ENVIRONMENTAL ASSESSMENT
NO. AZ-320-2008-022

CYPRUS COPPERSTONE GOLD MINE
PASSIVE WETLAND TREATMENT SYSTEM

Prepared for
Bureau of Land Management
Yuma Field Office
2555 East Gila Ridge Road
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On behalf of
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Acronyms and Abbreviations

ACEC	Area of Critical Environmental Concern
ADEQ	Arizona Department of Environmental Quality
AGFD	Arizona Game and Fish Department
APP	Aquifer Protection Permit
AWQS	Aquifer Water Quality Standards
BADCT	Best Available Demonstrated Control Technology
BLM	U.S. Bureau of Land Management
CCGC	Cyprus Copperstone Gold Corporation
CCGM	Cyprus Copperstone Gold Mine
CRIT	Colorado River Indian Tribes
EA	Environmental Assessment
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act of 1973, as amended
gpm	gallons per minute
HDPE	high-density polyethylene
IO	Isolated Occurrence
MDL	method detection limit
MPO	Mining Plan of Operations
MSL	above mean sea level
mg/L	milligrams/liter
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
OHV	off-highway vehicles
PVC	polyvinyl chloride
RMP	Resource Management Plan
ROS	Recreation Opportunity Spectrum
TMA	Travel Management Area
USFWS	U.S. Fish and Wildlife Service
VRM	Visual Resource Management
YFO	BLM Yuma Field Office

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1 Introduction

The Cyprus Copperstone Gold Mine (CCGM) has been inactive since 1992. Cyprus Copperstone Gold Corporation (CCGC)[1] proposes to modify the technology used to manage the effluent draining from the mine's decommissioned heap leach and tailings impoundment by constructing and operating a Passive Wetland Treatment System and closing the existing reclaim solution pond.

1.1 Background

The CCGM is located approximately 18 miles south of Parker, Arizona, and 13 miles north of Quartzsite, Arizona, in La Paz County (see Figure 1, *Site Location/Vicinity Map*). The CCGM was operated from 1987 to 1992 as an open pit gold mining and beneficiation facility that used heap leaching and carbon-in-pulp/carbon-in-liquor technology for gold extraction and recovery. Ore was mined, crushed, and leached on site. The CCGM site originally consisted of an open pit mine, ore crushing facility, heap leaching and vat leaching facilities, a tailings impoundment, a reclaim solution pond, waste rock dumps, off-road tire burial cell, and inert construction debris solid waste disposal facilities.

A mine closure plan was implemented in 1995, and mine closure activities have been completed in accordance with the requirements defined in the Mining Plan of Operations (MPO) AZA 23307 approved by the U.S. Bureau of Land Management (BLM) and the State of Arizona Aquifer Protection Permit (APP) P-100229. The reclaim solution pond is the only remaining facility to be closed, and it continues to collect, store, and evaporate effluent from the closed heap leach and tailings impoundment (CCGC 2006a, CCGC 2006b).

The closed heap leach and tailings impoundment are capped with coarse native rock to prevent erosion, and their surfaces are sloped to direct precipitation runoff off the tops of the two facilities. The residual draindown of process water and any precipitation that infiltrates through the cover material of the facilities is captured by the tailings underdrain system and is directed via three 8-inch-diameter corrugated plastic pipes to the approximately 2.65-acre reclaim solution pond. Effluent discharged to the reclaim solution pond is then disposed of by passive solar evaporation.

CCGC proposes to modify the technology used to manage the effluent from the decommissioned heap leach and tailings impoundment by constructing and operating a Passive Wetland Treatment System and closing the existing reclaim solution pond. The Passive Wetland Treatment System would operate until it is no longer needed to manage effluent from the facilities.

[1] CCGC is a wholly owned subsidiary of Cyprus Amax Minerals Corporation (CAMC). CAMC became a wholly owned subsidiary of Phelps Dodge Corporation when Phelps Dodge acquired CAMC in 1999. Phelps Dodge Corporation is now a wholly owned subsidiary of Freeport McMoRan Copper and Gold Inc., which acquired Phelps Dodge Corporation in 2007.

1.2 Location

The CCGM is located in La Paz County, Township 6 North, Range 20 West, portions of Sections 11, 12, and 13 (Gila and Salt River Base Line and Meridian). The latitude is 30°, 52', 20" N, and the longitude is 114°, 17', 19" W (CCGC 2006a).

1.3 Purpose and Need for the Proposed Action

The purpose of the Proposed Action is to install a new seepage treatment system at the former CCGM, consistent with an APP approved by the Arizona Department of Environmental Qaulity (ADEQ), which would replace an existing lined surface containment pond. The treatment system is designed for the following purposes:

- to reduce the concentrations of arsenic and cyanide in effluent draining from the closed heap leach and tailing facilities
- to ensure that groundwater quality standards are met at the APP point of compliance as required by APP P-100229[2]
- to reduce potential hazards to wildlife
- to accomplish closure of the reclaim solution pond and eliminate the pool of untreated effluent
- to implement a sustainable, long-term approach for managing and treating effluent without the need for an external power source or significant operation and maintenance activities.

The CCGM is located on lands administered by the BLM and was constructed, operated, and reclaimed in accordance with an approved MPO. Therefore, BLM approval is required for project activities related to development of the Passive Wetland Treatment System and closure of the reclaim solution pond (CCGC 1986, CCGC 1988, CCGC 1990, BLM 1986, BLM 1987a, BLM 1988).

The current effluent management system relies upon evaporation of untreated effluent from a lined reclaim solution pond. As of March 2006, the effluent discharged to the reclaim solution pond contained arsenic and cyanide at concentrations above the Arizona Aquifer Water Quality Standards (AWQS) (CCGC 2006a and CCGC 2006b).

Based on groundwater quality monitoring conducted since 1998, groundwater in the vicinity of the CCGM meets numeric AWQS, which demonstrates that the current effluent management system has thus far achieved compliance with AWQS. However, given the reliance on synthetic liners and evaporation to protect groundwater, CCGC has determined that a Passive Wetland Treatment System would afford greater environmental protection over the long term because the effluent would be treated to meet AWQS. Therefore, the

2 The Arizona Department of Environmental Quality (ADEQ) issued APP P-100229 to CCGC for closure of a truck wash facility in 1995. In 1999, the ADEQ issued a major modification to the APP for closure of the remaining facilities, including the heap leach, tailing impoundment, and reclaim solution pond, subject to Arizona APP requirements. In January 2007, CCGC initiated Amendment LTF 42953 to APP P-100229 (CCGC 2006b) to replace the existing reclaim solution pond with an engineered wetland system to treat the discharge. ADEQ has developed a draft APP amendment (ADEQ 2007a), and the ADEQ approved the amendment in September 2007 (ADEQ 2007b).

new treatment system is needed to ensure continued protection of regional groundwater by reducing the risk of potential leakage of untreated water from the existing reclaim solution pond. In addition, the potential hazard to wildlife from exposure to effluent also would be reduced.

CCGC evaluated a number of alternative treatment systems and determined that the Best Available Demonstrated Control Technology (BADCT) would be treatment of the effluent by means of a Passive Wetland Treatment System. The BADCT design would treat the effluent through pre-treatment and wetland treatment cells prior to its discharge to an unlined infiltration/evaporation basin. Based primarily on modeling and supported by bench-scale testing, the concentrations of arsenic and cyanide in the discharge infiltrating below the proposed system's infiltration/ evaporation basin would be reduced to levels that comply with AWQS (CCGC 2006b). Additional information on the quality of the discharged effluent is provided in Section 4.5.2, *Groundwater*. This preferred treatment technology would enable CCGC to discontinue use of the reclaim solution pond, where there is a potential environmental risk due to the presence of untreated effluent within the facility.

Elimination of the reclaim solution pond would also reduce the risk of exposure of wildlife to the potentially toxic effluent or effluent precipitates. Currently, hazards to wildlife must be mitigated through the use of fencing and bird exclusion devices (netting and/or bird balls). Flow through the various components of the Passive Wetland Treatment System is expected to progressively reduce cyanide and arsenic concentrations to levels that would be much less hazardous to wildlife. Additional information on the quality of the effluent as it passes through the Passive Wetland Treatment System is provided in Section 4.7, *Wildlife*.

1.4 Conformance with Land Use Plans

This document is being prepared in compliance with federal guidelines, including the National Environmental Policy Act (NEPA), the Council of Environmental Quality Implementation Procedures outlined in Part 40 of the Code of Federal Regulations, and Department of the Interior and BLM policies and manuals. The Proposed Action would be authorized in accordance with the regulations found at 43 CFR 2912 and the Recreation and Public Purposes Act (Act of June 14, 1926, as amended; 43 U.S.C. 869; 869-4).

1.5 Relationship to Other Plans

This Environmental Assessment (EA) is tiered to and in conformance with the Yuma District Resource Management Plan and Environmental Impact Statement (RMP), as amended (BLM 1987b). The RMP identifies current management designations for the Yuma Field Office (YFO) planning area. The Proposed Action would not result in any changes to current land uses

2 Description of Proposed Action and Alternatives

2.1 Proposed Action – Multi-Cell Passive Wetland Treatment System

2.1.1 Project Description

CCGC proposes to modify the technology used to manage the effluent from the heap leach and tailings impoundment by constructing a Passive Wetland Treatment System. The Passive Wetland Treatment System concept consists of four primary components including:

- diversion of effluent from the existing heap leach/tailing impoundment drain system to a multi-cell Passive Wetland Treatment System
- monitoring of effluent and groundwater to demonstrate adequacy of the treatment system
- closure of the reclaim solution pond
- development of a contingency plan for modifying the treatment system, if necessary (CCGC 2006a, CCGC 2006b).

Modification of the heap leach/tailings impoundment effluent treatment system would also involve construction of a small stormwater retention basin along the southern side of the reclaim solution pond and minor relocation of the existing fence and facility access road around the proposed passive wetland treatment facility.

A site plan depicting the major components of the Proposed Action is provided in Figure 2, *Site Plan*, and an aerial photo showing the footprint of development under the Proposed Action is provided in Figure 3, *Proposed Action Footprint*. Design details of the Passive Wetland Treatment System are presented in the amended APP (ADEQ 2007b).

The new Passive Wetland Treatment System would be constructed east of the existing reclaim solution pond. A sump would be constructed to collect discharge from the existing tailings underdrain system and any seepage from the toe of the tailings impoundment embankment, and a pipeline would be installed to convey the effluent by gravity flow from the sump to the Passive Wetland Treatment System.

Effluent flow into the Passive Wetland Treatment System would be split between two parallel treatment trains. Flow within each treatment train would first pass through a precast-concrete vault, anaerobic pre-treatment cell (e.g., Pre-Treatment Cell 1A in Figure 2, *Site Plan*) designed to reduce concentrations of cyanide and arsenic through contact with an engineered soil mixture of coarse sand and compost. Flow would be contained entirely within the engineered soil layer, which would be covered by a 1-foot-thick sand cover.

Effluent would then flow through a series of two lined wetland treatment cells (e.g., Wetland Treatment Cells 1A and 2A in Figure 2, *Site Plan*) for additional polishing. As illustrated in Figure 4, *Pre-Treatment and Wetland Treatment Cell Profiles*, the wetland treatment cells would include both shallow and deep zones. The shallow zones would be planted with emergent wetland vegetation, and the deep zones would redistribute flow and limit short-circuiting.

Shallow-zone wetland vegetation would include three wetland plant species, including hardstem bulrush (*Schoenoplectus acutus* var. *acutus*), three-square bulrush (*Scirpus pungens*), and common cattail (*Typha latifolia*). The slopes of the berm separating the two sets of wetland treatment cells would be planted with five other wetland plant species, including yerba mansa (*Anemopsis californica*), spikerush (*Eleocharis macrostachya/Eleocharis palustris*), horsetail (*Equisetum hyemale*), pennywort (*Hydrocotyle verticillata*), and Baltic rush (*Juncus balticus*). Propagation of these species would be by 2-inch plugs arranged at approximately 1.5-foot spacing according to the plan and details depicted in Figure 5, *Wetland Planting Plan*. Additional planting specifications are provided in the Figure 5 legend.

Flows from the parallel wetland treatment cells would join in one unlined infiltration/ evaporation cell (see Figure 2, *Site Plan*). Normal flows would infiltrate through an engineered soil zone, providing further polishing of the effluent prior to its percolation to groundwater (see Figure 6, *Infiltration/Evaporation Cell Profile*). The infiltration/evaporation cell would have sufficient overflow capacity to contain stormwater overflows from the wetland cells, and this water would ultimately infiltrate into native soils.

Inflow to the reclaim solution pond has been consistent at 1.5 to 2.5 gpm for nearly 8 years (CCGC 2007). The Passive Wetland Treatment System would be sized for a constant flow of 2.0 gallons per minute (gpm) and would be able to function at flow rates as low as 1.5 gpm during dry periods and as high as 3.0 gpm for brief periods, such as following storm events (CCGC 2006a). The maximum footprint of the wetland system was determined based on the goal of maintaining some level of through-flow even in the driest month (June), assuming an inflow to the system of 2.0 gpm and negligible precipitation (CCGC 2007).

The piping network throughout the Passive Wetland Treatment System would be sized to distribute flow as evenly as possible under gravity flow conditions. The piping system would accommodate significant variations in the effluent flow rate, and the drain system and parallel treatment trains would provide an engineered control on water levels that should ensure adequate moisture to sustain the wetlands (CCGC 2006a). The selected wetland plants are hardy and are adapted to survive some periods of low water. These combined measures are considered adequate to maintain Passive Wetland Treatment System performance.

Although CCGC considers the wetland system to be appropriately sized and adaptable to expected variations in flow and climatic conditions, supplemental irrigation of the wetland treatment cells would be provided if necessary to facilitate initial establishment of a stable wetland community (CCGC 2007) and thereafter as necessary to sustain the wetlands during short periods of extreme drought. Supplemental irrigation water would be provided by pumping groundwater from the CCGM APP point-of-compliance monitoring well (Well MW-257). A portable generator would be used to power the dedicated pump in this well. The need for supplemental irrigation would be determined based on monthly visual

inspections of the wetland treatment cells. Irrigation would likely be initiated when the water level in the wetland cells drops to approximately 6 inches below the soil surface in the shallow zones of the wetland cells.

The Passive Wetland Treatment System would be enclosed by a compacted earthen berm to prevent surface water and sediment from draining into the treatment system. The height of the berm would be calculated to provide containment for the normal operating water level required to sustain the wetland vegetation, plus the full depth of the 100-year/24-hour precipitation event, plus 2 feet of freeboard.

A subsurface biota barrier, keyed to the earthen berm, would be constructed around the perimeter of the pre-treatment and wetland treatment cells to exclude burrowing animals. A chain-link fence would be constructed around the entire perimeter of the Passive Wetland Treatment System to inhibit access by large animals and human trespassers.

Monitoring, as required by the amended APP, would be conducted to ascertain whether the Passive Wetland Treatment System is performing satisfactorily. Monitoring would include:

- visual inspection of the treatment system, including the condition of wetland vegetation
- measurement of flow rates within the system
- monitoring of the water quality at both the inlet to the Passive Wetland Treatment System and the discharge from the wetlands treatment cells to the evaporation/infiltration basin to evaluate the treatment system's performance
- groundwater monitoring at the point-of-compliance monitoring well MW-257 to ensure that the Passive Wetland Treatment System functions to prevent discharge of arsenic and cyanide to groundwater at concentrations in excess of AWQS (CCGC 2007).

Monitoring of the Passive Wetland Treatment System would generally be performed on a monthly basis (facility inspection) and on a quarterly basis (for water quality) for the first 2 years of Passive Wetland Treatment System operation, with quarterly groundwater monitoring continuing until 2 years after closure of the reclaim solution pond. Monitoring would include monitoring the perimeter of the waterbodies for bird and animal carcasses and recording the species and location if any or found. The amended APP allows for subsequent monitoring of the various elements on a less-frequent basis if all stated discharge limits are met during the initial 2-year test period. Details of the monitoring programs and schedules are provided in the amended APP (ADEQ 2007b).

Although not required by the APP, monthly monitoring would include inspecting the perimeters of all waterbodies that may pose a risk to wildlife. Any wildlife carcasses would be recorded as to location and species, to the extent possible.

Closure of the reclaim solution pond would be deferred until 2 years of adequate performance of the Passive Wetland Treatment System have been demonstrated by its having met all stated discharge limits. The main header pipe, extending from the tailings impoundment underdrain to the new Passive Wetland Treatment System, would include a lateral extension to a discharge point located along the northern edge of the reclaim solution pond. If the wetland does not perform as expected within the 2-year test period, the lateral pipe can be used to divert flow back to the reclaim solution pond. A contingency plan for modifying the treatment system has also been developed, and contingency action would be

initiated based on the results of monitoring. Details of the contingency plan are provided in the amended APP (ADEQ 2007b).

Once performance of the new Passive Wetland Treatment System has been verified, closure of the reclaim solution pond would be accomplished by:

- dewatering the reclaim solution pond either by transporting any remaining effluent to an effluent disposal area on the surface of the tailings impoundment (following removal of a portion of the tailings impoundment cover and preparation of an infiltration basin or trench) or by passive or enhanced evaporation within the reclaim pond
- removing existing facilities
- sampling and potential removal of sediment within the reclaim solution pond and soils beneath the pond liner that do not meet soil quality standards
- filling and grading the pond to establish positive surface water drainage
- seeding the final graded pond cover with locally adapted, perennial plant species.

Final grading of the reclaim solution pond cover would route stormwater runoff from that area to a new stormwater retention basin to be constructed along its south side. Stormwater runoff from the tailings impoundment embankment would also be routed to this retention basin via a drainage channel (see Figure 2, *Site Plan*).

The footprint of the Proposed Action would total approximately 6.5 acres. The Passive Wetland Treatment System would occupy approximately 2.0 acres immediately east of the existing reclaim solution pond (see Figure 2, *Site Plan*). This area currently supports sparse native vegetation and is fenced. Relocation of approximately 600 feet of the facility fence and access road to skirt the passive wetland treatment features would impact an additional 0.2 to 0.4 acre of predominantly native vegetation. Closure of the 2.65-acre reclaim solution pond and construction of the new approximately 0.2-acre stormwater retention pond would involve reconfiguration of approximately 4.3 acres of previously developed project features (see Figure 2, *Site Plan*). Any required construction laydown areas can be accommodated on previously disturbed lands. Earth-fill borrow materials used to backfill the reclaim solution pond would be obtained from the existing designated soil borrow area located west of the reclaim solution pond.

The Passive Wetland Treatment System would function without requiring an external power source or significant routine operation and maintenance activities. Following the initial 2-year test period, project inspection and monitoring staff would visit the site on a quarterly basis, with less frequent visits after several years of successful operation.

The Proposed Action, employing the multi-cell Passive Wetland Treatment System, represents a proven technology for treating arsenic and cyanide. It constitutes a cost-effective, flexible, relatively low-maintenance approach to achieving maximum reduction in the concentration of these constituents in the heap leach/tailings impoundment draindown effluent at this remote site. Implementation of the Proposed Action in lieu of continued use of the existing reclaim solution pond would positively impact or have no impact on groundwater quality at the monitoring well; with this alternative, the facility would continue to demonstrate compliance with AWQS. Relative to other alternatives, the system reduces the risk of exposure of wildlife to effluent. Finally, the treatment system area can be

expanded or reduced, as necessary, to accommodate changes in effluent flow rate over time. The Proposed Action meets the BADCT requirements of A.R.S. § 49-243(B)(1)(CCGC 2006a, CCGC 2006b).

2.1.2 Environmental Measures to Reduce or Mitigate Potential Impacts

The following environmental measures have been incorporated into the Passive Wetland Treatment System design to reduce or mitigate potential impacts of the Proposed Action.

- To minimize new ground disturbance and the loss of native vegetation, existing roads would be used for construction access; only approximately 600 feet of the existing access road would need to be realigned around the Passive Wetland Treatment System.
- To minimize impacts to geology and soils, earth-fill borrow materials used to backfill the reclaim solution pond would be obtained from the existing designated soil borrow area located west of the reclaim solution pond.
- To protect surface soils from wind erosion and to reduce the potential for release of fugitive dust, water trucks would be employed during construction of the Passive Wetland Treatment System and the stormwater retention basin and during closure of the reclaim solution pond.
- To minimize potential impacts to groundwater, effluent monitoring would be conducted to ascertain whether the Passive Wetland Treatment System is performing satisfactorily, and groundwater quality would continue to be monitored (see Section 2.1.1, *Project Description*).
- Based on the results of Passive Wetland Treatment System performance monitoring and groundwater quality monitoring, the treatment system would be modified, if necessary.
- To minimize the introduction of noxious weeds to the site, only certified weed-free seed and mulching materials would be used for project reclamation and site restoration. Disturbed areas and reseeded areas would be monitored for the presence of invasive species, and appropriate measures would be implemented to remove invasive plants found during such monitoring.
- To minimize potential impacts to birds, existing measures for preventing avian contact with untreated tailings impoundment effluents in the reclaim solution pond would be maintained until the reclaim solution pond is closed. Sufficient "bird balls" are placed for full coverage of the surface area portion of the pond that holds effluent under normal operating conditions. Bird balls can be displaced by wind, requiring periodic replacement to maintain full coverage. Netting is also used when needed to provide additional exclusion of birds from the reclaim solution pond.
- To minimize potential impacts to wildlife, a chain-link fence would be constructed around the perimeter of the Passive Wetland Treatment System to inhibit access by large terrestrial animals, and a subsurface biota barrier would be constructed around the perimeter of the pre-treatment and wetland treatment cells to exclude burrowing animals. The precast-concrete vault structure of the pre-treatment cells would exclude burrowing animals from that portion of the Passive Wetland Treatment System.
- To further minimize potential impacts to wildlife, the effluent in the Passive Wetland Treatment System's initial pre-treatment cells would be contained entirely within the engineered soil layer, which would be covered by a 1-foot-thick sand cover. Additional exclusionary measures, such as the subsurface wildlife barrier, chain-link fence, liners, and concrete walls, would prevent exposure of wildlife to untreated solutions.

- Although risks to wildlife from water quality in the wetland cells and the infiltration/evaporation cell are not anticipated, both the inlet and outlet of the Passive Wetland Treatment System would be monitored for water quality, and this information, along with monthly visual monitoring for potential wildlife impacts, would be used to determine whether additional measures are needed to protect wildlife. Such measures may include covering all exposed water that poses a risk to wildlife due to water quality.
- Appropriate procedures would be followed to avoid potential impact to banded Gila monsters (see Section 4.8.2, [*Special Status*] *Animals*).
- To minimize potential impacts to cultural resources, work would be discontinued in the immediate area pending consultation with the BLM should unanticipated cultural resources materials be discovered during construction.

2.2 Alternatives Eliminated from Detailed Analysis

A number of alternative treatment technologies have been considered but were eliminated from further consideration for the reasons described in the following sections. None of these alternatives was judged to meet the goals for closure of the reclaim solution pond described in Section 1.2, *Purpose and Need for the Proposed Action*, above, or to provide as great a degree of environmental protection as the Proposed Action.

2.2.1 Evapotranspiration Cell Treatment

This treatment alternative would involve diverting flow from the tailings impoundment drain system to an unlined evapotranspiration cell located east of the existing reclaim solution pond and closing the reclaim solution pond by backfilling and grading. Treatment within the evapotranspiration cell would be achieved by a combination evaporation, plant transpiration, removal of contaminants from the flow by an established vegetation community within the cell, and infiltration into subsurface soils. The infiltration component would be minimized by distributing water over as broad an area as feasible, thus maximizing removal of water through evaporation and transpiration. Groundwater monitoring would continue over a period of time necessary to ensure that the evapotranspiration cell functions to prevent discharge of arsenic and cyanide to groundwater at concentrations in excess of AWQS (CCGC 2006a, CCGC 2006b).

Although this design alternative achieves some of the goals for closure of the reclaim solution pond, the effectiveness of treatment is reduced relative to the Proposed Action because 1) there is no pre-treatment component and 2) due to subsurface infiltration, there would be minimal control over effluent residence time within the treatment system, and, thus, the residence time may be inadequate to achieve optimal treatment levels. Therefore, the subsurface hydrogeology in the vicinity of the system would likely require characterization to demonstrate that discharge via infiltration would not cause or contribute to exceedance of an AWQS (CCGC 2006a, CCGC 2006b).

2.2.2 Reduction in Reclaim Solution Pond Size

Under this alternative, closure of the reclaim solution pond would be achieved by reducing the size of the pond to approximately 25 percent of its current size. The pond is currently significantly larger than required to evaporate the amount of effluent currently draining from the tailings impoundment. Reduction in the pond size would be accomplished by

removing accumulated sediment and constructing an earthen berm to enclose a smaller area within the pond. The interior of the berm would be lined with high-density polyethylene (HDPE) keyed to the existing liner, and the tailings impoundment effluent flow would be redirected to the smaller pond (CCGC 2006a, CCGC 2006b).

Reducing the size of the reclaim solution pond would minimize the potential for adverse impacts to soil and groundwater beneath the pond by decreasing the size of the liner and, thus, potential discharge through the liner. It would also reduce the area of impacted sediment and effluent within the pond accessible by wildlife (CCGC 2006a, CCGC 2006b).

Although the reclaim solution pond has demonstrated effectiveness over the period of its operation and would still have sufficient storage capacity to accommodate significant storm events and variations in tailings effluent flow, this alternative does not provide any reduction in the concentration of arsenic and cyanide in the effluent. The pond surface would remain an attraction to wildlife, thereby requiring more extensive wildlife protection measures and a commitment of personnel for maintenance of these measures. Furthermore, the existing effluent collection and recovery system within the pond would require continuing operation and maintenance (CCGC 2006a, CCGC 2006b).

2.2.3 Reclaim Solution Pond Cover

Under this alternative, the reclaim solution pond would be closed, while still allowing for continued collection and evaporation of effluent. First, effluent flow through the existing discharge pipe would be temporarily shut off, and ponded effluent would be evaporated or removed to allow for inspection of the exposed pond liner and repair of any visible holes or defects. The pond would be backfilled and compacted with layers of spent ore borrow material and gravel, within which seepage inflow would be directed through a series of networked perforated polyvinyl chloride (PVC) pipes. Above this, the pond would be backfilled with alluvial sand to provide a capillary wick for facilitating upward movement and eventual evaporation of tailings flow. A layer of gravel and cobbles would be placed above the alluvial sand layer to prevent access by burrowing animals, allow for evaporation, and minimize development of precipitate at the surface. Monitoring standpipes would be installed (CCGC 2006a, CCGC 2006b).

Effluent flow would be slowly metered into the pond through valves, and visual inspections would ensure that the evaporative capacity of the system is not exceeded (CCGC 2006a, CCGC 2006b).

This alternative provides for wildlife protection and reduces the commitment of personnel for maintenance. It does not, however, provide for any reduction in the concentration of arsenic and cyanide in the effluent. Furthermore, this alternative greatly reduces effluent evaporation due to the presence of granular material and has the potential for gradual accumulation of effluent within the pond at depths below the evaporative zone. Potential effluent accumulation, combined with the lack of contaminant reduction, increases the potential for discharge of arsenic and cyanide to soils beneath the existing pond liner at concentrations in excess of AWQS (CCGC 2006a, CCGC 2006b).

2.3 No-Action Alternative

Under the No-Action Alternative, operation of the reclaim solution pond would continue consistent with current practice. This alternative does not represent a reduction in arsenic and cyanide concentrations in effluent and is not protective in terms of being an attraction to wildlife. The existing system would require continuing operation and maintenance. The No-Action Alternative would not meet the intent of reclaim solution pond closure and, therefore, of final facility closure by ADEQ (CCGC 2006a, CCGC 2006b).

3 Affected Environment

This section describes the current condition of elements of the human and natural environment that would or could be affected by the Proposed Action or the No-Action Alternative. Much of the information used to develop the description of the affected environment comes from the YFO Draft Resource Management Plan and Draft Environmental Impact Statement (Draft RMP), which is currently being prepared (BLM 2006). The Draft RMP identifies current characteristics of the human and natural environment of the YFO planning area.

The following sections provide information to serve as a baseline from which to identify and evaluate environmental and socioeconomic changes likely to result from implementation of the Proposed Action. Baseline conditions represent current conditions.

In compliance with NEPA and CEQ guidelines, the description of the Affected Environment focuses on resources and conditions potentially subject to impacts from the Proposed Action. Several critical elements of the environment are not evaluated in this EA because it was determined that implementation of the Proposed Action would be unlikely to have any impacts on these resources. The following critical elements have been excluded from analysis for the reasons noted.

- Floodplains – The Proposed Action would occur outside any 100-year floodplain.
- Prime or Unique Farmlands – No farmland would be affected by the Proposed Action.
- Areas of Critical Environmental Concern – No Areas of Critical Environmental Concern (ACECs) are located in the vicinity of the Proposed Action. The ACEC closest to the proposed project site is the Big Marias ACEC located approximately 13 miles to the west.
- Wilderness Areas – No Wilderness Areas are located in the vicinity of the Proposed Action. The closest Wilderness Area is the Big Marias Mountains Wilderness located approximately 15 miles to the west. The YFO Draft RMP identifies certain areas between 6 and 13 miles east of the proposed project site as having wilderness characteristics related to naturalness, solitude, and primitive and unconfined recreation. No Wilderness Study Areas are located in the YFO planning area (BLM 2006).
- Wild and Scenic Rivers – No Wild and Scenic Rivers are located in the YFO planning area (BLM 2006).
- Energy Policy -- The area of the Proposed Action contains no features related to energy development, production, supply, or distribution, and implementation of the Proposed Action would have no impacts on energy policy.

Paleontological resources have also been excluded from analysis in this EA because there are no geological outcrops in the vicinity that could potentially contain paleontological resources. The Proposed Action would occur in an area of alluvial and eolian deposits, and bedrock in the area is at great depth.

3.1 Land Use and Ownership

The Proposed Action would occur on BLM-managed lands at the northern end of the BLM YFO planning area. The CCGM is located approximately 1 mile east of the eastern boundary of the Colorado River Indian Tribes (CRIT) Reservation.

Land uses in the general vicinity of the project include recreation, grazing, mineral prospecting, and mining. The area has been identified as having moderate potential for metallic minerals, non-metallic minerals, and salable minerals but not oil and gas potential (BLM 2006). No current lands and realty/minerals uses have been designated in the vicinity of the proposed project area, and no communications sites are located nearby (BLM 2006). Aerial military training routes, both visual flight routes and slow speed routes, cross over the proposed project area (BLM 2006).

The Proposed Action would not occur within any current Grazing Allotment (BLM 2006).

No areas with BLM-supported special designations, including National Recreation Trails, National Historic Trails, National Scenic Byways, or National Back Country Byways, are located in the vicinity of the Proposed Action. No National Conservation Areas, National Monuments, or National Scenic Trails are located in the YFO planning area (BLM 2006).

The dominant nearby land use is the retired CCGM, including the open pit mine, heap leach/tailings impoundment, and reclaim solution pond. The proposed Passive Wetland Treatment System would be constructed immediately adjacent to the latter two features.

3.2 Topography, Geology, and Soils

3.2.1 Topography

The CCGM is located about 11 miles east of the Colorado River in an area that exhibits characteristic Basin and Range physiography, with sharply rising mountains separated by broad alluvial plains. The CCGM is situated on the northern portion of the La Posa Plain, a large, sediment-filled desert basin between the north- to northwest-trending Plomosa Mountains to the east and the Dome Rock Mountains to the southwest. The local topography is predominantly flat, with a typical slope of 30 to 40 feet vertical drop per mile horizontal to the south. The proposed project site is approximately 870 feet above mean sea level (MSL) (CCGC 2006b).

3.2.2 Geology

The CCGM is located within the Basin and Range physiographic province (Hendricks 1985). Local geologic units are Holocene-age (recent) alluvium and eolian sands overlying bedrock. The bedrock consists of Paleozoic-age sedimentary units and pre-Paleozoic igneous and metamorphic rocks. The alluvium is unconsolidated fine-grained silts, sand, and gravel with very low moisture content and weak to moderately lime-cemented lenses. The alluvium ranges from zero to 400 feet thick, with the average depth to bedrock in excess of 100 feet (Golder 1993, CCGC 2006b).

3.2.3 Soils

The soils of the project area belong to the soil order Aridisols (soils commonly found in dry environments that are low in organic matter and rich in deposited salts) and suborder Orthids (soils that are light colored, contain little organic matter, and have at least one diagnostic subhorizon) (BLM 2006). Orthids can be calcareous throughout, but can also have accumulations of carbonates, cemented carbonates, or cemented silica, with limited areas containing accumulations of gypsum.

Soils in the project area are light brown, predominantly fine-grained sands and silty sands that readily form sand dunes. They have a hyperthermic (hot) soil temperature regime and an aridic (dry) soil moisture regime. The soil type is likely Rositas sand (BLM 1986). The Rositas soil is deep, nearly level, and excessively drained with rapid permeability. Whether non-irrigated or irrigated, these soils have poor to very poor potential for rangeland or wildlife habitat. The sandy texture of the soil limits recreation development, and there is a high hazard of blowing soil. Soil disturbance (particularly to sensitive soils) lasts a long time in the arid southwest, where estimated recovery times range from less than a century up to several millennia depending on the nature and intensity of the disturbance and soil properties (Belnap et al. 2001; Weinstein et al. 2004).

Sensitive soils in the YFO planning area include desert pavement, cryptobiotic (biological) soil crusts, stabilized sand dunes, and wetland soils. Sensitive soils are significant because of their susceptibility to erosion and their roles in supporting plants and wildlife. No sensitive soils, as described in the YFO Draft RMP (BLM 2006), were observed at the project site during a site visit in March 2007 (CH2M HILL 2007). Sand that has accumulated around scattered shrubs was observed to exhibit a thin crust of slightly cemented nature.

3.3 Air Quality

3.3.1 Climate

The region has hot summers, mild winters, low rainfall, high evaporation rates, and low humidity. Regional climate data from 47 years of record (1959 through 2005) for the meteorological station in Quartzsite, Arizona, and the Western Regional Climate Center website (http://www.wrcc.dri.edu) indicate that the annual evaporation rate is approximately twenty times greater than the annual precipitation rate of 4.06 inches per year. The maximum annual total precipitation occurred in 2005, with a total of approximately 9 inches reported. The lowest annual total precipitation occurred in 2000, with a total of approximately 1.25 inches reported.

The largest daily precipitation events occur between July and December, with numerous events yielding over 1 inch per day. The months with the least daily rainfall are May and June, during which the mean daily precipitation is below 0.05 inch (CCGC 2006b).

Average maximum temperatures range from approximately 65° F in December and January to approximately 108° F in July. Approximately 110 days per year have average temperatures over 100° F (BLM 1986). Average minimum temperatures range from approximately 38° F in December and January to approximately 81° F in July and August (CCGC 2006b).

Prevailing wind directions are generally from the north in the fall and winter months, from the west-northwest and west in the spring, and from the south-southeast in the summer months. Wind speeds average 7.8 miles per hour annually (BLM 2006).

3.3.2 Air Quality

Air quality in the YFO planning area is generally excellent (BLM 2006). With the exception of the City of Yuma, which is a non-attainment area for PM10, all areas within the YFO planning area meet the NAAQS standards for criteria pollutants except for particulate matter.[3] The majority of emissions in La Paz County are attributable to prescribed burning, road construction, and fugitive dust (BLM 2006).

3.4 Noise

Ambient noise is minimal at the proposed project site. There is occasional noise from maintenance activities related to operation of the reclaim solution pond, maintenance personnel vehicles, and off-highway vehicles (OHV).

3.5 Water Resources

3.5.1 Surface Water

The CCGM is located in one of the driest regions in the United States, with large areas classified as arid and semiarid (Golder 1993). The Colorado River, which runs from north to south approximately 11 miles west of the CCGM, is the only river that flows through the area. The CCGM generally straddles the relatively flat surface water drainage divide between the Imperial Reservoir surface water sub-basin to the west and the Tyson Wash sub-basin to the south (BLM 2006). Surface water flows in the vicinity of the CCGM are ephemeral and usually the result of precipitation events. During such events, local drainage is generally to the west (CCGC 2006b).

The nearest significant surface drainage is Tyson Wash, which is located 5 miles to the southwest and drains the La Posa Plain. The only surface water in the vicinity of the CCGM is that contained in the existing reclaim solution pond. This pond is scheduled to be closed following the 2-year Passive Wetland Treatment System test period. Less than one-quarter of the original 2.65-acre pond currently holds effluent from the heap leach/tailings impoundment. To discourage use of the reclaim solution pond by avian fauna, sufficient bird balls are placed for full coverage of the surface area portion of the pond that holds effluent under normal operating conditions. Bird balls can be displaced by wind, requiring periodic replacement to maintain full coverage. Netting is also used when needed to provide additional exclusion of birds from the reclaim solution pond.

[3] The U.S. Environmental Protection Agency's (EPA) National Ambient Air Quality Standards (NAAQS) for seven pollutants (particulate matter less than 10 microns in diameter [PM_{10}], particulate matter less than 2.5 microns in diameter [$PM_{2.5}$], carbon monoxide [CO], nitrogen dioxide [NO_X], sulfur dioxide [SO_2], ozone [O_3], and lead [Pb]) are provided in Table 3-3 of the YFO Draft RMP (BLM 2006).

3.5.2 Groundwater

Hydrogeology

The CCGM is located within the La Posa Plain subbasin of the Parker groundwater basin. The La Posa Plain subbasin is an internal basin that is separated from direct impact by flow in the Colorado River (BLM 2006).

Based on geological characteristics and hydrogeologic conditions, two water-bearing formations have been defined in the region, the Holocene-age Older Alluvium and the bedrock of the pediment. However, in the vicinity of the CCGM, groundwater does not occur in the alluvium but rather occurs only within the underlying bedrock (CCGC 2006b). At the monitoring well, which is located approximately 130 feet southeast of the southeast corner of the reclaim solution pond (Figure 2, *Site Plan*), the depth to bedrock is 250 feet (Golder 1993, CCGC 2006a).

The depth to groundwater across the CCGM site ranges from approximately 550 feet to 870 feet below the ground surface (Golder 1993). Data from the monitoring well best represent water levels near the proposed Passive Wetland Treatment System site. Over the period of record, the water level in the monitoring well remained consistent at approximately 509 feet below the well head elevation. The water level data confirm that there is minimal influence on the aquifer as a result of precipitation and recharge because the aquifer is a deep regional bedrock aquifer with limited connection or response to surface conditions (CCGC 2006b).

Local groundwater flow direction at the CCGM site is structurally and stratigraphically controlled. The local lateral and vertical movement of groundwater is controlled by lithologic and permeability changes that are related to depositional environment and geologic structure. Local gradients may be highly irregular (Golder 1993, CCGC 2006b).

Groundwater Quality

The monitoring well intersects groundwater down gradient from the reclaim solution pond. This well has been sampled quarterly since June 1998. Samples from the well have historically been analyzed for arsenic, barium, beryllium, cadmium, cyanide, chromium, fluoride, mercury, nitrite, nitrate, nickel, lead, antimony, selenium, and titanium, as required by the CCGM APP (CCGC 2006b).

All data collected from the monitoring well were compared to Arizona Water Quality Standards (AWQS) (where a standard exists) for characterization of ambient groundwater quality. Only cadmium and fluoride concentrations have been detected in excess of AWQS. The cadmium concentration exceeded AWQS once in January 2005. Fluoride concentrations, which range from 4.8 to 5.9 mg/L, although higher than AWQS, are considered ambient groundwater quality conditions and are below the alert level of 7.4 mg/L set in the APP. All other analytical results indicate constituent concentrations either lower than method detection limits (MDLs) or lower than the AWQS. Based on these analyses, there is no evidence of discharge to the aquifer from the reclaim solution pond, and the facility demonstrates compliance with AWQS and the APP (CCGC 2006b).

3.6 Vegetation

3.6.1 Upland Vegetation

Southwestern Arizona is located in the American Semidesert and Desert Ecological Province, which includes the Mojave, Colorado, and Sonoran Deserts of southeastern California, southwestern Arizona, and southern Nevada (Bailey 1995). The CCGM is located in the Lower Sonoran Desert Scrub Major Land Resource Unit, whose upland plant communities are dominated by desert shrubs and cacti and where sand dunes may also be common (NRCS 2005, BLM 2006).

The project site supports a creosotebush-bursage community (BLM 2006), which is the most common plant community in the YFO planning area (BLM 1986). This community is characterized by sparse cover of shrubs dominated by creosotebush (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), triangle-leaf bursage (*Ambrosia deltoidea*), ocotillo (*Fouquieria splendens*), white ratany (*Krameria grayi*), and jumping cholla (*Opuntia fulgida*). The understory is typically sparse but may be seasonally abundant with ephemerals (BLM 2006). In 1986, the then-proposed CCGM site was described specifically as being dominated by creosotebush and white bursage, with an understory of false yarrow (*Chaenactis* sp.), sand verbena (*Abronia villosa*), and evening primrose (*Oenothera* sp.) (BLM 1986).

Sand dunes occupy some areas in the vicinity of the proposed project site. The dune complex is characterized by sparsely vegetated or unvegetated active dune fields, stabilized dunes with more dense vegetation cover that serves to anchor sand in place, and wind-blown sand sheets that overlie other soil substrates. Sand dunes support specialized plant communities and provide specialized wildlife habitat (see Section 3.7, *Wildlife*). In 1986, the large, stabilized sand dunes in the northern portion of the then-proposed CCGM site were described as supporting big galleta and Wiggin's croton (*Croton wigginsii*) (BLM 1986). No sand dunes are present on the proposed Passive Wetland Treatment System site or in the immediate vicinity.

The CCGM is not located in any YFO Vegetation Management Area or other area where vegetation use is restricted (BLM 2006). They are located in the Sonoran Desert Scrub Fire Management Unit in an area classified as YFO Fire Regime Group "barren" and YFO Fire Risk Condition Class "non-vegetation" (BLM 2006). At least one fire occurred within approximately 3 miles of the project site between 1980 and 2003 (BLM 2006).

3.6.2 Riparian Vegetation and Wetlands

Surface water flows in the vicinity of the CCGM are restricted to dry washes that only flow following sufficient precipitation events. Creosotebush, bursage (*Ambrosia* spp.), and brittlebush (*Encelia* spp.) are common to all desert washes. Trees such as paloverde (*Parkinsonia* spp.), ironwood, catclaw acacia (*Acacia greggii*), and mesquite (*Prosopis* spp.) are confined primarily to major washes (BLM 2006). No desert washes are present in the immediate vicinity of the CCGM or the proposed Passive Wetland Treatment System site.

The closest typical riparian vegetation, i.e., streamside communities supporting native obligate riparian trees such as cottonwoods (*Populus* spp.) and willows (*Salix* spp.), occurs along the Colorado River, approximately 11 miles to the west (BLM 2006).

There are no wetlands in the vicinity of the CCGM, and no wetland vegetation has become established around the existing reclaim solution pond (CH2M HILL 2007).

3.6.3 Noxious Weeds

Sahara mustard (*Brassica tornefortii*) is an invasive non-native annual weed that is common in the Sonoran Desert. It is most common in wind-blown sand deposits and in disturbed sites such as roadsides and abandoned fields. In the YFO planning area, Sahara mustard is common within the dune complex (Weinstein et al. 2003). Accumulations of the previous season's flowering stalks were observed in the immediate vicinity of the CCGM during a site visit in March 2007 (CH2M HILL 2007).

3.7 Wildlife

Habitats in the vicinity of the CCGM are used by a variety of desert wildlife common to the widespread creosotebush-bursage communities of the desert Southwest.

The most common mammals include the kangaroo rat (*Dipodomys* spp.), pocket mouse (*Perognathus* spp.), blacktail jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), and coyote (*Canis latrans*) (BLM 1986). Mule deer (*Odocoileus hemionus*) and desert bighorn sheep (*Ovis canadensis mexicanus*) occupy the nearby mountain ranges and associated washes. These big game species make use of desert habitats such as those in the vicinity of the CCGM only during cooler months and after seasonal rainstorms (BLM 2006). Special habitat features used by bighorn sheep, including lambing grounds and migration corridors, are not present in the vicinity of the CCGM (BLM 2006).

The most common birds include the black-throated sparrow (*Amphispiza bilineata*), sage sparrow (*Amphispiza belli*), red-tailed hawk (*Buteo jamaicensis*), and turkey vulture (*Cathartes aura*) (BLM 1986). Other birds that may frequent the area include the black-tailed gnatcatcher (*Piloptila melanura*), verdin (*Auriparus flaviceps*), and yellow-rumped warbler (*Dendroica dominica*).

Common reptile species include the sidewinder (*Crotalus crastes*), western diamondback rattlesnake (*Crotalus atrox*), and side-blotched lizard (*Uta stansburiana*) (BLM 1986).

Of the special habitat features (cliffs, sand dunes, snags, springs, reservoirs, rivers, marshes, lakes, and islands) and key habitat features (riparian habitats, sand dunes, mountain ranges, wildlife watering sites, braided-channel floodplains, and valley desert wash woodlands, abandoned mines, and natural caves) that are present in the YFO planning area, only sand dunes and the former CCGM underground mine occur in the vicinity of the proposed Passive Wetland Treatment System site. Sand dunes, a sensitive and unusual habitat in the low deserts of the planning area, host a variety of wildlife species, many of which, including Cowle's fringe-toed lizard (*Uma notata rufopunctata*), and flat-tailed horned lizard (*Phrynosoma mcallii*), occur in no other habitat (BLM 2006). Abandoned mines and natural caves are particularly important to bats for roosts and maternity colonies, and many of the bat species occurring in the YFO planning area use abandoned mines at least part of the year. Horizontal mine shafts and natural caves also provide shelter for other wildlife, such as ringtail (*Bassariscus astutus*) and fox (*Vulpes* spp.) (U.S. Army 1998, BLM 2006). Neither

sand dunes nor caves or mine shafts occur on the proposed Passive Wetland Treatment System site proper.

No riparian, wetland, or aquatic wildlife habitats are present in the vicinity of the CCGM or the proposed project site, and, therefore, no wildlife species that are restricted to these habitats occur there. The only surface water in the vicinity of the CCGM is that contained in the existing reclaim solution pond.

The project site is not located in any YFO Wildlife Habitat Management Area or in any YFO Wild Horse and Burro Herd Area or Herd Management Area (BLM 2006).

3.8 Special Status Species

3.8.1 Plants

Special status plants are those species listed by the USFWS, the BLM, or the State of Arizona. No plant species listed by the USFWS as threatened, endangered, or candidate species are known to occur in the YFO planning area (BLM 2006) or in La Paz County (USFWS 2006).

One BLM-sensitive species, the scaly sandplant (*Pholisma arenarium*), is known to occur in La Paz County (SEINet 2007). This species is endemic to sand dunes and may be present on sand dunes in the vicinity of the CCGC. Because the proposed site for the Passive Wetland Treatment System contains no sand dunes, this species would not be expected to occur there. Many plant species on the Arizona Native Plant Law list are widely distributed throughout the YFO planning area.

A complete list of BLM-sensitive and Arizona state-protected plant species may be found in Table 4 of Appendix 2-B of the YFO Draft RMP (BLM 2006). The list also includes nine plant species that are considered priority species due to their ecological importance, rarity, or human interest.

3.8.2 Animals

Special status animal species include federally listed (endangered or threatened), proposed, and candidate species, and designated or proposed critical habitat; federal species of concern, which do not have federal status under the Endangered Species Act (ESA) but are managed under BLM conservation agreements or management plans; BLM-sensitive species; and Arizona state-listed species.

Of the twelve federally protected species that potentially occur within the YFO planning area, the USFWS lists nine species as occurring within La Paz County, Arizona, within which the proposed project is located (BLM 2006, USFWS 2006) (see Table 1, *Federally Protected Animal Species in La Paz County, Arizona*). Note that the bald eagle (*Haliaeetus leucocephalus*) was delisted in 2007. As indicated in the table, each of the other listed species is restricted to riparian or aquatic habitats, neither of which is present at the project site.

Table 1 Federally Protected Animal Species in La Paz County, Arizona (BLM 2006)

Common Name	Scientific Name	Status	Habitat
Birds			
Bald eagle	*Haliaeetus leucocephalus*	Delisted July 2007	Upland Sonoran Desert Scrub, Riparian
California brown pelican	*Pelecanus occidentalis californicus*	Endangered	Riparian/ Aquatic
Southwestern willow flycatcher	*Empidonax trailii extimus*	Endangered	Riparian
Western yellow-billed cuckoo	*Coccyzus americanus*	Candidate	Riparian
Yuma clapper rail	*Rallus longirostris yumanensis*	Endangered	Riparian
Fish			
Bonytail chub	*Gila elegans*	Endangered*	Aquatic
Desert pupfish	*Cyprinodon macularius*	Endangered*	Aquatic
Gila topminnow	*Poeciliopsis occidentalis occidentalis*	Endangered *	Aquatic
Razorback sucker	*Xyrauchen texanus*	Endangered	Aquatic

* Extirpated from YFO planning area

One federal species of concern occurs within the YFO planning area. As indicated in Section 3.7, *Wildlife*, the flat-tailed horned lizard occurs only in sand dune habitats such as occur in the vicinity of the CCGM but not on the Passive Wetland Treatment System site proper.

BLM-administered lands within the YFO planning area have the potential for 84 wildlife and fish species that are BLM-sensitive species (13), state wildlife species of concern in Arizona (27), or California state-listed species (44). A complete list of these species may be found in Table 2 of Appendix 2-B of the YFO Draft RMP (BLM 2006); it includes 18 mammals, 62 birds, 5 reptiles, 3 amphibians, and 2 invertebrates. Of these, the peregrine falcon (*Falco peregrinus*) [status: AZSC] may visit the area at times but is not known to use the CCGM site specifically (BLM 1986). Banded Gila monsters (*Heolderma* sus*pe*ctum *cinctum*) [status: BLM] may frequent the area, and Colorado Desert fringe-toed lizards (*Uma notata notata*) most likely occur in stabilized sand dune areas (BLM 1986). Table 3 of Appendix 2-B of the YFO Draft RMP (BLM 2006) includes a list of priority animal species in the YFO planning area, including bats, big game, upland game birds, non-game migratory birds, and raptors.

3.9 Cultural Resources

Cultural resources are defined by the National Historic Preservation Act as prehistoric and historic sites, structures, districts, or any other physical evidence of human activity considered important to a culture, a subculture, or a community for scientific, traditional, religious, or any other reason.

3.9.1 Known Cultural Resource Sites

A cultural resources investigation conducted in April 2007 determined that a Class I cultural resources file review and a Class III cultural resource field inventory of the entire CCGM mine area had been completed in 2005 (e2M 2007, O'Hara and Ezzo 2006). A field check of the proposed Passive Wetland Treatment System site boundary confirmed that the 2005 survey area included the proposed project site (e2M 2007).

Previously recorded cultural resource sites in the vicinity of the proposed project area include:

- AZ R:3:5 (BLM) / AZ-050-1393: A low-density lithic scatter with two pieces of fire-cracked rock. This site was not relocated during the 2005 field inventory and is thought to have been destroyed (O'Hara and Ezzo 2006).
- R:3:4 (BLM) / AZ-050-1392: Nine pieces of flaked stone. This site could not be relocated during subsequent field inventories in 2005 (O'Hara and Ezzo 2006).
- AZ R:3:3 (ASM): A lithic reduction site with over 60 flaked stone artifacts. This site was recommended for listing on the National Register of Historic Places (NRHP) under Criterion D and recommended for avoidance by mining operations (O'Hara and Ezzo 2006).
- AZ R:3:4 (ASM): A lithic procurement site/temporary camp, including three ceramic sherds and 24 flaked stone artifacts. The site was recommended as eligible for listing on the NRHP under Criterion D, and avoidance by mining operations was recommended (O'Hara and Ezzo 2006).
- AZ R:3:5 (ASM): A resource processing site with seven fire-cracked rock concentrations, one ceramic sherd, and ten flaked-stone artifacts. The site was recommended as eligible for listing on the NRHP under Criterion D, and avoidance by mining operations was recommended (O'Hara and Ezzo 2006).
- AZ 3:6 (ASM): A lithic reduction site with 50 flaked stone artifacts. The site was recommended as eligible for listing on the NRHP under Criterion D, and avoidance by mining operations was recommended (O'Hara and Ezzo 2006).

These cultural resource sites are located between 0.6 and 1.0+ miles away from the proposed Passive Wetland Treatment System site.

43 isolated features and artifacts have been identified in the general vicinity of the proposed Passive Wetland Treatment System site. The closest isolated cultural resource to the proposed project site is a tested chert cobble located approximately 1000 feet southeast of the proposed project site (O'Hara and Ezzo 2006).

3.9.2 Native American Religious Concerns

No cultural resources would be affected by implementation of the Proposed Action. Based on coordination and consultation with interested Native American tribes, there are no known Native American religious concerns for the proposed project area.

3.10 Visual Resources

The CCGM is located on flat terrain in a broad desert basin with mountain ranges in the distance to the east and the southwest. Except for occasional dry washes supporting shrubby trees, the vegetation in the area is uniformly low and sparse, with a generally grey-green color. The existing 75-foot-high CCGM tailings impoundment is visible from a distance of at least 10 miles in any direction. Travelers along Arizona State Highway 95 view the tailings impoundment from as close as about 5 miles. The proposed Passive Wetland Treatment System would be situated at the base of the tailings impoundment.

The CCGM is located in an area designated as BLM Visual Resource Management (VRM) Class III (BLM 1987). The objective of VRM Class III is to partially retain the existing character of the landscape. The level of change to the characteristic landscape due to future projects should be moderate.

3.11 Recreation

The CCGM is within an area classified as "rural natural" according to the BLM Recreation Opportunity Spectrum (ROS)[4] (BLM 2006). The area is not within any Special Recreation Management Area (BLM 2006). It is within an area designated as the La Posa Travel Management Area (TMA) within a Limited OHV Management Area (BLM 2006). Motorized travel in Limited OHV Management Areas is restricted to existing roads, trails, and drivable washes (BLM 2006). The only inventoried road in the vicinity of the project site is the unpaved access road to the CCGM from Arizona State Highway 95 and a few primitive routes to the south and west (BLM 2006). A number of free camping areas and a fee Long-Term Visitor Area are available around the town of Quartzsite (BLM 2006).

Recreational activities in the vicinity of the CCGM include OHV travel and hunting.

3.12 Socioeconomics

The proposed project area is located in La Paz County, Arizona, approximately 13 miles north of the Town of Quartzsite. Socioeconomic data are from the U.S. Census Bureau and the Arizona Department of Economic Security.

3.12.1 Demographics

As of 2006, the total population of La Paz County, Arizona, was 21,255, an increase of approximately 53 percent since 1990 and approximately 7 percent increase since 2000 (Quartzsite, Arizona 2007, Arizona Workforce 2007). The total permanent population of the

[4] The rural natural recreation setting area provides prevalent opportunities to see, hear, or smell the natural resources because development, human activity, and natural resource modifications are occasional and infrequent; socialization with others is expected and tolerated; opportunity to relieve stress and to get away from built environment is important; a high sense of safety, security, comfort and convenience is not important nor expected; a sense of independence and freedom with a moderate level of management presence is important; moments of solitude, tranquility, and nature appreciation are important; experiences tend to be more resource dependent, although may be diverse, ranging from relaxation and contemplation to socialization, to physical exertion and challenge; area is typically attractive to extended weekend visitors using recreation vehicles, tents, or rustic cabins (BLM 2006).

Town of Quartzsite was 3,554, which represented an approximately 53 percent increase since 1990 and an approximately 9 percent increase since 2000 (Quartzsite, Arizona 2007, Arizona Workforce 2007). Major gem and mineral shows and swap meets attract on the order of 1.5 million tourists to the area annually, and during the winter, the population of Quartzsite may reach a temporary peak of 250,000 (Quartzsite, Arizona 2007).

The 2000 census indicated that the population of La Paz County was approximately 74 percent white, 13 percent American Indian/Alaska Native, 1 percent Black or African American, less than 1 percent Asian, less than 1 percent Hawaiian/Pacific Islander, approximately 9 percent "some other race," and approximately 3 percent two or more races (BLM 2005, BLM 2006). Approximately 22 percent of the population indicated Hispanic ancestry (BLM 2005). The Town of Quartzsite's population was approximately 94 percent white, 1 percent American Indian, and less than 1 percent each Asian, African American, or Hawaiian/Pacific Islander. Approximately 5 percent of the population indicated Hispanic origins (BLM 2005).

3.12.2 Principal Economic Activities

The primary economic activities and jobs in the area are provided by 1) government and government enterprises (2,362 full- and part-time workers in 2004), 2) retail and services industries (retail trade; real estate, rental, and leasing services; arts, entertainment, and recreation; accommodation and food services; and other services) (about 1,700 full- and part-time workers in 2004), and 3) agriculture and related activities (619 full- and part-time workers in 2004) (BLM 2006). Mining accounted for only 25 jobs in La Paz County in 1997, the last year for which employment data for mining were available (BLM 2006).

Tourism is the major contributor to the Town of Quartzsite's economy. Retail and services sectors, in particular, benefit from visitors residing at numerous mobile home and trailer parks in the vicinity between October and March, as well as from other visitors year-round. Construction constitutes about 10 percent of employment in Quartzsite.

3.12.3 Employment and Income

In 2004, approximately 7,000 persons were employed in La Paz County, with an unemployment rate of 6.9 percent (BLM 2006). The civilian labor force for the Town of Quartzsite was 633 persons, with an unemployment rate of 5.3 percent (Quartzsite, Arizona 2007). The median household income in 1999 was around $26,000 (BLM 2006). Low-income populations are present within La Paz County, with approximately 14 percent of households below the poverty threshold (BLM 2006), and within the Town of Quartzsite, with approximately 8 percent of families and 13 percent of individuals below the poverty threshold (BLM 2005).

3.12.4 Environmental Justice

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs federal agencies to identify and address disproportionately high and adverse human health or environment effects of its programs, policies, and activities on minority and low-income populations. Executive Order (EO) 13045, Protection of Children from Environmental Health Risks and Safety Risks, directs

federal agencies to identify and address environmental health risks or safety risks that may disproportionately affect children.

Low-income populations are present within La Paz County and the Town of Quartzsite (see Section 3.12.3, *Employment and Income*), but not at levels (i.e., 10 percent over the national poverty level) that warrant their classification as such for purposes of environmental justice considerations (BLM 2006).

Minorities constitute approximately 36 percent of the total population of La Paz County, which exceeds the state minority population by 10 percent, therefore meeting the standard for having a minority environmental justice population (BLM 2006).

The proposed site is located approximately 1 mile east of the eastern boundary of the CRIT Reservation. The CRIT economy is centered around agriculture, recreation, government, and light industry. In 2000, approximately 2000 people lived on the reservation. Approximately 27 percent of CRIT residents are below the poverty threshold.

No children live in the vicinity of the CCGM or the site of the proposed Passive Wetland Treatment System. Children may occasionally approach the site during recreational excursions. The site is currently fenced, and the proposed treatment system would be fenced to discourage access.

3.13 Hazardous and Solid Wastes

Hazardous materials currently used in the operation and maintenance of the existing reclaim solution pond are limited to fuels and lubricants used when equipment is present. No fuels or lubricants are stored on site. No hazardous materials are generated by the project. Solid wastes are minimal. Wastes, including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials, are removed to disposal facilities authorized to accept such materials.

4 Environmental Consequences of the Proposed Action

This section analyzes direct and indirect impacts on the affected environment that could potentially occur as a result of the Proposed Action. As indicated in Section 3, *Affected Environment*, the following critical elements were not present or would not be affected: Floodplains; Prime or Unique Farmlands; Grazing Management and Rangeland Health; Special Designations, including ACECs, National Recreation Trails, National Historic Trails, National Scenic Byways, National Back Country Byways, Wilderness Areas, National Conservation Areas, National Monuments, National Scenic Trails, Wilderness Study Areas, and Wild and Scenic Rivers; Paleontological Resources; Hazardous and Solid Wastes; and Energy Policy.

4.1 Land Use and Ownership

The Proposed Action would have no impact on land ownership in the vicinity of the proposed project area and negligible impact on existing land uses. The proposed Passive Wetland Treatment System would be constructed almost entirely within an area currently fenced in as part of the CCGM property and would occupy less than 1 acre of additional adjacent land. Construction and operation of the Passive Wetland Treatment System and eventual closure of the reclaim solution pond would be consistent with the site's current industrial use for the CCGM.

Construction and operation of the Passive Wetland Treatment System would be consistent with current land use designations for the project site (see Section 3, *Affected Environment*, and Section 3.1, *Land Use and Ownership*).

4.2 Topography, Geology, and Soils

The Proposed Action would have negligible impacts on the topography and geology of the proposed site. Any such impacts would be related to site engineering for the proposed Passive Wetland Treatment System features and recontouring of the existing reclaim solution pond in the process of its closure.

The Proposed Action would result in minor, permanent impacts on soils. Construction of the Passive Wetland Treatment System and relocation of the access road would result in the removal of less than 2.5 acres of topsoil. Closure of the reclaim solution pond and construction of the stormwater retention pond would involve reconfiguration of previously developed project features and, thus, would not result in additional new soil disturbance. Obtaining earth-fill borrow materials from the designated soil borrow area to backfill the reclaim solution pond would reduce potential impacts to soils by minimizing new disturbance for that purpose.

None of the soils at the proposed site is considered by the BLM to be a sensitive soil type. Employing water trucks during construction of the Passive Wetland Treatment System and the stormwater retention basin and closure of the reclaim solution pond would protect surface soils from wind erosion.

Implementation of the Proposed Action in lieu of continued use of the existing reclaim solution pond may positively impact soils by eliminating the potential for leakage of effluent through the pond liner into underlying soils.

4.3 Air Quality

The Proposed Action would result in minor, temporary impacts on air quality due to fugitive dust from construction activities. Construction of the Passive Wetland Treatment System and associated features would employ various earth-moving equipment, including backhoes, front-end loaders, "Bobcat" skid loaders, and dump trucks. Construction is scheduled to be accomplished during the winter (2007-2008) and is expected to take approximately 3 months. Employing water trucks during construction of the Passive Wetland Treatment System and the stormwater retention basin would reduce the potential for release of fugitive dust.

Ground-disturbing activities related to final closure of the reclaim solution pond would involve the use of loaders, scrapers, graders, and dump trucks to backfill and reclaim the pond. This activity is scheduled to take place after the performance of the Passive Wetland Treatment System has been monitored for 2 years and is also expected to take approximately 3 months. Employing water trucks during closure of the reclaim solution pond would reduce the potential for release of fugitive dust.

Operation of the construction equipment would also release minor amounts of exhaust emissions during the two relatively brief construction episodes.

No adverse impacts on air quality would result from operation of the Passive Wetland Treatment System. The Passive Wetland Treatment System would function without requiring an external power source, and operation and maintenance activities would be limited to site visits related to inspection and monitoring of the system.

Implementation of the Proposed Action in lieu of continued use of the existing reclaim solution pond may positively impact air quality by eliminating the potential for wind-borne dispersal of precipitates of the heap leach/tailings impoundment effluent. These precipitates currently cover the margins of the reclaim solution pond and the toe of the tailings impoundment embankment where effluents have bypassed the tailings impoundment underdrain system, and they can be mobilized by the prevailing windy conditions in the area. Once the Passive Wetland Treatment System is constructed, further flow of effluents into the reclaim solution pond would cease, and any remaining precipitate residues would be disposed of during pond closure.

4.4 Noise

The Proposed Action would result in minor, temporary noise impacts from construction activities. Construction equipment and the schedule and duration for construction of the Passive Wetland Treatment System and closure of the reclaim solution pond are described in Section 4.3, *Air Quality*, above. Construction noise would not be audible to travelers on Arizona State Highway 95 or to any sensitive receptor. Construction noise would occur during daylight working hours for two 3-month periods and would only be audible to occasional recreationists in the area and to the construction workers themselves.

4.5 Water Resources

4.5.1 Surface Water

The Proposed Action would have negligible impacts on surface water in the vicinity of the project. Final grading of the reclaim solution pond cover would route stormwater runoff from that area to a new stormwater retention basin, and stormwater runoff from the tailings impoundment embankment would also be routed to this retention basin via a drainage channel (see Figure 2, *Site Plan*). The Passive Wetland Treatment System infiltration/evaporation cell would have sufficient overflow capacity to contain stormwater overflows from the wetland cells, and this water would ultimately infiltrate through the bottom of the infiltration/evaporation cell into underlying soils.

4.5.2 Groundwater

The Proposed Action would positively impact or have no impact on future groundwater quality in the vicinity of the project. Although groundwater monitoring indicates that the current effluent management system achieves compliance with the Arizona Aquifer Water Quality Standards (AWQS), there is a risk of potential leakage of untreated water from the pool (see Section 1.3, *Purpose and Need for the Proposed Action*).

As of March 2006, the effluent discharged to the reclaim solution pond contained 0.124 milligram per liter (mg/L) dissolved arsenic and 69 mg/L total cyanide, including 65 mg/L free cyanide (CCGC 2006b). These concentrations are above the AWQS of 0.050 mg/L for total arsenic and 0.2 mg/L for total or free cyanide (CCGC 2006a). The Passive Wetland Treatment System is designed to ensure protection of regional groundwater from potential contamination by treating the heap leach/tailings impoundment effluent. The system includes impervious pre-treatment and wetland treatment cells, in which most of the reduction in contaminant concentrations would take place. Only after treatment in these two impervious components of the Passive Wetland Treatment System would the effluent enter the unlined infiltration/ evaporation cell. The concentrations of arsenic and cyanide in the discharge infiltrating below the infiltration/evaporation cell are expected to be less than the AWQS, reductions of approximately 96 percent and over 99 percent, respectively, from untreated effluent concentrations (CCGC 2006b).

Monitoring, as required by the amended APP, would be conducted to verify that the Passive Wetland Treatment System is performing satisfactorily. Water quality of both the inflow to the Passive Wetlands Treatment System and the discharge from the wetlands treatment cells

to the evaporation/infiltration cell would be monitored to confirm effective treatment. Groundwater quality would also continue to be monitored. Based on the results of monitoring, the treatment system would be modified, if necessary.

4.6 Vegetation

The Proposed Action would result in minor, permanent impacts on native vegetation. Construction of the Passive Wetland Treatment System and relocation of the access road would result in the removal of less than 2.5 acres of predominantly native vegetation. The sparse creosotebush-bursage community that currently occupies the proposed Passive Wetland Treatment System site is the most common plant community in the YFO planning area. No sand dunes and their associated plant communities, riparian areas, desert washes, or wetlands are present at the proposed site.

Closure of the reclaim solution pond and construction of the stormwater retention pond would involve reconfiguration of previously developed project features and, thus, would not result in additional removal of native vegetation.

Using only certified weed-free seed and mulching materials for project reclamation and site restoration would minimize the potential for introduction of noxious weeds to the site or their transportation off the site by construction vehicles. Disturbed areas and reseeded areas would be monitored for the presence of invasive species, and appropriate measures would be implemented to remove invasive plants found during such monitoring.

4.7 Wildlife

The proposed Passive Wetland Treatment System would have a beneficial impact on wildlife by reducing the potential for exposure of avian and other wildlife to untreated effluent that currently exists in the reclaim solution pond. Most non-avian wildlife would be excluded from the entire Passive Wetland Treatment System by the chain-link fence to be constructed around its entire perimeter and by the subsurface biota barrier to be constructed around the pre-treatment and wetland treatment cells. Furthermore, effluents in the initial pre-treatment cells would not be accessible to birds or small animals because the fluids would be contained entirely within the engineered soil layer, which would be covered by a 1-foot-thick sand cover.

Treatment within the pre-treatment cells is expected to reduce cyanide concentrations by more than 80 percent by the time the effluents enter the wetland treatment cells, and subsequent flow through the wetland treatment cells is expected to reduce cyanide concentrations by an additional 93 percent and arsenic concentrations to well below AWQS by the time the effluents enter the evaporation/infiltration basin (CCGC 2006b). Therefore, the Passive Wetland Treatment System's wetland treatment cells and the evaporation/infiltration basin pose less of a risk to birds and other animals that might enter the site than do untreated fluids in the existing reclaim solution pond. Although risks to wildlife from water quality are not anticipated, both the inlet and outlet of the Passive Wetland Treatment System would be monitored for water quality, as required by the APP. Water quality data, along with monthly visual monitoring for potential wildlife impacts (see Section 2.1.1, *Project Description*), would be used to determine whether additional measures are needed to

protect wildlife. Such measures may include covering all exposed water that poses a risk to wildlife due to water quality.

The existing reclaim solution pond would remain in place until adequate performance of the Passive Wetland Treatment System has been demonstrated over a 2-year period. During this time, the existing measures for preventing avian and other wildlife contact with untreated effluent in the reclaim solution pond would be maintained.

The Proposed Action would result in minor, permanent impacts on wildlife habitat. Construction of the Passive Wetland Treatment System and relocation of the access road would result in the removal of less than 2.5 acres of creosotebush-bursage vegetation, a common wildlife habitat in the YFO planning area. Closure of the reclaim solution pond and construction of the stormwater retention pond would involve reconfiguration of previously developed project features and, thus, would not result in additional loss of wildlife habitat.

No special habitat features occur on the proposed Passive Wetland Treatment System site proper. Although sand dunes and the former CCGM underground mine occur in the vicinity of the project, neither would be affected by project construction or operation.

The Proposed Action would result in minor, temporary impacts on wildlife due to construction activities. Most wildlife species that might occur at the site would leave the immediate area to avoid construction disturbance. Minor permanent impacts could result from direct harm to less-mobile species.

4.8 Special Status Species

4.8.1 Plants

No plant species listed by the USFWS as threatened, endangered, or candidate species are known to occur in the YFO planning area (BLM 2006) or in La Paz County (USFWS 2006). The single BLM-sensitive plant species known to occur in La Paz County is not likely to occur at the proposed site due to the absence of suitable sand dune habitat. Therefore, construction and operation of the Passive Wetland Treatment System and relocation of the access road would not adversely impact federally listed or BLM-sensitive plant species.

4.8.2 Animals

Eight of the nine federally protected animal species listed by the USFWS as occurring in La Paz County are restricted to riparian or aquatic habitat, none of which occurs at the proposed project site or in the immediate vicinity. Only the federally threatened bald eagle may occasionally visit the project area as a transient (see Section 3.8. *Special Status Species*). Of the two additional federal species of concern and the other special status animal species (BLM-sensitive and/or state-listed) that occur within the YFO planning area, the flat-tailed lizard and the Colorado Desert fringe-toed lizard are not likely to occupy the proposed site due to the absence of suitable sand dune habitat. The banded Gila monster may occur within the project area, and the peregrine falcon may visit the area at times. None of these species is known to use the proposed site specifically.

Construction and operation of the Passive Wetland Treatment System and relocation of the access road are not likely to adversely impact federally listed or BLM-sensitive animal species. Loss of potential habitat would be no more than 2.5 acres of the very widespread, common creosotebush-bursage vegetation community. All the special status animal species that might occur at the site are capable of moving rapidly enough to avoid construction activities and would leave the immediate area.

To avoid potential impacts to banded Gila monsters, construction workers would be advised of appropriate procedures to follow should a Gila monster be encountered at the site. If a banded Gila monster is found in a project area, activities would be modified to avoid injuring or harming it or disturbing it in any way if at all possible. If activities cannot be modified, it would be carefully transported a few hundred yards away and released unharmed. It would be moved in the direction it was originally traveling or facing and would be handled only as long as it takes to moved it.

4.9 Cultural Resources

The Proposed Action is not likely to result in adverse impacts to cultural resources. A Class III cultural resource field inventory of the entire CCGM mine area completed in 2005 found no cultural resources within the proposed project area (see Section 3.9, *Cultural Resources*). Thus, construction and operation of the Passive Wetland Treatment System would not affect any known historic properties.

If unanticipated cultural resources are discovered during construction, work would be discontinued in the immediate area pending consultation with the BLM. Because only existing roads would be used used for construction access, potential indirect impacts to cultural resources related to increased public access would not occur as a result of the Proposed Action.

4.9.1 Native American Religious Concerns

Based on the results of BLM's coordination and consultation, it is believed that implementation of the proposed project would have no impacts on Native American religious concerns.

4.10 Visual Resources

The Proposed Action would result in negligible impacts to visual resources. The proposed project site is located in an area designated as BLM VRM Class III, which allows for a moderate level of change to the characteristic landscape due to new construction projects (see Section 3.10, *Visual Resources*). The Passive Wetland Treatment System would be situated at the base of the existing CCGM tailings impoundment and would be consistent with the visual character of that feature, as well as with VRM Class III objectives.

While the 75-foot-high tailings impoundment is visible in the desert landscape for over 10 miles, the Passive Wetland Treatment System would rise no more than about 10 feet above the surrounding land surface. It would, therefore, be visible only to nearby visitors, such as occasional maintenance personnel or recreationists.

4.11 Recreation

The Proposed Action would result in negligible impacts on recreation resources. The proposed project site is currently fenced as part of the CCGM and is, therefore, unavailable for recreational uses. Once constructed, the Passive Wetland Treatment System would also be fenced to prevent access. The low level of recreational value of the immediate vicinity due to the presence of the CCGM development would be unchanged by the addition of the Passive Wetland Treatment System. Occasional use of the CCGM access road by OHV users and hunters would continue to be supported by the relocated access road.

4.12 Socioeconomics

The Proposed Action would result in minor, temporary impacts on local socioeconomics. Construction of the Passive Wetland Treatment System would involve only 6 to 8 workers, including equipment operators and a supervisor/safety officer, and would take place over a 3-month period during the winter of 2007-2008. Closure of the reclaim solution pond would also involve 6 to 8 workers and is scheduled to occur over a 3-month period 2 years later. The presence of these few temporary workers would have minor beneficial impacts on the economy of Quartzite related to the purchase of lodging, food, fuel, and incidentals. Demand for additional public services to provide for these workers would be negligible.

The Passive Wetland Treatment System would function without requiring significant operation and maintenance activities, and no new permanent personnel would be employed. Therefore, there would be no demand for increased public services such as schools, law enforcement, fire protection, etc.

Construction of the Passive Wetland Treatment System would largely be an earth-moving project. The only equipment to be installed would be piping, specialized valves, and liners. It is possible that some laborers, equipment, and materials would be procured locally.

4.12.1 Environmental Justice

Although low-income and minority populations are present within La Paz County, the Town of Quartzsite, and the CRIT, no adverse impacts to the local communities are anticipated due to the Proposed Action, and, consequently, no disproportionate impacts to minority or low-income populations are expected.

4.13 Hazardous and Solid Wastes

Materials required for construction and maintenance of the Passive Wetland Treatment System that are classified as hazardous would be limited to fuels and lubricants used when equipment is present. No hazardous materials would be generated by the project. Accidental releases of hazardous materials (e.g., vehicle fuel during construction) would be prevented or minimized through proper containment of these substances during use and transportation to the site. All hazardous materials would be managed properly, and precautions would be taken to prevent them from entering soils and water. All hazardous wastes would be removed and disposed of in an appropriately permitted disposal facility.

Non-hazardous wastes would be generated during construction of the Passive Wetland Treatment System. The construction site would be maintained in a sanitary condition at all times, and waste materials would be promptly removed from public land and disposed of at a state-permitted or county-permitted waste disposal site or sites. "Waste" includes all discarded matter, including but not limited to human waste, trash, garbage, refuse, oil, petroleum products, filters, welding rods, or equipment. Portable toilets would be available.

Very little solid waste would be produced during operation of the Passive Wetland Treatment System. These would be related to occasional maintenance activities and could consist of replaced piping or fencing, etc. Waste materials would be promptly removed from public land and disposed of at facilities authorized to accept such materials. Disposal of all liquid and solid waste produced during operation of the Passive Wetland Treatment System would be done so as not to impact the air, soil, water, vegetation, or animals.

Construction of the Passive Wetland Treatment System would be carried out in accordance with the Arizona Pollutant Discharge Elimination System (AZPDES) Construction General Permit (AZG2003-001). CCGM would develop a spill prevention and response plan, which would include Best Management Practices (BMPs) designed to minimize soil erosion and sediment transport.

5 Environmental Consequences of the No-Action Alternative

This section analyzes direct and indirect impacts on the affected environment that would occur as a result of the No-Action Alternative. As indicated in Section 3, *Affected Environment,* the following critical elements and other resources are not present or would not be affected: Floodplains; Prime or Unique Farmlands; ACECs; Wilderness Areas; Wild and Scenic Rivers; Hazardous and Solid Wastes; Energy Policy; and Paleontological Resources.

Under the No-Action Alternative, the Passive Wetland Treatment System would not be constructed or operated, and the existing reclaim solution pond would not be closed and reclaimed. Relative to current baseline conditions, the No-Action Alternative would have no new direct or indirect impacts on the following resources: Land Use and Ownership; Topography, Geology, and Soils; Air Quality; Noise; Water Resources; Vegetation; Wildlife; Special Status Species; Cultural Resources; Visual Resources; Recreation; and Socioeconomics (including Environmental Justice).

Under the No-Action Alternative, the reclaim solution pond would continue to function as the effluent management method. The potential for leakage of effluent through the pond liner would remain. The formation of precipitates around the margins of the reclaim solution pond would continue, with the potential for wind-borne dispersal of particulates. The potential for exposure of wildlife, including special status species, to potentially toxic effluents in the reclaim solution pond and to precipitates around the pond would also remain.

6 Cumulative Impacts

America Bonanza Gold Mining Corporation is currently pursuing advanced exploration to evaluate the mineral resource beneath and immediately adjacent to the CCGM open pit. Should further exploration or possible future mine development and the Proposed Action both occur, there could be cumulative impacts related to soils (removal of topsoil and possible wind erosion); air quality (fugitive dust and exhaust emissions); noise; vegetation (loss of native vegetated area); wildlife, including special status species, (loss of habitat and disturbance during construction); and socioeconomics.

Certain impacts of developing more than one project, e.g., noise, fugitive dust, exhaust emissions, and wildlife disturbance, would only be cumulative if the underlying activities were to occur at the same time. Because the two construction periods for the Passive Wetland Treatment System are each only 3 months long and because there are no other known construction activities planned to occur concurrently, no cumulative impacts of these kinds are expected.

Other impacts of developing more than one project, e.g., loss of native vegetation and wildlife habitat, would be cumulative through time. Due to the relatively small scale of Passive Wetland Treatment System and associated new ground disturbance, the relative contribution of the Proposed Action to any such cumulative impacts would be small.

No other existing projects or developments that may occur in the foreseeable future are known that would potentially contribute to cumulative impacts.

There would be no cumulative impacts from implementation of the No-Action Alternative.

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