PLAN OF OPERATIONS
Pinto Valley Mine

Prepared for:

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P.O. Box 100 • 2911 N Forest Service Road 287 • Miami, Arizona 85539

Project Number: 208.49

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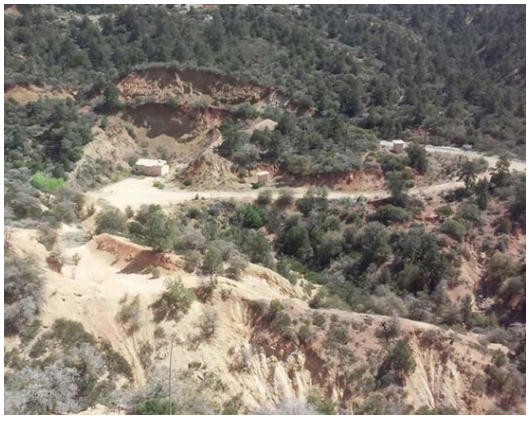

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Revision Log

Revision Date	Revision Lead	Purpose of Revision
05/13/2016	Tim Ralston	Initial Submittal
09/27/2016	Tim Ralston	Revised to incorporate information contained within the responses to comments from Forest Service received on August 11, 2016 and subsequent telecoms. See Replacement Pages 4, 6, 28 and 74.

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APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
Amsl	Above mean sea level
APP	aquifer Protection Permit
AOC	approximate original contour
ARRA	Arizona Radiation Regulatory Agency
ASMI	Arizona State Mine Inspector
ATF	Bureau of Alcohol, Tobacco, Firearms, and Explosives
AZPDES	Arizona Pollutant Discharge Elimination System
BADCT	Best Available Demonstrated Control Technology
BHP	BHP Copper, Inc.
BLM	U.S. Department of Interior, Bureau of Land Management
BMPs	Best Management Practices
$CaCO_3$	Calcium carbonate (hardness)
Capstone	Capstone Mining Corp.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cfs	cubic feet per second
CO	carbon monoxide
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
°F	degrees Fahrenheit
FOS	factor of safety
FR	Forest Road
g	gravitational acceleration
gpm	gallons per minute
HDPE	high-density polyethylene
HSEC	Health, Safety, Environment, and Community
H:V	Horizontal:Vertical
kV	Kilovolts
lb/f^3	pounds per cubic foot
M	Million
MLRP	Mined Land Reclamation Plan
MSGP	Multi-Sector General Permit
MSHA	Mine Safety and Health Administration
N/A	Not Applicable
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFS	National Forest System
NO_2	Nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration

NRCS	Natural Resources Conservation Service
O_3	Ozone
Pb	Lead
PCBs	polychlorinated biphenyls
PGA	peak ground acceleration
PCS	Petroleum contaminated soil
Plan	Plan of Operations
PLS	Pure Live Seed
$PM_{2.5}$	Particulate Matter greater than 2.5 microns in nominal aerodynamic diameter
PM_{10}	Particulate Matter greater than 10 microns in nominal aerodynamic diameter
PVMC	Pinto Valley Mining Corp.
RCRA	Resource Conservation and Recovery Act
SHPO	Arizona State Historic Preservation Office
SIP	State Implementation Plan
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasures
SRCE	Standard Reclamation Cost Estimator
SRP	Salt River Project
SWPPP	Stormwater Pollution Prevention Plan
SX/EW	solvent extraction/electrowinning
TAR	Temporary Access Road
tpd	tons per day
tpy	tons per year
TSF	Tailings Storage Facility
USFWS	U.S. Fish and Wildlife Service
USFS	U.S. Department of Agriculture, Forest Service
USGS	U.S. Geological Survey
V	volts
VQO	visual quality objectives
µm	microns
µm/L	micrograms per liter
$\mu m/m^3$	micrograms per cubic meter

CHAPTER 1. INTRODUCTION

The Pinto Valley Mine is an open pit copper and molybdenum mine with appurtenant ore beneficiation facilities. This Plan of Operations (Plan) describes operations conducted by Pinto Valley Mining Corp. (PVMC) on National Forest System (NFS) lands administrated by the U.S. Department of Agriculture, Forest Service (USFS) as the Tonto National Forest.

The activities covered under this Plan are related to PVMC's historical, current (2016), and proposed future use of NFS lands, primarily on unpatented claims adjacent to the private PVMC property, which itself consists of numerous patented claims and fee land. The past and present uses include a variety of previously authorized activities and inadvertent encroachments onto NFS lands. The future uses include continuation of certain current uses as well as future development onto NFS lands. The activities described in this Plan are anticipated to extend for approximately 23 years, from 2016 through 2039.

This Plan consists of:

- **Chapter 1**, *Introduction* (this chapter), describes the location and site history, summarizes PVMC's use of NFS lands, and identifies land ownership as well as PVMC's existing permits and approvals.
- **Chapter 2**, *Site Conditions*, describes the physical environment at and surrounding the Pinto Valley Mine.
- **Chapter 3**, *Project Description*, provides details about PVMC's use of NFS lands for mining, milling and processing, transportation, utilities, water use and treatment, and other aspects of the operation.
- **Chapter 4**, *Environmental Protection Measures*, describes PVMC's environmental protection program and the measures that are or will be taken to protect physical, biological, cultural, land use, and socioeconomic resources.
- **Chapter 5**, *Plan for Interim Curtailment*, describes the measures that PVMC will take to protect human health and the environment in the event of a temporary cessation of mining activities.
- **Chapter 6**, *Reclamation Plan*, describes the proposed strategy that PVMC will use to close the site at the end of the mine life, and monitor the site during a post-closure period.
- **Chapter 7**, *References*, lists the source materials cited in the Plan.

Figures depicting graphical information follow the text. Appended information includes:

- **Appendix A,** a completed copy of USFS Form FS 2800-5, *Plan of Operations for Mining Activities on National Forest System Lands.*
- **Appendix B,** electronic copies of all of the previously authorized Rights-of-Way, Plans of Operations, Special Use Permits, and a Letter Agreement.

- **Appendix C,** a map and list of the unpatented claims that will be affected by the activities described in this Plan.
- **Appendix D,** a collection of technical memoranda that support the information presented in this Plan.
- **Appendix E,** a set of "As-Built" sheets of that depict existing (2016) PVMC facilities on NFS lands, shown on March 14, 2105 aerial photographs.
- **Appendix F,** representative photographs of existing (2016) PVMC facilities on NFS lands.
- **Appendix G,** a map and list of the active PVMC wells and piezometers that are situated on NFS Lands.
- **Appendix H,** a summary of stormwater pollution prevention practices that PVMC implements for their industrial activities within discharging basins on NFS lands.
- **Appendix I,** a Road Use and Maintenance Plan for PVMC's use of Forest Roads (FRs) and temporary access roads (TARs).

1.1. LOCATION

The Pinto Valley Mine is located in the Globe-Miami copper mining district in central Arizona (**Figure 1-1**). It is situated on the eastern side of Pinto Creek Valley, through which Pinto Creek flows north toward Theodore Roosevelt Lake. The mine is approximately 8 miles west of Miami, Arizona in Gila County. The private PVMC property and NFS lands described in this Plan are situated, relative to the Gila and Salt River Baseline and Meridian, within portions of:

- Township 1 North, Range 13 East, Sections 1, 2, 3, 4 (Protracted) 11, 14, 23, 24, and 25;
- Township 1 North, Range 14 East, Sections 6, 7, 8, 17, 18, 20, 21 (Protracted), 28, 29, 30, 31, and 32;
- Township 1 South, Range 14 East, Sections 5 and 6; and
- Township 2 North, Range 13 East, Sections 25, 26, 27, 28, 34 (Protracted), 35, and 36.

1.2. SITE HISTORY

Prospecting in the general area of Globe, Arizona began in the 1860s (Woody and Schwartz 1977). Early prospecting in the district focused on gold and silver but the focus soon turned to exploration for copper as the primary resource. The Globe-Miami district is one of the oldest and most productive mining districts in the United States, with its first recorded production occurring in 1878. More than 15 billion pounds (lbs.) of copper have been produced in the district (Capstone 2016).

A chalcocite-enriched zone within the Porphyry Mountain copper deposit at Pinto Valley was mined from 1943 through 1953 by the Defense Plant Corporation at the Castle Dome Mine. The adjacent Pinto Valley Mine Open Pit was developed in 1972, and went into production in 1974. The Pinto Valley Mine eventually consumed the Castle Dome Mine (some abandoned processing structures

remain onsite, within patented PVMC claims). Overburden (waste rock) is stored in dumps. Sulfide ore is crushed and processed at a mill/concentrator, which produces copper and molybdenum concentrates that are transported offsite for smelting and refining. Tailings are stored in impoundments (tailings storage facilities). Leaching operations began in 1981. Low-grade and oxidized ore is processed on leaching piles that deliver pregnant leach solution to a solvent extraction/electrowinning (SX/EW) plant, where copper cathode is produced.

The Pinto Valley Mine property was originally owned by Miami Copper Company in 1909 (Capstone 2016). The modern mine ownership history began with Cities Service Company at the Castle Dome Mine and includes several companies. Recent operators include Magma Copper Company and BHP Copper Inc. (BHP), a subsidiary of BHP Billiton Ltd. In October 2013 Capstone Mining Corp. (Capstone), a Canadian-based copper mining company with operations in North and South America, acquired the Pinto Valley Mine from BHP. Capstone operates the Pinto Valley Mine as PVMC, a wholly owned indirect subsidiary.

Pinto Valley Mine has operated continuously from 1974 with the exception of a short period of curtailed operations in 1983, as well as curtailments from 1998 to 2007 and from 2008 to 2012. It has operated continuously since the 2012 re-start. PVMC produced 143M pounds of copper in 2014 and 134M pounds of copper in 2015 (Capstone 2016).

1.3. USE OF NFS LANDS

A completed copy of USFS Form FS 2800-5, *Plan of Operations for Mining Activities on National Forest System Lands* (**Appendix A**), provides the basis for the information required for the USFS to evaluate this Plan, and includes cross-references to sections of the Plan where detailed information is provided.

The majority of the Pinto Valley Mine is located on patented claims or fee land (i.e., private PVMC property). However, certain facilities and operations are located on unpatented lode and mill site claims, or other land, on the Tonto National Forest and were authorized by the USFS or the U.S. Department of Interior, Bureau of Land Management (BLM) through Rights-of-Way, Plans of Operations, Special Use Permits, and a Letter Agreement (**Appendix B**). The BLM Rights-of-Way were transferred to the USFS in 1989. The authorizations date from as early as the 1940s, and have been amended, updated, and re-authorized over the years. Footprints of the areas encompassed by these previous authorizations are depicted in **Figure 1-2**. In addition, some facilities were inadvertently placed or expanded onto other unpatented claims without modification to the existing authorizations by PVMC's predecessors.

In the mid-2000s, the USFS requested that all of the previous authorizations be consolidated into a single Plan of Operations to replace the prior permits and approvals, and to address the inadvertent encroachments. The original "Administrative Consolidation Plan of Operations" was submitted to the USFS in 2009 (the 2009 Plan) by Capstone's predecessor, BHP. The USFS subsequently requested

that the 2009 Plan be revised to incorporate "as-built" mapping and more detail about proposed reclamation activities on NFS lands.

Since acquisition of the Pinto Valley Mine in 2013, PVMC has planned further facility development, including additional activities on NFS lands. Based on the 2009 Plan and incorporating planned new uses of NFS lands, PVMC submitted a revised Plan to the USFS in October 2014. Further refinements to the Plan were made in March 2015, pursuant to the USFS's comments from their completeness review of the October 2014 version. Additional comments were received from the USFS in September 2015 and have been addressed in this Plan, which also includes the "as-built" information in **Appendix E**. This "final draft" version of the Plan will be revised as needed at the conclusion of the USFS's National Environmental Policy Act (NEPA) evaluation of the Plan to become the final, approved Plan of Operations.

Each of the past, present, and proposed future uses of NFS lands, summarized in **Table 1-1**, is addressed in this Plan. Disturbance areas and the associated area of affected claims (see **Section 1.4**) are provided in measured acres for large (non-linear) facilities and, for temporary access roads (TARs), length and calculated acres (based on average road width). The total length of Forest Roads (FRs) used by PVMC to access mine facilities is provided but not included in the calculation of disturbance area because the FRs were developed by the USFS, not PVMC. For other linear utility infrastructure (water pipelines and electrical power lines), lengths are provided but because most these facilities follow FRs or TARs, there is no additional disturbance area. In summary, at the end of the current planned life of mine PVMC will use 649.25 acres of NFS lands, plus 26.96 miles of FRs to access mine facilities and/or as alignments for linear utility infrastructure.

1.4 LAND OWNERSHIP

The Pinto Valley Mine is owned and operated by PVMC, a wholly owned indirect subsidiary of Capstone Mining Corp. (Capstone). Contact information for PVMC is provided below.

Pinto Valley Mining Corp.
P.O. Box 100
2911 N. Forest Road 287
Miami, Arizona 85539
(928) 473-6400

Adjacent NFS lands surrounding nearly the entire private PVMC property are administrated by the USFS as the Tonto National Forest, Globe Range District (**Figures 1-3**). Additional private land adjoining the southwestern corner of the private PVMC property is the Carlota Mine, owned by Carlota Copper Company. BLM-administrated lands lie nearby, but do not abut the private PVMC property.

PVMC owns approximately 6,000 acres (9.5 square miles) of patented land, several hundred unpatented mining claims around the perimeter of the patented land, and a 27-acre ranch that includes a 35,000-acre grazing allotment with the USFS (Capstone 2016). The core of Pinto Valley Mine consists of 69 patented lode claims and 53 patented mill site claims. Adjacent to and near the patented claims are 329 unpatented lode claims and mill site claims. Most of the unpatented claims were staked on NFS lands administrated by the USFS, but a limited number of the unpatented mining claims and mill sites are on federal land administrated by the BLM. Seven parcels of fee (private) land are associated with the property.

PVMC holds all the unpatented claims on NFS lands that will be the subject of the activities described in this Plan. **Appendix C, Figure C-1**, shows all of the unpatented claims on NFS lands that have been or will be utilized for the activities described in this Plan. A list of these claims is provided in **Appendix C, Table C-1**

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Table 1-1 Summary of PVMC Uses of NFS Lands at End of Mine Life

Facility	Disturbance Area (acres) or Length (miles)	Area of Affected Claims (acres)	Description
Mining Activities			
Open Pit	28.9 acres	75.7 acres	Pit and related infrastructure (excluding perimeter road, which is included in the TARs)
19 Dump	75.8 acres	101.3 acres	Waste rock dump
Milling and Processing			
Cottonwood Tailings Impoundment	278.5 acres	462.0 acres	Embankment and tailings impoundment, and related infrastructure (excluding Cottonwood Reservoir, which is included in the Ponds & Reservoirs)
Tailings Storage Facility No. 3 (TSF3)	25.8 acres	36.4 acres	Tailings impoundment, sediment trap and adjoining disturbance
Tailings Storage Facility No. 4 (TSF4)	171.0 acres	408.1 acres	Embankment, tailings impoundment, stockpiles (excluding perimeter road, which is included in the TARs)
Transportation			
Forest Roads (FRs)	26.96 miles	N/A	Used by PVMC employees and contractors to access the Pinto Valley Mine and related facilities on NFS lands
Temporary Access Roads (TARs)	30.4 acres	N/A	15.49 miles of 20-foot wide (average) unimproved (dirt) roads with berms, culverts, and erosion bars equals a calculated disturbance area 30.4 acres
Utilities			
Electrical Power Lines	10.9 miles	N/A	13.8-kV aerial lines or lower voltage ground cables, poles, transformers, and control boxes; the infrastructure lies within FR or TAR alignments and is not included as additional disturbance area.
Water Use & Treatment			
Peak Well 37	0.02 acre	N/A	Domestic water supply well
Water Pipelines	17.9 miles	N/A	High-density polyethylene (HDPE) and steel pipelines that lie within FR or TAR alignments and are therefore not included as additional disturbance area
Ponds & Reservoirs	38.62 acres	66.0 acres	Cottonwood Reservoir, Mine Reservoir, Upper Tule Pond, Pennell Pond, evaporation ponds southwest of Cottonwood Tailings Impoundment
Water Storage Tanks	0.2 acre	N/A	Potable water tank and fire/service water tank
Support Facilities			
"Pinto Valley Mine" Sign	0.01 acre	N/A	Property identification sign
Total Area			
Total of PVMC Uses of NFS Lands	649.25 acres 26.96 miles	1,149.5 acres	Linear utility infrastructure lies within FR or TAR alignments and are therefore not included as additional disturbance area. Mileage is length of FRs used by PVMC, some of which includes linear utility infrastructure (power lines and pipelines).

1.5. PERMITS AND APPROVALS

As mentioned above, PVMC holds numerous previous authorizations for use of NFS lands, as listed in **Table 1-2** and provided in **Appendix B**. Additionally, PVMC holds a range of environmental permits and approvals, principally from the Arizona Department of Environmental Quality (ADEQ) and the Arizona Department of Water Resources (ADWR), that cover PVMC activities on both private and public land. **Table 1-3** lists these other permits and approvals.

Table 1-2 Previously Authorized Rights-of-Way, Plans of Operations, Special Use Permits, and Letter Agreement

Number (Appendix No.)	Facility	Original Authorized Activities
Rights-of-Way		
PHX-080742 (**B-1**)	Cottonwood Tailings Impoundment, Cottonwood Reservoir, and a portion of 19 Dump	Originally construction, operation, and maintenance of a tailings dam and reservoir; tailings pipeline and return water pipeline in 20-foot-wide right-of-way; amended to include a portion of a mining waste dump (19 Dump, the balance of which is authorized by Plan of Operation POO-0003)
PHX-080933 (**B-2**)	Water Pipeline and Mine Reservoir	Construction, operation, and maintenance of a water pipeline in 20-foot-wide right-of-way and 2.32-acre water storage reservoir
Plans of Operation		
POO-0001 (**B-3**)	Tailing Storage Facility No. 3	Tailings impoundment expansion on to two unpatented claims (one of which is also covered by POO-0002)
POO-0002 (**B-4**)	Tailings Storage Facility No. 3	Construction of new service roads and improvement of an existing Forest Road to 25 feet wide, water pipeline, and electric cables along edge of roads on four unpatented claims (one of which is also used by POO-0001)
POO-0003 (**B-5**)	19 Dump	Waste rock dump, a portion of which is authorized by the amended Right-of-Way PHX-080742
Special Use Permits		
GLO-445301 (**B-6**)	Pinto Valley Mine sign	Use and maintenance of a non-illuminated company identification sign
GLO-445302 (**B-7**)	Electric power lines and access roads for operation of wells on Peak mill site claims, and the Burch pipeline booster station	Operation and maintenance of 13.8-kV electrical transmission lines along 20-foot-wide corridors; use and maintenance of Forest Roads for access
GLO-445303 (**B-8**)	Water pipelines and access roads from the Pinto Valley Mine to BHP Copper Cities and for wells on Peak mill site claims to the Pinto Valley Mine	Operation and maintenance of 4-, 12-, and 16-inch diameter pipelines along 8.19 miles of 20-foot-wide corridors, originally totaling 19.85 acres; use of a booster station in a 50-foot-wide portion of the corridor; use and maintenance of service roads for access within same corridor
Tonto 468 (**B-9**)	Peak Well 37	100-by-100 foot water well site, and 650 feet of roadway for pipeline and power line, and vehicular access
Letter Agreement		
Letter Agreement (**B-10**)	Commercial vehicle staging area	Storage of ADOT material on land adjacent to Cottonwood Tailings Impoundment

Table 1-3 Pinto Valley Mine Environmental Permits and Authorizations

Permit or Authorization	ID Number	Expiration	Description
ADEQ Air Quality Class II Synthetic Minor Permit	54118	5/8/2017	Amended 4/06/2015
ADEQ AZPDES Process Water Permit	AZ0020401	05/29/2019	Direct discharge from Outfall Nos. 003, 004, and 005
ADEQ AZPDES Stormwater Multi-Sector General Permit	AZMSG 2010-003 /AZMSG-78423	N/A	NOI updated 10/11/2013
ADEQ Area-Wide Aquifer Protection Permit (APP)	P-100329	Life of Facility	Amended 10/19/2015
ADEQ General APP for Concentrate Storage Facility Truck Wheel Wash	P-511408	9/20/2016	Type 3.03 Vehicle & Equipment Washes
ADEQ Public Water System Permit	AZ0404321	Life of Facility	Non-Transient Non-Community Water System
EPA Hazardous Waste Generator Identification	AZT000624353	N/A	Hazardous Waste Site ID
ADEQ Special Waste Generator Identification	320276	N/A	Special Condition Petroleum-Contaminated Soil (PCS) Only
ADEQ Off-Road Tire Burial Permit	Burial Cell A	Life of Facility	Per AAC R-18-8-704
AMSI Mined Land Reclamation Plan (MLRP)	N/A	Life of Facility	June 9, 1998 Approval; Updated in 2014 and 2016 (approval pending)
ADWR License of Approval	4.13	Life of Facility	Gold Gulch No. 2 Dam and Reservoir
ADWR License of Approval	4.16	Life of Facility	Gold Gulch 1A Dam and Reservoir
ADWR License of Approval	4.17	Life of Facility	Slack/Conklin Dam
ARRA Radioactive Permit	04-008	7/31/2020	Radioactive Material
ARRA Radioactive Permit	04-I-2050	9/30/2023	X-Ray Registration

CHAPTER 2. SITE CONDITIONS

This chapter describes the physical environment (climate, air, topography, geology, soils, and water resources) at and surrounding the Pinto Valley Mine.

2.1. CLIMATE

The regional climate is semiarid (Green and Sellers 1964). Annual precipitation in the region averages 23 inches and occurs in a bimodal pattern. Most of the rainfall occurs during the winter and summer months, with dry periods in the spring and fall. Precipitation during the winter months (December through March) usually occurs during steady, long duration storms. Although snow may occur at higher elevations, it does not typically accumulate. Rain events during the summer months (July to early September) are typically of short duration with more intensity due to the convective nature of thunderstorms. May and June are typically the driest months of the year and are the most likely to have drought conditions. In one out of 4 years, the region may not receive any precipitation during an entire month (Green and Sellers 1964).

The National Oceanic and Atmospheric Administration's (NOAA's) *Climate Atlas of the United States* (NOAA 2005) records and the Western Regional Climate Center records[1] include data from a weather station in Miami (Station No. 025512), approximately 6 miles east of the site. The published period of record for the Miami station is from 1914 to 2015. The mean annual temperature at the Miami station is 63.9 degrees Fahrenheit (°F). The annual average maximum temperature is 76.8°F whereas the annual average minimum temperature is 50.9°F. July is the warmest month, with an average maximum temperature of 96.7°F and an average minimum temperature of 70.7°F. January is the coolest month, with an average maximum temperature of 56.6°F and an average minimum temperature of 33.8°F. Rainfall recorded at the Miami station averages 18.8 inches per year. Total annual average snowfall in Miami is 2.6 inches.

Two gauges measure precipitation at the Pinto Valley Mine. A gauge near the mine administrative buildings has been maintained since 1972 and a gauge at TSF4 has been maintained since 2005. The annual average precipitation at the administrative buildings' gauge is 20.0 inches, comparing favorably with the Miami station long-term record, while annual average precipitation at the TSF4 gauge averages 14.2 inches.

The 43-year period of record for the gauge near the administrative buildings allows for an evaluation of long-term trends and variability. **Figure 2-1** shows that precipitation was below average in the mid-1970s, highly variable but consistently above average through the mid-1980s, and variable but typically below average with a general downward trend since then. Of particular note is the higher

1 http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?az5512

than average rainfall recorded in 2005. As described in **Section 2.6.2**, that high precipitation record correlates with a high stream flow record in Pinto Creek.

Table 2-1 provides seasonal precipitation averages for the two Pinto Valley Mine rain gauges.

Table 2-1 Seasonal Precipitation Averages at Two Pinto Valley Mine Rain Gauges

Season	Administrative Building Gauge 1972–2015 (inches)	TSF4 Gauge 2005–2015 (inches)
Winter	2.32	1.78
Spring	0.45	0.30
Summer	2.32	1.84
Fall	1.44	0.81

The high values recorded on site in the winter season and low values in the spring season are consistent with the regional characterization of a bimodal rainfall pattern. Early summer and late fall months are relatively dry, separating the summer season precipitation from the winter season precipitation.

Global climate change has resulted in the southwestern US regional climate becoming hotter and drier. NOAA reports that between 2001 and 2010 temperatures were almost 2°F higher than historic averages (NOAA 2016). Regional drought has caused earlier spring snowmelt and runoff. Regional annual average temperatures are projected to rise by 2.5°F to 5.5°F between 2041 and 2070. Summer heat waves are predicted to become longer and hotter with more frequent, intense, and longer lasting droughts occurring in the Colorado River Basin.

Locally, drought conditions in recent years are readily evident in rainfall records. **Figure 2-2** shows historical trends of precipitation over an 80-year period recorded at a site about 5 miles east of the Pinto Valley Mine. The record begins in the early 1930s and documents long-term precipitation averages on several rolling scales, showing that rainfall has been at a historical low since the late 1990s.

2.2. AIR

The Pinto Valley Mine is located within non-attainment areas for sulfur dioxide (SO_2) and particulate matter greater than 10 microns in aerodynamic diameter (PM_{10}). PVMC controls dust that may be generated from large earthen facilities by rock armoring or revegetating inactive surfaces, applying wet tailings to active tailings impoundments, regularly watering haul roads, and applying dust suppressant to heavily traveled access roads (including an unpaved portion of FR 287 through private PVMC property between the Pinto Valley Mine entrance and TSF3).

The Pinto Valley Mine is approximately 4 miles east of the Superstition Wilderness Area, a Class I visibility area. The National Park Service, which has regulatory authority over the Superstition Wilderness Area, uses a long-term air quality dataset for the Tonto National Monument (approximately 14 miles north of Pinto Valley Mine) as a surrogate to characterize the air quality in

the Superstition Wilderness Area. In general, air quality for this area continues to be good, and air pollution levels are lower than in populated areas.

2.3. TOPOGRAPHY

The Pinto Valley Mine lies on the eastern side of the Pinto Creek Valley (**Figure 2-3**). Pinto Creek, a drainage of the Pinal Mountains, is a northward-flowing perennial to ephemeral stream that discharges into Theodore Roosevelt Lake approximately 20 river miles (14 aerial miles) north of the site. Flow in the stream appears to be bedrock controlled: perennial flow occurs where bedrock is at or near the ground surface, with intermittent flow where bedrock is deeper and ephemeral flow where significant depths of alluvium are present. Generally, perennial segments occur in the upper reach, transitioning to intermittent and then ephemeral flow in the middle and lower reaches. Pinto Valley Mine is adjacent to the lower segment of the upper reach, where flow varies from intermittent to ephemeral.

The sidewalls of the Pinto Creek Valley are rugged with significant topographic relief and bedrock exposures; the mine site itself is characterized by natural and manmade steep ridges and canyons. Elevations at the site range from a low of about 3,000 feet above mean sea level (amsl) where Pinto Creek exits the northern extent of property, to a high of about 4,900 feet amsl at the top of the ridge on the east side of the mine.

As of 2016 the Pinto Valley Mine property consists of an approximately 1,200-foot deep open pit, waste rock dumps, tailings impoundments, and leaching and processing facilities to support the open pit mining operation. Excavating the Open Pit at the Pinto Valley Mine removed Porphyry Mountain, which originally rose to an elevation of approximately 4,800 feet amsl. Overburden has been placed in waste rock dumps north, south, and west of the Open Pit. Tailings from ore processing have been deposited in the Cottonwood Tailings Impoundment (south of the pit); TSFs 1, 2, and 3 (west of the pit); and TSF4 (north of the pit). Low-grade ore leaching piles are located northwest of the Open Pit. Numerous roads throughout the site allow access to these facilities. All of the facilities have involved cut-and-fill construction to a greater or lesser degree. The following paragraphs describe the topography of the PVMC facilities on NFS lands.

As of 2016 a small portion infrastructure related to the Open Pit extends onto NFS land, at the southeastern corner of this facility. The original topography of this area is not precisely known. The location is on the northern flank of an unnamed ridge adjacent to the abandoned Castle Dome Mine concentrator and originally sloped to the north and west. Two other areas on NFS lands along the southern boundary of the Open Pit have been cleared, but the topography at these locations has not been appreciably changed from natural conditions.

To the south of the Open Pit, the 19 Dump is situated entirely on NFS lands and the Cottonwood Tailings Impoundment is primarily on NFS lands. The 19 Dump is on the southern flank of an unnamed hillside above Cottonwood Canyon (the south side of the ridge noted above). The east-west

ridgeline includes three peaks that rise to 4,868, 4,876, and 4,738 feet amsl, respectively, from east to west, with a subsidiary peak at 4,495 feet amsl to the south of the main ridgeline. The maximum elevation of 19 Dump is 4,425 feet amsl, well below the ridgeline and subsidiary peak. Cottonwood Tailings Impoundment lies within Cottonwood Canyon (also known as Cottonwood Gulch) downslope from the 19 Dump. The elevation of the canyon at the toe of the tailings embankment is approximately 3,720 feet amsl, compared to a final embankment crest elevation of approximately 4,020 feet amsl.

West of the Open Pit, small sections of TSF3 extend onto NFS lands, with little change to the overall topographic relief in these areas. TSF3 is planned to extend onto existing unpatented claims on NFS lands to a maximum elevation of 3,860 feet amsl, compared to the adjacent ridge maximum elevation of approximately 3,880 feet amsl. North of the Open Pit, TSF4 lies entirely on patented PVMC claims, but is planned to extend onto unpatented claims on NFS lands to a maximum crest elevation of 4,250 feet amsl, compared to the adjacent ridge maximum elevation of 5,150 feet amsl.

2.4. GEOLOGY

A geologic map of the Pinto Valley Mine is presented on **Figure 2-4**. Pinto Valley Mine is located in east-central Arizona, in the structural transition zone between the Sonoran section of the Basin and Range physiographic province to the south-southwest and the Colorado Plateau to the north (Capstone 2016). The Pinto Valley copper deposit is in the Inspiration structural block. Geologic units ranging in age from Precambrian (oldest) to Quaternary (youngest) outcrop in the area. The geologic setting is a Precambrian crystalline basement complex of nested plutons intruding an older schist complex (Peterson, Gilbert, and Quick 1961). These formation were intruded by the regional Ruin Granite batholithic complex, which is intruded by the widespread Schultze Granite of Laramide Age. The area was uplifted in the Tertiary Period and covered with a thick sequence of semi-consolidated basin-fill sedimentary deposits, including Whitetail Conglomerate and Gila Group (locally and informally called the Gila Conglomerate). Thick volcanic ash-flow sequences of the Apache Leap Tuff (locally and informally called Dacite) blanketed the region from Pinto Valley and Superior. Unconsolidated Quaternary alluvium occurs sporadically along Pinto Creek and some of its tributaries. A thin veneer of soil, terrace gravels, and talus lie irregularly atop the bedrock in upland areas and bedrock exposures are common.

The main structures identified in the area are related directly to a set of lineaments, faults, and fractures with a north-south orientation (Capstone 2016). The oldest fault observed is the South Hill Fault. Field observations suggest that this fault controlled the emplacement of all the Precambrian intrusive phases along a northeast trend. The last reactivation along this fault has reverse movement, with a southeastern dip that has truncated mineralization of the Pinto Valley Mine deposit; this fault has placed the Pinal Schist over the Ruin Granite.

Most north-south structures are a product of extensional deformation from the Basin and Range event; the best example is the Gold Gulch Fault that separates, via horst and graben blocks, the Apache Group sediments and the Ruin Granite, respectively (Capstone 2016). Other large faults are the Castle Dome Fault and the Jewel Hill Fault, with normal movement and more restricted deformational features. Locally, the fault systems at surface present a north-northwest pattern with normal movements. Some minor reverse and transcurrent faults were observed and are closely related to extremely large structures, such as the Riedel-type faults, which all show subvertical dips.

The predominant geologic structure is the north-northwest trending quartz monzonite horst block of Porphyry Mountain (the Castle Dome horst block). As noted above, Porphyry Mountain has been removed by mining activity and that area is now an open pit. The Castle Dome horst block is bound on the west by the north-northwest trending West Branch Gold Gulch Fault and by the Jewel Hill Fault to the east.

Seismic activity is considered low in the area; per the Uniform Building Code (IVI International 2008). The Pinto Valley Mine lies within Seismic Zone 1, with a maximum ground acceleration rating of 0.8g ("g" represents gravitational acceleration). The estimated peak acceleration with a 2 percent probability of exceedance in 50 years is 18g (USGS 2008). The maximum design earthquake actually used for all PVMC facilities is an earthquake producing a peak ground acceleration (PGA) at the site of 0.082g with an exceedance probability of 5 percent in 50 years and a return period of 975 years (SRK 2016).

2.5. SOILS

As mentioned above, soil resources at and near the Pinto Valley Mine are sparse. Where present, a thin veneer of soil covers bedrock, but rock outcrops, subcrop (i.e., rock float and talus), and grus (i.e., weathered, crumbly rind mantling the top few inches of outcrop) are common throughout the site. Alluvium is present along drainage bottoms, but is rarely thick.

Mapped soils at the Pinto Valley Mine from the Natural Resources Conservation Service (NRCS) are depicted in **Figure 2-5**. The Pinto Valley Mine encompasses at least eight different soil types with some soils classified as "mined land" and other areas unmapped (NRCS 2015); NRCS generally does not map soils on NFS lands. PVMC facilities on NFS lands that have been mapped encompass at least four soil complexes:

- Mined Land;
- Silverstrike-Popcorn-Quillian complex, 15 to 50 percent slopes;
- Rock outcrop-Woodcutter complex, tuff, 15 to 50 percent slopes; and
- Rock outcrop-Turquoise complex, 25 to 65 percent slopes, boulder.

The majority of soil complexes located on NFS lands adjacent to the Pinto Valley Mine that have been mapped by NRCS are considered Mined Land, and include the entirety of Cottonwood Tailings Impoundment and 19 Dump.

2.6. WATER

This section describes groundwater and surface water at the Pinto Valley Mine and in the immediate vicinity.

2.6.1. Groundwater

Groundwater at the site occurs in two hydrogeologic units. A surficial, shallow groundwater system is present in the alluvium and upper weathered portions of underlying bedrock described above, and a more laterally extensive, deep groundwater system lies within basin-fill and volcanic formations (Gila Conglomerate, Whitetail Conglomerate, and Dacite) and in joints and fractures in the consolidated crystalline bedrock. Alluvium is present sporadically in major and minor ephemeral stream channels and drainages. Bedrock is present throughout the site, as described in **Section 2.4**, and acts as the deeper aquifer.

The potentiometric surface at the Pinto Valley Mine (**Appendix D-1**) reflects the altered surface topography, specifically in the vicinity of the Open Pit. The Open Pit acts as a hydrologic sink, drawing deep groundwater in the immediate vicinity toward the Open Pit from all directions. Outside of the influence of the Open Pit, groundwater flows generally west toward Pinto Creek, with northerly or southerly local flow.

2.6.2. Surface Water

The U.S. Geological Survey (USGS) maintains a series of stream flow gauges on Pinto Creek both upstream and downstream from the Pinto Valley Mine (**Figure 2-6**). The watershed reporting to the downstream Pinto Creek weir (also known as the Magma weir; USGS No. 09498501)[2] drains 37.3 square miles. Much of the Pinto Valley Mine lies within the Upper Pinto Creek Watershed, but portions of the mine are managed as stormwater zero-discharge areas (such as the Open Pit) that do not report to Pinto Creek.

The USGS National Water Information System Website[3] provides annual discharge rates from 1996 through 2015 for the Pinto Creek weir. Water year flow records for the period of record (**Table 2-2**) show average annual discharge rates in cubic feet per second (cfs) measured at the gauge. USGS uses the water year of October 1 through September 30 for data analysis.

2 There is an additional USGS stream flow gauge is stationed above Haunted Canyon (USGS No. 09498502), closer to the site but less representative of the watershed encompassing the entirety of the Pinto Valley Mine.

3 http://waterdata.usgs.gov/az/nwis/wys_rpt/?site_no=09498501&agency_cd=USGS

Table 2-2 Pinto Creek (Magma) Weir Average Annual Flow

Water Year	Average Annual Discharge (cfs)
1996	0.38
1997	2.81
1998	5.36
1999	0.73
2000	0.50
2001	5.52
2002	0.23
2003	2.63
2004	1.92
2005	23.60
2006	0.86
2007	0.32
2008	16.80
2009	3.81
2010	23.50
2011	0.45
2012	1.00
2013	4.28
2014	0.79
2015	0.70

Based on this data the average annual discharge at the weir for the period of record is approximately 4.81 cfs. Although weir measurements are not as accurate as implied by the precision indicated in **Table 2-2**, these data show a high degree of variability in Pinto Creek's average annual stream flow, ranging from a low average of 0.23 cfs in 2002 to a high average of 23.60 cfs in 2005.

CHAPTER 3. PROJECT DESCRIPTION

This chapter describes the existing and proposed PVMC operations on unpatented claims located on NFS lands, as well as other activities (certain linear infrastructure) not located on any claims. PVMC operations on patented tracts are described to the extent necessary to explain related operations on NFS lands. The historical, current, and proposed future use of NFS lands for each facility are described. **Figure 3-1** provides a schematic that identifies the PVMC facilities for mining and related activities. **Figure 3-2** depicts the site-wide use of NFS lands in aerial (**Figure 3-2a**) and topographic (**Figure 3-2b**) views. Subsequent figures depict the facilities referenced in the following sections, in the current (2016) and future (where appropriate) anticipated final configurations of each facility. **Appendix E** presents a set of aerial photographs with PVMC current (2016) uses of NFS lands delineated as "as-built" conditions.[4] Ground photographs of major facilities are provided in **Appendix F**.

3.1. MINING

PVMC utilizes conventional open-pit hard rock mining methods employing drilling, blasting, loading and hauling to move copper-bearing sulfide ore to the primary crusher (Capstone 2016). Total mining tonnages are forecast to increase from 54,000 tons per day (tpd) in 2016 to 56,000 tpd in 2017, and then gradually decrease between 2032 and the projected end of mine life in 2039.

PVMC mining facilities on unpatented claims on NFS lands consist of a portion of the Open Pit and one waste rock dump, as described in the following sections. This Plan covers a portion of the existing Open Pit and an expansion of the pit to the east, as well as the entire, inactive 19 Dump.

3.1.1. Open Pit and Related Infrastructure

Mining at the Pinto Valley Mine is conducted exclusively in the Open Pit; there is no underground mining at this site. The Open Pit and related infrastructure lie almost entirely within patented PVMC claims but there are three areas along the southern edge of the Open Pit footprint where unpatented PVMC claims on NFS lands have been cleared or used for related infrastructure (**Figure 3-3**; see also **Appendix E, Sheet 6**).

3.1.1.1. Historical Use of NFS Lands for the Open Pit

The Pinto Valley Mine Open Pit was initially developed in 1974 on patented PVMC claims. A small area adjacent to the Open Pit at the southeastern corner and two areas along the southern side were inadvertently extended onto unpatented claims on NFS lands. The historical uses included land disturbance associated with haul and perimeter roads, wells and exploration boreholes, stormwater

4 The as-built sheets were developed by analysis of recent (March 14, 2015) high-resolution aerial photographs to identify areas visibly disturbed by PVMC or predecessor mining activities, historical research of available documentation, and interviews with PVMC employees.

ponds, electrical power line, water pipelines and dispensers for dust control, and powder magazines. All of these facilities except the exploration boreholes, powder magazines, and electrical power lines are still in use, as described below.

3.1.1.2. Current Use of NFS Lands for the Open Pit

The current footprint of the Open Pit itself does not extend onto NFS lands, although adjacent land that has been cleared for roads, a former equipment laydown area, or other water and electrical infrastructure does include NFS lands (**Figures 3-3a and 3-3b**). The current area of NFS lands used for roads, laydown yard, and infrastructure related to the Open Pit is 24.0 acres. Much of the area at the southeast quadrant of the Open Pit (**Appendix F, Photograph 1**) and the associated uses will be subsumed by further development of the Open Pit, as described in **Section 3.1.1.3**.

The current uses of unpatented claims outside of the Open Pit footprint include:

- A portion of a haul road for mining in the Open Pit,
- An equipment laydown yard;
- TARs, including part of a perimeter access road system around the Open Pit and an isolated portion of FR 287B that was used to access the Castle Dome Mine;
- Stormwater ponds (G Pond, H Pond, K Pond [portion], and Pennell Pond [portion]) that collect runoff from the slopes immediately above the ponds to prevent the water from entering the Open Pit;
- An electrical power line that was part of the distribution system for equipment operating in and near the Open Pit but is now disabled;
- A water pipeline and a water stand dispenser for water from the Mine Reservoir, configured to fill water trucks for dust control on roads throughout the Open Pit (the water pipeline also supplies water to a second water stand on private PVMC property); and
- Three abandoned powder magazines.

The Open Pit area is also discussed in the current Stormwater Pollution Prevention Plan (SWPPP). The Open Pit lies within a stormwater zero-discharge area, the Pinto Mine Basin. Stormwater within this area does not discharge off-site. The existing stormwater ponds mentioned above collect runoff from adjacent upslope terrain, though most will be subsumed by further pit expansion.

PVMC maintains a robust pit slope monitoring program, monitoring dozens of slope prisms on a 24-hour scan sequence and a ground probe radar unit that scans the highwalls on a 24-hour basis. A recent occurrence within the Open Pit on private PVMC property affected adjacent NFS lands. In September 2015, tension cracks were observed in pit benches above the 4040 level of the Open Pit (referenced with respect to feet amsl) on private PVMC property; the slope instability at this location affects the existing haul road above this level (**Appendix F, Photograph 2**). The unstable ground

condition in this area was communicated to the USFS, and a remediation plan was put into effect. The remediation plan consists of removing approximately up to 415,000 tons of material from the unpatented PVMC claims.

3.1.1.3. Future Use of NFS Lands for the Open Pit

The Open Pit is an active facility that will be further expanded, as shown in **Figure 3**. The proposed final Open Pit configuration will extend onto unpatented claims beginning in 2020 (Capstone 2016). The existing infrastructure in the southeastern quadrant will be subsumed by the Open Pit expansion; other existing infrastructure along the southern boundary will not be affected. The area of unstable ground mentioned above will be reconstructed as a temporary ramp to allow haul truck to access a waste rock dump on the private PVMC property; this ramp will be subsumed by the pit after the waste rock dump reaches capacity.

Pond K, which lies largely on private PVMC property, will be almost completely filled by the waste rock dump. The small portion of Pond K that extends onto NFS land will not be filled by the dump.

A new perimeter haul road will be constructed around the proposed final footprint of the Open Pit. PVMC plans to design and construct the perimeter road within a buffer zone around the proposed final Open Pit footprint, on unpatented claims. The actual road alignment has not yet been determined but a conceptual alignment is depicted in **Figure 3-3**. The road will likely average 25 feet wide, with cut and fill areas of various widths to accommodate vehicle and mobile equipment crossing the rugged terrain. Water from the dispenser system (currently used only on private PVMC property) will be used for dust control on the new perimeter haul road as needed.

Several of the existing facilities on NFS lands will be removed or subsumed by the expanded Open Pit:

- The buried pipeline between the Mine Reservoir and the two water stands will be repositioned to accommodate the new Open Pit footprint (partially on NFS lands) and a waste rock dump (entirely on private PVMC property);
- The electrical power line and poles will be removed;
- The powder magazine buildings will be demolished;
- The existing stormwater ponds will be subsumed by further pit expansion, but the area will continue to be managed as a zero-discharge basin.

At the end of the life of mine, the total area of surface disturbance for the Open Pit and related infrastructure on NFS lands will measure 28.9 acres, affecting 14 claims that in total encompass 75.7 acres.

3.1.2. 19 Dump and Related Infrastructure

Overburden removed during mining has been stored in various waste rock dumps situated on both private PVMC property and unpatented claims on NFS lands. The only PVMC waste rock dump on unpatented claims is the inactive 19 Dump (**Figure 3-4; Appendix F, Photograph 3**; see also **Appendix E, Sheet 8**), which was constructed in 1984 and operated intermittently until 1993. PVMC does not plan to store additional waste rock on 19 Dump.

3.1.2.1. Historical Use of NFS Lands for 19 Dump

19 Dump was approved by the USFS in 1984 under a Plan of Operations (POO-0003; **Appendix B-5**). The toe of the dump near the Cottonwood Reservoir was authorized to extend onto the right-of-way for the Cottonwood Tailings Impoundment and Reservoir (PHX-080742, **Appendix B-1**; amended in 1984 to include the dump toe). Design drawings are not available for the 19 Dump, but it is likely that the facility was constructed by end-dumping overburden from access roads above the planned dump footprint. Site records indicate that the facility holds approximately 27 million tons of rock consisting almost entirely of Pinal Schist, a non-acid-forming material.

3.1.2.2. Current Use of NFS Lands for 19 Dump

19 Dump is an inactive facility; PVMC is not currently adding material and has not done so since 1993. The 19 Dump footprint currently measures 75.8 acres, and the facility reaches an elevation of 4,425 feet amsl (**Figure 3-4**). The outer slope of the waste rock dump ranges from 1:3H:1V to 1.5H:1V (horizontal:vertical) and is considered seismically stable (**Appendix D-2**). The overburden rests on bedrock exposures of granite, schist, and granodiorite. A summary of geotechnical and geochemical information about 19 Dump is provided in **Appendix D-3**.

The 19 Dump surface has naturally revegetated (**Appendix F, Photographs 3 and 4**). The current plant community on 19 Dump reflects the surrounding biotic community of Interior Chaparral ecotone with Madrean Evergreen Woodland (**Appendix D-4**). Mature native vegetation is growing on the surface, with estimated vegetative cover ranging from 50 to 70 percent on the top of the dump and up to 50 percent on the side slopes. Vegetative cover is higher in the berm and swale topography at the eastern portion of the dump than in the flatter areas in the western portion of the dump.

The 19 Dump area is also included in the current SWPPP. Existing stormwater management features directly associated with the 19 Dump "best management practices" (BMPs) consist of features such as water diversion bars, culverts, and erosion control features. There are no stormwater ponds directly associated with 19 Dump. Stormwater runoff from the 19 Dump area currently reports to the Cottonwood Reservoir (**Section 3.5**), which is a stormwater zero-discharge area.

3.1.2.3. Future Use of NFS Lands for 19 Dump

PVMC has no plans to add more material to the 19 Dump, but a portion of the stored overburden will likely be removed for use as cover material to reclaim certain features at the end of the mine life as described in detail in the Reclamation Plan (**Chapter 6**). The area of the dump where the material will be removed will be regraded, with no net change to the facility's footprint.

At the end of the life of mine, the total area of surface disturbance for 19 Dump and related infrastructure on NFS lands will measure 75.8 acres, encompassing 101.3 acres of claims (including overlapping mill and lode site claims).

3.2. MILLING AND PROCESSING

Most Pinto Valley Mine milling and processing facilities are on private PVMC property. The current mine plan calls for increasing the processing throughput from 54,000 tpd in 2016 to 56,000 tpd in 2017, through the end of mine life (Capstone 2016). A mill availability of 95 percent is anticipated. The tailings distribution and water reclamation systems have been evaluated for a tailings production rate of 64,950 tpd.

The flotation circuit, situated entirely on private PVMC property, operates as a staged process designed for the recovery of copper and molybdenum to individual concentrates (Capstone 2016). The primary focus of the rougher flotation circuit is to optimize recovery of the primary sulfide minerals from the gangue into a reduced mass for economic downstream processing. Cleaner flotation delivers economic concentrate grades for marketing while maintaining high recoveries. The rougher flotation section is operated in open circuit, with the rougher tailings going directly to the tailings storage facilities (TSFs). The tails of the cleaner scavenger bank are also sent to TSFs. Tailings from the three rougher banks and the cleaner scavenger bank are combined and feed three 350-foot diameter tailings thickeners where water is reclaimed, and the tails are thickened and sent on to the TSFs. Tailings gradation test results indicate that approximately 10 percent of the particles are finer than 4.8 microns (µm), approximately 50 percent of the particles are finer than 112 µm, and approximately 80 percent of the particles are finer than 360 µm. The design tailings pipeline flow rate is calculated to be 12,930 gallons per minute (gpm) with 55 percent solids. TSF4 is the primary location for the disposal of tailings from the mill. TSF3 is generally used as a backup but will be expanded as described below.

Three TSFs (including one inactive facility) are or will be at least partially situated on unpatented claims on NFS lands (**Figure 3-2**):

- Cottonwood Tailings Impoundment lies principally on unpatented claims on NFS lands;
- TSF3 currently extends slightly onto unpatented claims in NFS lands and will be further expanded in the future; and

- The planned development of TSF4 will extend onto unpatented claims in NFS lands in the future.

The following sections describe each of these facilities.

3.2.1. Cottonwood Tailings Impoundment and Related Infrastructure

The Cottonwood Tailings Impoundment and related infrastructure (**Figure 3-5**; see also **Appendix E, Sheet 9**) are situated principally on unpatented claims on NFS land. The impoundment is inactive but NFS lands are used for related infrastructure.

3.2.1.1. Historical Use of NFS Lands for Cottonwood Tailings Impoundment

The Cottonwood Tailings Impoundment was approved in 1944 by the BLM under a Right-of-Way (PHX-080742; **Appendix B-1**), which describes the tailings dam (embankment) and reservoir (Cottonwood Reservoir is discussed separately in **Section 3.5.1**) within Cottonwood Canyon, and tailings pipeline and return water line in a 20-foot wide right-of-way. As previously discussed, the right-of-way was amended in 1984 to allow a portion of the area to be used for a waste rock dump (i.e., 19 Dump) described in **Section 3.1** and was administratively transferred to the USFS in 1989.

A detailed history of the construction and operation of Cottonwood Tailings Impoundment is provided in **Appendix D-5**. In summary, the Cottonwood Tailings Impoundment embankment was constructed across Cottonwood Canyon near Manitou Hill to support the original Castle Dome Mine, which began operation in 1943. The embankment was constructed by hydraulic deposition of tailings from the crest gradually increasing the embankment height as the facility was operated. The Cottonwood Tailings Impoundment received tailings from ore processed at the Castle Dome mill from 1944 until 1954. The impoundment was deactivated in 1954, reactivated in 1974, and received tailings from ore processed at a new mill constructed for the Pinto Valley Mine until 1984. In 1988 the surface was capped with an approximately 6-inch thick layer of inert material and subsequently seeded with grasses (GSA 1998).

3.2.1.2. Current Use of NFS Lands for Cottonwood Tailings Impoundment

This facility is inactive. The embankment outer slope is 2H:1V and is considered seismically stable (**Appendix D-2**). Tailings embankments are not subject to ADWR dam safety regulations, but PVMC does inspect the embankment regularly as described in **Section 4.5.2**. A summary of geotechnical and geochemical information about the impoundment is provided in **Appendix D-6**. The current total area of the Cottonwood Tailings Impoundment footprint (including related infrastructure, but excluding the Cottonwood Reservoir) measures 278.5 acres. The current plant community on the Cottonwood Tailings Impoundment surface is described in **Appendix D-7** and depicted in **Appendix F, Photograph 5**.

Some of the original infrastructure related to the impoundment described in detail in **Appendix D-5** is still active. The current infrastructure related to the impoundment includes:

- The seepage collection system at the embankment (including Arizona Pollutant Discharge Elimination System [AZPDES] Outfall No. 004), which provides collected water to the service water circuit;
- The reclaim water system within the impoundment, which also provides collected water to the service water circuit;
- AZPDES Outfall No. 005 near the southeastern corner of the facility, which discharges to an un-named wash that eventually reports to Pinto Creek;
- Evaporation and settling ponds, which manage stormwater that falls on the impoundment surface; and
- Base for FR 287 along the west side of the impoundment.

NFS lands on and near the Cottonwood Tailings Impoundment are used by PVMC for several purposes:

- The impoundment surface is currently crossed by access roads used by PVMC for monitoring the facility. A road onto the impoundment enters from the Pinto Valley Mine plant area (on private PVMC land) and allows general access to the Cottonwood Tailings Impoundment surface, where other roads extend along the Cottonwood Reservoir embankment, along the crest of the inset embankment, or continue east toward the 19 Dump.
- Numerous groundwater wells and piezometers are situated within and around the impoundment. Well and piezometer locations[5] are shown in **Figure G-1**; specifications are listed in **Appendix G, Table G-1**.
- A contractor parking lot near the northwestern corner of the facility is situated partially within the impoundment footprint.
- An equipment laydown yard east of the parking lot is partially within the impoundment footprint.
- An area adjacent to the southern edge of the impoundment footprint has been developed as a commercial vehicle staging area (**Figure 3-5; Appendix F, Photograph 6**). The 80,000-square foot area is on the north side of FR 287, where a road cut through a low ridge isolated a small section of the ridge that was flattened for this purpose. Under a letter agreement with the USFS in 2009 (**Appendix B-10**), excess granitic material from an Arizona Department of Transportation (ADOT) US Highway 60 construction project was placed on the flattened area. The agreement transferred ownership of the material from ADOT to the

5 Certain wells have not been surveyed and are shown on **Figure G-1** in approximate locations based on historical mapping that is not always consistent with surveyed claim boundaries. PVMC will implement a program to survey the well locations and/or unpatented mill site claims to accurately map them in relationship to one another.

mine, and USFS stated that the permitted use of the Cottonwood Tailings Impoundment will not be affected by the material placement. PVMC currently uses this area for commercial vehicle staging. It is accessible from FR 287 but not from the impoundment surface.

The Cottonwood Tailings Impoundment area is also included in the current SWPPP. As described in the summary of PVMC's stormwater management practices on NFS lands (**Appendix H**), most of the stormwater falling or flowing onto the Cottonwood Tailings Impoundment evaporates from the surface or from a settling pond in the southeastern corner of the facility; only in extreme events would stormwater discharge off the facility. On rare occasions, the Cottonwood South sub-basin discharges to an unnamed drainage near the southeastern corner of the facility through stormwater outfall SW-CS1. Any stormwater that does not evaporate or discharge in extreme events, infiltrates through the tailings and reports to the Cottonwood Tailings Impoundment seepage collection system or recharges groundwater.

Stormwater from the from original Cottonwood Tailings Impoundment embankment face, a short section of FR 287, the north face of Manitou Hill, and portions of Cottonwood Canyon in the immediate vicinity is managed within the Lower Cottonwood Canyon Basin. A sub-basin has been defined for the easternmost portion of this basin; stormwater falling within the sub-basin reports to outfall SW-LCC1. The sub-basin includes two evaporation ponds (**Figure 3-5**) that have formed southwest of FR 287, outside of the Cottonwood Tailings Impoundment footprint, on the natural ground surface in a relatively flat area below the eastern flank of Manitou Hill. These two evaporation ponds are not connected to each other or the outfall by any defined channel. Stormwater that collects in these ponds does not report to the outfall except perhaps in extreme events. An access road in this area allows PVMC to monitor the embankment face. Two culverts direct stormwater flow from the immediately local area and FR 287 under the access road and to the steep wall on the south side of Cottonwood Canyon. This flow generally follows a channel cut across the south face of the Cottonwood Canyon wall, then runs down the steep slope to the bottom of the gulch.

3.2.1.3. Future Use of NFS Lands for Cottonwood Tailings Impoundment

PVMC does not plan to add more tailings to this impoundment. The uses of NFS lands for infrastructure related to the Cottonwood Tailings Impoundment and other facilities described above will continue through the conclusion of active mining operations and post-closure care. Specifically, PVMC will continue to use NFS lands in the Cottonwood Tailings Impoundment area for:

- Impoundment surface monitoring;
- Seepage collection;
- Groundwater monitoring;
- Stormwater management;
- Employee and contractor parking;
- Equipment laydown; and

- Commercial vehicle staging.

At the end of the life of mine, the total area of surface disturbance for the Cottonwood Tailings Impoundment and related infrastructure (excluding Cottonwood Reservoir) on NFS lands will measure approximately 278.5 acres, encompassing 462.0 acres of claims (including overlapping mill and lode site claims).

3.2.2. Tailings Storage Facility No. 3 and Related Infrastructure

Tailings Storage Facility No. 3 (TSF3) is situated principally on private PVMC property, but currently extends onto adjacent unpatented mining claims on NFS lands in one small area, with two additional associated infrastructure uses and two encroachment areas (**Figure 3-6**; see also **Appendix E, Sheet 5 and Sheet 10 View C**).

3.2.2.1. Historical Use of NFS Lands for TSF3

Tailings placement on unpatented PVMC claims adjacent to TSF3 was approved by the USFS in 1994 under a Plan of Operations (POO-001; **Appendix B-3**). TSF3 was started on private PVMC property in 1974 and operated intermittently until 2009. The impoundment was expanded onto unpatented claims on NFS lands (**Appendix F, Photograph 7**) beginning in 1994. Infrastructure related to TSF3 includes service roads, a water pipeline, and electrical cables that were also authorized by the USFS in 1994, but under a separate Plan of Operations (POO-002; **Appendix B-4**).

South of the authorized tailings placement area, an inadvertent encroachment of tailings occurred on other unpatented claims in 2013. Later that year a boundary dam was constructed on the private PVMC property to isolate the encroachment area and the tailings were removed in 2014 (**Appendix F, Photograph 8**).

A separate inadvertent encroachment onto unpatented claims in NFS lands associated with TSF3 encompasses a 0.53-acre sediment trap (informally referred to as a "sand trap") and adjoining cleared area, for a total disturbance area of 2.2 acres. The sediment trap is adjacent to the TSF3 embankment, which is on private PVMC property. It is not known when the sediment trap was constructed.

3.2.2.2. Current Use of NFS Lands for TSF3

The current surface area of TSF3 tailings placed on NFS lands is 1.7 acres (**Figure 3-6**). All tailings in TSF3 are from ore processed at the Pinto Valley Mine mill. A summary of geotechnical and geochemical information about TSF3 is provided in **Appendix D-8**.

The current infrastructure directly associated with TSF3 on unpatented claims consists of access roads for monitoring the tailings impoundment and two water pipelines (**Figure 3-6**). The electrical power lines have been removed. The current activities in this area include maintaining the water pipelines, access roads and stormwater BMPs such as water diversion bars, culverts, and erosion-control features

along the roads as necessary. All of these uses (as well as the reclaimed encroachment area) will be subsumed by the further development of TSF3 described in **Section 3.2.2.3**.

The existing reclaim water system at TSF3 is entirely on private PVMC property and consists of a single trailer-mounted self-priming centrifugal pump with an engine drive. The pump conveys water from the southern end of the TSF3 supernatant pool to the mill water supply tank, which is also on private PVMC property.

The sediment trap collects runoff from a portion of the embankment, and acts as a small detention basin. Solids settle to the bottom of the trap, and water flows back onto the private PVMC property into the Slack Pond. This water is pumped back to the PVMC water management system described in **Section 3.5.1**. The sediment trap is maintained as needed, using roads on the embankment face to access the trap and remove accumulated sediments to maintain the trap's capacity. The sediments are disposed of on private PVMC property within the TSF3 impoundment. The sediment trap will not be subsumed by further development of TSF3.

3.2.2.3. Future Use of NFS Lands for TSF3

Tailings Storage Facility No. 3 is designated to be used intermittently. The TSF3 embankment, on private PVMC property, is constructed in an upstream manner, with a cycloned sand shell. The TSF3 impoundment will be further expanded onto the area of unpatented claims under the current mine plan. The tailings already deposited on these claims will be covered, as will the infrastructure described above (except the sediment trap). The current mine plan calls for raising the top elevation of TSF3 from 3,750 feet amsl to 3,860 feet amsl (**Figures 3-6**), consistent with the elevation permitted in the APP. At this elevation, TSF3 will have an increased capacity of 21M tons of additional tailings at a settled density of 90 pounds per cubic foot (lb/f^3) (Capstone 2016). The maximum extent of tailings on unpatented claims at the end of this mine plan will occupy approximately 23.6 acres of NFS lands.

The TSF3 supernatant pool may extend onto NFS lands as the impoundment expands and the reclaim water system may be modified from its current trailer-mounted pump configuration. A barge pump with electrical power lines and return water line may be installed in the pool, and depending upon the size and depth of the pond could be situated on NFS lands.

At the end of the life of mine, the total area of surface disturbance for TSF3 and related infrastructure on NFS lands will measure 25.8 acres, affecting nine claims that encompass 36.4 acres.

3.2.3. Tailings Storage Facility No. 4 and Related Infrastructure

Tailings Storage Facility No. 4 (TSF4) is currently situated entirely on private PVMC property (**Figure 3-7**), but will extend onto adjacent unpatented claims on NFS lands as part of the current mine plan. A short length of electrical power lines and a TAR are situated on NFS lands near the southeastern extent of the current TSF4 footprint (see **Appendix E, Sheet 10 View B**).

3.2.3.1. Historical Use of NFS Lands for TSF4

Tailings Storage Facility No. 4 has not historically used NFS lands. However, PVMC's predecessors constructed a TAR and installed electrical power lines and poles that service pumps in the supernatant pond of the impoundment. The TAR and power lines were approved by the USFS in 1973 under a Special Use Permit (GLO-445302; **Appendix B-7**), and are discussed in **Sections 3.3 and 3.4**, respectively.

3.2.3.2. Current Use of NFS Lands for TSF4

PVMC currently uses the TAR and electrical power lines as described above. The area used for these facilities will be subsumed by the expanded TSF4 footprint described below. The TSF4 embankment, currently on private PVMC property, is raised by cyclone tailings. A 24-inch diameter polyurethane-lined steel pipeline is situated on the west side of the TSF4 embankment to the dam crest to deliver tailings slurry (Capstone 2016). The pipeline continues across the dam crest to the far abutment, still on private PVMC property. The taps for cyclones are spaced approximately 50 feet apart. Up to 16 cyclones may be in operation at any one time. The fine-grained fraction from the cyclone overflow is piped to the TSF beach. The coarse cyclone underflow material is used to construct the dam embankment.

The existing reclaim water system, all currently on private PVMC property, consists of barge-mounted pumps and two booster pump stations conveying water from the southern end of the TSF4 supernatant pool to the mill water supply tank. The nominal design flow rate of the reclaim water system is 6,500 gpm.

3.2.3.3. Future Use of NFS Lands for TSF4

Tailings Storage Facility No. 4 has been determined to be capable of storing 500 million (M) tons dry weight of tailings at a settled density of 95 lb/ft^3 (Capstone 2016). The area of NFS lands that will ultimately be covered by the TSF4 embankment and impoundment is approximately 126.8 acres. A summary of geotechnical and geochemical information about TSF4 is provided in **Appendix D-8**. TSF4 will be developed to a maximum elevation of 4,250 feet amsl (**Figure 3-7**), rising at an average 17 feet per year (Amec 2016). Raising the embankment crest and the impoundment surface top elevation will extend the crest as well as the tailings and supernatant pond onto adjacent unpatented claims on NFS lands. One and possibly both of the barge-mounted pumps and related pipeline for the reclaim water system will be moved to NFS lands to accommodate the supernatant pond when it extends onto NFS lands.

The existing TAR and electrical power line will be subsumed by the expanded impoundment footprint. A perimeter TAR will be constructed around the proposed final footprint of TSF4 to access the facility for monitoring purposes. The preliminary design of the perimeter road follows the 2.7-mile long

alignment depicted in **Figure 3-7**. The disturbance area associated with the TSF4 perimeter road is included in the TAR calculation described in **Section 3.3.2**.

Approximately 2.835 million cubic yards of excess material from the cuts is expected to be generated by the road construction. The excess material will be stockpiled adjacent to the perimeter road in three locations, generally on the downhill (west) side of the road where topography is suitable for material storage and future recovery. The preliminary design of the stockpiles, based on the volume of material that will be generated and the local topography, suggest that the three stockpiles will occupy approximately 44.2 acres of NFS lands adjacent to the perimeter road.

At the end of the life of mine, the total area of surface disturbance for TSF4 and related infrastructure (excluding the perimeter road) on NFS lands will measure 171.0 acres, affecting 23 claims that encompass 408.1 acres.

3.3. TRANSPORTATION

PVMC uses USFS roads ("Forest Roads" or FRs) to access the Pinto Valley Mine and various PVMC facilities on both patented and unpatented claims on NFS lands. Additionally, PVMC's predecessors constructed "temporary access roads" (TARs) on surrounding NFS lands, typically from existing FRs to access specific facilities either on private land or NFS lands. PVMC's use of FRs and TARs is described in this section; the alignments are depicted in **Figure 3-8** (see also **Appendix E, all Sheets)**. The *Road Use and Maintenance Plan* (**Appendix I**) describes these transportation routes in detail.

3.3.1. Forest Roads

A network of Forest Roads (FRs) extending north from US Highway 60 allows access to public lands and private property in the Pinto Valley and surrounding area. All of the FRs used by PVMC (**Figure 3-8**) are designated by the USFS for use by passenger cars or high clearance vehicles, or for basic custodial care (that is, administrative use only, closed to public). The public uses the FRs for recreation (e.g., off-road vehicle use) or to access points of interest in the Tonto National Forest such as Pinto Creek or Haunted Canyon, west of the Pinto Valley Mine.

3.3.1.1. Historical Use of Forest Roads by PVMC

PVMC and predecessors have used the FRs as thoroughfare to access proximate mine structures or appurtenant facilities and structures. In some cases, certain linear infrastructure such as electrical power lines or water pipelines follow FR alignments and are immediately adjacent to the FR travel way. The electrical power lines are described in **Section 3.4** and the water pipelines in **Section 3.5.1**.

Some of the FRs pass through PVMC's patented claims for Peak wells. Public access to these FRs through the private property has not been restricted. However FR 287B, a north-south road leading to the southeast corner of the Open Pit, has been blockaded at the intersection with FR 608, within

NFS lands. A predecessor owner installed a berm at this location to control public access to the Open Pit and prevent theft from the abandoned Castle Dome Mine facilities.

FR 287 has a unique role. FR 287 extends north 3.2 miles from US Highway 60 to the Pinto Valley Mine property as a paved two-lane road, then passes through the Pinto Valley Mine as an unimproved (dirt) road, and continues within the Tonto National Forest west and north of the mine. The paved segment was constructed in the mid-1970s around the Cottonwood Tailings Impoundment (see **Appendix D-5**) and is also known as Pinto Valley Mine Road.

3.3.1.2. Current Use of Forest Roads by PVMC

PVMC's current use of FRs is consistent with the historical use described above. All PVMC employees and contractors use FR 287 from US Highway 60 to access the mine. PVMC is in the process of negotiating with the USFS to secure a Road Rights-of-Way and Construction and Use Agreement in accordance with the Federal Roads and Trails Act (pursuant to implementing regulations at 36 CFR 212.9(d), Forest Service Manual 5400 Chapter 5467, and Forest Service Handbook 5409.17 Chapter 60) for use and maintenance of this segment of FR 287 to Maintenance Level 5, High Degree of User Comfort. Within the mine property, FR 287 is used by PVMC to access various mine facilities; while the public uses FR 287 to pass through PVMC property and, as mentioned above, access Pinto Creek and Haunted Canyon. The total length of FR 287 within the private PVMC property is currently 3.65 miles. The route through the private PVMC property is periodically altered to accommodate mine development, thus changing the length of this segment. PVMC maintains this segment and therefore it is part of this Plan of Operations. PVMC also uses the segments of FR 287 that continue west and north of the mine on federal land to access their facilities on patented and unpatented claims on NFS lands.

The measured total length of FRs currently used by PVMC (including the segment of FR 287 from US Highway 60 to the mine entrance) is 26.96 miles. PVMC intends to use the FRs through the duration of the current planned life of the mine (i.e., 2039).

3.3.1.3. Future Use of Forest Roads by PVMC

PVMC will continue to use the FRs to access mine facilities. The alignment of FR 287 through the private PVMC property may be altered periodically to accommodate mine development. No other changes to FRs used by PVMC are anticipated.

3.3.2. Temporary Access Roads

The Temporary Access Roads (TARs) were constructed by PVMC's predecessors to directly access mine facilities (earthwork structures, infrastructure, and environmental controls) both on private PVMC property and surrounding unpatented claims, principally for maintaining and monitoring the facilities. Most of the TARs extend from FRs to access nearby facilities. A typical TAR is shown in **Appendix F, Photograph 9**.

3.3.2.1. Historical Use of NFS Lands for TARs

Most of the TARs were constructed in conjunction with prior authorizations:

- POO-0002 (**Appendix B-4**) was authorized by the USFS in 1994 and includes construction of new service roads near TSF3;
- GLO-445302 (**Appendix B-7**) was authorized by the USFS in 1973 and includes construction of access roads to service electrical power lines for operation of wells on Peak mill sites;
- GLO-445303 (**Appendix B-8**) was authorized by the USFS in 1972 and includes construction of access roads to service water pipelines (e.g., the Burch pipeline, described in **Section 3.5.1.2**) for supplying water from the Diamond H pit at the Copper Cities facility and wells on Peak mill sites; and
- Tonto 468 (**Appendix B-9**) was authorized by the USFS in 1999 and includes 650 feet of roadway to service a water pipeline and electrical cables associated the Peak Well 37.

TARs associated with electrical power lines were typically constructed as short extensions from FRs to power poles, whereas TARs associated with water pipelines typically extend from FRs to follow the pipeline alignment and in some cases lead to well sites. Other TARs were constructed to lead to or around earthwork structures (such as the Open Pit, waste rock dumps, tailings impoundments, reservoirs) and environmental monitoring sites (monitoring wells, surface water discharge points, stormwater management and sampling sites, etc.). As appropriate (i.e., on steep slopes), erosion controls such as water bars, diversion channels, and culverts have been integrated in the TARs.

3.3.2.2. Current Use of NFS Lands for Temporary Access Roads

The TARs currently used by PVMC are described in detail in the *Road Use and Maintenance Plan* (**Appendix I**). Some TARs are no longer used and are not included in the *Road Use and Maintenance Plan*. The public does not use the TARs, but physical controls are not in place that will prevent public use.

The current measured total length of TARs used by PVMC on NFS lands is 14.89 miles.

3.3.2.3. Future Use of NFS Lands for Temporary Access Roads

Two new TARs on NFS lands are proposed around the Open Pit and TSF4 described in **Sections 3.1.1.3** and **3.2.3.3**, respectively. The total length of these new TARs on NFS lands will be approximately 3.1 miles. Conversely, some existing TARs will be subsumed by further expansion of the Open Pit, TSF3, and TSF4, as described in **Sections 3.1.1.3**, **3.2.2.3**, and **3.2.3.3**, respectively. The total length of the TARs that will be subsumed is 2.5 miles. At the end of active mining operations there will be approximately 15.49 miles of TARs on NFS lands. Based on an average width of 20 feet, the calculated disturbance area for the TARs is 30.4 acres.

3.4. UTILITIES

Electrical power to the Pinto Valley Mine is provided by Salt River Project (SRP) transmission lines, and delivered to usage sites by PVMC-owned distribution lines (**Appendix F, Photograph 10**) that cross both private PVMC property and NFS lands (**Figure 3-9**; see also **Appendix E, all Sheets**). SRP operates two substations at or near the Pinto Valley Mine: a substation on private PVMC property near the mill building supplies power to the Pinto Valley Mine, whereas a substation along FR 287 near the southeast corner of the Cottonwood Tailings Impoundment supplies power to the nearby Carlota Mine. Although the SRP substation for the Carlota Mine is near a PVMC facility, it does not supply electrical power to the Pinto Valley Mine and is therefore not included in this Plan.

3.4.1.1. Historical Use of NFS Lands for Electrical Power Lines

Three previous authorizations permitted use of NFS lands for the electrical power lines that distribute power from the SRP substation near the mill building, and the related TARs (described in detail in **Section 3.3.2**). The electrical power line-related components of the relevant previous authorizations are:

- GLO-445302 (**Appendix B-7**) was authorized by the USFS in 1973 (and amended in 1984) and allows operation and maintenance of 13.8-kV electrical transmission lines to power the Peak well system and the Burch pipeline booster station;
- POO-0002 (**Appendix B-4**) was authorized by the USFS in 1995 and allows electrical cables (on the ground surface) near TSF3; and
- Tonto 468 (**Appendix B-9**) was authorized by the USFS in 1999 and allows an electrical cable (on the ground surface) to Peak Well 37.

All of these authorizations also permitted TARs (**Section 3.3.2**). Two of these authorizations also permitted use of NFS lands for water pipelines (**Section 3.5.1**) that approximately follow the same alignments.

3.4.1.2. Current Use of NFS Lands for Electrical Power Lines

PVMC currently uses NFS lands for electrical power lines consistent with the authorizations listed above. Most of the electrical power lines follow various FR or TAR alignments, and overland lines are accessed by TARs, as described in **Section 3.3.2**. The land disturbance associated with the TAR alignments is described in that section and not repeated here. Similarly, one ground-mounted transformer on NFS lands, to support the pump at Cottonwood Reservoir, is adjacent to a TAR (**Figure 3-5**). The minimal footprints of the power poles, or electrical cables and the transformer on the ground surface, are incorporated in the land disturbance associated with the FRs or TARs and also not repeated here.

Most of the power lines supply electricity to power pumps in various "Peak" wells located northwest and west of the Pinto Valley Mine, or to support the conveyance of water in the Burch pipeline (**Section 3.5.1.2**) between BHP's Copper Cities Diamond H Pit facility east of the mine and the Cottonwood Tailings Impoundment. Other lines (i.e., those southeast of the Open Pit and east of TSF4) supply electricity to other pumps and equipment on the private PVMC property. Most of the electrical power lines are 13.8-kiloVolts (kV) and typically run from well site to well site, sometimes parallel to the roads. Two exceptions to the power line voltage are a 120/240-volt (V) line to Peak Well 9 and a 440-V line from the JH6 Ranch (formerly known as the Layton Ranch, on private PVMC property at the northwestern extent of the Pinto Valley Mine) to a pump at Peak Well 75. That well supplies water to the ranch, independent from the mine. No matter the voltage, electrical power is delivered via overhead lines supported by wooden poles and occasionally through cable lines that run on the ground surface along roadways. However, as mentioned in **Section 3.2.2**, the electrical cables that were placed along the edge of the road west of TSF3 have been abandoned. Only one ground-surface cable, 650 feet long, remains in active use. This cable supplies electricity to Peak Well 37, a potable water supply well southwest of the Pinto Valley Mine (**Section 3.5.1.2**).

The electrical distribution system also includes transformers to reduce the transmitted voltage. All of the PVMC transformers on NFS lands are pole mounted, except one located near the Cottonwood Reservoir. The pole-mounted transformers do not have any footprint on NFS land; as noted above the poles' minimal footprint is incorporated in the TAR disturbance area. The single transformer near Cottonwood Reservoir supplies electricity to the pump on the floating barge that extracts water from the reservoir for delivery to the ore processing system and a barge-mounted aerator. The disturbance area for this transformer is included in the area of the associated TAR (**Section 3.3.2**).

The total length of electrical power lines currently on NFS lands is 10.9 miles, with approximately 186 wooden power poles (some including pole-mounted transformers) supporting aerial lines.

3.4.1.3. Future Use of NFS Lands for Electrical Power Lines

Approximately 0.8 miles of the electrical infrastructure will be subsumed by the proposed further development of the Open Pit and TSF4 discussed in **Sections 3.1.1.3** and **3.2.3.3**, respectively. The only power line PVMC intends to add on NFS lands is for continued operation of the TSF4 reclaim barge as the supernatant pond extends up Eastwater Canyon in a southeasterly direction. The alignment of this power line has not been determined; it is assumed that the alignment will approximately follow the existing alignment of the power line from the private PVMC property to the TSF4 footprint, but for an unknown length. For the purposes of this Plan, it has been assumed that the new power line length will be approximately the same as the removed power line length. This change to the infrastructure may include relocation of existing backup generators (that are currently on private PVMC property) onto NFS lands near the reclaim barge. The total length of electrical power lines on NFS lands at the conclusion of active mining operations of 10.9 miles.

As described in **Section 3.2.2.3**, the TSF3 reclaim barge pump may also extend onto NFS lands as this facility is further developed.

3.5. WATER USE AND TREATMENT

PVMC maintains a complex system to supply, use, recycle, and manage water at the Pinto Valley Mine. This section describes the water supply system and stormwater management facilities on NFS lands.

3.5.1. Water Supply System

PVMC consumptively uses water for processing ore as well as for personnel use on private PVMC land. Certain components of the water supply and water management system are on or cross NFS lands. With one exception (Peak Well 37), the active sources for the water supply system are on private land (patented mill site claims). Pipelines cross NFS lands to transport the water to the Pinto Valley Mine, as well as Peak Well 37, a potable water storage tank and an emergency (fire) water tank, and water reservoirs. The pipelines generally follow various road alignments, as described in **Section 3.3**; the land disturbance associated with the road alignments is described in that section and not repeated here.

3.5.1.1. Historical Use of NFS Lands for Water Supply Systems

Five previous authorizations permitted use of NFS lands for the water pipelines and related roads (**Section 3.3**). The water-related land use authorizations and specific components are:

- PHX-080742 (**Appendix B-1**) was authorized by the BLM in 1944 and allowed a tailings slurry pipeline and a return water pipeline in a 20-foot wide right-of-way, as well as the Cottonwood Reservoir;
- PHX-080933 (**Appendix B-2**) was also authorized by the BLM in 1944 and allowed a water pipeline in 20-foot wide right-of-way and the Mine Reservoir;
- GLO-445303 (**Appendix B-8**) was authorized by the USFS in 1973 and allowed construction, operation, and maintenance of pipelines associated with the Peak well system, the Burch pipeline, and a concentrate line, as well as a booster station for the Burch pipeline; and
- Tonto 468 (**Appendix B-9**) was authorized by the USFS in 1999 and allowed a 100-foot by 100-foot water well site (Peak Well 37) and a pipeline.

The Cottonwood Reservoir is the primary water storage facility for the Pinto Valley Mine and is situated on unpatented claims on NFS lands. The reservoir was originally merely the supernatant pond of the Cottonwood Tailings Impoundment and a decant tower was used to recover water for use in the mill. The reservoir was isolated from the impoundment in the mid-1970s. As described in the technical memorandum provided in **Appendix D-5**, an embankment was constructed atop tailings at the upstream extent of the Cottonwood Tailings Impoundment. The crest of the berm when constructed was approximately 35 feet above the tailings level at that time. In anticipation of tailings backfilling against the embankment, a drainage blanket constructed of sand and gravel was placed on

the downstream portion of the dam to control seepage and to reduce piping. The upstream face of the dam was covered with a riprap layer of cobbles and boulders.

The Mine Reservoir is a water storage facility that, along with its associated pipeline, is situated within NFS lands but not on any unpatented claims. The Mine Reservoir provided water storage for the now-abandoned Castle Dome Mine. It was constructed in 1944 as a concrete-lined 2.32-acre pond that was supplied by a 16- to 18-inch diameter steel pipeline lying on the ground surface. The pipeline originated on private property at an unspecified mine site east of the Pinto Valley Mine, followed Liveoak Gulch, crossed overland through Barney Canyon, entered NFS lands and then followed the Little Pinto Creek Canyon to the reservoir (USGS 1945). This pipeline was abandoned and removed sometime after the Burch pipeline (described below) was constructed in the mid-1970s. A second 16- to 18-inch pipeline was constructed to convey water from the reservoir to the Castle Dome Mine, following the alignment of FR 287B. This second pipeline is still in place and is buried for its entire length; it is on NFS lands until it enters private PVMC property near the Open Pit (see **Section 3.1.1**).

The Peak well system was developed beginning in the mid-1970s to provide much of the water used at the site, which is transported to the mine site via surface and buried pipelines (**Figure 3-11**). With one exception (Peak Well 37, described below), the active Peak wells were installed on patented mill site claims. **Table G-2** in **Appendix G** lists the Peak wells and associated claims, indicating if the claims are patented or unpatented. NFS lands were used for pipelines to deliver water from the Peak well system to the Pinto Valley Mine site. The pipelines supporting the Peak well system were constructed following existing FRs; in some locations new TARs were built to access well sites and provide a corridor for associated water pipelines.

The Burch pipeline was constructed in 1973 or 1974 to provide water for storage in the Cottonwood Reservoir or directly to the Pinto Valley Mine mill for immediate use. The Burch pipeline runs from the Diamond H Pit across private property, entering NFS lands near Webster Gulch where Little Pinto Creek joins Webster Gulch. The alignment extends up to Little Pinto Creek Canyon to the Mine Reservoir (the upper reach of this segment parallels the original pipeline to the Mine Reservoir in the latter's alignment through Little Pinto Creek Canyon). From the Mine Reservoir the Burch pipeline follows a TAR to Pinto Valley Mine. Various segments of the 16- to 18-inch diameter pipeline were constructed of carbon steel and polyethylene pipe. Steel segments were typically elevated above ground surface with wooden cribbing, whereas polyethylene segments were placed directly on the ground surface. A booster station for the Burch pipeline was constructed along the alignment, but was removed in the 1980s. Various segments of the original pipe have since been replaced when needed (i.e., as a result of wear or weathering) with steel or high density polyethylene (HDPE) pipe.

A second pipeline follows the Burch alignment, on private property and NFS lands. This buried 4-inch diameter steel pipeline was used to transport copper concentrate slurry from the Pinto Valley Mine concentrator to the Miami Unit for smelting and refining between 1974 and 1997. The pipeline was

unused during a curtailment period until 2007, and then abandoned altogether after a filter plant and concentrate storage facility were constructed at Pinto Valley Mine.

Peak Well 37 is situated on an unpatented mill site claim, "Peak 94," near the western boundary of the private PVMC property. The well was drilled in 1999 on a 100- by 100-foot pad to supply potable water for personnel at the mine. A water pipeline and an electrical power line were installed from the well approximately 650 feet to the Pinto Valley Mine boundary, and enter the on-site infrastructure network.

Two other components of the water supply systems were constructed on NFS lands within the footprint of the area authorized by the Plan of Operations for 19 Dump (POO-003; **Appendix B-5**). Two water storage tanks are situated on unpatented claims near the 19 Dump: an 110,000-gallon steel-walled potable water tank and a 650,000-gallon steel-walled fire/service water tank. Both tanks are above-ground installations resting on concrete foundations.

3.5.1.2. Current Use of NFS Lands for Water Supply Systems

The major components of the PVMC process and potable water supply and water management system are depicted in a schematic as **Figure 3-10**. Most of the components described above are currently in use, but some have been modified from the original design or have been removed.

Cottonwood Reservoir (see **Appendix E, Sheet 9**) functions as originally designed, providing the primary water storage for the Pinto Valley Mine. Currently, Cottonwood Reservoir has a capacity of approximately 1,470 acre-feet. The crest elevation of the embankment is 4,023 feet amsl and the reservoir has a maximum depth of 61 feet. The actual footprint of Cottonwood Reservoir is currently 32.8 acres.

The reservoir continues to serve as a collection and retention point for water from both on- and off-site sources, including surface drainage, Peak wells, the Old Dominion Shaft, Diamond H Pit, mine pit dewatering operations, and various collection ponds, basins, and ditches associated with mining operations. Most water to the Cottonwood Reservoir is delivered via the Burch pipeline, with additional water delivered by a second pipeline from the Open Pit. Both of these pipelines terminate approximately 800 feet away from the reservoir, discharging to a channel adjacent to the 19 Dump. Water flows overland down the channel to enter the reservoir near the toe of 19 Dump. Water is also supplied from Upper Tule Pond (partially on NFS lands) and Upper Catchment Pond (on private PVMC property). The portion of Upper Tule Pond on NFS lands measures 1.54 acres. HDPE pipelines from these ponds deliver water directly to the reservoir, following the northern edge of the Cottonwood Tailings Impoundment and discharging into the northwestern corner of the reservoir. A pump barge is anchored near the northwestern corner of the reservoir and supplies water to the mill for ore processing via HDPE pipelines on the ground surface. An aerator barge is anchored near the center of the reservoir.

Water to the Mine Reservoir (see **Appendix E, Sheet 6**) is now supplied by the Burch pipeline. A Tee-junction in the Burch pipeline allows a portion of the flow to be diverted to the Mine Reservoir. A 6-inch diameter HDPE pipe taps the Burch pipeline and an inline valve is manually opened to fill the Mine Reservoir as needed. This water is stored temporarily in the reservoir and eventually used for dust control on haul roads in the Open Pit or waste rock dumps whose runoff reports to the Open Pit. The water flows out of the reservoir by gravity in a steel pipeline leading north, along an abandoned section of FR 287B (see **Section 3.3**) to one of two water stand dispensers on the southeastern side of the Open Pit (see **Section 3.1.1**). The Mine Reservoir occupies 2.32 acres of NFS lands.

The Peak well pipeline system (see **Appendix E, Sheets 1 through 5, 7 and 10 Views A and C**) also continues to function as designed, although two original pipeline segments are currently abandoned and will be removed as described in **Section 3.5.1.3**. The Burch pipeline (see **Appendix E, Sheets 6 and 8**) also functions as originally designed, although as noted above some pipeline segments have been replaced when needed. The foundation for the booster station still exists. The segment of the Burch pipeline that leads to Cottonwood Reservoir does not extend the full distance, but rather it terminates a short distance downstream of a pipe Tee and discharges to a channel above the reservoir, then flows overland from there approximately 800 feet to the reservoir. The pipeline segment from the Tee to the mill continues uninterrupted to the mill.

Flow in the Burch pipeline currently ranges from 1,500 to 1,700 gpm but can accommodate flows in excess of 3,300 gpm, and is continuously monitored by a series of flow meters along its length. Flow meters include one on BHP's Copper Cities Mine property, one between the Tee and the Mine Reservoir, and one on private PVMC property before the pipe Tee and valves that allow the flow to be directed to Cottonwood Reservoir or the mill. A discrepancy of greater than approximately 3 percent in the measured flow rate between water sent and water received triggers an alarm on a continuously monitored control panel. Operators are trained to then dispatch personnel to investigate or shut down the pipeline. The entire length of the Burch pipeline on NFS lands is also visually inspected daily.

The concentrate pipeline is still in place but, as noted above, was abandoned in 2007. The majority of the pipeline remains buried alongside and beneath the Burch water pipeline, although small segments have been removed.

Peak Well 37 (see **Appendix E, Sheet 7**) is still used as potable water supply for Pinto Valley Mine. The TAR to the well site includes stormwater BMPs (such as water diversion bars, culverts, and erosion-control features). Water from the well is delivered to the mine via an HDPE pipe, approximately 650 feet of which crosses NFS lands. Electricity for the well pump is provided via an above ground electrical cable also approximately 650 feet long and following the same alignment as the pipeline. The use of NFS lands for the pipeline and electrical cable is included in the area for the

TAR. The area encompassed by the Peak Well 37 parcel alone measures 1,000 square feet, or 0.02 acres.

The potable water tank (see **Appendix E, Sheet 8**) is currently supplied with water from Peak Well 37 via the associated pipeline described above. The fire/service water tank is supplied by water from the Peak well system, transported via the associated pipelines. The fire/service water tank is engineered so that service water is only extracted from the upper half of the tank, always leaving the lower half in reserve for emergency fire suppression. Maintenance activities include periodic cleaning, painting, and replacing valves, piping, and lights. The two tanks occupy an area of approximately 0.2 acre.

3.5.1.3. Future Use of NFS Lands for Water Supply Systems

PVMC does not plan to significantly alter the water supply systems as part of the current mine plan but will replace pipe segments in the Peak and Burch pipelines as needed. The replacement segments may vary in material (steel or HDPE) and diameter (i.e., 12-, 16-, 18-inch, etc.) from the current arrangement. During any pipeline replacement actions, adjacent FR or TAR roadway berms and drainage channels will be restored to minimize erosion.

PVMC will continue to use the Cottonwood Reservoir as the principal water storage facility for the Pinto Valley Mine throughout active mining operations.

With the exception of removing two segments described below, PVMC does not plan to significantly alter the Peak well pipeline system in support of active mining operations. PVMC does intend to re-install a 6- to 12-inch diameter HDPE pipeline to Peak Wells 11 and 13, adding 1.9 miles to the current Peak well pipeline system (**Figure 3-11**).

Two water pipeline segments, extending southeast from Peak Well 21 along FR 2500 and FR 2501, and south along FR 312 near Peak Well 14 are no longer in use and will be removed upon approval of this Plan. The first segment of abandoned pipeline proposed for removal consists of a 4,850-foot long 12-inch diameter carbon steel pipe which extends from Peak Well 21 to the southeast. The segment of abandoned pipeline proposed for removal near Peak Well 14 consists of a 3,000-foot long 12-inch diameter carbon steel pipe. **Figure 3-11** shows the pipelines proposed for removal in dashed blue lines. All removal activities will occur within a narrow path (< 12 feet wide) along the pipeline. The pipe will be field-cut to lengths that allow for safe extraction and minimal disturbance to surrounding ground and vegetation. Where possible, the pipe lengths will be hoisted by boom truck or other means and loaded onto a flatbed where they will be secured for transport. Where necessary, the pipe lengths will be winched or dragged to the nearest access point where they can be hoisted and placed on a flatbed truck or trailer for transport. The removed carbon steel pipelines will be recycled as scrap metal. HDPE pipe will be recycled or disposed of in a local landfill. Following removal, any disturbed areas will be reclaimed as described in the Reclamation Plan (**Chapter 6**). Should any stray

pipe segments be discovered on NFS land, they will be removed in a similar manner and any disturbed areas will be reclaimed, also in a similar manner as described above.

PVMC intends to continue to use the Burch pipeline to supply water to the Pinto Valley Mine from the BHP Copper Cities Mine. The Mine Reservoir and associated pipelines will continue to provide water for dust control throughout active mining operations. The northernmost segment of the pipeline between the Mine Reservoir and the water fill stations will be relocated to accommodate the expanded Open Pit, as describe in **Section 3.1.1.3**. Portions of the abandoned concentrate line may be removed during the Burch pipeline maintenance and replacement noted above.

PVMC will continue to use Peak Well 37 as a potable water source for the Pinto Valley Mine throughout active mining operations. PVMC also intends to continue to use the potable and service/fire water tanks for water storage for the Pinto Valley Mine throughout active mining operations.

With the two additional segments to Peak Wells 11 and 13, and removed segments to Peak Wells 14 and 21, the total length of the PVMC pipeline system will be 17.9 miles. The total area of PVMC ponds and reservoirs (excluding certain stormwater ponds, as described below) on NFS lands will be 38.62 acres.

3.5.2. Stormwater Management

Based upon the site-wide SWPPP for the Pinto Valley Mine, PVMC has developed a summary of stormwater management in discharging basins with industrial activities on NFS lands (**Appendix H**). For non-discharging basins, such as the Open Pit, stormwater is currently managed by a series of channels and ponds to direct flow away from mine facilities and, where feasible, collect stormwater for use in the service water circuit.

Three stormwater ponds not within the footprints of any other facilities described in this Plan are used for stormwater management. A portion of Pennell Pond, near the southwestern corner of the Open Pit, occupies approximately 0.26 acres of NFS lands. Two evaporation ponds outsides of the southwestern corner of the Cottonwood Tailings Impoundment footprint lie entirely on NFS lands, and measure approximately 1.70 acres. These ponds will continue to function as part of the site-wide stormwater management program. Other PVMC stormwater ponds on NFS lands will be subsumed by expansion of the Open Pit.

3.6. WORKFORCE AND SCHEDULE

PVMC maintains a work crew of approximately 600 employees at the Pinto Valley Mine. The mine normally operates 24 hours per day, 365 days per year. Security staff are also on-site 24 hours per day, 365 days per year. This work force and schedule will be continued throughout active mining operations.

3.7. SUPPORT FACILITIES

Special Use Permit GLO-445301 (**Appendix B-6**) was issued by the USFS in 1991 to allow the installation and maintenance of a sign identifying the Pinto Valley Mine on NFS lands at the corner of US Highway 60 and FR 287 (see **Appendix E, Sheet 10 View D)**. The sign is a non-illuminated company identification sign that is 16 feet long, 8 feet high, and 2 feet wide. The footprint occupied by the sign measures less than 0.01 acre.

PVMC intends to continue to use the Pinto Valley Mine sign throughout active mining operations.

3.8. EQUIPMENT

The equipment that may be used for activities covered under this Plan is listed in **Table 3-1**. The listed equipment represents the fleet from which individual vehicles will be selected as needed; this fleet of equipment will never all be on NFS lands at the same time. Other equipment may be used as needed, but is not expected to vary significantly from this list.

Table 3-1 Equipment List

Earthmoving Equipment	Make and Model (or similar)	Maximum Quantity
Track dozer	Caterpillar D4, D6, D7, D7 Wide Track, D9N, D10T, D10R	3
Wheel dozer	Caterpillar 834 RHD	2
Trackhoe	Caterpillar 326	1
Backhoe	Case 580; Caterpillar MU BH397, 426C, or 420F	1
Drill rig	Caterpillar 5150 or 6420	4
Blasthole rig	Caterpillar MD6420	3
Hydraulic Front Shovel	Hitachi EC5600	2
Front-end loader	Caterpillar 950-966, 980, or 994; Komatsu SH3N77	3
Excavator	Caterpillar 336 or Komatsu 380 (with or without thumb)	1
Motor grader	Caterpillar 140-16, 16M, or 16G, Ripper MU	2
Truck-mounted crane	F800, PB348, 14-ton	7
Swing-cab crane	20-, 60-, 80-, and 120-ton capacity (make and model unspecified)	3
Crawler crane	80-ton capacity with 80-foot lattice boom and 30-foot jib (make and model unspecified)	2
Haul truck	Caterpillar 789; Komatsu 21 or 28	18
Dump truck	Chevrolet or Kodiak (model unspecified)	4
Boom truck	20 ton crane	1
Water truck	Caterpillar 777G	2
Water truck	4,000-gallon capacity (make and model unspecified)	2
Utility vehicle and trailer	80,000-pound capacity telescoping forklift (make and model unspecified); 24-ton trailer (make and model unspecified)	1
Fuel/lube truck	Caterpillar 777G	1
Pick-up truck	Ford F150	8

3.9. SANITARY AND SOLID WASTE

Sanitary and solid waste are managed on private PVMC property; no sanitary or solid waste is disposed of on NFS lands by PVMC.

3.10. HAZARDOUS MATERIALS AND HAZARDOUS WASTES

Hazardous materials and hazardous wastes are managed on PVMC private property; no hazardous materials or hazardous wastes are stored or disposed of on NFS lands by PVMC. Certain regulated materials, such as petroleum-based fuels and lubricants, are used in PVMC mobile and fixed equipment on NFS lands. Equipment using fuels and lubricants is inspected and maintained on a regular basis to ensure that leaks and spills are avoided. Spill containment kits are readily available to use in the event of an emergency. PVMC personnel are trained to recognize, contain, clean-up and report spills of hazardous materials, hazardous wastes, and petroleum products. Spills on NFS lands that exceed NFS imposed reporting thresholds will be reported as directed.

CHAPTER 4. ENVIRONMENTAL PROTECTION MEASURES

This chapter presents the environmental protection measures that PVMC has implemented or will implement to reduce or eliminate effects to resources that may result from their activities on NFS lands related to operating the Pinto Valley Mine.

4.1. ENVIRONMENTAL PROTECTION PROGRAM

4.1.1. Objectives, Standards, and Thresholds of Concern

PVMC's environmental protection program is predicated on operating in compliance with relevant federal and state regulatory programs, and in particular permits and authorizations in place for the Pinto Valley Mine. **Table 1-3** lists the permits and authorizations under which PVMC operates. PVMC's objective is to maintain compliance with these permits and authorizations. The primary regulatory requirements are specified in the area-wide Aquifer Protection Permit (and associated *Closure and Post-Closure Strategy* [SRK 2016b]), the *2016 Mined Land Reclamation Plan* (SRK 2016a), the individual AZPDES permit, and the Class II Synthetic Minor air permit. The *Mined Land Reclamation Plan* and the *Closure and Post-Closure Strategy* describe the mine closure requirements that apply to the entire site; the portions of those plans applicable to PVMC's activities on NFS lands are described in **Chapter 6**.

The area-wide APP and Class II Synthetic Minor permits include terms and conditions that specify how groundwater and air quality will be protected by certain design, operation, monitoring, and response requirements. Other permits, also listed in **Table 1-3**, have narrower geographic applicability but are no less important to PVMC's compliance program.

PVMC's thresholds of concern are the numeric and narrative standards specified in permits or authorizations, or that are incorporated in laws and regulations, or are good engineering design or industry practice. Each of the resource-specific sections in this Chapter identify the relevant standards.

4.1.2. Proposed Methods

PVMC maintains a robust compliance program to ensure that all permit and authorization requirements are met. The Health, Safety, Environment, and Community (HSEC) Department is responsible for maintaining compliance. Compliance manuals document protocols that PVMC personnel use to protect resources, and agency reporting requirements ensure that environmental conditions are known.

In regard to PVMC's use of NFS lands PVMC will communicate and coordinate with the USFS Tonto National Forest on a regular basis and as needed should special situations arise.

4.1.3. Monitoring Methodology

PVMC monitors their activities on NFS lands according to a specified schedule and protocol. Certain facilities, such as the Burch pipeline, are inspected daily by appropriately qualified personnel. Other resources are monitored weekly, monthly, quarterly, or annually, pursuant to permit requirements such as the APP. Relevant monitoring requirements are summarized in the resource-specific discussions below.

4.2. GEOLOGY

The PVMC facilities on NFS lands of concern with regard to impacts to geology are:

- Open Pit;
- 19 Dump;
- Cottonwood Tailings Impoundment;
- Tailings Storage Facility No. 3 (TSF3); and
- Tailings Storage Facility No. 4 (TSF4).

The geology underlying these facilities comprises metamorphic and crystalline igneous bedrock, sedimentary formations, volcanic ash flow tuff, conglomeratic basin-fill formations, and recent colluvium and alluvium (**Figure 2-4**).

PVMC manages the five facilities listed above in accordance with good engineering practice. Stability analyses are conducted as needed. The Open Pit is designed taking into consideration the integrity of the overburden and ore removed, based on geotechnical information obtained from boreholes and analyzed by geotechnical experts. A stability analysis of the Cottonwood Tailings Impoundment and the 19 Dump was completed in 2013 (**Appendix D-2**). The Cottonwood Tailings Impoundment, TSF3, and TSF4 are inspected and assessed for stability quarterly and annual reports are prepared by a third party. Further development of TSF3 and TSF4 includes raising the embankments; these facilities were designed by Amec Foster Wheeler taking into consideration geotechnical characteristics of the tailings, the position of the facilities on the land, and underlying geologic characteristics (e.g., seismic stability).

4.3. WASTE SEGREGATION AND MANAGEMENT

PVMC does not dispose of solid waste, special waste, or hazardous waste on NFS lands. Waste rock and tailings are exempted from waste management regulations. Solid waste generated by any activities covered under this Plan will continue to be disposed of in a manner consistent with applicable local, state, and federal regulations. PVMC may manage materials on-site in its permitted non-municipal solid waste landfill, or elect to have wastes transported to offsite disposal sites. With the exception of petroleum products for powering, lubricating, or cooling motor vehicles or transformers, no regulated, hazardous, or toxic substances are or will be used on NFS lands in any of the activities described in this Plan.

4.4. AIR

Federal agencies have established ambient air quality standards to regulate air quality. Meeting the federal standards has, in some cases, been delegated to state or county agencies. The U.S. Environmental Protection Agency (EPA) has issued National Ambient Air Quality Standards (NAAQS) for seven "criteria pollutants": carbon monoxide (CO), sulfur dioxide (SO_2), particulates with an aerodynamic diameter less than or equal to a nominal 10 µm (PM_{10}), particulates with an aerodynamic diameter less than or equal to a nominal 2.5 µm ($PM_{2.5}$), ozone (O_3), nitrogen dioxide (NO_2), and lead (Pb). The Clean Air Act requires that each state develop a State Implementation Plan (SIP) describing how these standards will be met. Geographic areas in which air quality meets the NAAQS set for each pollutant are considered in "attainment," whereas areas where such standards are not met are designated as "non-attainment" areas. Once an area is redesignated to attainment, it then qualifies as a "maintenance" area. The state is required to document continued compliance of maintenance areas with NAAQS. In Arizona, air permitting and the development of SIPs is generally regulated by the ADEQ under the EPA's delegation of authority to the states.

In addition to implementing NAAQS for criteria pollutants, the EPA regulates stringent visibility standards for 156 national parks and wilderness areas designated by Congress as Class I areas (ADEQ 2011). The Clean Air Act mandates the reduction of man-made visibility impairment in all Class I areas for the protection of their scenic values. To reach national visibility goals, the EPA has adopted Regional Haze Rules requiring states to develop a SIP aimed at reducing emissions from sources that have the potential to contribute to visibility impairment in Class I areas (ADEQ 2011).

Pinto Valley Mine is located within non-attainment areas for SO_2 and PM_{10}. The primary NAAQS for SO_2 is 75 parts per billion in a 1-hour period, at the 99th percentile of 1-hour daily maximum concentrations averaged over 3 years.[6] The secondary standard for SO_2 is 0.5 parts per million in a 3-hour period, not to be exceeded more than once per year. The NAAQS for PM_{10} is 150 µg/m^3 for a 24-hr average concentration. The standard is met when the expected number of days per calendar year within a 24-hr average concentration above 150 µg/m^3 is equal to or less than one (second-high value).

4.4.1. Operating Permit Thresholds

The Pinto Valley Mine is currently operating under a Class II "synthetic minor" air quality control permit (No. 54118) issued by the ADEQ Air Quality Division and last updated on April 6, 2015. The facility operates in compliance with the permit requirements. The facility has the potential to emit, without controls, more than 100 tons per year (tpy) of particulate matter. Under the Class II synthetic minor permit, PVMC operates within voluntarily accepted and federally enforceable emission and operating limits and air pollution control requirements. Emission levels under this permit must stay below the major source threshold.

6 https://www.epa.gov/criteria-air-pollutants/naaqs-table

4.4.2. Control Measures

PVMC monitors air quality in accordance with the permit requirements and will continue to do so through the life of mine. Specific parameters relevant to air quality on NFS lands include bi-monthly opacity monitoring. The *Pinto Valley Mine Visual Observation Plan* includes opacity protocols. PVMC has also prepared a *Fugitive Dust Control Plan* for the Pinto Valley Mine that details reasonable precautions for limiting fugitive dust and provisions for reporting excess emissions. Both of these plans address dust that may be generated by mining activities. PVMC controls dust that may be generated from large earthen facilities by rock armoring or revegetating inactive surfaces, applying wet tailings to active tailings impoundments, regularly watering haul roads, and applying dust suppressant to heavily traveled access roads (including an unpaved portion of FR 287 through private PVMC property between the Pinto Valley Mine entrance and TSF3).

PVMC's use of TARs on NFS lands to access mine facilities or appurtenant infrastructure may generate dust from vehicle travel or high winds during dry conditions. The *Fugitive Dust Control Plan* specifies that water trucks will be dispatched and unpaved roads will be watered if excessive dust is encountered; however water is not applied to any road surfaces off private PVMC property. Some weather conditions during the summer months, such as low humidity and high winds, require a higher water frequency. The frequency and amount of water application is adjusted depending on weather conditions. PVMC relies on the facility's weather stations to provide a record of daily precipitation and humidity, high and low temperature, wind speed and direction readings, and dew point.

4.5. WATER

4.5.1. Design Standards for Discharging Facilities

Certain facilities at the Pinto Valley Mine that may discharge potential pollutants to surface water or groundwater are regulated by ADEQ under both the AZPDES and APP programs. The AZPDES permit requires PVMC to operate with BMPs to minimize and/or eliminate discharges and to review its BMP Plan at least annually. The AZPDES Stormwater MSGP requires that operators prepare a SWPPP that addresses inspections of the facilities within the watershed basins, outfall sampling, and compliance reporting. The BMPs and SWPPP are updated as needed to ensure impacted water is not released to surface water resources during routine operations or temporary construction activities.

The APP program dictates design standards and requires engineering controls and management practices for facilities that may discharge pollutants to groundwater. The APP design, operations management, and engineering control standards are referred to as "best available demonstrated control technology" (BADCT). For PVMC facilities on NFS lands, BADCT engineering controls to minimize degradation to groundwater and surface water resources consist of the following components:

- Open Pit
  - Maintain pit lake elevation below 3,450 feet amsl; and
  - Manage potential erosion of south pit walls from stormwater runoff from the upstream hillsides via system of ponds and ditches.
- 19 Dump
  - Regrade slopes disturbed by reclamation activities to ensure stability; and
  - Capture stormwater runoff in Cottonwood Reservoir.
- TSF3
  - Design, construct, and operate dam and impoundment to meet factor of safety criteria for pseudo-static and static conditions;
  - Monitor dam stability via physical inspections and piezometer network;
  - Optimize beach widths to enhance dam stability;
  - Minimize size of supernatant pond by constant recycling of water to mill; and
  - Capture TSF seepage and stormwater runoff via pumps, caissons, collection drains, ditches, and tanks for re-use in mill.
- TSF4
  - Design, construct, and operate dam and impoundment to meet factor of safety criteria for pseudo-static and static conditions;
  - Monitor dam stability via physical inspections and piezometer network;
  - Optimize beach widths to enhance dam stability;
  - Minimize size of supernatant pond by constant recycling of water to mill; and
  - Capture seepage and stormwater runoff through toe drains, ditches, and inception ponds for re-use in mill.
- Cottonwood Reservoir
  - Design and construct to minimize infiltration and seepage.
- Upper Tule Pond
  - Design and construct to minimize infiltration.

The APP program also regulates routine physical inspections and maintenance to ensure integrity of stormwater ponds, berms, diversion channels, and other surface water drainage features. Selected surface water management facilities on NFS lands are operated and maintained in accordance with the *Pinto Valley Catchment Ponds O&M Manual* including:

- Cottonwood Tailings Dam
- Cottonwood Reservoir
- Cottonwood Seepage Collection System
- Upper Tule Pond

The routine inspections and maintenance mandated by the AZPDES and APP programs (summarized below) address signs of substantial erosion, cracking, piping, sloughing, seepage from dams and berms,

impairment to access and/or embankment stability. Freeboard must be maintained in ponds and with proper pump operation and structural integrity at the pump locations, valves, and structures. The PVMC stormwater management facilities are designed to meet, at a minimum, the 100-year, 24-hour storm event capacity or flow requirements. The *Pinto Valley Catchment Ponds O&M Manual* provides specifics on the pumps and back-up power sources, as relevant, at each location and specifies water handling procedures during normal and abnormal operating conditions.

4.5.2. Monitoring Requirements for Surface Water Facilities

The monitoring schedule and general requirements for the surface water management facilities (impoundments, ponds, and reservoirs) are:

- Daily
  - Visual over-all observation of each site. Pump and discharge condition, adequate capacity in ponds, normal power source available and mechanical conditions of pumps are some of the parameters inspected.
  - Inspection criteria are recorded on daily pump man reports.
- Weekly
  - Emergency generators and diesel pumps are started and checked for reliability.
  - Inspections include sluffing of dams, cracking, vegetation growth, subsidence, etc. Inspection criteria are recorded on weekly APP reports.
- Monthly
  - On the last day of each month all pumps have their ending hour meter read, and at this time all pumps are started and run to ensure that all systems do start.
  - Surge capacities of all environmental containments are inspected and evaluated to ensure that BMPs are at 100 percent of capacity.
  - Inspection criteria are recorded on end of month reports, and end of month hours and surge capacity reports.
- Quarterly
  - Assess water level, surge capacity and freeboard.
- Annually
  - Siltation assessed at each surface water facility.

Specific inspection and maintenance protocols for rainfall events over 3 inches in 24 hours are:

- Assess water level, surge capacity and freeboard after rainfall events of over 3 inches in 24 hours. Document and report to HSEC Department. Restore required capacity as soon as practical.
- Assess siltation and remove solids to restore liquid storage capacity to greater than 80 percent of the required design volume.

Each pond marker staff has two band markings: a green band that indicates the maximum BMP Level, and black and a white striped band that indicates the BMP volume plus 25 percent. The latter marker indicates the elevation at which clean out is initiated.

Any malfunctions or problems found are submitted as work orders to the Maintenance Department. These work orders are prioritized as to the ranking and importance of each pumping facility.

4.5.3. Erosion Control Plan

Erosion control is accomplished in accordance with the site-wide SWPPP. The APP also requires routine inspections to review facilities for substantial erosion and maintenance to keep water catchment or water draining facilities free of debris, sediment, and obstructions caused by stormwater flow and erosion. Industry standard BMPs are implemented to control erosion. For the PVMC facilities on NFS lands, these practices include:

- Open Pit
  - Minimizing run-on into the Open Pit by collecting stormwater in retention ponds situated in drainages upgrade of the Open Pit.
- 19 Dump
  - Controlling erosion by slowing runoff with shallow berms placed in parallel rows on the top surfaces.
- Cottonwood Tailings Impoundment
  - Maintaining soil for vegetation or rock armor on the top surface and embankment faces.
  - Directing flow to settling or evaporation ponds in the southeastern and southwestern corners.
- TSF3
  - Managing run-on in the supernatant pond, which is reclaimed for use in the process water circuit.
  - Collecting embankment run-off in a sediment trap excavated adjacent to the embankment.

All of these facilities except Cottonwood Tailings Impoundment are situated in non-discharging stormwater basins. As explained in **Section 3.2.1.2**, stormwater discharges from Cottonwood Tailings Impoundment only in extreme events; the typical circumstance results in stormwater evaporating or infiltrating.

These practices will be continued through conclusion of active mining operations, except that some of the stormwater ponds near the Open Pit will be subsumed by further development of that facility. Additionally, TSF4, which currently does not extend onto NFS lands, will be added to this list. Erosion control for the portion of TSF4 that will extend onto NFS lands will be similar to that for TSF3. Run-on stormwater is already managed in the supernatant pond and reclaimed for use in the process water circuit.

Appendix H provides a summary of stormwater controls for PVMC's industrial activities in basins on NFS lands that discharge stormwater.

4.5.4. Water Quality Monitoring

This section describes surface water and groundwater quality monitoring pursuant to existing permits and authorizations.

4.5.4.1. Surface Water Quality

Surface water quality monitoring will be accomplished according to the MSGP for stormwater (Sectors G and J), AZPDES individual permit, and SWPPP requirements at designated outfalls and monitoring points.

4.5.4.2. Groundwater Quality

Groundwater protection in Arizona is regulated under ADEQ's APP program. PVMC holds area-wide APP No. P-100329, which was first issued in September 1996 and most recently amended in October 2015. The area-wide APP covers all contiguous land owned or controlled by PVMC for the Pinto Valley Mine, including the mining and processing areas that extend, or are planned to extend, onto NFS lands. Per the APP, groundwater monitoring infrastructure includes nine groundwater point of compliance monitoring locations, two spring point of compliance monitoring locations, and three alert level groundwater/seep/spring monitoring locations, none of which are present on NFS lands.

The APP requires compliance groundwater sampling at three frequencies: routine (quarterly), biennial (every 2 years), and contingency (following an Aquifer Quality Limit exceedance). Analytical results are submitted to ADEQ on Self-Monitoring Report Forms. PVMC will continue groundwater sampling from wells on private PVMC property in accordance with the permit requirements through the life of mine and through the required post-closure period. There will be no distinction for groundwater quality or quantity monitoring requirements of PVMC facilities on NFS lands.

4.5.5. Sediment Monitoring

Sediment monitoring will be accomplished according to the site SWPPP requirements at designated monitoring points. As described in the summary prepared for the PVMC facilities on NFS lands, there will be no distinction for sediment monitoring requirements of these facilities as compared to those on private PVMC property.

4.5.6. Point Source Discharge Monitoring

Seepage and stormwater runoff discharges are monitored in accordance with Pinto Valley Mine's AZPDES permits. Surface water monitoring is mandated by a facility-specific AZPDES individual permit (AZ0020401) that describes the four permitted outfalls, two of which are present on NFS lands (AZPDES Outfall No. 004, at the Cottonwood Seepage Collection Caisson, and AZPDES Outfall

No. 005, near the southeastern corner of the Cottonwood Tailings Impoundment). Pinto Valley Mine also complies with the MSGP for Mining (AZMSG-78423). Infrastructure for surface water monitoring and management is described in the site-wide SWPPP, which was approved by the ADEQ in 2015. PVMC will continue to monitor these discharges in accordance with permit requirements through the life of mine and life of the permits. There will be no distinction for point source discharge monitoring requirements of PVMC facilities on NFS lands.

4.6. SOILS

Soil resources on NFS lands surrounding the Pinto Valley Mine are limited, as described in **Section 2.5**. Bedrock is exposed in many areas, and a thin veneer of soil is present only in a few upland areas. Alluvium has accumulated in drainage bottoms, but deposits are rarely thick.

4.6.1. Salvage and Stockpiling

Given the limited soil resources present, PVMC does not currently salvage or stockpile soil. However, as described in **Section 3.2.3.3**, 2.835 million tons of excess material generated from cuts for the TSF4 perimeter road will be stockpiled in three locations adjacent to the road. The stockpiles will contain between 555,000 and 1,250,000 tons of surficial material such as talus, limestone, and dacite (**Figure 2-4**) removed during construction. The stockpiled material will be used as cover for TSF4 during final closure.

4.6.2. Erosion Control

Soil erosion is controlled as described in **Section 4.4.2**, pursuant to the SWPPP.

4.6.3. Soil Quality Analyses

Given the limited soil resources present, PVMC does not routinely analyze soil quality. Limited analyses have been performed to address geotechnical and geochemical characteristics of soils as related to permitting and/or engineering design. This includes unconsolidated alluvium present in select arroyos or gulches and the unconsolidated, scrapable portions of exposed Gila Conglomerate used for concurrent reclamation that has on private PVMC property.

4.6.4. Reclamation Procedures

Given the limited soil resources present, soil reclamation is not a significant component of the reclamation procedures described in **Chapter 6**. Most reclamation will be accomplished by covering large facilities with inert material such as the inert waste rock, which serves as a suitable growth media, or rock armor. Locally, soil may be used for reclaiming TARs: the Reclamation Plan calls for regrading cut-and-fill road sections with soil from the adjacent ground surface. The Mine Reservoir will be similarly reclaimed by soil sourced from adjacent areas.

4.6.5. Monitoring Procedures

Given the limited soil resources present, PVMC does not monitor soil resources except to control erosion, as described above.

4.7. WILDLIFE AND FISH

The post-mining land uses specified in **Chapter 6** include wildlife habitat. Areas surrounding the Pinto Valley Mine lie within the Arizona subdivision of Sonoran desertscrub and the Interior chaparral biological communities, with specific plant and animal associations.

4.7.1. Habitat Restoration

As described in **Section 4.8.1**, PVMC will revegetate, or sustain existing vegetation on, the 19 Dump, Cottonwood Tailings Impoundment, TSF3, TSF4, and the reclaimed TARs. The revegetated areas will provide suitable habitat for the wildlife species expected to occur in the area surrounding Pinto Valley Mine.

Habitat restoration also includes protecting species from physical hazards that may be presented by certain mine facilities, specifically the Open Pit. PVMC will construct a chain link fence, 6 feet tall with three strands of barbed wire around the perimeter of the Open Pit to prevent or minimize the potential for large animals (e.g., deer, javelin, coyotes) to enter the pit.

4.7.2. Special Status Animal Species

Special-status animal species described in this section include those covered by the Endangered Species Act (ESA) as administrated by the U.S. Fish and Wildlife Service (USFWS) and those considered sensitive by the USFS for Tonto National Forest. A screening analysis of special-status animal species that may occur on or near the Pinto Valley Mine is provided in **Appendix D-9**. The potential for occurrence was determined based on the presence of suitable habitat, geographic distribution of the species, and recent records. The following sections describe the special status species identified by the USFWS and USFS that have some potential to occur on the site, and how PVMC will mitigate impacts to special status species potentially affected by the Pinto Valley Mine.

4.7.2.1. ESA-listed Animal Species

The screening analysis determined that seven ESA-listed animal species have been recorded in the vicinity of Pinto Valley Mine. One animal species listed by the USFWS may actually occur at or near the Pinto Valley Mine: the yellow-billed cuckoo (*Coccyzus americanus* – threatened). This bird is known to be present in riparian gallery forests along Pinto Creek, in the Tonto National Forest off of the private PVMC property and may occur on the NFS lands that will be used by PVMC; however surveys for this species in 2015 were negative. Some segments of Pinto Creek near the Pinto Valley Mine were recently proposed for designation as critical habitat for the yellow-billed cuckoo (USFWS 2016). One

other animal species, the southwestern willow flycatcher (*Empidonax traillii extimus* – endangered) has been historically, but not recently, recorded in suitable habitat along Pinto Creek. Other listed animal species are unlikely or extremely unlikely to occur on or near the Pinto Valley Mine.

PVMC will survey for these species in potentially suitable habitat present within or near the undisturbed areas proposed for development.

4.7.2.2. Forest Service Sensitive Animal Species

The screening analysis determined that 20 Forest Sensitive animal species have been recorded in the vicinity of Pinto Valley Mine. Of these, only the pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*) is present in the Project Area and one other species, Bezy's night lizard (*Xantusia bezyi*), has some potential for occurrence. The bat species was observed during a recent survey at AZPDES Outfall No. 005 (**Appendix D-10**). The reptile has never been observed at the site.

PVMC has taken or will undertake the following surveys to identify the presence of USFS sensitive animal species:

- Mammals:
  - The bat survey (**Appendix D-10**) conducted at the AZPDES Outfall No. 005, southeast of the Cottonwood Tailings Impoundment, recorded pale Townsend's big-eared bat drinking from the perennial water source there, but no other sensitive bat species. There was no evidence of any bat species roosting inside the outfall. No other bat surveys are planned.
  - PVMC periodically clears aquatic vegetation (e.g., cattails) from the basin at the outfall, which promotes bat use of this feature as a drinking water source.
- Birds:
  - As noted above, prior to any construction activities PVMC will again survey for western yellow-billed cuckoos and southwestern willow flycatchers in suitable habitat that could be affected by mine development plans.
  - Other bird species that could occur at the Pinto Valley Mine are either transient or unlikely because the site is at or near the upper elevation range for the species. PVMC does not plan to survey for other sensitive bird species.
- Reptiles and Amphibians:
  - Bezy's night lizards are a cryptic nocturnal species, and typically occur in lower elevations (along the foothills of the Superstition Mountains) than are present at the Pinto Valley Mine. However, the Project Area is within the known geographic and elevation range and may contain suitable habitat. Surveys for Bezy's night lizard are not planned.
- Fish:
  - Fish species are not expected within the NFS lands proposed for use by PVMC, as there is no suitable habitat. PVMC does not plan to survey for sensitive fish species.

4.8. VEGETATION

Vegetation in undisturbed areas at and surrounding the Pinto Valley Mine includes species representative of the Arizona subdivision of Sonoran desertscrub and the Interior chaparral biological communities. In upland areas, vegetation is sparse, reflecting low water availability and minimal growth media. Along drainage bottoms and in shaded areas, where both water and soil are more available, vegetation is denser and more diverse.

4.8.1. Habitat Restoration

The Reclamation Plan, presented in **Chapter 6**, describes how portions of the 19 Dump, three tailings impoundments, reservoirs, and TARs will be recontoured to promote drainage and mimic natural topography, and covered with rock armor or growth media. The surfaces will be regraded and scarified, and seeded by hydromulching or mechanical broadcast dispersion. The proposed seed mix (**Appendix D-11**) will be finalized with the USFS prior to closure, and likely consist of native species appropriate for the site. Pure live seed (PLS) specifications will be identified, and a reputable contractor used to complete the revegetation.

4.8.2. Special Status Plant Species

Special-status plant species described in this section include those covered by the ESA as administrated by the USFWS and those considered sensitive by the USFS for Tonto National Forest. The screening analysis of special-status species that may occur on or near the Pinto Valley Mine included plant species and is provided in **Appendix D-9**. The following sections describe the special status plant species identified by the USFWS and USFS that may occur at or near the site, and how PVMC will mitigate impacts to special status plant species potentially affected by the Pinto Valley Mine.

4.8.2.1. ESA-Listed Plant Species

The screening analysis determined that one ESA-listed plant species has been recorded in the vicinity of Pinto Valley Mine. The only ESA-listed plant species that has a potential to actually occur at or near the Pinto Valley Mine site is the Arizona hedgehog cactus (*Echinocereus triglochidiatus* var. *arizonicus* – endangered). This cactus is possible in chaparral areas at higher elevations of the Pinto Valley Mine and surrounding ridges. PVMC has surveyed extensively for this species in potentially suitable habitat present within or near the undisturbed areas proposed for development. Additional surveys were conducted in the spring of 2016 to ensure survey-level coverage of all new develop areas on private PVMC property and proposed new use areas on NFS land.

4.8.2.2. Forest Service Sensitive Plant Species

The screening analysis also evaluated the potential for occurrence of USFS-listed sensitive plant species for Tonto National Forest. Twenty-three plant species have been recorded in the vicinity of

Pinto Valley Mine. The five sensitive plant species that are present or believed to be possible to occur on or near the Pinto Valley property are listed in **Table 4-1**.

Table 4-1 USFS Sensitive Plant Species for Tonto National Forest Potentially Present on or near the Pinto Valley Mine

Common Name	Scientific Name
Arizona alum root	*Heuchera glomerulata*
Galiuro sage (a.k.a. Aravaipa sage)	*Salvia amissa*
Mapleleaf false snapdragon	*Mabrya* [*Maurandya*] *acerifolia*
Mogollon fleabane	*Erigeron anchana*
Pima Indian mallow	*Abutilon parishii*

PVMC will coordinate with the USFS regarding protection of these species.

4.8.3. Noxious Weeds

PVMC will develop a Noxious Weed Control Plan to control the growth and dissemination of noxious weeds during reclamation. Reseeding activity will exclusively use certified seed and weed-free straw, and any equipment will be cleaned prior to use. USFS approval will be obtained prior to initiating any weed control program on federal land. Weed control will be limited to chemicals and procedures approved by the USFS.

4.9. CULTURAL RESOURCES

4.9.1. Cultural Resources Inventory

A Class III (full-pedestrian) survey has been completed for a wide area (approximately 5,000 acres) that is largely inclusive of the area covered in this Plan. *A Class III Cultural Resources Survey of 5,324.86 Acres in Pinto Valley, Gila County, Arizona* (WestLand Resources, Inc., 2010) was prepared for internal planning purposes and a copy was provided to the USFS archaeologist for the Tonto National Forest in 2010 to support the 2009 version of the Plan of Operations described in **Section 1.3**. The area covered by the Class III survey exceeds the area of existing and proposed uses of NFS lands described in this Plan. The full area of the Class III survey should not determine the "area of potential effect" to be evaluated for adverse effects to cultural resources within NFS lands encompassed by this Plan.

At the additional request of the USFS, cultural resource values of two specific sites within NFS lands that will be affected by proposed uses were evaluated (**Appendix D-12**). The set of three buildings identified as powder magazines near the southeastern corner of the Open Pit were determined to be less than 50 years old and therefore not of historic value. The AZPDES Outfall No. 005, near the southeastern corner of the Cottonwood Tailings Impoundment, is greater than 50 years old but does not display any characteristics that would qualify the structure for listing on the National Register of Historic Places.

4.9.2. Consultation Plan for Affected Cultural Resources

The proposed new use of NFS lands for continued development of TSF4 may impact a prehistoric site that is eligible for listing on the NRHP, as indicated in the Class III survey report cited above. PVMC will coordinate with the USFS to determine an appropriate strategy to address this site. In accordance with state laws, if burials or funerary objects are encountered during ground-disturbing activities, activities will stop until appropriate officials had been notified and a plan for handling the objects or remains had been developed.

4.9.3. Site Monitoring During Construction

PVMC construction personnel have received sensitivity training regarding cultural resources that may be encountered during construction activities. Examples of archaeological resources were displayed and explained by qualified archaeologists. Personnel were specifically instructed to immediately cease any construction activities should human remains be encountered, and contact supervisors. This training will be repeated as necessary for new construction personnel.

Known cultural resource sites have been mapped and this information shared with design engineers and contractors. PVMC will consult with the USFS and the Arizona State Historic Preservation Office (SHPO) under Section 106 of the National Historic Preservation Act should any cultural resource sites potentially be affected by the proposed new facilities described in **Chapter 3**. Future land disturbing activities on NFS lands will be monitored in accordance with USFS and SHPO requirements.

4.10. AESTHETICS

Pinto Valley Mine is part of the Globe-Miami mining district, which includes a number of existing and former copper, gold, silver, and turquoise mines extending north and east past the communities of Miami and Globe (**Figure 1-1**). The district also includes the Carlota Mine, which is immediately adjacent to the southwestern boundary of Pinto Valley Mine. US Highway 60 lies south of the Pinto Valley Mine property, traversing the upper reaches of the Pinto Creek drainage. The small community of Top-of-the-World is situated along the highway. The Superstition Wilderness borders the mining district on the west side. The highway and some locations within Top-of-the-World provide elevated views of portions of the Pinto Valley Mine. Elevated views are also provided from various back country viewpoints within the Superstition Wilderness near the Top-of-the-World community.

The Pinto Valley Mine includes large landscape features that are typical of open pit mines, including an open pit, leach facilities, various rock disposal areas and tailings impoundments, and support and processing facilities. Some of these features are partially or wholly on NFS lands. These mine-related landforms visually contrast with those portions of the surrounding landscape that remain undisturbed. The slopes associated with these landforms appear geometric, are composed of bedrock or waste rock and largely absent of vegetation. However, as described above, the mine is immediately adjacent to the Carlota Mine and is within the larger Globe-Miami mining district. Consequently, similarly large,

mine-related landforms are regularly visible to viewers, especially to travelers on US Highway 60. Therefore, views of the Pinto Valley Mine are consistent with many portions of the surrounding landscape.

4.10.1. FS Visual Resource Objectives

The USFS is currently conducting a Scenery Management System inventory of the Tonto National Forest. The *Travel Management, Tonto National Forest, Visual Resources Report* (USFS 2014) describes a broad range of visual quality objectives (VQOs) for the Forest, from completely undisturbed landscapes to fully developed areas. The area encompassed by the Pinto Valley Mine and vicinity is described as meeting the "maximum modification" VQO. This VQO is defined as:

> "Management activities of vegetative and land alterations form may dominate the characteristic landscape. However, when viewed as background, the visual characteristics must be those of natural occurrences within the surrounding area or character type. When viewed as foreground or middle ground, they may not appear to completely borrow from naturally established form, line, color, or texture. Alterations may also be out of scale or contain detail which is incongruent with natural occurrences as seen in foreground or middle ground."

4.10.2. Protection Measures for the Visual Environment

Two large Pinto Valley Mine facilities on NFS lands are visible from US Highway 60: 19 Dump and Cottonwood Tailings Impoundment. As described in **Sections 3.1.2 and 3.2.1**, respectively, vegetation is present on both of these facilities. Vegetation has naturally established on 19 Dump and was planted on the Cottonwood Tailings Impoundment. The visual impact of these facilities is reduced somewhat by the vegetation.

Further measures will be taken to protect the visual environment at closure. In order to reduce the visual impact of the Pinto Valley Mine and address the VQO goals for visual characteristics described above, the existing buildings and other mine-related structures will be removed from the site at closure. The large, mine-related facilities on NFS lands will be reclaimed to the extent practicable. As described in **Chapter 6**, these facilities will be reclaimed by recontouring slopes to promote drainage and reduce erosion, and covering exposed tailings with inert material (principally Gila Conglomerate and Pinal Schist) as growth media for revegetation. Where cover is applied, the slopes will be seeded with a mixture of native plant species such as the proposed seed mix (**Appendix D-11**). Over time, as these native plants become established on the surfaces of these slopes, the visual contrast between the mine-related landforms and the surrounding undisturbed landscape will be further reduced.

4.11. RECREATION

The Pinto Valley Mine is not currently used for any recreational activity, but will be reclaimed after mining activities are completed to allow recreation in some areas. The post-mining land uses specified in **Chapter 6** may include recreational use such as hunting, hiking, horseback riding, and camping.

4.11.1. Recreation Resources

The public currently uses open FRs to access destination points (Pinto Creek, Haunted Canyon) or for off-road vehicle enjoyment. As described in **Section 3.3.1**, some of these roads pass through the Pinto Valley Mine site or other private PVMC property. PVMC expects to negotiate a separate use and maintenance agreement with the USFS for public use of the roads that pass through PVMC property.

The TARs, which are currently used exclusively by PVMC for monitoring and maintaining mining-related facilities on NFS lands will be reclaimed and/or permanently closed to all vehicular traffic, although pedestrian traffic will be possible. Pedestrians such as hunters or bird watchers may use the reclaimed alignments to reach destination points not otherwise accessible.

4.11.2. Reclamation Measures for Recreational Activities

All linear infrastructure (electrical power lines and water pipelines) not needed for post-closure activities will be removed when active mining operations are ceased. As noted above, a safety fence will be constructed around the Open Pit to minimize the risk of public entry to the Open Pit. Reclaimed TARs may be blockaded to enhance effectiveness of reclamation activities and/or to prevent off-road vehicle use of the alignments.

4.12. FIRE AND SAFETY

4.12.1. Fire and Safety Measures

Extensive personnel training and the availability of appropriate equipment and supplies ensure a successful program to protect the adjoining NFS lands from fires potentially occurring during active mining operations. Site employees are trained in initial fire response and many are members of PVMC Emergency Response and Emergency Management Teams. Water trucks are located on-site and are available to control fire until help arrives. In addition to calling 911, all fires on NFS lands will be reported to the Forest Dispatcher's office at (602) 225-5355, even if the fire is extinguished.

Wildfire prevention is a special concern. Many mine vehicles are equipped with a serviceable fire extinguisher mounted in a position accessible to the operator. This extinguisher is checked as part of the pre-trip inspection. Where work needs to be performed, vegetation will be carefully trimmed back. Procedures such as prohibiting parking on top of vegetation and properly disposing of cigarette butts are established and enforced to minimize fire potential.

4.13. HAZARDOUS MATERIALS AND HAZARDOUS WASTES

PVMC generally does not use or store hazardous materials or hazardous wastes on NFS lands. As described elsewhere in this Plan, petroleum products are used for fueling, lubricating, and cooling vehicles and transformers that operate on NFS lands, but these products will not be stored or disposed of on NFS land. Use of herbicides will only be done if authorized by the USFS.

4.13.1. Transportation of Hazardous Materials on FS Roads

All industrial products used at Pinto Valley Mine are delivered using FR 287 from US Highway 60 to the mine entrance or the SX/EW plant. PVMC maintains and annually updates an inventory of all hazardous materials used at Pinto Valley Mine. Contractors deliver sulfuric acid to the site for use in the leach process in 6,000-gallon tanker trucks. An average of one truck per day use FR 287 for this purpose. Contractors also deliver diesel fuel, gasoline, and numerous other products used in the mining and the milling process. This use of FR 287 will continue through active mining operations and the reclamation period.

4.13.2. Spill Prevention and Response for Petroleum and Non-Petroleum Products

PVMC maintains a Spill Prevention, Control, and Countermeasures (SPCC) plan to address spills of petroleum and non-petroleum products. The SPCC plan is a "living document" that is updated continually to reflect current PVMC management of petroleum and non-petroleum products, and will be continued throughout active mining operations.

4.13.3. RCRA Wastes

PVMC does not currently generate or dispose of Resource Conservation and Recovery Act (RCRA) wastes on NFS lands, and will not generate or dispose of RCRA wastes on NFS lands.

4.13.4. FIFRA Pesticides

PVMC uses herbicides to control vegetation along water pipeline alignments and at electrical power line poles on a limited, as-needed basis, using compounds regulated by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). PVMC personnel responsible for maintaining this infrastructure are trained to use these chemicals properly. This use of herbicides will continue throughout active mining operations, but any herbicide or pesticide use on NFS lands will be done only with trained personnel using USFS approved products and application rates.

4.13.5. ATF Explosives

PVMC uses explosives to break up rock in the mining process in the Open Pit but does not store any explosives on NFS lands. A blasting contractor typically conducts this work. Blasting personnel are specifically trained on this task, and closely comply with Mine Safety and Health Administration

(MSHA) and the Bureau of Alcohol, Tobacco and Firearms (ATF) standards. This use of explosives will continue throughout active mining operations.

4.14. SOCIOECONOMICS

PVMC currently employs approximately 600 individuals who work year-round in a wide range of technical, professional, and managerial roles at the Pinto Valley Mine. Although the work force is likely to vary over the life of mine as economic conditions change, a similar number of employees is expected through the 23-year period of the current mine plan. It is not possible to disaggregate this employment to determine which portion is directly attributable to current use of NFS lands.

A site-specific economic impact study for Pinto Valley Mine has not been conducted. However, the most recent state-wide study provides data useful for estimating the impact from PVMC's operations. The *Economic Impact of the Mining Industry on the State of Arizona, 2014* (Arizona Mining Association, 2015) states that there were approximately 12,000 employees of mining companies in Arizona in 2014. The 600 individuals employed by PVMC represent 5 percent of that total. Accordingly, the economic impact of Pinto Valley Mine may be considered 5 percent of the state-wide economic impact of copper mining. The study states that the direct and indirect economic impact of Arizona mining activity in 2014 was estimated to provide a total of 43,800 jobs and income of $4.29 billion (including wages and tax payments). Five percent of these values is 2,190 jobs and income of $214 million that may be attributable to PVMC.

PVMC has established relationships with its communities of interest and stakeholders, and assigns dedicated personnel to this aspect of its business (Capstone 2016). The historic mining towns of Miami and Globe are the closest to Pinto Valley Mine, with a total population of approximately 10,000 residents. Local services are used if available, with the remainder of services coming from the greater Phoenix area, Florence, and Tucson.

Communication channels are in place, and forums for direct interaction with stakeholders are held as required. All levels of management and staff participate in community involvement initiatives. Engagement with community stakeholders is proscribed according to PVMC's Community Engagement Procedure. The procedure outlines stakeholder identification, documentation processes for stakeholder engagement, communication strategies for information requests and distribution of information, donations, sponsorships and employee support, employee involvement, memberships, documentation policies for grievances/complaints, and key roles within the organization with respect to community engagement.

CHAPTER 5. PLAN FOR INTERIM CURTAILMENT

This plan for interim curtailment describes the procedures that PVMC will implement to prevent unnecessary or undue degradation of NFS lands in the event of either a temporary suspension of mining, production, or other operations, or placement into standby status. This plan identifies personnel requirements, site-wide and facility-specific procedures (based on the facilities described in **Chapter 3**). These procedures are intended to provide for public safety and environmental protection, while facilitating resumption of operations when appropriate.

5.1. PERSONNEL

PVMC will have personnel on-site to care for and maintain equipment and infrastructure, and to provide for ongoing environmental activities and reclamation (as necessary). Care and maintenance activities are required during a curtailment so that operations may be efficiently resumed when appropriate. PVMC personnel will conduct routine maintenance and inspections, and maintain compliance with requirements in environmental permits and this Plan, as well as exercise key equipment and infrastructure. Environmental activities performed by PVMC personnel (such as monitoring, continuing stormwater BMPs, and reporting) are required by both Arizona and federal permits even during reduced, suspended, or standby operations.

5.2. SITE-WIDE PROCEDURES

PVMC will implement the following procedures throughout the Pinto Valley Mine as appropriate in the event of a curtailment. Actions taken within the PVMC facilities on NFS lands will be consistent with these site-wide procedures, and are described in more detail on a facility-specific basis in **Section 5.3**. At no time during a curtailment will the facility be un-staffed.

- *Measures to stabilize excavations and workings*: Excavations and workings anywhere within the Pinto Valley Mine will be stabilized by inspecting and maintaining walls and slopes, and preventing stormwater erosion of or excessive run-on into these features. PVMC facilities on NFS lands subject to these measures are a portion of the Open Pit, the 19 Dump, and the Cottonwood Tailings Impoundment embankment.
- *Measures to maintain the Pinto Valley Mine in a safe condition*: Because personnel will remain on-site, compliance with MSHA's safety regulations will continue. Regular MSHA inspections are expected to continue. The security measures described in **Chapter 6** of this Plan for final closure will be implemented. Public access will be controlled by signing, fencing, gates, or berms to warn the public of hazards associated with open excavations and unsafe buildings or facilities where chemicals, petroleum products, or reagents are stored. Of these hazards, only a small portion of the Open Pit occurs on NFS lands.
- *Measures to manage regulated materials:* Regulated materials (such as hazardous materials and hazardous wastes) will be managed in accordance with applicable requirements. Depending

upon the projected curtailment period, some regulated materials (e.g., those stored in small quantities and/or used consumptively only during operations) may be removed from the Pinto Valley Mine. Regulated materials that will be used during the shutdown period will be managed as during operations. Aboveground storage tanks will be managed as required by the SPCC Plan. Other structures used to store regulated materials will be emptied or maintained as appropriate.

- *Measures to maintain access and utilities*: Roads will be maintained as necessary to allow access to Pinto Valley Mine facilities for the inspections described in **Chapter 4**. Utilities, such as electricity that is needed for the operation, will continue to function. TARs and electrical power lines subject to these measures on NFS lands will be maintained.
- *Plans for managing water systems:* Facilities designed to divert, convey, store, or treat water will be inspected as described in **Chapter 4** and maintained during a curtailment period. Operation and maintenance of these facilities will continue as required by the SWPPP and other monitoring plans, and will include inspecting diversions, ditches, pipelines, tanks, and sediment ponds to ensure that they are intact and capable of handling design flows. Facilities covered by the APP will be maintained and monitored as required by the APP. Facilities covered by the AZPDES individual permit will be maintained and monitored as required by the permit conditions. Many components of the PVMC water management system, including wells, pipelines, reservoirs and ponds, and the stormwater management system, are partially or wholly situated on NFS lands and will be maintained during a curtailment.

5.3. FACILITY-SPECIFIC PROCEDURES

This section describes the curtailment procedures for the PVMC facilities that are partially or wholly on NFS lands.

5.3.1. Open Pit

A small portion of the Open Pit and related infrastructure is on NFS lands. This facility will be monitored as part of the SWPPP inspection program and in compliance with APP requirements. The Open Pit slopes will be monitored for stability, and the public excluded from access by placement of berms, fences and warning signs.

The small portion of the Open Pit on NFS lands will be maintained as described above. Currently existing stormwater ponds, if still extant (i.e., not yet consumed by pit expansion), will be monitored and maintained in accordance with the SWPPP and APP requirements.

5.3.2. 19 Dump

The 19 Dump is located entirely on NFS lands. This facility will remain in place and be monitored as part of the SWPPP inspection program and in compliance with APP requirements. This facility is not active and consists primary of inert material that does not generate acid drainage. Vegetation has

naturally re-established on the surface. No additional maintenance of the surface or vegetation will be conducted.

Infrastructure associated with 19 Dump on NFS lands includes access roads and stormwater BMPs. This infrastructure will be maintained and monitored.

5.3.3. Cottonwood Tailings Impoundment

Cottonwood Tailings Impoundment lies principally on NFS lands. This facility will remain in place and continue to be monitored as part of the SWPPP inspection program and in compliance with APP requirements. This facility is not active and was covered with inert material in the 1980s. Grasses were planted and other vegetation has naturally established on the surface. No additional maintenance of the surface or vegetation will be conducted.

Infrastructure associated with Cottonwood Tailings Impoundment on NFS lands includes access roads, power lines, pipelines, evaporation and settling ponds, the seepage caisson, and AZPDES Outfall No. 005. This infrastructure will be maintained and monitored.

5.3.4. Tailings Storage Facility No. 3

A small portion of TSF3 is located on NFS lands. This facility will remain in place and be monitored as part of the SWPPP inspection program and in compliance with APP requirements. Tailings reclaim water may be circulated to maintain wetted conditions over the tailings for dust control. Tailings delivery pipelines will be maintained as appropriate for the expected duration of the shutdown. Other utility lines will remain operational including power and water pipelines.

The sediment trap adjacent to the TSF3 embankment will be monitored and maintained as part of the SWPPP program. There is no other infrastructure associated with TSF3 on NFS lands that will be affected.

5.3.5. Tailings Storage Facility No. 4

TSF4 currently resides exclusively on private PVMC property but is proposed to gradually extend onto NFS lands. This facility will remain in place during temporary shutdown and be monitored as part of the SWPPP inspection program and in compliance with APP requirements. Tailings reclaim water may be circulated to maintain wetted conditions over the tailings for dust control. Tailings delivery pipelines will be maintained as appropriate for the expected duration of the shutdown. Other utility lines will remain operational including power and water pipelines.

The portion of TSF4 tailings on NFS lands will be maintained as described above. There is no infrastructure associated with TSF4 on NFS lands that will be affected by temporary curtailment. A barge pump in the supernatant pool, if present at curtailment, would either be shut down or operated to contribute to water as necessary.

5.3.6. Temporary Access Roads

TARs on NFS lands will remain in place for use to monitor and maintain PVMC facilities. The TARs will be maintained for their designated PVMC use, and erosion control features (water bars, diversion ditches, and culverts) will continue to be monitored as part of the SWPPP.

5.3.7. Utilities

Electrical power lines and cables on NFS lands will remain in place during curtailment to provide power to PVMC facilities, most typically pumps at groundwater wells and stormwater or process water ponds and reservoirs. The power lines and cables on NFS lands will be accessed via FRs and TARs.

5.3.8. Water Supply Systems

Components of the water supply systems that are situated on NFS lands (wells, pumps, pipelines, reservoirs) will remain in place. The extent of use during curtailment may vary according to the duration. Components related to consumptive use may be curtailed proportionally to the amount of water needed. The water supply systems on NFS lands will continue to be accessed via FRs and TARs. The Burch pipeline may be drained or an anti-corrosion agent may be added for a prolonged curtailment period.

5.3.9. Other Facilities

Ancillary support facilities that will not be active during a temporary curtailment will be disengaged but maintained as appropriate for the expected duration. Infrastructure required for securing the site, security gates and fencing, will be maintained. It is not anticipated that additional security infrastructure will be required during a curtailment period.

CHAPTER 6. RECLAMATION PLAN

This chapter describes potential reclamation activities for PVMC facilities on NFS lands. A detailed Reclamation Plan will be developed at the conclusion of the NEPA process or as the conclusion of active mining operations is approached, and will be submitted to the USFS for review and approval.

The reclamation practices and standards described below were developed using USFS guidance (USFS 2004) in conjunction with the *2016 Mined Land Reclamation Plan* (SRK 2016a) and the APP *Closure and Post Closure Strategy* (SRK 2016b), but are focused solely on the PVMC facilities on NFS lands. The *Mined Land Reclamation Plan* and the *Closure and Post-Closure Strategy* are the guiding documents that PVMC will comply with in finalizing the overall site closure plan. The PVMC facilities which are also APP discharging facilities on NFS lands will be reclaimed in compliance with those plans.

PVMC intends to return the land to a useful purpose at the conclusion of active mining operations. This Reclamation Plan has been prepared at a conceptual level to support the estimated bond amount for stabilizing, rehabilitating, and reclaiming the area of PVMC operations on NFS lands. The reclamation cost estimate is described at the end of this chapter. The actual closure approach employed may be modified to accommodate any requirements of the *Mined Lands Reclamation Plan* and the *Closure and Post-Closure Strategy* in place at the conclusion of active mining operations to the maximum extent possible. Additionally, mine closure strategies and technologies may have evolved in the interim.

6.1. RECLAMATION DESCRIPTION

This section summarizes the type of disturbance for those PVMC facilities located on NFS lands prior to reclamation and the estimated volume and type of material that may be moved, applied, or disposed of during reclamation. As described in **Chapter 3**, PVMC facilities located on NFS lands include at least part the Open Pit, a waste rock dump, three tailings impoundments, and a range of water supply and storage facilities. In addition, linear features include roads, pipelines, and electrical power distribution systems, as well as appurtenant support facilities. **Table 6-1** summarizes the proposed closure requirements for each PVMC facility on NFS lands.

Table 6-1 Summary of Proposed Closure Requirements for PVMC Facilities on NFS Lands

Facility	Feature	Decommission or Remove?	Regrade?	Cover Material		Revegetation		
				Type	Thickness (in)	Ripped	Seeded	Amendments
Open Pit	Security Fence	No	No	N/A	N/A	N/A	N/A	N/A
	Pennell Pond	No	Yes	Alluvium	12	Yes	Mix 1	1. Organic Matter 2. Straw Mulch
19 Dump	Waste Rock	No	No	N/A	N/A	N/A	N/A	N/A
	Borrow Area	No	Yes – 2.5H:1V	N/A	N/A	Yes	Mix 1	1. Organic Matter 2. Hydro mulched 3. Straw Mulch
	Two Diversion Berms	No	Yes – 1.5H:1V	N/A	N/A	No	Mix 1	1. Organic Matter 2. Hydro mulched
Cottonwood Tailings Impoundment	Embankment	No	Yes	Alluvium	12	N/A	N/A	N/A
	Impoundment	No	No	N/A	N/A	N/A	N/A	N/A
	Seepage Collection System	TBD	No	N/A	N/A	N/A	N/A	N/A
TSF3	Embankment	No	No	Alluvium	24	No	No	No
		No	No	Rock Rip-rap	6	No	Mix 1	1. Organic Matter 2. Hydro mulched
	Impoundment	No	Yes	Alluvium	12	Yes	Mix 1	1. Organic Matter 2. Straw Mulch
	Diversion Channel	No	Yes	Rock Rip-rap	6	No	No	No
TSF4	Embankment	No	Yes	Alluvium	24	Yes	Yes	1. Organic Matter 2. Hydro mulched
	Impoundment	No	Yes	Alluvium	12	Yes	Mix 1	1. Organic Matter 2. Straw Mulch
Transportation	FR 287	No	No	N/A	N/A	N/A	N/A	N/A
	TARs	No	Yes	No	No	Yes	Mix 1	1. Organic Matter 2. Hydro mulched
Utilities	Electric lines	Yes	No	N/A	N/A	N/A	N/A	N/A
	Electric Poles	Yes	No	N/A	N/A	N/A	N/A	N/A
	Transformers	Yes	Yes	N/A	N/A	N/A	N/A	N/A
Cottonwood Reservoir	Impoundment/Reservoir	No	Yes	Alluvium	24	No	No	No
Mine Reservoir	Impoundment/Pond	Yes	Yes – 1%	Alluvium	12	Yes	Mix 1	1. Organic Matter 2. Straw Mulch
	Pipelines	Yes	Yes	N/A	N/A	No	Mix 1	1. Organic Matter 2. Straw Mulch
Upper Tule Pond	Impoundment/Pond	Yes	Yes	Alluvium	12	Yes	Mix 1	1. Organic Matter 2. Straw Mulch
Burch Water and Concentrate Slurry Pipelines	Pipeline	Yes	Yes	No	No	Yes	Mix 1	1. Organic Matter 2. Straw Mulch
	Booster Station	Yes	Yes	N/A	N/A	Yes	Mix 1	1. Organic Matter 2. Straw Mulch
Peak Well System	Peak Well 37	Yes	No	N/A	N/A	N/A	N/A	N/A
	Supporting Pipelines	Yes	Yes	No	No	Yes	Mix 1	1. Organic Matter 2. Straw Mulch
Support Facilities	Pinto Valley Mine Sign	Yes	Yes	No	No	No	No	No

6.2. RECLAMATION SCHEDULE

6.2.1. Planned Operations and Phasing Schedule

Recoverable copper production at Pinto Valley Mine is projected to continue at least through approximately 2039, a 23-year life-of-mine from 2016. The actual mine life may be shortened or lengthened depending on actual annual production rates achieved and other factors such as unforeseen temporary curtailment of mining operations, discovery of new mining technologies, commodity prices, etc.

6.2.2. Post-Closure Land Use

One of the main objectives of the USFS reclamation policy is to ensure that disturbed lands are returned to a use that is consistent with long-term land and resource management plans (USFS 2004). Current and historic land uses on NFS lands surrounding the Pinto Valley Mine include low-density cattle grazing, public recreation, and mining activities. PVMC has identified a range of post-closure land uses for the Pinto Valley Mine that are consistent with these nearby uses: recreation (hunting, hiking, horseback riding, and camping), grazing, and wildlife habitat.

6.2.3. Planned Reclamation and Phasing Schedule

Reclamation may be completed in three phases: interim, concurrent, and final reclamation. Interim reclamation consists of activities intended to stabilize facilities, but does not include final closure. Concurrent reclamation consists of closure activities that are undertaken while other components of the mine are operational. Interim and concurrent reclamation, if conducted, will precede final reclamation. Final reclamation consists of the activities to close the site and prepare it for post-mining use. Post-closure maintenance and monitoring will continue after final reclamation. The estimated closure schedule may be shortened or lengthened depending on numerous factors. The following sections outline the interim, concurrent, and final reclamation concepts for PVMC facilities on NFS lands. The reclamation steps, standards and practices planned for PVMC activities on NFS lands are described in **Section 6.3**.

6.2.3.1. Interim Reclamation

Interim closure of specific PVMC facilities may be implemented on disturbed areas that are not needed at the time for active operations but may be used subsequently. The principal focus of interim reclamation will be to reduce wind and water erosion of inactive facilities. These facilities may be re-activated during the life of mine if warranted. The areas subject to interim reclamation may include inactive tailings impoundments, waste rock dumps, and other disturbed areas that are not used for specific purposes.

6.2.3.2. Concurrent Reclamation

Where practical, PVMC will implement concurrent reclamation of facilities that reach capacity or have no further operational purpose, such as tailings impoundments or embankment faces, prior to conclusion of the active mining operations. Concurrent reclamation activities will be consistent with final closure requirements and meet the standards and goals listed below. The amount of concurrent reclamation accomplished each year will be tracked and reported to the USFS, and Arizona State Mine Inspectors Office.

6.2.3.3. Final Reclamation

Final reclamation for the Pinto Valley Mine is defined as closure of all remaining PVMC facilities at the conclusion of active mining operations, and is currently anticipated to begin in 2039. Closure construction is expected to last 3 years. However, TSF4 and TSF3 may require as much as 10 years of consolidation (draindown) prior to performing regrading activities on the impoundment surfaces. The actual initiation of final reclamation may vary according to the tailings facility status as the end of active mining operations approaches. For example, final reclamation could be staged, addressing other facilities in a first phase and the TSFs in a second phase after consolidation is complete. Final reclamation will include any facilities that were subject to interim closure to meet final reclamation goals.

6.2.3.4. Post-Closure Maintenance and Monitoring

Post-closure reclamation activities include maintenance and monitoring to ensure that the closed facilities meet reclamation goals. The maintenance period will require 3 years and is planned for 3 weeks during the summer of each year. PVMC facilities and reclamation structures on NFS lands that will be maintained and monitored during the post-closure period include selected:

- TARs;
- Constructed water diversion channels and berms;
- Reclaimed areas;
- Security fences and gates; and
- Surface water monitoring locations.

During this period, PVMC will also meet APP and MLRP maintenance and monitoring requirements. For APP permitted discharging facilities, the monitoring period will last for up to 30 years, also commencing at the start of the post-closure care period.

6.3. RECLAMATION STEPS, STANDARDS, AND PRACTICES

This section describes the reclamation steps, standards, and practices that PVMC will implement for reclaiming the NFS lands affected by Pinto Valley Mine. The reclamation steps and associated reclamation standards were used to develop the reclamation practices for each facility.

6.3.1. Reclamation Steps

The general steps to be used in reclaiming disturbed areas at the Pinto Valley Mine on NFS lands are:

- Decommissioning facilities – recovering and removing salvageable and non-salvageable equipment and materials, disconnecting power sources, draining pipelines;
- Removing and/or closing structures – demolishing and/or dismantling and removing structures, pipelines, and culverts from the site;
- Re-contouring – regrading stockpiles, filling excavations, developing diversion channels for stormwater conveyance, salvaging soil and alluvium for growth media;
- Covering – placing soil or rock covers on re-contoured landforms;
- Revegetating – scarifying compacted lands, applying growth media or topsoil, seeding disturbed and newly designed features with native species, adding amendments such as fertilizer or mulch; and
- Monitoring and maintenance – ensuring that reclaimed facilities meet reclamation goals.

Not every facility will require each step outlined above or all portions of each step. **Section 6.4** describes the pertinent closure steps and strategy required for each major facility.

6.3.2. Reclamation Standards

Reclamation standards are used to measure when reclamation goals have been achieved. Reclamation standards can apply to project facilities, materials, equipment, and surface disturbance. The USFS does not identify specific standards, but does require that all reclamation requirements include measureable performance goals. PVMC has developed reclamation standards and goals for six parameters to apply during reclamation:

- Public safety and wildlife habitat;
- Water quality;
- Solid and hazardous waste disposal;
- Cover material and borrow areas;
- Physical and chemical stability; and
- Revegetation.

Each standard and associated goal were used to develop the reclamation practices and post-closure activities in **Section 6.4**.

6.3.2.1. Public Safety and Wildlife Habitat

Hazards to human and wildlife well-being must be identified throughout the process and appropriate measures taken to ensure public and wildlife safety. Safety measures may include posting signs that warn of hazards and creating physical barriers (fences, gates, berms, etc.) to the hazard. The safety barriers should be sufficient to minimize wildlife entry into hazardous areas, such as the Open Pit.

Reclamation Goal – Public safety and wildlife habitat hazards will be reduced to the extent practical for reclaimed PVMC facilities on NFS lands.

6.3.2.2. Water Management and Quality

Water discharged on NFS lands will be tested and monitored for compliance with applicable state and federal surface and/or groundwater quality standards. Surface water is typically monitored for metals, total suspended solids, pH, and hardness (measured as calcium carbonate, $CaCO^3$). Passive water management systems are preferred over active systems that may require continued operation during closure. Typical components of passive water management systems include ponds, berms, channels, aerobic or anaerobic wetlands, or anoxic limestone drains, while active systems require pumps, pipes, chemical bins, and a power supply. Open channel drainage will be favored over culvert, and passive water management systems shall be favored over active systems, where practical.

Groundwater beneath the Pinto Valley Mine will be monitored at point-of-compliance wells in accordance with APP requirements. The pit lake in the Open Pit is expected to act as a hydraulic sink indefinitely: groundwater flow into the lake with reach equilibrium with evaporation losses hundreds of years in the future, and the water level in the Open Pit will be below groundwater levels in the bedrock aquifer. Groundwater flow after mine closure will therefore be toward the Open Pit, similar to that depicted in the potentiometric surface map provided in **Appendix D-1**.

Reclamation Goal – Water discharged from PVMC facilities on NFS lands will meet applicable state or federal surface water and groundwater quality standards.

6.3.2.3. Solid and Hazardous Waste Disposal

Some PVMC facilities on NFS lands contain equipment or materials that will require removal and disposal at an appropriately permitted facility during the reclamation process. Proper disposal standards will identify where materials and waste can be disposed of during decommissioning and demolition.

Hazardous wastes, as defined by the RCRA or Comprehensive Environmental Compensation and Liability Act (CERCLA) and hazardous materials as defined by the U.S. Department of Transportation, are not anticipated but may be present in facilities such as abandoned pipelines. Hazardous materials or hazardous wastes identified at facilities will require isolation, treatment,

containment, or neutralization. Hazardous materials that cannot be neutralized or contained will require disposal to permitted hazardous waste disposal facilities in accordance with regulatory requirements of RCRA or CERCLA.

In general, all salvageable materials should be reused, resold, or recycled. Materials that are recycled will be managed at the proper recycling location. Following demolition, construction debris and all other non-hazardous and non-salvageable materials will be disposed of at an appropriately permitted facility.

PVMC will characterize all materials, equipment, or demolition debris to identify appropriate disposal requirements. As described in **Chapter 3**, PVMC infrastructure on NFS lands consists principally of the electrical power system and water pipelines; few buildings or other structures are present. Waste characterization is therefore expected to be minimal.

Reclamation Goal – Any hazardous or non-hazardous materials and equipment discovered in PVMC facilities on NFS lands will be disposed of at appropriately permitted facilities.

6.3.2.4. Cover Material and Borrow Areas

Cover material may be applied to any reclaimed area to minimize wind and water erosion, and potentially to serve as growth media. Covers on steep slopes or exposed surfaces may be rock material to armor the surface and reduce the potential for water erosion. Shallow slopes may be covered with soil to provide substrate for revegetation. Soil may be integrated with rock to provide growth media on steep slopes where warranted.

For cost estimation purposes, the USFS requested that borrow areas for covering facilities on NFS lands be located on land accessible to the agency (i.e., not private property), though this will not be a priority for PVMC. A memorandum summarizing potential borrow sources is provided in **Appendix D-13**. Large volumes of material required for covering extensive areas will be excavated from borrow areas that consist of non-acid generating materials, such as 19 Dump. Cover material for small area or linear features (i.e., roads) will be locally procured.

Reclamation Goal – A minimum of 1-foot thick layer of non-acid generating materials to stabilize slopes or prepare substrate for revegetation will be verified on areas that have not previously been reclaimed or rock armored.

6.3.2.5. Physical and Chemical Stability

Physical and chemical components of each facility will be assessed to ensure appropriate measures are taken to facilitate long-term stability. Physical stability refers to slope stability and erosion control, whereas chemical stability refers to the potential reactivity of soils and materials.

The physical stability of the materials and landforms must be assessed during backfilling, re-contouring, and grading. The physical stability goal is to create safe and approximate original contour (AOC) slopes with defined static and dynamic factors of safety (FOS). Minimum post-mining slope stability FOS to be used at Pinto Valley Mine include 1.3 minimum static FOS for non-water impounding structures (e.g., waste rock dumps[7]) and 1.5 FOS for water-impounding structures (e.g., tailings impoundments, and other ponds and reservoirs). A minimum 1.1 dynamic FOS will be used for all facilities. The maximum design earthquake for all facilities is an earthquake producing a peak ground acceleration (PGA) at the site of 0.082g with an exceedance probability of 5 percent in 50 years and a return period of 975 years.

Additionally, erosion control measures are required to support physical and chemical stability for each facility that is re-contoured. The guiding philosophy for the development of erosion control is to re-establish natural drainage patterns wherever practical and prevent the release of hazardous or toxic materials through containment, treatments, or neutralization processes. Where natural drainage patterns cannot be re-established, drainage features should be developed to suit the affected areas, to complement the natural drainage, and to minimize post-closure maintenance requirements. Diversion channels should be designed to convey, at a minimum, the 100-year, 24-hour storm event.

Reclamation Goal – Create physically and chemically stable landforms that meet the established FOS, approximate the original topography, and have natural and designed post-closure drainage patterns that minimize erosion for reclaimed PVMC facilities on NFS lands.

6.3.2.6. Revegetation

Some reclaimed facilities may be revegetated to reduce wind and water erosion, protect covers, and restore suitable wildlife habitat. Successful revegetation requires one or more of the following steps:

- Preparing subsoil via ripping/scarifying compacted soils;
- Replacing top soil or growth medium;
- Preparing seedbed via ripping/scarifying the top soil along the contour, using a heavy-duty disc or chisel plow;
- Applying fertilizers, mulch, organic matter, or other soil amendments to improve soil fertility:
- Installing sediment erosion control measures including mulch and mats or wattles; and
- Seeding, typically accomplished by hydroseeding or mechanical broadcast.

Growth media will be tested to determine if any amendment is required to support revegetation.

7 The 19 Dump face lies at angle-of-repose and has been determined to be stable (**Appendix D-2**); the 1.3 FOS will not be applied to this facility.

The proposed seed mix (**Appendix D-11**) will be re-evaluated for actual seed availability and revised, if needed, prior to beginning seeding activities. The final seed mix and seeding rates (in pounds of live seed [PLS] per acre) will be submitted to USFS for review and approval prior to final reclamation. Revegetation will take place at an optimal time during the growing season when interim or final grading and covering has been completed, ideally just prior to the wet season in the late summer or early fall to take advantage of winter rainfall.

Revegetation success criteria may be established in cooperation with the USFS when the final Reclamation Plan is prepared. Success criteria may include parameters such as species diversity, survivorship, and vegetation density.

Reclamation Goal – All landforms that have been specified for revegetation will be regraded and seeded with the final approved seed mix to support slope stability, water balance, and wildlife habitat. Growth media and amendments will be applied where soil fertility may be a factor in the successful restoration of NFS lands.

6.4. RECLAMATION PRACTICES AND POST-CLOSURE ACTIVITIES

This section describes the reclamation practices and post-closure monitoring and maintenance activities associated with specific facilities, addressing the reclamation standards defined in **Section 6.3.2**.

6.4.1. Open Pit

At the beginning of final reclamation, the portions of the Open Pit located on NFS lands will not have any equipment or structures that will require decommissioning and removal. At closure, there will be no hazardous materials or hazardous wastes that will require neutralization or disposal. The stability of the Open Pit high wall will be tested and left in a stable condition. Final reclamation for the Open Pit will be limited to installing a perimeter security fence and perimeter access road. The final configuration for the Open Pit is shown on **Figure 3-3**.

To ensure public and wildlife safety, the Open Pit will be posted with warning signs and surrounded with a 6-foot high chain-link fence, topped with three strands of barbed wire. The perimeter security fence will be monitored regularly during the post-closure period.

Neither surface water nor groundwater discharge from the Open Pit area. All stormwater from the surrounding land flows into the pit lake, which is expected to reach an equilibrium elevation several hundred years in the future. Similarly, the Open Pit acts as a hydraulic sink for groundwater, which flows toward the pit lake from all directions. As part of the APP *Closure and Post-Closure Strategy*, PVMC is required to monitor groundwater on the Pinto Valley Mine site occurring on private land for 30 years following closure of the mine to that ensure water quality standards are met.

Groundwater elevation will be monitored regularly to ensure the pit lake continues to function as a hydraulic sink. Groundwater quality monitoring is currently performed on a quarterly or a biennial basis depending on the parameter being analyzed and is reported to ADEQ in accordance with the site-wide APP. It is anticipated that groundwater monitoring frequency will decrease during the post-closure period following the completion of a minimum period of routine monitoring.

6.4.2. 19 Dump

At the beginning of final reclamation, 19 Dump will not have any equipment or structures that will require decommissioning and removal. At closure, there will not be any hazardous materials or hazardous wastes that will require neutralization or disposal.

19 Dump principally consists of schist, a non-acid generating and inert material, and suitable for engineered cover uses. A portion of 19 Dump may be excavated in benches and used to cover select portions of Cottonwood Reservoir, TSF3, and/or TSF4 on NFS lands. After excavation of the material, bulldozers will regrade the borrow area, creating a stable slope configuration for successful revegetation and erosion control. Where side slopes have been confirmed as stable, no re-contouring or covering is planned. The regraded area will be ripped (scarified) and revegetated. As described in **Section 3.1.2**, native vegetation has naturally established on the existing dump surface.

On the top of the 19 Dump, two diversion berms will be constructed to manage storm runoff and reduce erosion along the dump faces. The berms will likely be 9 feet wide by 3 feet high, and will direct water to natural drainage channels that currently exist on the southwest-facing slopes. Ultimately, water will drain into Cottonwood Reservoir. The berms will be revegetated with the final seed mix.

Post-closure inspections and monitoring for 19 Dump will include annual site inspections to assess for any signs of crest or toe slippage and that any required drainages are free and clear of obstructions. In addition, the re-established drainages will be inspected after major rainfall events to ensure that the diversion berms have remained intact and are properly conveying stormwater flow.

6.4.3. Cottonwood Tailings Impoundment

Cottonwood Tailings Impoundment was closed in 1988 by placement of a 6-inch thick layer of Gila conglomerate and reseeded with grasses. No further reclamation of the tailings surface is planned. However, the inset embankment face has eroded, exposing underlying tailings, and stormwater collects on the tailings surface. Final reclamation of this facility will consist of regrading and covering the embankment face, and re-contouring portions of the surface to direct stormwater off of the impoundment. The final stormwater management configuration may include the settling pond and evaporation ponds at the southeastern and southwestern corners, respectively, of the facility (**Figure 3-5**). Stormwater will be discharged to natural drainages that eventually report to Pinto Creek. Any tailings exposed during the regrading/re-contouring process will be covered with growth media and revegetated with the final seed mix or receive rock armor.

As described in **Section 3.2.1.2**, the seepage collection system in Cottonwood Canyon delivers collected water to the mill. At closure, the quantity and quality of water reporting to the caisson will be evaluated and, in cooperation with the USFS, an appropriate closure method will be developed. If the water meets applicable standards, it will be discharged to Cottonwood Canyon without treatment. If applicable standards are not met, a passive or active water collection and/or treatment systems will be designed and, with USFS approval as part of the final Reclamation Plan, implemented. Passive water treatment could include, depending upon the parameters of interest, aerobic or anaerobic wetlands, or anoxic limestone. Active water treatment could include chemical treatment or, if necessary, active management consisting of pumping the water to the Open Pit. If surface components of the seepage collection system (collection tank, caisson, pumps, and pipes) are not needed to support an active management arrangement, this infrastructure will be removed at closure.

The outfall at the southeastern corner of the Cottonwood Tailings Impoundment is expected to continue indefinitely. Water discharging from this outfall currently meets water quality standards and is expected to do so in the future. Depending upon the ultimate configuration of the final stormwater management system, flow from the outfall (currently about 7 to 8 gpm) may be reduced or increased at closure.

Other infrastructure associated with the Cottonwood Tailings Impoundment includes the inactive decant tower near the southwestern corner of the facility, the concrete apron on the south face of Cottonwood Canyon, a range of abandoned pipelines, and culverts under various roads. All of this infrastructure (except culverts under the paved segment of FR 287) will be removed and disposed of as demolition waste.

The commercial vehicle staging area along FR 287, within the impoundment footprint at the southern edge, will be left in place unless the material will be useful for reclamation elsewhere.

6.4.4. Tailings Storage Facility No. 3

The portions of the TSF3 located on NFS lands will not have any equipment or structures that will require decommissioning and removal at closure. There will be no hazardous materials or hazardous wastes that will require neutralization or disposal. TSF3 will be closed after the tailings have consolidated (approximately 10 years after last use). During the consolidation time period, PVMC will implement dust control measures consisting of temporary water sprays, dust covers or application of other commercial dust control additives to the top of the tailings.

As described in **Section 3.2.2**, the two portions of TSF3 that will be located on NFS lands at closure are approximate 23.6 acres of the tailings surface along the western edge of the facility, and the 2.2-acre "sediment trap" and adjoin disturbance adjacent to the embankment at the northern end of the facility. The tailings surface, including the portion on NFS lands, will be re-contoured, covered with alluvium, and revegetated. A 1-foot thick low-permeability evapotranspirative soil and vegetation cover will be

placed on the top surface, with a 2-foot thick cover on the side slopes of the facility. A conventional fertilizer truck may be used to spread the required organics, lime, limestone, and/or granular fertilizer, if necessary. Seed will be either broadcast simultaneously with the fertilizer or drilled with farm equipment. On some steeper slopes (not present on the portion of TSF3 on NFS lands), it may be necessary to use a hydroseeder/hydromulcher to apply the required amendments and seed. A rock-armored stormwater diversion channel will be constructed at the southwest corner of the impoundment on NFS lands, directing flow across the impoundment top surface on private PVMC property. The diversion channel will convey non-contact stormwater north and connect with a drop channel on the northeast side of the TSF3 embankment to discharge stormwater to a northern perimeter stormwater run-on interceptor channel and existing ponds.

The TSF3 embankment, entirely on private PVMC property, as well as the sediment trap on NFS lands, will be covered with a low-permeability, non-acid generating soil to reduce stormwater infiltration and minimize potential impacts to groundwater. The cover will be topped with rock armor and revegetated.

6.4.5. Tailings Storage Facility No. 4

The portion of the TSF4 located on NFS lands will not have any equipment or structures that will require decommissioning and removal at closure, except a barge pump (and related electrical power lines) in the supernatant pool. The barge pump and electrical power lines will be removed and sold for reuse or scrap. There will be no hazardous materials or hazardous wastes that will require neutralization or disposal. TSF4 will be closed at the end of the mine life after tailings consolidation has occurred (approximately 10 years after last use). During the consolidation time period, PVMC will implement dust control measures consisting of temporary water sprays, dust covers or application of other commercial dust control additives to the top of the tailings.

As described in **Section 3.2.3**, the portion of TSF4 that will be located on NFS lands at closure consists of approximately 126.8 acres of the tailings surface and embankment along the eastern edge of the facility. Following draindown, the tailings surface, including the portion on NFS lands, be re-contoured, covered with inert materials, and revegetated. The material stockpiled adjacent to the perimeter road (see **Sections 3.2.3.3 and 4.6.1**) will be used for cover; the stockpiles will occupy approximately 44.2 acres of NFS lands. A 1-foot thick low-permeability evapotranspirative soil and vegetation cover will be placed on the top surface, with a 2-foot thick layer on the side slopes of the facility. A conventional fertilizer truck may be used to spread the required organics, lime, limestone, and/or granular fertilizer, if necessary. Seed will be either broadcast simultaneously with the fertilizer or drilled with farm equipment.

The closure drainage design for TSF4 will include a system of collection and conveyance channels that will collect flows from the top surface of the impoundment and direct flows to a spillway located on west embankment face of the TSF4 for conveyance to the existing ponds or to natural drainages when

TSF4 is fully reclaimed. Seepage will be captured in one or more impoundments on private PVMC property throughout the post-closure period.

6.4.6. Transportation

PVMC will use some FRs to access closed facilities during the post-closure monitoring period. The segment of FR 287 passing through the private PVMC property will be managed in accordance with a Road Rights-of-Way and Construction and Use Agreement as mentioned in **Section 3.3.1.2**.

At the conclusion of active mining operations approximately 15.49 miles of TARs will be located on NFS lands. A portion of these roads will be used during closure and post-closure activities; the specific roads necessary for closure and post-closure will be determined at that time. The TARs that will not be used for closure and post-closure will be regraded to restore the underlying ground slope, (which varies between 0 and 60 percent), to the extent practical. Local material will be used to restore the slopes. Any road safety berms or culverts will be removed as part of the regrading process. After regrading, the restored surface will be ripped, seeded, fertilized, and mulched.

6.4.7. Utilities and Power Distribution

Approximately 10.9 miles of electrical power lines and 186 poles will be on NFS lands at the conclusion of the active mining operations. Some of the electrical infrastructure may be necessary to support post-closure activities on either private PVMC property or NFS lands; this infrastructure will remain in place as long as necessary. All other aerial lines or surface cables on NFS lands will be deactivated and removed, and recycled or sold for reuse if possible. The poles will also be removed and disposed of or sold for reuse if possible.

All transformers on NFS lands, whether pole- or ground-mounted will be removed and salvaged or disposed of properly. PVMC uses only transformers free of polychlorinated biphenyls (PCBs). The concrete foundation for the single ground-mounted transformer at Cottonwood Reservoir will be broken up and disposed of properly; the pad will be reclaimed along with the adjacent TAR.

6.4.8. Cottonwood Reservoir

Cottonwood Reservoir is distinct from the adjacent Cottonwood Tailings Impoundment and will be closed using a different reclamation approach. At the end of the active mining operations, water pipelines system will be deactivated, and Cottonwood Reservoir will no longer be used to store water from the Burch pipeline or other sources. The water remaining in the reservoir will be pumped out, either for use in other closure activities (e.g., hydromulching), stored in other facilities (potentially including the Open Pit), or allowed to evaporate.

Because Cottonwood Reservoir is unlined, the sediments in the bottom of the reservoir will be tested to determine the chemical characteristics of the sediment and develop an appropriate closure plan. Composite samples will be used to determine the quality of sediment that will need to be excavated

and treated or removed. An appropriate closure methodology will be implemented depending on the nature of the results. After any sediments are removed, the bottom of the reservoir will be graded to level and covered with a 2-foot deep layer of cover material, likely from the 19 Dump. A spillway channel and culvert will be excavated and installed on the northwest corner of the reservoir to promote the gradual release of storm waters. The reservoir will be allowed to fill naturally from local runoff to provide flood protection to the Cottonwood Tailings Impoundment. Diversion channels around the impoundment may be required to manage stormwater discharging from the reservoir; a preliminary diversion channel design is included in the Cottonwood Tailings Impoundment Reclamation Plan provided in **Appendix D-14**.

6.4.9. Mine Reservoir

The water stored in Mine Reservoir is used during mining operations for dust control. During closure construction this feature will remain operational to continue this function, and be closed when no longer needed. The inline valve connecting the Burch pipeline and the reservoir will be closed, shutting off input water. The water will be pumped or drained out of the reservoir. The concrete slab will be demolished and disposed of as demolition debris at an appropriate facility. The pond will be backfilled with material from the surrounding area and graded to a 1- to 2-percent slope. The surface will be revegetated with the final seed mix. A closure strategy for this facility is provided in **Appendix D-15.**

6.4.10. Upper Tule Pond

Upper Tule Pond receives water from Tule Tank (a day tank for water collected at the Cottonwood Tailings Impoundment seepage caisson) and stormwater from two diversion ditches that drain parking areas on private PVMC property. At final reclamation, Upper Tule Pond will be decommissioned and the seepage collection system reconfigured as described in **Section 6.4.3**. It is likely that the two diversion channels will be re-contoured to divert flow into a retention pond on private PVMC property prior to discharge off-site. After Upper Tule Pond has dried, it will be re-contoured and covered with a 1-foot thick of material from 19 Dump or other borrow area, if available and revegetated with the final seed mix. It will be graded to a slope of 1 percent, allowing water to sheet flow across the former footprint and join the final stormwater management system.

6.4.11. Burch Pipeline

At the conclusion of active mining operations, the Burch pipeline will be decommissioned, drained, and removed or repurposed under a separate permitting action. The segment of the Burch pipeline crossing NFS lands, approximately 11,200 feet long, will be closed at the same time as the segments on private land. The land disturbance associated with the Burch pipeline will be reclaimed at the same time as the associated TARs, as described in **Section 6.4.6**. In summary, the alignment will be re-contoured in accordance with the underlying slope to promote natural drainage and the alignment will be revegetated with the final seed mix.

As described in **Section 3.5.1.2**, the abandoned copper concentrate slurry pipeline that follows the Burch pipeline alignment will be removed in segments when corresponding lengths of the Burch pipeline are replaced for maintenance or periodic replacement. If any segments of the concentrate line remain at mine closure, they will be removed along with the Burch pipeline reclamation.

An abandoned booster station along the Burch pipeline alignment was dismantled in the mid-2000s. All salvageable materials were removed, leaving behind the concrete foundation and some concrete boxes. The concrete will be demolished and disposed of as demolition debris at an appropriate location. The disturbance area will be regraded and revegetated with the final seed mix.

6.4.12. Pipelines Supporting the Peak Well System

The pipelines supporting the Peak well system, north and west of the Pinto Valley Mine, will be reclaimed when water from the wells is no longer needed, or repurposed under a separate permitting action. Depending upon the actual closure at the conclusion of active mining operations, pipeline removal may be phased or completed as one effort. Water will be needed during the post-closure period for dust control; adequate supply for this purpose will be maintained as long as necessary.

Pipeline closure will be accomplished similarly to that described in **Section 3.5.1.3** for the two abandoned pipelines. Most surface pipelines will be salvaged or reused; those that have no value will be disposed of properly. Reclamation of the disturbance area associated with the pipelines will be accomplished with adjacent road reclamation.

6.4.13. Peak Well 37 and Water Supply Tanks

Peak Well 37 is the only PVMC water supply well on NFS lands, and is the domestic (potable) water source for the Pinto Valley Mine. When potable water is no longer needed at the site, Peak Well 37 will be decommissioned. The well will be closed in accordance with ADWR requirements. In summary, the pump and well casing will be removed, and the borehole backfilled with cement and bentonite.

The two water storage tanks will be dismantled and sold for scrap or reuse after they are no longer needed.

6.4.14. Other Support Facilities

The Pinto Valley Mine sign will be removed at closure, and the concrete foundation disposed of as demolition debris.

6.5. BOND CALCULATION

When this Plan is finalized and approved by the USFS, reclamation costs will be calculated using the Standard Reclamation Cost Estimator (SRCE) or other USFS approved tool. The cost estimate will be updated periodically for interim closures and permit or operating plan amendments.

CHAPTER 7. REFERENCES

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FIGURES

APPENDIX A

Plan of Operations for Mining Activities on National Forest System Lands (FS-2800-5)

APPENDIX B

Previously Authorized Rights-of-Way, Plans of Operations, Special Use Permits, and Letter Agreement
(*Electronic Copy Only —see enclosed Disc*)

APPENDIX C

Affected Claims on National Forest System Lands

APPENDIX D

Supporting Technical Memoranda
(D-1 through D-15)

Appendix D-1:

2015 Conceptual Groundwater Elevation Map and Cross Sections

Appendix D-2:

Stability Analysis
Cottonwood TSF
and No. 19 Dump
Pinto Valley Operations
near Miami, Arizona

Appendix D-3:

19 Dump Characterization

Appendix D-4:

19 Dump at the Pinto Valley Mine (Vegetation Survey)

Appendix D-5:

Cottonwood Tailings Impoundment History of Construction and Operation

Appendix D-6:

Cottonwood Tailings Impoundment Characterization

Appendix D-7:

Vegetation Characterization of the Cottonwood Tailings Impoundment at Pinto Valley Mine

Appendix D-8:

Tailings Storage Facility Nos. 3 & 4 Characterization and Reclamation Strategies

Appendix D-9:

Special Status Species Screening Analysis, Pinto Valley Mine

Appendix D-10:

Bat Survey of AZPDES Outfall No. 005 on Tonto National Forest Land near Superior, Pinal County, Arizona

Appendix D-11:

Proposed
Seed Mix
for Reclamation

Appendix D-12:

Cultural Resources Evaluation of AZPDES Outfall No. 005 and Powder Magazines at Pinto Valley Mine, Gila County

Appendix D-13:

Borrow Sources at Pinto Valley Mine for Reclamation of Planned Activities on National Forest System Lands

Appendix D-14:

Cottonwood Reservoir Reclamation Plan

Appendix D-15:

Mine
Reservoir
Reclamation
Plan and Cost

APPENDIX E

As-Built Sheets

APPENDIX F

Representative Photographs of PVMC Facilities on National Forest System Lands

APPENDIX G

Wells and Piezometers on National Forest System Lands

APPENDIX H

Summary of Stormwater and Process Water Management on National Forest System Lands in Association with Operation of the Pinto Valley Mine

APPENDIX I

Road Use and Maintenance Plan, Pinto Valley Mine