EXECUTIVE SUMMARY

INTRODUCTION

On July 21, 2009, the Department of the Interior published notice of the Secretary of the Interior (Secretary) Ken Salazar's proposal to withdraw (proposed withdrawal) approximately 1 million acres of federal locatable minerals in northern Arizona from the location of new mining claims under the Mining Law of 1872 [30 United States Code (USC) 22–54] (Mining Law), subject to valid existing rights. The withdrawal was proposed in response to increased mining interest in the region's uranium deposits, as reflected in the number of new mining claim locations, and concern over potential impacts of uranium mining on the Grand Canyon watershed, adjacent to Grand Canyon National Park (the Park).

The Northern Arizona Proposed Withdrawal Environmental Impact Statement (EIS) is being prepared to provide guidance to the Secretary in deciding upon this withdrawal. This document represents many months of concerted efforts on the part of experts, specialists, and representatives of the Bureau of Land Management (BLM) Arizona State Office, Arizona Strip District Office and Arizona Strip Field Office; Kaibab National Forest; Grand Canyon National Park; and multiple other federal, tribal, state, and local agencies. Any of the action alternatives outlined in the tables that follow, as a distillation of the combined thought, effort, and research from all those involved, will enable the Secretary to decide the appropriateness of withdrawal to protect the Grand Canyon watershed from adverse effects of locatable mineral exploration and development.

Currently, approximately 1,010,776 acres of federal mineral estate are segregated from entry under the Mining Law and are divided into three parcels. The three proposed withdrawal parcels border Grand Canyon National Park. They are all rich in natural and cultural resources and are intricately connected to the watershed of the Grand Canyon. The North Parcel comprises approximately 554,124 acres, the South Parcel approximately 134,454 acres, and the East Parcel approximately 322,198. Approximately 27,775 acres of non-federal surface are located within the three segregated parcels. Both the current segregation and the proposed withdrawal from location and entry under the Mining Law apply only to public domain federal mineral estate, including federal mineral estate underlying non-federal surface lands. Neither the current segregation order nor the proposed withdrawal apply to non-federal mineral estate or to leasable or salable minerals (e.g., oil and gas leasing, sand and gravel permits), which are not subject to appropriation under the Mining Law. The proposed withdrawal is subject to valid existing rights that are determined to exist on those mining claims located prior to July 21, 2009, the date the lands were segregated from location and entry under the Mining Law by the publication of the notice of proposed withdrawal in the *Federal Register*.

PURPOSE AND NEED

The purpose of preparing the Northern Arizona Proposed Withdrawal EIS is to provide guidance to the Secretary in deciding upon this withdrawal. The Proposed Action analyzed in this document is the withdrawal of minerals in approximately 1,010,776 acres near Grand Canyon National Park from location and entry under the Mining Law for 20 years. The underlying purpose of the Proposed Action is to protect the natural, cultural, and social resources in the Grand Canyon watershed from the possible adverse effects of the reasonably foreseeable locatable mineral exploration and development that could occur in the segregated area.

The need for the preparation of the EIS has been established by three factors: the Secretary's proposed withdrawal, the lasting impacts of some of the historic hardrock mining activities in the Grand Canyon

watershed, and the concern that these historical impacts and the recent increase in the number and extent of mining claims in the area could have adverse effects on resources within the human environment.

PUBLIC ISSUES AND MANAGEMENT CONCERNS IDENTIFIED DURING SCOPING

The most important step in the process of developing this EIS has been the identification of relevant issues and concerns. An issue is defined as an opportunity, conflict, or problem regarding the use or management of federally managed lands. The formal public scoping process began on August 26, 2009, with the *Federal Register* publication of a Notice of Intent to prepare an EIS for a proposed withdrawal. By the end of the formal scoping period, the BLM had received a total of 83,525 comment submittals. All comments received for this scoping effort were assigned, based on content, to one of nine preliminary concerns categories. Individual comments were then assigned to one of 25 resource categories on the basis of the overall theme of the comment. Comments were received concerning the proposed withdrawal as well as concerning exploration and development activity.

Air Quality

Concerns for air quality in the area of the Grand Canyon include potential impacts from uranium mining, including fugitive dust from vehicular travel associated with mines, and emissions from exploration and development activity, including greenhouse gas emissions.

Alternatives

The range of alternatives developed for the EIS should reflect the expressed interest in limited withdrawal options that would protect sensitive resources, but also keep exploration and development activity open yet restricted to areas relatively close to the communities that support mine development.

Cultural and American Indian Resources

The project area is very rich in cultural and American Indian resources, including Traditional Cultural Properties, sacred and traditional sites, and historic and archaeological resources. Protection of these resources was considered in the development of alternatives for the EIS.

Aquatic Wildlife

Concerns for aquatic wildlife include potential impacts of mineral exploration and development on fish habitat surrounding the Park as well as potential impacts on water quality of surface waters in the region and the implications for aquatic species within those waters.

Cumulative Impacts

The potential for cumulative impacts in the project area extends from legacy exploration and development activity into future mine development and may include both beneficial and adverse impacts on resources such as water, sensitive species, soils, air quality, vegetation, wildlife, human health, and cultural resources.

Economic Conditions and Values

The economic condition of the project area is a considerable issue and concern. The EIS should consider general economic trends in the area, including employment, revenue generated by tourism and mineral exploration and development activity, and development in and around federal lands and how these trends may be impacted by any alternative selected.

Environmental Justice

Environmental justice, identified as disproportionate impacts to low-income and minority populations, is an issue within the project area, especially with regard to the American Indian tribes and others living in the area.

Health and Safety

Human health and safety issues have the potential to affect local residents, visiting and recreating public, and employees involved with uranium exploration and mining. Concerns for health and safety include exposure to radiation, miner safety, hazardous/toxic wastes, and potential contamination of area resources.

Lands

The proposed withdrawal area includes 986,703 acres of federal locatable minerals underlying public (BLM) land and National Forest System lands and 24,073 acres of federal locatable minerals underlying non-federal surface. Federal lands in the immediate vicinity of the proposed withdrawal include Grand Canyon National Park as well as two national monuments, a national recreation area, and four American Indian reservations. Issues regarding lands include multiple use and resource protection concerns for federal lands proposed for withdrawal as well as potential impacts on surrounding lands, both federal and non-federal.

Laws and Policies

Mining operations must comply with a variety of environmental and mining laws, including the 1872 Mining Law and BLM and Forest Service management plans. Compliance with federal law (including the National Environmental Policy Act [NEPA]), regulations, and policies and consideration of state and local statutes should be paramount in the development of the EIS.

Minerals

Issues regarding minerals, including the number of claims, quality of the mineral deposits, locatable mineral exploration and development activities, valid existing rights, and revenues associated with minerals, should be considered in the EIS.

Miscellaneous

Miscellaneous concerns that arose during scoping included requests for public involvement and full disclosure of the controversy surrounding the proposed withdrawal, as well as requests for an

announcement of either support for or opposition to the proposed withdrawal and to uranium mining itself.

Natural Environment

Concern for the natural environment and the local and regional ecosystems in and near the proposed withdrawal area is a driving concern behind the proposed withdrawal.

Natural Resources

The proposed withdrawal area is rich in natural resources, including mineral and biological resources. Biological resources include timber, non-timber vegetation, and grazing range. Protection and development of these resources needs to be considered in the development of alternatives for the EIS.

Noise

Noise issues, such as the preservation of natural quiet soundscapes, include concerns about auditory intrusions into Grand Canyon National Park from machinery and equipment associated with uranium exploration and development.

Persons and Groups Affected

Groups affected by the proposed withdrawal include the BLM, U.S. Forest Service (Forest Service), National Park Service (NPS), and U.S. Environmental Protection Agency (EPA); state, local, and tribal governments; business and industrial organizations; and environmental groups such as the Center for Biological Diversity. Persons affected include local citizens, including tribal members, the touring and recreating public users, and citizens both national and international.

Recreation

Recreation concerns regarding the proposed withdrawal include access and value issues for both dispersed and developed recreation, personal recreation experiences, and illegal access by motorized recreation.

Social Conditions and Values

Issues related to social conditions include quality of life and well-being of local residents, the visiting public, and mine workers. Social values considered in the development of the EIS should include impacts on American Indian communities and lifeways, the preservation of natural and cultural resources for future generations, and impacts on the national heritage of the area.

Species of Concern

Issues associated with species of concern include the potential for exploration and mining to impact habitat for species of concern as well as individuals within populations. Specific species include California condors, black-footed ferrets, and Gunnison’s prairie dogs.

Soils and Geology

Issues related to soils and geology also include concerns for paleontological resources. Other concerns considered in the EIS are the potential for the loss of topsoil and soil contamination from mineral exploration and development activities.

Transportation

Issues related to transportation include access road construction, vehicular traffic supporting mineral exploration and development, and conflicts between industrial and recreational vehicle activity.

Vegetation

Issues related to vegetation include concerns about the potential increase in noxious and invasive weeds, the loss of vegetation as wildlife habitat, and the general loss of vegetation through mineral exploration and development activity.

Visual Resources

The proposed withdrawal area is rich in scenic resources, including the vistas of the Grand Canyon. Issues related to visual resources include impacts on the scenic quality from mineral exploration and development activity, as well as concerns for visibility within the area.

Water Resources

Water resources addressed in scoping include ground and surface waters of the Grand Canyon watershed. Issues related to water resources include concerns about water quality and quantity, including contamination and/or depletion from uranium exploration and development activity, and potential impacts on riparian resources.

Wildlife

Issues related to wildlife include potential impacts on all wildlife species from exploration and development activities, as well as concerns about wildlife tolerance of contaminants that could result from the activities. Specific concerns were raised regarding impacts on game species, including mule deer, pronghorn, and turkeys, and impacts on game birds and migratory birds.

ALTERNATIVES

Alternatives are the heart of the EIS, as they present other possible courses of action that could achieve the underlying purpose of and need for action to which the agency is responding. In this case, the underlying purpose of and need for action is to protect the natural, cultural, and social resources in the Grand Canyon watershed from the possible adverse effects of locatable mineral exploration and development that could occur in the area. Alternatives must meet the purpose and need; be reasonable; provide a mix of resource protection, use, and development; be responsive to the issues; and meet the established planning criteria. Each action alternative is a withdrawal that provides a framework for

multiple use management within the management area. Under all alternatives, federal land will be managed in accordance with all applicable laws, regulations, and agency policy and guidance.

Comparison of Key Alternative Components

Proposed Withdrawal Parcel	Alternative A No Action Area Open under the Mining Law	Alternative B Proposed Action 20 Years ~1 Million Acres Withdrawn		Alternative C Partial Withdrawal 20 Years ~700,000 Acres Withdrawn		Alternative D Partial Withdrawal 20 Years ~300,000 Acres Withdrawn	
North	None	*Surface Ownership*		*Surface Ownership*		*Surface Ownership*	
		BLM	523,922	BLM	334,724	BLM	101,797
		FS*	7,919	FS	7,919	FS	7,919
		State	4,204	State	4,204	State	801
		Private	18,079	Private	9,249	Private	681
East	None	*Surface Ownership*		*Surface Ownership*		*Surface Ownership*	
		BLM	102,432	BLM	65,125	BLM	31,444
		FS	31,273	FS	24,359	FS	24,359
		State	0	State	0	State	0
		Private	749	Private	749	Private	429
South	None	*Surface Ownership*		*Surface Ownership*		*Surface Ownership*	
		BLM	0	BLM	0	BLM	0
		FS	321,157	FS	205,616	FS	132,764
		State	80	State	80	State	80
		Private	961	Private	961	Private	407
Total Acres of Federal Locatable Mineral Estate to Be Withdrawn:	None	*Surface Ownership*		*Surface Ownership*		*Surface Ownership*	
		BLM	626,354	BLM	399,849	BLM	133,241
		FS	360,349	FS	237,894	FS	165,042
		State	4,284	State	4,284	State	881
		Private	19,789	Private	10,959	Private	1,517
		Total:	**1,010,776**	**Total:**	**652,986**	**Total:**	**300,681**

* FS = Forest Service.

Alternative A, the No Action Alternative: the proposed withdrawal would not be implemented and the proposed withdrawal area would remain open to location and entry under the Mining Law. New mining claims could be located, and exploration and mine development proposals would continue to be processed by the BLM or the Forest Service. This alternative serves as the baseline for measuring the impacts of the other action alternatives and reflects the current management situation for all federal land currently under segregation.

Alternative B, the Proposed Action: the proposed withdrawal would be implemented and the entire 1,010,776 acres of federal locatable mineral estate within the three parcels would be withdrawn for 20 years from operation of the Mining Law, subject to valid existing rights. On mining claims where valid existing rights are determined to exist, drilling and mining activities would continue to be processed by the BLM or the Forest Service.

Alternative C, Partial Withdrawal: 652,986 acres of federal locatable mineral estate within the three parcels would be withdrawn for 20 years from operation of the Mining Law, subject to valid existing rights. This alternative would withdraw a large proportion of those areas, identified by analysis, having

concentrations of cultural, hydrologic, recreational, visual, and biological resources that could be adversely affected by locatable mineral exploration and development. Alternative C would leave the remaining portion of the proposed withdrawal area with isolated or lower concentrations of these resources open to operation of the Mining Law. The mitigation of potential effects from exploration or development would continue under the applicable surface managing agency regulations.

Alternative D, Partial Withdrawal: 300,681 acres of federal locatable mineral estate within the three parcels would be withdrawn for 20 years from operation of the Mining Law, subject to valid existing rights. This alternative would withdraw areas, identified by analysis, where there is a relatively high concentration of cultural, hydrologic, recreational, visual, and biological resources that could be adversely affected by locatable mineral exploration and development (see also Figures 2.4-5 through 2.4-7 in Section 2.4.5). Alternative D would leave the remaining portion of the proposed withdrawal area with isolated or relatively low concentrations of these resources open to operation of the Mining Law. The mitigation of potential effects from exploration or development would continue under the applicable surface managing agency regulations.

PUBLIC INVOLVEMENT

The BLM decision-making process is conducted in accordance with the requirements of the National Environmental Policy Act of 1969, Council on Environmental Quality regulations, and Department of the Interior and BLM policies and procedures implementing NEPA. NEPA and the associated regulatory and policy framework requires that all federal agencies involve interested groups of the public in their decision-making, consider reasonable alternatives to proposed actions, and prepare environmental documents that disclose the potential impacts of proposed actions and alternatives. Public involvement, consultation, and coordination have been at the heart of the planning process leading to this EIS. This was accomplished through public meetings, alternative means of comment submittal, news releases, a planning web site, and *Federal Register* notices.

The scoping process used for this EIS was initiated by publication of a Notice of Intent in the *Federal Register* on August 26, 2009. The formal period for submitting scoping comments was from August 26, 2009, through October 30, 2009, although scoping does not end until the EIS is completed.

The BLM hosted two public meetings, one in Fredonia, Arizona, and one in Flagstaff, Arizona, in September and October 2009, respectively. Pursuant to NEPA requirements, the scoping meetings were advertised in a variety of formats, beginning at least 2 weeks prior to their scheduled dates. In each format, the advertisements provided logistics and explained the purpose of the public meetings, gave the schedule for the public comment, outlined additional ways to comment, and provided methods for obtaining additional information.

The meetings were conducted in an open house format designed to allow attendees to view informational displays, ask specialists about the Proposed Action and the EIS process, and submit written or verbal comments on-site. Meeting attendees were invited to sign in upon entering and were provided with handouts and informed of the meeting format and how to comment at the meeting. Comments from the public were collected during the scoping meetings and throughout the scoping period through a variety of methods, including postal mail, fax, and electronic mail.

AFFECTED ENVIRONMENT

Air Quality and Climate

The proposed withdrawal parcels are designated Class II areas for criteria pollutants. One federally designated Class I area, the Grand Canyon National Park, borders the proposed withdrawal parcels (see Figure 3.2-1 in Section 3.2). There are several other Class I and II areas in close proximity to the proposed withdrawal parcels. The proposed withdrawal parcels are classified as being in attainment for all criteria pollutants.

The air quality resource condition indicators likely to be affected as a result of mineral exploration and development activities in the proposed withdrawal parcels include the quantity of hazardous air pollutants emitted to the atmosphere; comparison of the maximum criteria pollutant concentrations with the National Ambient Air Quality Standards; comparison of the maximum criteria pollutant concentrations with the Prevention of Significant Deterioration air quality increments; greenhouse gas emissions; and air quality related values relative to visibility.

Cultural Resources

Cultural resources are physical phenomena associated with past or present cultures and include archaeological sites and historic buildings and structures, as well as places of traditional religious and cultural importance. Cultural resources refer to both humanmade and natural physical features associated with human activity and, in most cases, are finite, unique, fragile, and nonrenewable. The proposed withdrawal parcels contain unique and distinctive resources that represent several themes important to history and prehistory. A Class I inventory of all known cultural resources within the three parcels was conducted to determine the nature of site type and distribution. Within the three parcels, 461 sites have been evaluated and recommended eligible for the National Register of Historic Places (NRHP); 12 sites have already been listed. To date, 201 sites have been determined ineligible for the NRHP; 1,981 sites have not yet been evaluated with respect to NRHP eligibility status.

Resource conditions indicators for cultural resources likely to be affected as a result of mineral exploration and development activities in the proposed withdrawal parcels include the number of known historic properties (historic and prehistoric) to be affected, the number of acres to be disturbed by mineral exploration and development, the changes in settings or visual qualities that contribute to the integrity of cultural resource sites (evaluated qualitatively), and the degree to which reclamation practices can be used to restore the settings of sites.

American Indian Resources

American Indian resources refer to places regarded as important to American Indian cultures and traditions. These places may be individual landforms or large landscapes; they may be associated with sacred beings or ancestors, places where people came and still come to hunt game or gather plant resources, or archaeological sites. Known American Indian resources within the proposed withdrawal area include cultural landscapes; rivers, creeks, and springs; known activity areas; and trails and subsistence areas. Data on important places within the withdrawal parcels are presently available for the following American Indian groups: Southern Paiute (Las Vegas Paiute Tribe, Kaibab Band of Paiute Indians, Moapa Band of Paiute Indians, Pahrump Paiute Indian Tribe, Paiute Tribe of Utah, which includes the Shivwits Band of Paiute, and San Juan Southern Paiute Tribe), Havasupai Indian Tribe, Hualapai Tribe, Navajo Nation, Hopi Tribe, and Pueblo of Zuni.

Resource condition indicators for cultural landscapes and places are not easily definable or quantifiable. Some possible indicators include the proximity of traditional use areas to anticipated mineral exploration and development activity, the likelihood of concurrent or overlapping timing of traditional activity with mineral exploration and development activity, the manner and degree of auditory or visual disruptions in the traditional use area, and the number or acres of key springs, plants, or traditional use items lost or damaged as a result of exploration and development activity.

Economic Conditions

Economic conditions include population and demographics; employment, unemployment, and personal income; industry and economy; taxes and revenues; and mineral and recreation economics. Mineral exploration and development activities; construction, operation, and maintenance of proposed uranium mine facilities; and/or the proposed withdrawal of mineral estates and the associated reduction in mineral exploration and development activity all have the potential to impact economic conditions resources within the study area.

Resource condition indicators for economic conditions likely to be affected as a result of mineral exploration and development activities in the proposed withdrawal parcels include the value of energy produced from study area and the equivalent amount of other energy-producing commodity represented by uranium production; visitor use days and value per visitor use days to tourist destinations, primarily Grand Canyon National Park but also National Forest System and BLM lands; number of persons in the region directly and indirectly employed by the uranium mining industry; local and state revenue from property and income taxes directly tied to uranium mining activity; and number of haul trips anticipated on major public use roads over the next 20 years; the required maintenance level on public roads systems used for mineral operations; and the net change in funding available for road maintenance.

Fish and Wildlife

The greater Colorado Plateau ecoregion supports a wide variety of terrestrial and aquatic wildlife species. With the exception of Kanab Creek on the Kaibab Plateau, perennial aquatic systems and associated riparian habitats are extremely rare within the proposed withdrawal area; therefore, fish and riparian-dependent wildlife species are naturally limited. Aquatic and riparian habitats are relatively abundant, however, immediately adjacent to the proposed withdrawal parcels along the Colorado River, seeps and springs, and associated drainages in Grand Canyon National Park.

Within the proposed withdrawal area, there are 14 associated bird species, 18 small-mammal species, including 13 bat species, nine fish species, five large-mammal species, eight reptile or amphibian species, and six invertebrate species. These include general wildlife species as well as species of special concern.

Resource condition indicators for fish and wildlife likely to be affected as a result of mineral exploration and development activities in the proposed withdrawal parcels include changes in habitat, specifically patch size, contiguity, structure, and quality (including water quality and chemistry at aquatic sites); and the influence of these habitat changes on the reproductive success, population size, health, and diversity of organisms.

Geology and Mineral Resources

The proposed withdrawal area lies within the Colorado Plateau physiographic province. The primary economic mineral resource within the proposed withdrawal area consists of locatable mineral deposits, including both stratabound deposits and breccia pipe deposits. Stratabound deposits were studied and

considered small and unattractive for commercial development. All other locatable deposits are associated entirely with breccia pipes. The uranium deposits within the northern Arizona breccia pipes are of higher grade than approximately 85% of the world's known uranium deposits. The lands within the proposed withdrawal area are considered to have a high potential for uranium with a high level of certainty.

Resource condition indicators likely to be affected as a result of mineral exploration and development activities in the proposed withdrawal parcels include the availability of high mineral potential lands; number of ore deposits mined; potential for subsidence and alteration of geology or topography; amount of uranium mined as percent of known domestic resources, current domestic demand, and current domestic production; depletion of uranium resources within withdrawal area; amount of uranium mined as percent of global demand and production; and cumulative amount of high potential uranium resources lands withdrawn from exploration and development.

Recreation

Recreation activities occurring throughout the proposed withdrawal area involve a broad spectrum of pursuits, ranging from dispersed and casual recreation to organized, BLM-permitted and Forest Service–permitted group uses. The Arizona Strip is known for its large-scale undeveloped areas and remoteness. Typical recreation in the region includes off-highway vehicle driving, scenic driving, hunting, hiking, wildlife viewing, horseback riding, camping, backpacking, mountain biking, geocaching, picnicking, night-sky viewing, and photography. The area's proximity to the globally recognized Grand Canyon enables large numbers of U.S. residents and foreign visitors to access the public lands conveniently.

Resource condition indicators for recreation resources likely to be affected as a result of mineral exploration and development activities in the proposed withdrawal parcels include visitor use by activity and desired recreation experiences, acres within the BLM Recreation Opportunity Spectrum designation, and the miles, acres, or number of recreation sites that are currently designated in the proposed withdrawal area.

Social Conditions

The six-county socioeconomics study area for this EIS covers more than 46,000 square miles in northern Arizona and southern Utah. Other than a handful of towns and cities in each county, the study area is relatively remote and sparsely populated. Population centers in Coconino and Mohave counties are generally located south of the proposed withdrawal area. With the exception of tribal communities located along travel routes, communities in the area tend to be located far from major transportation corridors and industrial centers, and in general the small towns and communities within the counties have maintained their rural character. American Indians who live within the study area reside predominantly in Coconino County and form part of the Navajo Nation, Hopi Tribe, Hualapai Tribe, Havasupai Indian Reservation, and Kaibab Band of Paiutes. Some of the Navajo Nation chapters in the area include Cameron, Bodaway, Tuba City, and LeChee. Hopi chapters in Coconino County include Moenkopi and West Dinnebito.

Mineral exploration activities; construction, operation, and maintenance of proposed uranium mine facilities; and/or the proposed withdrawal of mineral estates and the associated reduction in mineral exploration and development activity have the potential to affect social condition resources. Resource condition indicators for social conditions likely to be affected as a result of exploration and development activities in the proposed withdrawal parcels include demographics, stakeholder values, public health and safety, and environmental justice.

Soils

Soil types within the three proposed withdrawal parcels vary widely, reflecting differences in the environmental and geomorphic conditions under which soils were formed and differences in parent materials. The dominant soil orders that occur in the proposed withdrawal parcels are Alfisols, Aridisols, Entisols, and Mollisols. Resource condition indicators for soil resources likely to be affected as a result of mineral exploration and development activities in the proposed withdrawal parcels include soil physical properties, soil erosion, and soil chemical quality.

Soundscapes

All three of the proposed withdrawal parcels border Grand Canyon National Park. The area is naturally quiet and generally not subject to modern sources of unnatural sound intrusion or noise. The Grand Canyon National Park Enlargement Act of 1975 established that natural quiet should be protected as a resource and value to the Park. Natural quiet, defined as the level of all natural sounds in an area, excluding all mechanical, electrical, and other human-caused sounds, is the baseline sound level used for this analysis.

Special Status Species

Special status species within the proposed withdrawal area include 1) species listed or being considered for listing by the U.S. Fish and Wildlife Service; 2) BLM Sensitive species; 3) Forest Service Sensitive species; 4) NPS species of concern; and 5) Arizona Game and Fish Department species of greatest conservation need. There are 10 federally listed plant species, one mammal species, seven bird species, five amphibian or reptile species, and five fish species. In addition to these, the BLM lists 14 plant species, eight mammal species, three amphibian or reptile species, four fish species, one bird species, and three invertebrate species as Sensitive. The Forest Service Sensitive species list adds three plant species, seven mammal species, two bird species, and one reptile species to the tally. The Arizona Game and Fish Department list one additional fish species and 10 bird species as being species of greatest conservation need.

In addition to the resource condition indicators for fish and wildlife, resource condition indicators for special status species include changes in habitat, specifically patch size, contiguity, structure, and quality (including water quality and chemistry at aquatic sites), which affect overall species health and abundance, as well as potential impacts to (modification or destruction of) designated critical habitat.

Vegetation Resources

More than 300 plant species are endemic to the Colorado Plateau and the Colorado Plateau provides habitat for numerous vertebrates, many of which are identified as “species of greatest conservation need” by the Southwest Regional Gap Analysis Project. In addition, several plant species are listed as federally protected species. Vegetation communities in the proposed withdrawal parcels include riparian, Great Basin Grassland, Great Basin Desertscrub, Great Basin Conifer Woodland, and Petran Montane Conifer Forest.

Resource condition indicators for vegetation resources likely to be affected as a result of the exploration and development activities in the proposed withdrawal parcels include the amount of disturbance resulting in loss of vegetation, change in productivity, loss of diversity; degree of infestation of invasive

species, degree and amount of fragmentation, degree and amount of contamination, and loss of water resources for vegetation.

Visual Resources

Visual resources are the visible physical features on a landscape and may include land, water, vegetation, animals, structures, and other features. The combination of these physical features creates scenery and provides an overall landscape character. The proposed withdrawal area is internationally recognized for its diverse landscapes and scenic qualities and offers many developed and dispersed backcountry recreation opportunities for sightseeing, wildlife viewing, and on-road touring.

Resource conditions indicators for visual resources likely to be affected as a result of mineral exploration and development activities in the proposed withdrawal parcels include consistency with and conformity to designated BLM Visual Resource Management class objectives; consistency with and conformity to Forest Service scenic quality management or integrity objectives; consistency with and conformity to Park visual objectives from key viewpoints within the Park; and qualitative analysis of the potential changes to the darkness of the night sky in the proposed withdrawal parcels and Grand Canyon National Park.

Water Resources

The study area for the water resources analysis includes local surface water drainage areas and groundwater basins that could potentially be impacted by reasonably foreseeable activities in the three proposed withdrawal parcels. Except for the main stem of the Colorado River, virtually all of the perennial surface water base flow in the study area, including the base flow for the Little Colorado River, is supported solely by flow from springs and seeps. Groundwater moves from areas of recharge to areas of discharge. In the study area, groundwater recharge occurs from infiltration of precipitation and ephemeral stream flow.

Resource condition indicators for water resources likely to be affected as a result of mineral exploration and development activities in the proposed withdrawal parcels include the quantity and quality of water discharge at springs that issue from perched groundwater zones that may be affected by operations at nearby mine sites, quantity and quality of water discharge at springs that issue from the regional R-aquifer system that may be depleted by operations at mine sites, and the quantity and chemical quality of receiving surface waters.

Wilderness

Designated wilderness areas are, by designation, withdrawn from mineral entry. There is one wilderness area adjacent to the North Parcel: Kanab Creek. There are two wilderness areas adjacent to the east parcel: Paria Canyon–Vermilion Cliffs and Saddle Mountain. There are no wilderness areas adjacent to the South Parcel. These wilderness areas currently provide a standard of solitude and naturalness that ranges from good to outstanding. They contain little to no evidence of surface disturbance, other than former vehicle ways and scattered prospects. The basic resource condition indicators used to characterize wilderness are those indicators that reflect the wilderness characteristics that supported the designation. Resource condition indicators for wilderness likely to be affected as a result of the exploration and development activities in the proposed withdrawal parcels include changes in or to the wilderness characteristics of naturalness, opportunities for solitude, and opportunities for primitive and unconfined recreation.

ENVIRONMENTAL CONSEQUENCES

Impacts on Air Quality

Under all alternatives, pollutants would be emitted into the atmosphere during the mine operation activities. The amount of pollutants emitted would depend on the level of mineral exploration and development activity under each alternative. Modeling results demonstrate that plume impacts from a typical mining operation are below absolute contrast value but exceed the contrast limit (i.e., ΔE). Current governing laws and regulations would require any future exploration and development activities to demonstrate that the proposed activity would not impact Class I areas such as Grand Canyon National Park, and a Level 2 analysis would be required to determine potential impacts on the Park.

Impacts on Cultural Resources

Under all alternatives, there would be no direct impacts to the disturbance of historic and prehistoric sites, assuming that direct impacts on sites by individual projects are mitigated through established regulations and policies. Under current regulations and policies, any proposed project would require an individual assessment of the impacts to cultural resources and mitigation of impacts if necessary. The primary mitigation measure for both the BLM and Forest Service would be avoidance. If direct impact mitigation is not possible, *Alternative A* would have a major direct impact on all parcels; *Alternative B* would have a major direct impact on the North Parcel, no direct impact on the East Parcel, and a minor direct impact on the South Parcel; *Alternative C* would have a major direct impact on the North and East parcels and a minor direct impact on the South Parcel; and *Alternative D* would have a major direct impact on all parcels. All alternatives would have minor short-term indirect impacts to historic and prehistoric sites as a result of visual and auditory impacts to the sites.

Impacts on American Indian Resources

There are no tribal trust resources or assets within the proposed withdrawal area; however, all alternatives could result in long-term indirect impacts of unknown magnitude on Havasupai Springs, which is located outside the proposed withdrawal area. The types of known resources for traditional cultural practices and uses in the proposed withdrawal area include landscapes, trails, springs, creeks, ceremonial sites, traditional territories, ranges and use areas, resource procurement areas, and camps. *Alternative A* would have a major long-term direct impact on resources on all three parcels including disturbance to a Traditional Cultural Place, minor short-term visual and auditory (indirect) impacts, and major long-term visual impacts from power lines. *Alternative B* would have major long-term direct impacts to resources on the North Parcel, no direct impacts on resources in the East Parcel, minor long-term direct impacts on the South Parcel, minor long-term visual and auditory (indirect) impacts on the North and South parcels, and major long-term visual impacts from power lines on the North and South parcels. *Alternative C* would have major long-term direct impacts on resources on the North and East parcels in areas excluded from withdrawal, minor long-term direct impacts on the South Parcel, minor long-term visual and auditory (indirect) impacts on all three parcels, and major long-term visual impacts from power lines on the North and South parcels. Since the majority of resources would be outside the withdrawal boundaries, *Alternative D* would have major long-term direct impacts to resources on all three parcels, including disturbance to a Traditional Cultural Place, minor short-term visual and auditory (indirect) impacts on all three parcels, and major long-term visual impacts from power lines on all three parcels.

Impacts on Economic Conditions

Overall regional tourist activity and associated employment within the proposed withdrawal area would not be affected under all alternatives. Mining companies would be responsible for maintenance of unpaved public roads used to haul ore under all alternatives, resulting in no impact to road condition and maintenance. *Alternative A* would result in beneficial moderate to major long-term impacts to economic activity from mineral development because of the potential economic value of uranium mined of $2.9 billion and direct industry employment total of $613.7 million. *Alternative B* would result in beneficial minor long-term impacts to economic activity from mineral development because of the potential economic value of uranium mined of $364.9 million and direct industry employment total of $225 million. *Alternative C* would result in beneficial moderate long-term impacts to economic activity from mineral development because of the potential economic value of uranium mined of $1.28 billion and direct industry employment total of $368.27 million. *Alternative D* would result in beneficial moderate to major long-term impacts to economic activity from mineral development because of the potential economic value of uranium mined of $2.34 billion and direct industry employment total of $531.9 million.

Impacts on Fish and Wildlife

Impacts on wildlife habitat and habitat fragmentation are expected to occur under each alternative. The magnitude of these impacts will vary, depending on the location of mines and overall water quality and quantity impacts to area seeps, springs, and other water bodies. *Alternative A* would have a minor to major long-term impact on aquatic and terrestrial habitats and a minor long-term impact on unfragmented habitat. *Alternatives B* and *C* would have minor long-term impacts on aquatic and terrestrial habitats and minor long-term impacts to unfragmented habitat as a result of the decrease in acres disturbed, compared with *Alternative A. Alternative D* would have a moderate impact to aquatic and terrestrial habitats and a moderate long-term impact to unfragmented habitat as a result of the decrease in acres disturbed, compared with *Alternative A.* The increase in the levels of uranium and its decay constituents in water and soil is anticipated to be minor and long term under all alternatives. While these increased levels may impact individuals, impacts are not anticipated to alter overall fish and wildlife populations. Impacts to sensitive aquatic habitats, such as Kanab Creek, are anticipated to be reduced under *Alternatives B, C,* and *D* because a greater area is being withdrawn from new mines.

Impacts on Geology and Mineral Resources

Alternative A would have no impact on the underground geological conditions, availability of mineral resources, or depletion of uranium resources within the proposed withdrawal area. *Alternative B* would reduce the number of ore deposits mined but would not change the potential for subsidence or alteration of geology or topography in the proposed withdrawal area. *Alternatives C* and *D* would also reduce the number of ore deposits mined but would not reduce the number as much as *Alternative A. Alternatives B, C,* and *D* would also cause a moderate to major long-term impact to the availability of mineral resources and depletion of uranium resources within the proposed withdrawal area.

Impacts on Recreation

The increase in miles of new mining-related roads for all alternatives would benefit driving for pleasure but would adversely impact users seeking primitive recreation opportunities in adjacent areas, although there are no primitive settings within the proposed withdrawal area. *Alternative A* would increase the road density more than the other alternatives and would increase visitor use of the remote and undeveloped

areas; users accessing adjacent primitive areas would be moderately impacted by exploration and development activity. The haul traffic on State Route 64 would be moderate and would have a long-term impact on visitors driving to Grand Canyon Village. *Alternative B* would have minor increases to the existing road density and visitor use of the remote and undeveloped areas; users accessing adjacent primitive areas would experience minor impacts from exploration and development activity. Impacts to visitor use on State Route 64 would be minor and long term. *Alternative C* would have the smallest increase in road density and the least impact on visitor use of the remote and undeveloped areas; users accessing adjacent primitive areas would be moderately impacted by exploration and development activity. Impacts on visitor use on State Route 64 would be moderate and long term. *Alternative D* would increase the road density more than any other action alternative and would have a moderate impact to visitor use of the remote and undeveloped areas; users accessing adjacent primitive areas would be moderately impacted by exploration and development activity. Impacts to visitor use on State Route 64 would be moderate and long term.

Impacts on Social Conditions

There are no impacts on demographics under *Alternatives B, C,* and *D*; however, *Alternative A* could result in minor long-term impacts as a result of the population increase from exploration and development activity. In terms of stakeholder values, impacts on different groups (i.e., those who support mineral exploration and development activity or those who support withdrawal) depend on the groups' perspective and the level of exploration and development activity under each alternative; generally, impacts range from minor to moderate and would be long term. Similarly, impacts on health and human safety range from no measurable impacts to minor or moderate long-term impacts, depending on the level of exploration and development activity; the more exploration and development activity under a given alternative, the higher the risk for health or human safety impacts. Nine communities and four tribes meet EPA criteria for an environmental justice population; however, there are no disproportionate health or environmental impacts as a result of any of the alternatives. This would result in a minor long-term impact on environmental justice populations.

Impacts on Soils

The magnitude, extent, and duration of impacts to soil resources depend on the amount of disturbed area exposed to water and wind, soil types affected, topography at sites of disturbance, duration of individual exploration or development operations, and success of reclamation efforts at each area of operation. Disturbance of soils could result in reduced productivity and increased erosion, which would generally be minor and limited to the vicinity of sites of disturbance. Duration of such impacts would be expected to be long term for soil productivity and short term for increased erosion. Impacts from distribution of mine-related constituents in soil would generally be limited to the vicinity of mine sites but would be long term. *Alternative A* potential impacts range from minor to moderate in all three parcels because some mines might be located in areas with sensitive soils or where increased erosion and contaminant distribution might extend beyond the vicinity of sites of activity. *Alternative B* potential impacts are minor to moderate in the North Parcel because substantial new exploration and development activity is foreseen throughout the parcel, regardless of the proposed withdrawal; impacts are none in the East Parcel because no mining-related exploration or development is foreseen; and impacts are minor in the South Parcel, where all sensitive areas would be withdrawn. *Alternative C* potential impacts are minor to moderate in the North Parcel and minor in the East and South parcels because nearly all sensitive areas would be withdrawn. *Alternative D* potential impacts are minor to moderate in the North Parcel and minor to moderate in the East and South parcels because a few sensitive areas are not withdrawn.

Impacts on Soundscapes

Mineral exploration and development of a proposed mine site would cause temporary increases in ambient noise levels in the immediate vicinity of the exploration and development sites for all alternatives. Impacts on soundscapes within the proposed withdrawal area range from minor to moderate long-term impacts, depending on the location and level of mining-related exploration and development.

Impacts on Special Status Species

Impacts on special status species are expected to occur under each alternative. The magnitude of these impacts will vary, depending on the location of mines and overall water quality and quantity impacts on area seeps, springs, and other water bodies. *Alternative A* would have a minor to major long-term impact on aquatic and terrestrial habitats. *Alternatives B* and *C* would have minor long-term impacts on aquatic and terrestrial habitats as a result of the respective decrease in acres disturbed, compared with *Alternative A. Alternative D* would have a moderate impact on aquatic and terrestrial habitats as a result of the decrease in acres disturbed, compared with *Alternative A.* The increase in the levels of uranium and its decay constituents in water and soil is anticipated to be minor and long term under all alternatives. While these increase levels may impact individuals, impacts are not anticipated to alter special status species populations. Impacts on sensitive aquatic habitats, such as Kanab Creek, are anticipated to be reduced under *Alternatives B, C,* and *D* because more area is being withdrawn from new mines.

Impacts on Vegetation Resources

Impacts on vegetation are expected to occur under each alternative. The magnitude of these impacts will vary, depending on the location of the mine and associated roadway and transmission line facilities. Depending on the location of the mine facilities, impacts could range from minor to moderate and have the potential to be measurable but not apparent. The acres disturbed under *Alternative B* would be an approximate decrease of 88%, compared with *Alternative A*; acres disturbed under *Alternative C* would be a 61% decrease, compared with *Alternative A*; and acres disturbed under *Alternative D* would be a 30% decrease, compared with *Alternative A.* All alternatives would have a minor long-term impact on the productivity of aquatic and terrestrial habitats.

Impacts on Visual Resources

The degrees of contrast and impact vary and are specific to each viewpoint, ranging from temporary to major and short to long-term under all alternatives. *Alternative A* does not withdraw any sensitive visual designations (Class I, Class II, Preservation, High), resulting in a moderate long-term impact on the conformance with BLM and Forest Service visual management objectives and a minor to moderate long-term impact on the conformance with Grand Canyon National Park visual objectives from key observation points. *Alternative A* would have a minor to moderate short-term impact on changes in night sky within the proposed withdrawal area. *Alternative B* would withdraw all of the sensitive visual designations, resulting in no impact on the conformance with BLM and Forest Service visual management objectives and on the conformance with Grand Canyon National Park visual objectives from key observation points. *Alternative B* would have no impact to minor short-term impact on changes in night sky within the proposed withdrawal area. *Alternative C* would withdraw approximately 88% of the sensitive visual designations, resulting in a minor long-term impact on the conformance with BLM and Forest Service visual management objectives and on the conformance with Grand Canyon National Park visual objectives from key observation points. *Alternative C* would have a minor short-term impact on changes in night sky within the proposed withdrawal area. *Alternative D* would withdraw approximately

53% of the sensitive visual designations, resulting in a minor long-term impact on the conformance with BLM Visual Resource Management class objectives and a minor to moderate long-term impact on the conformance with Grand Canyon National Park visual objectives from key observation points. *Alternative D* would have would have a minor to moderate short-term impact on changes in night sky within the proposed withdrawal area.

Impacts on Water Resources

The degree of impact on water resources varies, depending on the number and location of mines, and is specific to each water resource condition and local groundwater and surface water sub-basin. Under all alternatives, impacts range from none to major and impact duration ranges from short to long term. Duration of impacts is generally long term for groundwater and ranges from short to long term for surface water across all alternatives. *Alternative A* has the greatest overall impact and *Alternative B* has the least overall impact, including no impact in the East Parcel. For all alternatives, the impact on perched aquifer groundwater is none or negligible, except where it ranges up to moderate or major in the North Parcel. The impact on deep aquifer springs is none or negligible across all alternatives, except where it ranges up to moderate for water quality in the North Parcel (*all alternatives*) and East Parcel (*Alternatives A, C,* and *D*), and locations where it ranges up to major for the South Rim springs near the South Parcel (Alternative A). Under all alternatives, the impact on deep wells at Tusayan, Arizona, is negligible for water quantity and none to major for water quality. The impact on surface water under *Alternative A* ranges from negligible to moderate, except where it ranges up to major for quantity and quality in the South Parcel. The impact on surface water under *Alternatives B* and *C* is none or negligible, except where it ranges up to moderate in the North Parcel. The impact on surface water under *Alternative D* is none or negligible, except where it ranges up to moderate in the North and South parcels. The impact on the Colorado River across all alternatives is none or negligible and of short-term to long-term duration. The impact on the Virgin River across all alternatives is none or negligible and of long-term duration.

Impacts on Wilderness

Under all alternatives, there would be no direct impacts on designated and proposed wilderness characteristics. Potential indirect impacts to designated and proposed wilderness range from minor to moderate and from short-term to long-term depending on the placement and density of specific exploration and mining operations and thus become project specific. Mining activities that occur closer to designated or proposed wilderness would have a greater potential impact than those occurring farther away.

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