APPENDIX J. MITIGATION AND MONITORING PLAN

Introduction

This mitigation and monitoring plan has been developed by the Tonto National Forest using information from a number of sources. As stated in section 2.3 of the environmental impact statement (EIS), the Council on Environmental Quality states that agencies should not commit to mitigation measures absent the authority or expectation of necessary resources to ensure the mitigation is performed (Council on Environmental Quality 2011). This mitigation and monitoring plan is designed to clearly disclose which mitigation and monitoring items are within the authority of the U.S. Department of Agriculture Forest Service (Forest Service) or other regulatory permitting agency (e.g., U.S. Army Corps of Engineers, Bureau of Land Management [BLM], Arizona Department of Environmental Quality, or Arizona Department of Water Resources).

This appendix discusses the following items:

- Design Features and Applicant-Committed Environmental Protection Measures
- Mitigation and Monitoring Measures Considered in Chapter 3 Impacts Analysis
- Other Mitigation and Monitoring Measures Not Considered in Chapter 3 Impacts Analysis

Design Features and Applicant-Committed Environmental Protection Measures

The environmental analysis considered for this EIS includes the implementation of Applicant-Committed Environmental Protection Measures. These measures are listed in each resource section of chapter 3 in a section titled: “Summary of Applicant-Committed Environmental Protection Measures.” Applicant-Committed Environmental Protection Measures are features incorporated into the design of the project by Resolution Copper Mining, LLC (Resolution Copper) to reduce potential impacts on resources. These measures would be non-discretionary as they are included in the project design, and their effects are accounted for in the analysis of environmental consequences disclosed in each resource section of chapter 3.

Many of these features are either specified in the General Plan of Operations (GPO) or were developed as part of the action alternatives. Resolution Copper has created the following plans to detail the protection measures they will employ under the action alternatives:

- Subsidence management plan (appendix to GPO; also updated in May 2018 in response to the Geology and Subsidence Workgroup [Tshishens 2018a])
- Groundwater mitigation and monitoring plan (created in April 2019 in response to the Groundwater Modeling Workgroup [Montgomery & Associates 2019])
- Road use plan—updating for tailings storage facility alternatives (appendix to GPO)
- Environmental emergency and response and contingency plan (appendix to GPO)
- Fire prevention and response plan (appendix to GPO)
- Preliminary spill prevention control and countermeasures plan (SPCC) (appendix to GPO)
- Explosives management plan (appendix to GPO)
- Acid rock drainage management plan (appendix to GPO)

- Hydrocarbon management plan (appendix to GPO)
- Environmental materials management plan (appendix to GPO)
- Preliminary stormwater pollution prevention plan (SWPPP) (appendix to GPO)
- Wildlife management plan (appendix to GPO)
- Noxious weed and invasive species plan (created May 2019 in response to EIS analysis [Resolution Copper 2019])
- Historic properties treatment plan, Oak Flat land exchange parcel (currently under development as part of tribal consultation and Section 106 consultation)
- Historic properties treatment plan for GPO (currently under development as part of tribal consultation and Section 106 consultation)
- Tailings Pipeline Management Plan (AMEC Foster Wheeler Americas Limited 2019)
- Concentrate Pipeline Management Plan (M3 Engineering and Technology Corporation 2019)

The implementation and effectiveness of Applicant-Committed Environmental Protection Measures are considered integral to the analysis considered in this EIS. These design features would be a requirement of the final Record of Decision (ROD) and final mining plan of operations. As these measures are considered part of the proposed project, they are not reiterated in this appendix.

Mitigation and Monitoring Measures Considered in Chapter 3 Impacts Analysis

Mitigation and Monitoring Required by Forest Service

The role of the Tonto National Forest under its primary authorities in the Organic Administration Act, Locatable Regulations (36 Code of Federal Regulations [CFR] 228 Subpart A), and Multiple-Use Mining Act is to ensure that mining activities minimize adverse environmental effects on National Forest System (NFS) surface resources. The Forest Service authority related to mitigation is limited to protection of surface resources of NFS lands (see 30 United States Code [U.S.C.] 612, 5 U.S.C. 551, and 36 CFR 228.1).

In order for the Forest Service to require implementation of mitigation, the mitigation must have a direct connection to avoiding, mitigating, or minimizing effects on NFS surface resources. The Forest Service has no authority, obligation, or expertise to determine or enforce compliance with other agencies' laws or regulations. However, it is the operator's responsibility to ensure that its actions comply with applicable laws. The Forest Service will only approve a final plan of operations once all other necessary permits are approved.

Mitigation and monitoring items under this heading are within the authority of the Forest Service, the U.S. Fish and Wildlife Service through the Biological Opinion resulting from consultation under Section 7 of the Endangered Species Act, or the Arizona State Historic Preservation Office (SHPO) through the current programmatic agreement (PA) and associated historic properties treatment plan (HPTP). These measures would be specified as a requirement of the final ROD and incorporated into the final mining plan of operations. The Forest Service is responsible for determining whether the implementation of mitigation and the results of monitoring in this category are in compliance with the decision that will be

documented in the final ROD and final mining plan of operations, and it has a legal obligation to ensure that the requirements of the biological opinion and PA/HPTP are implemented. Resolution Copper would submit reports to the Tonto National Forest for review of work done in the previous year and be subject to routine inspections to verify mitigation and monitoring effectiveness.

Mitigation and Monitoring Agreed to by Resolution Copper Mining, LLC

Resolution Copper has publicly agreed to implement the mitigation and monitoring items under this heading. These include contractual, financial, and other agreements over which the Forest Service and other regulatory agencies have no jurisdiction. The Forest Service and regulatory agencies have no authority, obligation, or expertise to determine or enforce compliance of the measures included in this category. They are presented here to facilitate disclosure of currently known mitigation and monitoring and their consideration in impacts analyses.

These measures differ from the Applicant-Committed Environmental Protection Measures in that they were not proposed as part of the project or alternatives and in many cases were developed directly in response to the EIS analysis in order to reduce resource impacts. Since the Forest Service and regulatory permitting agencies cannot require implementation of the mitigation and monitoring measures in this category, their implementation is not assured. The effectiveness of these mitigation measures is included in chapter 3 of the EIS. At the current point in the National Environmental Policy Act (NEPA) process, it is recognized that these are measures that may occur, as opposed to measures that would occur. However, once these measures are included in the signed Final ROD and final mining plan of operations, they would be legally binding on Resolution Copper.

Reporting and Evaluation

Monitoring would be evaluated annually after reports are reviewed by the appropriate land-managing agency to determine whether the level of monitoring and/or reporting is appropriate for the current conditions. This review may result in a change in the monitoring requirements. Please refer to section 2.3 of the EIS for a discussion of mitigation-related monitoring and evaluation.

Detail of Mitigation and Monitoring Measures Analyzed in Chapter 3 Impacts Analysis

At this time, the mitigation and monitoring measures analyzed are conceptual in nature. The following information is included, with additional implementation details to be developed prior to the Record of Decision:

- Unique identification number
- Title of mitigation/monitoring measure
- Description/overview of measure
- Source of measure
- Resource affected/impacts being mitigated
- Alternatives to which the measure is applicable

Geology, Minerals, Subsidence (1 measure)

FS-222: Subsidence Monitoring Plan
Description/overview: The subsidence monitoring plan proposed by Resolution Copper has been included in the EIS as an Applicant-Committed Environmental Protection Measure, however, as subsidence has the potential to impact Tonto National Forest surface resources, the Forest Service will require that a final subsidence monitoring plan be completed and approved by the Forest Service prior to signing a decision.
Source of measure: The preliminary subsidence monitoring plan is included by Resolution Copper as an Applicant-Committed Environmental Protection Measure. The requirement for a final subsidence monitoring plan was identified by the Forest Service as a required mitigation measure.
Resource affected/impacts being mitigated: This statement seeks to mitigate impacts of subsidence on Forest Service surface resources, including the Apache Leap Special Management Area.
Applicable alternatives: All
Authority to require: As subsidence would impact Forest Service surface resources, authority exists under 36 CFR 228.8.
Additional ground disturbance: No additional ground disturbance anticipated.

Soils and Vegetation (5 measures)

RC-208: Salvage of select vegetation and trees within the Tailings Storage Facility footprint
Description/overview: To the extent practicable, Resolution Copper will salvage select vegetation and select suitable trees within the tailings storage facility footprint.
Source of measure: Resolution Copper
Resource affected/impacts being mitigated: This statement seeks to mitigate impacts on vegetation by directly salvaging individual plants, but also through improving reclamation success and recovery of habitat after closure.
Applicable alternatives: All
Authority to require: As an applicant-proposed measure, implementation is not assured; however, once this measure is included in the ROD/Final mining plan of operations it would be required by the Forest Service.
Additional ground disturbance: While this would require ground disturbance, it would be within the existing area of analysis of the project fence line.

FS-223: Conduct soil surveys within the area to be disturbed by the Preferred Alternative Tailings Storage Facility footprint
Description/overview: While adequate soil and vegetation information exists to conduct an assessment for the purposes of disclosing impacts under NEPA and comparing between alternatives, the level of information may not be sufficient to support detailed final reclamation plans and a final mining plan of operations. To support these documents, soil surveys need to be conducted within the disturbance footprint of the Preferred Alternative tailings storage facility. The specific purpose of the surveys would be identify general soil characteristics, estimate the amount of soil or unconsolidated material that would be available for salvage to support reclamation activities, and inform the ability of salvaged material to support reclamation efforts. The appropriate level of detail for the soil survey would be determined in conjunction with the Tonto National Forest. The Forest Service is requiring that these surveys be conducted between the draft EIS (DEIS) and final EIS (FEIS).
Source of measure: Forest Service
Resource affected/impacts being mitigated: This statement seeks to mitigate impacts on long-term reclamation and vegetation.
Applicable alternatives: Preferred Alternative
Authority to require: While the footprint of the Preferred Alternative may not involve Forest Service surface resources, other aspects of the project still involve Forest Service surface resources, and the information collected under this measure is considered necessary for the development of reclamation plans supporting the final mining plan of operations.
Additional ground disturbance: While this would require ground disturbance, it would be within the existing area of analysis of the project fence line.

FS-224: Conduct appropriate testing of soil materials within the Preferred Alternative Tailings Storage Facility footprint
Description/overview: Similarly, in order to support detailed final reclamation plans and a final mining plan of operations, appropriate testing would be conducted on soil samples collected from within the Preferred Alternative footprint. These tests could include such parameters as soil organic carbon, moisture capacity, nutrients, pH/acidity/alkalinity. Tests would also include those appropriate to estimate post-closure water quality of stormwater runoff interacting with the salvaged soil. The appropriate suite of tests to be conducted would be determined in conjunction with the Tonto National Forest. The Forest Service is requiring that these tests be conducted between the DEIS and FEIS.
Source of measure: Forest Service
Resource affected/impacts being mitigated: This statement seeks to mitigate impacts on long-term reclamation and vegetation.
Applicable alternatives: Preferred Alternative

Authority to require:
While the footprint of the Preferred Alternative may not involve Forest Service surface resources, other aspects of the project still involve Forest Service surface resources, and the information collected under this measure is considered necessary for the development of reclamation plans supporting the final mining plan of operations.

Additional ground disturbance:
While this would require ground disturbance, it would be within the existing area of analysis of the project fence line.

FS-225: Conduct vegetation surveys within the Preferred Alternative Tailings Storage Facility footprint

Description/overview:
In order to support detailed final reclamation plans and a final mining plan of operations, vegetation surveys need to be conducted within the disturbance footprint of the Preferred Alternative tailings storage facility. These surveys would identify general vegetation present, density, abundance of native/non-native species, and any special status plant species for which site characteristics are appropriate for occurrence. The appropriate level of detail for these surveys would be determined in conjunction with the Tonto National Forest. The Forest Service is requiring that these surveys be conducted between the DEIS and FEIS.

Source of measure:
Forest Service

Resource affected/impacts being mitigated:
This statement seeks to mitigate impacts on long-term reclamation and vegetation.

Applicable alternatives:
Preferred Alternative

Authority to require:
While the footprint of the Preferred Alternative may not involve Forest Service surface resources, other aspects of the project still involve Forest Service surface resources, and the information collected under this measure is considered necessary for the development of reclamation plans supporting the final mining plan of operations.

Additional ground disturbance:
No ground disturbance anticipated.

FS-226: Preparation of detailed reclamation plans for the Preferred Alternative
Description/overview: Information derived from the soil surveys, vegetation surveys, and soil testing would be used to develop detailed reclamation plans for the Preferred Alternative. These reclamation plans would be more specific than those included in the GPO, and would include such details as: maps of the post-closure landform depicting the type of final closure cover for each area (depth of material, type of material, anticipated source of material and preparation methods like crushing or sorting, and need for/presence of armoring); anticipated reclamation techniques such as surface preparation, seeding, planting, watering (if any), soil amendments; soil salvage storage locations and storage management techniques; maps of the post-closure landform or the landform over time, depicting phasing of revegetation or reclamation activities; monitoring details including proposed success criteria and the potential use of comparison reference plots. The detailed reclamation plans would also include more specific information on post-closure stormwater controls, the anticipated longevity of engineered control systems, and criteria for when stormwater would be deemed appropriate for release back to the downstream drainages. The appropriate level of detail for the final reclamation plans would be determined in conjunction with the Tonto National Forest. The Forest Service is requiring that these plans be prepared between the DEIS and FEIS.
Source of measure: Forest Service
Resource affected/impacts being mitigated: This statement seeks to mitigate impacts on long-term reclamation and vegetation.
Applicable alternatives: Preferred Alternative
Authority to require: While the footprint of the Preferred Alternative may not involve Forest Service surface resources, other aspects of the project still involve Forest Service surface resources, and the information collected under this measure is considered necessary to support the final mining plan of operations.
Additional ground disturbance: No additional ground disturbance anticipated.

Noise and Vibration (1 measure)

RC-218: Alternate road access to Skunk Camp Tailings Storage Facility
Description/overview: Alternate access to Skunk Camp tailings storage facility to reduce noise impacts on residences along Dripping Springs Road. Two road corridors have been proposed and are shown in Attachment 2. Initial corridors are based on a 1,000-foot right-of-way (ROW), but road width would likely be smaller or the corridor could be changed based on ground surveys. Cultural and biological surveys would be required as well as consultation with the adjacent landowners or land-managing agencies.
Source of measure: Resolution Copper
Resource affected/impacts being mitigated: This statement seeks to mitigate impacts from noise, dust, and traffic along Dripping Springs Road.
Applicable alternatives: Alternative 6 only

Authority to require:
As an applicant-proposed measure, implementation is not assured; however, once this measure is included in the ROD/Final mining plan of operations it would be required by the Forest Service.

Additional ground disturbance:
Yes. The shorter road would include 364 acres based on 1,000-foot ROW for construction and 3.12 miles in length. The longer road would include 1,391 acres based on 1,000-foot ROW for construction and 11.92 miles in length.

Transportation and Access (none)

Air Quality (none)

Water Resources (1 measure)

RC-211: Seeps and Spring Monitoring and Mitigation Plan (GDE plan)

Description/overview:
In April 2019, the Forest Service received from Resolution Copper a document titled "Monitoring and Mitigation Plan for Groundwater Dependent Ecosystems and Water Wells" (Montgomery and Associates Inc. 2019). This document outlines monitoring plan to assess potential impacts on each groundwater-dependent ecosystem (GDE), identifies triggers and associated actions to be taken by Resolution Copper to ensure that GDEs are preserved, and suggested mitigation measures for each GDE if it is shown to be impacted by future mine dewatering. Note that this plan includes actions both for GDEs and water supply wells.

The plan focuses on the same GDEs described in this section of the EIS, as these are the GDEs that are believed to rely on regional groundwater that could be impacted by the mine. The stated goal of the plan is "to ensure that groundwater supported flow that is lost due to mining activity is replaced and continues to be available to the ecosystem." The plan specifically notes that it is not intended to address water sources associated with perched shallow groundwater in alluvium or fractures.

The specific GDEs addressed by this plan include

- Bitter, Bored, Hidden, Iberri, Kane, McGinnel, McGinnel Mine, No Name, Rock Horizontal, and Walker Springs;
- Queen Creek below Superior (reach km 17.39 to 15.55) and at Whitlow Ranch Dam;
- Arnett Creek in two locations;
- Telegraph Canyon in two locations;
- Devil's Canyon springs (DC4.1E, DC6.1E, DC6.6W, and DC8.2W)
- Devil's Canyon surface water in two locations (reach km 9.1 to 7.5, and reach km 6.1 to 5.4)
- Mineral Creek springs (Government Springs, MC3.4W)
- Mineral Creek surface water in two locations (MC8.4C, and reach km 6.9 to 1.6)

Monitoring frequency and parameters are discussed in the plan, and include such things as groundwater level or pressure, surface water level, presence of water or flow, extent of saturated reach, and phreatophyte area. In general, groundwater level or pressure and surface water level would be monitored daily (using automated equipment), while other methods would be monitored quarterly or annually.

Water supplies to be monitored are Superior (using well DHRES-16_743 as a proxy), Boyce Thompson Arboretum (using the Gallery Well as a proxy), and Top-of-the-World (using HRES-06 as a proxy).

A variety of potential actions are identified that could be used to replace water sources if monitoring reaches a specified trigger. Specific details (likely sources and pipeline corridor routes) are shown in the plan. These include the following:

- Drilling new wells, applicable to both water supplies and GDEs. The intent of installing a well for a GDE is to pump supplemental groundwater that can be used to augment flow. The exact location and construction of the well would vary; it is assumed in many cases groundwater would be transported to GDEs via an overland pipeline to minimize ground disturbance. Wells require maintenance in perpetuity, and likely would be equipped with storage tanks and solar panels, depending on specific site needs.
- Installing spring boxes. These are structures installed into a slope at the discharge point of an existing spring, designed to capture natural flow. The natural flow is stored in a box and discharged through a pipe. Spring boxes can be deepened to maintain access to water if the water level decreases. Spring boxes require little ongoing maintenance to operate.
- Installing guzzlers. Guzzlers are systems for harvesting rainwater for wildlife consumption. Guzzlers use an impermeable apron, typically installed on a slope, to collect rainwater which is then piped to a storage tank. A drinker allows wildlife and/or livestock to access water without trampling or further degrading the spring or water feature. Guzzlers require little ongoing maintenance to operate.
- Installing surface water capture systems such as check dams, alluvial capture, recharge wells, or surface water diversions. All of these can be used to supplement diminished groundwater flow at GDEs by retaining precipitation in the form of runoff or snowmelt, making it available for ecosystem requirements.
- Providing alternative water supplies from a non-local source. This would be considered only if no other water supply is available, with Arizona Water Company or the Desert Wellfield being likely sources of water.

Source of measure:
Resolution Copper

Resource affected/impacts being mitigated:
This statement seeks to mitigate impacts on water resources.

Applicable alternatives:
All

Authority to require:
As an applicant-proposed measure, implementation is not assured; however, once this measure is included in the ROD/Final mining plan of operations it would be required by the Forest Service. As some GDEs impacted are Forest Service surface resources, authority exists under 36 CFR 228.8 for part of this measure.

Additional ground disturbance:
Yes, quantified in Seeps and Springs Plan

Wildlife (6 measures)

GP-125: Follow AGFD and FWS guidance for mitigation of impacts on wildlife
Description/overview: Follow guidance from the Arizona Game and Fish Department (AGFD) and U.S. Fish and Wildlife Service (FWS) regarding avoidance, minimization, and mitigation measures for wildlife. The AGFD's Heritage Data Management System (HDMS) and Project Evaluation Program work together to provide current, reliable, objective information on Arizona's plant and wildlife species to aid in the environmental decision-making process. The information can be used to guide preliminary decisions and assessments for the Resolution Copper Project. Similarly, the FWS provides guidance for protecting wildlife.
Source of measure: Public comment submittal during scoping period
Resource affected/impacts being mitigated: These statements seek to mitigate potential adverse effects to wildlife.
Applicable alternatives: All
Authority to require: While the measure specifies guidance from other agencies, the habitats impacted are Forest Service surface resources for Alternatives 2, 3, and 4, and authority exists under 36 CFR 228.8 for these areas. In addition, the Forest Service is responsible for implementing any conservation measures brought forward during Section 7 Endangered Species Act (ESA) consultation, or any conditions specified in a Biological Opinion by FWS. For Alternative 5, 43 CFR 3809.2 provides similar authority to BLM to regulate mining to prevent unnecessary or undue degradation. For Alternative 6, the Forest Service would not have jurisdiction over the tailings storage facility, but would have authority over the pipeline corridors.
Additional ground disturbance: No additional ground disturbance anticipated.

GP-131: Implement a wildlife management plan for stormwater ponds, including wildlife exclusion fencing
Description/overview: Implement a wildlife management plan for stormwater ponds, including wildlife exclusion fencing.
Source of measure: Public comment submittal during scoping period
Resource affected/impacts being mitigated: These statements seek to mitigate potential adverse effects to wildlife.
Applicable alternatives: Alternatives 2, 3, 4, and 5
Authority to require: The habitats impacted are Forest Service surface resources for Alternatives 2, 3, and 4, and authority exists under 36 CFR 228.8 for these areas. In addition, the Forest Service is responsible for implementing any conservation measures brought forward during Section 7 ESA consultation, or any conditions specified in a Biological Opinion by FWS. For Alternative 5, 43 CFR 3809.2 provides similar authority to BLM to regulate mining to prevent unnecessary or undue degradation.
Additional ground disturbance: No additional ground disturbance anticipated.

CA-191: Reptile and Sonoran Desert Tortoise (ESA-CCA) Plan
Description/overview: Implement conservation actions detailed in the Candidate Conservation Agreement (CCA). The Candidate Conservation Agreement would be a formal agreement between the FWS and Resolution Copper to address the conservation needs of proposed or candidate species, or species likely to become candidates, before they become listed as endangered or threatened. Resolution Copper would voluntarily commit to conservation actions that would help stabilize or restore the species with the goal that listing would become unnecessary.
Source of measure: Arizona Game and Fish Department
Resource affected/impacts being mitigated: This statement seeks to mitigate potential adverse effects to wildlife.
Applicable alternatives: All
Authority to require: If solely a voluntary agreement entered into by Resolution Copper, implementation is not assured; however, once this measure is included in the ROD/Final mining plan of operations it would be required by the Forest Service. The habitats impacted are Forest Service surface resources for Alternatives 2, 3, and 4, and authority exists under 36 CFR 228.8 for these areas. In addition, the Forest Service is responsible for implementing any conservation measures brought forward during Section 7 ESA consultation, or any conditions specified in a Biological Opinion by FWS. For Alternative 5, 43 CFR 3809.2 provides similar authority to BLM to regulate mining to prevent unnecessary or undue degradation. For Alternative 6, the Forest Service would not have jurisdiction over the tailings storage facility, but would have authority over the pipeline corridors.

Additional ground disturbance:
No additional ground disturbance anticipated.

CA-172: Mitigation of loss of abandoned mine or cave habitat for bats

Description/overview:
Mitigate impacts on bat habitat by conducting pre-closure surveys over multiple years and multiple visits per year, to document species presence/absence and develop appropriate closure methods in coordination with AGFD, Bat Conservation International, and Forest Service biologists; implement wildlife exclusion measures pre-closure to minimize wildlife entrapment and mortality during closure; consider seasonal timing of closure on any sites with suitable maternity roosts; and identify mines, adits, and/or shafts with known bat roosting areas. If activities are adjacent to bat roosting/maternity sites, develop best management practices to reduce human encroachment.

Source of measure:
Arizona Game and Fish Department

Resource affected/impacts being mitigated:
These actions seek to mitigate potential adverse effects to wildlife habitat.

Applicable alternatives:
Alternatives 2, 3, 4, and 5

Authority to require:
If solely a voluntary agreement entered into by Resolution Copper, implementation is not assured; however, once this measure is included in the ROD/Final Mining Plan of Operations it would be required by the Forest Service.

The habitats impacted are Forest Service surface resources for Alternatives 2, 3, and 4, and authority exists under 36 CFR 228.8 for these areas. In addition, the Forest Service is responsible for implementing any conservation measures brought forward during Section 7 ESA consultation, or any conditions specified in a Biological Opinion by FWS. For Alternative 5, 43 CFR 3809.2 provides similar authority to BLM to regulate mining to prevent unnecessary or undue degradation.

Additional ground disturbance:
No additional ground disturbance anticipated.

CA-175: Maintain or replace access to stock tanks and Arizona Game and Fish Department wildlife waters

Description/overview: Resolution Copper would maintain or replace access to stock tanks and AGFD wildlife waters impacted by the project. Stock tanks are used to provide drinking water for livestock. AGFD constructs wildlife water developments to support a variety of wildlife, including game species. Benefits of AGFD wildlife water developments include a long lifespan; year-round, acceptable water quality for wildlife use; require no supplemental water hauling, except in rare or exceptional circumstances; minimal visual impacts and blends in with the surrounding landscape; accessible to and used by target species and excludes undesirable/feral species to the greatest extent possible; and minimized risk of animal entrapment and mortality.

Source of measure:
Arizona Game and Fish Department

Resource affected/impacts being mitigated: These actions seek to mitigate potential adverse effects to livestock grazing, recreation, and wildlife habitat.
Applicable alternatives: All
Authority to require: If solely a voluntary agreement entered into by Resolution Copper, implementation is not assured; however, once this measure is included in the ROD/Final mining plan of operations it would be required by the Forest Service. The habitats impacted are Forest Service surface resources for Alternatives 2, 3, and 4, and authority exists under 36 CFR 228.8 for these areas. In addition, the Forest Service is responsible for implementing any conservation measures brought forward during Section 7 ESA consultation, or any conditions specified in a Biological Opinion by FWS. For Alternative 5, 43 CFR 3809.2 provides similar authority to BLM to regulate mining to prevent unnecessary or undue degradation. For Alternative 6, the Forest Service would not have jurisdiction over the tailings storage facility, but would have authority over the pipeline corridors.
Additional ground disturbance: No additional ground disturbance anticipated.

CA-176: Use of best management practices during pipeline construction and operations
Description/overview: Resolution Copper would adhere to best management practices during pipeline construction and operation. During pipeline construction, Resolution Copper would cover open trenching; inspect trenches routinely for entrapped wildlife and remove; provide wildlife escape ramps; inspect under construction equipment prior to use and remove any wildlife seeking cover. Resolution Copper would also include wildlife crossing structures along the pipeline corridor (overpass or underpass) and coordinate with AGFD and Forest Service biologists to determine the location, frequency, and design of wildlife crossing structures.
Source of measure: Arizona Game and Fish Department
Resource affected/impacts being mitigated: These actions seek to mitigate potential adverse effects to wildlife.
Applicable alternatives: All
Authority to require: If solely a voluntary agreement entered into by Resolution Copper, implementation is not assured; however, once this measure is included in the ROD/Final Mining Plan of Operations it would be required by the Forest Service. The habitats impacted are Forest Service surface resources for Alternatives 2, 3, and 4, and authority exists under 36 CFR 228.8 for these areas. In addition, the Forest Service is responsible for implementing any conservation measures brought forward during Section 7 ESA consultation, or any conditions specified in a Biological Opinion by FWS. For Alternative 5, 43 CFR 3809.2 provides similar authority to BLM to regulate mining to prevent unnecessary or undue degradation. For Alternative 6, the Forest Service would not have jurisdiction over the tailings storage facility, but would have authority over the pipeline corridors.
Additional ground disturbance: No additional ground disturbance anticipated.

Recreation (5 measures)

RC-212: Relocation of Arizona National Scenic Trail
Description/overview: Resolution Copper has proposed to fund the relocation of a segment of the Arizona National Scenic Trail as well as the construction of new trailheads. Approximately 9 miles of new trail would need to be built between U.S. Route 60 and NFS Road 650 near Whitford Canyon. This measure was proposed by Resolution Copper and seeks to mitigate impacts on recreational opportunities on the trail. This measure is only applicable to Alternatives 2, 3, and 4. Relocating the trail and constructing new trailheads would require additional ground disturbance but the exact area of new disturbance has yet to be determined, although it is assumed the new trail would be about 2 to 3 feet in width and approximately 3 acres of total surface area.
Source of measure: Resolution Copper
Resource affected/impacts being mitigated: These actions seek to mitigate potential adverse effects to recreation.

Applicable alternatives: Alternative 2, 3, and 4
Authority to require: As an applicant-proposed measure, implementation is not assured; however, once this measure is included in the ROD/Final mining plan of operations it would be required by the Forest Service.
Additional ground disturbance: Yes, to be determined, but roughly can be assumed that a new trail would be about 2 to 3 feet in width, and would account for approximately 3 acres of additional ground disturbance.

RC-213: Mitigate loss of bouldering at Oak Flat by establishing access to "Inconceivables"
Description/overview: To mitigate impacts on recreation through the loss of bouldering areas at Oak Flat, Resolution Copper has proposed to establish access to an alternative area known as "Inconceivables." This area extends along cliffs for approximately 3 miles on Tonto National Forest land and is located off State Route 177. This mitigation measure is applicable to all alternatives.
Source of measure: Resolution Copper
Resource affected/impacts being mitigated: These actions seek to mitigate potential adverse effects to recreation.
Applicable alternatives: All
Authority to require: As an applicant-proposed measure, implementation is not assured; however, once this measure is included in the ROD/Final mining plan of operations it would be required by the Forest Service.
Additional ground disturbance: Yes, to be determined after further development of the proposed idea.

RC-214: Implement RUG and Superior Trail Network Plan
Description/overview: Resolution Copper has proposed to implement the Recreation User Group (RUG) and the Superior Trail Network Plan to offset loss of public roads at Oak Flat. The RUG was formed to develop a recreational trail design in the town of Superior area. The RUG has developed a conceptual plan for a trail system on the Tonto National Forest that would meet the needs and interests of different stakeholders. Within the vicinity of Superior there is a network of unpaved roads and trails, many of which are not authorized by the Tonto National Forest, that are contributing to ongoing resource degradation. The development of a trail system would help with reducing continued development of unauthorized trails. The purposes of the RUG and Superior Trail Network Plan are to provide recreation opportunities for hikers, equestrians, mountain bicyclists, and off-highway vehicle enthusiasts; provide readily accessible recreation opportunities to the Superior and Phoenix metropolitan area; offer long-term, sustainable economic benefits to the local community through recreation and ecotourism; protect soil resources in the area from erosion; and provide access to uniquely beautiful viewsheds within Tonto National Forest that are not currently accessible by authorized trails.

Attachment 1 of this Appendix has the Proposed RUG Recreation Project Conceptual Plan submitted to the Forest Service in 2019.
Source of measure: Resolution Copper
Resource affected/impacts being mitigated: These actions seek to mitigate potential adverse effects to recreation.
Applicable alternatives: All
Authority to require: As an applicant-proposed measure, implementation is not assured; however, once this measure is included in the ROD/Final Mining Plan of Operations it would be required by the Forest Service.
Additional ground disturbance: Yes, the full plan would encompass 66.5 acres; however, it is unknown whether the full plan would be approved in its entirety.

RC-215: Provide replacement campground
Description/overview: Resolution Copper has proposed to establish an alternative campground site, known as Castleberry, to mitigate the loss of Oak Flat Campground. The development of the new campground as well as access to the property would require additional ground disturbance of 41 acres.
Source of measure: Resolution Copper
Resource affected/impacts being mitigated: These actions seek to mitigate potential adverse effects to recreation.
Applicable alternatives: All
Authority to require: As an applicant-proposed measure, implementation is not assured; however, once this measure is included in the ROD/Final Mining Plan of Operations it would be required by the Forest Service.
Additional ground disturbance: Yes, additional disturbance on the Castleberry property and access to property could include up to 41 acres.

RC-216: Develop access to Oak Flat Campground while safe per MSHA regulations
Description/overview: To mitigate the future permanent loss of Oak Flat Campground, Resolution Copper has proposed to develop an access plan for the campground as long as it is safe per MSHA regulations. This would allow access to Oak Flat Campground after the land exchange has occurred and the parcel is privately owned by Resolution Copper. The exact duration and extent of access would be determined later per safety requirements by MSHA. This measure would mitigate both losses to recreation as well as impacts on tribal values, would be applicable to all alternatives, and would require no additional ground disturbance.
Source of measure: Resolution Copper
Resource affected/impacts being mitigated: These actions seek to mitigate potential adverse effects to recreation and tribal values.
Applicable alternatives: All
Authority to require: As an applicant-proposed measure, implementation is not assured; however, once this measure is included in the ROD/Final Mining Plan of Operations it would be required by the Forest Service.
Additional ground disturbance: No additional ground disturbance anticipated.

Public Health & Safety (5 measures)

FS-01: Satellite Monitoring of Tailings Storage Facility
Description/overview: High-resolution satellite imagery would be collected and processed at regular intervals. Processed output provided to the Forest Service or BLM would include beach width, tailings surface slope contours, and constructed site topography. This output could be provided for land manager verification of adherence to design criteria, as well as long-term monitoring of facility performance over time.
Source of measure: Tonto National Forest Interdisciplinary Team
Resource affected/impacts being mitigated: This statement seeks to mitigate impacts on tailings safety, which in turn is protective of human life, property, and numerous downstream resources.
Applicable alternatives: Alternatives 2, 3, 4, and 5
Authority to require: Alternatives 2, 3, and 4: 36 CFR 228.8 (Forest Service authority to regulate mining to minimize adverse environmental impacts on NFS surface resources) Alternative 5: 43 CFR 3809.2 (BLM authority to regulate mining to prevent unnecessary or undue degradation) Alternative 6: As facility would ultimately be located on private land, Forest Service would not have authority to require long-term monitoring of the tailings storage facility.

If this were to be an applicant-proposed measure for this alternative, implementation is not assured; however, once this measure is included in the ROD/Final mining plan of operations it would be required by the Forest Service.

Additional ground disturbance:
No additional ground disturbance anticipated.

GP-26: Improve Resiliency of Tailings Storage Facility

Description/overview:
Some recommended mitigation measures regarding the tailings storage facility to include where appropriate include the use of a liner, constructing a secondary backup containment facility, developing a mitigation plan for tailings storage facility embankment breach, implementing a cease operation plan in the event of a tailings embankment failure, requiring an environmental damage assessment in the event of a tailings embankment release, and identifying alternative energy sources for the tailings storage facility in the event of an electrical outage.

Source of measure:
Public comment submittal during scoping period

Resource affected/impacts being mitigated:
This statement seeks to mitigate impacts on tailings safety, which in turn is protective of human life, property, and numerous downstream resources.

Applicable alternatives:
All

Authority to require:
The suggestions noted in this measure are general in nature, and many of the concepts are already incorporated into the facility designs. In addition, further facility design requirements that may overlap this measure would be developed under other measures (see for example FS-227 and FS-228). To the extent additional components are developed and incorporated by the applicant into the design, they would be included in the ROD/Final mining plan of operations and would be required by the Forest Service.

Additional ground disturbance:
No additional ground disturbance anticipated.

FS-227: Conduct Refined FMEA before Final EIS for the Preferred Alternative
Description/overview: The failure modes and effects analysis (FMEA) conducted by Resolution Copper is based on the DEIS alternative design documents. With more refined designs and site-specific information, a more robust and refined FMEA can be conducted. The Forest Service is requiring that this refined FMEA be conducted between the DEIS and FEIS. This exercise will inform the requirements to be specified in the ROD and ultimately incorporated into a final plan of operations. The refined FMEA would be a collaborative group process that would be led by the Forest Service. It is likely to include Forest Service personnel, cooperating agency representatives, Resolution Copper and their tailings experts and contractors, and the NEPA team and their tailings experts. This group would identify possible failure modes, their likelihood of occurring, the level of confidence in the predictions, the severity of the consequences if that failure mode were to occur, and possible controls to reduce the risk of failure. The collaborative group would likely also be asked to identify a reasonable failure scenario to use in a refined breach analysis. During an FMEA, the tailings storage facility is considered as a complete system with a number of components, including geology, foundation, engineered structures, seepage controls, drains, containment, diversions, and spillways. Sufficient information on the design and specifications of each component is needed in order to understand how they would function as a system, and how they might respond to the anticipated stresses on the system. The information needed to support a collaborative, refined FMEA would include the results of site investigations (geology and foundation), lab testing, engineering analyses, borrow material analyses and specifications, and engineered drawings and specifications. The less information available during the FMEA process, the more assumptions have to be made, leading to a less meaningful assessment that may not be representative of the true risks for the ultimate designed facility.
Source of measure: Tonto National Forest Interdisciplinary Team and Cooperating Agencies
Resource affected/impacts being mitigated: This statement seeks to mitigate impacts on tailings safety, which in turn is protective of human life, property, and numerous downstream resources.
Applicable alternatives: Preferred Alternative
Authority to require: While the footprint of the Preferred Alternative may not involve Forest Service surface resources, other aspects of the project still involve Forest Service surface resources, and the information collected under this measure is considered necessary to support both the FEIS and the final mining plan of operations.
Additional ground disturbance: No additional ground disturbance anticipated.

FS-228: Adherence to National Dam Safety Program Standards
Description/overview: For a tailings storage facility built on Federal land, the Forest Service is requiring that Resolution Copper adhere, at a minimum, to the requirements of the National Dam Safety Program discussed in "Relevant Laws, Regulations, Policies, and Plans" in section 3.10.1.3.
Source of measure: Tonto National Forest Interdisciplinary Team
Resource affected/impacts being mitigated: This statement seeks to mitigate impacts on tailings safety, which in turn is protective of human life, property, and numerous downstream resources.
Applicable alternatives: Alternatives 2, 3, 4, and 5
Authority to require: Alternatives 2, 3, and 4: 36 CFR 228.8 (Forest Service authority to regulate mining to minimize adverse environmental impacts on NFS surface resources) Alternative 5: 43 CFR 3809.2 (BLM authority to regulate mining to prevent unnecessary or undue degradation) Alternative 6: As facility would ultimately be located on private land, Forest Service would not have authority to require these specific design standards. If this were to be an applicant-proposed measure for this alternative, implementation is not assured; however, once this measure is included in the ROD/Final mining plan of operations it would be required by the Forest Service.
Additional ground disturbance: No additional ground disturbance anticipated.

FS-229: Development of an Emergency Action Plan for the Tailings Storage Facility for the Preferred Alternative
Description/overview: For a tailings storage facility built on Federal land, the Forest Service is requiring that Resolution Copper undertake Emergency Action Planning, as required under the National Dam Safety Program (Federal Emergency Management Agency 2004). The FMEA would provide key information to this process. Emergency Action Planning would include evaluation of emergency potential, inundation mapping and classification of downstream inundated areas, response times, notification plans, evacuation plans, and plans for actions upon discovery of a potentially unsafe condition. The breach analysis prepared for the DEIS is not sufficient to meet National Dam Safety Standards for emergency planning. The Forest Service will require a refined breach analysis be conducted between the DEIS and FEIS, using appropriate models, based on the outcome of the FMEA and a selected failure scenario.
Source of measure: Tonto National Forest Interdisciplinary Team
Resource affected/impacts being mitigated: This statement seeks to mitigate impacts on tailings safety, which in turn is protective of human life, property, and numerous downstream resources.
Applicable alternatives: Preferred Alternative

Authority to require: While the footprint of the Preferred Alternative may not involve Forest Service surface resources, other aspects of the project still involve Forest Service surface resources, and the information collected under this measure is considered necessary to support both the FEIS and the final mining plan of operations.
Additional ground disturbance: No additional ground disturbance anticipated.

Scenic (1 measure)

FS-03: Transmission Lines
Description/overview: Use best management practices or other guidelines (on NFS lands) that would minimize visual impacts from transmissions lines that could include: • Non-specular transmission lines, transformers, and towers; • Avoid use of monopole transmission structures; • Avoid "skylining" of transmission/communication towers and other structures. Consider topography when siting transmission structures to avoid "skylining" of structures on high ridges in the landscape; • In areas of the highest visual sensitivity with difficult access, air transport capability should be used to mobilize equipment and materials for clearing, grading, and erecting transmission towers.
Source of measure: Internal NEPA Team Scoping
Resource affected/impacts being mitigated: These measures seek to reduce and minimize the scenery impacts and project contrast of mining operations in the surrounding landscape and impacts upon sensitive viewers. All recommendations would be effective in reducing the form, line, and color contrasts presented by the project elements.
Applicable alternatives: All
Authority to require: Power line corridors occur mainly on Forest-managed lands and mitigation can be required regardless of alternative under 36 CFR 228.8 (Forest Service authority to regulate mining to minimize adverse environmental impacts on NFS surface resources)
Additional ground disturbance: No additional ground disturbance anticipated.

Cultural/Historical Resources and Tribal Values (2 measures)

RC-209: Cultural and Archaeological Data Recovery – Oak Flat HPTP
Description/overview: The "Resolution Copper Oak Flat Land Exchange Treatment Plan" (Oak Flat Historic Properties Treatment Plan [HPTP]) (Deaver and O'Mack 2019) sets out a plan for treatments to resolve the adverse effects to 42 historic properties that have been identified within the Oak Flat Federal Parcel. In accordance with the plan, Resolution Copper would conduct archaeological data recovery on sites eligible under Criterion D that would be adversely affected. Project materials and archaeological collections would be curated in accordance with 36 CFR 79 (Curation of Federally-Owned and Administered Archaeological Collections) with Gila River Indian Community, Salt River Pima-Maricopa Indian Community, and the Arizona State Museum. This measure is applicable to all alternatives and would be noted in the ROD/Final Mining Plan of Operations.
Source of measure: Resolution Copper
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on cultural resources.
Applicable alternatives: All
Authority to require: Ultimately, the land exchange removes the Oak Flat parcel from Federal ownership and oversight. However, the data recovery plans are being developed as part of the Programmatic Agreement and, when signed, would be required to occur.
Additional ground disturbance: Yes, but data recovery activities would take place within the area already assumed to be disturbed in the EIS.

RC-210: Cultural and Archaeological Data Recovery – GPO HPTP
Description/overview: The GPO Research Design and data recovery plans detail treatments to resolve adverse effects on historic properties within the GPO project area with the exception of those in the Oak Flat Federal Parcel. Data recovery would be conducted on archaeological sites eligible under Criterion D within the GPO project area. Project materials and archaeological collections would be curated in accordance with 36 CFR 79 (Curation of Federally-Owned and Administered Archaeological Collections) with Gila River Indian Community, Salt River Pima-Maricopa Indian Community, and the Arizona State Museum. This measure is applicable to all alternatives and would be noted in the ROD/Final Mining Plan of Operations.
Source of measure: Resolution Copper
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on cultural resources.
Applicable alternatives: All

Authority to require: Authority varies by alternative; however, the data recovery plans are being developed as part of the Programmatic Agreement and, when signed, would be required to occur.
Additional ground disturbance: Yes, but data recovery activities would take place within the area already assumed to be disturbed in the EIS.

Socioeconomics/Environmental Justice (none)

Grazing (none)

Reclamation/Other Plans (1 measure)

CA-166: BLM offered lands preservation/improvement
Description/overview: Proposed mitigation for offered lands: 7B Ranch/Lower San Pedro River Parcels • Assure that water monitoring area is preserved, and species protection features remain in place. • Remove all graffiti, commercial use, billboards, remove refuse. • Prevent unauthorized uses. • Prevent and mitigate new hazardous material that may occur on property. Appleton Ranch • Ensure water features are preserved and left intact.
Source of measure: BLM
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on recreation, wildlife habitat, visual resources, and water quality.
Applicable alternatives: All
Authority to require: With respect to the offered lands, these proposed measures apply to actions Resolution Copper would take prior to the land exchange, would take place through the ongoing appraisal and exchange process, and would no longer be applicable after the exchange occurs.
Additional ground disturbance: Yes, but within the land exchange parcels as disclosed in the DEIS.

Other Mitigation and Monitoring Measures Not Considered in Chapter 3 Impacts Analysis

While not analyzed for effectiveness in the EIS, other mitigation and monitoring measures were suggested during the scoping process, during alternatives development, or would be likely under a permit or authorization required for the mine. As stated above, the Forest Service has the authority to limit

impacts on Forest Service surface resources, but not those imposed by another regulating authority or on private land outside of regulating authorities.

The Forest Service would not have authority to require the items listed below, but they could be implemented in the future to limit impacts. These measures were not considered within the analysis of the EIS.

The Forest Service welcomes comments on these ideas for future consideration of incorporation by other agencies with permitting authority or Resolution Copper as an Applicant-Committed Environmental Protection Measure.

Mitigation and Monitoring Required by Other Regulatory and Permitting Agencies

Mitigation and monitoring items under this heading are within the authority of other regulatory permitting agencies, including the Arizona Department of Environmental Quality and Arizona Department of Water Resources. At this point in the NEPA process, the Forest Service has no authority, obligation, or expertise to determine or enforce compliance for the measures included in this category, as they have neither been required by other agencies or agreed to by Resolution Copper. However, as with other measures discussed, if these measures are eventually included in the ROD/Final Mining Plan of Operations, they would be required by the Forest Service. They are presented here to facilitate disclosure of currently known mitigation and monitoring and their consideration in impacts analyses. The mitigation and monitoring measures in this category include permit requirements and stipulations from legally binding permits and authorizations such as the air quality permit, Aquifer Protection Permit, and groundwater withdrawal permit.

Many of these permits are not yet issued but would be issued prior to approval of the final mining plan of operations. Those permits received prior to the issuance of the final ROD may need to be modified to reflect the alternative selected by the deciding official. These regulatory and permitting agencies would share monitoring results and any instances of noncompliance with the Forest Service. The Forest Service would use the information provided by the regulatory and permitting agencies to determine compliance with the decision that would be documented in the final ROD and compliance with the final mining plan of operations. Some of the other permits, licenses, and authorizations (see table 1.5.4-1 in chapter 1) that would be required for the mine to be operational (and may include additional mitigations in addition to those noted here) include:

- Aquifer Protection Permit (APP)
- Arizona Pollutant Discharge Elimination System (AZPDES) Permit
- Clean Water Act Section 401 Certification
- Special Use Permits
- Project-Specific Section 404 Clean Water Act Permit
- Air Quality Control Permit

Geology, Minerals, Subsidence (none)

Soils and Vegetation (none)

Noise and Vibration (3 measures)

GP-132: Maintain equipment regularly to reduce noise from heavy machinery operations
Description/overview: Maintain equipment regularly to reduce noise from heavy machinery operations
Source of measure: Public comment submittal during scoping period
Resource affected/impacts being mitigated: This statement seeks to reduce impacts from noise.
Applicable alternatives: All
Possible authority to require: Pinal County
Additional ground disturbance: No additional ground disturbance anticipated.

GP-133: Establish procedures for reporting noise complaints
Description/overview: Establish procedures for reporting noise complaints, such as providing a telephone number for the public to report noise complaints and posting the number at various locations
Source of measure: Public comment submittal during scoping period
Resource affected/impacts being mitigated: This statement seeks to reduce impacts from noise.
Applicable alternatives: All
Possible authority to require: Pinal County
Additional ground disturbance: No additional ground disturbance anticipated.

GP-134: Develop noise limits and a fine structure for noise violations
Description/overview: Develop noise limits and a fine structure for noise violations
Source of measure: Public comment submittal during scoping period
Resource affected/impacts being mitigated: This statement seeks to reduce impacts from noise.
Applicable alternatives: All
Possible authority to require: Pinal County
Additional ground disturbance: No additional ground disturbance anticipated.

Transportation and Access (none)

Air Quality (3 measures)

GP-111: Identify monitoring thresholds for fugitive dust pollution
Description/overview: Identify monitoring thresholds for fugitive dust pollution
Source of measure: Public comment submittal during scoping period
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on air quality.
Applicable alternatives: All
Possible authority to require: Pinal County Air Quality Control District
Additional ground disturbance: No additional ground disturbance anticipated.

GP-112: Implement enforcement strategies for air quality mitigation
Description/overview: Implement enforcement strategies for air quality mitigation.
Source of measure: Public comment submittal during scoping period
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on air quality.

Applicable alternatives: All
Possible authority to require: Pinal County Air Quality Control District
Additional ground disturbance: No additional ground disturbance anticipated.

GP-110: Reevaluate GPO dust abatement strategy
Description/overview: Reevaluate the GPO dust abatement strategy and implement additional mitigation measures as needed
Source of measure: Public comment submittal during scoping period
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on air quality.
Applicable alternatives: All
Possible authority to require: Pinal County Air Quality Control District
Additional ground disturbance: No additional ground disturbance anticipated

Water Resources (9 measures)

RC-217: Compensatory mitigation plan (404 permit)
Description/overview: Appendix to EIS for impacts on ephemeral drainages and waters of the U.S.
Source of measure: Resolution Copper
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on water resources.
Applicable alternatives: Alternative 5 and 6 that would require a 404 permit
Possible authority to require: As noted in chapter 1 of the EIS, the U.S. Army Corps of Engineers would have a permitting role if either Alternative 5 or 6 is pursued and would rely on this EIS to support their decision. Compensatory mitigation is a required component, and preliminary concepts have been included as part of the EIS.
Additional ground disturbance: Yes, negligible and not quantifiable, more details found within Draft Resolution Copper Project Clean Water Act Section 404 Conceptual Compensatory Mitigation Plan (see appendix D to EIS)

GP-76: Test stormwater runoff through running washes
Description/overview: Test stormwater runoff for toxins to prevent recreational exposure through running washes
Source of measure: Public comment submittal during scoping period
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on water resources and public health and safety.
Applicable alternatives: All
Possible authority to require: Arizona Department of Environmental Quality under the AZPDES permit
Additional ground disturbance: No additional ground disturbance anticipated.

GP-79: Disclose results of water monitoring
Description/overview: Monitor groundwater and surface water quality and publicly disclose the results quarterly.
Source of measure: Public comment submittal during scoping period
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on water resources.
Applicable alternatives: All
Possible authority to require: Arizona Department of Environmental Quality under the APP or AZPDES permits
Additional ground disturbance: No additional ground disturbance anticipated.

GP-91: Clarify "interim shutdown"
Description/overview: Clarify "interim shutdown" mitigation measures relative to water discharge.
Source of measure: Public comment submittal during scoping period
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on water resources.
Applicable alternatives: All
Possible authority to require: Arizona Department of Environmental Quality under the APP or AZPDES permits

Additional ground disturbance: No additional ground disturbance anticipated.

GP-92: Detail methodology for monitoring and mitigation of discharge water
Description/overview: Describe the methods and regulatory oversight that will be applied to monitor and mitigate the quality of mine and tailings discharge water.
Source of measure: Public comment submittal during scoping period
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on water resources.
Applicable alternatives: All
Possible authority to require: Arizona Department of Environmental Quality under the APP or AZPDES permits
Additional ground disturbance: No additional ground disturbance anticipated.

FS-151: Implement a long-term monitoring and mitigation plan for releases
Description/overview: A long-term monitoring and mitigation plan for such releases (i.e., long-term seepage to groundwater and surface waters) is an essential element of a Forest Service–approved mining plan of operations.
Source of measure: Internal scoping
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on water resources.
Applicable alternatives: All
Possible authority to require: The first part of this appendix focuses on the Forest Service mitigation and monitoring. Additional monitoring plans could be associated with other agencies and coordinated with the Forest Service, including plans required by the Arizona Department of Environmental Quality under the APP or AZPDES permits.
Additional ground disturbance: No additional ground disturbance anticipated.

CA-206: Wells up- and down-gradient of site
Description/overview: Installing wells up- and down-gradient of the site would allow analysis of the groundwater elevation contours, discontinuities within the bedrock with seepage potential, and would establish baseline groundwater quality data to support further analysis of impacts and mitigation
Source of measure: Arizona Department of Environmental Quality
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on water resources.
Applicable alternatives: All
Possible authority to require: Monitoring wells are an integral part of the Arizona Department of Environmental Quality APP permitting process. Additional wells that extend beyond the area required under the APP may also be considered as part of monitoring efforts.
Additional ground disturbance: No additional ground disturbance anticipated.

GP-37: Install Additional Deep Monitoring Wells
Description/overview: Additional deep monitoring wells should be installed with “clearly defined water quality goals” for groundwater geochemistry.
Source of measure: Public comment submittal during scoping period
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on water resources.
Applicable alternatives: All
Possible authority to require: Monitoring wells are an integral part of the Arizona Department of Environmental Quality APP permitting process. Additional wells that extend beyond the area required under the APP may also be considered as part of monitoring efforts.
Additional ground disturbance: Yes, with some impacts of drilling additional wells quantified in the seeps and spring monitoring and mitigation plan (see RC-211)

CA-168: Streams and Riparian Ecosystem mitigation of impacts
Description/overview: Contribution to ongoing restoration efforts in the Middle Gila HUC 8 watershed could be appropriate for inclusions in mitigation plans. Where unavoidable impacts on aquatic resources cannot be restored or replaced where the effects occur, suggest compensation within the same and then adjacent watersheds be prioritized over more distant options. Such projects could include 1) restoration work via vegetation removal within the Gila River Indian Community along the Lower Salt and Agua Fria Rivers; 2) BLM restoration work via mesquite removal and establishment of native grasses within the San Pedro Riparian National Conservation area near the Upper San Pedro HUC.
Source of measure: Environmental Protection Agency
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on water resources and riparian ecosystems.
Applicable alternatives: All
Possible authority to require: As noted in chapter 1 of the EIS, the U.S. Army Corps of Engineers would have a permitting role if either Alternative 5 or 6 is pursued and would rely on this EIS to support their decision. Compensatory mitigation is a required component, and preliminary concepts have been included as part of the EIS. The types of measures discussed are similar in nature to those included in the conceptual compensatory mitigation, and may form part of further changes to that mitigation package. There would be no permitting role for the U.S. Army Corps of Engineers for Alternatives 2, 3, or 4, and these measures would only be implemented if brought forth voluntarily by Resolution Copper.
Additional ground disturbance: Yes, ground disturbance would be preliminarily estimated in the Draft Resolution Copper Project Clean Water Act Section 404 Conceptual Compensatory Mitigation Plan (see appendix D to EIS)

Wildlife (6 measures)

CA-185: Reduce impacts on Golden Eagles
Description/overview: **Golden eagle –** Near West and Peg Leg tailings storage facility sites are within 10 miles of two active nest sites and one potential nest site; impacts include loss of foraging habitat at tailings storage facility and mine facilities. • Identify raptor resources potentially affected; recommend minimum 3-year monitoring period prior to construction to identify nesting, foraging, and wintering habitats and, if feasible, include one cycle of prey population fluctuations (FWS guidelines 2002) • Monitor nest productivity at active nest sites within 5 miles of project boundaries pre- and post-construction to see if land conversion and habitat loss impact nest productivity; document changes. Carry into reclamation phase and evaluate post-closure reclamation and raptor response. • Utilize seasonal and/or spatial buffer zones for level and duration of construction activities during nesting period at occupied versus unoccupied nest sites (see Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances (USFWS 2002); and time construction outside breeding season if feasible.

• Prevent additional encroachment of human activity on nest sites (i.e., new roads, trails etc.); acquire lands around nest sites; create habitat management plans around nest sites
Source of measure: Arizona Game and Fish Department
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on wildlife.
Applicable alternatives: All
Possible authority to require: This type of mitigation could be required as an outcome of Section 7 ESA consultation with FWS. If so, the Forest Service is responsible for implementing any conservation measures brought forward during Section 7 ESA consultation, or any conditions specified in a Biological Opinion by FWS.
Additional ground disturbance: No additional ground disturbance anticipated.

CA-186: Reduce impacts on Peregrine Falcon
Description/overview: **Peregrine Falcon –** active breeding along Apache Leap; tier mitigation to USFWS 2003 Monitoring Plan for the American Peregrine Falcon. A species recovered under the Endangered Species Act. • Monitor nest productivity along Apache Leap.
Source of measure: Arizona Game and Fish Department
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on wildlife.
Applicable alternatives: All
Possible authority to require: This type of mitigation could be required as an outcome of Section 7 ESA consultation with FWS. If so, the Forest Service is responsible for implementing any conservation measures brought forward during Section 7 ESA consultation, or any conditions specified in a Biological Opinion by FWS.
Additional ground disturbance: No additional ground disturbance anticipated.

CA-187: Reduce impacts on Migratory and Breeding Birds
Description/overview: Migratory and breeding birds – tied to impacts and mitigation for riparian habitats. During the initial project construction and startup and delivery of tailings material to tailings storage facility site(s), adult migratory bird species that are currently nesting are likely to abandon nests during tailings delivery/deposit. This impact is likely to be lessened once delivery starts as birds are not likely to begin nesting while materials are being deposited.

• Initiate construction outside breeding periods for species that use saguaros (SGCN: elf owl, Gila woodpecker, gilded flicker, white-winged dove), key riparian habitats • Develop an Avian and Bat Protection Plan in coordination with the AGFD.
Source of measure: Arizona Game and Fish Department
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on wildlife.
Applicable alternatives: All
Possible authority to require: This type of mitigation could be required as an outcome of Section 7 ESA consultation with FWS. If so, the Forest Service is responsible for implementing any conservation measures brought forward during Section 7 ESA consultation, or any conditions specified in a Biological Opinion by FWS. The habitats impacted are Forest Service surface resources for Alternatives 2, 3, and 4, and authority exists under 36 CFR 228.8 for these areas. For Alternative 5, 43 CFR 3809.2 provides similar authority to BLM to regulate mining to prevent unnecessary or undue degradation. For Alternative 6, the Forest Service would not have jurisdiction over the tailings storage facility, but would have authority over the pipeline corridors.
Additional ground disturbance: No additional ground disturbance anticipated.

GP-122: Implement impact avoidance and minimization measures for special status species
Description/overview: Implement impact avoidance and minimization measures for special status species
Source of measure: Public comment submittal during scoping period
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on wildlife.
Applicable alternatives: All
Possible authority to require: This type of mitigation could be required as an outcome of Section 7 ESA consultation with FWS. If so, the Forest Service is responsible for implementing any conservation measures brought forward during Section 7 ESA consultation, or any conditions specified in a Biological Opinion by FWS. The habitats impacted are Forest Service surface resources for Alternatives 2, 3, and 4, and authority exists under 36 CFR 228.8 for these areas. For Alternative 5, 43 CFR 3809.2 provides similar authority to BLM to regulate mining to prevent unnecessary or undue degradation. For Alternative 6, the Forest Service would not have jurisdiction over the tailings storage facility, but would have authority over the pipeline corridors.
Additional ground disturbance: No additional ground disturbance anticipated.

CA-189: Surveys of Riparian and Aquatic Species
Description/overview: Riparian and Aquatic Species – native fish, lowland leopard frogs, Sonoran mud turtle, southwestern willow flycatcher, western yellow-billed cuckoo, common black-hawk, Arizona Bell's vireo • Conduct pre-construction species and habitat surveys and monitoring for riparian and aquatic species.
Source of measure: Arizona Game and Fish Department
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on wildlife
Applicable alternatives: All
Possible authority to require: This type of mitigation could be required as an outcome of Section 7 ESA consultation with FWS. If so, the Forest Service is responsible for implementing any conservation measures brought forward during Section 7 ESA consultation, or any conditions specified in a Biological Opinion by FWS. The habitats impacted are Forest Service surface resources for Alternatives 2, 3, and 4, and authority exists under 36 CFR 228.8 for these areas. For Alternative 5, 43 CFR 3809.2 provides similar authority to BLM to regulate mining to prevent unnecessary or undue degradation. For Alternative 6, the Forest Service would not have jurisdiction over the tailings storage facility, but would have authority over the pipeline corridors.
Additional ground disturbance: No additional ground disturbance anticipated.

CA-177: Special Species Surveys prior to construction and site-specific plans
Description/overview: Conduct special status species surveys prior to construction of tailings pipeline corridors across perennial or intermittent streams and rivers (e.g., Gila River, Mineral Creek, Devil's Canyon) and designated Critical Habitats to determine species presence/absence. Develop site-specific wildlife mitigation plan in coordination with Arizona Game and Fish Department, FWS, and Forest Service biologists to address construction-related actions to avoid, minimize, and mitigate impacts on special status species (e.g., timing of construction, species relocations, etc.).
Source of measure: Arizona Game and Fish Department
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on wildlife.
Applicable alternatives: All
Possible authority to require: This type of mitigation could be required as an outcome of Section 7 ESA consultation with FWS. If so, the Forest Service is responsible for implementing any conservation measures brought forward during Section 7 ESA consultation, or any conditions specified in a Biological Opinion by FWS. The habitats impacted are Forest Service surface resources for Alternatives 2, 3, and 4, and authority exists under 36 CFR 228.8 for these areas. For Alternative 5, 43 CFR 3809.2 provides similar authority to BLM to regulate mining to prevent unnecessary or undue degradation. For Alternative 6, the Forest Service would not have jurisdiction over the tailings storage facility, but would have authority over the pipeline corridors.
Additional ground disturbance: No additional ground disturbance anticipated.

Recreation (1 measure)

GP-230 Arizona Trail construction considerations
Description/overview: Incorporate construction measures into any road crossings, pipeline crossings, or reroutes of the Arizona National Scenic Trail to minimize impediments to trail use and minimize visual impacts on trail users.
Source of measure: Arizona Trail Association comment
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on recreation.
Applicable alternatives: All
Possible authority to require: This would likely be an applicant-proposed measure, and if so implementation is not assured; however, once this measure is included in the ROD/Final Mining Plan of Operations it would be required by the Forest Service. Depending on the location of the crossing, there could be authority under 36 CFR 228.8 for these areas.
Additional ground disturbance: Yes, additional ground disturbance would be expected in order to bury the pipeline near the Arizona Trail.

Public Health & Safety (1 measure)

GP-113: Provide PPE to employees
Description/overview: Provide employees with personal protective equipment specific to deep shaft mining hazards.
Source of measure: Public comment submittal during scoping period
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on public health and safety.
Applicable alternatives: All.
Possible authority to require: MSHA and OSHA
Additional ground disturbance: No additional ground disturbance anticipated.

Scenic (none)

Cultural/Historical Resources and Tribal Values (none)

Socioeconomic/Environmental Justice (none)

Livestock and Grazing (none)

Reclamation/Other Plans (1 measure)

GP-102: Require adequate bond amount
Description/overview: Require an adequate bond amount for mine reclamation.
Source of measure: Public comment submittal during scoping period
Resource affected/impacts being mitigated: This statement seeks to reduce impacts on long-term reclamation, soils, and vegetation post-closure.
Applicable alternatives: All
Possible authority to require: U.S. Forest Service, BLM, Arizona Department of Environmental Quality (APP program), and Arizona State Mine Inspector would all require bonding on the project for various components.
Additional ground disturbance: No additional ground disturbance anticipated.

Attachment 1 – RUG Recreation Project Conceptual Plan

Attachment 2 – Alternative 6 Proposed Mitigation Routes Map

SUPERIOR, ARIZONA
RECREATION PROJECT CONCEPTUAL PLAN
Recreation User Group

Prepared for:

Recreation User Group

Project Number: 807.135

March 2019

WestLand Resources

WestLand Resources, Inc. • 4001 E. Paradise Falls Drive • Tucson, Arizona 85712 • 520•206•9585

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(follow text)

1. INTRODUCTION

In 2016, the Recreation User Group (the Group) was formed to develop a recreational trail design within the vicinity of Superior, in Pinal County, Arizona (the Project Area; **Figure 1**). The Group was charged with developing a conceptual plan for a trail system on the Tonto National Forest (TNF) that will meet the needs and interests of different stakeholder groups while also meeting the management priorities of the U.S. Forest Service (USFS). The proposed trail network occurs on a mixture of public lands or public rights-of-way and private land within portions of Township 2 South, Range 11-13 East, and Township 3 South, Range 12 East (**Figure 2**). The majority occur on the Globe Range District of the TNF, and a small portion occurs on private land owned or managed by Resolution Copper (Resolution).

A network of unpaved roads and trails, many of which are user-created alignments that are not authorized by the USFS, currently exists within the Project Area. These trails and roads have resulted in ongoing resource degradation. The Group, which is comprised of representatives from the Town of Superior's intended recreational users, including hikers, equestrians, mountain bicyclists and off-highway vehicle (OHV) enthusiasts, was created to identify recreational resources and develop a conceptual layout for the recreational trail design (the Project). On July 25, 2018, the Group voted to move forward with the preparation of the conceptual plan for submittal to the USFS.

This report has been prepared to detail the review process used to develop the conceptual plan; the existing conditions within the Project Area; the project construction, maintenance, and funding; the members of the Group; and references cited.

2. BACKGROUND

2.1. HISTORY OF THE AREA

The proposed trail system is located on TNF lands adjacent to Superior, Arizona, a mining town that like many mining towns has been subject to the inherently cyclical nature of the mining industry. The Superior area is a one-hour drive from Phoenix, a city with a population of more than 4.73 million in the greater metropolitan area. With its proximity to Phoenix, the TNF is "one of the most-visited 'urban' forests in the United States (approximately 5.8 million visitors annually)" (TNF 2019)[1].

Superior, which serves as a gateway to the TNF, is surrounded by natural beauty and world class recreation opportunities on the TNF that are currently unrecognized, underdeveloped, and subject to misuse, including unauthorized roads and trails, wildcat dumping, and informal target practice sites.

[1] https://www.fs.usda.gov/tonto/; accessed on February 7, 2019.

2.2. PROJECT PURPOSE

There is a need for a trail system in the vicinity of Superior, Arizona, in order to reduce the haphazard development of unauthorized trails that has led to the degradation of riparian habitat and impacts to wildlife and plant species. The purpose of the Project is to provide a recreational trail system within the TNF with the following characteristics:

- Provides recreation opportunities for hikers, equestrians, mountain bicyclists and OHV enthusiasts.
- Is readily accessible to Superior and the Phoenix metropolitan area
- Offers long-term, sustainable economic benefits to the local community through recreation and ecotourism
- Protects soil resources in this area from erosion, thus preventing sediment yield into surface waters
- Provides access to uniquely beautiful viewsheds within TNF that are not currently accessible by authorized trails

3. PROJECT AREA DESCRIPTION

3.1. EXISTING LAND USES

Land uses within TNF lands near the Project Area consist predominantly of livestock grazing, mining, and outdoor recreation including hiking, birding, horseback riding, mountain biking and off-roading. Additionally, hunting regulated by Arizona Game and Fish Department occurs on TNF lands within and adjacent to the Project Area (Game Units 24A and 37B), and an informal shooting area is located near the upper reach of Arnett Canyon. There are a number of areas devoid of vegetation that appear to be dispersed camp sites or staging areas. Several isolated illegal trash dumps are also scattered around the Project Area. Where the terrain is rocky and steep, and access is more challenging, the landscape remains relatively undisturbed. With the exception of the portion of the Arizona National Scenic Trail (AZNST) that crosses through the Project Area, existing trails on TNF lands are primarily unauthorized motorized and non-motorized trails (**Table 1**).

Table 1. Existing Unauthorized Trails on USFS Lands within the Project Area

Trail Type	Existing (miles)
Motorized	24.6
Motorized (single track)	0
Non-Motorized	17.3
TOTAL	**41.9**

Land uses on private and state lands adjacent to the Project Area include rural and suburban residential neighborhoods, livestock grazing, recreation, industrial activities such as mining and an active quarry. The Boyce Thompson Arboretum State Park, an Important Bird and Biodiversity Area recognized by Audubon Arizona, is located immediately north of the northwestern extent of the proposed trail system. The northeast portion of the proposed trail system consists of private property in Superior and includes facilities such as the Town of Superior waste water treatment plant, Superior Municipal Airport, and the Superior Unified School District. The Perlite Superior Plant is located east of Picketpost Mountain, immediately north of the north central portion of the trail system. Two private inholdings are located along Arnett Creek in the central east portion of the Project Area owned by a cattle company and a living trust.

In general, more extensive human disturbance occurs within the eastern portion of the Project Area, while the western portion remains relatively undisturbed.

3.2. PHYSICAL FEATURES

The Project Area is located in the Central Highlands Physiographic Province, a transitional area between the Colorado Plateau Physiographic Province and the Basin and Range Physiographic Province (Ffolliott 1999). Elevations within the Project Area range from approximately 2,400 feet (ft) above mean sea level (amsl) in the lower reach of Arnett Creek to the summit of Picketpost Mountain at approximately 4,375 ft amsl. Topography within the Project Area is associated with the foothills of surrounding mountains and is dominated by steep to rolling terrain and includes highly scenic features such as standing boulders and other rock outcrops, dramatic rock faces, narrow rocky ridges, and sharply incised canyons.

The terrain within the Project Area can be generally divided into two areas. The eastern portion of the Project Area, between State Route 177 and the eastern ridge of Wood Canyon, is characterized by gently rolling hills. This lowland area affords extensive views of the Apache Leap formation to the east and Picketpost Mountain to the west. The portion of the Project Area located to the west, between Wood and Telephone Canyons, is characterized by more rugged terrain created by the ridges and drainages of the Canyons. These formations follow a roughly parallel course until the two canyons reach the lower slopes of Picketpost Mountain.

3.3. CLIMATE AND AIR

The regional climate in the vicinity of the Project Area is characterized as semiarid, with long periods of little or no precipitation (Western Regional Climate Center 2019)[2]. Precipitation falls in a bimodal pattern: most of the annual rainfall within the region occurs during the winter and summer months,

[2] https://wrcc.dri.edu/Climate/west_coop_summaries.php; accessed on February 7, 2019.

with dry periods characterizing spring and fall. The average annual precipitation in the Superior region is 20.22 inches, with just over half occurring between November and April (U.S. Climate Data 2019)[3].

Air quality within the vicinity of the Project Area currently meets National Ambient Air Quality Standards (NAAQS) standards for the seven "criteria pollutants": carbon monoxide (CO), sulfur dioxide (SO_2), particulates with an aerodynamic diameter less than or equal to a nominal 10 µm (PM_{10}), particulates with an aerodynamic diameter less than or equal to a nominal 2.5 µm ($PM_{2.5}$), ozone (O_3), nitrogen dioxide (NO_2), and lead (Pb). The National Park Service has a long-term air quality dataset for the Tonto National Monument located to characterize the air quality in the Superstition Wilderness, located north of the Project Area, which indicates air quality is good and air pollution levels are lower than in populated areas. All of the areas within the Project Area are in attainment status. The nearest non-attainment areas include the Hayden airshed, which is in non-attainment for PM_{10} immediately east of the Project Area, and the Phoenix airshed, which is in non-attainment for O_3.

3.4. VEGETATION

Based on the broad scale biotic community mapping of Brown and Lowe (Brown and Lowe 1980), the majority of the Project Area is mapped as the Arizona Upland Subdivision of Sonoran Desertscrub (Turner and Brown 1982), with vegetation characteristic of that biotic community present, including saguaro (*Carnegiea gigantea*), paloverde (*Parkinsonia* spp.), jojoba (*Simmondsia chinensis*) and occasional crucifixion thorn (*Canotia holacantha*).

Telegraph Canyon, Arnett Creek, Queen Creek, and some of the unnamed side canyons and springs within the Project Area support relatively narrow bands or patches of riparian vegetation consistent with Interior Riparian Deciduous Forests and Woodlands (Minckley and Brown 1994). Fremont cottonwood (*Populus fremontii*), Goodding's willow (*Salix gooddingii*), Arizona sycamore (*Platanus wrightii*), Arizona walnut (*Juglans major*), netleaf hackberry (*Celtis reticulata*), seepwillow (*Baccharis salicifolia*), California buckthorn (*Rhamnus californica*), and the nonnative saltcedar (*Tamarix* sp.) are the dominant species in these areas. The other ephemeral drainages, exhibit xeroriparian vegetation, with plant species composition similar to that of the surrounding upland areas, but in higher stature and densities.

3.5. SURFACE WATER FEATURES

Intermittent and near-perennial surface waters in Arnett and Queen creeks support riparian plant communities and aquatic and wetland features within portions of the Project Area. The riparian woodlands are represented by narrow, linear stands comprised of Fremont cottonwood, Goodding's willow, Arizona walnut, and Arizona sycamore and salt cedar. The linear stands are largely contiguous with occasional breaks in the canopy.

[3] https://www.usclimatedata.com/climate/superior/arizona/united-states/usaz0228; accessed on February 7, 2019.

4. PROJECT DESCRIPTION

4.1. CONCEPTUAL PLAN DEVELOPMENT AND COMMUNITY INVOLVEMENT

The Project was first proposed by Resolution to TNF as a mitigation measure for Resolution's planned mining activities. The Group was developed as part of TNF's efforts to engage the local community throughout the planning and development process. Stakeholders were identified for the Group with the intention of creating a well-designed and well-implemented trail system that meets stakeholder needs. The Group ultimately included representatives from the Town of Superior, the local community, Resolution, and members of the outdoor recreation community (see **Table 3** for Group members). Additionally, TNF representatives attended regularly to provide input and direction for the Group.

The Project is located within Forest Plan Management Area 2F, and the proposed trail system must conform with the management priorities for this management area, which predominantly focuses on wildlife habitat improvement, water quality maintenance, livestock forage production, and dispersed recreation. The Forest plans to manage watersheds to improve them to a satisfactory or better condition and improve and manage adjacent riparian areas to benefit riparian dependent resources (USFS 1985, page 85).

The following is direction provided directly from the TNF Plan (USFS 1985) for the Project Area:

- Continue periodic inspection and maintenance of existing wildlife exclusions and restoration projects. Develop reports as needed to describe results of studies. Improve the level of protection and maintenance at these sites to ensure their continued informational value for wildlife management (USFS 1985, page 87).
- Based on Transportation Operation and Maintenance (O&M) Plans, identify alternative routes for new trails near urban centers and/or main travel routes. Gather information for cost estimating and design criteria. Includes trail location and selection, survey design and field review (USFS 1985, page 89).
- O&M of entire trail system to provide for a variety of user experience levels, resource protection and public safety. Includes trail condition surveys and maintenance plans (USFS 1985, page 89).

During the conceptual plan development for the Project Area, the Group balanced TNF management and recreation priorities with the priorities identified by the stakeholders. Ultimately, the following goals for the trail network design were identified:

(a) consolidate the existing trail network to reduce unauthorized disturbance;
(b) allow for a diverse range of trail types for both motorized and non-motorized uses;
(c) maximize and preserve views of the outstanding natural scenery of the area;

(d) segregate use types as necessary to minimize conflicts and facilitate public safety;
(e) be sustainable and require minimal maintenance;
(f) be able to be constructed in phases.

The Group has met on a regular basis since 2016 (**Table 2**). Conceptual trail routes were developed using aerial imagery, topographic information and the local expertise of Group members. The Group engaged an environmental consultant (WestLand Resources, Inc.) to review cultural and biological resources within the proposed trail routes as well as a trail design consultant (Southwest Trail Solutions) to assist with the development of the trail design and resource review process.

Table 2. Recreation User Group Meeting Dates *

Day	Year
September 24	2015
November 30	2015
February 10	2016
April 13	2016
September 14	2016
December 7	2016
February 8	2017
April 12	2017
October 10	2017
November 9	2017
December 13	2017
February 14	2018
April 11	2018
July 25	2018
November 14	2018
January 9	2019

* List of meeting dates is based on information provided on the Superior Arizona Community Working Group website: https://superiorazcwg.org/category/meeting-notes/recreation-user-group/. CWG Recreation & Access Task Force Meeting dates are excluded from this list.

The stakeholder representatives comprising the Group membership are listed in **Table 3**.

Table 3. Recreation User Group Members

Representative	Organization
John Bricker	Tonto Recreation Alliance
Rich Smith	Tonto Recreation Alliance
Kevin Patterson	Tonto Recreation Alliance
Mila Besich-Lira	Town of Superior
Todd Pryor	Town of Superior
Elizabeth Butler	Friends of Tonto National Forest & Equestrians
Jim Schenck	Superior Community Working Group
Greg Waterman	Sun City Anthem Hiking Club
Bruce Odegaard	Sun City Anthem Hiking Club
Lynn Martin	Ranching community
George Martin	Ranching community
Rick Schonfeld	WestLand Resources, Inc.
Mark Flint	WestLand Resources, Inc./Southwest Trail Solutions
Mary Morissette	Resolution Copper
Erik Filsinger	Queen Creek Coalition
Patrick Kell	International Mountain Bicycling Association
John Godec	Godec, Randall & Associates
Debra Duerr	Godec, Randall & Associates
Bill Volger	Legends of Superior Trails (LOST)
Nancy Volger	Legends of Superior Trails (LOST)

4.2. DESIGN

The preliminary trail designs were developed by the Group stakeholders and then refined based on field reconnaissance and cultural resources identified for avoidance. The trail alignments and trailhead areas were surveyed for impacts to cultural resources. For the trail alignments, a corridor width of 10 meters to either side of the proposed travel way (20 meters total) was surveyed to ensure the conceptual plan does not conflict with cultural resources that are eligible for the National Register of Historic Places. The preliminary designs were adjusted where needed to ensure each trail alignment is constructible, consistent with USFS construction standards, sustainable, and navigable.

During field reconnaissance, trail designers identified the opportunity to segregate the two major trail use categories – motorized and non-motorized – into different sections of the trail system. The ridge line extending approximately north/south separating Telegraph Canyon and Wood Canyon serves as a natural boundary between the two use areas (**Figure 2**). One portion of the trail system, north and

east of Wood Canyon, was designed primarily for operation of motorized equipment, both two-wheeled (motorcycles) and four-wheeled (small all-terrain vehicles and larger jeeps and sport-utility vehicles). The other portion of the trail, to the west of Wood Canyon, was designed primarily for non-motorized recreation (equestrian, mountain biking, and hiking).

Physically separating the two categories of trail use meets the Groups' goals of providing a diverse range of trail types in a safe and sustainable way. There are two exceptions to this segregation, however. A single new non-motorized trail has been proposed within the lowlands of the primarily-motorized section to provide a more moderate non-motorized trail with easy access from Superior and the highways. The other exception is the presence of an existing designated motorized USFS road within the portion western portion of the Project Area that is primarily non-motorized. A short segment of new motorized trail is proposed to connect the motorized trail system through the primarily non-motorized portion of the Project Area to the existing USFS road.

Potential locations for trailhead parking areas which were also segregated for motorized and non-motorized (primarily equestrian) uses. Users of both types of trails often use trailers, so the trailhead for each type of trail was designed to provide ample room for parking and unloading. All trailheads will be located within the lowlands in the northeast of the Project Area to provide easy access to the trailheads from Superior and the highways.

All trails are designed to maximize long-term sustainability and minimize erosion with consideration given to grade, angle, slope, and clearance. The trail system design also considers existing roads, unauthorized trails, and other sources of resource degradation and/or public safety concerns within the Project Area and identifies strategies for addressing these issues. The trail system is also designed to provide a variety of trail difficulty levels ranging from novice to expert. Design standards for the two user types (motorized vs. non-motorized) are identical, with the exception that sight-line distances and turning radii will be greater on motorized trails to accommodate the greater speeds and power associated with motorcycle use.

Final trail design and construction will take into consideration the local hydrology, soil types, cultural sites, and sensitive species that are listed, proposed or candidate for listing as threatened or endangered under the Endangered Species Act (ESA) within the area of the desired trail location. Known caves within the immediate vicinity of the proposed trail routes will continued to be managed by the USFS to protect culturally significant sites and follow U.S. Fish and Wildlife Service white nose syndrome protocols for bat populations that may frequent the caves. Trail designers will also identify sources of erosion, assess the potential impacts, and ensure that water and wind will not adversely affect the intended travel way.

4.3. LAYOUT

The trail system has been laid out as a standalone recreation system for both motorized and non-motorized users in the Superior region. The trail system has been designed to deliberately limit AZNST tie-ins to already-designated locations in an effort to avoid additional unplanned pressures on AZNST usage.

The trail layout is designed to encourage the use of the proposed trail system while discouraging the use of the existing unauthorized trails and the creation of new unauthorized trails. The is accomplished through two primary approaches: signage placement and route design. First, signs will be strategically placed at trail heads to indicate the authorized paths and reinforce good trail stewardship by stressing the importance of staying on designated trails. Signs will also be placed as a deterrent, along with boulders, railings, etc., at unauthorized access points to discourage off-trail usage. Second, the trail route has been located such that turns in the trail (a common point where unauthorized trail usage occurs) will be placed adjacent to features that will serve as natural deterrents to off-trail use, such as large boulders, steep inclines or drop-offs, etc.

Three staging areas are planned on TNF lands (**Figure 3**) totaling 2.9 acres of disturbance. These staging areas are strategically located to be close to desirable recreation areas while also being accessible to passenger vehicles and close enough to Superior to encourage visitor use of the town.

Table 4 provides a summary of the of trail lengths segregated by trail type. Motorized trails include two track routes appropriate for four-wheeled vehicles and single-track routes appropriate for off-highway motorcycles. Non-motorized trails are proposed single-track routes that are intended for hikers, cyclists, and equestrians.

Table 4. New Trails Proposed on TNF Lands

Trail Type	Trail Length (miles)
Motorized (two track)*	14.7
Motorized (single track)	28.7
Non-Motorized	25.6
TOTAL	**69.0**

* Existing unauthorized two-track trails

The layout of existing trails on private land with the potential to be connected to the proposed network on TNF lands are not included in the estimated trail lengths, as private trails are not included in this plan unless an easement already exists or the land owner has agreed to grant an easement for the trail.

4.4. CONSTRUCTION

Most proposed trail construction within the lowlands of the Project Area (in the northeast portion) will consist of improvements to existing unauthorized two-track roads to reduce ongoing erosion and increase public safety. Redundant existing roads will be obliterated and reclaimed to the extent possible. The construction of one new non-motorized single-track trail and three trailhead parking areas are proposed within this section (**Figure 2**).

Typical activities associated with the construction of the new trail alignments will include shaping the thin soil layer where present and moving and/or reducing the sizes of boulders where they conflict with the intended users. Where possible, boulders and rock ledges will be incorporated into the trail alignments in accordance with the skill level of the anticipated users. Vegetation along proposed new single track alignments will be pruned to an approximate height of 10 feet and an approximate width of 6 to 8 feet to allow sufficient space for users to pass in opposite directions.

The bulk of construction will be done manually by volunteer crews, including youth, veteran, and ancestral lands crews, during the cooler months of the year. Most of the new trails will be constructed in the upland areas on top of solid rock. Manual construction activities will include shaping the thin soil layer where possible, moving boulders out of the planned trail route, and breaking rock to allow for passage where necessary. Some rocks and rock ledges will be preserved to provide a more challenging terrain for bicyclists.

Where necessary, professional operators will use mechanized equipment for trail construction. This will likely be limited primarily to the lowlands along the northern extent of the Project. In these cases (and where feasible) a SWECO trail dozer and mini excavator (or equivalent) would be used to construct the trail. Construction will proceed in phases.

The majority of new motorized trails will be for single-track (motorcycle) use only.[4] Design and construction standards will be essentially the same as for non-motorized use trails. Because of the greater speed and power associated with motorcycle use, sight-line distances, turning radii and switchback construction will all be adjusted accordingly.

4.5. MAINTENANCE

Sustainable trail design and construction are being applied from the outset to minimize trail maintenance. As a result, most of the maintenance is anticipated to consist of pruning vegetation and maintaining drainage crossings. Unusually severe weather events may require more intensive maintenance and possible trail reconstruction.

[4] Approximately 3.2 miles of existing unauthorized trails are two track.

The success of numerous volunteer groups, such as the Arizona Trail Association (which maintains the AZNST), illustrates the fact that non-profit organizations can provide ongoing maintenance for recreational trails. It is anticipated that at least one such organization will be formed to recruit, train, and manage trail stewards and to raise funds for major repair projects.

4.6. FUNDING

It is anticipated that all final design and construction costs will be provided by at least one dedicated non-profit organization with additional funding provided by other entities. Construction and maintenance work will be conducted mainly by volunteers, such as youth, veteran, and ancestral lands volunteer crews. The bulk of construction expenses will come from the development of the final design and field layout by professional contractors, and the professional crews needed for more challenging trail sections. Possible funding sources include Resolution as well as grants, donations, and special organized events.

4.7. TRAIL BENEFITS

The trail is anticipated to provide benefits to the local economy in the form of long-term sustainable recreation and ecotourism, to reduce resource degradation from unauthorized trail use, and to better employ the currently underdeveloped recreational opportunities of National Forest lands located in proximity to a major metropolitan area.

The economic impacts that outdoor recreation provide to rural communities are well documented, and it is anticipated that development of the Project will be no exception for Superior, Arizona. Because the Project contains such a diverse range of scenic terrain within a relatively small area, it has the potential to become a popular destination for the growing number of outdoor recreation enthusiasts not only from the greater Phoenix area but also from across the country. In order to encourage visitors to use the town as a starting point, the Project includes the extension of an existing trail from town to the Picketpost trailhead on the Arizona National Scenic Trail (**Figure 2**), thereby providing a direct non-motorized connection to the Project Area. It is anticipated that the local business community will promote and participate in volunteer trail construction and maintenance efforts. The phasing of Project construction will allow for existing businesses to adapt to an expanding clientele and for new businesses to take advantage of new opportunities.

Developing a planned trail with appropriate signage and design elements will reduce the impacts to soil erosion, wildlife, plant life, and riparian habitat that the area is currently experiencing from the haphazard and unauthorized trail use that is occurring due to the lack of a planned system. The plan has identified sensitive resources and designed the trail system to avoid or minimize impacts to these resources.

The Group was developed specifically to ensure the trail system plan is one that meet the interests of the current users in a sustainable way that is in line with USFS management priorities. As a result, the proposed Project provides recreation opportunities currently unavailable in this location that are of interest to potential users. Furthermore, the Project's proximity to a major metropolitan area will facilitate access to these resources to in a more deliberate and environmentally sustainable way.

The proposed plan addresses ongoing management concerns for the TNF while providing a service and recreation opportunities that are currently underdeveloped to the local and regional communities, creating long-reaching benefits to the region.

5. REFERENCES

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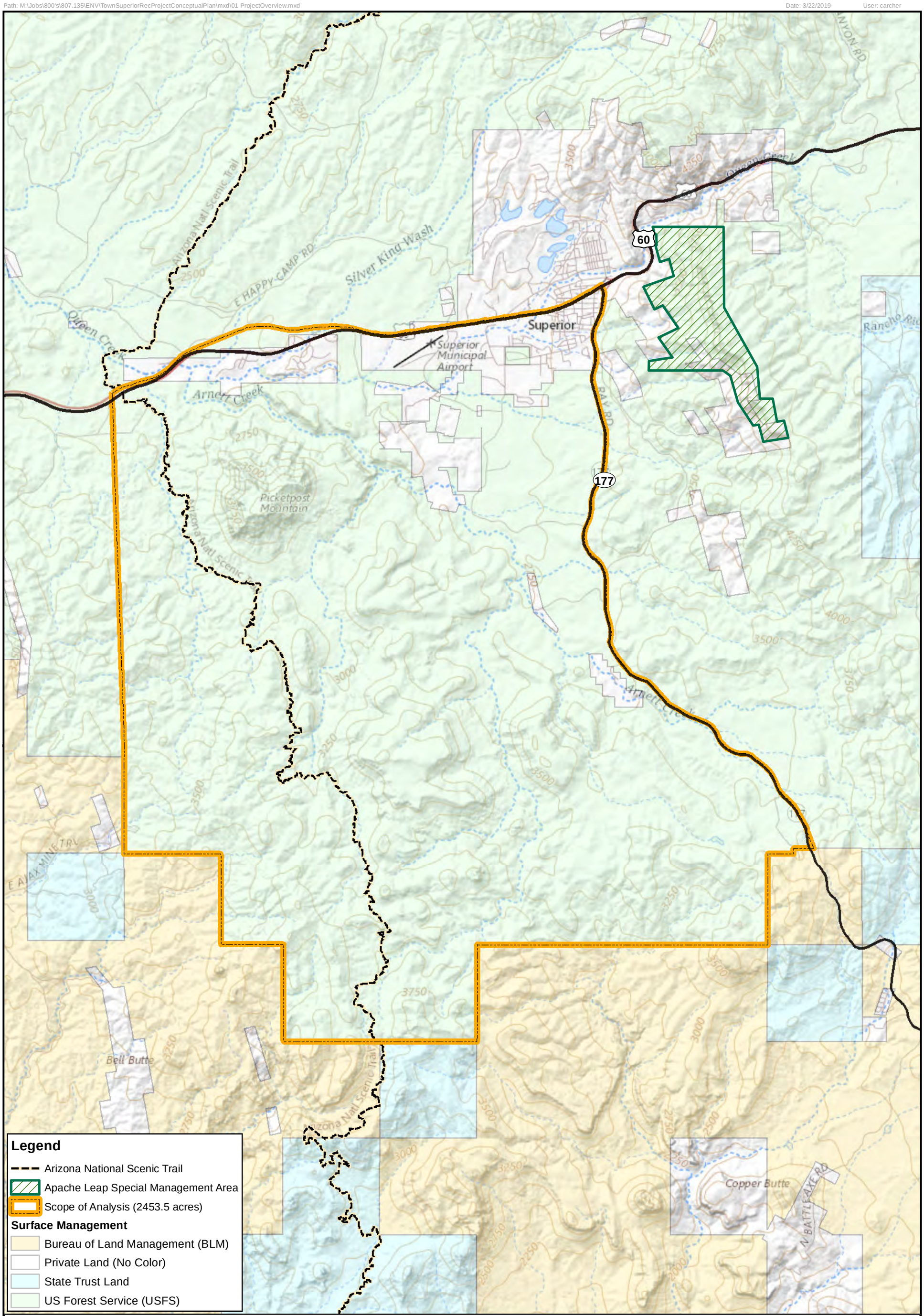
FIGURES

Path: M:\Jobs\800's\807.135\ENV\TownSuperiorRecProjectConceptualPlan\mxd\01 ProjectOverview.mxd Date: 3/22/2019 User: carcher



Scope of Analysis within:
T2S, R11-13E, and T3S, R12E,
Pinal County, Arizona,
Data Source: AZ Trail Association and
Surface Management: BLM 2018, WRI modified 2018
Image Source: ArcGIS Online USGS National Map

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N

0 2,500 5,000 Feet

0 1,000 2,000 Meters

RECREATION USER GROUP
SUPERIOR, AZ
Conceptual Plan

PROJECT OVERVIEW
Figure 1

Picketpost Trailhead

Proposed Trailhead/Parking Lot 1
Off-Highway Vehicle Users

Proposed Trailhead/Parking Lot 2
Equestrians and Mountain Bicyclists

Proposed Trailhead/Parking Lot 3
Equestrians and Mountain Bicyclists

Scope of Analysis within:
T2S, R11-13E, and T3S, R12E,
Pinal County, Arizona,
Mesa USGS 1:100,000 USGS Quadrangle
Data Source: Surface Management (BLM 2018, WRI Modified 2018),
Recreation User Group (RUG)
Road Classification: ArcGIS Online, USA Major Roads

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N

0 1,250 2,500 Feet

0 500 1,000 Meters

Legend

Recreation Use Trail
- Proposed Trail, Motorized (Single Track)
- Existing Forest Road, Motorized
- Proposed Road, Motorized
- Existing Trail, Non-Motorized
- Proposed Trail, Non-Motorized
- Telegraph Canyon/Wood Canyon Ridgeline

Road Classification
- Other Major Road
- Secondary Road
- Important Local Road
- Scope of Analysis (2453.5 acres)

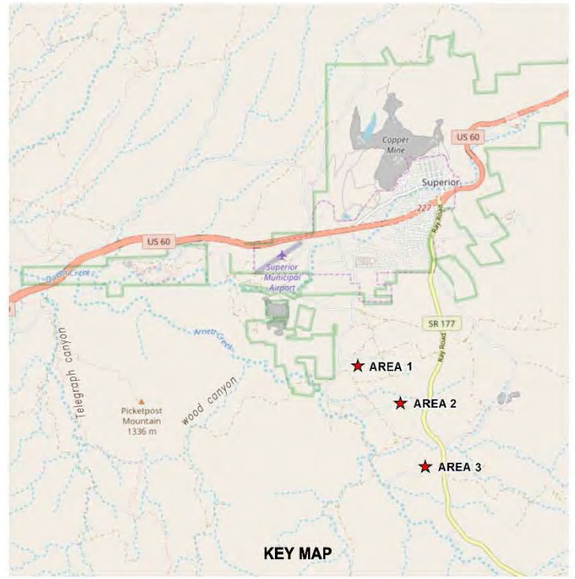
Surface Management
- Bureau of Land Management (BLM)
- Private Land (No Color)
- State Trust Land
- US Forest Service (USFS)

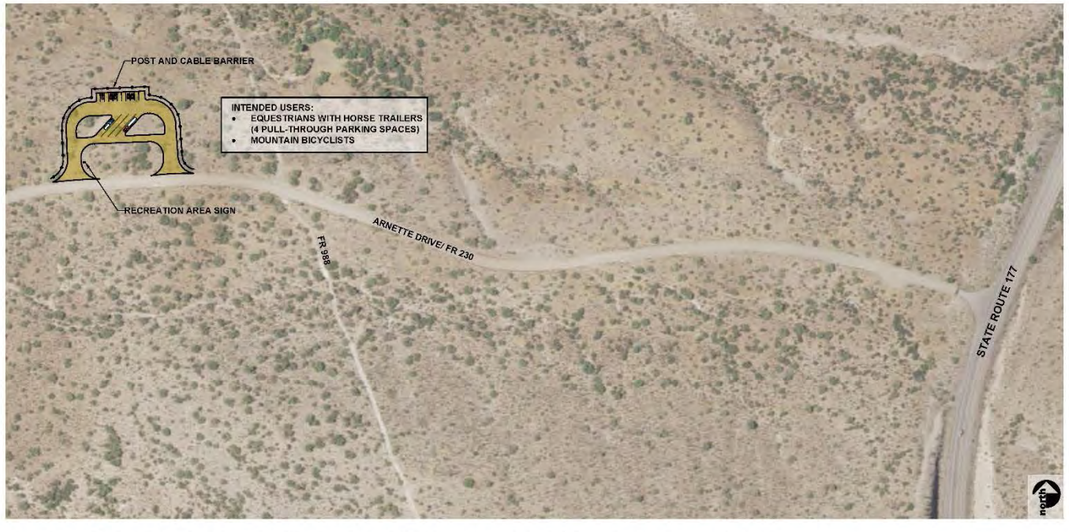
RECREATION USER GROUP
SUPERIOR, AZ
Conceptual Plan

TRAIL DESIGN
Figure 2

1 TRAILHEAD PARKING AREA (FOREST ROADS 2421 & 2422) : OFF-HIGHWAY VEHICLES

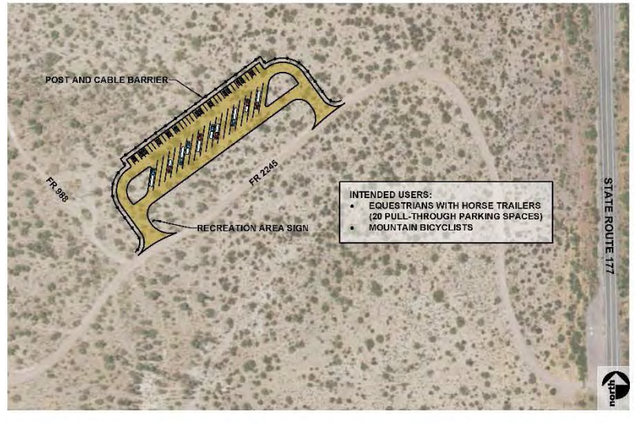
SCALE: 1" = 200'





2 TRAILHEAD PARKING AREA (ARNETT DRIVE/ FOREST ROAD 230) : EQUESTRIAN & MOUNTAIN BICYCLIST

SCALE: 1" = 200'



3 TRAILHEAD PARKING AREA (FOREST ROAD 2245) : EQUESTRIAN & MOUNTAIN BICYCLIST

SCALE: 1" = 200'

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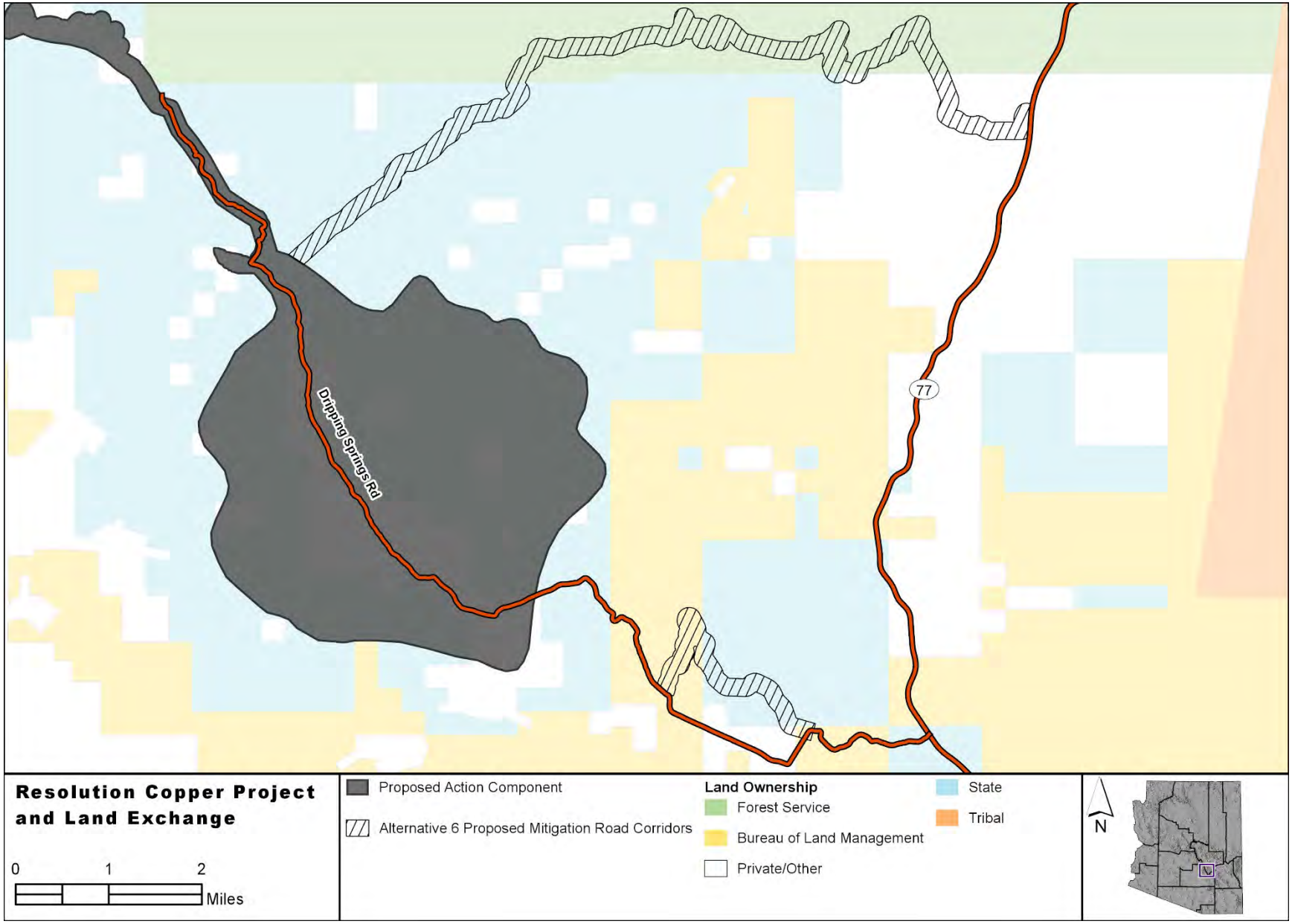
RECREATION USER GROUP
SUPERIOR, AZ
Conceptual Plan

TRAILHEAD PARKING AREAS

Figure 3


Dripping Springs Rd
77
Resolution Copper Project and Land Exchange
0
1
2
Miles
Proposed Action Component
Alternative 6 Proposed Mitigation Road Corridors
Land Ownership
Forest Service
Bureau of Land Management
Private/Other
State
Tribal
N