

### Overview

Chapter 3 describes the natural and human environment that may be affected by the proposed action and its alternatives, and discloses the direct, indirect, and cumulative impacts that could occur because of the proposed action or alternatives.

Direct and indirect impacts are those caused by the project itself. Cumulative impacts take into account not just the direct and indirect impacts of the proposed action (or alternatives), but also the combined effects of other past, present, and reasonably foreseeable future actions. These actions may have individually minor effects but become significant when combined. In most cases past and present actions, including ongoing trends, are part of the description of the affected environment.

## AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

### 3.1 Introduction

Each of the following sections in chapter 3 focuses on a specific resource, describes the environment that may be affected by the proposed action and its alternatives, and describes the direct, indirect, and cumulative impacts that could occur for that resource.

“Geology, Minerals, and Subsidence” (section 3.2) describes known geological characteristics at each of the major facilities of the proposed mine—including alternative tailings storage locations—and how the development of the project may impact existing cave and karst features, paleontological resources, area seismicity and other geological hazards, and mining claims. It also outlines subsidence impacts that would result from Resolution Copper’s plans to extract the ore from below the deposit using a mining technique known as “block caving” or “panel caving” and describes how subsidence would affect Apache Leap.

“Soils and Vegetation” (section 3.3) explains how the proposed mine would disturb large areas of ground and potentially destroy native vegetation, including species given special status by the Forest Service, and encourage noxious or invasive weeds. This section also discusses reclamation plans and expected reclamation success.

“Noise and Vibration” (section 3.4) provides a detailed analysis of estimated impacts from noise

and vibration under the proposed mining plan and each of the alternatives, including blasting impacts.

“Transportation and Access” (section 3.5) discusses how the proposed Resolution Copper Mine would increase traffic on local roads and highways and likely alter local and regional traffic patterns and levels of service. NFS road closures, along with accelerated deterioration of local roadways as a result of increased use, are examined.

“Air Quality” (section 3.6) analyzes potential impacts from an increase in dust, wind-borne particulate, and transportation-related emissions as a result of construction, mining, and reclamation activities at the mine. It also assesses how those emissions affect distant sensitive areas like the Superstition Wilderness.

“Water Resources” analyzes how the Resolution Copper Project could affect water availability and quality in three key areas: groundwater quantity and groundwater-dependent ecosystems (section 3.7.1); groundwater and surface water quality (section 3.7.2); and surface water quantity (3.7.3). This includes analysis of the impacts of dewatering at the mine site, analysis of pumping from the Desert Wellfield for the mine water supply, and anticipated effects from tailings seepage.

“Wildlife and Special Status Wildlife Species” (section 3.8) describes how impacts on wildlife can occur from habitat loss and fragmentation as well as from artificial lighting, noise, vibration, traffic, loss of water sources, or changes in air or water quality.

“Recreation” (section 3.9) describes the anticipated changes to some of the area’s natural features

and recreational opportunities as a result of infrastructure development related to the project.

“Public Health and Safety” addresses three areas of interest: tailings and pipeline safety (section 3.10.1), fire risks (section 3.10.2), and the potential for releases or public exposure to hazardous materials (section 3.10.3).

“Scenic Resources” (section 3.11) addresses the existing conditions of scenic resources (including dark skies) in the area of the proposed action and alternatives, along with the potential changes to those conditions from construction and operation of the proposed project.

“Cultural Resources” (section 3.12) analyzes potential impacts on all known cultural resources within the project area.

“Socioeconomics” (section 3.13) examines the social and economic impacts on the quality of life for neighboring communities near the proposed mine.

“Tribal Values and Concerns” (section 3.14) discusses the high potential for the proposed mine to directly, adversely, and permanently affect numerous cultural artifacts, sacred seeps and springs, traditional ceremonial areas, resource gathering localities, burial locations, and other places and experiences of high spiritual and other value to tribal members.

“Environmental Justice” (section 3.15) examines issues related to the project that have the potential to harm vulnerable or disadvantaged communities.

“Livestock and Grazing” (section 3.16) describes the loss to public use of Federal and State lands—including livestock grazing—from implementation of the proposed action or alternatives.

The analyses contained in chapter 3 were developed from issues identified during the scoping process. The relevant issues are only briefly recapped in chapter 3. The reader is directed to chapter 1, appendix E, or the November 2017 report titled “Resolution Copper Project and Land Exchange Environmental Impact Statement: Final Summary of Issues Identified Through Scoping Process” (Issues Report) for full

details (SWCA Environmental Consultants 2017b). The geographic area included for analysis is unique to each resource and encompasses areas in which direct or indirect impacts would be expected to occur. The anticipated impacts on each resource are analyzed for all phases of the project (construction, operation, and post-closure); in some cases, the analysis may focus on the time period that would cause the maximum impact on that resource.

As with the issues, for brevity’s sake, several other discussions in the EIS are only summarized, with the full details found elsewhere. For “Analysis Methodology, Assumptions, and Uncertain and Unknown Information,” the intent is to provide enough information in the EIS for the reader to understand what tools were chosen for the analysis and any limitations of those tools. For “Relevant Laws, Regulations, Policies, and Plans,” the intent is to briefly list the most pertinent items for the reader. Most of this information is captured in a detailed memorandum for the project record; a guide to the additional information available in these memoranda is included in appendix K.

The “Affected Environment” section describes the existing conditions for the resource. Existing conditions include effects of past, present, and ongoing actions that are occurring or have occurred within the analysis area.

The “Environmental Consequences” section describes the impacts of the proposed action or alternatives on the environment. Impacts include both the direct effects and indirect effects of the proposed action or alternatives. Direct effects are caused by the action and occur at the same time and in the same place. Indirect effects are caused by the action and are later in time and/or farther removed in distance but are still reasonably foreseeable (40 CFR 1508.8). Where alternatives have similar (though not necessarily identical) impacts, all alternatives may be discussed together, to be followed if needed by a discussion of the impacts that differ substantially between the alternatives.

The “Environmental Consequences” section also describes the cumulative impacts of the proposed action or alternatives. CEQ regulations define a cumulative impact as one that “results from the incremental impact of the action when added to other past, present,

and reasonably foreseeable actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” (40 CFR 1508.7).

Cumulative impacts are the combination of impacts from the proposed action or alternatives with other past, present, or reasonably foreseeable future actions. Past and present actions contribute to the existing condition of the affected environment in the project area and are included under the “Affected Environment” heading. The additional effects of the proposed action or alternatives are discussed under the “Environmental Consequences” heading. To assess cumulative impacts, those effects must then be considered in conjunction with the effects of “reasonably foreseeable” future actions, as long as they overlap in both space and time.

A “reasonably foreseeable” action is one that is likely to occur in the future and does not include those that are speculative. The Forest Service compiled a list of future actions to form the basis for the cumulative effects analysis and applied specific criteria to determine whether they were reasonably foreseeable or speculative (Rigg and Morey 2018). Only the effects of those actions determined to be reasonably foreseeable, and to overlap spatially and temporally with effects from the proposed action or alternatives, are included in the “Cumulative Effects” section of each resource (SWCA Environmental Consultants 2018a).

As described in chapter 2, the Forest Service is in the process of developing a comprehensive set of mitigation measures that, where practical and technically feasible to implement, would serve to avoid, minimize, rectify, reduce, or compensate for resource impacts identified during effects analyses conducted for this EIS. Concurrent with these mitigation measures, monitoring plans have been developed that would be used to gauge the effectiveness over time of each mitigation measure. If prior experience or analysis shows that a given mitigation measure is likely to reduce but is unlikely to eliminate an impact, an assessment was made to characterize the nature and scale of the anticipated residual impact. Thus, each chapter 3 resource section includes discussions of

applicable mitigation measures, monitoring plans, and unavoidable adverse impacts.