



Forest Service
U.S. DEPARTMENT OF AGRICULTURE

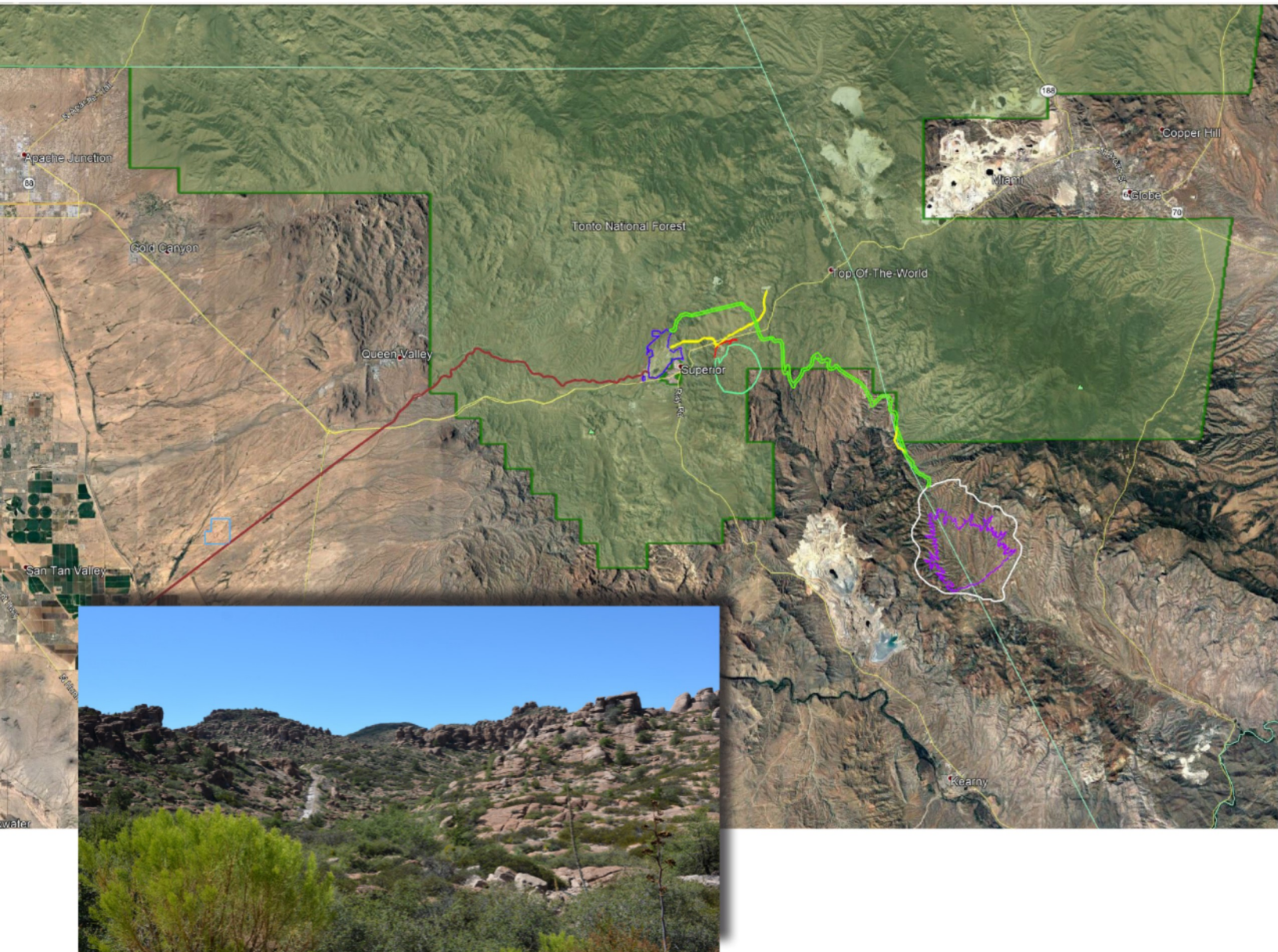
Tonto National Forest

MB-R3-12-10

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FINAL Environmental Impact Statement Resolution Copper Project and Land Exchange

Coconino, Gila, Maricopa, Pinal, Santa Cruz, and Yavapai Counties, Arizona



Volume 1

ES-3. Summary of Impacts

ES-3.1 Introduction

Information in chapter 3 of the FEIS describes the natural and human environment that may be affected by the proposed action and its alternatives and discloses the direct, indirect, and cumulative impacts that could occur as a result of implementation of the proposed action or alternatives. The effects of the legislated land exchange are also disclosed in the FEIS. Once the land exchange is completed, Forest Service management regulations would no longer apply on 2,422 acres of the Oak Flat Federal Parcel transferred to Resolution Copper, and 5,460 acres scattered across southeast Arizona would transfer from private ownership into Federal ownership and regulation.

ES-3.2 Geology, Minerals, and Subsidence

This section describes known geological characteristics at each of the major facilities of the proposed mine—including alternative tailings storage locations—and how the development of the project may impact existing cave and karst features, paleontological resources, area seismicity, and unpatented mining claims. It also outlines subsidence impacts that would result from Resolution Copper's plans to extract the ore from below the deposit using a mining technique known as "block caving" or "panel caving." The analysis concludes the following:

- The subsidence zone at the Oak Flat Federal Parcel would break through to the surface at mine year 6, would be between 800 and 1,115 feet deep, and would be about 1.8 miles in diameter.
- No damage is expected to Apache Leap, Devil's Canyon, or U.S. Route 60 as a result of the subsidence. The mine is also unlikely to induce seismic activity that would cause damage.
- Some unpatented mining claims not belonging to Resolution Copper are located within the project footprint, and access to these claims may be inhibited.

ES-3.3 Soils and Vegetation

This section explains how the proposed mine would disturb large areas of ground and potentially destroy native vegetation, including species given special status by the Forest Service, and encourage noxious or invasive weeds. The analysis concludes the following:

- Between 9,900 and 17,000 acres of soil and vegetation would be disturbed by the project.
- Revegetation success in these desert ecosystems is demonstrated. However, impacts to soil health and productivity may last centuries to millennia, and the ecosystem may not meet desired future conditions. The habitat may be suitable for generalist wildlife and plant species, but rare plants and wildlife with specific habitat requirements are unlikely to return.
- Arizona hedgehog cactus (endangered) may be impacted during operations at the East Plant Site, by ground subsidence, and by the pipeline/power line corridor for Alternative 6. The pipeline corridor associated with Alternative 5 would impact critical habitat for acuña cactus (endangered).
- Reclamation of disturbed areas would decrease but not eliminate the likelihood of noxious weeds' becoming established or spreading.

ES-3.4 Noise and Vibration

This section provides a detailed analysis of estimated impacts from noise and vibration under the proposed GPO and each of the alternatives. The analysis concludes the following:

- Noise impacts were modeled for 15 sensitive receptors representing residential, recreation, and conservation land uses. Under most conditions, predicted noise and vibration during construction and operations, for blasting and non-blasting activities, at sensitive receptors are below thresholds of concern. Rural character would not change due to noise.
- One exception is that noise along Dripping Springs Road (Alternative 6) is above thresholds of concern. However, no residual impacts would occur once mitigation is implemented. After mitigation, no unavoidable adverse impacts are anticipated from noise or vibration from any alternative.

ES-3.5 Transportation and Access

This section discusses how the proposed Resolution Copper Mine would increase traffic on local roads and highways and likely alter local and regional traffic patterns and levels of service. This section also examines NFS road closures, along with accelerated deterioration of local roadways as a result of increased use. The analysis concludes the following:

- Approximately 8.0 miles of NFS roads are expected to be decommissioned or lost from the East Plant Site, West Plant Site, or subsidence area.
- An additional 21.7 miles of NFS roads would be lost as a result of the Alternative 2 and 3 tailings storage facility. Another 17.7 miles of NFS roads would be lost as a result of the Alternative 4 tailings storage facility. Approximately 29 miles of BLM inventoried roads would be lost as a result of the Alternative 5 tailings storage facility. The Alternative 6 tailings storage facility would impact 5.7 miles of private roads.
- NFS roads lost to the subsidence area provide access to areas that include Apache Leap and Devil's Canyon. Access to these areas still would be available but would require using routes that are not as direct or convenient. Alternative 4 would also change access to the highlands north of Superior, as well as to private inholdings in the Tonto National Forest.

ES-3.6 Air Quality

This section analyzes potential impacts from an increase in dust, wind-borne particulates, and transportation-related emissions as a result of construction, mining, and reclamation activities at the mine and along transportation and utility corridors. The analysis concludes the following:

- Neither daily nor annual maximum impacts for fugitive dust (particulate matter 2.5 (PM_{2.5}) and particulate matter 10 (PM₁₀)) would exceed established air quality thresholds.
- None of the predicted results are anticipated to exceed the National Ambient Air Quality Standards at the project fence line (where public access is excluded).
- Impacts on air quality related values (deposition and visibility) at Class 1 and other sensitive areas would be within acceptable levels.

ES-3.7 Water Resources

This section analyzes how the Resolution Copper Project could affect water availability and quality in three key areas: groundwater quantity and groundwater-dependent ecosystems (GDEs), groundwater and surface water quality, and surface water quantity. The analysis concludes the following:

- Impacts to between 18 and 20 GDEs are anticipated. Six of these are springs that are anticipated to be impacted by groundwater drawdown under the no action alternative as a result of ongoing dewatering by Resolution Copper. When block caving occurs, groundwater impacts would expand to overlying aquifers, and two more springs would be impacted. Direct disturbance within the project footprint would impact another six to nine springs or ponds. Depending on the alternative, GDEs associated with Queen Creek, Devil's Canyon, and the Gila River would be impacted as a result of reductions in surface runoff. The loss of water would be mitigated for some GDEs, but impacts to the natural setting would remain.
- Groundwater supplies in Superior and Top-of-the-World could be impacted by groundwater drawdown but would be replaced through mitigation.
- Over the mine life, 87,000 acre-feet of water would be pumped from the mine, and between 180,000 and 590,000 acre-feet of makeup water would be pumped from the Desert Wellfield in the East Salt River valley. Alternative 4, which uses filtered (dry-stack) tailings, requires the least amount of makeup water. The wellfield pumping would incrementally contribute to the lowering of groundwater levels and cumulatively reduce overall groundwater availability in the area.
- After closure, the reflooded block-cave zone could have poor water quality. However, a lake in the subsidence zone is not anticipated, and no other exposure pathways exist for this water.
- Stormwater runoff could have poor water quality, but under normal conditions no stormwater contacting tailings or facilities would be released during operations or post-closure until reclamation is successful. For some combination of extreme storms (300-year return period or greater) and operational upset conditions, stormwater could be released over the spillway of the seepage pond.
- All of the tailings facilities would lose seepage with poor water quality to the environment, and all are dependent on a suite of engineered seepage controls to reduce this lost seepage. Modeling indicates that seepage from Alternatives 2 and 4 would result in water quality problems in Queen Creek; Alternative 3 would not, but requires highly efficient seepage control to achieve this (99.5 percent capture). Seepage from Alternatives 5 and 6 would not result in any anticipated water quality problems. These two alternatives also have substantial opportunity for additional seepage controls if needed.
- There would be a reduction in average annual runoff as a result of the capturing of precipitation by the subsidence zone and tailings facilities, varying by alternative: 3.5 percent at the mouth of Devil's Canyon, between 6.5 and 8.9 percent in Queen Creek at Whitlow Ranch Dam, and between 0.2 and 0.5 percent in the Gila River. Alternative 4 also would result in an almost 20 percent loss of flow in Queen Creek at Boyce Thompson Arboretum.
- Under the Clean Water Act, Alternatives 2, 3, and 4 would impact zero acres of jurisdictional waters, based on a decision by the USACE that no such waters exist above Whitlow Ranch Dam. Alternative 5 directly would impact about 180 acres, and Alternative 6 would directly impact about 130 acres of potentially jurisdictional waters.

ES-3.8 Wildlife and Special Status Wildlife Species

This section describes how impacts to wildlife can occur from habitat loss and fragmentation, as well as from artificial lighting, noise, vibration, traffic, loss of water sources, or changes in air or water quality. The analysis concludes the following:

- Habitat would be impacted in the analysis area for about 50 special status wildlife species. General impacts include a high probability of mortality or injury with vehicles or from grading; increased stress due to noise, vibration, and artificial light; and changes in cover. Changes in behavior include changes in foraging efficiency and success, changes in reproductive success, changes in growth rates of young, changes in predator–prey relationships, increased movement, and increased roadkill.
- There would be loss and fragmentation of movement and dispersal habitats from the subsidence area and tailings storage facility. Ground-clearing and consequent fragmentation of habitat blocks for other mine-related facilities would also inhibit wildlife movement and increase edge effects.
- For Tonto National Forest and BLM sensitive wildlife species, the proposed project may adversely impact individuals but is not likely to result in a loss of viability in the analysis area, nor is it likely to cause a trend toward Federal listing of these species as threatened or endangered.
- The general removal of vegetation, increased activity, and potential changes in streamflow and associated riparian vegetation along Devil’s Canyon could impact the yellow-billed cuckoo (threatened); during consultation under Section 7 of the Endangered Species Act, U.S. Fish and Wildlife Service concurred that the project may affect, but is not likely to adversely affect, the yellow-billed cuckoo and designated critical habitat.
- The pipeline crossings of the Gila River under Alternative 5, including removal of vegetation and increased activity, could impact southwestern willow flycatcher (endangered).
- Critical habitat for Gila chub (endangered) occurs in Mineral Creek above Devil’s Canyon. No individuals have been identified here during surveys, and this area is not anticipated to be impacted by groundwater drawdown. During consultation under Section 7 of the Endangered Species Act, U.S. Fish and Wildlife Service concurred that the project may affect, but is not likely to adversely affect, the Gila chub and designated critical habitat.

ES-3.9 Recreation

This section quantifies, when possible, anticipated changes to some of the area’s natural features and recreational opportunities as a result of infrastructure development related to the project. The analysis concludes the following:

- Public access (Tonto National Forest, Arizona State Land Department, and BLM lands) would be eliminated on 8,400 to 15,200 acres. Alternatives 2, 3, and 4 would result in 7,200 to 7,900 acres of access lost on Tonto National Forest land. Alternative 5 would primarily impact access to 2,600 acres of Tonto National Forest land and 7,000 acres of BLM land, as well as 4,600 acres of Arizona State land, and Alternative 6 would primarily impact access to 11,600 acres, of which 8,200 acres is Arizona State land.
- There would be changes to the recreation opportunity spectrum acres within the Globe Ranger District, with losses of 18 to 166 acres of semi-primitive non-motorized areas.

- Visitors to the Superstition Wilderness, Picketpost Mountain, and Apache Leap would have foreground and background views of the tailings facilities from trails and overlooks, and the recreation setting from certain site-specific views could change. Three miles of the Arizona National Scenic Trail would be impacted by Alternative 4 and require rerouting, whereas pipeline corridor crossings for Alternatives 2 and 5 would impact the trail.
- The exchange of the Oak Flat Federal Parcel would remove world-recognized rock climbing areas from public access, as well as Oak Flat campground. Both of these would be partially mitigated by replacement areas.
- The number of Arizona hunting permits that are issued in individual Game Management Units would not change as a result of implementation of any of the action alternatives.

ES-3.10 Public Health and Safety

This section addresses three areas of interest: tailings embankment safety, fire risks, and the potential for releases or public exposure to hazardous materials. The analysis concludes the following:

- The risk of embankment failure for all alternatives would be minimized by required adherence to Federal and Arizona design standards and by applicant-committed environmental protection measures.
- The consequences of a catastrophic failure and the downstream flow of tailings would include possible loss of life and limb, destruction of property, displacement of large downstream populations, disruption of the Arizona economy, contamination of soils and water, and risk to water supplies and key water infrastructure like the CAP canal. The highest population is located downstream of Alternative 2.
- All alternative designs are built to the same safety standards, but they have inherent differences in their resilience when unexpected events or upsets happen. Alternatives 2 and 3 are the least resilient because they use modified-centerline embankments, have long (10-mile) freestanding embankments, and do not use separately contained PAG storage cells. Alternative 6 is the most resilient of the slurry tailings alternatives because it uses a centerline embankment that is only 3 miles long and anchored on each side and has separate PAG storage cells that use downstream embankments.
- Alternative 4, using filtered (dry-stack) tailings, is more resilient than slurry tailings alternatives and would have the fewest consequences if a failure occurred, collapsing as a slump or landslide, and impacting the local vicinity only.
- With respect to other public safety risks, the risk of inadvertent ignition and resulting wildland fire is considered quite low. However, Alternative 4 includes areas classified with shrub fuels that burn with high intensity in the event of ignition. As the Mine Safety and Health Administration and other regulations and standards govern the transport and storage of explosives and hazardous chemicals, risks of spills or releases are therefore considered possible, but unlikely, with appropriate response plans in place.

ES-3.11 Scenic Resources

This section addresses the existing conditions of scenic resources (including dark skies) in the area of the proposed action and alternatives. It also addresses the potential changes to those conditions from construction and operation of the proposed project. The analysis concludes the following:

- All tailings facilities would be visible from long distances, and the change in contrast caused by land disturbance and vegetation removal, dust, and equipment would strongly impact viewers, including recreationists on scenic highways.

- Alternatives 2 and 3 would impact Arizona National Scenic Trail users and off-highway vehicle users, as would Alternative 4. Alternative 4 would be the tallest facility when viewed (1,000 feet high). It would dominate the scene and be viewable from sensitive locations (like Picketpost Mountain). Alternative 5 would also be highly visible and would impact Arizona National Scenic Trail and off-highway vehicle users. Alternative 6 would be visible from within the valley of Dripping Spring Wash but otherwise would not be as visible on the landscape as the other alternatives.

ES-3.12 Cultural Resources

This section analyzes potential impacts on all known cultural resources within the project area. The analysis concludes the following:

- The NRHP-listed *Chi'chil Bildagoteel* Historic District TCP would be directly and permanently damaged by the subsidence area at the Oak Flat Federal Parcel.
- A Programmatic Agreement (PA) was pursued and drafted during the Section 106 consultation process. The Rescinded FEIS included that PA (appendix O). All signatories, other than the Advisory Council on Historic Preservation (ACHP), had signed the PA as of January 15, 2021. On February 11, 2021, ACHP notified the Forest Service that “ACHP believes that further consultation in this case would be unproductive and therefore, we are hereby terminating consultation pursuant to 36 CFR § 800.7(a)(4).” In accordance with 36 CFR 800.7(c)(4), the Secretary of Agriculture delivered a written response to the ACHP on April 17, 2025, and that response concluded the Section 106 process for this undertaking. Since ACHP did not sign the PA, the PA was never executed. Therefore, mitigation measures identified in the PA and any others identified subsequently will now be implemented through the final record of decision and special use permit for use of NFS lands, through enforcement by other State and federal agencies, and through third parties in separate agreements. Changes in enforcement of the measures described in the draft PA are further described in appendix J.
- All alternative area surveys anticipated are complete at this time. Any remaining acreage slated for ground disturbance or land sale would be inventoried and cultural sites identified and addressed in accordance with several agreements that are detailed in appendix J. From surveyed areas, the number of NRHP-eligible sites are as follows:
 - Alternatives 2 and 3: 120 NRHP-eligible sites and 18 sites of undetermined eligibility would be directly affected, and 59 sites would be indirectly affected;
 - Alternative 4: 145 NRHP-eligible sites and 2 sites of undetermined eligibility would be directly affected, and 55 sites would be indirectly affected;
 - Alternative 5: 154 NRHP-eligible sites and 3 sites of undetermined eligibility would be directly affected, and 77 sites would be indirectly affected; and
 - Alternative 6: 377 NRHP-eligible sites and 3 sites of undetermined eligibility would be directly affected, and 55 sites would be indirectly affected.

ES-3.13 Socioeconomics

This section examines the social and economic impacts on the quality of life for neighboring communities near the proposed mine. The analysis concludes the following:

- On average, the mine is projected to directly employ 1,434 workers, pay about \$149 million per year in total employee compensation, and purchase about \$490 million per year in goods and

services. Including direct and multiplier effects, the proposed mine is projected to increase the average annual economic value added in Arizona by about \$1.2 billion.

- The proposed mine is projected to generate an average of between \$80 and \$120 million per year in State and local tax revenues and would also produce substantial revenues for the Federal Government, estimated at more than \$200 million per year. There would be a loss of hunting revenue as a result of the tailings storage facilities. With Alternatives 2, 3, and 4, the loss would be highest in the Superior area.
- Construction and operations of the proposed mine could affect costs for both the Town of Superior and Pinal County to maintain street and road networks and could strain public services. A number of agreements between Resolution Copper and the Town of Superior would offset impacts to quality of life, education, and emergency services.
- Property values are expected to decline in close proximity to the tailings storage facilities.

ES-3.14 Tribal Values and Concerns

This section discusses the potential for the proposed mine to directly, adversely, and permanently affect numerous cultural artifacts, sacred seeps and springs, traditional ceremonial areas, resource gathering localities, burial locations, and other places and experiences of high spiritual and other value to Tribal members.

Under all action alternatives, the Oak Flat Federal Parcel will be adversely impacted by the proposed mining operation. Extraction of the ore via block caving will eventually lead to the subsidence of the parcel; access to Oak Flat and the subsidence zone will be curtailed once it is no longer safe for visitors. Several springs located on the Oak Flat Federal Parcel will be lost due to the development of the subsidence area. The subsidence has a high potential to directly and permanently adversely affect numerous cultural resources sites, including the following: archaeological resources; areas with sacred values such as springs, seeps, and prayer locations; resource gathering sites; ancestor burial sites; traditional ceremonial and dance locations; and other places of spiritual and cultural significance to members of federally recognized Tribes.

ES-3.15 Environmental Justice

This section has been removed in compliance with Executive Orders 14148 and 14173.

ES-3.16 Livestock and Grazing

This section discloses the impacts to currently authorized livestock grazing on lands managed by the Forest Service, BLM, or Arizona State Land Department that are located within the project area. The analysis concludes the following:

- There would be a reduction in available allotment acreage (BLM, Forest Service, and Arizona State land) ranging from around 8,600 to 15,700 acres and a proportional reduction in livestock capacity from around 700 to 2,800 animal-unit months. The water sources and grazing infrastructure associated with these allotment areas would also be lost.

ES-3.17 Impact Avoidance, Minimization, and Mitigation

The FEIS serves in part to inform the public and review agencies of design features, best management practices, and mitigation measures that are included with the project to reduce or avoid impacts. The Forest Service views these elements as part of the project and considers Resolution Copper's

proposed mitigation measures, described in appendix J of the FEIS, as inherent to the proposed alternative, as well as other action alternatives' applicable components.

To the extent possible, these measures, including any potential impacts associated with these measures, were considered when assessing the impacts of the project on the resources. Where there is insufficient detail to determine whether an impact can be avoided or minimized, the measure cannot be incorporated into the impact analysis but serves to inform the public of Resolution Copper's plans.

Additional mitigation measures identified or recommended to date during the NEPA process have been compiled and will be considered by the Forest Service and cooperating agencies as part of their permit decisions to further minimize project impacts. This list will be further updated upon completion of the Forest Service administrative review process (objection process), as needed, to provide a comprehensive list of all measures identified during the NEPA process.

All measures will be assessed with the goal of disclosing the likelihood that the measures would be adopted by the applicant or implemented as a condition in a State, Federal, or local permit by the responsible agencies as part of their permit decisions following completion of the NEPA process. Specific mitigation conditions would be determined following completion of the environmental review and would be included in the record of decision for any permit that may be issued.

Compensatory mitigation for unavoidable impacts to aquatic resources may be required to ensure that activities requiring a permit comply with 404(b)(1) guidelines. Compensatory mitigation is the restoration (reestablishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources to offset unavoidable adverse impacts.

Resolution Copper has developed a draft conceptual compensatory mitigation plan outlining its proposed approach for compensatory mitigation. The draft conceptual compensatory mitigation plan would be amended in the future to include proposed mitigation plans. In addition, Resolution Copper proposes to use monitoring measures through construction, operation, and closure of the project to assess predicted project impacts and the effectiveness of mitigation measures.

The draft conceptual compensatory mitigation plan submitted to the USACE by Resolution Copper is included in the EIS as appendix D.

ES-4. FEIS Appendices

The final section of the FEIS provides detailed information on 21 subjects. These appendices are as follows:

- Appendix A: Section 3003 of PL 113-291
- Appendix B: Existing Conditions of Offered Lands
- Appendix C: Clean Water Act 404(B)(1) Alternatives Analysis – Resolution Copper
- Appendix D: Clean Water Act Section 404 Conceptual Mitigation Plan – Resolution Copper Project
- Appendix E: Alternatives Impact Summary
- Appendix F: Alternatives Considered but Dismissed from Detailed Analysis
- Appendix G: Further Details of East Plant Site, West Plant Site, MARRCO Corridor, and Filter Plant and Loadout Facility Infrastructure