Required Disclosures

This section addresses additional disclosures that are required by CEQ regulations and/or NEPA.

Short-Term Uses and Long-Term Productivity

NEPA requires consideration of "the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity" (40 CFR 1502.16). As declared by Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA Section 101).

This portion of NEPA regulations recognizes that short-term uses and long-term productivity of the environment are linked and that opportunities that are acted upon have corollary opportunity costs in terms of forgone options and productivity that could have continuing effects well into the future. The following discussion examines short-term uses and long-term productivity together, according to resource categories. Specific impacts of the proposed project on resources are described in the various resource sections throughout chapter 3.

The relationships between short-term uses and long-term productivity would not be appreciably different from one alternative segment to another but instead come largely from whether the project is constructed. Resource areas not listed are not expected to have adverse environmental impacts in which maintenance of long-term productivity is a concern.

Geology, Minerals, and Paleontology

Construction of the Rosemont Copper Project would convert mostly undeveloped lands into an industrial mining operation. Construction of mine facilities would alter the area's topography. Impacts related to the pit and tailings and waste rock facilities would be permanent. Other changes would be short term.

Soils and Revegetation

Productivity loss for soils would be limited to the disturbed areas affected by land clearing, grading, and construction; the mine pit; and areas permanently occupied by tailings and waste rock. It is unlikely that the tailings and waste rock would ever be removed, or that the open pit would be filled, and effects on soils and some land uses would be permanent. This includes the current livestock grazing on the area of the mine pit, which would be permanently forgone.

Reclamation efforts are anticipated to reestablish vegetation to all area other than the mine pit. Test plots at the site have demonstrated that it is possible to successfully revegetate under certain conditions; however, it is not known whether the areas would return to current conditions or the length of time that would be needed to successfully reclaim the site. However, the goal of reclamation is to create a self-sustainable ecosystem that would promote site stability and repair hydrologic function, and it is likely that livestock grazing and wildlife habitat would eventually be reestablished.

Air Quality and Climate Change

Impacts to air quality from mining operations would be short term and are expected to end with mine closure.

Groundwater Quantity

Groundwater drawdown from mine supply pumping could be mitigated through active recharge near the Green Valley area; however, there is no guarantee that Rosemont Copper would be able to achieve its stated desire to recharge more water than it uses for mine purposes. Pumping would last the duration of the mine life; if pumping is not mitigated, groundwater levels would slowly equilibrate after about 140 years. Groundwater drawdown from dewatering of the pit would be perpetuated by the hydraulic sink created by the pit lake and would constitute a permanent change.

Surface Water Quantity

Desert washes in the footprint of the pit, tailings facility, and waste rock facility, including WUS, would be permanently impacted. A permanent reduction in the quantity of surface water entering drainages immediately downstream of the mine would occur as a result of capture of runoff by the mine pit and other areas.

Seeps, Springs, and Riparian Areas

Seeps and springs would be permanently impacted by drawdown in groundwater levels, as would riparian areas associated with springs. Riparian areas directly lost to surface disturbance would be permanently impacted. The possible transition of riparian areas along Empire Gulch from hydroriparian to xeroriparian would be permanent. The possible reduction in quantity and quality of xeroriparian areas along Barrel Canyon and Davidson Canyon would be permanent, and the most severe impacts would occur during the active mine life.

Biological Resources

Impacts to wildlife and wildlife habitat would primarily be short term and would include destruction of habitat for mine construction, disturbance from mining and associated activities, and direct mortality from increased mine related vehicle traffic. Disturbance and direct mortality would cease when mine closure occurs, and reclamation would eventually allow wildlife habitat to reestablish itself.

Dark Skies

Increased night sky brightness would occur while mine construction, operation, reclamation, and closure are occurring. This is a short-term impact, and lighting would be removed during mine closure.

Visual Resources

Impacts to visual resources would be both short and long term. While impacts associated with processing plant buildings and structures such as utility lines and fences would cease when they are removed at closure, the mine pit, tailings facility, and waste rock facility would permanently alter the scenic landscape and affect the scenic quality of the area in perpetuity.

Recreation and Wilderness

Recreation would be impacted in both the short and long term. Public access would be restricted within the perimeter fence until mine closure, which is considered to be a short-term impact. However, much or all of the tailings and waste rock facilities may not be available for uses such as off-highway vehicle use in the future, depending on the final stability and revegetation of these areas.

Transportation/Access

Impacts from increased mine related traffic; noise related to mining activities; and public health and safety would be short-term impacts that would cease when the mine is closed.

Cultural Resources

Physical and visual impacts to archaeological sites, cultural landscapes, and plant and mineral resources caused by construction of the mine would be immediate, permanent, and large in scale. Mitigation measures cannot replace or replicate the historic properties that would be destroyed by the mine construction. The landscape, which is imbued with specific cultural attributions by each of the consulted tribes, would also be permanently affected.

Socioeconomics and Environmental Justice

Socioeconomic impacts are both positive and negative and are primarily short term. The project would provide increased jobs and tax revenue from construction through closure. However, this would be offset by potential impacts to local tourism and outdoor recreation economies, possible impacts to the astronomy industry, and a decrease in nearby property values. The long-term continued population and economic growth in areas of southern Arizona with existing open-pit copper mines indicates that these impacts are in the magnitude of being decades long and would not be permanent.

Environmental justice impacts are not expected, with one exception. Tribes with cultural, social, and religious ties to the mine site would be affected permanently from direct, permanent impacts to these sites and values.

Unavoidable Adverse Effects

As required by CEQ regulations implementing NEPA (40 CFR 1502.16), this EIS describes the adverse or significant environmental effects that cannot be avoided from implementation of the proposed project or alternatives. In the resource sections of this chapter, the direct, indirect, and cumulative environmental effects of the project are discussed in detail. Impacts that are significant and cannot be avoided are summarized below. Refer to the referenced resource section in this chapter for a complete description of these impacts. Resource areas that are not listed are not expected to experience unavoidable adverse effects.

Air Quality and Climate Change

For the proposed action, Phased Tailings Alternative, and Barrel Alternative, emissions from mine related activities would meet applicable Federal and State standards for air quality but would constitute impacts that cannot be avoided. The Barrel Trail and Scholefield-McCleary Alternatives would not meet applicable Federal and State air quality standards during active mining; therefore,

these alternatives would produce greater impacts for a longer period of time than the other action alternatives.

Soils and Revegetation

Soil productivity would be impacted in the location of the mine pit. While the area that is covered by the tailings and waste rock would be permanently impacted, the top layer of soil would be removed from this area, stockpiled, and used during reclamation. Soil productivity would be expected to be reestablished on the tailings and waste rock facilities over the long term, but short-term adverse impacts cannot be avoided.

Groundwater Quantity

Groundwater quantity would be reduced by mine supply pumping in the Upper Santa Cruz Sub-Basin. However, Rosemont Copper's aquifer recharge mitigation could offset this drawdown, should that mitigation continue to occur. Groundwater quantity reductions resulting from the hydraulic sink created by the pit lake would constitute a permanent adverse impact that cannot be avoided.

Surface Water Quantity

The amount of surface water that would flow into drainages immediately downstream of the mine site would be permanently decreased, constituting a permanent adverse impact that cannot be avoided or completely mitigated.

Seeps, Springs, and Riparian Areas

The loss of seeps and springs and associated riparian areas constitutes a permanent adverse impact that cannot be avoided or completely mitigated. The potential transition of riparian areas from hydroriparian to xeroriparian, or to a lower quality of xeroriparian, also would constitute a permanent adverse impact that cannot be avoided.

Biological Resources

Biological resources would be impacted by direct surface disturbance, noise, vibration, light, dust, air pollutants, and traffic. Adverse impacts that cannot be avoided or completely mitigated include changes in cover, changes in foraging efficiency and success, changes in reproductive success, changes in growth rates of young, changes in predator-prey relationships, increased movement habitat fragmentation and disruption of dispersal and migration patterns for species using four animal movement corridors, and increased roadkill on SR 83.

Livestock Grazing

Grazing would be impacted by a reduction in the area available for grazing (a permanent reduction for the area of the pit; a temporary reduction for the area within the security fence and possibly within perimeter fence until reclamation returns the area to a condition that is compatible with livestock grazing) and by impacts to seeps, springs, and stock tanks that are used by livestock. Water source enhancement conservation measures may offset some of the impacts to seeps, springs, and stock tanks used by livestock on Forest Service grazing allotments. These impacts cannot be avoided or fully mitigated.

Dark Skies

While night brightness from mine facility lighting would be mitigated to a large degree, residual impacts would remain that are not avoidable and cannot be completely mitigated.

Visual Resources

The mine pit and residual tailings and waste rock facilities would constitute a permanent adverse impact that cannot be avoided or completely mitigated.

Recreation and Wilderness

Recreation use of the area would be permanently adversely impacted. Unavoidable adverse impacts to recreation include long-term displacement from the project area; changes from the existing semiprimitive, natural setting to a developed, industrial setting; and the loss of public access roads throughout the project area. These impacts cannot be avoided or fully mitigated.

Hazardous Materials

While the risk of hazardous materials spills would increase during mine construction and operation, following applicable Federal and State laws and regulations for storage, transport, and handling of such materials is expected to mitigate for this risk.

Fuels and Fire Management

Increased risks of fire ignition from mine activities are expected to be mitigated through adherence to a fire plan that requires mine employees to be trained for initial fire suppression and to have fire tools and water readily available.

Transportation/Access

Increases traffic associated with mine worker commuting and truck traffic to and from the mine are expected to result in impacts that cannot be avoided or fully mitigated, including increased traffic congestion and increased risk of traffic accidents.

Noise

Noise from mining activities is expected to have adverse impacts that cannot be avoided or fully mitigated in close proximity to the mine site or in areas where construction is occurring.

Public Health and Safety

The mine and associated activities are expected to increase risks to public health and safety, primarily from increased traffic and associated risk of additional traffic accidents. Potential impacts from emissions and fugitive dust are expected to be mitigated to a large degree by meeting Federal air quality standards. Potential impacts from transport, use, and storage of hazardous materials is expected to be mitigated by complying with applicable State and Federal laws and regulations for such materials.

Cultural Resources

Cultural resources and historic properties and uses would be directly and permanently impacted. These impacts cannot be avoided within the areas of direct impact, nor can they be fully mitigated.

Socioeconomics and Environmental Justice

Loss of jobs in the local tourism and outdoor recreation industries cannot be avoided or fully mitigated. Likewise, loss in property values for property close to the mine would constitute an impact that cannot be avoided or fully mitigated**.** While much of the impact to dark skies has been mitigated, the potential risks to the local astronomy industry from the perception that the area's dark skies are not sustainable cannot be avoided.

Irreversible and Irretrievable Commitments of Resources

As required by NEPA, this section also includes a discussion by resource of any irreversible or irretrievable commitment of resources that would result from implementing the alternatives. Irreversible and irretrievable commitment of resources is defined as follows in FSH 1909.15 (09/10/2011):

> Irretrievable. A term that applies to the loss of production, harvest, or use of natural resources. For example, some or all of the timber production from an area is lost irretrievably while an area is serving as a winter sports site. The production lost is irretrievable, but the action is not irreversible. If the use changes, it is possible to resume timber production.
>
> Irreversible. A term that describes the loss of future options. Applies primarily to the effects of use of nonrenewable resources, such as minerals or cultural resources, or to those factors, such as soil productivity that are renewable only over long periods of time.

Geology, Minerals, and Paleontology

Irreversible commitment of geological and mineral resources would occur with the excavation and relocation of approximately 1.8 billion tons of ore and waste rock and with the recovery of approximately 4.6 billion pounds of copper, 100 million pounds of molybdenum, and 70 million ounces of silver.

A commitment of resources is considered to be irretrievable when project impacts limit the future use or productivity of a nonrenewable resource over a limited amount of time, e.g., structures built on top of paleontologically sensitive geological units. A commitment of resources is considered to be irreversible when project impacts cause a nonrenewable resource to be permanently lost, e.g., destruction of significant fossils and loss of associated scientific data. With the implementation of proper mitigation measures, the project is not likely to result in the irreversible commitment of paleontological resources. An irretrievable commitment of paleontological resources may occur should building structures be situated on top of paleontologically sensitive geological units. Such a commitment would be considered temporary, as the building structures would subsequently be removed when the project ends.

Air Quality and Climate Change

During construction and operation of the project, air pollutant concentrations would be higher throughout the analysis area than current levels but within applicable air quality standards. Following mine closure and successful reclamation, pollutant concentrations would return to premining levels. There would be no long-term irreversible or irretrievable commitment of resources.

Soils and Revegetation

Soils are a finite resource, and any loss of soils resulting from their removal for tailings and waste rock facilities and from erosion and delivery to downstream channels is irreversible. The loss of soil productivity is irreversible because a stable new plant community would take an extremely long time to redevelop on the surface of the tailings and waste rock facilities. The area of the open pit would constitute an irreversible loss of approximately 955 acres of soil that would be lost in perpetuity.

Groundwater Quantity

The proposed action and all action alternatives would result in the same commitment of groundwater quantity resources. In the Upper Santa Cruz Sub-Basin, the resource commitment is limited to the mine water supply withdrawal of approximately 99,600 acre-feet over approximately 20 years. There is a commitment from Rosemont Copper to recharge 105 percent of its mine water supply withdrawal, or approximately 104,600 acre-feet. While recharge to date has taken place at facilities located in the Tucson Active Management Area but far from the influence area of the mine water supply wells, there are mechanisms in place that would allow for eventual recharge of all committed water in the Upper Santa Cruz Sub-Basin. However, recharge of groundwater is a voluntary mitigation measure and is not guaranteed to occur. Loss of this water from the aquifer in the Upper Santa Cruz Sub-Basin is an irretrievable impact; the use of this water would be lost during the life of the mine. However, once recharge has occurred in the Upper Santa Cruz Sub-Basin, this water would once again be available for use.

The groundwater resource commitment associated with the flow into the mine pit is the approximately 17,800 to 18,500 acre-feet of groundwater withdrawn to maintain minable conditions in the pit during the approximately 20-year active mine life. This water would be withdrawn either from the pit sump itself or with the use of dewatering wells or drains. After closure of the mine, a mine pit lake would form. Estimates of the amount of water lost in perpetuity from the aquifer due to evaporation by the mine pit lake ranges from 170 acre-feet per year (Montgomery and Associates Inc. 2010) to 370 acre-feet per year (Tetra Tech 2010). Loss of this water from the aquifer in the Davidson Canyon/Cienega Basin would continue in perpetuity as a result of the formation of the mine pit lake and is an irreversible impact.

Groundwater Quality and Geochemistry

In general, changes to groundwater quality are for the most part considered to be irreversible, depending on the ability for remediation to occur. However, for the Rosemont Copper Project, changes in groundwater quality from tailings seepage, waste rock seepage, treated heap leach seepage, or the mine pit lake are expected to be minimal, and exceedances of aquifer water quality standards are not expected. Therefore irreversible or irretrievable commitments are not anticipated for groundwater quality.

Surface Water Quantity

The loss of stock tanks that would be directly impacted by the footprint of mining operations associated with any action alternative would be irretrievable, with some water sources proposed to be replaced, depending on wildlife and livestock needs.

With respect to surface water flows from the project area, all action alternatives would result in some variation of both irreversible and irretrievable commitment of surface water resources. Each action alternative would result in varying amounts of indirect loss to flow in downstream drainages. Irreversible commitment of surface water flows would result from the permanent reduction in stormwater flows into downstream drainages. Irretrievable commitment of surface water resources would be associated with additional temporary diversion, storage, and use of stormwater during mining operations.

Surface Water Quality

With respect to surface water quality, the resources that would constitute an irreversible commitment of surface water quality include the following: (1) the indirect effect on water quality as a result of the loss of WUS that would be impacted by the footprint of mining operations associated with any action alternative; and (2) the reduction of sediment movement in downstream channels.

Seeps, Springs, and Riparian Areas

The proposed action and all action alternatives would result in the same commitment of resources with respect to seeps, springs, and riparian areas. The resources that would be impacted include the following: (1) the direct effect on seeps, springs, and riparian areas that would be impacted by the footprint of mining operations associated with any action alternative constitutes an irreversible commitment of resources; (2) the indirect effect on seeps, springs, and riparian areas as a result of the lowering of groundwater levels constitutes an irreversible commitment of resources; and (3) the associated loss of riparian vegetation constitutes an irreversible commitment of resources.

Biological Resources

The mine pit would be an irreversible commitment of vegetation resources, as the pit would remain in perpetuity after the project is complete. Thus, 955 acres is considered lost to future use by wildlife, consisting of 955 acres of lost Madrean evergreen woodland. The direct loss of productivity of thousands of acres of Madrean evergreen woodland, semidesert grassland, and riparian vegetation from the waste rock, tailings, and plant facilities would result in both irreversible and irretrievable commitment of the resources that these areas provide for wildlife (i.e., wildlife breeding, foraging, wintering, and roosting habitat; animal movement corridors, etc.) and the vegetation communities themselves.

Proper implementation of the reclamation plan and mitigation measures would ensure that most of the project area would be considered an irretrievable commitment of vegetation and topographic resources, as these areas would be replanted and reclaimed and eventually redevelop into functioning Madrean evergreen woodland habitat. However, it is possible that some of these areas would include an irreversible commitment of an unknown number of acres of native vegetation communities. For example, some of these areas may be converted from their current native vegetation state (Madrean evergreen woodland, semidesert grassland, etc.) and may not return to the previous condition, thus being lost for certain plant and animal species.

Additionally, there would be an overall reduced presence of wildlife in the project area as a result of lost habitat and the impacts of dust and artificially night lighting, and there would be a potential reduced presence of wildlife in the analysis area as a result of decreased surface water flow in Barrel and Davidson Canyons, groundwater drawdown, vibrations, noise, and other human activity during the life of the project. Most of this would be considered an irretrievable commitment of resources, as it is expected that many species would use the area again after the project is completed and activity has ceased. However, it is possible that some species may never return to the area for a variety of reasons (change in topography resulting from waste rock facility, tailings facility, and the pit; groundwater drawdown of springs and seeps; areas that may not be reestablished to native vegetative communities, etc.), and this would then constitute an irreversible commitment of resources for wildlife.

Livestock Grazing

Vegetation on the site would be constantly changing as reclamation procedures are implemented. Eventually, reclamation is expected to return the site to conditions acceptable for postclosure land uses such as grazing. Irretrievable commitment of grazing resources would occur until reclamation has returned the site to conditions acceptable for grazing.

However, the approximately 955-acre open pit represents an irreversible loss of grazing land that would not be reclaimed.

Dark Skies

There would be an irretrievable, regional, long-term loss of night sky viewing during Rosemont Copper Mine construction and operation because night sky brightening, light pollution, and sky glow caused by mine lighting would diminish nighttime viewing conditions in the direction of the mine. Once the mine completes operations and is closed (including removal of mine lighting), night sky visibility would return to conditions similar to those prior to mine construction and operation.

Visual Resources

For all action alternatives, there would be an irretrievable loss of scenic quality from increased access roads and commuter and truck traffic during the premining and active mining phases of the mine. There would be a loss of scenic quality to the existing view of the Santa Rita Mountains caused by the upper pit face, pit haul roads, and pit diversion channel cut slope color contrasts until permanent timescale rock weathering has reduced these contrasts. The size and extent of the waste rock and tailings facilities would create losses of scenic quality until rock weathering and slope revegetation have reduced color, form, line, and texture contrasts to a degree that they blend in with the surrounding landscape. Due to the geological time frame necessary for these processes to occur, the loss of scenic quality associated with the waste rock and tailings facilities would effectively be irreversible.

There would be an irretrievable loss of scenic quality along SR 83 and along Santa Rita Mountain west slope roads until the power lines are removed at the time of mine closure. For each action alternative, the visual contrasts that would result from the introduction of facilities associated with the project would be an irretrievable loss of the undeveloped, semiprimitive setting until the project is closed and full reclamation is complete. Under all of the action alternatives, existing views of the

Santa Rita Mountains would be irreversibly lost behind the waste rock and tailings facilities because of the height and extent of the piles.

Recreation and Wilderness

In general, there would be irretrievable and irreversible impacts as a result of displaced recreation users and adverse effects on recreation experiences and activities.

There would be irretrievable impacts to recreation along the Arizona National Scenic Trail with the proposed action and Phased Tailings Alternative. These two alternatives propose to relocate segments of the Arizona National Scenic Trail between the perimeter fence and SR 83. That location would not mitigate the impacts to the trail because the relocated trail segments would not fully meet the scenic and recreational values for which the current location was chosen. The remaining alternatives would relocate the Arizona National Scenic Trail to the east side of SR 83, which would mitigate adverse effects and provide a recreational experience similar to the existing trail, except where highway crossings are required.

Each action alternative would result in the permanent removal of Forest Service off-highway routes, resulting in a permanent loss of recreation opportunities and activities. Although an east-west route to access the project area during mining operations would be constructed, public access would only be permitted outside the mine perimeter fence. North-south routes through the project site would be closed permanently. Although routes through the project area might be reestablished via the primary access road and utility maintenance road after mine closure, the possibility of reestablishing a north-south route and other routes destroyed by mining operations through the reclaimed area would be difficult due to topography, suitable lands, and resource impacts. Therefore, the impacts to off-highway vehicle routes are considered both irretrievable for those that would be reestablished following mine closure and irreversible for those that would be permanently affected.

Even after full reclamation is complete, the postmine topography of the project area would limit the recreation value and potential for future recreation opportunities.

Hazardous Materials

With respect to hazardous materials, there are not expected to be any irretrievable or irreversible changes to resources. Although there is the potential for contamination of surface water, groundwater, or soils in the event of a spill or accidental release, such an occurrence is not expected to occur, and environmental remediation is possible (and required by law) if it does occur.

Fire and Fuels Management

With respect to fuels and fire management, there are not expected to be any irretrievable or irreversible changes to resources. Vegetation and fuels in the project area would be constantly changing as reclamation procedures are implemented. Eventually, reclamation is expected to return site vegetation to a state that is reminiscent of existing vegetation communities in the area.

Transportation/Access

Irretrievable impacts to transportation and access would occur as a result of an increase of traffic on State, County, and public forest roads from mining operations within the analysis area and from the reduction of public access to roads within the perimeter fence. Because mine related traffic would

cease after mine closure, traffic impacts would not be considered an irreversible commitment of resources. Existing public forest roads that would be destroyed within the perimeter fence of the mine would constitute both an irreversible and irretrievable commitment of resources. Roads that are permanently covered with tailings and waste rock would be an irreversible commitment, while those that are cut off to public access by the perimeter fence could potentially be restored or rerouted following mine closure and therefore are considered to be an irretrievable commitment of resources.

Noise

Irretrievable commitment of resources would consist of mine related noise during the premining, active mining, and final reclamation and closure phases of the mine. Because the mine related noise would cease after closure of the mine, noise impacts would not be considered an irreversible commitment of resources.

Public Health and Safety

Irreversible changes with respect to public health and safety are not expected. All potential hazards discussed are limited solely to the construction and operation phases of the mine and are not expected to remain after closure of the mine. Therefore, they would constitute an irretrievable commitment of resources.

Cultural Resources

The direct impacts to cultural resources and historic properties from construction of the mine and associated facilities constitute an irreversible commitment of resources. Archaeological sites cannot be reconstructed once disturbed, nor can they be fully mitigated. Sacred springs would be eradicated by mine construction and affected by adjacent water drawdown. Changes that permanently affect the ability of tribal members to use the area for cultural and religious purposes are also an irreversible commitment of resources. Temporary exclusion of uses such as gathering of traditional materials during the period of mine construction through closure would constitute an irretrievable commitment, as reclamation would not restore sources of clays and minerals and may not restore the original vegetative communities.

Socioeconomics and Environmental Justice

There would be irretrievable socioeconomic impacts under all action alternatives because existing land uses, including recreation opportunities, would be precluded within the project area during the life of the copper mine. Adverse impacts from increases in nighttime lighting to dark skies could have irretrievable impacts on the observatories and related research and tourism. Upon termination and reclamation of the site, it is possible that these uses would return.

Mining is usually an irreversible use of land, particularly where extraction is from open-pit rather than underground mines (Crowson 2009). The action alternatives would potentially cause irreversible impacts to the affected area with regard to changes in the local landscape, community values, and quality of life. Disturbance to cultural resources that would disproportionately adversely impact the Tohono O’odham Nation, as an environmental justice community, would be irreversible.

Cumulative Effects

Cumulative effects analysis has been conducted, and the results are addressed in each individual resource section in this chapter.

Other Required Disclosures

The Coronado has consulted with the following agencies, as required by pertinent law and regulation.

Consultation under the Endangered Species Act

The Coronado has completed consultation with the USFWS regarding species protected under Section 7 of the ESA. The USFWS has issued a biological opinion, which can be found in appendix F of this FEIS. All conservation measures, reasonable and prudent measures, and terms and conditions specified in the biological opinion are nondiscretionary and would be included as components of the decision in the ROD.

Consultation under the National Historic Preservation Act

The Coronado has completed consultation with the Arizona SHPO regarding cultural resources protected under section 106 of the National Historic Preservation Act. The Arizona SHPO has entered into an MOA with the Forest Service (refer to appendix D of this FEIS). All agreements and mitigation measures specified in the MOA and the historic properties treatment plan are nondiscretionary and would be included as components of the decision in the ROD.

Conflicts with Regional, State, and Local Plans, Policies, and Controls

NEPA at 40 CFR 1502.16 directs, "Statements shall discuss (c) Possible conflicts between the proposed action and the objectives of Federal, regional, State, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned. (See 1506.2(d).)" Title 40 CFR 1506.2(d) states, "To better integrate environmental impact statements into State or local planning processes, statements shall discuss any inconsistency of a proposed action with any approved State or local plan and laws (whether or not federally sanctioned). Where an inconsistency exists, the statement should describe the extent to which the agency would reconcile its proposed action with the plan or law."

Las Cienegas National Conservation Area Resource Management Plan

The Las Cienegas National Conservation Area was established by an act of Congress on December 6, 2000 (Public Law 106-538). The Las Cienegas National Conservation Area is managed by the BLM.

The Las Cienegas Resource Management Plan and ROD were approved in July 2003. The purpose of this section is to address the extent to which the Rosemont Copper Project would conflict with accomplishment of the goals of the resource management plan and whether those conflicts could be rectified. It is important to note that the goals of the resource management plan that are summarized below directly apply only to the areas within the Las Cienegas National Conservation Area. However, the achievement of some of those goals could be affected by wide-ranging impacts from the Rosemont Copper Project, and those are the goals that are the subject of this exercise.

According to the resource management plan,

> The approved Las Cienegas RMP is designed to achieve or maintain desired future conditions that were developed through the collaborative planning process with the Sonoita Valley Planning Partnership. Under the approved RMP, the public lands are open to livestock grazing and dispersed recreation. Both motorized and mechanized vehicles are limited to designated routes. Recreation is managed within three zones. Two utility corridors are established and the public lands are closed to mineral entry and location. The public lands in the planning area are designated as an Area of Critical Environmental Concern (ACEC). This approved RMP also includes a series of management actions to meet the desired resource conditions for upland and riparian vegetation, wildlife habitats, cultural and visual resources, as well as livestock grazing and recreation management actions.

Goals for the Sonoita Valley (Upper Cienega Creek Watershed) specified in the resource management plan include the following:

1. Maintain and improve watershed health.
2. Maintain and improve native wildlife habitats and populations.
3. Maintain and restore native plant diversity and abundance.
4. Protect water quality.
5. Protect water quantity.
6. Assure sustainability and a complementary relationship of mineral resources to the protection of water quality and quantity.
7. Maintain the region's scenic beauty and open spaces.
8. Sustain compatible traditional, current, and future use of the land.
9. Promote stewardship of the resources to accommodate current and future opportunities and demands.
10. Manage the cultural resources in the planning area in a manner that provides for their preservation and protection and also avails selected properties for scientific, public, and sociocultural uses.

As described in the resources analyses in this chapter, the Rosemont Copper Project could have indirect impacts to resource values within the Las Cienegas National Conservation Area, as follows:

- Projected groundwater draw from the mine pit down could reduce surface water flows, resulting in changes to riparian vegetation and associated wildlife habitat. While these impacts are mostly beyond the ability of modeling to predict with any certainty, it seems likely that some reduction in stream and spring flow would occur in Empire Gulch over the long term (100+ years). The extent of impacts is not known; however, these impacts would not further achievement of goals 1, 2, 3, or 5 above.
- No practicable ways to significantly mitigate the drawdown of groundwater from the pit were identified. Therefore, the conflict between implementation of the Rosemont Copper Project and achieving the goals of the resource management plan cannot be rectified. The proposed acquisition, severance, and transfer of certificated surface water rights as in-stream flow rights on upper Cienega Creek would offer legal protection of water quantity within the national conservation area that does not exist at this time and would help further achieve goal 5 above.

- Visitors to the Las Cienegas National Conservation Area would be able to view the Rosemont Copper Project pit and tailings and waste rock facilities as background from some areas within the national conservation area. The view of this industrial mining operation would not further the achievement of goal 7 above.
- A number of mitigation measures designed to soften or reduce visual impacts of the mine site have been identified, and their implementation would be required. However, there have been no practicable mitigations identified that would significantly lessen the visual impact of this industrial mining development. Therefore, the conflict between implementation of the Rosemont Copper Project and achieving the goals of the resource management plan cannot be rectified.

While the Rosemont Copper Project would not further the achievement of many of the goals of the national conservation area, it would not violate the implementing legislation for the Las Cienegas National Conservation Area. Section 5 of Public Law 106-538 establishes management of the Las Cienegas National Conservation Area. Section 5(i) contains the following language:

> NO BUFFER ZONES – The establishment of the Conservation Area shall not lead to the creation of protective perimeters or buffer zones around the Conservation Area. The fact that there may be activities or uses on lands outside the Conservation Area that would not be permitted in the Conservation Area shall not preclude such activities or uses on such lands up to the boundary of the Conservation Area consistent with other applicable laws.

Cienega Creek Wild and Scenic River Eligibility

In December 1994, the BLM approved the "Final Arizona Statewide Wild and Scenic Rivers Legislative Environmental Impact Statement," which determined that 10.5 miles of Cienega Creek was suitable for recommending to Congress for inclusion in the National Wild and Scenic River System.

The EIS found that two segments were suitable for designating as Scenic. Segment 1 includes 3.0 miles along Cienega Creek and 1.0 miles along Empire Gulch, where this tributary enters Cienega Creek. Segment 2 includes 5.5 miles of Cienega Creek and 1.0 miles of Mattie Canyon, where it enters Cienega Creek. The 10.5-mile total includes 8.5 miles along Cienega Creek, 1.0 miles along Mattie Canyon, and 1.0 miles along Empire Gulch. Empire Gulch and Mattie Canyon contribute year-round flow to Cienega Creek within the conservation area.

These two segments of Cienega Creek were determined to be eligible for inclusion in the Wild and Scenic Rivers System by the BLM because the river is free-flowing and has outstandingly remarkable essential habitat for the Gila topminnow.

While some impacts to the outstandingly remarkable essential habitat for the Gila topminnow could occur in Empire Gulch, these impacts would not occur in the foreseeable future.

Groundwater drawdown could affect stream flow in Empire Gulch 150 years or more in the future. This would reduce the amount of water that Empire Gulch contributes to Cienega Creek. Indirect impacts on the Gila topminnow could occur in Empire Gulch, where groundwater drawdown is modeled to occur. These impacts would not affect the free-flowing nature of the 10.5 miles of Cienega Creek deemed suitable for inclusion in the National Wild and Scenic River System; however, these impacts have the potential to affect the outstandingly remarkable essential habitat for the Gila

topminnow. However, modeling indicates these impacts will not occur for 150 years following mine closure, and it is likely that it will be many of hundreds of years before drawdown reaches levels in upper Empire Gulch that impact stream flow levels and thus impact Gila topminnow habitat.

While the Rosemont Copper Project could potentially have long-term impacts that could affect the outstandingly remarkable essential habitat for the Gila topminnow, impacts would not be expected to occur for 150 years or more.

Saguaro National Park Management Plan

Given the National Park Service's role as stewards of National Park Service lands, the National Park Service is deemed to have "special expertise" when assessing potential impacts lands within its jurisdiction. This is particularly true in the case of parks designated as Class I areas under the CAA, such as Saguaro National Park. Under the CAA, the Federal land manager for these areas has the "affirmative responsibility to protect the AQRVs [air quality related values] (including visibility) of any such lands" (42 U.S.C. 7475(d)(2)(B)). To achieve this complex task, the National Park Service must use the best available science to: (1) evaluate the impact new and existing sources of air pollution may have on National Park Service units and work to reduce or eliminate adverse air pollution impacts in parks; (2) monitor current air pollution impacts in parks; (3) provide important information about air pollution impacts in parks to decisionmakers. This statutory responsibility positions the National Park Service to serve as the primary experts in identifying and assessing the effects of air pollution in national parks.

The primary mission of the National Park Service is derived from the 1916 National Park Service Organic Act, which requires the National Park Service to leave park resources and values "unimpaired for the enjoyment of future generations" (16 U.S.C. 1). Congress further clarified this mandate in subsequent legislation and amendments, which found that all parks are part of an important "single national heritage" and should all be managed and preserved accordingly. As such, the National Park Service manages all units in the national park system with a requisite level of resource protection. Class I designation under the CAA reaffirms and further clarifies National Park Service responsibility with respect to air quality and air quality related values.

The National Park Service clarifies agency policy for meeting these statutory mandates in the 2006 National Park Service management policies. The management policies state that the National Park Service will seek to "perpetuate the best possible air quality in parks" (Section 4.7.1). This means establishing benchmark conditions for air quality that are consistent with the CAA and other policy goals. The policies also direct the National Park Service to engage in extensive "cooperative conservation" with air regulatory agencies, stakeholders, and other Federal land managers to address air resource issues. The National Park Service aims to address these mandates and policies when evaluating predicted air quality impacts in National Park Service units.

Finally, these National Park Service policies and mandates can be addressed through the NEPA framework. The CEQ regulations implementing NEPA in 40 CFR 1502.16 identify the required components of the "environmental consequences" section of an EIS, stating that discussions should include any "adverse environmental effects which cannot be avoided should the proposal be implemented." The "environmental consequences analysis" "shall" also include a discussion of "possible conflicts between the proposed action and the objectives of Federal, regional, State, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned" (40 CFR 1502.16 (c)).

National Park Service concerns regarding predicted air quality related value impacts to Saguaro National Park from emissions associated with the proposed Rosemont Copper Mine are described below.

Under EPA definitions in the best available retrofit technology (BART) guidelines for the Regional Haze Rule, the Rosemont Copper Mine would be considered to "cause" visibility impairment in this Class I area, based on exceedance of modeling thresholds.

Visibility impacts of this magnitude are of significant concern to the National Park Service in general, and are of particular concern in this circumstance considering that Saguaro National Park will not meet the regional haze goals under the ADEQ proposed regional haze state implementation plan. Regional modeling completed for the regional haze process demonstrates that visibility on the 20% best visibility days at Saguaro National Park will degrade in the future. The goal of the regional haze program is to improve visibility on the 20 percent worst days and prevent degradation on the 20 percent best days. Visibility impacts from the Rosemont Copper Mine may impede progress toward the national visibility goal.

The National Park Service is concerned about the predicted nitrogen deposition in Saguaro National Park, which may exceed the National Park Service deposition analysis threshold almost by a factor of 10. The deposition analysis threshold represents a significance threshold and is used only to determine whether the predicted deposition impacts from the source alone warrant further evaluation in light of current ecosystem conditions.

In this case, the National Park Service believes that desert and semiarid ecosystems, such as those found in Saguaro National Park, may be impacted by current levels of nitrogen deposition. Research published recently for other arid areas in the western United States suggests that natural ecosystems in Saguaro National Park may be at risk for invasion of exotic grasses like cheatgrass and buffelgrass as a result of increased nitrogen deposition and that biodiversity may be reduced. Nitrogen deposition in these areas has also been shown to increase fire frequency from enhanced fuel loading of grasses. Many National Park Service sites in this area also contain cultural resources that could be at risk if fire frequency increases.

The Four Corners region has experienced long-term deposition from large sources of nitrogen emissions, including stationary point sources and significant growth in the area source sector from regional oil and gas development. Accordingly, a recent risk assessment evaluating the sensitivity of numerous National Park Service areas to nutrient enrichment effects from nitrogen deposition ranked Saguaro National Park at very high risk to impacts from nitrogen deposition.

In addition, a recent review report documenting nitrogen critical loads in ecoregions across the country indicates that nitrogen critical loads may currently be exceeded for herbaceous plants and shrubs in the vicinity of Saguaro National Park (see the "Projected Effects on Deposition of Sulfates and Nitrates on Class I Areas" part of the "Air Quality and Climate Change" resource section in this chapter).

Site-specific research has not been conducted in Saguaro National Park to determine the degree to which nitrogen deposition may be impacting vegetation, including the extent, species composition, or fuel loading of grasses. However, the existing body of evidence and the nitrogen risk assessment results for this park suggest that nitrogen deposition is a significant concern. Therefore, the magnitude of the modeled deposition analysis threshold exceedance due to emissions from the Rosemont Copper mine is a significant concern for the National Park Service.

Patagonia-Sonoita Scenic Road Corridor Management Plan

The "Patagonia-Sonoita Scenic Road Corridor Management Plan" was completed in 2003 to encourage collaborative community planning for the road and to provide strategies to preserve the visual and cultural-historic resources along the road (Wheat Scharf Associates 2003). The corridor management plan describes the existing conditions and opportunities for the road, defines the six intrinsic qualities as archaeological, cultural, historic, natural, recreational, and scenic resources, and lays out strategies to preserve and enhance the intrinsic qualities that draw residents and visitors to the corridor. It defines the measure of scenic quality as "how memorable, distinctive, uninterrupted, and unified" the view is perceived to be (Wheat Scharf Associates 2003).

The Rosemont Copper Project could conflict to some degree with each of the intrinsic qualities that were considered when designating the corridor. While mitigation measures could reduce these conflicts, impacts and thus conflicts would remain.

Pima County Sonoran Desert Conservation Plan

In 1998, the Pima County Board of Supervisors initiated discussions on land use planning that ultimately led to development of the "Sonoran Desert Conservation Plan." The "Sonoran Desert Conservation Plan," which was adopted in 2001 as part of the "Comprehensive Land Use Plan Update," was developed using science-based principles shaped by public review and discussion, resulting in a plan that reflects community values. The "Sonoran Desert Conservation Plan" is used to guide regional efforts to conserve the best lands and most precious resources for future generations of Pima County residents to enjoy.

According to the "Sonoran Desert Conservation Plan," the plan is meant to guide all future land use decisions of Pima County, as well as where public money is spent by Pima County to conserve open space, how cultural and historic resources are protected, and how our Western lifestyle continues. While the "Sonoran Desert Conservation Plan" covers lands under all ownership within Pima County, the plan does not regulate land uses on Federal lands administered by the Forest Service. The "Sonoran Desert Conservation Plan" identifies critical habitat and biological corridors; riparian resources; ranch conservation lands; mountain peaks and natural preserves; and cultural resources. The area that could be impacted by the Rosemont Copper Mine contains biological core areas and multiple use areas; priority archaeological sites, priority archaeological site complexes, archaeological sensitivity zones, and NRHP properties; and existing natural preserves (i.e., the Coronado National Forest). The proposed project could potentially affect downstream riparian restoration/rehabilitation areas. There are many areas of overlap between the conservation principles of the "Sonoran Desert Conservation Plan" and the issues addressed in the FEIS. For instance, biological corridors and critical habitat for a wide variety of species are addressed in the "Biological Resources" resource section of this chapter. Potential impacts to riparian resources are addressed in the "Seeps, Springs, and Riparian Areas," groundwater, and surface water resource sections of this chapter. Other potential impacts that are relevant to the objectives of the "Sonoran Desert Conservation Plan" are well described in the FEIS in the various resource sections. As stated in the resource sections in chapter 3 of the FEIS, impacts have been mitigated to the degree practicable; however, conflicts with aspects of the "Sonoran Desert Conservation Plan" would remain.

Town of Sahuarita General Plan

The "General Plan" for the town of Sahuarita was approved by the Town Council on December 9, 2002, and ratified by town residents on May 20, 2003. The plan is a comprehensive effort to guide

Town of Sahuarita policy and decisionmakers and staff in planning the future of the town. As stated in the plan, the plan is not a law—it is a guide.

Throughout the NEPA process, the Town of Sahuarita has indicated a number of areas where they feel the Rosemont Copper Project conflicts with the "General Plan:"

- Continued pumping of groundwater from region that serves Sahuarita residents does not meet the Town of Sahuarita objective of encouraging water providers to evaluate water demand within the Town of Sahuarita to ensure that the rate of use does not exceed a potential future supply. The Town of Sahuarita has also indicated that the planned pumping conflicts with a Town objective of encouraging water providers to use alternative water sources and water conservation methods and strategies by all users requiring large quantities of water.

  Rosemont Copper has addressed this concern by committing to recharge the aquifer with 105 percent of the groundwater it has been authorized to pump for mine operations. Mechanisms would be in place that would allow the recharge of this area in the Sahuarita area. However, it should be noted that implementation of these recharge efforts are not within the jurisdiction of the Forest Service.
- According to the Town of Sahuarita, the pump stations associated with the water supply line would not be consistent with aspects of the "General Plan."

  Rosemont Copper has addressed this concern by reducing one pump station and by contracting with the University of Arizona to design pump stations to fit into the surrounding landscape from an aesthetic standpoint. However, it should be noted that building the pump stations to University of Arizona specifications cannot be required by the Forest Service.
- Solid waste would be recycled as appropriate and feasible. Nonrecyclable inert waste would be disposed of at a State licensed onsite landfill located on Rosemont Copper's private property. According to the Town of Sahuarita, this landfill would not be consistent with aspects of the "General Plan."

  The landfill in question would follow all applicable State laws. It is important to note that the landfill is located on Rosemont Copper private land on the east side of the Santa Rita Mountains, while the Town of Sahuarita is located on the west side of the Santa Rita Mountains. It is unlikely that the landfill in question would have any effect on residents or businesses located in or near Sahuarita.

Santa Cruz County Comprehensive Plan

On June 29, 2004, the Santa Cruz County Board of Supervisors adopted the Santa Cruz County 2004 "Comprehensive Plan." The purpose of the "Comprehensive Plan" is to provide guidance to the County Board of Supervisors in maintaining the diverse development styles, cultures, and environments. The plan provides specific goals for the Northeast Santa Cruz County Character Area, which encompasses an area west and south of the Rosemont Copper Project area.

While a number of comments were received that stated that the Santa Cruz County "Comprehensive Plan" was not considered in the DEIS, no specific conflicts or inconsistencies were identified at that time. In response to these comments, the 2004 Santa Cruz County "Comprehensive Plan" was reviewed.

No land within Santa Cruz County would be directly impacted by the Rosemont Copper Project; however, indirect impacts would occur from the project that may not be consistent with some of the goals of the Northeast Santa Cruz County Character Area. These include the following:

- GOAL 2: OPEN SPACE AND NATURAL TERRAIN REMAIN DOMINANT FEATURES OF THE LANDSCAPE AND VIEWSHEDS ARE PROTECTED.

  As described in the "Visual Resources" section in this chapter, the Rosemont Copper Project would be seen from some areas within Santa Cruz County. From these areas, natural terrain may not remain the dominant features of the landscape and certain viewsheds may be adversely impacted. While mitigation and reclamation would reduce the visual impacts of the mine to some degree, particularly from distant viewpoints, impacts would remain that cannot be rectified. Please refer to the "Visual Resources" resource section in this chapter for further information.

- GOAL 7: WILDLIFE HABITAT AND WILDLIFE MOVEMENT CORRIDORS ARE RECOGNIZED AND PRESERVED THROUGH THE USE OF ESTABLISHED AND INNOVATIVE LAND USE MANAGEMENT TOOLS.

  Map 7 in the "Comprehensive Plan" shows wildlife corridor possibilities. One broad corridor connects to the block of NFS land in which the Rosemont Copper Project is located. This area of NFS land is connected via linkages to other surrounding areas, thus allowing for the movement of wildlife between areas. The impacts of the Rosemont Copper Project on wildlife movement corridors and connectivity have been analyzed, and the results are disclosed in the "Biological Resources" resource section of this chapter. The analysis found that movement habitat fragmentation would increase with the Barrel Alternative, and dispersal and migration patterns of species using five animal movement corridors would be disrupted. The project would restore small amounts of two movement corridors due to decommissioning of roads. Overall, wildlife movement corridors outside Santa Cruz County would be impacted, which could have broader impacts that extend into Santa Cruz County. This is a potential conflict with the comprehensive plan goal of preserving wildlife movement corridors. These impacts cannot be avoided or fully mitigated; thus, the conflict with this goal of the "Comprehensive Plan" cannot be rectified.

- GOAL 19: WATER SUPPLIES ARE PROTECTED AND CONSERVED.

  This goal is focused on protecting and conserving groundwater resources. The "Groundwater Quantity" section in this chapter details the extensive groundwater impact modeling and peer review that have been conducted for this project. While significant impacts to groundwater are predicted, it is unlikely that any of these impacts would extend into Santa Cruz County. Modeling indicates that a slight drawdown in the level of groundwater from the mine pit may extend slightly into Santa Cruz County in about 1,000 years. However, the amount of this drawdown and the time period involved are well beyond the capability of this or any model to predict with any confidence. It is unlikely that the Rosemont Copper Mine would result in impacts that conflict with this goal of the "Comprehensive Plan" in Santa Cruz County; note that there is a substantial amount of uncertainty involved with this conclusion.

- GOAL 20: DARK NIGHT SKIES ARE PROTECTED.

Dark skies would be affected by the Rosemont Copper Project. Impacts to dark skies have been analyzed and are disclosed in the "Dark Skies" resource section of this chapter. Rosemont Copper has developed a mitigation plan for reducing lighting from facilities and operations, which has reduced impacts to dark skies substantially from those that were predicted in the DEIS. However, the area in which the mine would be located would be noticeably brighter than current conditions, and this brightness would be seen from some areas within Santa Cruz County. The increase in sky glow may conflict with the "Comprehensive Plan" goal of protecting dark skies during the premining through final reclamation and closure phases. The impacts to dark skies are being mitigated to the extent possible, given the mine's need to operate 24 hours per day and safety requirements. Thus, this conflict cannot be rectified.