construction phase, which is estimated to last up to 16 months. These trips may include the following:

- Deliveries of supplies, building materials, and equipment
- Transportation of construction equipment, including but not limited to
    - Augers
    - Bulldozers
    - Trucks
    - Trailers
    - Tractors
    - Cranes

Construction activities are expected to be limited to a single shift lasting up to 12 hours, although the specific start times may vary depending on weather conditions and the construction schedule.

Once construction has been completed and the Project is fully operational, it is anticipated that daily trips will not be required.

## 4. Site Access

The following two intersections are proposed as site access points:

- South Veterans Memorial Boulevard and Republic Road
- South Veterans Memorial Boulevard and South McNab Parkway

Both the proposed site access points are paved and stop-controlled for the left turn movement and yield-controlled for the right turn movement. At the intersection of South Veterans Memorial Boulevard and Republic Road, there are two existing driveways within 0.25 miles of the site driveway (refer to ***Figure 11***). On the other side, at the intersection of South Veterans Boulevard and S McNab Parkway there are four existing driveways within 0.25 miles of site driveway (refer to ***Figure 12***). According to Pinal County Access Management Manual, driveway spacing along collector roadways shall be 250 feet. The existing driveway spacing adjacent to the site access points meets the Pinal County Access Management Manual criteria.

It is assumed that equipment deliveries and construction workers will likely come to the project site via Hwy 77 and turn south on to Veterans Memorial Blvd. The Project access points will be constructed to accommodate construction vehicles, project vehicles, and emergency vehicles.

### 4.1. Sight Distance Analysis

South Veterans Memorial Boulevard is relatively flat with little vertical inflection and is virtually straight with very little horizontal deflection for 0.5 mile to the north and south of the site access points. From the American Association of State Highway and Transportation Officials (AASHTO) Greenbook, the stopping sight distances were calculated. The stopping sight distance for a 45-mph roadway is 360 feet and the intersection sight distance needed to maneuver from Republic Road to South Veterans Memorial Boulevard is 530 feet looking to the left and 530 feet looking to the right and the intersection sight distance needed to maneuver from South McNab Parkway to South Veterans Memorial Boulevard is 530 feet looking to the left and 565 feet looking to the right. The available sight distance exceeds the needs given the flatness and little horizontal deflection of South Veterans Memorial Boulevard.

It is also recommended that during construction, advanced warning signs are placed on South Veterans Memorial Boulevard approaching Republic Road and South McNab Parkway to warn the traveling public of the temporary increase in traffic at Republic Road and South McNab Parkway and of vehicles turning to/from South Veterans Memorial Boulevard. These advanced warning signs (shown in ***Figure 13***) could include “Slow Traffic Ahead” (W23-1) or “Trucks Entering and Leaving Highway” should be placed a minimum of 775 feet (according to Table 2C-3 of Manual on Uniform Traffic Control Devices (MUTCD), 11$^{th}$ Edition) in advance of both Republic Road and South McNab Parkway on both directions on South Veterans Memorial Boulevard.

## 5. Site Trip Generation, Distribution, and Assignment

### 5.1. Site Trip Generation

There are no trip generation rates specific to construction of a project in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*. The construction period is anticipated to generate the most traffic for this site. After discussion with the site developer, the trip generation for this site was developed from an approximation of anticipated site construction workers and expected deliveries.

During regular operations once the construction is completed, the Project would employ up to two full-time remote workers during operation. However, site visits might be required for any unexpected situations. The site visits would be on an infrequent and as-needed basis and are not anticipated to consistently affect daily traffic patterns in the vicinity. However, for a conservative analysis, it is estimated that a maximum of 6 personnel might be at the site during such infrequent events, and thus 12 trips per day on that day, with 6 entering in the morning peak hour and 6 departing in the evening peak hour, can be expected. It is noted that no outgoing trips during the AM peak hour, or incoming trips during the PM peak hour are estimated.

The construction period is expected to last approximately 16 months (February 2026 to May 2027). It is anticipated that a maximum of 275 to 325 workers will be present on-site each day during the peak construction period. For a conservative analysis, 325 persons were used for

calculating the trip generation. Additionally, there will be a range of 30 to 60 truck trips per day for equipment, materials, watering, etc., with 15 to 30 trips during the morning peak hour and 15 to 30 trips during the evening peak hour.

While it is unlikely that all construction workers will drive themselves to and from the site daily, a range of 680 to 710 vehicle trips can be anticipated daily. This estimate includes 650 worker trips and 30 to 60 truck trips... However, this maximum number is not expected to occur every day. Additionally, many workers are likely to arrive before the typical morning peak hour and leave before the typical evening peak hour and therefore, not all workers are included in the peak hour trip calculations.

***Table 1*** provides a summary of the approximate trip generation estimates for this site, both during the construction phase and during regular operation.

***Table 1: Trip Generation***

| Phase | Daily Total | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | In | Out | Total | In | Out | Total |
| **Construction** | 680 to 710 | 9 to 18 | 6 to 12 | 15 to 30 | 6 to 12 | 9 to 18 | 15 to 30 |
| **Special needs, during normal operation** | 12 | 6 | 0 | 6 | 0 | 6 | 6 |

## 5.2. Trip Distribution and Assignment

For the analysis, the intersection of South Veterans Memorial Boulevard and Republic Road was used assuming all the site traffic will use Republic Road. This trip distribution is also valid for the other access point at the intersection of South Veterans Memorial Boulevard and S McNab Parkway. However, the final access point will be chosen by the developer prior to the start of construction. It is expected that a significant portion of the traffic will be comprised of equipment and material deliveries during construction. For the purpose of this study, it is assumed that during construction 100% of the traffic will be traveling to or from the north along South Veterans Memorial Boulevard, while during normal operations, 67% of the traffic will be traveling to or from the north along South Veterans Memorial Boulevard, and the remaining 33% will be coming from or going to the south on South Veterans Memorial Boulevard. These percentages were applied to estimate the site trips which are summarized in ***Table 1***. ***Figure 14*** illustrates the estimated number of trips generated by the site at the intersection of Republic Road and South Veterans Memorial Boulevard during both the construction phase and the special infrequent events during normal operations.

# 6. Impacts to Adjacent Existing Infrastructure

There are one right turn deceleration lane and one left turn deceleration lane on South Veterans Memorial Boulevard and one channelized right turn lane on Republic Road at the intersection of South Veterans Memorial Boulevard and Republic Road. Besides that, at the intersection of South Veterans Memorial Boulevard and South McNab Parkway, there are one right turn deceleration lane and one left turn deceleration lane on South Veterans Memorial Boulevard in

both directions and one channelized right turn lane and one shared through and left turn lane on the east side of South McNab Parkway. Considering the limited number of site traffic and through vehicles along the South Veterans Memorial Boulevard, the existing roadway configuration is expected to be adequate. However, if traffic patterns change, a new analysis to evaluate the need for additional turn or deceleration lanes may be necessary. Traffic Impact Statement (TIS) Guidelines by Pinal County mentioned the following factors that may require additional analysis which are not applicable for our project

- The existence of any current traffic problems or concerns in the local area such as an offset intersection, a high number of traffic accidents, etc.
    - No significant traffic concerns have been identified by the traffic team and no additional analysis is needed at this time.
- The sensitivity of the adjacent neighborhoods or other areas where the public may perceive an adverse impact.
    - There is no indication of public concern regarding adverse impacts from proposed development and no further analysis is required.
- The proximity of proposed site driveways to existing driveways or intersections,
    - As the site generated traffic is low, the proposed site driveways are not anticipated to impact the existing driveways or intersections. As a result, no additional analysis is required.
- Other specific problems or safety related concerns that may be aggravated by the proposed development.
    - No specific safety concerns related to the proposed development have been identified that could exacerbate existing conditions. As a result, no additional safety analysis is warranted.

However, the traffic team manually collected AM Peak traffic data (refer to ***Appendix C***) at the intersection of South Veterans Memorial Boulevard and South McNab Parkway to understand the operational performance of the intersection. The operational performance of an intersection or a highway facility is based on Level-of-Service (LOS) criteria based on Highway Capacity Manual (HCM). The LOS is a measure of intersection performance in terms of how much delay is experienced by drivers. There are six LOS categories ranging from “A” to “F”. Each level is used to describe traffic flow in terms of the projected delay experienced by motorists. A LOS of “A” represents the lowest amount of delay and congestion, and a LOS of “F” represents the highest amount of delay and congestion. A LOS of “E” is considered a representation of an intersection operating at capacity. ***Table 2*** show the LOS criteria for unsignalized intersection.

Synchro analysis software was used to analyze the study intersection for LOS. The results for Synchro analysis are summarized in ***Table 3***. Complete Synchro Analysis data can be found at ***Appendix D***.

***Table 2: LOS Criteria for Unsignalized Intersection***

| LOS | Average Control Delay (sec/veh) |
|---|---|
| A | 0-10 |
| B | >10-15 |
| C | >15-25 |
| D | >25-35 |
| E | >35-50 |

*Table 3: LOS Summary*

| Intersection | | | Existing Condition | |
|---|---|---|---|---|
| | | | Delay (Sec/Veh) | LOS |
| S Veterans Memorial Blvd and S McNab Parkway | AM Peak | NBL | 7.4 | A |
| | | EBL | 9.5 | A |

## 7. Conclusions/Recommendations

The following conclusions have been documented in this statement:

- Due to the nature of the activities in solar facilities, the site will have minimal to no traffic during regular operations, and most of the traffic will be during the construction of the facility.
- During regular operations i.e., once the construction is completed, the Project would employ up to two full-time remote workers during operation. However, site visits might require for any unexpected situations. The site visits would be on an infrequent and as needed basis and would not consistently affect daily traffic patterns in the vicinity. However, for a conservative analysis, it is estimated that a maximum of 6 personnel might be at the site during such infrequent events, and thus 12 trips per day on that day, with 6 entering in the morning peak hour and 6 departing in the evening peak hour, can be expected.
- Based on information from the Project developer, the construction period is expected to last up to 16 months (February 2026 to May 2027). It is anticipated that a maximum of up to 325 workers will be present on-site each day during the peak construction period. Additionally, there will be a range of 30 to 60 truck trips per day for equipment, materials, water, etc.,
- The following two intersections are proposed as site access points:
    - South Veterans Memorial Boulevard and Republic Road
    - South Veterans Memorial Boulevard and South McNab Parkway
- South Veterans Memorial Boulevard is relatively flat with little vertical inflection and is virtually straight with very little horizontal deflection for 0.5 mile to the north and south of the site access point. The available sight distance exceeds the needs given the flatness and little horizontal deflection of South Veterans Memorial Boulevard.
- It is also recommended that during construction, advanced warning signs such as “Slow Traffic Ahead” (W23-1) or “Trucks Entering and Leaving Highway” should be placed a

minimum of 775 feet in advance of Republic Road and South McNab Parkway on both directions on South Veterans Memorial Boulevard.

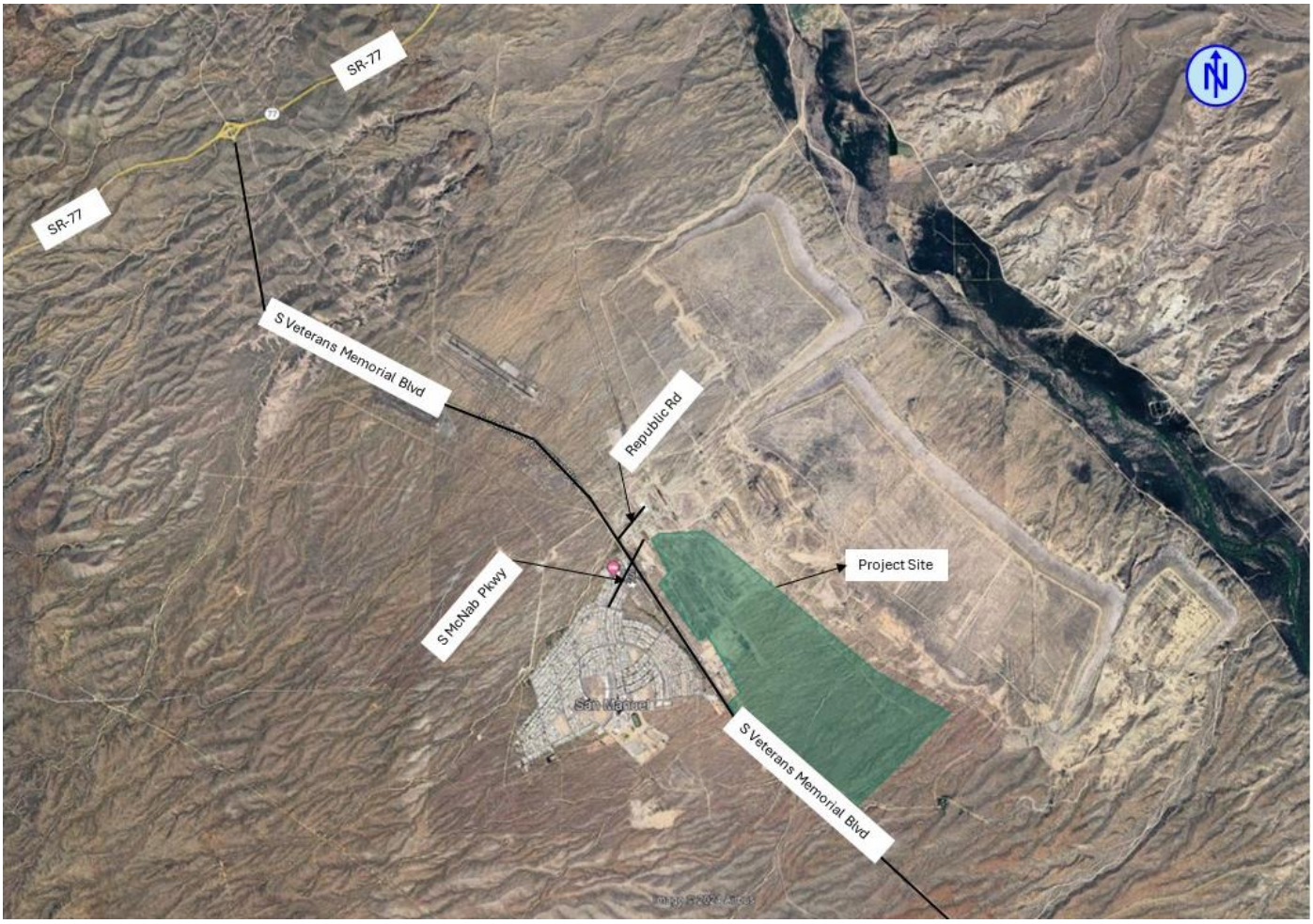



*Figure 1: Vicinity Map*



*Figure 2: Existing Land Condition*




*Figure 3: Stop Control on the Intersection of Republic Road & S Veterans Memorial Blvd*



*Figure 4: Yield Control on the Intersection of Republic Road & S Veterans Memorial Blvd*



*Figure 5: Left Turn Deceleration Lane on S Veterans Memorial Boulevard at the Intersection with Republic Road*



*Figure 6: Right Turn Deceleration Lane on S Veterans Memorial Boulevard at the Intersection with Republic Road*




*Figure 7: Stop and Yield Controlled S McNab Parkway (East Side)*



*Figure 8: Left and Right Turn Deceleration Lanes on S Veterans Memorial Boulevard at the Intersection with S McNab Parkway (Northbound)*



*Figure 9: Left and Right Turn Deceleration Lanes on S Veterans Memorial Boulevard at the Intersection with S McNab Parkway (Southbound)*

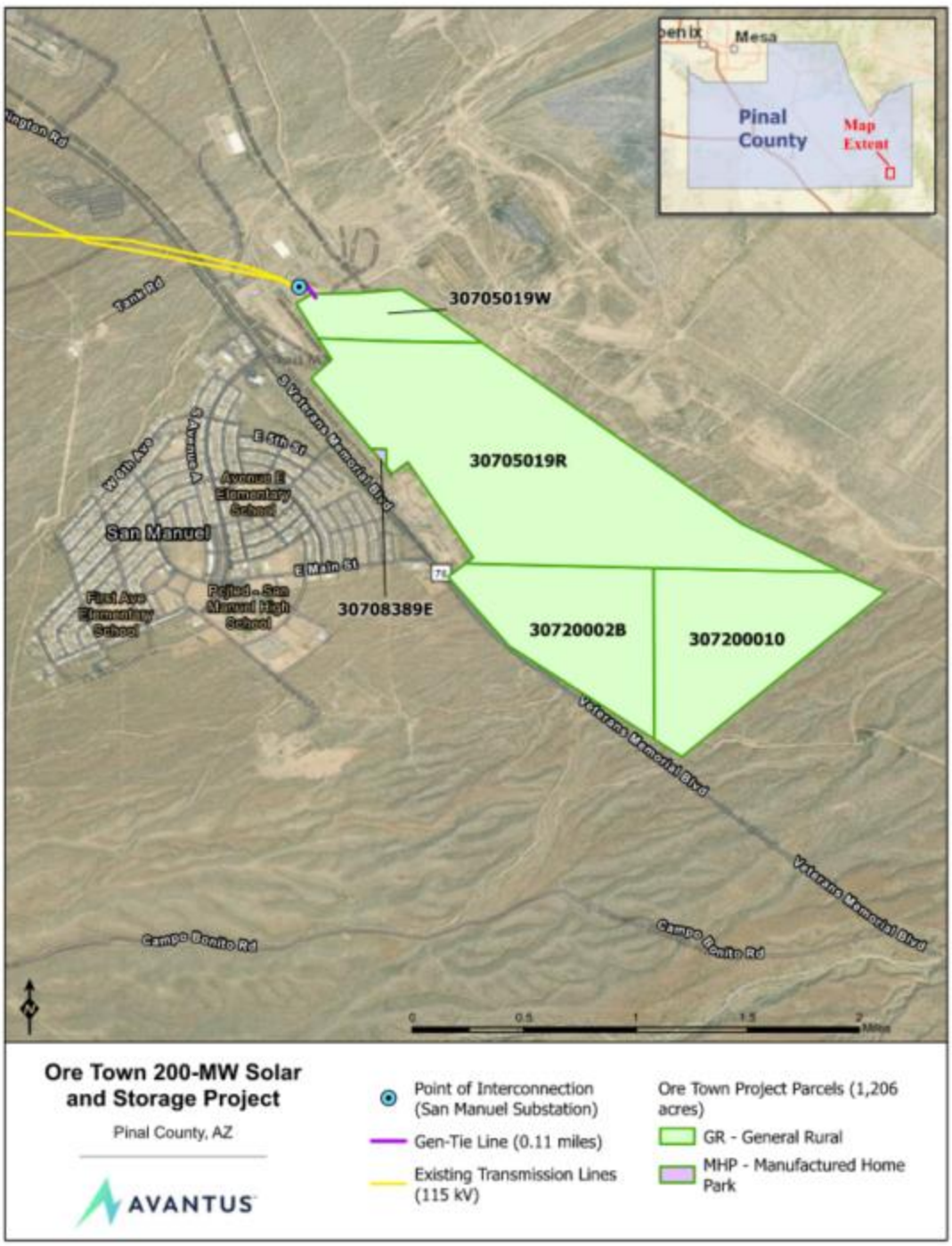



*Figure 10: Ore Town Solar Site Plan*




*Figure 11: Distance between existing Driveways and Site Driveway at the Intersection of S Veterans Blvd and Republic Rd*




*Figure 12: Distance Between Existing Driveways and Site Driveway at the Intersection of S McNab Parkway and S Veterans Memorial Blvd*




*Figure 13: Recommended Advanced Warning Signage Examples*

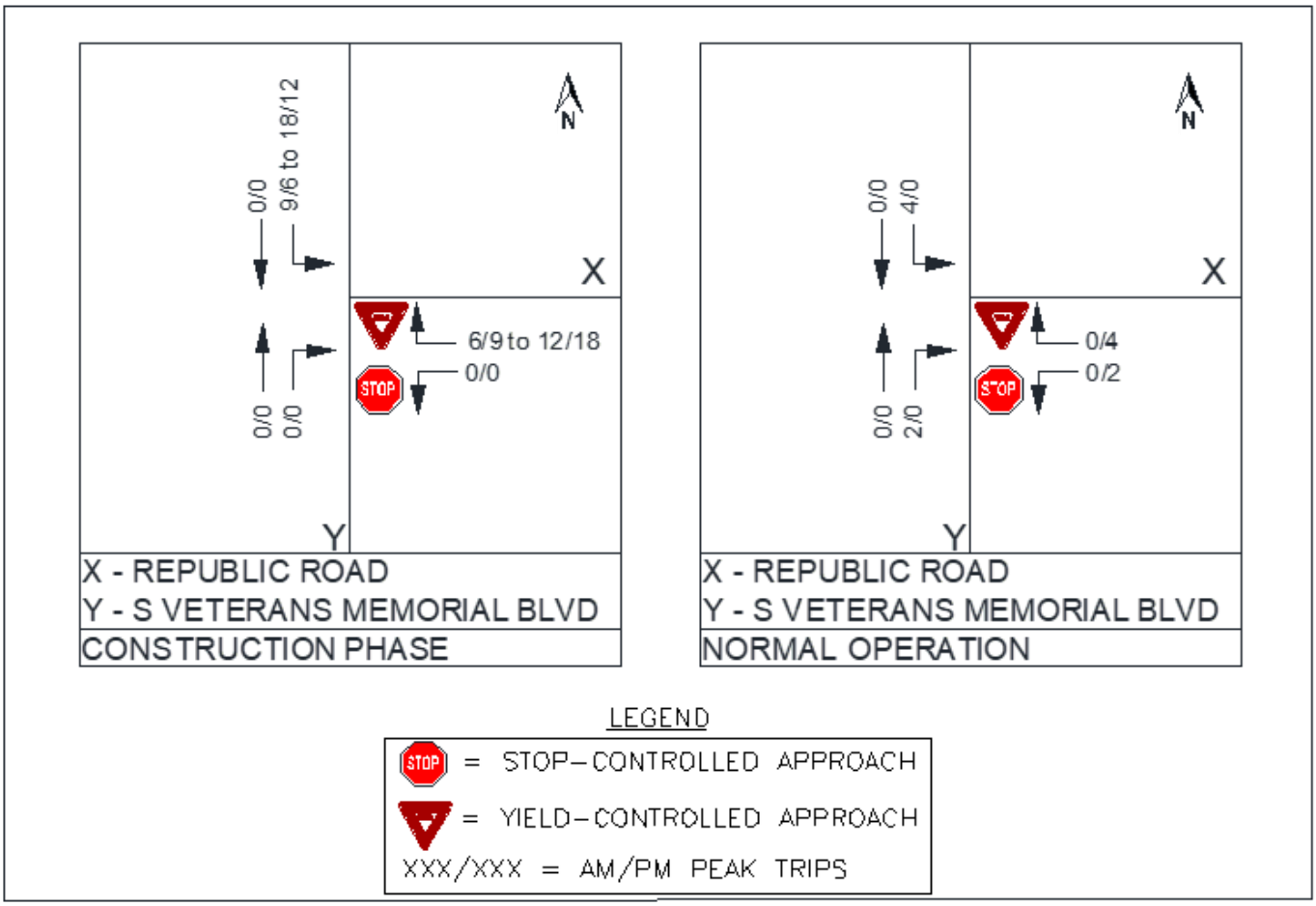
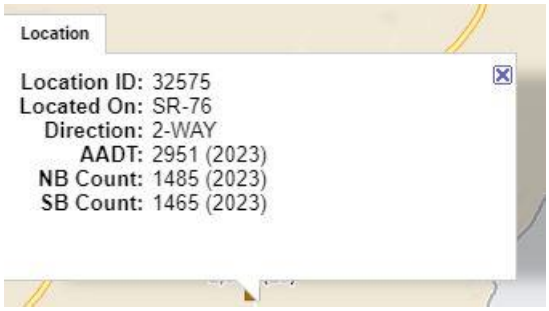



*Figure 14: Site Generated Traffic*

# Appendix A

## Annual Average Daily Traffic Count




AADT on S Veterans Memorial Boulevard, north of Republic Road




AADT on S Veterans Memorial Boulevard, south of Republic Road

# Appendix B

## Intersection Sight Distance Analysis

## INTERSECTION SIGHT DISTANCE CALCULATIONS

**Intersection of South Veterans Memorial Boulevard and Republic Road**

Reference: 2018 AASHTO “Green Book” chapter 9.5

Design Vehicle: Passenger Vehicles

Major Road Speed:

South Veterans Memorial Boulevard: 45 mph

Case B1: A stopped vehicle turning left from a minor street approach onto a major road

Case C2: A vehicle turning right from a minor street approach onto a major road with yield control on the minor street

FORMULA:

$ISD = 1.47 \times V_{major} \times t_g$

Units: ISD (ft), $V_{major}$ (mph), and $t_g$ (seconds)

Time Gaps ($t_g$):

7.5 (for passenger vehicles turning left, crossing one lane of traffic)

6.5 (for passenger vehicles turning right)

0.5 (added for each additional lane or median crossed)

CASE B1 (LEFT TURN):

Time Gap ($t_g$) = 7.5 + 0.5 = 8.0 sec

ISD = 1.47 × 45 × 8 = 530 ft

CASE C2 (RIGHT TURN):

Assumption: Design vehicle is turning into the first lane of the major roadway.

Time Gap ($t_g$) = 8.0 sec

ISD = 1.47 × 45 × 8.0 = 530 ft

**Intersection of South Veterans Memorial Boulevard and South McNab Parkway:**

Reference: 2018 AASHTO “Green Book” chapter 9.5

Design Vehicle: Passenger Vehicles

Major Road Speed:

South Veterans Memorial Boulevard: 45 mph

Case B1: A stopped vehicle turning left from a minor street approach onto a major road

Case C2: A vehicle turning right from a minor street approach onto a major road with yield control on the minor street

FORMULA:

$ISD = 1.47 \times V_{major} \times t_g$

Units: ISD (ft), $V_{major}$ (mph), and $t_g$ (seconds)

Time Gaps ($t_g$):

7.5 (for passenger vehicles turning left, crossing one lane of traffic)

6.5 (for passenger vehicles turning right)

0.5 (added for each additional lane or median crossed)

CASE B1 (LEFT TURN):

Time Gap ($t_g$) = 7.5 + 0.5 + 0.5 = 8.5 sec

ISD = 1.47 × 45 × 8.5 = 565 ft

CASE C2 (RIGHT TURN):

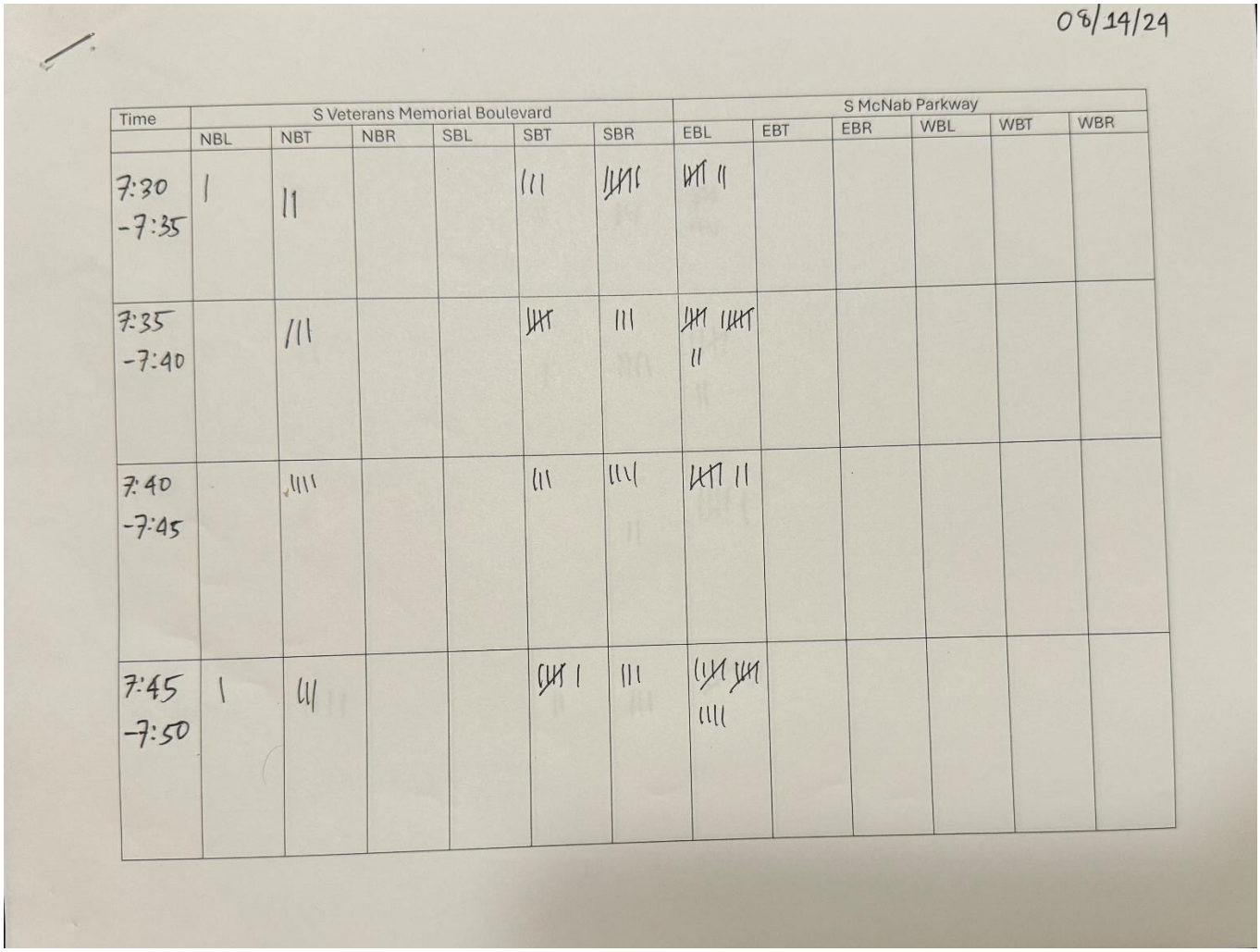
Assumption: Design vehicle is turning into the first lane of the major roadway.

Time Gap ($t_g$) = 8.0 sec

ISD = 1.47 × 45 × 8.0 = 530 ft

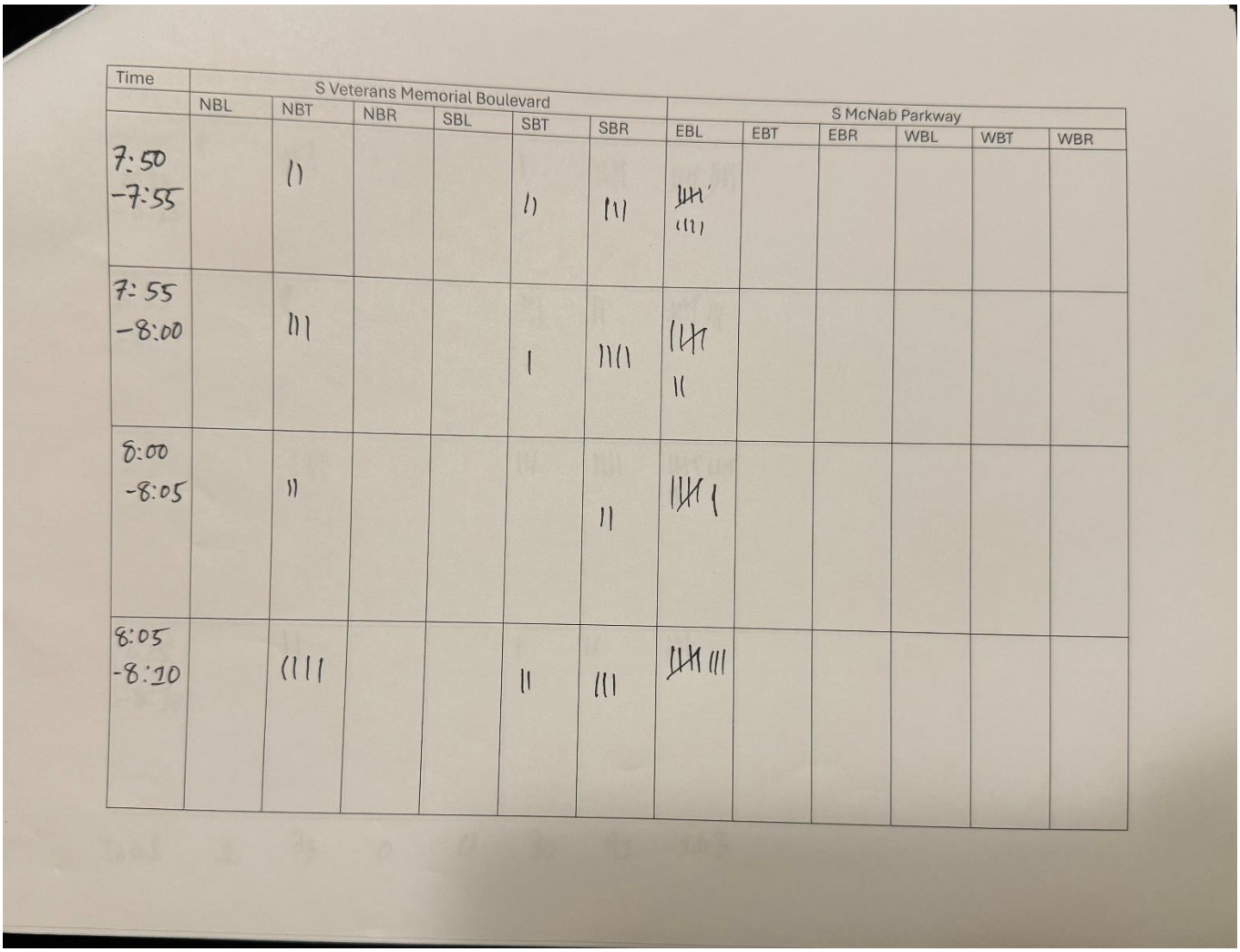
# Appendix C

## AM Peak Traffic Data at the South Veterans Memorial Boulevard and South McNab Parkway Intersection

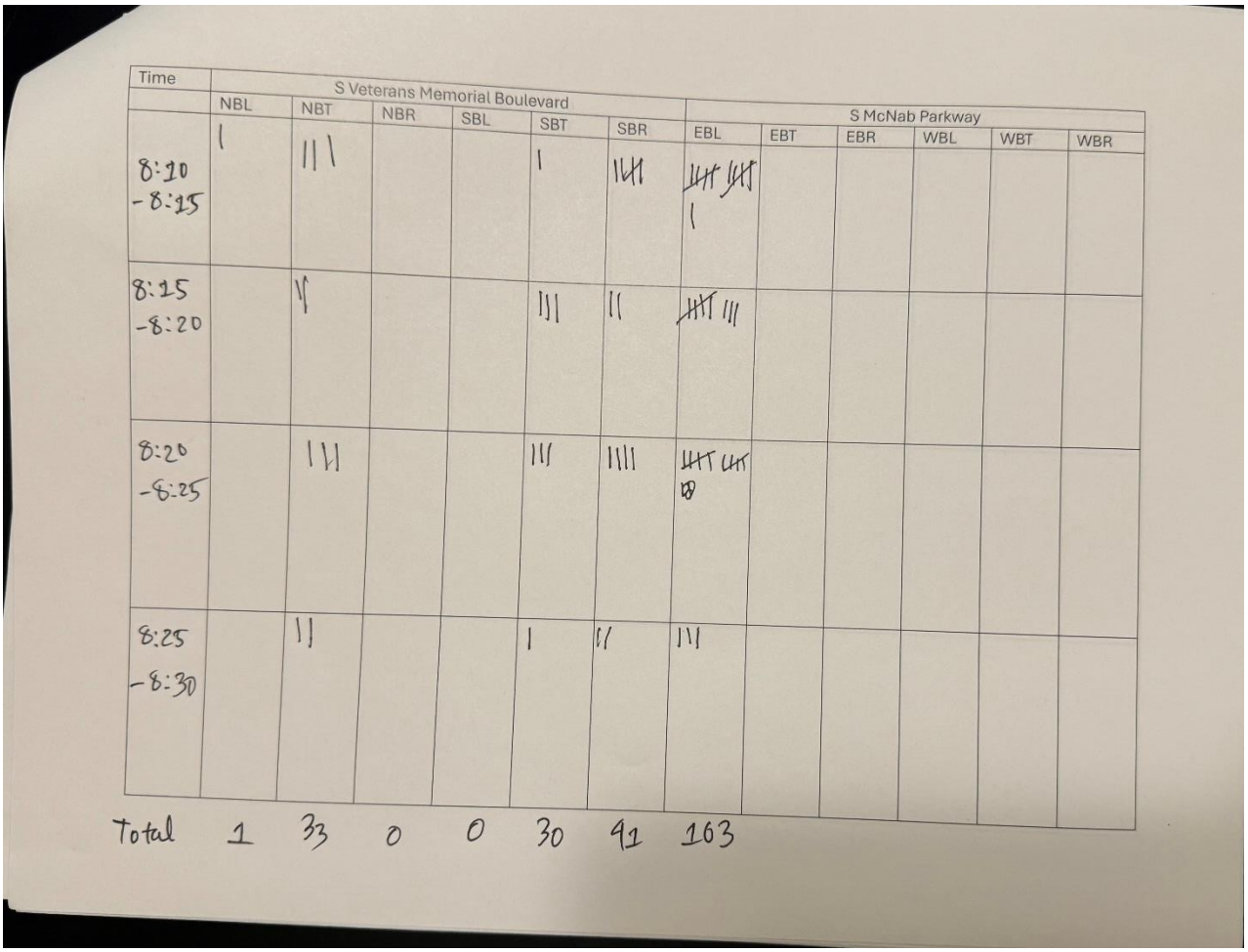


08/14/24

| Time | S Veterans Memorial Boulevard | | | | | | S McNab Parkway | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR |
| 7:30 -7:35 | 1 | 11 | | | 111 | 1111 | 1111 11 | | | | | |
| 7:35 -7:40 | | 111 | | | 1111 | 111 | 1111 1111 11 | | | | | |
| 7:40 -7:45 | | 1111 | | | 111 | 1111 | 1111 11 | | | | | |
| 7:45 -7:50 | 1 | 11 | | | 1111 1 | 111 | 1111 1111 1111 | | | | | |



| Time | S Veterans Memorial Boulevard | | | | | | S McNab Parkway | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR |
| 7:50 -7:55 | | 11 | | | 11 | 111 | 1111 (11) | | | | | |
| 7:55 -8:00 | | 111 | | | 1 | 1111 | 1111 11 | | | | | |
| 8:00 -8:05 | | 11 | | | | 11 | 1111 1 | | | | | |
| 8:05 -8:10 | | 1111 | | | 11 | 111 | 1111 111 | | | | | |



| Time | S Veterans Memorial Boulevard | | | | | | S McNab Parkway | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR |
| 8:10 -8:15 | 1 | 111 | | | 1 | 1111 | 1111 1111 1 | | | | | |
| 8:15 -8:20 | | 1 | | | 111 | 11 | 1111 111 | | | | | |
| 8:20 -8:25 | | 111 | | | 111 | 1111 | 1111 1111 8 | | | | | |
| 8:25 -8:30 | | 11 | | | 1 | 11 | 111 | | | | | |
| Total | 1 | 33 | 0 | 0 | 30 | 91 | 103 | | | | | |

# Appendix D

## Synchro Analysis Report

HCM 7th TWSC
3: S veterans Memorial Blvd & S McNab Parkway 08/16/2024

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.7 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 103 | 0 | 0 | 0 | 0 | 0 | 1 | 33 | 0 | 0 | 30 | 41 |
| Future Vol, veh/h | 103 | 0 | 0 | 0 | 0 | 0 | 1 | 33 | 0 | 0 | 30 | 41 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | Yield | - | - | None | - | - | None |
| Storage Length | 150 | - | 150 | - | - | 150 | 135 | - | 135 | 135 | - | 135 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 112 | 0 | 0 | 0 | 0 | 0 | 1 | 36 | 0 | 0 | 33 | 45 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 71 | 71 | 33 | 71 | 115 | 36 | 77 | 0 | 0 | 36 | 0 | 0 |
| Stage 1 | 33 | 33 | - | 38 | 38 | - | - | - | - | - | - | - |
| Stage 2 | 38 | 38 | - | 33 | 77 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 | 4.12 | - | - | 4.12 | - | - |
| Critical Hdwy Stg 1 | 6.12 | 5.52 | - | 6.12 | 5.52 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.12 | 5.52 | - | 6.12 | 5.52 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 | 2.218 | - | - | 2.218 | - | - |
| Pot Cap-1 Maneuver | 921 | 820 | 1041 | 921 | 775 | 1037 | 1521 | - | - | 1575 | - | - |
| Stage 1 | 984 | 868 | - | 977 | 863 | - | - | - | - | - | - | - |
| Stage 2 | 977 | 863 | - | 984 | 831 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 920 | 819 | 1041 | 920 | 774 | 1037 | 1521 | - | - | 1575 | - | - |
| Mov Cap-2 Maneuver | 920 | 819 | - | 920 | 774 | - | - | - | - | - | - | - |
| Stage 1 | 984 | 868 | - | 976 | 863 | - | - | - | - | - | - | - |
| Stage 2 | 976 | 863 | - | 984 | 831 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 9.45 | 0 | 0.22 | 0 |
| HCM LOS | A | A | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | EBLn2 | EBLn3 | WBLn1 | WBLn2 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1521 | - | - | 920 | - | - | - | - | 1575 | - | - |
| HCM Lane V/C Ratio | 0.001 | - | - | 0.122 | - | - | - | - | - | - | - |
| HCM Control Delay (s/veh) | 7.4 | - | - | 9.5 | 0 | 0 | 0 | 0 | 0 | - | - |
| HCM Lane LOS | A | - | - | A | A | A | A | A | A | - | - |
| HCM 95th %tile Q(veh) | 0 | - | - | 0.4 | - | - | - | - | 0 | - | - |

# BHP Copper San Manuel Plant Site
# Pinal County, Arizona

## Closure Plan

BHP Copper Inc.
San Manuel Operations
P. O. Box M
San Manuel, AZ 85631

Prepared by SRK Consulting (U.S.), Inc.

December 20, 2004

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# 1 INTRODUCTION

This closure plan for the BHP Copper San Manuel Plant Site (Plant Site) is prepared in accordance with Arizona Administrative Code (A.A.C.) R18-9-A209.B(1)(a). The previous closure plan has been withdrawn. The ten demonstrations required by the rule are listed below, with the location of each within this document indicated in parentheses.

- Approximate quantity and characteristics of materials removed from the facility (Section 3);
- Final destination of the materials removed from the facility (Section 4);
- Approximate quantity and characteristics of material that remains at the facility (Section 5);
- Method used to treat any materials remaining at the facility (Section 6);
- Method used to control the discharge of pollutants from the facility (Section 7);
- Limitations of future land or water uses created as a result of the facility operation (Section 8);
- Methods used to secure the facility (Section 9);
- Estimate of the cost of closure (Section 10);
- Schedule for implementation of the closure plan and submission of the post-closure plan (Section 11); and
- Other information, which includes the schedule for supplemental submittals for the Aquifer Protection Permit (APP) application (Section 12).

The closure plan focuses on discharging facilities and formerly discharging (now inactive) facilities. Closure of facilities that may have the potential to discharge in the future (e.g., the tailings impoundments) will also be addressed in Section 12.

APP-exempt facilities are discussed briefly in the context of disposal of waste and unused materials and chemicals. APP-exempt facilities, such as the solid waste landfill, asbestos landfill, and wood dump landfill, are operated in accordance with accepted procedures and guidelines under other state and federal programs. Closure of these facilities will follow regulations established by the Arizona Department of Environmental Quality (ADEQ) Waste Programs Division and other state and federal agencies as necessary. The wastewater treatment facilities will continue to operate until such time that the transfer of ownership is made to a licensed third party.

## 1.1 Closure Activities

The Plant Site consists of the ore processing and beneficiation facilities located approximately 40 miles northeast of Tucson, Arizona. The location of the site is shown on Figure 1. The Plant Site has been under "care and maintenance" since 1999. BHP announced closure in October 2003. Characterization of the site and demolition of the surface structures began in December 2003.

Closure will involve demolition of the aboveground structures, decommissioning of utilities, removal of waste materials, and remediation of contaminated soils. Remaining assets and materials will be sold. Hazardous waste will be properly disposed of in accordance with applicable regulations. The site perimeter will be fenced. The site will be regraded to provide a suitable profile for future potential industrial redevelopment and for the elimination of attractive nuisances. Portions of the tailings impoundments will be covered with soil and rock armoring to address erosion. Certain areas of the Plant Site and the tailings impoundments will be revegetated.

## 1.2 Facility and Contact Data

The Plant Site is operated by BHP Copper Inc. (BHP), a wholly-owned subsidiary of BHP Billiton Ltd. The Plant Site is located about 40 miles northeast of Tucson on Veterans Memorial Boulevard in San Manuel, Arizona.

The site is located in Pinal County in portions of T. 9 S., R. 17 E.; T. 9 S., R. 18 E.; T. 10 S., R. 17 E.; and T. 10 S., R. 18 E. of the Gila-Salt River meridians (Figure 1). The latitude and longitude are approximately 32º41'15"N and 110º41'52"W.

Facility contact:

Mr. John T. Kline
Manager, Health, Safety, Environment, and Community Affairs
BHP Copper Inc.
BHP San Manuel Operations
200 South Veterans Memorial Blvd., P.O. Box M
San Manuel, AZ 85631-0460
(520) 385-3122

## 1.3 Owner and Operator Information

BHP Copper Inc. is the sole owner and sole operator of the San Manuel Plant Site in Pinal County, Arizona. The facilities are on private property owned by BHP, with the

exception of the COMEX warehouse, which is located on privately owned property. The contact information for the landowner and owner/operator is as follows:

BHP Copper Inc.
BHP San Manuel Operations
200 South Veterans Memorial Blvd., P.O. Box M
San Manuel, AZ 85631-0460
(520) 385-3122

## 1.4 Existing Environmental Permits

An individual APP application for operation of the facility was submitted to ADEQ in 1995 (Magma Copper Company, 1995). In 2003, the application was under technical review by ADEQ when BHP announced closure of the Plant Site. Therefore, at the time of the closure announcement in October 2003, BHP did not have an APP in effect for the Plant Site. Closure of the facility will be in accordance with an area-wide closure APP.

Storm water runoff from the facility is managed under the Arizona Pollutant Discharge Elimination System (AZPDES) Permit Program Multi-Sector General Permit (MSGP), administered by the Water Quality Division of ADEQ. The facility MSGP for storm water was reissued on October 30, 2000 (facility permit number AZR05B411) and expires September 30, 2005. In accordance with the MSGP, BHP maintains a Storm Water Pollution Prevention Plan (SWPPP) for the Plant Site. In Arizona, release of financial assurance provisions under the Mined Land Reclamation Program (MLRP) would arguably constitute a release from the MSGP program. Upon successful completion of the MLRP requirements, BHP will file a notice of termination for release from storm water regulation at the Plant Site.

There are also Wastewater Treatment Plant (WWTP) and Solid Waste Permits for the existing WWTP for the town of San Manuel. BHP will continue to operate the WWTP in its present configuration. BHP intends to formally transfer operation and ownership of the WWTP to Pivotal. The APP process will be revisited for proper transfer of permit responsibility and obligations from BHP to Pivotal. Transfer of ownership will occur when Pivotal obtains an APP permit for the WWTP in its name.

Three Solid Waste Permits cover the Asbestos, Wood, and Solid Waste landfills. Multiple Federal Communications Commission (FCC) licenses cover communication permits at the Plant Site. A Hazardous Waste Facility identification number, a User of High Explosives permit, an Air Quality Earthmoving permit, and Radioactive Material

licenses are also in place. A complete list of all environmental permits for the Plant Site is presented in Table 1.

# 2 SITE INFORMATION

The following sections provide background information on the Plant Site and former operations. The facilities and their locations are described below. A brief history of the development of the Plant Site is provided in this section.

## 2.1 Frame of Reference

The operating areas include the concentrator; flash smelter; acid plant; electrolytic refinery; rod plant; tailings impoundments; maintenance and ancillary facilities; utility, water, and process distribution infrastructure; roads; ponds; wastewater treatment facilities; and solid waste disposal facilities. The facilities at the Plant Site were divided into three groups for technical discussion of APP-related discharging facilities; these groups are called the E-series, C-series and D-series facilities. The facilities are designated by a letter indicating the type of facility (i.e., E-, C- or D-), plus a number. The layout of the facilities is illustrated in Figure 2.

## 2.2 Discharging Facilities Defined

In accordance with R18-9-A202 (A) (4), a summary of known past facility discharges, as well as anticipated facility discharges under closure conditions, is provided in the General Information APP submittal. The facility groups are discussed below.

The facilities are grouped into three categories based on their post-closure status:

- Closed facilities (designated as C-series facilities) are decommissioned in a manner that removes pollutants with the potential to discharge to groundwater. For example, the possibility of discharge associated with the Flash Furnace Building (C-1) will no longer exist after this structure is demolished.

- Discharging facilities (designated as D-series facilities) have the potential to discharge pollutants to the environment after implementation of the closure design. These facilities will require individual, performance-based, closure design plans and will require post-closure monitoring. Discharging facilities include the tailings impoundments (D-79 through D-83), where the possibility exists for storm water contact to produce low quality runoff or seepage, and the sewage treatment facilities (D-19, D-20, and D-114), which will continue to operate under new ownership to serve the town of San Manuel.

- Exempt facilities (designated as E-series facilities) as defined by Arizona Revised Statutes (A.R.S.) 49-250 B, are exempt from the APP program. They

include pipelines, tanks, zero-discharge facilities, facilities that closed prior to January 1, 1986 (A.R.S. 49-201), and landfills. Exempt facilities were designed, constructed, operated, and regularly maintained so as not to discharge. These facilities will be removed and will not require post-closure monitoring under the APP and/or will be covered by other permit programs (e.g., MSGP, Resource Conservation and Recovery Act (RCRA), and MLRP).

## 2.3 Description of Facilities

The APP facility inventory, including the facility identification number, facility description and status, for the Plant Site is presented in Table 2. The inventory includes all facilities on the site. Some buildings and other facilities have been removed as of November 2004, as indicated under "Facility Status" in Table 2.

## 2.4 Point of Compliance

The designated points of compliance for groundwater at the Plant Site will be designated as part of the post-closure strategy for the property. Post-Closure Monitoring and Contingency Plans will be finalized once the closure strategy has been developed. A Monitoring Schedule will be negotiated during the application process.

## 2.5 History and Development

Design and construction of the facility began in 1953 (Dale, 1962; Magma Copper Annual Report, various dates). The concentrator, oxidation ponds, and Tailings Impoundment #1/2 were completed in 1955. The first copper anode was poured on January 10, 1956. The molybdenum sulfide section of the concentrator was put into operation in April 1956.

The cyanide plant for the recovery of gold from the molybdenum sulfide concentrate was added in July 1960 (Magma Copper Annual Report, 1961). By the end of 1964, the concentrator had been expanded to increase production from 30,000 to 35,000 tons per day (tpd). By July 1965, production was up to 40,000 tpd, as a result of further expansion of the concentrator, and installation of a new reverberatory furnace at the smelter (Engineering and Mining Journal, 1966; Magma Copper Annual Report, 1966).

In March 1970, work began on a refinery designed for 200,000 tons per year (tpy) (about 650 tpd) of copper. The first cathodes were produced September 16, 1971 (Pay Dirt, 1971). A sulfuric acid plant was also installed in 1971 to recover $SO_2$ from smelter gases. Expansion work also included the enlargement of the concentrator, additional crushing facilities, and erection of the smelter stack (550 feet tall) (Pay Dirt,

1972). Smelter capacity was increased from 100,000 tpy to 200,000 tpy (Dayton, 1972).

The evaporation ponds were constructed in 1975 and consisted of three unlined, rectangular, cut-and-fill ponds with a total surface area of 10 acres. The slag processing facility began operation in 1986 and continued until the end of smelter operation. The reverberatory furnaces in the smelter were replaced in 1988 by a more efficient and environmentally friendly Outokumpu flash smelting furnace. In 1990, the oxygen manufacturing plant was completed to supply oxygen to the smelter.

In 1999, the Outokumpu flash furnace and other smelter components were rebuilt after successfully operating for 11 years. In 1999, 43 years after first starting production, the operations were put into care and maintenance due to suppressed copper prices.

# 3 MATERIALS TO BE REMOVED

BHP began a period of site clean up activities in July 1999. As presented in Table 3, unused materials, chemicals, and other commodities were transferred to other BHP operations or sold to private entities. Waste materials from the site were shipped to various permitted hazardous waste disposal facilities. A summary of the primary waste materials and unused commodities is presented in the following sections. A discussion of the destination of the various waste and unused materials removed from the facility is presented in Section 4.

## 3.1 Unused Materials, Chemicals, and Supplies

BHP purchased many supplies, materials, and chemicals, such as bulk fluids and materials in 55-gallon barrels and in other packages and containers. Processing chemicals and diesel were some of the major consumables used during operations.

After the announcement of care and maintenance status, unused materials and chemicals were transferred to other BHP facilities or private entities. These included products such as:

- Motor oil, lubricants, anti-freeze, degreasers, and other petroleum products;
- Paints, soaps, rust inhibitors, solvents, parts cleaners, chemical/oil absorbers, and other miscellaneous cleaning products;
- Herbicides, biocides, and fungicides;
- Fluorescent tubes and mercury light bulbs;
- Batteries; and
- Sulfuric acid and organic reagents.

During operations, petroleum products and processing chemicals were stored in APP-exempt facilities such as above-ground tanks and pipelines. The contents of the majority of these tanks (e.g., sulfuric acid and diesel) were shipped off property as described in Section 4. Tanks were cleaned prior to transfer or demolition.

## 3.2 Waste Materials

During operations, waste materials were routinely removed from the facility and shipped directly to a permitted waste disposal facility or were temporarily shipped to the BHP Hazardous Waste Storage Facility (C-18). BHP was and continues to be a large quantity hazardous waste generator. Hazardous wastes are sent off site to regulated facilities. The waste materials routinely collected at the Plant Site included the following:

- Motor oil and transformer oil;
- Paint, soaps, rust inhibitors, and solvents;
- Asbestos-containing building products and transite-covered pipes;
- Herbicides, biocides, fungicides, and other chemicals;
- Fluorescent tubes and mercury light bulbs;
- Batteries;
- Lead anode and lead flake; and
- Miscellaneous contaminated debris and sludge.

Following the announcement of care and maintenance status, BHP collected many of these waste materials for final disposal. Some of the surface waste materials, such as asbestos-containing building products, continue to be removed as demolition activities progress. The asbestos-containing materials are placed in the on-site asbestos landfill.

## 3.3 Surface Facilities

The surface facilities consisted of a 60,000-short tons per day (stpd), copper concentrator/secondary crushing facility, a 3,000-stpd copper concentrate smelter, three sulfuric acid plants, a 380,000-short tons per year (stpy) electrolytic copper refinery, and a 186,000-stpy continuous cast copper rod plant. These main production units were supported and serviced by facilities that included a 30-megawatt power house, an 800-stpd gaseous oxygen plant, workshops, fuel storage tanks, sulfuric acid storage and loading facilities, the San Pedro well field [12,000 gallons per minute (gpm) capacity] and delivery system, two high voltage [115 kilovolt (kv)] electrical lines, offices, maintenance shops, and warehouses. The facility is served by rail and road access. The industrial complex covers an area of approximately 500 acres [203 hectare (ha)]. The buildings are generally of steel frame construction on concrete foundations. There are several smaller non-industrial buildings such as warehouses, offices, and laboratories.

Some of the buildings are contaminated by residues of the process. While a considerable volume of residuals has already been removed, the rafters and some of the internal process components remain. Some of the construction materials are now considered hazardous and must be treated in a regulated manner. The most noteworthy of these is asbestos, which is contained in some of the galvestos siding (cladding), roofing, and insulation. Other regulated materials include PCB-containing transformers, lubricants, light fixtures, some meters, and switches. The two original smelter stacks (reverb 500 feet tall, converter 550 feet tall) contain brick lining and insulation and may be contaminated with heavy metals.

There are 10.5 miles of railroad track at the facility. This track is the property of the San Manuel Arizona Railroad Company (SMARRCO), an industrial division of BHP that operates on BHP-controlled land outside federal regulation. This track will be removed and reclaimed at BHP's discretion.

The 29.5-mile track between the facility and the mainline at Hayden Junction is also owned by SMARRCO, but is regulated by the Federal Railroad Administration (FRA). This operation is subject to the requirements of the FRA and will be abandoned and closed accordingly (SRK, 2004a).

## 3.4 Impacted Soils

Soils that exceed site-specific Soil Remediation Levels (SRLs) are to be buried in place and deed restricted. Soil characterization work is ongoing and will determine all areas to be capped with clean cover.

# 4 DESTINATION OF REMOVED MATERIALS

Unused processing chemicals, compounds, fuel, and supplies were returned to the vendor, transferred to other operating BHP facilities, or sold to private parties. Waste material removed from the facility since June 1999 was delivered to permitted hazardous waste disposal facilities. Residual waste materials will continue to be removed as the site closure and demolition activities progress. Surface facilities will be inspected, dismantled, and salvaged. Soils exceeding the Arizona non-residential SRLs will be buried and capped with clean fill. The final disposition of removed materials is summarized in Table 3 and discussed below by type.

## 4.1 Unused Materials, Chemicals and Supplies

After the announcement of care and maintenance, unused processing materials such as motor oil, fuel, chemicals, and supplies were transferred to other BHP operations or were sold to outside companies and entities. For some products, such as sulfuric acid produced by the operating smelter, there is no inventory remaining on site. For other products, such as organic reagent, the inventory was sent to other BHP operations for use in the process.

## 4.2 Waste Materials

Waste materials, including the items described in Section 3.2, were shipped in 55-gallon barrels, tanker trucks, pallets, and other containers to permitted waste facilities in Arizona. The manifests for these shipments are on file at the BHP administration office in San Manuel. The shipping manifests do not indicate the specific location or building from which the materials were removed. Some items, such as batteries and waste motor oil, are collected at the BHP Hazardous Waste Storage Facility (C-18) and are shipped when sufficient quantities are generated. Remaining waste materials will be shipped to the same facilities listed in Table 3 or to other permitted facilities. Storage times do not exceed RCRA regulatory guidelines.

## 4.3 Surface Facilities

The closure plan for all structures involves inspecting, dismantling, and salvaging the machinery and equipment; razing of structures; salvaging recyclable scrap materials; and removing and safely disposing of demolition debris. Where practical, concrete foundations and structural members will be cracked for good drainage and buried in place.

Each building is prepared for demolition following an environmental assessment. Asbestos siding, roofing and insulation will be removed prior to the building demolition where practical and safe. The asbestos will be disposed of at the on-site permitted asbestos landfill. Equipment and areas where potential contaminants were handled will be cleaned prior to salvage or demolition. Oils and grease will be sent to a recycler or licensed waste disposal facility. Construction debris found to contain contaminants exceeding regulated levels will be disposed of in an appropriate manner.

Polychlorinated biphenyls (PCBs) contained in transformer oil or light ballasts have been inventoried. Equipment containing PCBs was sampled and documented with photographs for future proper disposal. Additional inspections of other equipment that may contain PCBs will be made prior to demolition of buildings and facilities.

Where practical and economically feasible, equipment and machinery will be salvaged for sale. Demolition debris and other materials that have no value for reuse or scrap will be transported to an appropriate, on-site solid waste facility. Inert materials such as wood, concrete, and masonry may be sent to the solid waste landfills on site. Scrap metals will be shipped off site and recycled.

The closure of railroads will involve removing track, ballast and ties, demolishing trestles, and removing fill and culverts from drainages. The track and ties may be salvaged. Drainage barriers associated with the railroad will be demolished so as to return drainage patterns to the pre-existing routing before construction of the rail line.

# 5 MATERIALS REMAINING

The materials remaining are related to the discharging facilities specified in Table 2 and will require post-closure monitoring. The materials remaining include tailings, impacted soils, and landfills. BHP is in the process of developing individual closure plans for the tailings impoundments. Plans will incorporate discharge characterization, Best Available Demonstrated Control Technology (BADCT) analyses (ADEQ, 1998), detailed closure designs, pollutant management controls, and post-closure monitoring requirements. BHP will address these discharging facilities in separate submittals to ADEQ as the studies and engineering plans are completed. The timeline for these submittals is addressed in Section 12 and Table 4. Impacted soil will be remediated. The landfills will be closed under another regulatory program.

## 5.1 Tailings

707,000,000 tons of sulfide-bearing mill tailings were deposited over the past 50 years in seven impoundments adjacent to the San Pedro River. The impoundments are up to 250-feet thick and cover approximately 3,407 acres. The embankments have an external (downstream) overall slope of approximately 3:1 (horizontal: vertical). Internal beach areas have a slope of approximately 0.5% or less. The tailings impoundments at San Manuel present the risk of potential impacts of poor quality leachate seeping into the local groundwater and impacted storm water draining into the San Pedro River system.

- The combined surface area of Tailings Impoundment #1/2 (Facility D-79) is 627 acres (BHP, 2000). The impoundment contains approximately 128 million tons of tailings (accumulated tonnage for 1999) (BHP, 2000). The current surveyed elevation of the surface of the impoundment is 2,975 feet above mean sea level (amsl).

- The combined surface area of Tailings Impoundment #3/4 (Facility D-80) is 908 acres (BHP, 2000). The impoundment contains approximately 198 million tons of tailings (accumulated tonnage for 1999) (BHP, 2000). The current surveyed elevation of the surface of the impoundment is 2,990 feet amsl.

- The approximate surface area of Tailings Impoundment #5 (Facility D-81) is 531 acres (BHP, 2000). The impoundment contains approximately 98 million tons of tailings (accumulated tonnage for 1999) (BHP, 2000). The current surveyed elevation of the surface of the impoundment is 2,950 feet amsl.

- The approximate surface area of Tailings Impoundment #6 (Facility D-82) is 428 acres (BHP, 2000). The impoundment contains approximately 94 million tons of tailings (accumulated tonnage for 1999) (BHP, 2000). The current surveyed elevation of the surface of the impoundment is 2,815 feet amsl.

- The approximate surface area of Tailings Impoundment #10 (Facility D-83) is 913 acres (BHP, 2000). The impoundment contains approximately 189 million tons of tailings (accumulated tonnage for 1999) (BHP, 2000). The current surveyed elevation of the surface of the impoundment is 2,894 feet amsl.

The tailings impoundments contain the common rock-forming elements of iron (Fe), aluminum (Al), calcium (Ca), magnesium (Mg), silicon (Si), and potassium (K). Copper (Cu) is present in all of the tailings impoundments. Other significant trace elements included barium (Ba), nickel (Ni), lead (Pb), selenium (Se), antimony (Sb), uranium (U), vanadium (V), and zinc (Zn). None of these elements is present in concentrations that exceed the residential or non-residential SRLs. The tailings met the non-residential SRL for all parameters except arsenic (As). Total arsenic concentrations in the tailings impoundments vary from a minimum of 1.04 milligrams/kilogram (mg/kg) to a maximum of 21.80 mg/kg. These concentrations approach or exceed the residential and non-residential SRL (residential and non-residential SRL = 10 mg/kg As) (SRK, 2004b).

## 5.2 Impacted Soils

Plant Site operations have impacted near-surface soils in the disturbed area (approximately 30 acres). Areas of known contamination from specific incidents or practices have been sampled to assess the extent of soils that require remediation. After demolition is completed, a characterization of the disturbed area will be conducted. Soils with concentrations of regulated pollutants that exceed applicable standards established for the project will be controlled in place (SRK, 2004a).

## 5.3 Landfills

Three landfills (Solid Waste, E-48; Asbestos, E-49; and Wood, E-50) are operated in accordance with ADEQ Solid Waste requirements. Closure of these facilities will follow regulations established by the ADEQ Waste Programs Division and other state and federal agencies as necessary.

The Solid Waste Landfill is permitted for the disposal of scrap glass, rubber, siding, unsalvageable steel, and non-toxic trash. The remaining volume for waste as of February 2004 is approximately 135,000 cubic yards.

The Asbestos Landfill is permitted for the disposal of asbestos-containing material. The landfill covers an area of approximately 3 acres. The remaining volume for waste as of February 2004 is approximately 550,000 cubic yards.

The Wood Dump Landfill is permitted for the disposal of inert debris such as wood and concrete. The remaining volume for waste as of February 2004 is approximately 135,000 cubic yards.

## 5.4 Other

The Arizona Public Service Company (APS) and Magma Substations (E-95), Wastewater Treatment Plant (WWTP) (D-19, D-20, and D-114), and the No. 5 Water Booster Station (E-96) will remain on the property. These facilities will be used by the town of San Manuel. The Truck Shop (C-31) and Smelter Office Building (E-26) will remain for use during closure then be removed.

The buildings are constructed over concrete foundations that are, in some cases, of considerable mass. For example, the concentrator building included the mill foundations. The reverberatory furnaces, converters, and smelter stacks also have deep, massive foundations.

Buried utilities include power, water, sewer, and natural gas lines, as well as a utility tunnel between the power house and the concentrator. Some of the utilities will be required during demolition and closure. Interest has been expressed by third parties in the use of portions of the natural gas and power lines. Portions of the utility infrastructure will be required to service industrial components sold for operation on site by others. All these features are inert, and do not impact groundwater quality or otherwise pose a threat to the environment.

Some roads will be maintained at closure to service the facilities transferred to others and to access the site for inspection and maintenance. The access used by the COMEX warehouse will be maintained. The rail underpass will be removed to provide unrestricted access for oversized loads.

# 6 TREATMENT METHOD FOR MATERIALS REMAINING

Treatment methods for the materials remaining on site are contingent on the closure designs that control the quality and quantity of post-closure discharges. Treatment methods, if applicable at that point, cannot be specified until the closure designs are complete. Applicable treatment methods for the discharging facilities will be addressed in specific closure plans submitted to ADEQ according to the schedule outlined in Section 12.

## 6.1 Tailings

The tailings reclamation plan seeks to ensure long-term stabilization of the area through the mitigation of dust and water erosion and the minimization of the impact of recharged surface water. It is assumed that the stability of the embankments will improve as the tailings drain and consolidate. Closure measures include constructing spillways behind the dams to allow excess runoff to be removed from the impoundments without damage to the impoundment structures and without the loss of tailings material.

Diversion facilities will be upgraded, Best Management Practices (BMPs) structures will be constructed, and new diversions will be created to reroute post-closure runoff. Surface water drainage channels near the toe of the dams will be protected with rip rap to prevent erosion of the tailings. Spillway channels will be widened to reduce outflow velocity and will have a rip rap core to prevent headward erosion. The dam crests will be regraded to carry the dam face's overall slope up to the current crest elevation (SRK, 2004a).

## 6.2 Impacted Soils

Impacted soil will be remediated to site-specific soil remediation levels based on the placement of an engineered cap over areas of concern. Future use of the impacted areas will be limited by deed restrictions ensuring the maintenance of the cap and declaring the quality of the impacted soils.

## 6.3 Landfills

There are three landfills (Solid Waste, E-48; Asbestos, E-49; and Wood, E-50) that will be closed in accordance with ADEQ Solid Waste Requirements. Closure of these facilities will follow regulations established by the ADEQ Waste Programs Division and other state and federal agencies as necessary.

All three landfills will be reclaimed and closed in largely the same manner although the type of material contained within each will be different. A soil cover will be placed over each landfill. This cover material will be hauled from the same borrow source as the daily cover and will be spread over the entire area. The landfill and the borrow area will be revegetated.

## 6.4 Other

Ownership of the APS and Magma Substations (E-95) will be transferred to APS. Ownership of the WWTP (D-19, D-20, and D-114) and associated facilities will be transferred to Pivotal. Pivotal is currently operating the WWTP under an Operation and Maintenance (O & M) agreement. Pivotal is in the process of developing a site-specific APP application. The No. 5 Water Booster Station (E-96) will remain; it is a non-discharging, storage facility of potable water. Concrete foundations, subsurface sumps, and pipelines associated with E-96 will remain. These items will be punctured and capped so that they cannot retain water. The Truck Shop (C-31) and Smelter Office Building (E-26) will remain for use during closure then be removed.

Apart from power lines connecting San Manuel (APS Switchyard) to the national grid, all utilities are buried. For closure, the various utilities will be left in place unless it is cost-effective to excavate and recycle certain components (e.g., electrical cable).

Sewer lines will be isolated, flushed, and capped with the exception of the sewer line owned by Pinal County that conveys sewage from the town of San Manuel to the WWTP. Sewer lines from Plant Site buildings to the WWTP will be closed. Manholes will be backfilled and capped below grade. Natural gas lines will be purged, flushed, and capped. Electrical conduits will be isolated, tagged, and buried in place. Water lines will be isolated, purged, and capped. The utility tunnel between the Power House and the concentrator/crushers will be plugged at either end.

Approximately ten miles of pavement will be ground up and placed in the basements as backfill or will be left in place. Culverts will be removed, the roadbed will be scarified, and the disturbed area will be reseeded. Some roads will be left in place for access. Approximately 15 acres of paved and 200 acres of unpaved yards will be reclaimed. Asphalt and concrete pavement will be broken. Following a cost benefit analysis, the broken pavement will be removed or covered in place. The pavement to be covered will be broken or scarified, then covered with one foot of soil to aid in revegetation.

# 7 DISCHARGE POLLUTANT CONTROLS

Discharge pollutant controls and BMPs are currently in effect for the Plant Site discharging facilities. BHP has a SWPPP as required by Part 4.0 of the MSGP-2000 program, which includes construction, maintenance, and inspection of BMPs consistent with the MSGP-2000 permit terms (BHP, 2001). Future pollutant control management and BMPs are dependent on the closure designs developed for the individual APP-related discharging facilities.

# 8 FUTURE LAND AND WATER RESTRICTIONS

## 8.1 Land Use Restrictions

BHP plans on achieving site-specific non-residential SRLs or controlling future use through deed restriction or disclosure.

BHP has constructed a 5.5-mile fence around the perimeter of the facility to prevent unauthorized site access (Figure 1).

## 8.2 Water Use Restrictions

There are no water use restrictions on the facility.

# 9 METHODS TO SECURE FACILITY

BHP constructed a 5.5-mile fence around the perimeter of the facility to prevent unauthorized site access (Figure 1). The fence line consists of a six-foot high chain link fence topped with three strands of barbed wire. Vehicular access to the property is restricted by 17 locked gates.

# 10 CLOSURE COST ESTIMATE

The cost of closing the various APP-related facilities is a function of the closure design developed for each facility. The costs cover activities related to bulk earthwork, soil cover and revegetation, rerouting surface water drainage, demolition, and waste removal and/or waste treatment. Estimated closure costs for the various APP-related Plant Site facilities will be provided in the specific closure plans to be submitted to ADEQ according to the schedule discussed in Section 12.

# 11 CLOSURE PLAN IMPLEMENTATION AND SUBMISSION OF POST-CLOSURE PLAN

Above-ground structures in the process area are being demolished in accordance with Mine Safety and Health Administration (MSHA), Occupational Safety and Health Administration (OSHA), and RCRA requirements. Waste materials are being documented, transported, and disposed of in an appropriate manner. BHP continues to evaluate options for closure of the major discharging components, dispose of recyclable equipment, and remediate and dispose of all materials with no future beneficial use.

Closure plans for the APP-related discharging facilities will be implemented as individual plans are developed and submitted to the ADEQ. BHP will submit the closure plans for the individual discharging facilities and the post-closure monitoring plan according to the schedule provided in Table 4. A summary schedule for the closure activities is provided in Figure 3.

# 12 COMPLIANCE SCHEDULE

BHP is currently evaluating conceptual closure designs for the entire facility. The results of these investigations will be included in their respective facility submittals. General background information is provided in this submittal. The remaining submittals will be completed and submitted to ADEQ according to the schedule indicated in the Aquifer Protection Permit application (SRK, 2004c).

In the interim period, facility demolition, site characterization, and groundwater monitoring are taking place. Post-closure monitoring and contingency plans will be finalized once the closure strategy has been developed. A monitoring schedule will be negotiated during the application process.

# 13 REFERENCES

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SRK Consulting, 2004a, Pre-feasibility closure cost estimate, BHP San Manuel Plant Site, Pinal County, Arizona: unpublished report for BHP Copper, April 15, 2004.

SRK Consulting, 2004b, Technical memorandum no. 8 - Report on geochemical static test work, BHP San Manuel Plant Site: unpublished report for BHP Copper, August 31, 2004, 99 p. plus appendices.

SRK Consulting, 2004c, General information: area-wide aquifer protection permit application for closure of the San Manuel Plant Site: unpublished report for BHP Copper, December 20, 2004, 302 p. plus five appendices.

# TABLES

## Table 1 Environmental permits

| Division | Department | Contact | Water [1] | Expiration | Permit No. | Comments |
|---|---|---|---|---|---|---|
| San Manuel | Plant Site | John Kline | Aquifer Protection Permit (APP) Application- Arizona Department of Environmental Quality (ADEQ) | NA | NA | APP application for closure is scheduled to be submitted to ADEQ in December 2004. |
| San Manuel | Mill | Gerry Brunskill/ Jeff Parker | Potable Drinking Water from 11 Production Wells. | Indefinite | 11-347 | This permit covers pumping and treatment of approximately 10,500 gallons per minute (gpm) from 11 production wells along the San Pedro River. All water is strictly groundwater - ADEQ/Arizona Department of Health Services (ADHS) |
| San Manuel | Plant Site | Jeff Parker | Notice of Disposal (NOD) - ADHS | None | None | The permit will be replaced by an approved APP. |
| San Manuel | Plant Site | Jeff Parker | 404/401 | NA | None | To divert storm water runoff from #3/4, 5 and 6 Tailings Impoundments into Peppersauce Wash. |
| San Manuel | Plant Site | Jeff Parker/ James Glasston | Arizona Pollution Discharge Elimination System (AZPDES) Storm Water | 1/31/2005 | Storm Water AZR005B411 | This ADEQ General Permit is due for plan review every three years. |
| **Division** | **Department** | **Contact** | **Waste** | **Expiration** | **Permit No.** | **Comments** |
| San Manuel | Plant Site Asbestos Landfill | James Glasston | Solid Waste Permit | NA | Account # 175 | Solid Waste Section 37 Notifications dated October 30, 1992. |

Note: NA = not applicable
[1] Well registration numbers can be found in Appendix B (SRK, 2004c).

**Table 1 Environmental permits (continued)**

| Division | Department | Contact | Waste | Expiration | Permit No. | Comments |
|---|---|---|---|---|---|---|
| San Manuel | Plant Site Landfill | Jeff Parker | Solid Waste Permit | NA | Account # 177 | Solid Waste Section 37 Notifications dated October 30, 1992. |
| San Manuel | Plant Site Wood Landfill | James Glasston | Solid Waste Permit | NA | Account # 176 | Solid Waste Section 37 Notifications dated October 30, 1992. |
| San Manuel | Plant Site | Raymond Maldonado | Wastewater Treatment Plant (WWTP) Permit(s) | 2/28/2007 | Operator ID No. 04937 | Grade 2 WWTP Operator Grade 1 Wastewater Collection System Operator. |
| San Manuel | All San Manuel Operations | James Glasston | Hazardous Waste – Environmental Protection Agency (EPA) | None | AZD001886597 | This permit covers the EPA Hazardous Waste identification number. This number is used in the documentation of wastes including shipping, storage and disposal. |
| San Manuel | Plant Site | James Glasston | Special Waste Permit ID Number - ADEQ | current | 300,721 | Off-site Petroleum Contaminated Soils (PCS) disposal. |
| **Division** | **Department** | **Contact** | **Communication** | **Expiration** | **Permit No.** | **Comments** |
| San Manuel | Surveyors Plant Engineering | Keith Murray | Federal Communications Commission (FCC) License | 1/23/2013 | Frequency 464.600; 464.625; 464.650; 464.700; 464.725; 464.750 | This permit covers the plant engineering surveyors (WPLK528). |
| San Manuel | Electronic & Environmental Maintenance | Keith Murray | FCC License | 5/1/2013 | Frequency 452.9000 | This license covers the environmental control center (20K0F3E) (WNJH251). |
| San Manuel | Electronic & Environmental Maintenance | Keith Murray | FCC License | 5/1/2013 | Frequency 457.9000 | This license covers the 6th Ave. station (20K0F3E) (WNJH251). |

Note: NA = not applicable

**Table 1 Environmental permits (continued)**

| Division | Department | Contact | Communication | Expiration | Permit No. | Comments |
|---|---|---|---|---|---|---|
| San Manuel | Electronic & Environmental Maintenance | Keith Murray | FCC License | 5/1/2013 | Frequency 457.9000 | This license covers the San Manuel Hospital station (20K0F3E) (WNJH251). |
| San Manuel | Electronic & Environmental Maintenance | Keith Murray | FCC License | 5/1/2013 | Frequency 457.9000 | This license cover the station located 0.8 mile south by southwest of the Plant Site (20K0F3E) (WNJH251). |
| San Manuel | Surveyors Plant Engineering | Keith Murray | FCC License | 3/2/2013 | Frequency 464.50; 464.55 | (WPLU816) |
| San Manuel | Mill - Ore Transport | Keith Murray | FCC License | 3/18/2012 | Frequency 160.6800 | This license covers the mill ore transport (KNFA345). |
| San Manuel | Mill - Operations | Keith Murray | FCC License | 5/7/2014 | Frequency 151.6850 | This license covers the mill operations (WPOD567). |
| San Manuel | Mill - Operations | Keith Murray | FCC License | 3/7/2005 | Frequency 158.2800 | This license covers the mill operations with the railroad (KRS437). |
| San Manuel | Mill - San Pedro | Keith Murray | FCC License | 5/31/2005 | Frequency 173.3125 | This license covers the operations between the mill and the San Pedro (WPHG328). |
| San Manuel | Mill - San Pedro | Keith Murray | FCC License | 5/31/2005 | Frequency 173.3125 | This license covers the operations between the mill and the San Pedro (WPHG329). |
| San Manuel | Plant Maintenance & Refinery | Keith Murray | FCC License | 3/6/2011 | Frequency 153.0350 | This license covers the operations between the plant maintenance and the refinery (KZL851). |
| San Manuel | Plant Warehouse & Lab | Keith Murray | FCC License | 1/16/2012 | Frequency 151.5500 | This license covers the operations between the plant warehouse and the lab (KEJ371). |
| San Manuel | Smelter & Power House | Keith Murray | FCC License | 6/7/2014 | Frequency 152.9450 | This license covers the operations between the Smelter and the Power House (WPNT366). |

**Table 1 Environmental permits (continued)**

| Division | Department | Contact | Communication | Expiration | Permit No. | Comments |
|---|---|---|---|---|---|---|
| San Manuel | SMARRCO | Keith Murray | FCC License | 1/17/2012 | Frequency 161.4600 | This license covers the operations at SMARRCO (KNCR216). |
| San Manuel | Rigger Shop | Keith Murray | FCC License | 7/29/2013 | Frequency 464.3250; 464.575 | This license covers the operations at the rigger shop (WPCT263). |
| San Manuel | Plant Main Gate | Keith Murray | FCC License | 1/23/2012 | Frequency 153.1850 | This license covers emergency operations on the Plant Site (KAZ767). |
| San Manuel | Plant Site Use | Keith Murray | FCC License | 9/2/2013 | Frequency 457.925 | (WPML312) |
| San Manuel | Engineering Dept/Survey (GPS) | Keith Murray | FCC License | 11/19/2013 | Frequency 462.28750; 462.32650; 462.43750; 467.23750 | (WPMR564) |
| San Manuel | Security Repeater | Keith Murray | FCC License | 1/21/2012 | Frequency 464.2750; 463.275; 152.2775; 157.5375 | (WYNF278) |
| **Division** | **Department** | **Contact** | **Miscellaneous** | **Expiration** | **Permit No.** | **Comments** |
| San Manuel | Mill & Metallurgical Laboratory | Guillermo Thomas/Bob Martin | Registration Certificate – Arizona Radiation Regulatory Agency (ARRA) | 12/1/2004 | 11-I-3539 | This permit covers radioactive devices used in sampling for the Industrial Hygiene department. |
| San Manuel | Mill & Smelter | Guillermo Thomas/Bob Martin | Radioactive Material - ARRA | 12/31/2006 | 2-Nov | This permit covers radioactive elements used in certain mill equipment for flow regulation. Covers Category D-15 possession only. |

Note: NA = not applicable

**Table 1 Environmental permits (continued)**

| Division | Department | Contact | Miscellaneous | Expiration | Permit No. | Comments |
|---|---|---|---|---|---|---|
| San Manuel | San Manuel Operations | Dave Palmer | 33-User of High Explosives - Bureau of Alcohol, Tobacco and Firearms (ATF) | 10/1/2006 | 9-AZ-021-33-6K-12083 | This permit covers blasting activities per 18 U.S.C. Chapter 40, Explosives. |
| San Manuel | San Manuel Operations | Bob Martin | Weights and Measure Device | unknown | 3519 | This permit covers the truck scales used at the Plant Site for weighing concentrates, acid, and other incoming materials. |
| San Manuel | Town Site Landfill | James Glasston | NA | Annual Inspection 10 year requirement ends on Dec. 8, 2005. | Not an APP Number, an Inventory No. of 100927 | The town site landfill was granted official closure on December 8, 1995. ADEQ's Solid Waste Unit granted a "Sanitary Landfill Closure" and will not require sampling. Periodic inspections of the area will be required. |
| San Manuel | Plant Site | James Glasston | Air Quality Earthmoving | 8/1/2005 | None | This permit covers 20-30 acres at the Plant Site. |

Note: NA = not applicable

## Table 2 List of facilities

| Facility Number (SRK, 2004) [1] | 2004 Facility Description | Facility Status (November 2004) | Facility Number (Magma Copper Company, 1995) [2] | 1995 Facility Description |
|---|---|---|---|---|
| C-1 | Flash Furnace Building | Future removal. | 1 | Flash Furnace Building |
| E-2 | Converter Building | Future removal. | 2* | Converter Building |
| C-3 | Secondary Crusher Building | Demolition started. | 3 | Secondary Crusher Building |
| C-4 | Coarse Ore Receiving Bin | Future removal. | 4* | Ore Receiving Bin |
| C-5 | Concentrator/Mill | Demolition 60% complete. | 5* | Concentrator/Mill |
| E-6 | Molybdenum Concentrate Thickener | Removed. | 6a | Molybdenum Concentrate Thickener |
| E-7 | Plant Site Safety Training Center | Future removal. | 7* | Plant Site Safety Training Center |
| E-8 | Core Storage | Future removal. | 8* | Core Storage |
| E-9 | Copper Concentrate Thickeners | Demolition started. | 9a | Copper Concentrate Thickeners |
| E-10 | Main Gate Employee Change Room | Future removal. | 10* | Main Gate Employee Change Room |
| E-11 | Hourly Employee Time Office/Security Station | Future removal. | 11* | Hourly Employee Time Office/Security Station |
| E-12 | Engineering Services Building | Future removal. | 12* | Building |
| E-13 | Administration Building | Future sale. | 13* | Administration Building |

See last page for notes.

## Table 2 List of facilities (continued)

| Facility Number (SRK, 2004) [1] | 2004 Facility Description | Facility Status (November 2004) | Facility Number (Magma Copper Company, 1995) [2] | 1995 Facility Description |
|---|---|---|---|---|
| E-14 | Purchasing Department Building | Future removal. | 14* | Purchasing Department Building |
| E-17 | Ore Haulage Line | Future removal. | 17* | Ore Haulage Line |
| C-18 | Hazardous Waste Storage Building | Future removal. | 18 | Echo Trucking Facility |
| D-19 | Primary Oxidation Ponds | To be transferred to new ownership. | 19a | Primary Oxidation Ponds |
| D-20 | Sewage Evaporation Ponds | To be transferred to new ownership. | 20a | Sewage Evaporation Ponds |
| E-21 | Mill Office Building | Removed. | 21* | Mill Office Building |
| E-22 | Spent Electrolyte Tank | Future removal. | 22 | Leachate Storage Tank |
| C-23 | Oxygen Plant | Future removal. | 23* | Oxygen Plant |
| C-24 | Oxygen Plant Cooling Towers | Future removal. | 24 | Oxygen Plant Cooling Towers |
| E-25 | lndustrial Hygiene & Environmental Office | Future removal. | 25* | Industrial Hygiene Building |
| E-26 | Smelter Office Building | Future removal. To be used during demolition. | 26* | Smelter Office Building |

See last page for notes.

## Table 2 List of facilities (continued)

| Facility Number (SRK, 2004) [1] | 2004 Facility Description | Facility Status (November 2004) | Facility Number (Magma Copper Company, 1995) [2] | 1995 Facility Description |
|---|---|---|---|---|
| E-27 | Anode Casting Area | Future removal. | 27* | Anode Housing |
| C-28 | Power House | Future removal. | 28 | Powerhouse |
| E-30 | Carpenter Shop | Future removal. | 30* | Carpenter Shop & Laydown Yard |
| C-31 | Truck Shop | Future removal. To be used during demolition. | 31* | Truck Shop and Yard |
| E-32 | Fugitive Gas Stacks | Future removal. | 32* | Flash Fugitive Stack |
| E-33 | Converter Stack | Future removal. | 33* | Converter Stack |
| C-34 | Acid Plant Tail Stacks | Future removal. | 34* | Acid Plant Tail Stacks |
| E-35 | Flue Dust Leach Facility Storage Pond | Future removal. | 35a | Flue Dust Leach Facility Storage Pond |
| C-36 | Concentrate Storage Area | Future removal. | 36 | Concentrate Storage Bedding Plant |
| E-37 | North Gate Guard Station | Future removal. | 37* | North (Main) Gate Guard Station |
| E-38 | South Gate Guard Station | Future removal. | 38* | South (Main) Gate Guard Station |
| E-39 | Metallurgical Department Storage | Future removal. | 39* | Metallurgic Dead Storage |
| E-40 | Refinery Scales | Future removal. | 40* | Refinery Scales |
| E-42 | Oxygen Pipeline | Future removal. | 42* | Oxygen Pipeline |
| E-43 | Nitrogen Pipeline | Future removal. | 43* | Nitrogen Pipeline |
| E-44 | Paint Shop | Future removal. | 44* | Paint Shop |
| E-45 | Brickshed Warehouse | Future removal. | 45 | Brickshed Warehouse and Laydown Yard |
| C-46 | Slag Cooling Pits | Future removal. | 46 | Slag Cooling Pits |
| C-47 | Slag Primary Crusher/Handling Area | Future removal. | 47 | Slag Primary Crusher |
| C-51 | Tank House | Future removal. | 51 | Refinery Electrolytic Tankhouse |

See last page for notes.

## Table 2 List of facilities (continued)

| Facility Number (SRK, 2004) [1] | 2004 Facility Description | Facility Status (November 2004) | Facility Number (Magma Copper Company, 1995) [2] | 1995 Facility Description |
|---|---|---|---|---|
| C-52 | Rod Plant | Future removal. | 52 | Rod Plant |
| C-53 | Hyster Shop | Future removal. | 53* | Hyster Shop |
| C-54 | Acid Plant | Future removal. | 54 | Acid Plant and Control Room |
| E-55 | Acid Plant Change House and Safety Supply | Future removal. | 55* | Acid Plant Change Room, Safety Office |
| C-56 | Water Treatment Plant | Future removal. | 56* | Powerhouse Switchgear Rooms |
| E-57 | Smelter Switchgears | Future removal. | 57* | Smelter Switchgears |
| C-58 | Flash Furnace Quality Control Laboratory | Future removal. | 58* | Quality Control Laboratory |
| C-59 | Metallurgical Laboratory | Demolition started. | 59* | Quality Control Laboratory |
| E-60 | Metallurgical Office | Future removal. | 60* | Metallurgic Offices |
| C-61 | Lime and Flux Plant Storage Yard | No structures to be removed. | 61 | Lime and Flux Plant Storage Yard |
| C-62 | Truck Shop Wash Area | Future removal. | 62 | Truck Shop Wash Area |
| C-63 | Hyster Shop Wash Area | Future removal. | 63 | Hyster Shop Wash Area |
| E-64 | 2c Precipitator | Future removal. | 64* | 2c Precipitator |
| E-65 | 1c Precipitator | Future removal. | 65* | 1c Precipitator |
| E-66 | Concentrator Fueling Station | Future removal. | 66* | Fueling Station |
| C-67 | Rod Plant Crop Bar Wash Station | Future removal. | 67* | Rod Plant Laydown Yard |
| E-68 | Anode Laydown Yard | Future removal. | 68* | Anode Laydown Yard |
| E-69 | Maintenance Services Offices | Future removal. | 69* | Maintenance Services |
| C-70 | Electrical Shop | Future removal. | 70* | Electrical Shop |
| C-71 | Machine Shop | Future removal. | 71* | Machine Shop |

See last page for notes.

## Table 2 List of facilities (continued)

| Facility Number (SRK, 2004) [1] | 2004 Facility Description | Facility Status (November 2004) | Facility Number (Magma Copper Company, 1995) [2] | 1995 Facility Description |
|---|---|---|---|---|
| E-72 | Electronics Shop | Future removal. | 72* | Electronics Stop |
| C-73 | Locomotive Shop | Future removal. | 73 | Locomotive Shop |
| E-74 | Locomotive Yard | Future removal. | 74 | Locomotive Yard |
| C-75 | Molybdenum Plant | Demolition started. | 75a | Molybdenum Plant |
| E-76 | Main Warehouse | Future removal. | 76* | Main Warehouse |
| E-77 | Warehouse Storage Yard | Future removal. | 77* | Warehouse Storage Yards |
| C-78 | Acid Plant Cooling Towers | Future removal. | 78 | Acid Plant Cooling Tower Overflow |
| D-79 | Tailings Impoundment #1/2 | Facility to remain | 79 | Tailings Impoundment 1 & 2 |
| D-80 | Tailings Impoundment #3/4 | Facility to remain | 80 | Tailings Impoundment 3 & 4 |
| D-81 | Tailings Impoundment #5 | Facility to remain | 81 | Tailings Impoundment 5 |
| D-82 | Tailings Impoundment #6 | Facility to remain | 82 | Tailings Impoundment 6 |
| D-83 | Tailings Impoundment #10 | Facility to remain | 83 | Tailings Impoundment 10 |
| E-84 | Tailings Transite Pipeline | Future removal. | 84* | Tailings Tran-site Pipeline |
| E-85 | Acid Plant Blowdown Line | Future removal. | 85* | Acid Plant Blowdown Line |
| E-86 | Diesel Fuel Pumping Station | Future removal. | 86 | Smelter Fuel Pumping Stations |
| E-87a | North Concentrate Scale | Future removal. | 87* | North/South Concentrate Scales |
| E-87b | South Concentrate Scale | Future removal. | --- | --- |
| E-88 | SMARRCO Train Depot | Future removal. | 88* | SMARRCO Train Depot |
| E-89 | Refinery/Rod Plant Main Office | Future removal. | 89* | Refinery/Rod Plant Main Office |
| C-90 | Acid Truck Loading Station #1 | Future removal. | 90 | Acid Loading Station #1 |

See last page for notes.

## Table 2 List of facilities (continued)

| Facility Number (SRK, 2004) [1] | 2004 Facility Description | Facility Status (November 2004) | Facility Number (Magma Copper Company, 1995) [2] | 1995 Facility Description |
|---|---|---|---|---|
| C-91 | Acid Truck Loading Station #2 | Future removal. | 91 | Acid Loading Station #2 |
| C-92 | Acid Truck Loading Station #3/#4 | Future removal. | 92 | Acid Loading Station #3 & 4 |
| E-93 | Electrical Booster Station | Future removal. | 93* | Electrical Booster Station |
| C-94 | Tailings Thickeners | Future removal. | 94a | Tailings Thickeners |
| E-95 | APS and Magma Substations | Facility to remain. | 95* | Electrical Booster Switchgear, Magma/APS |
| E-96 | Number 5 Water Booster Station | Facility to remain. | 96* | Number 5 Water Booster Station |
| E-98 | Hazardous Waste Bunkers | Future removal. | 98* | Hazardous Waste Bunkers |
| E-99 | $O_2$ Salvage Yard | Future removal. | 99 | Salvage Yard/Used Oil Storage Facility |
| E-100 | McCabe Bunkers (Concentrate Storage) | Future removal. | 100 | Concentrate Storage Bunkers |
| E-101 | Main Gate Scales | Future removal. | 101* | Main Gate Scales |
| C-104 | Collection Pond #1 | Facility to remain. | 104 | Tailings Settling Pond #6 |
| C-105 | Collection Pond #6 | Facility to remain. | 105 | Tailings Settling Pond #1 & 2 |
| C-106 | Collection Pond #10 | Facility to remain. | 106 | Tailings Settling Pond #10 |
| C-107 | Slag Dump Fuel Station and Wash Pad | Future removal. | 107 | Slag Fuel Washdown Pad Area |
| C-108 | Mill Materials Storage Yard | Future removal. | 108 | Waste Dump Materials |
| C-109 | Power House Diesel Generators | Future removal. | 109 | Powerhouse Generator Sumps |
| E-110 | Ball Mill Storage | Future removal. | 110* | Mill Laydown Yard |
| C-111 | Boiler House | Future removal. | 111* | Contractors Building |
| C-112 | Rod Plant/Refinery Maintenance Shop | Future removal. | 112 | Rod Plant/Refinery Maintenance Shop |
| C-113 | Copper Oxide Settling Basin | Future removal. | 113 | Copper Oxide Recovery Tank |

See last page for notes.

## Table 2 List of facilities (continued)

| Facility Number (SRK, 2004) [1] | 2004 Facility Description | Facility Status (November 2004) | Facility Number (Magma Copper Company, 1995) [2] | 1995 Facility Description |
|---|---|---|---|---|
| D-114 | Sewage Plant Digester and Sludge Drying Beds | Facility to remain. | 114 | Sewage Plant Digester and Sludge Drying Beds |
| E-115 | Acid Neutralization/J-2 Drop Box | Future removal. | 115 | J-2 Drop Box |
| E-116 | Tailings Impoundment #10 Drop Box | Future removal. | 116 | #10 Tailings Pile Drop Box |
| C-118 | Soluble Oil Pond | Ponds closed in 1991. | 118 | Weak Acid Ponds |
| C-119 | Soluble Oil Pond | Ponds closed in 1991. | 119 | Soluble Oil Ponds |

Notes: [1] = Revised facility list prepared by SRK Consulting (U.S.), Inc.
[2] = Facility list provided in "*Aquifer Protection Permit Application for San Manuel Plant Site*", Magma Copper Company, September 29, 1995.
* = indicates that it was assigned a location number only and was not assigned an APP facility number.
--- = indicates that the number was previously combined with another facility number.

## Table 3 Final destination of waste materials removed

| Materials Removed | Year Removed | Owner | Location |
|---|---|---|---|
| Acid Plant saddles | 2004 | Allied Waste | Apache Junction, Arizona |
| asbestos | 2004 | BHP Plant Site Asbestos Landfill | San Manuel, Arizona |
| batteries | 2004 | Kinsbursky Brothers | City of Industry, California |
| batteries, dry. Contains potassium hydroxide, solid | 2004 | Romic Env Tech | Chandler, Arizona |
| batteries, wet filled with acid | 2004 | Romic Env Tech | Chandler, Arizona |
| contaminated debris | 2004 | Romic Env Tech | Chandler, Arizona |
| crushed fluorescent tubes | 2004 | Romic Env Tech | Chandler, Arizona |
| crushed fluorescent tubes, mercury | 2004 | Romic Env Tech | Chandler, Arizona |
| dry batteries | 2004 | Romic Env Tech | Chandler, Arizona |
| Enviro. Haz. substance liquid, (polyethylene glycol) | 2004 | Romic Env Tech | Chandler, Arizona |
| Enviro. Haz. substance (formaldehyde) | 2004 | Romic Env Tech | Chandler, Arizona |
| Enviro. Haz. substance (universal mercury) | 2004 | Romic Env Tech | Chandler, Arizona |
| Enviro. Haz. substance, liquid, formaldehyde | 2004 | Romic Env Tech | Chandler, Arizona |
| Enviro. Haz. substance, liquid, potassium, naphtha, formaldehyde | 2004 | Romic Env Tech | Chandler, Arizona |
| fluorescent bulbs | 2004 | Romic Env Tech | Chandler, Arizona |
| grease | 2004 | Romic Env Tech | Chandler, Arizona |
| hazardous waste, solid | 2004 | Romic Env Tech | Chandler, Arizona |
| hazardous waste, solid, mercury | 2004 | Romic Env Tech | Chandler, Arizona |
| iodine | 2004 | Romic Env Tech | Chandler, Arizona |
| isocyanates, toxic (diphenylmethane) | 2004 | Romic Env Tech | Chandler, Arizona |
| latex paint, methyl ethyl ketone | 2004 | Romic Env Tech | Chandler, Arizona |
| lithium battery | 2004 | Romic Env Tech | Chandler, Arizona |
| non-PCB light ballasts | 2004 | Romic Env Tech | Chandler, Arizona |
| non-RCRA, non-hazardous (grease) | 2004 | Romic Env Tech | Chandler, Arizona |
| parts washing solvent | 2004 | Safety-Kleen | Tucson, Arizona |
| PCB light ballasts, non-leaking | 2004 | Romic Env Tech | Chandler, Arizona |
| RQ sulfuric acid | 2004 | BHP Miami Unit | Miami, Arizona |
| RQ waste corrosive liquid, inorganic potassium hydroxide | 2004 | Romic Env Tech | Chandler, Arizona |
| RQ waste corrosive liquids, | 2004 | Romic Env Tech | Chandler, Arizona |
| RQ waste corrosive liquids, sodium hydroxide | 2004 | Romic Env Tech | Chandler, Arizona |
| RQ waste corrosive liquids, sulfuric acid | 2004 | Romic Env Tech | Chandler, Arizona |
| RQ waste cyanide solution | 2004 | Romic Env Tech | Chandler, Arizona |

Notes:
1. Documentation regarding quantity and destination of the materials that have been removed, or will be removed, is (or will be) located at the facility and is available upon reasonable request.
2. Complete information regarding waste disposal will be included in the *Facility Closeout Report*.
3. RQ = Required Quantities reportable.

## Table 3 Final destination of waste materials removed (continued)

| Materials Removed | Year Removed | Owner | Location |
|---|---|---|---|
| RQ waste ethanol solutions | 2004 | Romic Env Tech | Chandler, Arizona |
| RQ waste sodium hydroxide, solution | 2004 | Romic Env Tech | Chandler, Arizona |
| RQ, waste paint-related material | 2004 | Romic Env Tech | Chandler, Arizona |
| RQ, waste, liquid (oil, trichloroethane) | 2004 | Romic Env Tech | Chandler, Arizona |
| sodium bisulfate | 2004 | Romic Env Tech | Chandler, Arizona |
| sodium hydroxide | 2004 | Romic Env Tech | Chandler, Arizona |
| sulfuric acid | 2004 | Romic Env Tech | Chandler, Arizona |
| sulfuric acid, Copper | 2004 | Romic Env Tech | Chandler, Arizona |
| toxic liquids (methylene bis thiocyante) | 2004 | Romic Env Tech | Chandler, Arizona |
| trichloroethane | 2004 | Romic Env Tech | Chandler, Arizona |
| universal waste lamps | 2004 | Romic Env Tech | Chandler, Arizona |
| used oil | 2004 | AZ Oil Company | Tucson, Arizona |
| vanadium pentoxide | 2004 | Romic Env Tech | Chandler, Arizona |
| waste aerosols | 2004 | Romic Env Tech | Chandler, Arizona |
| waste combustible liquid (petroleum naphtha) | 2004 | Romic Env Tech | Chandler, Arizona |
| waste corrosive liquid (monoethanolamine) | 2004 | Romic Env Tech | Chandler, Arizona |
| waste corrosive liquid (sulfuric acid, lead) | 2004 | Romic Env Tech | Chandler, Arizona |
| waste corrosive liquid, acidic, inorganic | 2004 | Romic Env Tech | Chandler, Arizona |
| waste corrosive liquid, acidic, inorganic, sulfuric acid, copper sulfate | 2004 | Romic Env Tech | Chandler, Arizona |
| waste flammable liquids (gum turpentine) | 2004 | Romic Env Tech | Chandler, Arizona |
| waste flammable liquids (DOT-E-10933) | 2004 | Romic Env Tech | Chandler, Arizona |
| waste mercury contained in manufactured articles | 2004 | Romic Env Tech | Chandler, Arizona |
| waste oxidizing solid (DOT-E-10933) | 2004 | Romic Env Tech | Chandler, Arizona |
| waste paint | 2004 | Romic Env Tech | Chandler, Arizona |
| waste sodium hydroxide solution | 2004 | Romic Env Tech | Chandler, Arizona |
| waste zinc dust | 2004 | Romic Env Tech | Chandler, Arizona |
| water petroleum distillates | 2004 | Romic Env Tech | Chandler, Arizona |
| wet batteries | 2004 | Romic Env Tech | Chandler, Arizona |
| non-determined | 1999 | Safety-Kleen | Tucson, Arizona |
| PCB (liquid) | 2004 | Onyx Special Services | Phoenix, Arizona |
| PCB-contaminated switches | 2004 | Onyx Special Services | Phoenix, Arizona |
| PCB debris | 1999 | Trans-Cycle | Pell City, Alabama |
| PCB liquid | 2004 | Onyx Special Services | Phoenix, Arizona |
| PCB liquid | 1999 | Trans-Cycle | Pell City, Alabama |
| transformer | 2004 | Onyx Special Services | Phoenix, Arizona |

Notes:
1. Documentation regarding quantity and destination of the materials that have been removed, or will be removed, is (or will be) located at the facility and is available upon reasonable request.
2. Complete information regarding waste disposal will be included in the *Facility Closeout Report*.
3. RQ = Required Quantities reportable.

## Table 3 Final destination of waste materials removed (continued)

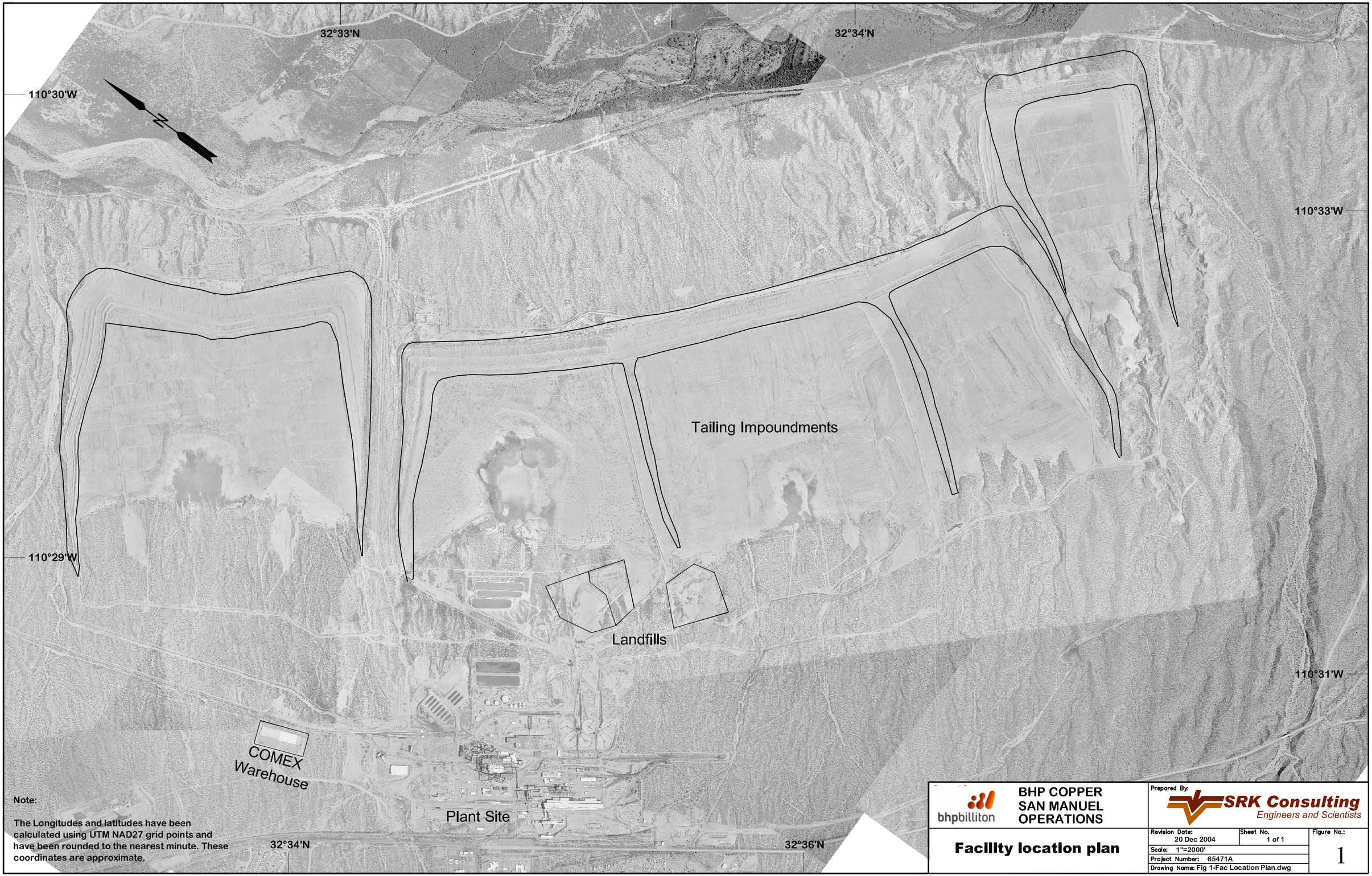
| Materials Removed | Year Removed | Owner | Location |
|---|---|---|---|
| transformer, drained | 2004 | Onyx Special Services | Phoenix, Arizona |
| transformers | 2004 | Onyx Special Services | Phoenix, Arizona |
| transformers, drained | 2004 | Onyx Special Serv | Phoenix, Arizona |
| transformers, drained | 1999 | Trans-Cycle | Pell City, Alabama |
| transformers, non-PCB | 2004 | Onyx Special Serv | Phoenix, Arizona |
| transformers, oil filled | 2004 | Onyx Special Serv | Phoenix, Arizona |

Notes:
1. Documentation regarding quantity and destination of the materials that have been removed, or will be removed, is (or will be) located at the facility and is available upon reasonable request.
2. Complete information regarding waste disposal will be included in the *Facility Closeout Report*.
3. RQ = Required Quantities reportable.

## Table 4 Submittal schedule

| Description of Supplemental Submittals | Date to be Completed |
|---|---|
| Soil Characterization Report | March 3, 2005 |
| Tailings Characterization Report | May 19, 2005 |
| Groundwater Characterization Report | June 30, 2005 |
| Design Reports | June 30, 2005 |
| Demonstration of Compliance with Aquifer Water Quality Standards (AWQSs) | July 30, 2005 |
| Demonstration of Best Available Demonstrated Control Technology (BADCT) | September 21, 2005 |
| Soil Remediation Summary Report | December 6, 2006 |
| Facility Closeout Report | February 28, 2008 |
| Contingency Plan | February 28, 2008 |
| Post-closure Monitoring Plan | February 28, 2008 |

# FIGURES




Note:

The Longitudes and latitudes have been calculated using UTM NAD27 grid points and have been rounded to the nearest minute. These coordinates are approximate.

bhpbilliton

BHP COPPER
SAN MANUEL
OPERATIONS

Prepared By:
SRK Consulting
Engineers and Scientists

**Facility location plan**

| | | |
|---|---|---|
| Revision Date: 20 Dec 2004 | Sheet No. 1 of 1 | Figure No.: 1 |
| Scale: 1"=2000' | | |
| Project Number: 65471A | | |
| Drawing Name: Fig 1-Fac Location Plan.dwg | | |

32°34'N

32°35'N

110°29'W

110°29'W

110°29'W

110°29'W

Hazardous waste storage building

Note:

The Longitudes and Latitudes have been calculated using UTM NAD27 grid points and have been rounded to the nearest minute. These coordinates are approximate.

32°35'N

32°35'N

Prepared For: bhpbilliton BHP COPPER SAN MANUEL OPERATIONS

Prepared By: SRK Consulting Engineers and Scientists

**Facility site plan**

| | | |
|---|---|---|
| Revision Date: 20 Dec 2004 | Sheet No. 1 of 1 | Figure No.: 2 |
| Scale: 1"=500' | | |
| Project Number: 65471A | | |
| Drawing Name: Fig 2-Site Plan.dwg | | |

# BHP Copper
## San Manuel Plant Site Closure Plan

| ID | Task Name | Start | Finish |
|---|---|---|---|
| 1 | **Plant Site Facilities Closure** | **10/20/2003** | **3/7/2008** |
| 2 | Acid Plant | 5/2/2005 | 9/12/2005 |
| 3 | Concentrator/Mill | 10/1/2004 | 3/9/2005 |
| 4 | Coarse Ore Receiving Area | 1/27/2005 | 3/31/2005 |
| 5 | Secondary Crusher Building | 8/26/2004 | 1/5/2005 |
| 6 | Concentrate Storage and Handling | 3/10/2005 | 4/1/2005 |
| 7 | Concentrate Storage | 5/26/2006 | 6/30/2006 |
| 8 | Flue Dust Leach Facility | 2/10/2005 | 3/9/2005 |
| 9 | Landfills (tentative) | 10/20/2003 | 7/13/2007 |
| 10 | Lime and Flux Plant | 10/5/2004 | 1/21/2005 |
| 11 | Locomotive Shop | 7/15/2005 | 8/18/2005 |
| 12 | Molybdenum Plant | 9/29/2004 | 1/19/2005 |
| 13 | Offices and Maintenance | 6/10/2005 | 8/4/2005 |
| 14 | Oxygen Plant | 8/23/2005 | 9/19/2005 |
| 15 | Power House | 9/9/2005 | 11/17/2005 |
| 16 | Regrading | 10/24/2005 | 11/3/2006 |
| 17 | Tank House | 4/14/2005 | 7/21/2005 |
| 18 | Rod Plant | 3/31/2005 | 4/27/2005 |
| 19 | Railways | 10/13/2006 | 9/14/2007 |
| 20 | Smelter | 1/20/2005 | 12/29/2005 |
| 21 | Slag Cooling Pits | 2/3/2005 | 2/16/2005 |
| 22 | Soil Remediation | 2/11/2005 | 6/23/2006 |
| 23 | Tank Farm Complex | 2/23/2005 | 3/11/2005 |
| 24 | Tailings Impoundment #10 | 6/2/2006 | 8/31/2007 |
| 25 | Tailings Impoundments #1-5 | 10/27/2005 | 3/7/2008 |
| 26 | Tailings Impoundment #6 | 8/25/2005 | 5/10/2006 |
| 27 | Tailings Thickeners | 2/10/2005 | 3/9/2005 |

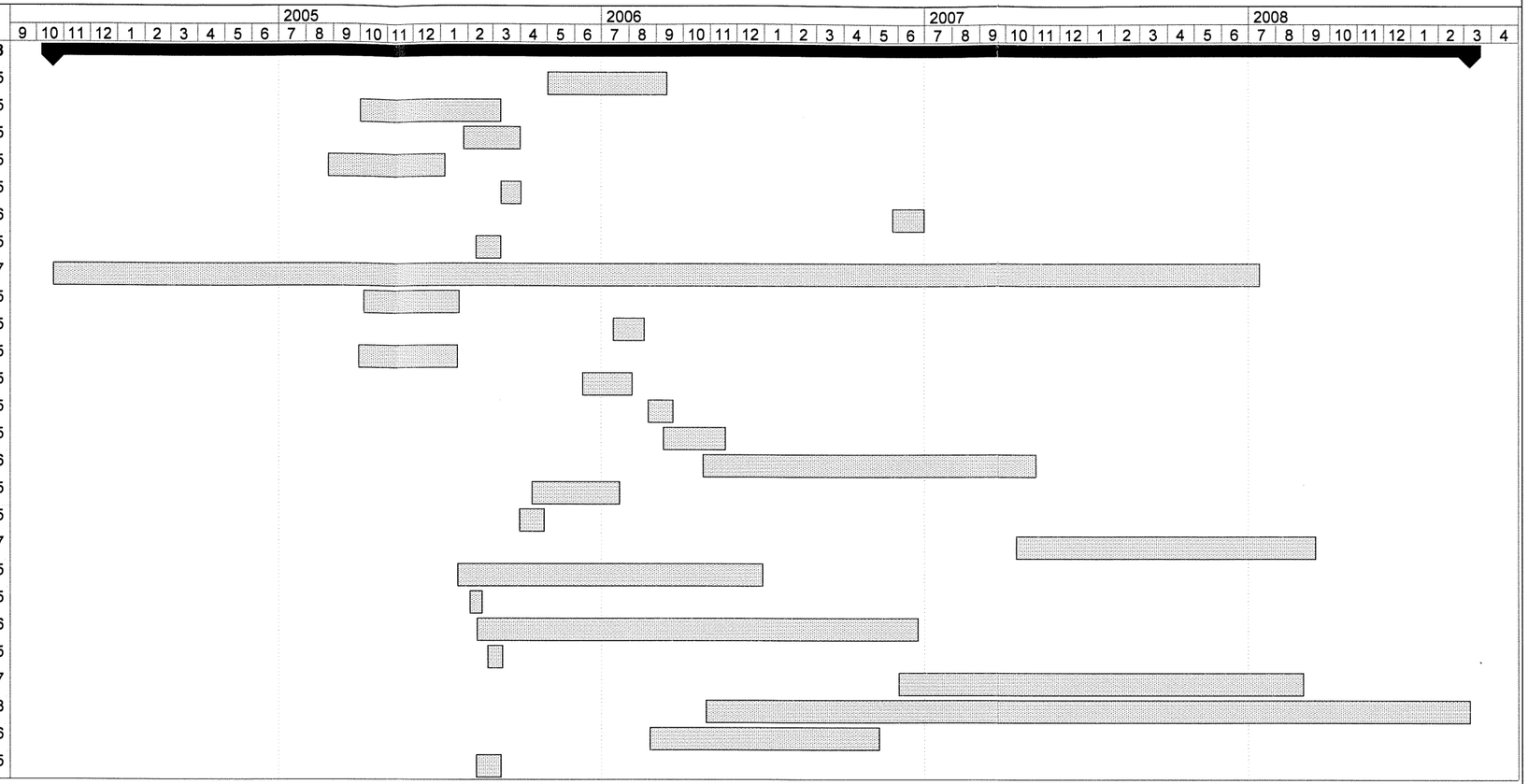



**Figure 3 Facility closure schedule**

**AQUIFER PROTECTION PERMIT NO. P-102370**
**OTHER AMENDMENT**
**PLACE ID 15585, LTF 70266**

## 1.0 Authorization

In compliance with the provisions of Arizona Revised Statutes (A.R.S.) Title 49, Chapter 2, Articles 1, 2 and 3, Arizona Administrative Code (A.A.C.) Title 18, Chapter 9, Articles 1 and 2, A. A. C. Title 18, Chapter 11, Article 4 and amendments thereto, and the conditions set forth in this permit, the Arizona Department of Environmental Quality (ADEQ) hereby authorizes BHP Copper, Inc. to operate the San Manuel Plant Site located in northwest of San Manuel, Pinal County, Arizona, over groundwater of the San Pedro River Basin, in Township 9 South, Range 17 East, Sections 16, 21, 22, 25, 26, 27, 28, 29, 32, 35 and 36, of the Gila and Salt River Base Line and Meridian.

This permit becomes effective on the date of the Water Quality Division Director's signature and shall be valid for the life of the facility (operational, closure, and post-closure periods), unless suspended or revoked pursuant to A.A.C. R18-9-A213. The permittee shall construct, operate, and maintain the permitted facilities:

1. Following all the conditions of this permit including the design and operational information documented or referenced below, and
2. Such that Aquifer Water Quality Standards (AWQS) are not violated at the applicable point(s) of compliance (POC) set forth below, or if an AWQS for a pollutant has been exceeded in an aquifer at the time of permit issuance, that no additional degradation of the aquifer relative to that pollutant, and as determined at the applicable POC, occurs as a result of the discharge from the facility.

### 1.1 Permittee Information

| | |
|---|---|
| **Facility Name:** | BHP Copper Inc., San Manuel Plant Site |
| **Facility Address:** | 28545 South Veterans Memorial Blvd<br>San Manuel, AZ 85631 |

**Annual Registration Fee Flow Rate:** 100,000 gallons per day (gpd)

| | |
|---|---|
| **Permittee:** | BHP Copper Inc. |
| **Permittee Address:** | P.O. Box M<br>San Manuel, AZ 85631 |
| **Facility Contact:** | Brent Musslewhite, 928 275-1717 |
| **Emergency Phone No.:** | Frank Molina, 520 302-8753 |
| **Latitude/Longitude:** | 32° 36' 56" North, 110° 37' 16" West |
| **Legal Description:** | Township 9 South, Range 17 East, Sections 16, 21, 22, 25, 26, 27, 28, 29, 32, 35 and 36, of the Gila and Salt River Base Line and Meridian |

### 1.2 Authorizing Signature

**David W. Dunaway, Groundwater Protection Value Stream Manager**
**Water Quality Division**
**Arizona Department of Environmental Quality**
**Signed this** 28 **day of** September, **2018**

**THIS AMENDMENT SUPERSEDES ALL PREVIOUS PERMITS**

## 2.0 SPECIFIC CONDITIONS [A.R.S. §§ 49-203(4), 49-241(A)]

### 2.1 Facility / Site Description [A.R.S. § 49-243(K)(8)]

The San Manuel Plant Site is located adjacent to the Town of San Manuel in Pinal County and consisted of the Plant Area (milling and processing facilities) and the Tailings Area (tailings impoundments). The Plant Site processed ore from the San Manuel Mine (Mine Site), and other BHP operations, and performed custom smelting of concentrates from other copper producers from 1953 to 1999. Closure activities have been completed for all facilities except for the Solid Waste Landfill and post-closure maintenance and monitoring activities are ongoing as required herein. BHP has approval to construct solar photovoltaic generating facilities on one or more of the closed tailings impoundments.

The purpose of this amendment is to revise the Alert Level (AL) and Aquifer Quality Limit (AQL) for POC Well SMW-20, add Tailings Impoundment Monitor Well DH17-T6-B, and submit an updated Post-Closure Contingency Plan.

The site includes the following permitted discharging facilities:

**Table 2.1.1 Discharging Facilities**

| ADEQ Facility # | BHP Facility # | Discharging Facility Name | Latitude | Longitude |
|---|---|---|---|---|
| 1 | D-79 | Tailings Impoundment #1/2 (in post-closure) | 32° 37' 42" N | 110° 36' 03" W |
| 2 | D-80 | Tailings Impoundment #3/4 (in post-closure) | 32° 36' 52" N | 110° 35' 17" W |
| 3 | D-81 | Tailings Impoundment #5 (in post-closure) | 32° 36' 22" N | 110° 03' 30" W |
| 4 | D-82 | Tailings Impoundment #6 (in post-closure) | 32° 36' 32" N | 110° 33' 31" W |
| 5 | D-83 | Tailings Impoundment #10 (in post-closure) | 32° 38' 41" N | 110° 36' 03" W |
| 6 | C-104 | Collection Pond #1 (in post-closure) | 32° 38' 12" N | 110° 35' 50" W |
| 7 | C-105 | Collection Pond #6 (in post-closure) | 32° 36' 40" N | 110° 33' 05" W |
| 8 | C-106 | Collection Pond #10 (in post-closure) | 32° 38' 50" N | 110° 36' 07" W |
| 9 | E-48 | Solid Waste Landfill | 32° 37' 04" N | 110° 36' 30" W |
| 10 | E-50 | Wood Landfill (in post-closure) | 32° 36' 44" N | 110° 36' 04" W |

#### 2.1.1 APP Annual Registration Fee [A.R.S. § 49-242 and A.A.C. R18-14-104]

The annual registration fee for this permit is payable to ADEQ each year. The permitted flow for fee calculation is 100,000 gallons per day (gpd).

#### 2.1.2 Solid Waste Annual Registration and Disposal Fees [A.R.S. §§ 49-747, 49-836]

The annual registration fee for the solid waste landfills is established by A.R.S. § 49-747 and A.A.C. R18-13-2102 and 2103 (effective July 1, 2012). The solid waste landfill disposal fees are established by A.R.S. § 49-836 based on the amount of waste landfilled. The fees are payable to ADEQ each year.

#### 2.1.3 Financial Capability [A.R.S. § 49-243(N) and A.A.C. R18-9-A203]

The permittee 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 net present value of the estimated closure and post-closure cost is $2,712,000. The financial assurance mechanism was demonstrated by a letter of credit pursuant to A.A.C. R18-9-A203(C)(5).

**2.2 Best Available Demonstrated Control Technology [A.R.S. § 49-243(B) and A.A.C. R18-9-A202(A)(5)]**
Facilities regulated by this permit shall be designed, constructed, operated, and maintained to meet requirements specified by A.R.S. §49-243(B) and A.A.C. R18-9-A202(A)(5).

**2.2.1 Engineering Design**
BADCT description for the permitted facilities is presented in Section 4.1, Table 1A.

**2.2.2 Site-specific Characteristics**
Not applicable.

**2.2.3 Pre-operational Requirements**
Not applicable.

**2.2.4 Operational Requirements**
A description of required inspections for the discharging facilities is presented in Section 4.2, Table 2A. If damage is identified during an inspection that could cause or contribute to a discharge, proper repairs shall be promptly performed.

**2.3 Discharge Limitations [A.R.S. §§ 49-201(14), 49-243 and A.A.C. R18-9-A205(B)]**
The permittee shall operate and maintain all permitted facilities to prevent unauthorized discharges pursuant to A.R.S. §§ 49-201(12) resulting from failure or bypassing of BADCT pollutant control technologies including liner failure, uncontrollable leakage, berm breaches that result in an unexpected loss of fluid, accidental spills, or other unauthorized discharges. Liner failure in a single-lined impoundment is any condition that would result in leakage exceeding 550 gallons per day per acre. The discharge limitations in this section are not applicable to any discharge caused by precipitation in excess of a single 100-year/24 hour storm event or process overflow during a power outage exceeding 24 hours in duration

**2.4 Point(s) of Compliance and Alert Level Monitoring Well(s)**

**2.4.1 Point(s) of Compliance [A.R.S. § 49-244]**
The POC(s) are established by the following monitoring location(s):

**Table 2.4.1 Point of Compliance Wells**

| Well Number | Latitude | Longitude | ADWR Number |
|---|---|---|---|
| SMW-17 | 32° 38' 55" N | 110° 35' 60" W | 55-900316 |
| SMW-18 | 32° 38' 04" N | 110° 35' 40" W | 55-900317 |
| SMW-19 | 32° 37' 18" N | 110° 34' 43" W | 55-900318 |
| SMW-20 | 32° 36' 54" N | 110° 33' 14" W | 55-900319 |
| SMW-22 | 32° 39' 32" N | 110° 36' 33" W | 55-900681 |

Monitoring requirements for each POC are listed in Section 4.2, Table 2B.

The Director may amend this permit to designate additional POCs if information on groundwater gradients or groundwater usage indicates the need.

### 2.4.2 Alert Level Monitoring Well(s)

The Alert Level Monitoring Well(s) are established at the following location(s):

| Table 2.4.2 Alert Level Monitoring Well(s) | | | |
|---|---|---|---|
| Well Number | Latitude | Longitude | ADWR Number |
| DH17-T6-B | 32° 36' 58.79" | 110° 33' 26.1" | 55-227784 |

## 2.5 Monitoring Requirements [A.R.S. § 49-243(B) and (K)(1), A.A.C. R18-9-A206(A)]

Unless otherwise specified in this permit, all monitoring required in this permit shall continue for the duration of the permit, regardless of the status of the facility. Monitoring shall commence the first full monitoring period following permit issuance. All sampling, preservation and holding times shall be in accordance with currently accepted standards of professional practice. Trip blanks, equipment blanks and duplicate samples shall also be obtained, and Chain-of-Custody procedures shall be followed, in accordance with currently accepted standards of professional practice. Copies of laboratory analyses and Chain-of-Custody forms shall be maintained at the permitted facility. Upon request, these documents shall be made immediately available for review by ADEQ personnel.

### 2.5.1 Discharge Monitoring

None required by this permit.

### 2.5.2 Facility Closure Monitoring

The facility monitoring during closure shall consist of site inspections relating to the storm water drainage network, slope stability, soil cover and monitoring groundwater quality. The site inspections and monitoring requirements are listed in Section 4.2, Table 2A. Groundwater monitoring requirements are listed in Section 4.2, Table 2B and Table 2C. The monitoring points are listed in Section 2.4, Table 2.4.1 and Table 2.4.2.

### 2.5.3 Groundwater Monitoring and Sampling Protocols

Compliance groundwater monitoring is required under the terms of this permit. For all sampling methods, static water levels shall be measured and recorded prior to sampling.

Wells shall be purged of at least three borehole volumes (as calculated using the static water level) or until field parameters (pH, temperature, and conductivity) are stable, whichever represents the greater volume. If evacuation results in the well going dry, the well shall be allowed to recover to 80 percent of the original borehole volume, or for 24 hours, whichever is shorter, prior to sampling. If after 24 hours there is not sufficient water for sampling, the well shall be recorded as "dry" for the monitoring event. An explanation for reduced pumping volumes, a record of the volume pumped, and modified sampling procedures shall be reported and submitted with the Self-monitoring Report Form (SMRF).

As an alternative method for sampling, the permittee may conduct the sampling using the low-flow purging method as described in the Arizona Water Resources Research Center, March 1995 *Field Manual for Water Quality Sampling*. The well must be purged until indicator parameters stabilize. Indicator parameters shall include dissolved oxygen, turbidity, pH, temperature, and conductivity.

As a third alternative method for sampling within POC wells with very low recharge rates, the permittee may conduct the sampling using no-purge sampling techniques using HydraSleeve™ or similar type methodology. The use of HydraSleeve™ or similar type samplers shall follow accepted EPA, USGS, and DOD protocols. In addition, the HydroSleeve™ or similar type sampler shall be placed just below the water table.

**2.5.3.1 Point of Compliance Well Replacement**

In the event that one or more of the designated POC wells should become unusable or inaccessible due to damage, or any other event, a replacement POC well shall be constructed and installed upon approval by ADEQ. If the replacement well is 50 feet or less from the original well, the ALs and/or aquifer quality limits (AQLs) calculated for the designated POC well shall apply to the replacement well. Otherwise, the ALs and/or AQLs shall be set following the provisions in Section 2.5.3.3 through Section 2.5.3.5 of this permit.

**2.5.3.2 Compliance Groundwater Monitoring**

Annual compliance groundwater monitoring in each POC well shall commence within the first calendar quarter following permit issuance. The parameters to be analyzed for annual compliance monitoring are listed in Section 4.2, Table 2B.

The permittee may submit a written request to the Groundwater Protection Value Stream to reduce the monitoring parameters in annual Compliance Groundwater Monitoring Section 4.2, Table 2B in Section 4.0 in accordance with the following criteria:

1. The parameter in question has not been detected for at least three, consecutive, annual, monitoring periods. The PQL reported by the laboratory shall be less than 80 percent of the established numeric AWQS, and shall not be greater than three times the laboratory's method detection limit for that pollutant.
2. The permittee shall submit a written report indicating the parameter(s) proposed for deletion and accompanied by the supporting data, including the laboratory analytical reports and quality assurance/quality control data to the ADEQ Groundwater Protection Value Stream for review and approval.
3. Upon review and approval by the ADEQ Groundwater Protection Value Stream, the parameter in question may be dropped from the list of monitoring parameters or the respective AQL or AL modified in the permit. The respective changes, if approved, will require an amendment to the permit.

**2.5.3.3 Ambient Groundwater Quality Monitoring for Point of Compliance Wells**

If ambient groundwater quality monitoring is required, the permittee shall complete eight quarterly rounds of ambient groundwater monitoring for all constituents listed with numeric alert levels and/or aquifer quality limits in Section 4.2, Tables 2B.

**2.5.3.4 Alert Levels for Point of Compliance Wells**

ALs shall be calculated for all contaminants with an established numeric AWQS for any new or replacement POC wells, ALs shall be calculated for all contaminants with an established numeric AWQS, as described below.

Following receipt of the laboratory analyses for the final month of the ambient groundwater monitoring period for any new or replacement POC well, the permittee shall submit the ambient groundwater data in tabulated form to Groundwater Protection Value Stream for review. Copies of all laboratory analytical reports, field notes, and the Quality Assurance/Quality Control (QA/QC) procedures used in collection and analyses of the samples for all parameters listed in Section 4.2, Table 2B to be established for each POC well, shall be submitted to Groundwater Protection Value Stream. The permittee may submit a report with the calculations for each AL and AQL included in the permit for review and approval by ADEQ, or the permittee may defer calculation of the ALs and AQLs by Groundwater Protection Value Stream. The ALs shall be established and calculated by the following formula, or another valid statistical method submitted to Groundwater Protection Value Stream in writing and approved for this permit by Groundwater Protection Value Stream:

$AL = M + KS$

Where M = mean, S = standard deviation, and K = one-sided normal tolerance interval with a 95% confidence level (Lieberman, G.J. (1958) Tables for One-sided Statistical Tolerance Limits: Industrial Quality Control, Vol XIV, No. 10). Obvious outliers should be excluded from the data used in the AL calculation.

The following criteria shall be met in establishing ALs in the permit:

1. The AL shall be calculated for a parameter using the analyses from a minimum of eight sample events.
2. Any data where the laboratory Practical Quantitation Limit (PQL) exceeds 80% of the AWQS shall not be included in the AL calculation.
3. If a parameter is below the detection limit, the permittee must report the value as "less than" the numeric value for the PQL or detection limit for the parameter, not just as "non-detect". For those parameters, the permittee shall use a value of one-half the reported detection limit for the AL calculation.
4. If the analytical results from more than 50% of the samples for a specific parameter are non-detect, then the AL shall be set at 80% of the AWQS.
5. If the calculated AL for a specific constituent and well is less than 80% of the AWQS, the AL shall be set at 80% of the AWQS for that constituent in that well.

#### 2.5.3.5 Aquifer Quality Limits for POC Wells

For each of the monitored analytes for which a numeric AWQS has been adopted, the AQL shall be established as follows:

1. If the calculated AL is less than the AWQS, then the AQL shall be set equal to the AWQS.
2. If the calculated AL is greater than the AWQS, then the AQL shall be set equal to the calculated AL value, and no AL shall be set for that constituent at that monitoring point.

### 2.5.4 Solid Waste Landfill Methane Gas Monitoring

1. Routine methane gas monitoring shall be conducted quarterly during the operation and post-closure care period of the landfill.
2. The permittee shall operate and maintain methane gas monitoring equipment to ensure that the standards of 40 CFR § 257.3–8 are met. Such routine methane monitoring shall include monitoring the gas probes installed around the landfill footprint as shown on Figure 2 of the document titled *Revised Work Plan for Landfill Gas Monitoring Locations at the Solid Waste Landfill, BHP San Manuel Plant Site, APP 102370,* dated January 31, 2018.
3. The permittee must ensure, in accordance with 40 CFR § 257.3–8, that the concentration of methane gas does not exceed:
    a. Twenty-five percent (25%) of the lower explosive limit for the gases in facility structures (excluding gas control or recovery system components), and
    b. The lower explosive limit for the gases at the property boundary.
4. If a methane gas exceedance occurs at facility structures or at the facility property boundaries, as described above, the permittee shall immediately report the exceedance to ADEQ Solid Waste Unit as specified in Sections 2.7.4.
5. The permittee shall initiate an investigation followed by corrective actions to resolve any problems identified by the investigation that may have led to an LEL exceedance. To implement any corrective action the permittee shall obtain prior approval from ADEQ.
6. Results of routine methane gas monitoring shall be maintained at the permitted facility. Upon request, the results shall be made immediately available for review by ADEQ personnel.

7. The permittee may request a permit amendment to reduce the required frequency of methane gas monitoring if it is demonstrated that methane gas concentrations are consistently less than 25 percent of the lower explosive limit.

### 2.5.5 Alert Level Well Monitoring

Annual monitoring in alert level monitoring well(s) shall commence within the first calendar quarter following permit issuance. The parameters to be analyzed for annual alert level monitoring are listed in Section 4.2, Table 2C.

### 2.5.6 Analytical Methodology

All samples collected for compliance monitoring shall be analyzed using Arizona state-approved methods. If no state-approved method exists, then any appropriate EPA-approved method shall be used. Regardless of the method used, the detection limits must be sufficient to determine compliance with the regulatory limits of the parameters specified in this permit. If all methods have detection limits higher than the applicable limit, the permittee shall follow the contingency requirements of Section 2.6 and may propose "other actions" including amending the permit to set higher limits. Analyses shall be performed by a laboratory licensed by the Arizona Department of Health Services, Office of Laboratory Licensure and Certification unless exempted under A.R.S. § 36-495.02. For results to be considered valid, all analytical work shall meet quality control standards specified in the approved methods. A list of Arizona state-certified laboratories can be obtained at the address below:

Arizona Department of Health Services
Office of Laboratory Licensure and Certification
250 North 17th Avenue
Phoenix, AZ 85007
Phone: (602) 364-0720

### 2.5.7 Installation and Maintenance of Monitoring Equipment

Monitoring equipment required by this permit shall be installed and maintained so that representative samples required by the permit can be collected. If new groundwater wells are determined to be necessary, the construction details shall be submitted to the ADEQ Groundwater Protection Value Stream for approval prior to installation and the permit shall be amended to include any new points.

## 2.6 Contingency Plan Requirements
**[A.R.S. § 49-243(K)(3), (K)(7) and A.A.C. R18-9-A204 and R18-9-A205]**

### 2.6.1 General Contingency Plan Requirements

At least one copy of this permit and the approved contingency and emergency response plan submitted June 18, 2018 shall be maintained at the location where day-to-day decisions regarding the operation of the facility are made. The permittee shall be aware of and follow the contingency and emergency plan.

Any AL that is exceeded or any violation of an AQL, discharge limit (DL), or other permit condition shall be reported to ADEQ following the reporting requirements in Section 2.7.3.

Some contingency actions involve verification sampling. Verification sampling shall consist of the first follow-up sample collected from a location that previously indicated a violation or the exceedance of an AL. Collection and analysis of the verification sample shall use the same protocols and test methods to analyze for the pollutant or pollutants that exceeded an AL or violated an AQL. The permittee is subject to enforcement action for the failure to comply with any contingency actions in this permit. Where verification sampling is specified in this permit, it is the option of the permittee to perform such sampling. If verification sampling is not conducted within the timeframe allotted, ADEQ and the permittee shall presume the initial sampling result to be confirmed as if verification sampling has been conducted. The permittee is responsible for compliance with contingency plans relating to the exceedance of an AL or violation of a DL, AQL or any other permit condition.

### 2.6.2 Exceeding of Alert Levels

#### 2.6.2.1 Exceeding of Performance Levels Set for Operational Conditions

##### 2.6.2.1.1 Performance Levels Set for Freeboard

1. Not applicable

##### 2.6.2.1.2 Performance Levels, Other Than Freeboard

1. If an operational performance level (PL) listed in Section 4.2, Table 2A has been observed or noted during required inspection and operational monitoring, such that the result could cause or contribute to an unauthorized discharge, the permittee shall immediately investigate to determine the cause of the condition. The investigation shall include the following:
   a. Inspection, testing, and assessment of the current condition of all treatment or pollutant discharge control systems that may have contributed to the operational performance condition.
   b. Review of recent process logs, reports, and other operational control information to identify any unusual occurrences.
2. The PL exceedance, results of the investigation, and any corrective action taken shall be reported to the Groundwater Protection Value Stream, within 30 days of the discovery of the condition. Upon review of the submitted report, the Department may amend the permit to require additional monitoring, increased frequency of monitoring, or other actions.
3. The permittee shall initiate actions identified in the approved contingency plan referenced in Section 5 and any necessary contingency measures to resolve problems identified by the investigation which may have led to a PL being exceeded. To implement any other corrective action the permittee may choose to obtain prior approval from ADEQ according to Section 2.6.6.

#### 2.6.2.2 Exceeding of Alert Levels Set for Discharge Monitoring

Not applicable.

#### 2.6.2.3 Exceeding of Alert Levels in Groundwater Monitoring

##### 2.6.2.3.1 Alert Levels for Indicator Parameters

Not applicable.

##### 2.6.2.3.2 Alert Levels for Pollutants with Numeric Aquifer Water Quality Standards

1. If an AL for a pollutant set in Section 4.2, Table 2B has been exceeded, the permittee may conduct verification sampling within 5 days of becoming aware of an AL exceedance. The permittee may use the results of another sample taken between the date of the last sampling event and the date of receiving the result as verification.
2. If verification sampling confirms the AL exceedance or if the permittee opts not to perform verification sampling, then the permittee shall increase the frequency of monitoring to monthly. In addition, the permittee shall immediately initiate an investigation of the cause of the AL exceedance, including inspection of all discharging units and all related pollution control devices, review of any operational and maintenance practices that might have resulted in an unexpected discharge, and hydrologic review of groundwater conditions including upgradient water quality.

3. The permittee shall initiate actions identified in the approved contingency plan referenced in Section 5.0 and specific contingency measures identified in Section 2.6 to resolve any problems identified by the investigation which may have led to an AL exceedance. To implement any other corrective action the permittee shall obtain prior approval from ADEQ according to Section 2.6.6. Alternatively, the permittee may submit a technical demonstration, subject to written approval by the Groundwater Protection Value Stream, that although an AL is exceeded, pollutants are not reasonably expected to cause a violation of an AQL. The demonstration may propose a revised AL or monitoring frequency for approval in writing by the Groundwater Protection Value Stream.
4. Within 30 days after confirmation of an AL exceedance, the permittee shall submit the laboratory results to Groundwater Protection Value Stream along with a summary of the findings of the investigation, the cause of the AL exceedance, and actions taken to resolve the problem.
5. Upon review of the submitted report, the Department may amend the permit to require additional monitoring, increased frequency of monitoring, or other actions.
6. The increased monitoring required as a result of an AL exceedance may be reduced to the regularly scheduled frequency, if the results of three sequential sampling events demonstrate that no parameters exceed the AL.
7. If the increased monitoring required as a result of an AL exceedance continues for more than six sequential sampling events, the permittee shall submit a second report documenting an investigation of the continued AL exceedance within 30 days of the receipt of laboratory results of the sixth sampling event.

**2.6.2.3.3 Alert Levels to Protect Downgradient Users from Pollutants without Numeric Aquifer Water Quality Standards**

Not applicable.

**2.6.2.3.4 Alert Level for Groundwater Level**

1. If monitoring indicates that the groundwater level is not within the allowable range established in Section 4.2 Table 2C, the permittee shall submit a written report to the ADEQ Groundwater Protection Value Stream within 30 days after becoming aware of the exceedance. The report shall document the following:
   a. The as-built configuration of the well including the screened interval;
   b. all groundwater level measurements available for the well;
   c. a discussion and analysis of any trends or seasonal variations in the groundwater level measurements;
   d. information on groundwater recharge, withdrawal, or other hydrologic conditions in the vicinity of the well;
   e. any other pertinent information obtained by the permittee, and;
   f. an evaluation of the cause(s) of the exceedance and recommendations on whether or not further contingency actions are necessary.

2. Upon review of the submitted report, the Department may amend the permit to require replacement of the well, require additional permit conditions, or other actions.

### 2.6.3 Discharge Limitations Violations

#### 2.6.3.1 Liner Failure, Containment Structure Failure, or Unexpected Loss of Fluid

Not applicable

#### 2.6.3.2 Overtopping of a Surface Impoundment

Not applicable.

#### 2.6.3.3 Inflows of Unexpected Materials to a Surface Impoundment

Not applicable.

#### 2.6.3.4 Loss of Tailings Material from the Tailings Facilities

If there is an unexpected loss of tailings materials owing to a stability failure of a tailings facility, the permittee shall take the following actions:

1. Within 24 hours of discovery, notify the ADEQ Groundwater Protection Value Stream.
2. Within 5 days of discovery of a failure that resulted in a significant release to the surface, implement temporary measures to contain released material and collect representative samples of the tailings material and associated runoff if present. Solid samples shall be analyzed for the total metals in the solids according to the metal parameters specified in Section 4.2, Table 2B. Within 30 days of the incident, submit a copy of the analytical results to ADEQ Groundwater Protection Value Stream.
3. Within 15 days of discovery, initiate an evaluation to determine the cause for the incident. Identify the circumstances that resulted in the failure and assess the condition of the tailings facility. Implement corrective actions as necessary to resolve the problems identified in the evaluation. Initiate repairs to any failed system, structure, or other component as needed to restore proper functioning of the tailings facilities. Repair procedures, methods, and materials used to restore the system(s) to proper closure condition shall be described in the facility log/recordkeeping file and made available for ADEQ review.
4. Within 30 days of discovery of the incident, submit a report to ADEQ as specified in Section 2.7.3 (Permit Violation and Alert Level Status Reporting). Include a description of the actions performed in subsections 1 through 3 listed above. Upon review of the report, ADEQ may request additional monitoring or remedial actions.
5. Within 60 days of discovery, conduct an assessment of the impacts to the subsoil and/or groundwater resulting from the incident, including geophysical assessment of release to the sub-surface. If soil or groundwater is impacted such that there is a reasonable probability that pollutants will reach an aquifer, submit to ADEQ a corrective action plan for approval. The plan shall address problems identified in the assessment, including identification of releases to the environment, remedial actions and/or monitoring, and a schedule for completion of activities. At the direction of ADEQ, the permittee shall implement the approved plan.
6. Within 30 days of completion of corrective actions, submit to ADEQ a written report as specified in Section 2.6.6 (Corrective Actions).

### 2.6.4 Aquifer Quality Limit Violation

1. If an AQL set in Section 4.2 Table 2B has been exceeded, the permittee may conduct verification sampling within 5 days of becoming aware of an AQL exceedance. The permittee may use the results of another sample taken between the date of the last sampling event and the date of receiving the result as verification.
2. If verification sampling confirms that the AQL is violated for any parameter or if the permittee opts not to perform verification sampling, then the permittee shall increase the frequency of monitoring to monthly. In addition, the permittee shall immediately initiate an evaluation for the cause of the violation, including inspection of all discharging units and all related pollution

control devices, and review of any operational and maintenance practices that might have resulted in unexpected discharge.

The permittee also shall submit a report according to Section 2.7.3, which includes a summary of the findings of the investigation, the cause of the violation, and actions taken to resolve the problem. A verified exceedance of an AQL will be considered a violation unless the permittee demonstrates within 90 days or a longer time period if agreed to by ADEQ that the exceedance was not caused or contributed to by pollutants discharged from the facility. Unless the permittee has demonstrated that the exceedance was not caused or contributed to by pollutants discharged from the facility, the permittee shall consider and ADEQ may require corrective action that may include control of the source of discharge, cleanup of affected soil, surface water or groundwater, and mitigation of the impact of pollutants on existing uses of the aquifer. Corrective actions shall either be specifically identified in this permit, included in an ADEQ approved contingency plan, or separately approved according to Section 2.6.6.

3. Upon review of the submitted report, the Department may amend the permit to require additional monitoring, increased frequency of monitoring, or other actions.
4. The permittee shall notify any downstream or downgradient users who may be directly affected by the discharge.
5. The permittee shall continue monitoring at the increased frequency until the contaminant(s) is below the AQL and AL for three consecutive months.

**2.6.5 Emergency Response and Contingency Requirements for Unauthorized Discharges pursuant to A.R.S. §49-201(12) and pursuant to A.R.S. § 49-241 That Are Not Addressed Elsewhere in Section 2.6**

**2.6.5.1 Duty to Respond**

The permittee shall act immediately to correct any condition resulting from a discharge pursuant to A.R.S. § 49-201(12) if that condition could pose an imminent and substantial endangerment to public health or the environment.

**2.6.5.2 Discharge of Hazardous Substances or Toxic Pollutants**

In the event of any unauthorized discharge pursuant to A.R.S. § 49-201(12) of suspected hazardous substances (A.R.S. § 49-201(19)) or toxic pollutants (A.R.S. § 49-243(I)) on the facility site, the permittee shall promptly isolate the area and attempt to identify the discharged material. The permittee shall record information, including name, nature of exposure and follow-up medical treatment, if necessary, on persons who may have been exposed during the incident. The permittee shall notify Groundwater Protection Value Stream within 24 hours upon discovering the discharge of hazardous material which (a) has the potential to cause an AWQS or AQL to be exceeded, or (b) could pose an endangerment to public health or the environment.

**2.6.5.3 Discharge of Non-hazardous Materials**

In the event of any unauthorized discharge pursuant to A.R.S. § 49-201(12) of non-hazardous materials from the facility, the permittee shall promptly attempt to cease the discharge and isolate the discharged material. Discharged material shall be removed and the site cleaned up as soon as possible. The permittee shall notify Groundwater Protection Value Stream within 24 hours upon discovering the discharge of non-hazardous material which (a) has the potential to cause an AQL to be exceeded, or (b) could pose an endangerment to public health or the environment.

**2.6.5.4 Reporting Requirements**

The permittee shall submit a written report for any unauthorized discharges reported under Sections 2.6.5.2 and 2.6.5.3 to Groundwater Protection Value Stream within 30 days of the discharge or as required by subsequent ADEQ action. The report shall summarize the event, including any human exposure, and facility response activities and include all information

specified in Section 2.7.3. If a notice is issued by ADEQ subsequent to the discharge notification, any additional information requested in the notice shall also be submitted within the time frame specified in that notice. Upon review of the submitted report, ADEQ may require additional monitoring or corrective actions.

### 2.6.6 Corrective Actions

Specific contingency measures identified in Section 2.6 have already been approved by ADEQ and do not require written approval to implement.

With the exception of emergency response actions taken under Section 2.6.5, the permittee shall obtain written approval from the Groundwater Protection Value Stream prior to implementing a corrective action to accomplish any of the following goals in response to exceeding an AL or violation of an AQL, DL, or other permit condition:

1. Control of the source of an unauthorized discharge;
2. Soil cleanup;
3. Cleanup of affected surface waters;
4. Cleanup of affected parts of the aquifer; and/or
5. Mitigation to limit the impact of pollutants on existing uses of the aquifer.

Within 30 days of completion of any corrective action, the operator shall submit to the Groundwater Protection Value Stream, a written report describing the causes, impacts, and actions taken to resolve the problem.

## 2.7 Reporting and Recordkeeping Requirements [A.R.S. § 49-243(K)(2) and A.A.C. R18-9-A206(B) and R18-9-A207]

### 2.7.1 Self-monitoring Report Form

1. When submitting hard copy, the permittee shall complete the SMRFs provided by ADEQ, and submit them to Groundwater Protection Value Stream. The permittee shall use the format devised by ADEQ.
2. The permittee shall complete the SMRF to the extent that the information reported may be entered on the form. If no information is required during a reporting period, the permittee shall enter "not required" on the SMRF, include an explanation, and submit the report to Groundwater Protection Value Stream.
3. The following tables contained in Section 4.0 list the parameters to be monitored and the frequency for reporting results on the SMRFs.
    - TABLE 2B: Annual Compliance Groundwater Monitoring for POC Wells
    - TABLE 2C: Alert Level Monitor Wells

    The parameters listed in the above identified tables from Section 4.0 are the only parameters for which SMRF reporting is required

    In addition to the SMRF, the information contained in A.A.C. R18-9-A206(B)(1) shall be included for exceeding an alert level (AL) or violation of an Aquifer Quality Limit (AQL), discharge limit (DL), or any other permit condition being reported in the current reporting period.

### 2.7.2 Operation Inspection / Log Book Recordkeeping

A signed copy of this permit shall be maintained at all times at the location where day-to-day decisions regarding the operation of the facility are made. A log book (paper copies, forms or electronic data) of the inspections and measurements required by this permit shall be maintained at the location where

day-to-day decisions are made regarding the operation of the facility. The log book shall be retained for ten years from the date of each inspection, and upon request, the permit and the log book shall be made immediately available for review by ADEQ personnel. The information in the log book shall include, but not be limited to, the following information as applicable:

1. Name of inspector;
2. Date and shift inspection was conducted;
3. Condition of applicable facility components;
4. Any damage or malfunction, and the date and time any repairs were performed;
5. Documentation of sampling date and time;
6. Any other information required by this permit to be entered in the log book; and
7. Monitoring records for each measurement shall comply with R18-9 A206(B)(2).

### 2.7.3 Permit Violation and Alert Level Status Reporting

1. The permittee shall notify Groundwater Protection in writing within 5 days (except as provided in Section 2.6.5) of becoming aware of a violation of any permit condition, discharge limitation or of an AL exceedance.
2. The permittee shall submit a written report to Groundwater Protection Value Stream within 30 days of becoming aware of the violation of any permit condition or discharge limitation. The report shall document all of the following:
   a. Identification and description of the permit condition for which there has been a violation and a description of its cause;
   b. The period of violation including exact date(s) and time(s), if known, and the anticipated time period during which the violation is expected to continue;
   c. Any corrective action taken or planned to mitigate the effects of the violation, or to eliminate or prevent a recurrence of the violation;
   d. Any monitoring activity or other information which indicates that any pollutants would be reasonably expected to cause a violation of an AWQS;
   e. Proposed changes to the monitoring which include changes in constituents or increased frequency of monitoring; and
   f. Description of any malfunction or failure of pollution control devices or other equipment or processes.

### 2.7.4 Methane Gas Exceedance Reporting

The following notifications are required if there is a methane gas exceedance:

1. Within twenty-four (24) hours or one (1) business day of any methane gas exceedance where the gas concentration in facility structures exceeds twenty-five percent (25%) of the lower explosive limit or gas concentrations at the property boundary exceed the lower explosive limit, the permittee shall notify the ADEQ Solid Waste Unit.
2. Within seven (7) days of detection, the permittee shall place in the operating record a description of the steps taken to protect human health. A copy of this description shall be sent to the ADEQ Solid Waste Unit.
3. Within sixty (60) days of detection of any methane gas exceedance, a remediation plan shall be implemented, and a copy of the plan placed in the operating record. A copy of the plan, accompanied by a notification that the plan has been implemented, shall be sent to the ADEQ Solid Waste Unit.

### 2.7.5 Operational, Other or Miscellaneous Reporting

The permittee shall record the information requested in Table 2A in the facility log book as per Section 2.7.2, and report to ADEQ any violations or exceedances as per Section 2.7.3.

#### 2.7.5.1 Annual Report

The permittee shall submit an annual groundwater monitoring summary report to the ADEQ Groundwater Protection Value Stream. This report shall be due as required by Section 2.7.7. The report shall include, but not be limited to the following:

1. A description of any deviations from standard sampling protocols during the reporting period.
2. A summary of all exceedances of ALs or AQLs that occurred during the reporting period.
3. Graphical time versus concentration plots of field pH, sulfate, total dissolved solids, and any parameter that exceeded an applicable AL or AQL.
4. An updated table of all monitor wells and piezometers in the Discharge Impact Area including, but not limited to, location of well, depth of well, and current depth to water.
5. A summary of any groundwater monitor wells replaced in the reporting period including, but not limited to, location of well, depth of well, depth to water, and screened interval.

### 2.7.6 Reporting Location

All SMRFs shall be submitted to:

Arizona Department of Environmental Quality
Groundwater Protection Value Stream
Mail Code: 5415B-3
1110 W. Washington Street
Phoenix, AZ 85007
Phone (602) 771-4681

Or

Through the myDEQ portal accessible on the ADEQ website at:
http://www.azdeq.gov/welcome-mydeq

All documents required by this permit to be submitted to the Groundwater Protection Value Stream shall be directed to:

Arizona Department of Environmental Quality
Groundwater Protection Value Stream
Mail Code: 5415B-3
1110 W. Washington Street
Phoenix, AZ 85007
Phone (602) 771-4999

All documents required by this permit to be submitted to the Solid Waste Unit shall be directed to:

Arizona Department of Environmental Quality
Waste Programs Division
Solid/Hazardous Waste Section
1110 W. Washington Street
Phoenix, AZ 85007

### 2.7.7 Reporting Deadline

The following table lists the due date for TABLE 2B: Annual Compliance Groundwater Monitoring (i.e. SMRF) for POC wells and TABLE 2C: Alert Level Monitor Wells:

| Monitoring conducted: | Report due by: |
|---|---|
| Annual: January-December | January 30 of the following year |

The following table lists the due date for the annual groundwater monitoring summary report per Section 2.7.5.1:

| Monitoring conducted during the year: | Annual Report due by: |
|---|---|
| January 1–December 31 | April 30th of the following year |

**2.7.8 Changes to Facility Information in Section 1.0**

Groundwater Protection Value Stream shall be notified within 15 days of any change of facility information including Facility Name, Permittee Name, Mailing or Street Address, Facility Contact Person or Emergency Telephone Number.

**2.8 Temporary Cessation [A.R.S. § 49-243(K)(8) and A.A.C. R18-9-A209(A)]**

The permittee shall give written notice to Groundwater Protection Value Stream before ceasing operation of the facility for a period of 60 days or greater. The permittee shall take the following measures upon temporary cessation:

1. Submittal of Self-Monitoring Report Forms (SMRFs) is still required; report "temporary cessation" in the comment section.

At the time of notification, the permittee shall submit for ADEQ approval a plan for maintenance of discharge control systems and for monitoring during the period of temporary cessation. Immediately following ADEQ's approval, the permittee shall implement the approved plan. If necessary, ADEQ shall amend permit conditions to incorporate conditions to address temporary cessation. During the period of temporary cessation, the permittee shall provide written notice to Groundwater Protection Value Stream of the operational status of the facility every three years. If the permittee intends to permanently cease operation of any facility, the permittee shall submit closure notification, as set forth in Section 2.9 below.

**2.9 Closure [A.R.S. §§ 49-243(K)(6), 49-252 and A.A.C. R18-9-A209(B)]**

For a facility addressed under this permit, the permittee shall give written notice of closure to the Groundwater Protection Value Stream of the permittee's intent to cease operation without resuming activity for which the facility was designed or operated. Submittal of SMRFs is still required; report "closure in process" in the comment section.

**2.9.1 Closure Plan**

Following notification of closure, BHP Copper submitted for approval to ADEQ Groundwater Protection Value Stream, a detailed Closure Plan (BHP Copper San Manuel Plant Site - Closure Plan dated December 20, 2004) to meet the requirements of A.R.S. § 49-252 and A.A.C. R18-9-A209(B)(3). The Closure Plan discussed the site cleanup activities, facility demolition, materials remaining on site after closure, and the removal and disposal of hazardous waste materials. The Closure Plan Demonstration did not achieve clean closure, as post-closure monitoring is required and further action is necessary to keep the tailings facilities in compliance with AWQS at the applicable POC.

BHP Copper submitted a design plan and post-closure care plan for the Solid Waste Landfill for review and approval on April 12, 2018. Per Section 3.0, No. 2, the permittee shall submit final Closure Plan for the Solid Waste Landfill and conduct closure activities following ADEQ approval of the closure plan.

### 2.9.2 Closure Completion

The Plant Site Facility Closeout Report (April 30, 2008) provided a final report on the materials remaining at the Plant Site, the types of non-hazardous and hazardous materials removed, and the fate of those materials. Other previously submitted reports include a Soil Remediation Summary Report (May 30, 2008), a Plant Site Sampling, Analysis, and Monitoring Plan (September 18, 2015), and a Post-Closure Contingency Plan dated June 15, 2018. As-built reports documenting regrading earthwork, soil cover, channel construction, quality control, and inspection records were submitted to ADEQ following the completion of closure of the Tailings Area and Plant Area facilities (April 30, 2008, and April 9, 2007, respectively).

Per Section 3.0, No. 4, the permittee shall submit a closure certification to document the completion of closure of the Solid Waste Landfill.

## 2.10 Post-closure [A.R.S. §§ 49-243(K)(6), 49-252 and A.A.C. R18-9-A209(C)]

Post-closure requirements shall be established based on a review of facility closure actions and will be subject to review and approval by the Groundwater Protection Value Stream.

### 2.10.1 Post-closure Plan

A Post-closure Plan was provided to ADEQ for review and approval (Plant Site Sampling and Analysis, and Monitoring Plan, submitted on September 18, 2015 and Post Closure Contingency Plan, submitted June 18, 2018). The plan eliminates, to the greatest extent practicable, any further discharge from the facility and ensures that the aquifer meets AWQS at the applicable points of compliance. The plan described the following:

1. Duration of post-closure care;
2. Monitoring procedures to be implemented by the permittee, including monitoring frequency, type, and location;
3. Description of the operating and maintenance procedures to be implemented for aquifer quality protection devices, such as liners, treatment systems, pump-back systems, and monitoring wells;
4. Schedule and description of physical inspections to be conducted at the facility following closure;
5. Estimate of the cost of post-closure maintenance and monitoring; and
6. Description of limitations on future land or water uses, or both, at the facility site as a result of facility operations.

Per Section 3.0, No. 2, the permittee shall submit a Post-closure Plan for the Solid Waste Landfill that addresses post-closure maintenance and monitoring actions at the facility. The Post-closure Plan shall meet all requirements of A.R.S. §§ 49-201(30) and 49-252 and A.A.C. R18-9-A209(C). Upon approval of the Post-closure Plan, this permit shall be amended to incorporate all post-closure controls and monitoring activities of the Post-closure Plan.

### 2.10.2 Post-closure Completion

Reserved

## 3.0 COMPLIANCE SCHEDULE [A.R.S. § 49-243(K)(5) and A.A.C. R18-9-A208]

For each compliance schedule item listed below, the permittee shall submit the required information, including a cover letter that lists the compliance schedule items, to the Groundwater Protection Value Stream.

| No. | Description | Due by: | Permit Amendment Required? |
|---|---|---|---|
| 1 | **Solid Waste Landfill Closure Notification**: Permittee shall notify the Groundwater Protection Value Stream of the permittee's intent to close the Solid Waste Landfill. | Upon decision to close the facility | No |
| 2 | **Solid Waste Landfill Closure Plan and Post-Closure Plan**<br>The Landfill Closure Plan shall include the following elements:<br>• Final cover over the entire waste boundary (waste footprint);<br>• Final cover shall consist of the following design elements (from top to bottom):<br>o 12-inch-thick vegetative soil cover 1 x $10^{-3}$ cm/sec. (erosion control layer);<br>o 18-inch-thick infiltration barrier layer (maximum permeability of 1 x $10^{-5}$ cm/sec);<br>o Average of 12-inch-thick foundation layer (maximum permeability of 1 x $10^{-3}$ cm/sec), if no intermediate cover presented;<br>o If intermediate cover is presented layer that required to provide firm and stable foundation layer over existing daily cover;<br>o Any alternative cover system, other than the above, must be authorized by the Groundwater Protection Value Stream prior to use.<br>• Run-on control system designed to prevent the flow of surface water onto the closed landfill facility during the period of greatest precipitation in a 25-year storm;<br>• Runoff control system designed to control and mitigates cover erosion, reduce surface discharge of wastes in solution or suspension, and minimize run-on available to percolate down through waste that creates leachate.<br>• The methods to be used to secure the facility;<br>• An estimate of the cost of closure;<br>• A schedule for implementation of the closure plan;<br>• The construction quality assurance/construction quality control plan;<br>**The Landfill Post-closure plan shall include the following elements**:<br>• Duration of post-closure period;<br>• The monitoring procedure to be implemented by the permittee, including monitoring frequency, type, and location(s);<br>• A description of operating and maintenance procedures to be implemented for maintaining aquifer quality protection devices, such as final cover, monitoring wells, etc.;<br>• A schedule and description of physical inspections to be conducted at the facility following closure;<br>• An estimate of the cost of post-closure maintenance and monitoring;<br>• A description of monitoring, maintenance procedures to be implemented for maintaining security fencing, storm water management structures. | Within 90 days following the notification of the intent to close the facility. | Yes |
| 3 | **Solid Waste Landfill Closure Implementation** - completion of final cover and run-on and run-off control systems. | Within 180 days of ADEQ approval of Closure Plan | No |

| No. | Description | Due by: | Permit Amendment Required? |
|---|---|---|---|
| 4 | **Solid Waste Landfill Closure Documentation -** Following the closure construction, the permittee shall notify the Groundwater Protection Value Stream through a certification document, signed and sealed by a registered professional engineer, that the closure has been completed in accordance with the approved closure plan. | Within 90 days of completion of closure | Yes |
| 5 | The permittee shall submit design drawings for the solar panel foundations. An appropriate setback for construction of the solar panel foundations from the dam crest shall be established based on a calculated factor of safety which meets guidance provided in the Arizona Mining BADCT Manual, Appendix E. | At least 60 days prior to construction | No |
| 6 | The permittee shall submit as-built documentation for solar panel foundations. | Within 90 days of completion of construction | No |
| 7 | The permittee shall submit a demonstration that the financial assurance mechanism listed in Section 2.1, Financial Capability, is being maintained as per A.R.S. 49-243.N.4 and A.A.C. R18-9-A203(H) for all estimated closure and post-closure costs including updated costs submitted under Section 3.0, No.9 below. The demonstration shall include a statement that the closure and post-closure strategy has not changed, the discharging facilities listed in the permit have not been altered in a manner that would affect the closure and post-closure costs, and discharging facilities have not been added. The demonstration shall also include information in support of a letter of credit as required in A.A.C. R18-9-A203(C)(5). | June 30, 2024, and every 6 years thereafter for the duration of the permit | No |
| 8 | The permittee shall submit updated cost estimates for facility closure and post-closure, as per A.A.C. R18-9-A201(B)(5) and A.R.S. 49-243.N.2.a. | June 30, 2024, and every 6 years thereafter for the duration of the permit | Yes |
| 9 | The permittee shall submit an Annual Report, as required by Section 2.7.5.1. | Annually as required by Section 2.7.7 | No |

## 4.0 TABLES

### 4.1 DISCHARGING FACILITIES AND BADCT TABLE

TABLE 1A Discharging Facilities and BADCT

### 4.2 REQUIRED MONITORING

TABLE 2A Inspections and Operational Monitoring
TABLE 2B Annual Compliance Groundwater Monitoring for POC Wells
TABLE 2C Alert Level Monitor Wells

**4.1 Table 1A Discharging Facilities and BADCT**

**Facility Name and Number,**
Tailings Impoundment #1/2 (D-79)
Tailings Impoundment #3/4 (D-80)
Tailings impoundment #5 (D-81
Tailings Impoundment #6 (D-82)
Tailings Impoundment #10 (D-83)

**Individual BADCT**

- Permittee constructed diversion structures to intercept surface water run-on upgradient of the tailings facilities, as well as the unimpacted storm water runoff from the covered tailings impoundment beaches. The diversion channels include existing structures, upgraded existing structures, and new diversion facilities to route storm water around the tailings facilities.
- Diversion structures were designed for peak flow from a 100-year, 24-hour storm event. Design of emergency spillways was based on 6-hour and 72-hour Probable Maximum Precipitation (PMP) events to prevent overtopping of the tailings embankments in extreme events.
- Design did not include impounding of storm water run-on as a control technology; however, the 6-hour and 72-hour PMP events were used to develop the emergency spillway design to ensure against overtopping of the embankment (Tailings Closure Design Report, Sections 4.2.7 and 5.2.3).
- Permittee recontoured the upper surface of the tailings basins and face of the embankments, including drainage channels and spillways to reduce ponding of direct precipitation.
- A minimum 12-inch soil cover was placed over the tailings basin and vegetated to minimize infiltration from precipitation, to eliminate precipitation contact with tailings material and to prevent erosion.
- A minimum 24-inch cover of coarse alluvium was placed over the upper third of the tailings embankments and vegetated to eliminate precipitation contact with tailings material and to prevent erosion.
- An engineered cover consisting of a minimum of 12 inches of fine alluvium and a minimum of 12 inches of rock armor was placed on the bottom two-thirds of embankment slope surfaces to prevent erosion.
- Permittee placed inert rock armor on embankment slopes as a long-term Best Management Practice (BMP).
- The current Storm Water Pollution Prevention Plan (SWPPP) (revised June 2015).
- Pemittee revegetated all soil-covered slopes on tailings to provide transpiration and erosion control.
- The calculated Factor of Safety (FOS) for drained loading conditions ranged from 1.94 - 2.38
- The calculated pseudostatic FOS analysis ranged from 1.37 - 1.70
- A qualitative assessment of the potential effects of solar panel assembly construction on the stability of #1/2 Dam, #3/4 Dam, #5 Dam and #10 Dam, concluded that the construction will not have a substantial influence on dam stability. The final design of the solar panel foundations and an appropriate setback for construction of the foundations from the dam crest shall be submitted per Section 3, No.5.

| **Facility Name, Number,** | **Latitude, Longitude** |
|---|---|
| Collection Pond #1 (C-104) | 32°38'12"N, 110°35'50" W |

**Individual BADCT**

Results from sampling for characterization of the dried material in the bottom of the facility for potential pollutants indicated levels to be below both the Groundwater Protection Levels (GPL) and Soil Remediation Levels (SRL). Closure BADCT for the facility shall be demonstrated by cementing the decant pipes and by covering the facility by pushing berm material into the collection pond and shall have additional cover according to the tailings slope BADCT design, including placement of surface armoring, to minimize infiltration of storm water. Cover design shall slope away from the toe of the tailings.

| **4.1 Table 1A Discharging Facilities and BADCT (continued)** | |
|---|---|
| **Facility Name, Number,** | **Latitude, Longitude** |
| Collection Pond #6 (C-105) | 32°36'40"N 110°33'05" W |
| **Individual BADCT** | |
| Results from sampling for characterization of the dried material in the bottom of the facility for potential pollutants indicated levels to be below both the Groundwater Protection Levels (GPL) and Soil Remediation Levels (SRL). Closure BADCT for the facility shall be demonstrated by cementing the decant pipe and by covering the facility by pushing berm material into the collection pond and shall have additional cover according to the tailings slope BADCT design, including placement of surface armoring, to minimize infiltration of storm water. Cover design shall slope away from the toe of the tailings. | |
| **Facility Name, Number,** | **Latitude, Longitude** |
| Collection Pond #10 (C-106) | 32°38'50"N, 110°36'07" W |
| **Individual BADCT** | |
| Results from sampling for characterization of the dried material in the bottom of the facility for potential pollutants indicated levels to be below both the Groundwater Protection Levels (GPL) and Soil Remediation Levels (SRL). Closure BADCT for facility 8 shall be demonstrated by cementing the decant pipe and by covering the facility by pushing berm material into the collection pond and shall have additional cover according to the tailings slope BADCT design, including placement of surface armoring, to minimize infiltration of storm water. Cover design shall slope away from the toe of the tailings. | |
| **Facility Name, Number,** | **Latitude, Longitude** |
| Solid Waste Landfill (E-48) | 32°36'25"N 110°36'25" W |
| **Individual BADCT** | |
| Waste material in this facility consists chiefly of rubber, glass, paper, wood and metal scrap from the Plant Site. The solid waste is periodically (weekly during operations) covered by indigenous soils utilizing bulldozers. Volumes of waste received at the landfill during operations ranged from 300 to 600 tons per three month period.<br><br>Final cover design will be presented to and approved by ADEQ at the time of landfill closure. | |
| **Facility Name, Number,** | **Latitude, Longitude** |
| Wood Landfill (E-50) | 32°36'44"N 110°36'04" W |
| **Individual BADCT** | |
| Waste material in this facility consists of inert wood and minor, associated concrete from the Plant Site. The volume of waste received during operation of the facility averaged 3 to 6 tons per week. The facility was regraded at a maximum 3H:1V slope, covered by a minimum of 30 inches of indigenous soils that retard infiltration, and revegetated. A diversion ditch collects stormwater run-off and diverts it away from the facility. | |

| 4.2 Table 2A Inspections and Operational Monitoring[1] | | |
|---|---|---|
| **FACILITY** | **INSPECTIONS** | **PERFORMANCE LEVEL** |
| Tailings Impoundment #1/2 (D-79) | Inspect storm water drainage network, slope stability and soil cover quarterly and after a significant storm event. | Per the requirements of *Tailings Closure Design Report;* Maintain the drainage network free of obstructions. Remove sediment in the diversion channels periodically to maintain optimal performance. Maintain diversion berm soil cover slopes 3:1 or less. Maintain 12 inches of soil cover on all beach surfaces. Erosion gullies encountered in tailings shall be filled with fill material with a similar density to that of adjacent tailings. |
| Tailings Impoundment #3/4 (D-80) | | |
| Tailings Impoundment #5 (D-81) | | |
| Tailings Impoundment #6 (D-82) | | |
| Tailings Impoundment #10 (D-83) | | |
| Engineered Soil Cover in Plant Area | Inspect soil cover and maintain erosion control structures quarterly and after significant storm event. | Maintain drainage network free of obstructions. Maintain soil cover slopes of at least 1% (maximum of 33% slopes, or 3:1) to allow positive drainage off the regraded and covered areas. Vegetation that is required to limit erosion shall be inspected and amended, as necessary, to prevent erosion. |
| Solid Waste Landfill (E-48) | Inspect stormwater drainage network, slope stability, and soil cover quarterly and after a significant storm event. Monitor for methane as required by Section 2.5.4 | Maintain drainage network free of obstructions. Until the landfill is closed and a final cover has been constructed, maintain intermediate soil cover on top of waste, performing repairs, when necessary, to maintain proper control of stormwater resulting from a 25-year, 24-hr storm event. |
| Wood Landfill (E-50) | Inspect stormwater drainage network, slope stability, and soil cover quarterly and after a significant storm event. | Maintain drainage network free of obstructions. Maintain soil cover of at least 30 inches and perform repairs, when necessary, to maintain proper control of stormwater resulting from a 25-year, 24-hr storm event. Vegetation that is required to limit erosion shall be inspected and amended, as necessary, to prevent erosion. |

[1] The permittee shall record the inspection performance levels in a log book as per Section 2.7.2, and report any violations or exceedances as per Section 2.7.3. In the case of an exceedance, identify which structure exceeds the performance level in the log book.

| 4.2 Table 2B Annual Compliance Groundwater Monitoring Requirements for POC Wells | | | | | | |
|---|---|---|---|---|---|---|
| Parameter[2,3,4] | SMW-17 | | SMW-18 | | SMW-19 | |
| | AQL[5] | AL[6] | AQL | AL | AQL | AL |
| Depth to Water (in feet) | Monitor7 | Monitor | Monitor | Monitor | Monitor | Monitor |
| Water Level Elevation (amsl) | Monitor | Monitor | Monitor | Monitor | Monitor | Monitor |
| Temperature (°F) | Monitor | Monitor | Monitor | Monitor | Monitor | Monitor |
| Specific Conductance (µmhos/cm) | Monitor | Monitor | Monitor | Monitor | Monitor | Monitor |
| pH (S.U.) – field | Monitor | Monitor | Monitor | Monitor | Monitor | Monitor |
| Total Dissolved Solids | Monitor | Monitor | Monitor | Monitor | Monitor | Monitor |
| Sulfate | Monitor | Monitor | Monitor | Monitor | Monitor | Monitor |
| Total Alkalinity | Monitor | Monitor | Monitor | Monitor | Monitor | Monitor |
| Chloride | Monitor | Monitor | Monitor | Monitor | Monitor | Monitor |
| Fluoride | 4 | 3.2 | 4 | 3.2 | 4 | 3.2 |
| Nitrate+Nitrite as N | 10 | 8 | 10 | 8 | 10 | 8 |
| Calcium | Monitor | Monitor | Monitor | Monitor | Monitor | Monitor |
| Magnesium | Monitor | Monitor | Monitor | Monitor | Monitor | Monitor |
| Potassium | Monitor | Monitor | Monitor | Monitor | Monitor | Monitor |
| Sodium | Monitor | Monitor | Monitor | Monitor | Monitor | Monitor |
| Iron | Monitor | Monitor | Monitor | Monitor | Monitor | Monitor |
| Aluminum | Monitor | Monitor | Monitor | Monitor | Monitor | Monitor |
| Antimony | 0.006 | 0.0048 | 0.006 | 0.0048 | 0.006 | 0.0048 |
| Arsenic | 0.05 | 0.04 | 0.05 | 0.04 | 0.05 | 0.04 |
| Barium | 2 | 1.6 | 2 | 1.6 | 2 | 1.6 |
| Beryllium | 0.004 | 0.0032 | 0.004 | 0.0032 | 0.004 | 0.0032 |
| Cadmium | 0.005 | 0.004 | 0.005 | 0.004 | 0.005 | 0.004 |
| Chromium | 0.1 | 0.08 | 0.1 | 0.08 | 0.1 | 0.08 |
| Cobalt | Monitor | Monitor | Monitor | Monitor | Monitor | Monitor |
| Copper | Monitor | Monitor | Monitor | Monitor | Monitor | Monitor |
| Lead | 0.05 | 0.04 | 0.05 | 0.04 | 0.05 | 0.04 |
| Manganese | Monitor | Monitor | Monitor | Monitor | Monitor | Monitor |
| Mercury | 0.002 | 0.0016 | 0.002 | 0.0016 | 0.002 | 0.0016 |
| Nickel | 0.1 | 0.08 | 0.1 | 0.08 | 0.1 | 0.08 |
| Selenium | 0.05 | 0.04 | 0.05 | 0.04 | 0.05 | 0.04 |
| Thallium | 0.002 | 0.0016 | 0.002 | 0.0016 | 0.002 | 0.0016 |
| Zinc | Monitor | Monitor | Monitor | Monitor | Monitor | Monitor |
| Total Petroleum Hydrocarbons | Monitor | Monitor | Monitor | Monitor | Monitor | Monitor |
| Adjusted Gross Alpha Activity (pCi/L) | 15 | 12 | 15 | 12 | 15 | 12 |
| Radium 226+Radium 228 (pCi/L) | 5 | 4 | 5 | 4 | 5 | 4 |
| Uranium (mg/L) | Monitor | Monitor | Monitor | Monitor | Monitor | Monitor |

[2] Metals shall be analyzed as dissolved metals
[3] All concentrations are in milligrams per liter (mg/L) unless otherwise specified.
[4] Carbon disulfide and free cyanide were eliminated from annual compliance monitoring requirements, based on results of ambient groundwater sampling. Future replacement wells, where appropriate, will be analyzed for these parameters.
[5] AQL = Aquifer Quality Limit
[6] AL = Alert Level
[7] Monitor = Monitoring required, but no AQL or AL established in the permit

| **4.2 Table 2B Annual Compliance Groundwater Monitoring Requirements for POC Wells (continued)** | | | | |
|---|---|---|---|---|
| **Parameter** | **SMW-20** | | **SMW-22** | |
| | **AQL** | **AL** | **AQL** | **AL** |
| Depth to Water (in feet) | Monitor | Monitor | Monitor | Monitor |
| Water Level Elevation (amsl) | Monitor | Monitor | Monitor | Monitor |
| Temperature (°F) | Monitor | Monitor | Monitor | Monitor |
| Specific Conductance (µmhos/cm) | Monitor | Monitor | Monitor | Monitor |
| pH (S.U.) – field | Monitor | Monitor | Monitor | Monitor |
| Total Dissolved Solids | Monitor | Monitor | Monitor | Monitor |
| Sulfate | Monitor | Monitor | Monitor | Monitor |
| Total Alkalinity | Monitor | Monitor | Monitor | Monitor |
| Chloride | Monitor | Monitor | Monitor | Monitor |
| Fluoride | 7.7 | None | 4 | 3.2 |
| Nitrate+Nitrite | 10 | 8 | 10 | 8 |
| Calcium | Monitor | Monitor | Monitor | Monitor |
| Magnesium | Monitor | Monitor | Monitor | Monitor |
| Potassium | Monitor | Monitor | Monitor | Monitor |
| Sodium | Monitor | Monitor | Monitor | Monitor |
| Iron | Monitor | Monitor | Monitor | Monitor |
| Aluminum | Monitor | Monitor | Monitor | Monitor |
| Antimony | 0.006 | 0.0048 | 0.006 | 0.0048 |
| Arsenic | 0.066 | Not Established[8] | 0.05 | 0.04 |
| Barium | 2 | 1.6 | 2 | 1.6 |
| Beryllium | 0.004 | 0.0032 | 0.004 | 0.0032 |
| Cadmium | 0.005 | 0.004 | 0.005 | 0.004 |
| Chromium | 0.1 | 0.08 | 0.1 | 0.08 |
| Cobalt | Monitor | Monitor | Monitor | Monitor |
| Copper | Monitor | Monitor | Monitor | Monitor |
| Lead | 0.05 | 0.04 | 0.05 | 0.04 |
| Manganese | Monitor | Monitor | Monitor | Monitor |
| Mercury | 0.002 | 0.0016 | 0.002 | 0.0016 |
| Nickel | 0.1 | 0.08 | 0.1 | 0.08 |
| Selenium | 0.05 | 0.04 | 0.05 | 0.046 |
| Thallium | 0.002 | 0.0016 | 0.002 | 0.0016 |
| Zinc | Monitor | Monitor | Monitor | Monitor |
| Total Petroleum Hydrocarbons | Monitor | Monitor | Monitor | Monitor |
| Adjusted Gross Alpha Activity (pCi/L)[9] | 15 | 12 | 15 | 12 |
| Radium 226+Radium 228 (pCi/L) | 5 | 4 | 5 | 4 |
| Uranium (mg/L) | Monitor | Monitor | Monitor | Monitor |

[8] Not Established means monitoring is required but no limits have been specified.
[9] If the gross alpha particle activity is greater than 15 pCi/L, then test for adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity including radium 226, minus radon and total uranium (the sum of the uranium 238, uranium 235 and uranium 234 isotopes) reported in pCi/L.

| **4.2 Table 2C Alert Level Monitor Wells** | | | | | |
|---|---|---|---|---|---|
| **Sampling Point Identification** | | | | **Latitude** | **Longitude** |
| DH17-T6-B | | | | 32° 36' 58.79" | 110° 33' 26.1" |
| **Parameter** | **AL**[10] | **AQL**[11] | **Units** | **Sampling Frequency** | **Reporting Frequency** |
| Depth to Groundwater | Present/Absent[12] | Monitor | Ft. Bgs.[13] | Annually | Annually |

[10] AL = Alert Level
[11] AQL = Aquifer Quality Limit
[12] If no water is detected in the well, the permittee shall record "0" on the Self-Monitoring Report Form (SMRF). If water is detected in the well, the permittee shall record the depth to water on the SMRF and follow the contingency actions per Section 2.6.2.3.4
[13] Ft. Bgs. = Feet Below Ground Surface

## 5.0 REFERENCES AND PERTINENT INFORMATION

The terms and conditions set forth in this permit have been developed based upon the information contained in the following, which are on file with the Department:

1. APP Other Amendment Application received November 27, 2017, and subsequent submittals
2. Revised Work Plan for Landfill Gas Monitoring Locations at the Solid Waste Landfill, BHP San Manuel Plant Site, APP 102370, dated January 31, 2018

## 6.0 NOTIFICATION PROVISIONS

### 6.1 Annual Registration Fees

The permittee is notified of the obligation to pay an Annual Registration Fee to ADEQ. The Annual Registration Fee is based upon the amount of daily influent or discharge of pollutants in gallons per day as established by A.R.S. § 49-242.

### 6.2 Duty to Comply [A.R.S. §§ 49-221 through 49-263]

The permittee is notified of the obligation to comply with all conditions of this permit and all applicable provisions of Title 49, Chapter 2, Articles 1, 2 and 3 of the Arizona Revised Statutes, Title 18, Chapter 9, Articles 1 through 4, and Title 18, Chapter 11, Article 4 of the Arizona Administrative Code. Any permit non-compliance constitutes a violation and is grounds for an enforcement action pursuant to Title 49, Chapter 2, Article 4 or permit amendment, suspension, or revocation.

### 6.3 Duty to Provide Information [A.R.S. §§ 49-243(K)(2) and 49-243(K)(8)]

The permittee shall furnish to the Director, or an authorized representative, within a time specified, any information which the Director may request to determine whether cause exists for amending or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

### 6.4 Compliance with Aquifer Water Quality Standards [A.R.S. §§ 49-243(B)(2) and 49-243(B)(3)]

The permittee shall not cause or contribute to a violation of an aquifer water quality standard at the applicable point of compliance for the facility. Where, at the time of issuance of the permit, an aquifer already exceeds an aquifer water quality standard for a pollutant, the permittee shall not discharge that pollutant so as to further degrade, at the applicable point of compliance for the facility, the water quality of any aquifer for that pollutant.

### 6.5 Technical and Financial Capability

**[A.R.S. §§ 49-243(K)(8) and 49-243(N) and A.A.C. R18-9-A202(B) and R18-9-A203(E) and (F)]**

The permittee shall have and maintain the technical and financial capability necessary to fully carry out the terms and conditions of this permit. Any bond, insurance policy, trust fund, or other financial assurance mechanism provided as a demonstration of financial capability in the permit application, pursuant to A.A.C. R18-9-A203(D), shall be in effect prior to any discharge authorized by this permit and shall remain in effect for the duration of the permit.

### 6.6 Reporting of Bankruptcy or Environmental Enforcement [A.A.C. R18-9-A207(C)]

The permittee shall notify the Director within five days after the occurrence of any one of the following:

1. The filing of bankruptcy by the permittee.
2. The entry of any order or judgment not issued by the Director against the permittee for the enforcement of any environmental protection statute or rule.

### 6.7 Monitoring and Records [A.R.S. § 49-243(K)(8) and A.A.C. R18-9-A206]

The permittee shall conduct any monitoring activity necessary to assure compliance with this permit, with the applicable water quality standards established pursuant to A.R.S. §§ 49-221 and 49-223 and §§ 49-241 through 49-252.

### 6.8 Inspection and Entry [A.R.S. §§ 41-1009, 49-203(B) and 49-243(K)(8)]

In accordance with A.R.S. §§ 41-1009 and 49-203(B), the permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to enter and inspect the facility as reasonably necessary to ensure compliance with Title 49, Chapter 2, Article 3 of the Arizona Revised Statutes, and Title 18, Chapter 9, Articles 1 through 4 of the Arizona Administrative Code and the terms and conditions of this permit.

**6.9 Duty to Modify [A.R.S. § 49-243(K)(8) and A.A.C. R18-9-A211]**
The permittee shall apply for and receive a written amendment before deviating from any of the designs or operational practices specified by this permit.

**6.10 Permit Action: Amendment, Transfer, Suspension & Revocation**
**[A.R.S. §§ 49-201, 49-241 through 251, A.A.C. R18-9-A211, R18-9-A212 and R18-9-A213]**
This permit may be amended, transferred, renewed, or revoked for cause, under the rules of the Department.

The permittee shall notify the Groundwater Protection Value Stream in writing within 15 days after any change in the owner or operator of the facility. The notification shall state the permit number, the name of the facility, the date of property transfer, and the name, address, and phone number where the new owner or operator can be reached. The operator shall advise the new owner or operators of the terms of this permit and the need for permit transfer in accordance with the rules.

## 7.0 ADDITIONAL PERMIT CONDITIONS

### 7.1 Other Information [A.R.S. § 49-243(K)(8)]

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, the permittee shall promptly submit the correct facts or information.

### 7.2 Severability

**[A.R.S. §§ 49-201, 49-241 through 251, A.A.C. R18-9-A211, R18-9-A212 and R18-9-A213]**

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby. The filing of a request by the permittee for a permit action does not stay or suspend the effectiveness of any existing permit condition.

### 7.3 Permit Transfer

This permit may not be transferred to any other person except after notice to and approval of the transfer by the Department. No transfer shall be approved until the applicant complies with all transfer requirements as specified in A.A.C. R18-9-A212(B) and (C).