

5.0 CUMULATIVE EFFECTS

5.1 Introduction

Cumulative effects are those impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions (RFFAs) within the cumulative effects analysis areas (CEAs). They can result from individually minor, but collectively significant actions taken over a period of time. Major past and present land uses in the CEAs, which are projected to continue into the future include: mining, roads/trails, timber harvesting, wildfires, fisheries restoration, and exercise of Tribal Treaty Rights. Dispersed recreation (including hunting, fishing, float boating) and residential development also occur in parts of the CEAs.

Guidance from CEQ, “Considering Cumulative Effects – January 1997,” was used in identifying geographic boundaries and ultimately the CEA for each resource. The CEA for each environmental resource is presented in **Table 5.1-1** and discussed under the specific resource subsection.

5.1.1 Cumulative Effects Areas

Past, present, and RFFAs include activities, developments, or events that have the potential to change the physical, social, economic, and/or biological nature of a specified area. Existing and projected activities directly associated with past and present activities, and other RFFAs, provide the basis for defining and analyzing cumulative impacts. A cumulative effect overlaps in space and time with the direct and indirect effects of the action.

Due to the nature of the SGP that requires many miles of transmission line and roads, the direct and indirect effects areas are expansive. However, the effects themselves are not expansive. Therefore, the analysis of cumulative effects does not result in a broader analysis area for most resources. **Table 5.1-1** presents the CEAs by resource and the associated figure number.

Table 5.1-1 CEAs by Resource and Rationale

Resource	Cumulative Effects Area	Figure
Geologic Resources and Geotechnical Hazards	The HUC 12 subwatershed boundary surrounding the SGP components.	Figure 3.8-1
Air Quality	The near field region is defined as a 50-km radius from the SGP. The far field region is defined as a 300-km radius from the SGP.	Figure 3.3-2
Climate Change	The SGP components including the mine site and access roads, utilities, and offsite facilities, and the vehicles and equipment that operate within those areas.	No figure
Soils and Reclamation Cover Materials	The subwatersheds of the TSRC analysis area.	Figure 3.5-1
Noise	Areas within a 5-mile radius of SGP components including the mine site and access roads, utilities, and offsite facilities.	Figure 3.6-1
Hazardous Materials	Bounded by the bordering transportation routes that would provide access to the mine site. SGP components including the mine site and access roads.	Figure 3.7-1

Resource	Cumulative Effects Area	Figure
Surface Water and Groundwater Quantity	The HUC 12 or subwatersheds that overlap the SGP.	Figure 3.8-1
Surface Water and Groundwater Quality	For surface water, the 22 watersheds that encompass the SGP, access roads, transmission lines, and off-site facilities. For ground water, the two sub-watersheds that encompass the SGP.	Figure 3.9-1 Figure 3.9-2
Vegetation: General Vegetation Communities, Botanical Resources, and Non-native Plants	The 300-foot buffer around SGP action alternative components.	Figure 3.10-1
Wetlands and Riparian Resources	Watersheds containing the SGP components including the mine site and access roads, utilities, and offsite facilities.	Figure 3.11-1
Fish Resources and Fish Habitat	All of the watercourses and waterbodies in the HUC 6th field (10-digit code) watersheds that overlap potential SGP disturbance areas. SFSR hydrological subbasin and the North Fork Payette River hydrological subbasin.	Figure 3.12-1
Wildlife and Wildlife Habitat including TEPC Species	The wildlife 6 th -level HUC at the 12-digit scale (HUC 12) subwatershed boundaries.	Figure 3.13-1
Timber Resources	The PNF and BNF, as well as any commercial timberlands in Valley County.	Figure 3.14-1
Land Use and Land Management	The SGP components including the mine site and access roads, utilities, and offsite facilities.	Figure 3.15-1
Access and Transportation	The overall road system encompassing the SGP components.	Figure 3.16-1
Heritage Resources	The VAV APE.	Figure 3.17-1
Public Health and Safety	Valley County, particularly the residents of the village of Yellow Pine, the nearest residential community to the mine site area, as well as recreational visitors who frequent the area.	No Figure
Recreation	A 5-mile radius from the SGP components to account for where the SGP could be visible within foreground or middle ground distances and noise from SGP activities could be audible and thus could potentially affect recreation opportunities and settings.	Figure 3.19-1
Scenic Resources	NFS lands in Valley and Adams Counties.	Figure 3.20-1
Social and Economic Conditions	Valley and Adams Counties.	Figure 3.21-1
Environmental Justice	Valley and Adams Counties and Native American Tribes whose traditional subsistence range includes the mine site.	Figure 3.22-1
Special Designations	All WSR waterways in the watershed. IRAs and RNAs within 5 miles of SGP facilities.	Figures 3.23-1 through 3.23-4
Tribal Rights and Interests	Lands administered by the PNF and BNF, and other federal, state, and private lands within and adjacent to these National Forests.	No Figure

5.1.2 Past and Present Actions

Past actions include activities that may have been initiated in the past but may have lingering effects in impacting the environment or may influence trends in the physical, biological, or social environment.

Present actions include other mining projects and their related activities (i.e., exploration, reclamation) that are currently underway and are causing impacts. They also may include other non-mining related projects currently in progress, such as timber sales or vegetation treatment; tribal fisheries restoration activities; recreation; other utility lines (e.g., powerlines) and roads; maintenance and use of the existing transportation network; urban development in Valley County; private land development and uses; and sand and gravel extraction.

Past and present actions that have an interactive, synergistic, and/or additive effect (per 40 CFR 1508.7) with a specific resource (such as lingering effects or influencing trends) in the SGP area are described below:

Mineral Exploration and Mining Activities – Past and present mineral exploration and mining have occurred in the vicinity of the SGP, including prospecting, exploration, underground mining, and open pit mining. To support past mining, other related activities occurred at or near the SGP site, including ore milling and processing, tailings disposal, smelting, heap leaching of ore, spent heap leach ore disposal, development rock disposal, hydropower generation, water retention dam construction, sawmill operations, electric power transmission line construction, and occupancy by thousands of people in housing camps and later in the town of Stibnite.

The past mining, milling, and processing activities created numerous legacy impacts including underground mine workings, multiple open pits, development rock dumps, tailings deposits, heap leach pads, spent heap leach ore piles, a mill and smelter site, three town sites, camp sites, a ruptured water dam (with its associated erosion and downstream sedimentation), haul roads, an abandoned water diversion tunnel, and an airstrip.

Other past and/or present mining projects considered in the cumulative effects analysis include:

- Fourth of July Mine – Located in Government Creek on NFS land, Fourth of July Mine has been inactive (Forest Service 2012d).
- Camp Bird Mine – Located in Logan Creek on private land, Camp Bird Mine has been inactive for more than 30 years (Forest Service 2012d).
- Valley County Quarry Development – Development and operation of an aggregate source to support the road maintenance activities on McCall-Stibnite Road (CR 50-412), Johnson Creek Road (CR 10-413), and other backcountry roads as determined by Valley County (Forest Service 2017g).
- Walker Millsite – Located in Logan Creek on private land, the plan of operations approved in 1990 included a 50 ton per day ball mill and gravity milling process with the following components: a 50-foot by 100-foot by 8-foot-deep tailings impoundment, 1,000 feet of access

road, a water transmission line, and explosives magazine. The millsite on NFS land has been reclaimed (Forest Service 2012d).

- Golden Hand No. 1 and No. 2 Lode Mining Claims – Located in the Big Creek drainage on 1,309 acres of NFS land, approximately 19 miles north of Yellow Pine, the plan of operations included drilling operations, trenching and sampling, and reopening the caved Ella Mine adit. The project also would include the collection of subsurface geological information to prepare for a new mineral examination. The claims encompass approximately 20 acres each and are adjacent to Coin Creek (Forest Service 2012d).
- Cinnabar Mine – Located 15 miles east of Yellow Pine and approximately 50 acres in extent, most of the mining occurred during the 1950s. No reclamation has been performed at the site and contaminants of concern include mercury, methylmercury, and arsenic (EPA 2020).

Exploration activities for potential future mining development have been occurring for the last decade and are ongoing at or within the vicinity of the SGP. Affiliates of Midas Gold initiated mineral exploration activities in 2009 as part of the Golden Meadows Exploration Project to better define the mineral deposit potential for the area. Activities associated with the Golden Meadows Exploration Project included the use of the existing road network, and construction of several temporary roads to access drill sites, drill pad construction, drilling on both NFS and private lands, and reclamation (Forest Service 2015). The following is a brief summary of the activities:

- Midas Gold Exploratory Drilling (2009-2012) –Exploratory drilling consisting of approximately 6 to 122 drill pads mostly occurred on private land. Crews were housed on private property in Yellow Pine. All equipment was staged on private property and drilling activities generally occurred 24 hours per day. Water withdrawal sites included existing sediment retention ponds and streams. Private and Forest Service temporary roads were used and/or authorized to access drill pads located on NFS lands. Road maintenance was needed to open the existing roads. For winter activities, chained rubber-tired vehicle, helicopter, snowcat, or snowmobile provided access. Where drill pads were located next to roads, some snow plowing occurred at select locations. During snow-free periods, access occurred by helicopter, and where there was authorized access on NFS land or on private land, rubber-tired vehicles also were used for access. Midas Gold also drilled 16 new groundwater alluvial and bedrock monitoring wells on 8 pads in 2012 (Forest Service 2015).
- Monitoring Wells for the Golden Meadows Project (2013) – Midas Gold drilled four new groundwater alluvial and bedrock monitoring wells on two pads in 2013. Exploration drilling was conducted in 26 drill areas within NFS land. Twenty-four of the drill areas were accessed by helicopter (i.e., for transport of equipment and crew) and contained temporary helicopter-supported drill pads. No temporary roads were needed for these 24 drill sites (Forest Service 2015).
- Midas Gold Baseline Studies (2013-2017) – Baseline data collection studies including water quality, fishery surveys, wildlife surveys, and vegetation mapping were conducted (Forest Service 2015).

- Winter Geotechnical Study (2017) – Exploration drilling was conducted in 26 drill locations within NFS land. Twenty-four of the drill sites were accessed by helicopter (i.e., for transport of equipment and crew) and contain temporary helicopter-supported drill pads (Forest Service 2015).
- Geotechnical Studies along Meadow Creek (2017) – Geotechnical study field work program was conducted in support of feasibility level engineering work on the proposed tailings impoundment and impoundment dam foundation conditions. Midas Gold utilized a track mounted Cone-Penetrometer Test rig to access eight locations along Meadow Creek in September/October 2017 (Forest Service 2015).
- Operations Exploratory Drilling (2016-2019) – In addition to exploratory drilling for the winter geotechnical study in 2017, expansion of an existing borrow source on NFS land just east of the camp and shop area also occurred. The borrow material supplied approximately 7,000 cubic yards of crushed rock to support the exploration program, including road maintenance and site reclamation activities and also was used by previous operators and the Forest Service. Approximately 141,000 gallons of fuel (diesel, gasoline, and jet fuel) per calendar year was transported on existing Valley County roads to the fuel storage facility (located on private land) (Forest Service 2015).
- Exploration and Geotechnical Drilling (2018) – Midas Gold drilled 62 exploration and geotechnical drilling pads within the project area. Fifty-six of the pads were track-supported and the remaining six were helicopter-supported. The 62 proposed pads are located in the vicinities of the following water bodies: Upper East Fork SFSR, Meadow Creek, Middle East Fork SFSR, Lower East Fork SFSR, Upper Meadow Creek, and West End Creek (HDR 2017p).
- On-going Monitoring for Golden Meadows Project – Monitoring for weeds, water quality, minerals and geology, access and haul route water quality monitoring, monitoring of water quality best management practices and project standard operating procedures associated with haul and access road use, wildlife and rare plants continue to be conducted (Forest Service 2015).
- Burntlog Route Geophysical Investigation Field Work (2020-2021) – Midas Gold (now Perpetua) collected geophysical data at proposed rock quarries, bridge abutments, cut slopes, and soil nail/mechanically stabilized earth wall locations using four methods including a Dynamic Cone Penetrometer Test, a track mounted excavator, a truck/track mounted hollow stem auger/core rig, and a helicopter assisted casing advancer/core drill rig. Perpetua is investigating 24 locations by drilling or excavating 40 borings/test pits along the proposed Burntlog Route (Midas Gold 2019e).

Transportation Projects – Road maintenance, improvement projects, airstrip operations and maintenance, and culvert and bridge replacements have occurred in the past and are expected to continue in the future. Installation or improvement of culverts and bridges may impact aquatic habitat due to construction-related effects and erosion. Maintenance of existing roadways, culverts, and bridges will likely be short-term, while new roadways, culverts, and bridges would have a larger effect. More information regarding current and future road maintenance and airstrip operations are provided below:

- Road Maintenance of NFS Roads – Thunder Mountain Road (FR 50375) and Meadow Creek Lookout Road (FR 51290) are both NFS maintenance Level 2 roads that received maintenance in 2014 and are on a regular maintenance schedule. Road maintenance activities include blading, slough removal, and culvert cleaning. It is assumed that private landowners on private lands keep roads open and maintained to meet their needs.
- Road Maintenance of County Roads –Warren Profile Gap Road (CR 50-340) and the road to the Big Creek Trailhead are currently maintained by Valley County under a cooperative agreement; both roads are on an annual or biannual maintenance schedule. Road maintenance activities include blading, slough removal, and culvert cleaning. Smith Creek and Pueblo Summit Roads have not received any maintenance for years (Forest Service 2016i).
- McCall-Stibnite Road (CR 50-412) is currently maintained on a regular maintenance schedule by Valley County under a cooperative agreement. There is an agreement between Valley County and Perpetua to allow Perpetua to provide maintenance along the road from Yellow Pine to Perpetua's property.
- Road Maintenance of State Roads – SH 55 is maintained by the ITD. Recent upgrades and improvements included the Banks Beach parking study and the ongoing Smiths Ferry safety improvements. SH 55 was recently repaved between Donnelly and McCall (ITD 2021). The project addressed wear and tear to increase the service life of the roadway.
- The ITD, Division of Aeronautics maintains and operates the Johnson Creek, Warm Springs, and Bruce Meadows airstrips which are located on NFS land.

Mine Closure and Reclamation – Closure and reclamation of Hecla and SMI mining and processing facilities located in the headwaters of East Fork SFSR and Sugar Creek occurred between 1993 and 2000. Several CERCLA Removal Actions also were conducted in the same area by the Forest Service, EPA, and Exxon-Mobil Corporation to minimize risks to human health and the environment from legacy mining and processing activities during the 1930s, 40s, and 50s.

Recreation and Tourism – Past and present recreation and tourism activities include sport hunting, fishing, trapping, boating and river recreation, bike races, OHV use, camping, hiking, backpacking, outfitter/guide operations, tourist services – Big Creek Lodge, Elk Springs Outfitters, and Juniper Mountain Outfitters. These activities take place primarily from late spring to late fall, and there may be small plane, helicopter, and vehicle traffic associated with access. OSV use, skiing, and snowshoeing occur in winter months. Some of the OSV routes are groomed for use.

Infrastructure Development – Past and present community infrastructure projects include the transmission line upgrades in the West Central Mountain Electric Plan 2014, which follows the general location of the SGP upgraded transmission line route (IPCo 2014). In 2020, IPCo rerouted approximately 2.5 miles of the existing Warm Lake Feeder overhead 7.2kV distribution line with approximately 2.75 miles of single-phase underground line in the Yellow Pine area (Forest Service 2020j).

Water Diversions and Hydro Power Projects – There are eight water diversions on federal and private lands in vicinity of the SGP area. There also are three residential, small-scale hydroelectric operations (0.4 to 0.9 cubic feet per second permitted), and one hydroelectric operation at Big Creek Lodge.

Wildland Fire, Noxious Weed Control, and Firewood Harvest – There have been numerous wildland fires in vicinity of the SGP area and more could occur in the future. Past fires within the headwaters of the East Fork SFSR and Sugar Creek include Indian Creek Point (12,204 acres); Tamarack (2,348 acres); Bishop Creek (2,610 acres); Cascade Complex (299,930 acres); Thunder City (13,263 acres), and Buck Fire (19,474 acres). In fall of 2021, the Krassel Ranger District conducted prescribed burns to areas east of Yellow Pine (Bald Hill project area) and along the SFSR (Four Mile project areas). Removal of firewood for non-commercial use has occurred in the past and is expected to continue in the future on NFS land, in compliance with general permit requirements for the PNF.

Authorized in May 2021, the Big Creek Hazardous Fuel Reduction was a community protection project for Edwardsburg/Big Creek area using commercial and noncommercial treatments and prescription fire to reduce hazardous fuels. Treatments were on NFS lands along public roads and adjacent to private property, outside of wilderness. The project implementation reduced wildfire risk and fire severity/intensity on NFS lands around Big Creek and Edwardsburg and private property using commercial timber harvest, understory treatment, and prescribed burning. Approximately 10,290 acres were treated including, approximately 631 acres of mastication and/or hand thin, no removal; 847 acres of commercial and pre-commercial thinning; 1,047 acres of hand-thinning, no removal; 7,765 acres of natural fuel prescribed fire burn blocks; and less than 1 mile of temporary road constructed to facilitate equipment access and product removal reclaimed after vegetation management treatments were completed.

Several noxious weed species have been identified in the vicinity of the SGP including spotted knapweed, Canada thistle, yellow toadflax, and rush skeletonweed. Treatment of noxious weeds occurs regularly throughout the area. Treatments include chemical spraying and pulling. Main areas of treatment for noxious weeds include Chamberlain area, Beaver Creek, and Big Creek trails, and along road access areas. The Lost Horse vegetation management project was completed within the Clear Creek drainage along FRs 405, 406, 407, 409, and 433; the objective of this project was to restore species composition and stand structure while reducing undesirable tree densities and favoring retention of larger diameter, more fire-resistant trees (Forest Service 2020j).

Forest Management - These activities include easements and other management actions. There are several easements in the SGP area and vicinity that are granted and maintained by the Forest Service including: Road ROW, FRTA on McCall-Stibnite Road (CR 50-412), Road ROW and Linear Utility easement to the IPCo. The Yellow Pine Blowdown Project near Yellow Pine was conducted to remove down material from camping and recreating areas, reduce the risk of insect outbreak, and to reduce the fuel loading to help to ensure the safety of the Yellow Pine community. In 2020, the BNF decommissioned approximately 18 miles of non-system routes in the Six-bit Creek and Curtis Creek subwatersheds, part of the SFSR subbasin (Forest Service 2020j).

The South Fork Restoration and Access Management Plan (RAMP) is in the implementation phase with the decision dated July 13, 2021. The project's objective is to determine the minimum road system,

improve watershed condition, provide ATV and motorcycle trail opportunities, and provide dispersed camping and parking opportunities. The project includes numerous actions relating to watershed restoration, motorized and non-motorized access, and improvements of recreation facilities within the SFSR watershed within a 329,000-acre project area. Target dates for implementation are 2022-2027 (Forest Service 2021a).

Fisheries Restoration – The Nez Perce Tribe began the Johnson Creek Artificial Propagation Enhancement Project in 1998 in response to critically low numbers of returning adult Chinook salmon to Johnson Creek (Columbia River Inter-Tribal Fish Commission 2018). The program uses only natural-origin returns for broodstock, and currently has an annual target release level of 100,000 yearling smolts into Johnson Creek (NMFS 2016).

Further, the Nez Perce Tribe and IDFG translocated adult Chinook salmon from the SFSR to Meadow Creek, but not as part of the Johnson Creek Artificial Propagation Enhancement Project. Since 2008, Chinook salmon spawners were released into Meadow Creek most years. Spawning-ready adult Chinook salmon are periodically translocated from the SFSR to upstream of the Yellow Pine pit lake barrier with support from the Nez Perce Tribe.

Commercial and Subsistence Harvest of Fish and Wildlife – Past and present harvest of fish and wildlife for recreational and subsistence purposes puts some degree of pressure on those resources. Legal hunting, fishing, and trapping has occurred and is currently occurring in the SGP area and vicinity. Fish and wildlife resources are managed by the IDFG and federal agencies to maintain sustainable populations. Managers use management tools such as harvest limits and areas open and closed to sport and commercial harvest of fish and wildlife to maintain sustainable resources and allocate harvest.

5.1.3 Reasonably Foreseeable Future Actions

Table 5.1-2 describes RFFAs in the CEAs.

Table 5.1-2 RFFAs in the Vicinity of the SGP Area

Project or Activity Name	Agency Document/ District	Brief Description	Approximate Implementation/ Construction/ Operation Dates
Stibnite Mine Site ASAO	EPA and Forest Service ASAO	In Phase 1, address legacy mining impacts, including time critical removal actions consisting of stream diversion ditches and removal of about 325,000 tons of development rock and tailings.	2022-2024
East Fork RAMP	EA/PNF SOPA	Scoping for the East Fork RAMP estimated to start late 2021. The spatial extent of the East Fork RAMP could include Yellow Pine, Big Creek, and Thunder Mountain within the PNF. The purpose of the East Fork RAMP is travel management. The Forest Service would conduct travel planning to identify a Minimum Road System (MRS) (36 CFR 212 Subpart A) and the routes open for public use (36 CFR 212 Subpart B), including motorized trail opportunities, dispersed camping, and parking	Expected Decision: 04/2023 Expected Implementation: 05/2023

Project or Activity Name	Agency Document/ District	Brief Description	Approximate Implementation/ Construction/ Operation Dates
		opportunities and update the Forest Motor Vehicle Use Map.	
Granite Meadows	EIS/PNF SOPA	This project is part of the forest's Collaborative Forest Landscape Restoration Program. The project includes vegetation, watershed, transportation, and recreation management activities.	On hold
Burntlog Route Geophysical Investigation	CE/BNF SOPA)	The purpose of the investigation is to collect geophysical data along the existing Burnt Log Road and proposed new alignment between Trapper Creek and Stibnite.	This project is currently on hold.
Wildlife Conservation Strategy	EIS (Forest Plan Amendment) 101 PNF SOPA	Short- and long-term management strategies and priorities for maintaining and restoring habitats associated with terrestrial wildlife species.	On hold
Nez Perce Tribe Research Equipment	CE/PNF SOPA	Replacement of an existing propane tank servicing a fish detection system (PIT array) with a 1,000-gallon tank in an existing hardened area to ensure fuel supply through winter months.	Scoping initiation: 11/2021 Expected Decision: 05/2022 Expected Implementation: 06/2022
Stallion Gold – Horse Heaven Project		Surface exploration of gold and antimony deposits. The project consists of 695 unpatented federal mining claims and mineral rights on 13,950 acres. This project would share its eastern boundary with the SGP.	
South Fork Plunge Watershed Restoration	CE / BNF SOPA	The project would decommission NFSR 490; remove old bridge, abutments, and road fill from the active floodplain of the SFSR.	06/2023

Source: FHWA 2020; Forest Service 2018d, 2020i, 2020j, 2020k, 2021c, 2021d, 2022r, 2022s; ITD 2020, 2021
CE = Categorical Exemption; EA = Environmental Assessment; EIS = Environmental Impact Statement; SOPA = Schedule of Proposed Actions

5.2 Geologic Resources and Geotechnical Hazards

The CEA for geologic resources and geotechnical hazards that could be directly or indirectly affected by the SGP encompasses the direct and indirect impact analysis area, which is the footprint of disturbance of all SGP components, and extends out to the sixth-level HUC at the 12-digit scale (HUC 12) subwatershed boundaries (**Figure 3.8-1**); HUCs used in this analysis are local subwatershed levels that encompass tributary stream systems where mine site activities that affect geology are proposed.

5.2.1 No Action Alternative

Under the No Action Alternative there would be no open-pit mining or ore processing at the mine site, or other supporting infrastructure corridors and facilities. The effects of past mining activities and their

current geological/geotechnical conditions (e.g., alteration of topography/ridgelines, the presence of the Yellow Pine pit and current condition of the adjacent highwall slopes, reclaimed areas, etc.) would remain. Under the No Action Alternative, Perpetua could continue to implement the proposed actions included in the applicable Golden Meadows Exploration Project Plan of Operations and EA (Forest Service 2015), and the exploration and subsequent reclamation activities would have an insignificant direct effect to geology/soils and therefore an insignificant cumulative contribution.

Phase 1 of the ASAOC includes removal of tailings and other mining wastes from the stream channels of lower Meadow Creek and East Fork SFSR and placing the excavated wastes in selected, on-site locations where they would no longer impact water quality in these streams. It also includes construction of three stream diversions to avoid contact of runoff with legacy mining wastes.

5.2.2 Action Alternatives

Cumulative effects associated with the 2021 MMP and Johnson Creek Route Alternative consider the range of existing and foreseeable activities and their potential effects with respect to geologic resources and geotechnical hazards. Potential effects to geologic resources and geotechnical hazards consist of mineral resource depletion, topographic changes, and geotechnical instability. Past and present actions that have, or are currently, affecting geologic resources and geotechnical hazards include mineral exploration and mining activities, infrastructure and road development, and previous road construction or upgrades within the CEA.

Both action alternatives would have the same permanent impact on ore reserves in the CEA, which would combine with the impacts of past mining activities such as from Valley County Quarry Development, Fourth of July Mine, Camp Bird Mine, etc., that also have depleted ore reserves in this part of Idaho, as well as combine with any future mine operations in the region, such as the Horse Heaven Project, which would further deplete ore reserves. The contribution of either action alternative to this cumulative impact would deplete an additional approximately 115 million tons of ore, the volume of ore proposed to be extracted under the 2021 MMP and Johnson Creek Route Alternative.

Both action alternatives would increase risks from mass wasting hazards by introducing additional personnel and equipment into existing hazard areas. Geohazards and seismic conditions are site-specific, as individual project sites would be geologically removed from one another. A few of the RFFAs (e.g., mineral exploration and mining associated with Golden Hand No. 3, 4, and 8, Big Creek Fuels Reduction Project, Morgan Ridge Exploration Project, Dewey Mine Sediment Stabilization Project, Horse Heaven Project) have the potential to increase traffic on Stibnite Road (CR 50-412) to access their respective project sites. Although Stibnite Road has an existing avalanche hazard (i.e., is located at the bottom of avalanche runout zones) that could impact travel along the road, use of this road by the SGP and by RFFAs would not exacerbate the existing avalanche occurrence, but it would add additional personnel on this road, which would increase the risk of damage, injury, or loss of life from the hazard.

Geohazards and seismic conditions are site-specific, as individual project sites would be geologically removed from one another. As such, the RFFAs would not increase risks associated with geotechnical hazards.

By their nature, impacts on geologic resources and geotechnical hazards are geographically isolated and not interdependent within the area. Therefore, while individual impacts are measurable, the cumulative effects are still considered to be limited given the spatially-separated nature of disturbance over the region.

5.3 Air Quality

With respect to air quality, activities directly associated with the SGP and other RFFAs having air pollutant emissions at a level that cause overlap with SGP-related effects in time and location, would result in cumulative impacts. The air quality cumulative effects analysis considers the potential contributions of actions that could occur in the relatively large analysis area. The CEA for air quality is generally the same as the larger far-field region (**Figure 3.3-2**).

5.3.1 No Action Alternative

For the No Action Alternative, the nature and extent of cumulative effects is represented by the current air quality conditions in the CEA. Ambient air data for CO, NO₂, SO₂, and on-site data for PM₁₀ and PM_{2.5} are available to serve as quantitative indicators for the impacts from current non-SGP sources on air quality. These background ambient air measurements offer the best indication of cumulative effects due to current emissions sources, absent the SGP. The monitored baseline values used for the air quality impact assessment were obtained at locations that are more developed than the SGP area. By comparison, the cumulative effects in the analysis area due to the current activities and air emission sources would be minor.

The federal agencies entered into an ASAOC with Midas Gold (now Perpetua) in January 2021 for the cleanup of certain legacy mining wastes in the SGP area. The work would involve excavating the wastes out of certain portions of Meadow Creek and East Fork SFSR and then relocating those wastes to more suitable locations on site. This work is scheduled for the construction seasons in 2022-2024 and would involve excavation and hauling equipment as well as other vehicles for personnel and fuel/supplies transportation on the current access roads to the area. This would produce dust and tailpipe emissions that would likely precede the major construction activities of the action alternatives and so would not be cumulative to the air emissions from those activities.

5.3.2 2021 MMP

For the far-field air quality impact analysis, a suitable far-field modeling domain was defined as an area 420 km by 420 km in extent, centered on the SGP, as shown in **Figure 3.3-2**. This area encompasses the closest Class I areas and Class II wilderness areas that are most likely to have impacts. The four Class I areas for which far-field modeling results were reported are SAWT, SELW, HECA, and CRMO.

Cumulative effects analysis for air quality considers the geographic range and timeframe of impacts from past, current, and foreseeable activities. The air quality effects from past projects do not generate cumulative effects with current ones due to the transient nature of air quality conditions. Transport from far more distant urban regions, even overseas, may contribute to local air conditions (e.g., ozone) but are not in the scope of a cumulative effects analysis. Therefore, past operations by Perpetua in the SGP area, such as exploratory drilling, monitoring wells, and roadway construction and maintenance, are not

contributors to air quality cumulative effects. Similarly, past activities in the CEA, such as prior roadway and infrastructure construction projects, and timber and underbrush harvesting, would not have effects that overlap in time with the SGP emissions, and therefore would not contribute to air quality cumulative effects.

The ambient air data for CO, NO₂, SO₂, and on-site data for PM₁₀ and PM_{2.5} indicate the existing impacts from off-site sources on air quality near the SGP area was reviewed for this analysis (**Section 3.3**). These background ambient air measurements offer the best indication of cumulative effects due to current emissions sources. Although some background measurements of ozone in the Boise urban area are above the NAAQS, the ozone baseline value for this assessment recommended by the IDEQ is compliant with the NAAQS. The monitored baseline values used for the SGP air quality impact assessment were obtained at locations that are more developed than the SGP area. By comparison, the cumulative effects in the analysis area due to current activities and air emission sources would be minor.

There are no other permitted sources of HAP emissions in the vicinity of the SGP area. One source, the Tamarack Mill, LLC is 75 miles from the SGP, and has reported minor source level emissions to IDEQ. The HAP emission inventory in the vicinity of the SGP area is unknown; however, given the absence of large HAP emission sources near the SGP area, it can be assumed that the baseline HAP cumulative effects are low.

Several reasonably foreseeable activities in the CEA that were considered regarding cumulative air quality effects are listed in **Tables 5.3-1** and **5.3-2**. The nature of the air emissions and contributions to potential cumulative effects are described for each project. Activities that are anticipated to have overlapping impacts with the SGP related to air quality include wildfires and Big Creek fuels reduction.

Table 5.3-1 RFFAs Considered Regarding Cumulative Air Quality Effects for Specific Planning Projects

Project Type	Project Names/Description	Nature of Air Emissions and Contribution to Cumulative Effects
Roadway Development and Maintenance	<ul style="list-style-type: none"> • Big Creek Road Plan of Operations Project EA • Morgan Ridge Exploration Project – Access Road Plan • Such projects authorize the use of and/or improvement of roads to conduct exploration and development of locatable mineral claims 	Dispersed short-term local emissions of road dust and vehicle tailpipe emissions. Negligible long-term cumulative air quality effects in combination with the SGP.
Exploratory Drilling for Mineral Resources	<ul style="list-style-type: none"> • Morgan Ridge Exploratory Drilling Plan of Operations EA • Project involves exploratory drilling for locatable minerals from remote drill pads approximately 10 miles north of the SGP. Project is reportedly on hold. 	Local emissions from drilling equipment (e.g., compressor engines), road dust, and tailpipe emissions. The magnitude of emissions is not expected to be sufficient to have overlapping pollutant concentration effects at this distance from the SGP.

Project Type	Project Names/Description	Nature of Air Emissions and Contribution to Cumulative Effects
Forest Maintenance and Fire Risk Reduction	<ul style="list-style-type: none"> • Big Creek fuels reduction project approx. 10 miles north of the SGP • South Fork RAMP EA, 25 miles southwest of the SGP • Projects to reduce wildfire risk and fire severity/intensity on NFS lands and private property using commercial timber harvest, understory treatment, and prescribed burning 	Local emissions from portable generator equipment (e.g., compressor engines, road dust, and tailpipe emissions). Particulate emissions from lumbering activities and hauling. The Big Creek project may be of sufficient magnitude to have overlapping PM concentration effects from the SGP. The South Fork project is of sufficient distance that it would have negligible cumulative air quality effects.

Table 5.3-2 RFFAs Considered Regarding Cumulative Air Quality Effects for Ongoing Projects and Foreseeable Emissions Sources

Project Type	Project Names/Description	Nature of Air Emissions and Contribution to Cumulative Effects
Construction Projects	<ul style="list-style-type: none"> • Creek remediation/restoration (ASAOC) • Trail construction and maintenance • Bridge and culvert replacement projects, generally located more than 10 miles north of the SGP area • Hydroelectric projects: small residential projects for power generation • Road maintenance 	Short-term emissions during construction with no long-term emission impacts that would likely overlap with impacts related to the SGP.
Natural Emission Events	<ul style="list-style-type: none"> • Wildland fires • Past fires with the headwaters of the East Fork SFSR and Sugar Creek include Indian Creek Point (12,204 acres); Tamarack (2,348 acres); Bishop Creek (2,610 acres); Cascade Complex (299,930 acres); Thunder City (13,263 acres), and Buck Fire (19,474 acres). In the fall of 2021, the Krassel Ranger District conducted prescribed burns to areas east of Yellow Pine (Bald Hill project area) and along the SFSR (Four Mile project areas). 	Areas devoid of trees and vegetation may have potentially large, short-term air quality effects, due to increased windblown dust.
Mining Activities	<ul style="list-style-type: none"> • Ongoing mining activities on patented land. • Mineral exploration and mining have occurred in several locations around the SGP area. • Exploration activities area ongoing for potential future mining development. 	Local emissions from drilling equipment (e.g., compressor engines), road dust, and tailpipe emissions. Known mine operations are small in size (50 tpd or less) or are inactive. Locations of foreseeable projects with low emissions are at sufficient distances from the SGP to not contribute overlapping effects.

Project Type	Project Names/Description	Nature of Air Emissions and Contribution to Cumulative Effects
Recreation and tourism	Recreation and Tourist activities: <ul style="list-style-type: none"> • Sport hunting, fishing, trapping • Snowmobile trails • Fugitive dust and tailpipe emissions from traffic on unpaved roads • Boating and river recreation • Camping, hiking, backpacking • Outfitter/Guide Operations • Tourist Services – Big Creek Lodge • Off-highway vehicle use • Tourist Services – e.g., Big Creek Lodge 	Collectively air emissions from vehicles on unpaved roads and trails, boats, and stationary fuel combustion sources. Depending on the proximity of these activities to the SGP area, transient cumulative effects may occur.

Past and present actions that have influenced air quality are expected to continue, such as existing infrastructure operations, transportation modes, plus energy and utility development and upgrades. RFFAs in the CEA would likely induce little additional change to air quality, because large scale activities associated with RFFAs are speculative at this time. Overall, air emissions are expected to increase as a result of the SGP and the past, present, and future actions. However, these emissions would be regulated in accordance with State and federal air permitting requirements.

5.3.3 Johnson Creek Route Alternative

Although the magnitude and location of SGP air emission sources related to access roads are different for the two action alternatives, the differences are not large enough to significantly change off-site air quality impacts. Consequently, the potential for cumulative air quality effects described above for the 2021 MMP would also apply to the Johnson Creek Route Alternative. The extent and magnitude of potential cumulative air quality effects due to foreseeable projects in the analysis area would be the same.

5.4 Climate Change

In accordance with NEPA and the CEQ guidelines, cumulative effects are to be analyzed as a component of any project undergoing a NEPA analysis. RFFA emission sources directly associated with the alternatives, and RFFAs having emissions that may or may not overlap with the alternatives in time, could result in cumulative climate change impacts, even though it is not possible to quantify such incremental effects.

Regional levels of GHG emissions will change due to many factors, the primary ones being trends in industrial activity, pace of energy resource development, transportation fuel consumption rate, and population growth. But within this generalized framework, it cannot be predicted with certainty the extent to which the mix of all these activities will collectively contribute to the global phenomenon of climate change. However, cumulative regional emissions can be estimated by including SGP values to current and predicted future numbers. A specific regional impact directly from those emissions or sources would not be definitive because of the numerous other factors described above.

5.4.1 No Action Alternative

Under the No Action Alternative, the SGP would not be implemented and therefore would not contribute to cumulative climate effects. The same cumulative effects contributions from potential development in the surrounding area would be the same as described above.

Past and ongoing activities in the region surrounding the SGP area include forest management (e.g., prescribed burns), motorized use of roads for land management and recreation, and fire suppression. These activities would continue as GHG contributors in the context of the total GHG inventory for Idaho and would not be expected to add to substantial cumulative GHG-related effects in the region or to climate change in general. **Table 5.4-1** describes the current and reasonably foreseeable activities that may affect cumulative GHG emissions.

Areas of the SGP disturbed by previous mining activities would remain as they are, except those identified in the ASAOC, and (without targeted revegetation efforts tied to required mine reclamation) would be anticipated to recover at a natural, although very slow, rate as new soil forms and plants are established.

Table 5.4-1 Current and RFFAs Considered Regarding Cumulative GHG Emissions

Project Type	Project Names/Description	Nature of Air Emissions and Contribution to Cumulative Effects
Exploratory Drilling for Mineral Resources	<ul style="list-style-type: none"> • Morgan Ridge Exploratory Drilling. • Project involves exploratory drilling for locatable minerals from remote drill pads approximately 10 miles north of the SGP. Project is reportedly on hold. • Horse Heaven Project. • Exploratory drilling for locatable minerals adjacent to the SGP on the west. 	Local GHG emissions from drilling equipment (e.g., compressor engines), and vehicle tailpipe emissions. Expected to have GHG emissions that are a very small portion of the Idaho inventory ¹ .
Forest Maintenance and Fire Risk Reduction	<ul style="list-style-type: none"> • Big Creek Fuels Reduction Project, approximately 10 miles north of the SGP. • South Fork RAMP, approximately 25 miles southwest of the SGP. • East Fork RAMP, approximately 5 miles northwest of the SGP. • Projects to reduce wildfire risk and fire severity/intensity on NFS lands and private property using commercial timber harvest, understory treatment, and prescribed burning. • Granite Meadows, north and west of McCall. 	Local GHG emissions from portable generators equipment (e.g., compressor engines), and vehicle tailpipe emissions. Expected to have GHG emissions that are temporary and a very small portion of the Idaho inventory ¹ .
Construction Projects	<ul style="list-style-type: none"> • Creek restoration. • Trail construction and maintenance. • Bridge and culvert replacement projects generally located more than 10 miles north of the SGP. • Hydroelectric projects: small residential projects for power generation. • Road maintenance. 	Short-term GHG emissions during construction with no long-term emission impacts that would overlap with impacts related to the SGP.

Project Type	Project Names/Description	Nature of Air Emissions and Contribution to Cumulative Effects
Natural Emission Events	<ul style="list-style-type: none"> • Wildland fires • Between 2005 and 2015, over 88,000 acres of the Big Creek watershed have been burned. Between 1990 and 2013 over 330,000 acres have burned within the headwaters of East Fork SFSR and Sugar Creek. In 2020, the Buck Fire burned 19,474 acres in the Johnson Creek Road area north of Warm Lake. 	Future fires may add additional GHG to the atmosphere.
Mining Activities	<ul style="list-style-type: none"> • Ongoing mining activities on patented land. • Mineral exploration and mining have occurred in several locations around the SGP area. Exploration activities are ongoing for potential future mining development. 	Local emissions from drilling equipment (e.g., compressor engines), and tailpipe GHG emissions. Known mine operations are of small size (50 tons per day or less) or are inactive. Expected to have GHG emissions that are temporary and a very small portion of the Idaho inventory ¹ .
Reclamation Activities	<ul style="list-style-type: none"> • ASAOC • Reclamation of certain legacy mining impacts including construction of stream diversion ditches, removal of 325,000 tons of development rock and tailings from Meadow Creek or East Fork SFSR that are currently impacting water quality. 	Local emissions from tailpipe GHG emissions. Expected to have GHG emissions that are temporary and a very small portion of the Idaho inventory ¹ .
Recreation and tourism	<p>Recreation and Tourist activities:</p> <ul style="list-style-type: none"> • Sport hunting, fishing, trapping • Snowmobile trails/OSV use • Fugitive dust and tailpipe emissions from traffic on unpaved roads • Boating and river recreation • Camping, hiking, backpacking • Outfitter/Guide Operations • Tourist Services – Big Creek Lodge • OHV use • Tourist Services – e.g., Big Creek Lodge 	Collectively substantial GHG emissions from vehicles on unpaved roads and trails, boats, and stationary fuel combustion sources. These sources are already included in the Idaho inventory ¹ .
Other	Nez Perce Tribe Research Equipment Propane tank replacement project for a fish detection system	Short-term VOC and GHG emissions during installation. This source is already included in the Idaho inventory ¹ .

¹ The total Idaho GHG emissions estimates are 31.44 MMT (EPA 2021c).

5.4.2 Action Alternatives

While the magnitude and location of air emission sources associated with the SGP are different for the action alternatives, the differences are not sufficiently large enough to significantly affect GHG emission and climate change. The extent and magnitude of potential cumulative GHG emission and climate change effects due to foreseeable projects in the CEA when added to the GHG emissions and climate effects (**Table 5.4-1**) would be the same for both action alternatives.

Past and present actions that have influenced climate changes are expected to continue, such as existing infrastructure operations, transportation modes, plus energy and utility development and upgrades. RFFAs in the CEA would likely induce little additional change to climate change trends. While the individual impacts of the SGP are measurable, the cumulative effect is still considered to be limited, given the limited contribution of GHGs from the SGP over the region, state, or world.

5.5 Soils and Reclamation Cover Materials

The CEA for soils and RCM is the same as the larger analysis area defined in **Section 3.5** that encompasses the various activity areas used for analysis of TSRC and DD. Thus, the CEA for this resource includes the sixth-level (12-digit hydrologic unit code) subwatersheds within which disturbance of SGP components would occur (**Figure 3.5-1**).

5.5.1 No Action Alternative

Under the No Action Alternative, there would be no open-pit mining or ore processing at the SGP, or construction disturbance for other supporting infrastructure and facilities. The effects of past mining activities and their long-term impacts to soils would remain except for the removal of legacy mine waste materials under Phase I of the ASAOC. Although removal of legacy material would reduce impacts to soil resources in the Phase I areas, effects from other legacy mining would continue. The ASAOC removal activities would target approximately 30 acres of historical tailings and waste rock that would also need to be reclaimed using locally obtained growth media from sources in the Operations Area Boundary near the removal locations.

Although none of the RFFAs identified in **Table 5.1-3**, except for the future geophysical work along the Burntlog Route, would physically overlap with the action alternative disturbance footprints, forest management, motorized use of road systems, fire suppression, prescribed fire and wildfire, dispersed camping, fishing, and hunting activities would continue in the CEA and vicinity, which would continue to utilize dedicated facilities (areas of TSRC) or contribute to incremental DD effects.

Under the No Action Alternative, Perpetua would continue to comply with reclamation and monitoring commitments included in the applicable Golden Meadows Exploration Project Plan of Operations and EA, which include reclamation of the drill pads and temporary roads by backfilling, re-contouring, and seeding using standard reclamation practices; however, as described in the Golden Meadows EA, the exploration and subsequent reclamation activities would have an insignificant direct effect to geology and soils and therefore an insignificant cumulative contribution to effects upon soils and RCM.

5.5.2 Action Alternatives

Past and ongoing activities in the CEA include forest management, mining and mine reclamation, mineral exploration (e.g., Golden Meadows Exploration Project), motorized use of road systems, fire suppression, prescribed fire and wildfire, dispersed camping, boating, fishing, and hunting. RFFAs include the East Fork RAMP and South Fork Plunge Watershed Restoration projects.

The potential for cumulative effects to soils and RCM, as it relates to the analysis of the issues and indicators for the SGP, would be additional soil disturbance within the activity areas for TSRC or incremental detrimental soil disturbance within the vicinity of SGP components. Ongoing mineral exploration activities associated with Perpetua's Golden Meadows Exploration Project in the vicinity of the SGP would contribute a very small (less than 5 acres) incremental increase in disturbance within the PNF. Exploration activities associated with the Horse Heaven Project to the west could contribute an increase in disturbance within the BNF. Both projects would comply with reclamation and monitoring commitments, which would include reclamation of the drill pads and temporary roads by backfilling, re-contouring, and seeding using standard reclamation practices. The East Fork RAMP and South Fork Plunge Watershed Restoration projects would have minor benefits to the TSRC by improving soil quality and related soil functions.

Phase 1 of the ASAOC work would be accomplished in 2022-2024; the other phases of the ASAOC scope of work would potentially be completed at later dates. Wildland fires that occur in the CEA could temporarily (i.e., 0 to 3 years) remove ground cover that holds soil in place, leading to increased erosion and sedimentation from burned areas, or lead to increased detrimental soil disturbance, especially if logging (or motorized use) were to occur in the area shortly after.

Increased regulatory control on soil erosion, verified by reclamation monitoring, would minimize impacts to soil productivity and erosion within the CEA.

5.6 Noise

The CEA for noise is a 5-mile radius of SGP components including proposed mine site and access roads, utilities, and offsite facilities (**Figure 3.6-1**), as noise from mining is attenuated by vegetation and topography to levels that are not discernable to humans at long distances. Noise related to access traffic and haul roads is of importance to persons along nearby public roads and in nearby residences.

Cumulative noise impacts typically occur when sensitive receivers are exposed to multiple noise sources at approximately the same time. The SGP, access roads, construction of utilities (transmission lines), and off-site facilities would each contribute to the noise environment at varying levels, durations, and locations during each SGP phase.

Past actions include activities such as mineral exploration, infrastructure development, and non-mining related actions are unlikely to present current noise impacts.

Present actions include mining projects, timber harvest or vegetation treatment; recreation; utility lines work, maintenance and use of the existing transportation network, urban development in Valley County, and private land development uses.

RFFAs in the vicinity of the SGP area that could affect the noise environment are described in **Table 5.6-1**. Each of these activities could contribute to noise levels in the CEA. Construction projects would likely contribute noise levels similar to the SGP but over discrete and likely short timeframes. The spatial distance between cumulative SGP sites would make it less likely that noise would be detectable at a given point from more than one RFFA; the impacts from noise are not expected to be additive because the SGP would not occur in the same place or the same time as most RFFAs.

The SGP has the greatest potential to contribute to cumulative noise impacts in the vicinity of the FCRNRW. However, given the mountainous topography, cumulative impacts would likely only occur if other ongoing or future actions in the general area occur within the same mountain valley or on nearby ridgelines.

Table 5.6-1 RFFAs Considered Regarding Cumulative Noise Emissions – Ongoing Projects and Foreseeable Noise Sources

Project Type	Project Names/Description	Nature of Noise Contribution to Cumulative Effects
Construction Projects	<ul style="list-style-type: none"> • Creek restoration • Trail construction and maintenance • Bridge and culvert replacement projects, generally located more than 10 miles north of SGP area • Hydroelectric projects: small residential projects for power generation • Road maintenance 	Short-term noise emissions during construction with no long-term noise impacts that would overlap with impacts related to the SGP.
Mining Activities	<ul style="list-style-type: none"> • Ongoing mining activities on patented land <p>Mineral exploration and mining have occurred in several locations around the SGP area. Exploration activities are ongoing for potential future mining development.</p>	Local noise from drilling equipment (e.g., compressor engines), and vehicles. Known mine operations are of small size (50 tons per day or less) or are inactive.
Recreation and tourism	<p>Recreation and Tourist activities:</p> <ul style="list-style-type: none"> • Sport hunting, fishing, trapping • Snowmobile trails • Traffic on unpaved roads • Boating and river recreation • Camping, hiking, backpacking • Outfitter/Guide Operations • Tourist Services – Big Creek Lodge OHV use • Tourist Services – e.g., Big Creek Lodge 	Collectively noise from vehicles on unpaved roads and trails, boats, and generators.

5.7 Hazardous Materials

The CEA for hazardous materials is bound by the bordering transportation routes that would provide access to the SGP.

5.7.1 No Action Alternative

Under the No Action Alternative, there would be no large-scale mine operations by Perpetua and use or transportation of certain hazardous materials would continue due to past, present, and reasonably foreseeable activities and by currently permitted Perpetua exploration activities as described in **Section 5.7.2**.

5.7.2 Action Alternatives

Cumulative effects associated with the SGP consider the range of existing and foreseeable activities and their potential effects with respect to hazardous materials. Past and present actions that have, or are currently, involving hazardous materials include the following:

- Perpetua Resources Operations and Exploratory Drilling from 2016 to 2019. The SGP has included transportation of fuel (diesel, gasoline, and jet fuel) to the mine site. This activity occurs on existing County and Forest Service roads.
- Mine Closure and Reclamation of Hecla and Stibnite Mine, Inc. mining and processing facilities occurred between 1993 and 2000. These activities were conducted near the headwaters of East Fork SFSR and Sugar Creek.
- CERCLA Actions. Several CERCLA removal actions were conducted by the Forest Service, EPA, and Exxon-Mobil Corporation. These activities were conducted at the proposed SGP mine site.

Some of the RFFAs have the potential to use some of the same roads as the SGP for access (e.g., Warm Lake Road, Johnson Creek Road, Stibnite Road). Although there is insufficient information about the nature of the RFFAs to assess specific hazardous materials usage, these RFFAs would similarly be required to comply with state and federal regulations regarding transport and use of hazardous materials. The Stallion Gold - Horse Heaven exploration project may use the same roads as it is adjacent to the Operations Area Boundary on the west. The Big Creek Hazardous Fuels Reduction Project in the Edwardsburg area north of Yellow Pine could be accessed via McCall - Stibnite Road; however, this project would involve 10,600 acres of treatment over a short period of time, such that the contribution of the action alternatives combined with this, and other similar projects would result in negligible changes to the overall traffic volume.

5.8 Surface Water and Groundwater Quantity

The CEA for surface water and groundwater quantity is the same area that could be directly or indirectly affected by the SGP on stream flows and/or the quantity of groundwater in storage, groundwater levels, and groundwater transmission (**Figure 3.8-1**).

Past and present actions that may have impacted water quantity through short-term water use include historical mining and reclamation activities in the area, as well as the Golden Meadows Exploration Project, which requires water for borehole drilling and other purposes.

The active Valley County Quarry (located near the village of Yellow Pine and about 7 miles to the west of the SGP area) may require some groundwater consumption, but since the quarry is located in a different sub-watershed from the SGP that is outside the CEA, it would not contribute to cumulative groundwater quantity impacts.

There are no RFFAs that have or would affect surface water and groundwater quantity in the CEA. In making this determination, a number of other nearby projects that have the potential to affect surface water and groundwater quantity were considered. These include Big Creek area's small-scale hydroelectric projects plus the Morgan Ridge Exploration Project and Stallion Gold Horse Heaven Project. Although these projects could affect the surface water and groundwater systems within their respective watersheds, activities identified to date are located within a different sub-watershed from the SGP and lack direct communication via waterways to combine and result in cumulative water quantity effects.

5.9 Surface Water and Groundwater Quality

For surface water, the CEA includes 22 watersheds that encompass the SGP, access roads, transmission lines, and off-site facilities (**Figure 3.9-1**). For groundwater, the CEA includes two sub-watersheds that encompass the SGP (**Figure 3.9-2**).

Cumulative effects associated with the SGP consider the range of existing and foreseeable activities and their potential effects with respect to surface water and groundwater quality. Past and present actions that have, or are currently, affecting surface water quality include development projects, transportation projects, mineral exploration and mining activities, and mine closure and reclamation projects. Past and present actions that have or are currently affecting the mine site groundwater quality mainly include historical mining activity and recent mineral exploration undertaken by Perpetua.

RFFAs that could cumulatively contribute to water quality impacts in the CEA include:

- South Fork RAMP,
- East Fork RAMP,
- Gold Stallion Horse Heaven Project, and
- the Stibnite ASAOC.

5.9.1 No Action Alternative

The existing baseline surface water quality associated with the mine site is expected to improve to an extent due to the removal of legacy mining materials in contact with surface waters in Meadow Creek and the East Fork SFSR under the ASAOC Phase I. Phase I of the ASAOC is a separate action and not tied to the permitting of the SGP. Although impacts would likely be reduced due to a reduction of mine waste available for contact with surface water, elevated arsenic and antimony concentrations would persist as a cumulative impact with inputs from other historical sources (e.g., SODA) and inputs from natural sources that would continue to cause contaminant loading to the environment and influence Meadow Creek and East Fork SFSR stream water quality.

Cumulative surface water quality impacts also could occur in the CEA due to continuing surface exploration for the Golden Meadows Exploration Project. The continuation of approved exploration activities at the SGP by Perpetua could cumulatively increase stream sediment levels resulting from surface disturbance and erosion. Exploration activities also could cause cumulative surface water quality impacts through accidental spills of diesel, gasoline, and jet fuel stored at the SGP in aboveground tanks.

5.9.2 2021 Modified Mine Plan

Compared to the No Action Alternative, the 2021 MMP would remove additional legacy mining materials and further reduce their impacts on water quality but would also contribute new sources of mine waste material to the East Fork SFSR drainage. However, the new mine waste materials would be equipped with current technologies and design features (e.g., liner and cover systems) to reduce their impacts.

Across the rest of the CEA, future actions that could impact surface water quality would mainly affect stream temperatures and stream sediment concentrations. Other RFFAs in the CEA would mainly contribute sediment loading to adjacent streams. Although most of these future actions would likely have sediment control measures in place, the cumulative effect across the watershed may still include higher sediment loads in the East Fork SFSR and its tributaries.

Valley County Quarry, an active aggregate mine approximately 0.25 mile east-southeast of the village of Yellow Pine, is separated from the East Fork SFSR and Johnson Creek by the village itself, as well as several forest roads and native vegetation buffers. The quarry also includes surface water management features that retain runoff within the quarry perimeter (Forest Service 2017g). Thus, the Valley County Quarry would not contribute to cumulative surface water quality effects in the CEA.

5.9.3 Johnson Creek Route Alternative

Compared to the No Action Alternative and the 2021 MMP, cumulative effects to stream sediment concentrations from RFFAs would be affected by mine access because the Johnson Creek Route Alternative would require all mine-related traffic during construction, operations, and reclamation to use the Johnson Creek Route. This would increase traffic on Johnson Creek Route during the mine operational and reclamation period, leading to potentially higher erosion rates from the road surface along the Johnson Creek Route. The cumulative effect from this change could combine with other planned activities in the Johnson Creek watershed to increase the sediment load in Johnson Creek. This consideration is especially important given that Johnson Creek Road primarily follows the course of Johnson Creek.

5.10 Vegetation: General Vegetation Communities, Botanical Resources, and Non-native Plants

The CEA for vegetation resources is the same extent as the analysis area for direct and indirect impacts to vegetation, which is the 300-foot buffer around SGP components (**Figure 3.10-1**). Past and present actions in the CEA that have affected or are currently affecting vegetation resources are summarized in **Table 5.10-1**.

Table 5.10-1 Past and Present Actions in the Vegetation Analysis Area

Past or Present Action	Potential Effects on Vegetation
Past and present mineral exploration and mining in the vicinity of the SGP	Vegetation has been removed and soil conditions have been altered in areas with past and present mineral exploration and mining in the vicinity of the SGP. Increased dust and transportation of non-native plant propagules associated with these projects have likely indirectly impacted vegetation communities in the vicinity of these areas.
Wildland Fire	Wildland fires have occurred in the vegetation analysis area, which has resulted in seral changes to vegetation communities. Fires have been both characteristic and uncharacteristic.
South Fork RAMP	The numerous actions relating to watershed restoration, motorized and non-motorized access, and improvements of recreation facilities within the SFSR watershed within a 329,000-acre project area are likely to impact vegetation communities and special status plants in various ways. Impacts to vegetation communities and special status plants were documented as part of the project analysis.
Removal of Firewood	Removal of firewood by the public has likely occurred in the vegetation analysis area, resulting in loss of coarse woody debris and snags over time, primarily adjacent to roads.
Recreation and tourism	Recreational activities (i.e., camping, hiking, hunting, trapping, trail riding, etc.) are likely to continue to affect vegetation communities. Increased road networks (e.g., new portions of the Burntlog Route) open new NFS areas to additional human disturbance, which will likely result in increased non-native plant spread and establishment in the analysis area.
Mineral exploration and mining activities	Exploration activities for potential future mining development in the vegetation analysis area have likely impacted vegetation via removal and soil compaction at drill pad sites and temporary roads and will likely continue to do so as these activities continue.
Transportation projects	Road maintenance projects (McCall-Stibnite Road [CR 50-412], Profile Gap Road [CR 50340] and the road to the Big Creek Trailhead, and Yellow Pine Road) are ongoing in the analysis areas. Roadways impact vegetation communities through habitat fragmentation, noxious weed introduction, and possibly dust propagation during construction. Maintenance projects for existing roadways will likely impact vegetation indirectly and only during the time of construction.
Infrastructure Development projects	Transmission line upgrades in the West Central Mountain Electric Plan 2014, which follows the general location Stibnite Mine transmission line route, have required removal of tall trees in the right-of-way for safe operation of the transmission line. Removal of tall trees has altered understory vegetation community composition and likely removed potential habitat for special status plants.

Source: Forest Service 2020i, 2020j, 2020k, 2021c, and 2021d.

RFFAs in the CEA that are anticipated to impact vegetation resources are shown in **Table 5.10-2**. These RFFAs would result in loss of habitat, but all projects (private or federal actions) would have to meet the requirements of Section 7 of the ESA, which include consultation with federal agencies on listed plant species, completion of appropriate analysis documents, and compliance with agency-mandated reasonable and prudent measures to protect listed species.

Table 5.10-2 RFFAs in the Vegetation Analysis Area

Project	Potential Effects on Vegetation
Stibnite Mine Site ASAOC	This project’s purpose and need is to eliminate or reduce potential ecological and human exposure to metals by mitigating sources of contamination from contact with sediment and surface water. This will be accomplished through the removal of mill tailings and mine waste located within the channels and floodplain of the East Fork SFSR and select tributaries, and the diversion of surface water around mine wastes that are sources of metals. This project is located primarily along the East Fork SFSR and Meadow Creek at the mine site and would result in disturbance to vegetation.
East Fork RAMP	This travel management planning would likely impact vegetation communities and special status plants located within the spatial extent of the East Fork RAMP which could include Yellow Pine, Big Creek, and Thunder Mountain within the PNF. Impacts to vegetation communities and special status plants were documented as part of the project analysis.
Stallion Gold – Horse Heaven Project	Surface exploration of gold and antimony deposits. The project consists of 695 unpatented federal mining claims and mineral rights on 13,950 acres. This project would share its eastern boundary with the SGP.

Source: Forest Service 2020i, 2020j, 2020k, 2021c, and 2021d.

5.10.1 No Action Alternative

Forest management, motorized use of road systems, fire suppression, prescribed fire and wildfire, dispersed camping, fishing, and hunting activities would continue in the CEA and vicinity, which would alter vegetation resources through direct removal (trampling, cutting, harvest, etc.) and incidental damage. Under the No Action Alternative, Perpetua would continue to comply with reclamation and monitoring commitments included in the applicable Golden Meadows Exploration Project Plan of Operations and EA, which include reclamation of the drill pads and temporary roads by backfilling, re-contouring, and seeding using standard reclamation practices. However, as described in the Golden Meadows EA, the exploration and subsequent reclamation activities would have only a small direct effect on vegetation resources, as the disturbance footprint associated with the Golden Meadows EA is primarily isolated to temporary access roads to pads and the exploration drilling holes. Therefore, implementation of the No Action Alternative would present a minimal cumulative contribution to impacts to vegetation resources.

5.10.2 Action Alternatives

Acres of previous disturbance from past mining actions within 300 feet of the action alternatives are presented in **Table 5.10-3**. The total cumulative disturbance to vegetation in the CEA under both action alternatives is the sum of acres of previous disturbance within 300 feet of each alternative and the acres of previously undisturbed vegetation that would be impacted under each of the alternatives.

The 2021 MMP would result in the largest contribution to mining-related cumulative impacts to vegetation communities with the Johnson Creek Route Alternative impacting approximately 251 acres less. Cumulative impacts of the SGP on botanical resources and non-native plants would follow the same ranking as for vegetation communities, with the 2021 MMP having the highest potential and the Johnson Creek Route Alternative having a reduced potential for negative impacts on botanical resources and non-native plants in conjunction with past mining actions.

Table 5.10-3 Cumulative Disturbance to Vegetation

Vegetation¹	2021 MMP	Johnson Creek Route Alternative
New Disturbance to Previously Undisturbed Areas	2,050.1 ²	1,841.0 ²
Previous Disturbance within 300 feet of an Alternative Footprint	1,593.6	1,552.1
Total Cumulative Disturbance to Vegetation within 300 feet of an Alternative Footprint ³	3,643.7	3,393.1

Source: Perpetua 2021a; Acres of new disturbance to previously undisturbed areas were calculated by overlaying SGP components with PVG data (Forest Service 2005a, 2017g), VCMQ data (Forest Service 2016b, 2021d), and LANDFIRE data (USGS 2016a). Acres of previous disturbance within 300 feet of an alternative footprint were calculated by overlaying a 300-foot buffer of SGP components with previous mine site disturbance spatial data (Perpetua 2021a) and omitting areas of new disturbance.

¹ Vegetation communities are defined for the purpose of these calculations as a combination of forest PVGs on NFS-administered lands, non-forest areas on NFS-administered lands identified through PVG mapping, and LANDFIRE vegetation classes outside NFS-administered lands.

² Includes acreage associated with tall tree clearing as shown in Table 7-6 and Table 7-11 of the Vegetation Specialist Report (Forest Service 2022g).

³ Due to rounding, numbers presented in this table may not sum precisely to the totals provided.

PVG = Potential Vegetation Group.

VCMQI = Vegetation Classification, Mapping, and Quantitative Inventory.

Other past and present actions (**Table 5.10-1**) and RFFAs (**Table 5.10-2**) have and would likely impact vegetation communities, occurrences of special status plants including whitebark pine, habitats for special status plants, and distribution of non-native plants throughout the analysis area. Specific impact acreages of most of these actions on these resources are not known. It is likely that the ranking of potential contribution of the SGP alternatives when combined with other RFFAs on vegetation, most special status plants, and non-native plants would be the same as described in the preceding paragraph for mining-related impacts, with the 2021 MMP having the highest potential for cumulative impacts on these resources based on disturbance acreage. For whitebark pine, the potential for cumulative impacts would be lowest under the Johnson Creek Route Alternative and highest under the 2021 MMP based on disturbance acreage and estimated number of trees removed.

Cumulative impacts of the SGP on known special status plant occurrences from either action alternative would likely be the same as described in **Section 4.10**, even when considered with past, present, and RFFAs (i.e., no loss of viability or trend towards ESA listing for all species known to occur in the analysis area).

5.11 Wetlands and Riparian Resources

The CEA for wetlands and riparian resources is the same extent as the analysis area for direct and indirect impacts to these resources, which is the watersheds containing the SGP components (**Figure 3.11-1**).

Potential cumulative effects to wetlands are limited to ASAOC activities.

5.11.1 No Action Alternative

No new impacts to wetlands would occur under the No Action Alternative from the SGP. The SGP would not contribute to cumulative effects on wetlands or riparian areas in the CEA. Although no new impacts

would occur, existing elevated arsenic, antimony, and mercury concentrations would continue to contribute to contaminant loading to surface water, affecting adjacent and downstream wetlands.

Under the No Action Alternative, Perpetua would continue to comply with reclamation and monitoring commitments included in the applicable Golden Meadows Exploration Project Plan of Operations and EA, which includes reclamation of the drill pads and temporary roads by backfilling, re-contouring, and seeding using standard reclamation practices. However, as described in the Golden Meadows Environmental Assessment, the exploration and subsequent reclamation activities would have only a small direct effect on wetland and riparian resources, as the disturbance footprint is confined to exploration holes.

The CERCLA removal actions planned for Phase I of the ASAOC would disturb stream channels and adjacent riparian habitats to remove mining wastes from these areas. The stream channels would be restored better than their baseline conditions and the riparian habitats would also be restored.

Therefore, the No Action Alternative would not present a significant contribution to cumulative impacts on wetland and riparian resources.

5.11.2 2021 MMP

The 2021 MMP would result in temporary and permanent losses of approximately 119.8 acres of wetlands in the mine site focus area, 76.3 acres outside the mine site, and 1,054.4 wetland functional units (375.9 of which would be high-value functional units) (Forest Service 2022h). It is currently planned that required compensatory wetland mitigation would replace all permanently lost wetland acreages and functions, and therefore this alternative would not contribute to cumulative losses of wetland acreages or functions in the wetland and riparian resources cumulative effects analysis area.

5.11.3 Johnson Creek Route Alternative

The Johnson Creek Route Alternative would result in temporary and permanent losses of approximately 119.8 acres of wetlands at the mine site, 71.2 acres outside the mine site, and 1,028.3 wetland functional units (370.6 of which would be high-value functional units) (Forest Service 2022h). It is assumed that required compensatory wetland mitigation would replace all permanently lost wetland acreages and functions, and therefore this alternative would not contribute to cumulative losses of wetland acreages or functions in the wetland and riparian resources CEA.

5.12 Fish Resources and Fish Habitat

The cumulative effects analysis area for fish and aquatic habitat that could be directly or indirectly affected by the SGP is the same analysis area used to evaluate direct effects on fish and aquatic habitat, which consists of all of the watercourses and waterbodies in the HUC 6th field (10-digit code watersheds that overlap potential SGP disturbance areas (**Figure 3.12-1**).

Cumulative effects consider the range of existing and foreseeable activities and their potential effects with respect to fish and aquatic habitat when combined with the potential direct and indirect impacts of the SGP. Past and present actions that have, or are currently, affecting fish and aquatic habitat include past and current mining activities (including exploration), infrastructure projects, ongoing Forest Service

management projects, recreation, fishing, transportation projects, water diversions, hydropower projects, and wildland fires.

Reasonably foreseeable future actions that could cumulatively contribute to fisheries and aquatic habitat impacts in the analysis area include:

- South Fork RAMP,
- East Fork RAMP,
- Granite Meadows,
- Stallion Gold Horse Heaven Project,
- Burntlog Route Geophysical Investigation, and
- Stibnite ASAOC

5.12.1 No Action

The existing baseline conditions of fish and aquatic habitat in and adjacent to the mine site are expected to improve due to the removal of legacy mining materials that are in contact with surface waters in Meadow Creek and the East Fork SFSR under the ASAOC Phase I. The ASAOC is a separate action and not tied to the permitting of the SGP. Although impacts would likely be reduced due to a reduction of mine waste in contact with surface water, elevated arsenic and antimony concentrations would persist as a cumulative impact with inputs from other historical sources (e.g., SODA) and inputs from natural sources that would continue to cause contaminant loading to the environment and influence Meadow Creek and East Fork SFSR water quality. Cumulative impacts to fisheries also could occur at the SGP area due to continuing surface exploration for the Golden Meadows Exploration Project. These previously approved activities include construction of several temporary roads (approximately 0.32 mile of temporary roads) to access drill sites (total of 28 drill sites), drill pad construction (total of 182 drill pads) and drilling on both Forest Service and private lands at and in the vicinity of the SGP. The continuation of approved exploration activities at the SGP by Perpetua could cumulatively increase stream sediment levels resulting from surface disturbance and erosion. Exploration activities also could cause cumulative surface water quality impacts through accidental spills of diesel, gasoline, and jet fuel stored at the SGP in aboveground tanks. Similarly, exploration activities associated with the Stallion Gold Horse Heaven Project could contribute as well.

5.12.2 2021 MMP

Some of the RFFAs (**Table 5.1-2**) would occur in the same watershed and are expected to have similar types of impacts to fish and aquatic habitat as described for the 2021 MMP, such as increases in sediment and stream temperatures, stream flow reductions, and stream channel changes. However, because these projects appear to be at a smaller scale than the SGP, their impacts also would be less. These RFFAs also could have beneficial effects on fish and aquatic habitat in the long-term and are summarized below.

The South Fork RAMP and the East Fork RAMP include numerous actions related to watershed reclamation within the SFSR watershed and are therefore expected to have a long-term beneficial effect on habitat conditions for fish.

The PNF's WCS would affect fish because one of its objectives is to actively reclaim or maintain conditions for sensitive fish and 303(d) listed waterbodies.

Cumulative effects from large-scale management of Forest vegetation could include short-term disturbance of fish habitats and increases in sediment; but would be beneficial in the long-term. **Table 5-12-1** provides a general description of effects on fish and aquatic resources from the other types of projects that are expected to occur in the CEA.

When combined with the potential impacts and duration of the 2021 MMP, the duration and scale of cumulative impacts on fish and aquatic habitat would be larger because all these projects would occur during the same time period. The resulting cumulative effect on fish and aquatic habitat in the CEA would be temporal losses or degradation of habitat and behavioral disturbances, along with some long-term beneficial effects from habitat improvements.

Table 5.12-1 Cumulative Effects on Fish and Aquatic Habitat from RFFAs

Cumulative Project Type	Effects on Fish and Aquatic Habitat
Mineral exploration and mining activities	Currently planned or future mine development would affect fish and habitat during development through direct disturbance of habitat, increase sediment, changes in stream flow and temperature.
Closure and reclamation projects	Projects within fish habitat that are currently, or in the future, undergoing reclamation would likely improve fish habitat because these projects involve the removal of some infrastructure and reclamation of native habitats.
Transportation projects	Road maintenance, bridge or culvert replacement, and improvement projects are likely in the analysis area. Installation or improvement of culverts or bridges may impact fish habitat due to construction-related effects such as erosion and sediment in streams. Maintenance of existing roadways and culverts/bridges would create short-term impacts, while new roadways and culverts/bridges could have impacts for a longer period.
Recreation and tourism effects	Recreational activities such as fishing would continue to affect fish in the future. Fishing activities could decrease localized fish populations. These are regulated by the IDFG and would not lead to cumulative impacts when combined with impacts from the SGP.
Private Development Projects	Private residential developments are likely to have minor temporary impacts on fish and fish habitat, such as culvert installations or replacements, and increases in sediment related to construction and vehicle use in the future.

5.12.3 Johnson Creek Route Alternative

The effects discussed for the 2021 MMP for the SGP and RFFAs would also occur under the Johnson Creek Route Alternative. The use of the Johnson Creek Route rather than the construction of the Burntlog Route would increase the risk of spills and sedimentation in Johnson Creek and East Fork SFSR. Therefore, the cumulative effects from the Johnson Creek Route Alternative would be greater in degree with regards to spills and sediment compared to the 2021 MMP but would be comparable with regard to other effects.

5.13 Wildlife and Wildlife Habitat including Threatened, Endangered, Proposed, and Sensitive Species

The CEA for wildlife and wildlife habitat is the same as the area that could be directly or indirectly affected by the SGP consists of the analysis area shown on **Figure 3.13-1**.

Cumulative effects associated with the SGP consider the range of existing and foreseeable activities and their potential effects with respect to wildlife and wildlife habitat. Past and present actions that have, or are currently, affecting wildlife and wildlife habitat, as well as RFFAs that could cumulatively contribute to wildlife and wildlife habitat impacts in the analysis area include mineral exploration and mining activities, closure and reclamation projects, transportation projects, recreation and tourism effects, wildfire and noxious weed control projects, and development projects (**Table 5.13-1**).

Table 5.13-1 Cumulative Effects on Wildlife Species in the Analysis Area

Cumulative Project Type	Potential Effects on Wildlife
Mineral Exploration and Mining Activities	Several historic mines in the analysis areas have changed the habitat over time through removal of vegetation and displacement of wildlife species. Currently planned or future mine development will modify additional habitat types during development; these habitats will likely also be reclaimed in part on closure of the mine projects. During exploratory drilling, development, and operations, the increased noise and light impacts and road networks will be a source of disturbance and mortality for wildlife and will likely also displace several species.
Closure and Reclamation Projects	Projects that are currently undergoing reclamation, or will in the future, will likely improve habitat for wildlife. Additional habitat would generally become available to wildlife use within different time frames, depending on the type of reclamation. Early seral and grassland habitats would be available for wildlife within a short time, while mature forest types would not be available for decades.
Transportation Projects	Road maintenance, improvement projects, and bridge replacements are likely in the analysis areas. As roadways represent a threat to wildlife due to vehicle-wildlife collisions, habitat fragmentation, and noxious weed introduction, these types of projects are likely to also cause an impact on wildlife. Maintenance of existing roadways will likely only be short-term effects, while new roadways would have a larger effect.
Recreation and Tourism	Recreational activities (i.e., camping, hiking, hunting, trapping, trail riding, firewood harvest, etc.) are likely to continue to affect wildlife in the future. Increased road and trail networks open new areas to additional human disturbance, which can displace wildlife. Hunting activities also could decrease localized wildlife populations, although these are regulated closely by IDFG.
Wildfire and Noxious Weed Control Projects	Wildfires and noxious weeds have affected wildlife throughout the analysis areas. Additional wildfires are likely to affect wildlife in the future by reducing mature forest structure and transitioning to early seral communities. Small-scale harvesting of timber on private lands in the area also reduces the amount of forested habitat available. Control of invasive and noxious plant species also is likely to affect wildlife positively, because spraying or hand-pulling will reduce the invasive species present.
Development Projects	Private residential developments are likely to impact wildlife in the future. Native habitats would be disturbed for wildlife, and additional human presence would likely displace individuals.

These RFFAs would result in loss of habitat, but all projects (private or federal actions) would have to meet the requirements of Section 7 of the ESA, which include consultation with federal agencies (e.g., USFWS, NOAA, etc.) on listed species, completion of appropriate analysis documents, and compliance with agency-mandated reasonable and prudent measures to protect listed species. In addition, actions on PNF and BNF must meet the standards of the Forest Plans, which specifically addresses threatened, endangered, proposed, or candidate species, as well as sensitive species and species of special interest, such as elk, and related habitat.

5.13.1 No Action

Under the No Action Alternative, the CEA would still be impacted by the types of projects discussed in **Table 5.13-1**. Also included would be continued exploration work at Stibnite by Perpetua and the ASAOC Phase I mine waste removal project that would occur in 2022 - 2024.

5.13.2 2021 MMP

The 2021 MMP would impact 3,266 acres from the combined mine site, access roads, utilities, and off-site facilities, which would be a large increase of disturbed habitat compared to other past, present, and RFFAs in the CEA. Various components of this larger area would be considered habitat for different species, depending on the potential vegetation groups, tree size classes, and canopy cover classes present. However, these impacts would be offset and reduced through restoration of vegetation communities native to the area during the closure and reclamation process. The result is that long-term, net impacts (e.g., functional habitat losses and disturbed habitat in the analysis areas) would be reduced, although it would be decades before habitats would be restored to similar functionalities. The effects of road upgrades and traffic-related incidents with wildlife are likely under the 2021 MMP, which would contribute to the other past, present, and RFFAs.

Following closure and reclamation, existing and ongoing mineral exploration for the SGP would cease in the wildlife CEA. Activities that would continue in the future, and may contribute to cumulative effects on wildlife and habitats would include mineral exploration activities outside the Operations Area Boundary; other closure and reclamation projects; continued road use, transportation infrastructure improvements and maintenance; recreational and tourism activities; wildfire and vegetation management actions (e.g., mechanical vegetation treatment, salvage harvest, and prescribed fire); and private development projects. Potential cumulative effects from these types of actions would include further ground disturbance and habitat alteration. These RFFAs would have the potential to disturb wildlife habitats because of vegetation removal and ground disturbance. RFFAs would be governed by applicable laws and regulations and would be required to conform to applicable forest plan standards on PNF and BNF.

Cumulative impacts from past and present projects have resulted in temporary and permanent losses of habitats and ecological functions in the region, and future projects also would likely impact terrestrial wildlife species. However, the region is still somewhat remote and relatively wild, and the types of projects listed above are unlikely to significantly change this wilderness character in the near term, with the exception of additional wildfires reducing mature forest structure.

The 2021 MMP includes a variety of reclamation projects over the course of mine construction, operation, and closure and reclamation. However, the 2021 MMP would likely result in impacts that would be considered to permanently contribute to an adverse cumulative impact on these resources when combined with past, present, or RFFAs.

5.13.3 Johnson Creek Route Alternative

The Johnson Creek Route Alternative would impact 3,096 acres from the combined mine site, access roads, utilities, and off-site facilities footprints, and would be a large increase in the amount of disturbed habitat compared to other past, present, and RFFAs in the area. Because the size of the disturbance footprint is smaller than that of the 2021 MMP due to the absence of the Burntlog Route, the cumulative impacts of the Johnson Creek Route Alternative would be less than the 2021 MMP.

5.14 Timber Resources

The CEA for timber resources is the entire area of the PNF and BNF, as well as any commercial timberlands in Valley County. The analysis focuses on current and future projects on the PNF and BNF as those forests have established harvest volume limits and spatially designated lands suitable for timber production. Timber harvest projects occurring on commercial timberlands in the analysis area are unknown at this time and are therefore unavailable to consider in the analysis of cumulative effects to timber resources.

Cumulative effects associated with the SGP consider the range of existing and foreseeable activities and their potential effects with respect to timber resources. This includes past and present actions that have, or are currently, affecting timber resources and areas from which timber is harvested, as well as RFFAs that could cumulatively contribute to timber resource impacts in the analysis area. This list of projects includes timber harvest, as well as mineral exploration and mining activities, transportation projects, hazardous fuels and noxious weed control projects, and wildfires that could occur within the same timeframe as the impacts of SGP. Projects with a vegetation management component that includes incidental removal of conifer tree species would not be considered to cumulatively contribute to timber resource impacts in the CEA unless the project included sale of the cut conifer trees. The potential for cumulative effects associated with each project type, and example projects in the CEA, are described below.

5.14.1 Forest Management

None of the current and future forest management projects within the timber resources CEA include a commercial timber sale component and are therefore not considered to contribute to cumulative impacts on timber resources.

5.14.2 Mineral Exploration and Mining Activities

None of the currently planned or future mine development projects in the CEA include sale of cut trees at this time and therefore were determined to not contribute to potential cumulative effects on timber resources.

5.14.3 Transportation Projects

Road maintenance, improvement (widening) projects, and bridge replacements are likely to occur in the future in the timber resources CEA. Roadway projects could impact timber resources through removal of productive timber along roadways. Maintenance of existing roadways would likely be short-term, while new roadways could have a larger effect by removing timberland from permanent production, depending upon the location of the project and its proximity to land suited for timber production. Projects with a road improvement or transportation element include the East Fork RAMP on the PNF, the Granite Meadows project on the PNF, and the South Fork RAMP on PNF as well as BNF. Only the Granite Meadows project includes an explicit discussion of commercial timber sales and therefore it is the only transportation project that could contribute to cumulative effects on timber resources.

5.14.4 Hazardous Fuels Reduction and Noxious Weed Control Projects

Wildfires have affected timber resources throughout the analysis area and will continue to do so in the future. Future wildfires may affect timber resources, in the event they occur on land suited for timber production, by applying hazardous fuels reduction treatments to the landscape. The damaging effect of wildfire may be mitigated and projects with this aim could contribute beneficially to the cumulative effect of timber removal in the analysis area. Similarly, control of invasive and noxious plant species is likely to benefit timber resources by improving stand productivity. Fuels management projects include Big Creek Fuels Reduction and the Granite Meadows Project. Both Big Creek Fuels Reduction and the Granite Meadows projects include explicit discussions of commercial timber sales associated with fuels reduction activities therefore they both could contribute to cumulative effects on timber resources.

Two known RFFAs (the Big Creek Fuels Reduction Project and Granite Meadows Project) could result in loss of timber resources. However, all projects (private or federal actions) would have to meet the requirements of either National Forest Management Act of 1975 or The State of Idaho and Valley County, which include appropriate planning and compliance to meet their standards for timber stand health and productivity (sustained yield). In addition, actions on NFS lands must meet the standards of the Forest Plan, which specifically addresses annual harvest limits for timber resources on suited and unsuited timberlands.

5.14.5 No Action Alternative

Implementation of the No Action Alternative would present no cumulative impact contribution to timber resources.

5.14.6 Action Alternatives

Available information for RFFAs indicates timber harvest could occur on an additional 67,250 acres of the PNF with implementation of the Big Creek Hazardous Fuel Reduction Project and the Granite Meadows Project. It is unknown if any portions of these areas would occur on land suited for timber production, but if the entire acreage was on land suited for timber production, the combined harvest area would only represent 20 percent of the suited lands on the PNF. It also is not known what volume of timber resources these project areas support, but the projects are PNF-sponsored actions and therefore would be coordinated with the local silviculturist on the PNF and designed to not exceed ASQ and TSPQ. In addition, these projects would not remove suited lands from production, rather they would, by their

intent, maintain forest health and productivity. Implementation of activities proposed under the 2021 MMP, when combined with other potential activities associated with projects in the cumulative impact analysis area would not exceed harvest volume limits or contribute significantly to removal of timber from land suited for timber production in the CEA. Therefore, these activities would not result in impacts that would be considered to contribute to cumulative effect on timber resources.

5.15 Land Use and Land Management

The CEA for land use and land management would be the same as the analysis area for direct and indirect effects (**Figure 3.15-1**).

Cumulative effects associated with the SGP consider the range of existing and RFFAs and their potential effects with respect to land use and management. Past and present actions that have, or are currently, affecting land use and land management include ongoing and planned mining activities, exploratory drilling (e.g., Golden Meadows Exploration Project), reclamation and closure of mining and processing facilities, road and airstrip maintenance, infrastructure management and development, noxious weed control, recreation and tourism, water diversion projects, firewood and timber harvest on public and private lands, wildlife conservation and rehabilitation plans, creek restoration, trail construction and maintenance, and hydroelectric projects. RFFAs that could cumulatively contribute to land use and land management impacts in the analysis area include (briefly described in **Table 5.1-2**):

- South Fork RAMP,
- East Fork RAMP,
- Wildlife Conservation Strategy,
- Granite Meadows,
- Big Creek Hazardous Fuel Reduction,
- Morgan Ridge Exploratory Drilling, and
- Stallion Gold Horse Heaven Project.

5.15.1 No Action Alternative

Cumulative impacts to land use and land management under the No Action Alternative would result from the current ongoing activities combined with past and present actions, as well as the RFFAs in the CEA. These include ongoing and planned mining activities, exploratory drilling, reclamation and closure of mining and processing facilities, road and airstrip maintenance, infrastructure management and development, noxious weed control, recreation and tourism, water diversion projects, firewood and timber harvest on public and private lands, wildlife conservation and rehabilitation plans, creek restoration, trail construction and maintenance, and hydroelectric projects.

5.15.2 Action Alternatives

Cumulative effects associated with the action alternatives would occur in combination with past, present, and future actions if these actions result in changes in land use and land management, or if additional ROW or easements were authorized by federal, state, or local entities.

Land use would be impacted by the action alternatives from construction and operations of the mine site and construction of associated facilities (access roads, utilities, and off-site facilities). The conversion of these lands to mine and transportation uses, combined with past, present, and planned mining activities, would result in a larger portion of the analysis area being used for industrial and transportation land uses. Other activities that could change land management include ongoing and planned mining activities, exploratory drilling, reclamation and closure of mining and processing facilities, road and airstrip maintenance, infrastructure management and development, noxious weed control, recreation and tourism, water diversion projects, firewood and timber harvest on public and private lands, wildlife conservation and rehabilitation plans, creek restoration, trail construction and maintenance, and hydroelectric projects. Land use in the CEA would change from existing conditions as a result of the action alternatives and land management activities associated with the RFFAs.

5.16 Access and Transportation

The CEA for access and transportation includes the overall road system encompassing the SGP components (**Figure 3.16-1**). Transportation should not be substantially affected beyond this area; travel and transportation outside of the CEA would not likely be impacted by the SGP.

5.16.1 No Action Alternative

Under the No Action Alternative, there would be no SGP. The effects of past mining activities and the currently planned ASAOC and geophysical investigation activities would remain. The RFFAs identified in **Table 5.1-3** including forest management, motorized use of road systems, fire suppression, prescribed fire and wildfire, dispersed camping, fishing, and hunting activities would continue in the CEA and vicinity, which could impact access and transportation in the CEA. Under the No Action Alternative, the Golden Meadows Exploration Project and Stallion Gold Horse Heaven Project would have a negligible direct effect to access and transportation and, therefore, a negligible cumulative contribution.

5.16.2 Action Alternatives

Supplies and deliveries for the SGP during construction, operations, and closure and reclamation would go to the SGLF using SH 55 to Warm Lake Road. Approximately two-thirds of all mine-related traffic would originate south of Warm Lake Road and would use SH 55 through the communities of Cascade, Banks, and Horseshoe Bend. Approximately one-third of all mine-related traffic would originate north of Warm Lake Road and would use SH 55 through the communities of Donnelly, Lake Fork, and McCall. Through McCall, mine-related traffic would use Deinhard Lane and Boydston Street.

As previously discussed, the traffic for the action alternatives would travel on SH 55 to Warm Lake Road then either along Johnson Creek Road to Stibnite Road or along the existing Burnt Log Road and newly constructed Burntlog Route to access the SGP. The SGP would generate considerable impacts to access and transportation as the action alternatives would individually add over a 100 percent increase in traffic volume on Burnt Log Road, Johnson Creek Road, and Stibnite Road during construction and operations.

The local NFS roads within the CEA are in a rural area, and baseline traffic volumes are generally low. A higher percent increase in traffic volumes for the action alternatives would be likely the closer the roads are to the SGP. The South Fork RAMP, the East Fork RAMP, and the Big Creek Hazardous Fuel

Reduction projects are located closer to the SGP. The contribution to traffic volumes of the action alternatives which include traffic generated from the reconstruction of the transmission line combined with these projects would likely have a greater cumulative effect on the roadways closer to the SGP.

Contrary, the closer to the larger arterial (e.g., SH 55) and collector (e.g., Warm Lake Road) roads, the percent increase in traffic volume decreases to less than approximately four percent for the action alternatives. The Granite Meadows, SH 55 Banks Beach Parking Study, and SH 55 Round Valley Improvements projects are located along or accessed via SH 55 and would affect traffic along the major arterial and collector roads. The traffic contribution of the action alternatives combined with these projects would result in negligible changes to the overall traffic volume as the SGP-level volumes dissipate into the larger traffic volumes of other projects and general travel along these roads.

The ASAOC (EPA 2021) (**Table 5.1-3**) would be additive to anticipated SGP traffic. Light vehicle traffic is anticipated during 2022 with approximately five roundtrips every two weeks over three months, totaling 30 trips. Additionally, 28 trips would occur in support of seven fuel hauls. In total, light vehicle traffic would result in 58 trips total in 2022, and heavy truck traffic would result in approximately six roundtrips. The seven anticipated fuel haul trips would include three-truck convoys (using 4,500-gallon trucks), amounting to a total of 21 individual trips. In 2023, it is anticipated that 50 contractors would be traveling to and from the SGP, with five people per vehicle over six months. Light vehicle traffic (including buses and vans) would result in approximately 12 round trips every two weeks, for a total of 144 trips, plus 64 trips in support of 16 fuel hauls, which would amount to 208 trips total. Heavy truck traffic during 2023 would equal approximately 15 roundtrips. The 16 anticipated fuel haul trips would also include three-truck convoys (using 4,500-gallon trucks), amounting to a total of 48 individual trips.

As such, the SGP combined with other RFFAs would have a greater cumulative effect on roads closer to the Operations Area Boundary and less contribution on the larger arterials farther from the Operations Area Boundary.

5.17 Heritage Resources

The CEA for heritage resources is the same area as the VAV APE. This includes approved activities, such as continued mining and reclamation work on private land. Existing and future activities directly associated with a proposed action and other RFFAs provide the basis for defining and analyzing cumulative impacts.

Past actions (**Table 5.1-2**) have impacted heritage resources in the CEA. Mining activities have impacted archaeological and historic resources, as well as TCPs. Natural activities like wildfires also have impacted heritage resources and could continue to do so. Many of the past human activities were conducted prior to statutory and regulatory protection measures for historic properties resulting in the loss of unknown resources.

Present actions include mining projects and their related activities (i.e., exploration, reclamation) that are currently underway and are causing impacts. They also may include other non-mining related projects currently in progress, such as timber sales or vegetation treatment; recreation; other utility lines (e.g.,

powerlines) and roads; maintenance and use of the existing transportation network; urban development in Valley County; private land development and uses; and sand and gravel extraction.

RFFAs are described in **Table 5.1-3**. **Table 5.17-1** summarizes potential cumulative impacts to historic properties from RFFAs.

Table 5.17-1 RFFAs and Potential Cumulative Effects to Historic Properties

Cumulative Project Type	Potential Effects to Historic Properties
Mineral exploration and mining activities	Historic mines in the analysis areas have changed the landscape over time through removal of vegetation and displacement of soils. Currently planned or future mine development would further alter the landscape from its pre-contact and historic state during exploratory drilling, development; and operations upon closure of the mine. During exploratory drilling, development, and operations, the increased ground disturbance may disturb historic properties.
Closure and Reclamation Projects/CERCLA Actions	Projects that are currently undergoing reclamation or will in the future would likely cause further damage to any historic properties in the area. These projects would likely be closed, which involves the removal of some of the infrastructure and reclamation of the land to restore native wildlife and plant habitats that are important to Native American tribes. However, mature forest types wouldn't be available for decades. Several CERCLA Removal Actions were conducted by the Forest Service, EPA, and Exxon-Mobil Corporation. These actions also can impact historic properties by removing potentially hazardous, but also historic, tailings and capping historic dumps.
Transportation projects	Road maintenance, improvement projects, and culvert replacements are likely in the analysis areas. These types of improvements cause ground disturbance that represents a potential impact to historic properties. Maintenance of existing roadways would likely only be short-term, while new roadways would have a more permanent effect. Also related to transportation projects are gravel quarry or gravel pit development to provide fill material for road construction. This activity would be a potential impact to any historic properties present in those areas.
Infrastructure Development	Local communities perform upgrades to infrastructure, such as electrical transmission lines. These development activities can cause ground disturbance that could impact historic properties, and they often involve physical upgrades to historic transmission lines.
Recreation and tourism	Recreational activities (i.e., camping, hiking, fishing, hunting, trapping, trail riding, firewood harvest, etc.) are likely to continue to affect historic properties in the future. Increased road and trail networks open new wilderness areas to additional human disturbance, which can increase access to historic properties in the APE potentially leading to vandalism or accidental destruction of artifacts of site features.
Wildfire and noxious weed control projects	Wildfires and noxious weeds have affected historic properties throughout the analysis area either by burning structures or by increasing visibility of pre-contact historic properties. Additional wildfires could affect historic properties in the future in the same way. Control of invasive and noxious plant species could have an effect on historic properties, as mechanical or hand-pulling would increase ground surface visibility and would cause some ground disturbance.
Development projects	Private residential developments could impact historic properties in the future. Pre-contact and historic landscapes would be lost, while additional human presence would potentially affect historic properties through increased access.

Cumulative Project Type	Potential Effects to Historic Properties
Watershed Management	Watershed management can involve repairs and reclamation of roads and recreation site repairs to prevent erosion into watersheds, but many projects involve only monitoring of erosion of roadway sediments into watersheds, and this would not have an impact on historic properties. Ground disturbance from road repairs or reclamation could impact unidentified historic properties in those areas; however, the Forest Service Heritage Programs would generally complete archaeological surveys of any Forest Service roads or campsites being repaired or reclaimed so any historic properties encountered during the surveys could be avoided.

5.17.1 No Action Alternative

Cumulative effects associated with the No Action Alternative could occur with approved activities associated with the Golden Meadows Exploration Project or proposed such as the Stallion Gold Horse Heaven Project, such as exploratory drilling for mineral resources and construction of support facilities either by Perpetua or other groups on private land. The CERCLA work that is underway per the current ASAOC would continue over the next few years and would remove certain legacy mine waste deposits from flowing streams. Impacts to historic properties would be governed by the NHPA Section 106 process, and, therefore, minimal impacts would occur.

5.17.2 Action Alternatives

The 2021 MMP, taken together with other concurrent actions and RFFAs, would create an increase in ground disturbance and visual and noise intrusions along with increased public access in some areas and restricted access in other areas within the analysis area. These cumulative actions would increase the impacts to historic properties within the CEA. For all RFFAs on federally managed lands historic properties would be governed by the NHPA Section 106 process. RFFAs identified in the CEA could generate incremental changes to historic properties, exposing additional sites, or causing disturbance to the sites or their setting. Effects to historic properties would also occur due to physical disturbance or changes to the character or setting of historic properties. There would be adverse cumulative effects on historic properties. Cumulative impacts under the Johnson Creek Route Alternative would be similar to the 2021 MMP.

5.18 Public Health and Safety

The CEA for Public Health and Safety includes Valley County (no figure). Existing and RFFAs have the potential to result in cumulative impacts by increasing variables related to public health and safety.

5.18.1 No Action Alternative

Under the No Action Alternative, there would not be the cumulative benefit of the SGP-related reclamation of legacy impacts in addition to those required under the ASAOC. There would be potential for wildfire from natural and man-made causes.

5.18.2 Action Alternatives

Past and present activities and RFFAs that could cumulatively contribute to public health and safety impacts in the analysis area include all the projects listed in **Table 5.1-2** pertaining to land use

management and development, road management, and hazardous materials management. The economic benefits associated with increased SGP employment opportunities and tax revenues, could lead to continued or improved access to health services (through employment insurance benefits and/or increased income), better nutrition, and better overall well-being for the local community. The potential negative effects from economic dislocation and disruption to local area economy after cessation of mine operations (“boom and bust” impacts) would be somewhat offset by the residual positive impacts on social economic conditions.

Because of the amount of activity associated with the 2021 MMP and Johnson Creek Route Alternative compared to the other activities and RFFAs, it is likely that cumulative impacts would not be noticeably different than the direct and indirect effects of the SGP.

5.19 Recreation

The CEA for recreation is the same as the analysis area for direct and indirect effects to recreation (**Figure 3.19-1**). Other past, present, and RFFAs occurring on federal and non-federal lands, with similar effects that overlap in time and space include forest management, mining and mine reclamation, road maintenance, campground upgrades, and winter motorized use of forest roads.

Past actions include activities that may have been initiated in the past but also could have lingering effects in degrading the environment or may influence trends in the physical, biological, or social environment.

Present actions include mining projects and their related activities (i.e., exploration, reclamation) that are currently underway and are causing impacts. They also may include other non-mining related projects currently in progress, such as timber sales or vegetation treatment; recreation; other utility lines (e.g., powerlines) and roads; maintenance and use of the existing transportation network; urban development in Valley County; private land development and uses; and sand and gravel extraction.

5.19.1 No Action Alternative

Cumulative effects would be minimal as there would be minimal displaced recreation use or changes to recreation opportunities from the SGP. In the long term there would be some modifications to the recreation setting in the SGP area from continued surface exploration, continued low level of unauthorized motorized use, and increased winter motorized access and use. The RFFAs in combination with the No Action Alternative could result in cumulative effects to the designated ROS classes and the estimated ROS physical setting by increasing development, resulting in an overall increase in more developed ROS settings and a decrease in less developed settings within the CEA.

5.19.2 2021 MMP

5.19.2.1 Recreation Opportunities, Facilities, Use, and Recreation Special Use Permits

In general, construction of the 2021 MMP, could result in cumulative effects to the recreation setting due to additional noise and activity, cumulative effects to recreation experiences due to access delays, and further reduced recreation opportunities due to noise and wildlife displacement, but cumulative

construction-related effects would be temporary and conclude when the 2021 MMP construction activities concluded.

Other mining-related activities in the CEA would decrease the area for dispersed recreation due to physical development and wildlife displacement and also would decrease the overall area available for any recreation and permitted use displaced from the CEA due to impacts to recreation from the 2021 MMP. Development in the Big Creek area also may result in displacement of recreation and permitted use to other areas, possibly to campgrounds and wilderness trailheads south of Stibnite Road (CR 50-412). This displacement could increase recreation and permitted use within the analysis area, which may already see an increase in recreation use due to new motorized access, in addition to displacement of some recreation use to other areas. The South Fork RAMP, and the East Fork RAMP may in the short term also reduce the area available for displaced recreation use from the 2021 MMP and could result in displaced recreation use during restoration and development activities. Therefore, the reasonably foreseeable projects in combination with the 2021 MMP may result in cumulative effects to recreation use, recreation opportunities, and recreation special use permits.

5.19.2.2 ROS Classes and Physical Setting

Planned restoration projects of forest and roads would enhance the natural appearance of the greater cumulative area. However, mining and other development projects would likely decrease the natural appearance of the area and may lead to a decrease in non-motorized areas due to mine operations and new access roads, particularly north of Stibnite Road (CR 50-412) towards Big Creek. Overall, the RFFAs in combination with the 2021 MMP could result in cumulative effects to the designated ROS classes and the estimated ROS physical setting by increasing development, resulting in an overall increase in more developed ROS settings and a decrease in less developed settings within the CEA.

5.19.3 Johnson Creek Route Alternative

Cumulative effects would be similar to those described for the 2021 MMP; however, cumulative effects to recreation use, opportunities, and the recreation setting related to displaced use would be less due to use of the Johnson Creek Route instead of the creation of the Burntlog Route, which would both displace recreation use and increase recreation use in the CEA. However, any cumulative effects along Johnson Creek Road and Stibnite Road would be increased due to use as part of the Johnson Creek Route.

5.20 Scenic Resources

For scenic resources, the CEA is broader than the analysis area for direct and indirect effects; and in this case, includes areas on NFS lands in Valley and Adams counties (**Figure 3.20-1**), including several projects in the PNF and BNF.

5.20.1 No Action Alternative

Under the No Action Alternative, neither action alternatives would be implemented, and no development of the SGP or supporting facilities would occur or be introduced. Some reclamation activities would still occur, such as those associated with the Meadow Gold exploration project and the Phase I of the ASAOC. These activities would contribute some visual changes to the landscape in the area of the historical mine

activities, but others would persist and continue to contribute to the cumulative visual changes to the landscape in the forest.

5.20.2 Action Alternatives

Legacy mining activities have impacted visual resources, including surface disturbances along roads, mining pits, and facilities; however, due to rugged terrain, visual impacts of these activities are highly localized. Activities associated with mineral exploration would locally increase the amount of vegetation removed to accommodate drill pad sites and improvement of access roads. Timber harvest activities also would contribute incrementally to landscape modification through the removal of vegetation over time. Forest management–related plans for noxious weed management, rehabilitation, and reclamation would result in a positive cumulative effect for the landscape by enhancing the natural, rugged setting that is characteristic of this area. There would be no new major utility corridors introduced through infrastructure development projects. Some mineral development projects have been put on hold in the CEA; but overall, mining activity has not significantly modified these backcountry landscapes. However, RFFAs, such as the Stallion Gold Horse Heaven project, could change that. The characteristic backcountry landscape setting would continue to be modified locally by these activities, but collectively, they would not trend toward a more highly developed or industrial-type setting. Disturbance associated with the SGP components would be reclaimed. Most disturbance areas would be reclaimed concurrently or at mine closure, and the visual effects of the disturbance would gradually decrease as vegetation matures reducing color contrasts. For areas where revegetation is not possible, color contrasts would be permanent because of the coloration and angular nature of the granitic rock against more surficial sedimentary type rocks. Permanent visual contrast would range from minor to major, and would contribute to the cumulative effects from past, present, and reasonably foreseeable actions.

5.21 Social and Economic Conditions

The CEA for social and economic conditions is the same area as the analysis area as described for direct and indirect socioeconomic effects (**Figure 3.21-1**). Other past, present, and reasonably foreseeable actions occurring on federal and non-federal lands, with similar effects that overlap in time and space include forest management, mining and mine reclamation, roadway changes, campground upgrades, and winter motorized use of forest roads.

Past and present mining and mining-related activities have occurred around the Stibnite Mining District for over 100 years. These activities have contributed to the local analysis area’s present socioeconomic conditions.

5.21.1 No Action Alternative

Under the No Action Alternative, the SGP would not be approved by the Forest Service. There would be no open-pit mining or ore processing in the SGP area, no new or upgraded access roads, no changes to utilities, and no construction of off-site facilities. Although none of the RFFAs identified in **Table 5.1-2** would physically overlap with action alternative disturbance footprints, the existing or future activities such as forest management, motorized use of road systems, fire suppression, prescribed fire and wildfire, dispersed camping, fishing, and hunting activities would continue in the CEA and vicinity. These existing and future activities would remain and continue to contribute to the cumulative socioeconomic effects on

the local area's residents, businesses, or economy triggered by or related to the RFFAs. Under No Action, continuation of the Golden Meadows Exploration Project and activity associated with the ASAOC would have negligible cumulative effects to socioeconomic conditions on the local area's residents, businesses, and economy. Therefore, the No Action Alternative would result in negligible cumulative effects on the local area's residents, businesses, and economy.

5.21.2 Action Alternatives

Social and economic conditions and effects within the CEA have occurred and would occur from past, present, and RFFAs. These effects have occurred primarily in Valley and Adams counties in terms of tax revenues, purchases of equipment and other services, and resulting employment income impacts.

The 2021 MMP, in addition to the reasonably foreseeable Stallion Gold Horse Heaven mining project, would provide the economic benefits associated with mine operations. The anticipated increases in the populations of Valley and Adams counties associated with in-migration as a result of these projects would be minor to moderate depending on the actual distribution of in-migrating resident locations. Further, there would be a related level of adverse cumulative effects to housing availability, housing affordability, community services, and infrastructure.

The SGP, ASAOC, and East Fork RAMP could have potential positive cumulative effects with regard to antimony and arsenic concentrations in water and reduced sedimentation; these effects could have an indirect effect on socioeconomics for activities benefiting from improved water quality such as recreation and fisheries restoration.

The cumulative effects under the Johnson Creek Route Alternative would be the same as under the 2021 MMP.

5.22 Environmental Justice

The CEA for environmental justice conditions is the same area as the analysis area for direct and indirect effects (**Figure 3.22-1**). Other past, present, and reasonably foreseeable actions occurring on federal and non-federal lands, with similar effects that overlap in time and space include forest management, mining and mine reclamation, roadway changes, campground upgrades, and winter motorized use of forest roads (**Tables 5.1-2 and 5.1-3**).

5.22.1 No Action Alternative

Cumulative effects associated with the No Action Alternative include past and present actions, as well as RFFAs. These include ongoing and planned mining activities, exploratory drilling, reclamation and closure of mining and processing facilities, recreation and tourism, timber harvest on public lands, and transportation projects. These projects could affect Tribal communities with environmental justice concerns by changing access to, availability, and/or quality of subsistence resources and/or traditional use area conditions, but the SGP would not contribute any additional impacts or restricted access.

5.22.2 Action Alternatives

Cumulative impacts resulting from constructing and operating the SGP and other simultaneous construction projects and RFFAs could alter access to Tribal traditional use areas and subsistence resources; use of identified sacred sites within the affected area (e.g., noise, vibration, and visual impacts); cause habitat loss, behavioral disturbance to resources from increased noise and human activity, concerns about contamination of resources, and avoidance by Tribal members of traditional use areas; and discourage and restrict subsistence use by Tribal members in proximity to construction activity locations.

The SGP and RFFAs may facilitate increased public and Tribal member access, particularly for recreational users. The South Fork RAMP and East Fork RAMP include numerous actions relating to motorized and non-motorized access and improvements of recreation facilities within the SFSR watershed. Other RFFAs, such as development in the Big Creek area, may result in displacement of recreation to other areas, possibly increasing recreation and permitted use within the analysis area, which may already see an increase in recreation use from the SGP. This increased access and use could result in potential indirect adverse cumulative impacts to Tribal members due to increased human activity if it results in actual or perceived decreases in their access to, availability, and/or quality of subsistence resources and/or traditional use area conditions.

In general, cumulative effects of the 2021 MMP or the Johnson Creek Route Alternative with other RFFAs and their potential to impact subsistence resource availability on Tribal communities with environmental justice concerns would potentially be adverse.

5.23 Special Designations

5.23.1 Wilderness

For untrammeled, natural, undeveloped, solitude, remoteness, and primitive recreation opportunities quality of wilderness character, the CEA includes NFS lands and projects in the Krassel and McCall Ranger Districts.

The following RFFAs have been identified that, in conjunction with the development of the SGP and the South Fork RAMP, could contribute to cumulative effects on the untrammeled, natural, and solitude, remoteness, and primitive recreation qualities of wilderness character.

- Stallion Gold Horse Heaven Project,
- East Fork RAMP, and
- Big Creek Hazardous Fuels Reduction Project

5.23.1.1 No Action Alternative

Under the No Action Alternative, the SGP would not be implemented. Topography and the distance between the FCRNRW and human activity at the SGP and locations of the RFFAs would not measurably change the untrammeled, natural, undeveloped, or solitude, remoteness, and primitive recreation opportunities quality of wilderness character compared to existing conditions.

5.23.1.2 2021 MMP

Untrammelled

Under the 2021 MMP, the increase in human activity during the implementation of the RFFAs and construction and operation of the mine-related facilities could change the natural distribution of wildlife and plants. Increased human activity from project or recreation activities could change wildlife distribution into or from the FCRNRW or recommended wilderness areas. The extent where noise from these activities could change the natural distribution of wildlife would vary depending upon the season activities were implemented, duration, topography, and weather. The potential for non-native plant species establishment could increase. Surveys and treatments for non-native invasive species are ongoing in the cumulative impact analysis area. Each project is reviewed or surveyed for protected plant species and mitigation is developed where any of these species are found.

The RFFAs would be implemented during daylight hours on weekdays, limiting the extent and duration of potential changes to wildlife distribution. Surveys and implementing treatments as described in the Frank Church-River of No Return Noxious Weed Prevention Plan and the Integrated Weed Management program for the PNF and BNF would reduce the spread of non-native plant species. As such, the 2021 MMP, in combination with the RFFAs, could cumulatively impact the untrammelled quality of wilderness character.

Natural

Plants

The activities from the RFFAs and the 2021 MMP would result in additional land disturbance. The potential for non-native plant species establishment could increase either from project activities or from changes in recreation use. These effects have or would occur primarily along the western boundary of the FCRNRW near the Idaho-Valley County border and Logan Creek, or the recommended wilderness areas west of the SFSR. The potential for an increase in non-native plant species to establish with FCRNRW or recommended wilderness would be influenced by existing vegetation, site conditions, and non-native plant species characteristics. The extent where non-native plant species could become established is unknown. Surveys and implementing treatments as described in the Frank Church-River of No Return Noxious Weed Prevention Plan and the Integrated Weed Management program for the PNF and BNF would reduce the spread of non-native plant species. The potential for introduction and spread of non-native plant species increases as visitors may transport vegetative matter on clothing and equipment along attractive, improved trails. As such, the 2021 MMP and RFFAs would cumulatively impact natural quality of wilderness character where non-native plant species become established.

Fish and Wildlife

The SGP and the RFFAs would disturb sensitive wildlife species within the FCRNRW and recommended wilderness areas. These actions could increase wildlife mortality from vehicles. The extent where the natural wildlife distribution and movement could change or increase in mortality is unknown. A cumulative impact to the natural quality of wilderness character would occur where there is a decrease in wildlife habitat quality, an impact on wildlife distribution, or mortality from vehicles.

The South Fork and East Fork RAMPs in combination with the 2021 MMP could reduce sediment in the SFSR drainage and barriers to fish passage. Reducing sediment in the drainage would improve water quality and indirectly fish habitat quality.

Replacing culverts could reduce barriers to fish passage and improve aquatic species habitat connectivity within the SFSR drainage. Long-term improvements to fish habitat quality could increase fish populations in the SFSR drainage. The increase in fish populations in a specific stream is unknown. The natural quality of wilderness character could improve where sediment load in streams decline and barriers to fish passage are removed.

Solitude, Remoteness, and Primitive Recreation Opportunities

The extent that wilderness visitors see or hear human activities could cumulatively increase. The extent where noise from human activity within the FCRNRW and recommended wilderness areas is influenced by topography and weather. The duration of increased noise from the RFFAs and project activities would be temporary as implementing the RFFAs would be completed in 10 days to several months in a specific area during weekdays. A temporary cumulative impact on solitude, remoteness, and primitive recreation opportunities quality of wilderness character would occur.

5.23.1.3 Johnson Creek Route Alternative

Under the Johnson Creek Route Alternative, the cumulative impacts described for the 2021 MMP would essentially be identical, although the impacts would be somewhat reduced as the Burntlog Route would not be constructed and the location of impacts would be shifted to the Johnson Creek Route area.

5.23.2 Wild and Scenic Rivers

The CEA for WSRs includes all federally managed land and actions in the SFSR watershed, and includes any action that could affect other eligible, suitable, or designated WSR waterways in the watershed. The Secesh River is in the SFSR watershed and is considered suitable for inclusion in the National WSR System. The upper and lower portions of the Secesh River are classified as Recreational, and the central portion, between NFST 080 and the Lick Creek Road portion of McCall-Stibnite Road (CR 50-412), is classified as Wild.

Cumulative effects associated with the SGP consider the range of existing activities and RFFAs and their potential effects with respect to WSR. Past and present actions that have, or are currently, affecting WSR and RFFAs that could cumulatively contribute to WSR impacts in the CEA are described in **Sections 5.1.2 and 5.1.3** and have the following effects with respect to the WSR indicators:

- No cumulative impacts to the free-flowing characteristics of eligible and suitable WSRs.
- Improvements to the water quality of eligible, suitable, and designated WSRs would likely result from watershed management; CERCLA actions; and bridge/culvert improvement projects.
- Improvements to fish ORVs would likely result from the RFFAs.
- No impacts to the preliminary Wild, Scenic, or Recreational classification for eligible and suitable WSRs from these projects combined with impacts from the SGP.

5.23.3 Inventoried Roadless Areas

Effects on IRAs and the lands contiguous to unroaded areas could overlap in space and time with the direct and indirect effects and the following RFFAs:

- Stallion Gold Horse Heaven Project,
- South Fork RAMP,
- East Fork RAMP, and
- Big Creek Hazardous Fuels Reduction Project.

Cumulative effects from the SGP and RFFAs could affect naturalness and outstanding opportunities for solitude and primitive types of recreation.

5.23.3.1 No Action Alternative

Naturalness

The No Action Alternative could affect the wilderness attributes of naturalness and undeveloped character which inform impacts to roadless characteristics. Under the No Action Alternative, surface exploration authorized as part of the RFFAs could increase the potential for non-native invasive plant species to spread. The surface exploration for the Horse Heaven Project could disturb soils and remove vegetation in the Horse Heaven IRA while the Golden Meadow project and the RFFAs could disturb soils and remove vegetation adjacent to Sugar Mountain IRA. Surface disturbing activities could increase the spread of non-native invasive plant species into Horse Heaven IRA and the adjacent area of Sugar Mountain IRA. The extent where non-native invasive plant species could become established is unknown. Surveys and treatments implemented for the RFFAs would reduce the cumulative effects on the natural roadless character.

Outstanding Opportunities for Solitude and Primitive Recreation

The wilderness attribute of outstanding opportunities for solitude or primitive and unconfined recreation corresponds with the roadless area characteristic of primitive, semi-primitive non-motorized, semi-primitive motorized recreation opportunity spectrum classes of dispersed recreation. Under the No Action Alternative, noise from surface exploration authorized for the Horse Heaven and Golden Meadow projects combined with the East Fork RAMP and the ASAOC activities, could decrease outstanding opportunities for solitude within the area of Sugar Mountain, Meadow Creek, and Horse Heaven IRAs. The noise extent from the Horse Heaven and Golden Meadows projects mineral exploration in combination with the RFFAs is unknown. Topography and distance between surface exploration activities and the RFFAs influence the area where noise could decrease outstanding opportunities for solitude and primitive recreation.

5.23.3.2 2021 MMP

Naturalness

The 2021 MMP could affect the wilderness attributes of naturalness and undeveloped character which inform impacts to roadless characteristics. Surface disturbance and vehicles from SGP and RFFA

activities could spread non-native plant species. Depending on site conditions, and non-native plant species characteristics, non-native invasive plant species could spread into Sugar Mountain, Horse Heaven, and Meadow Creek IRAs. The extent where non-native invasive plant species could become established within these IRAs is unknown. Surveys and treatments implemented for the 2021 MMP and RFFAs would reduce the potential for non-native species to spread.

The 2021 MMP and the RFFAs could result in temporary to short term barriers to wildlife movement, disturbance, and increase vehicle-wildlife collisions. Wildlife mortality and distribution would be influenced by existing vegetation, site conditions, the wildlife species sensitivity to disturbance. The extent where wildlife distribution and movement could change or increase in vehicle-wildlife collisions is unknown. Changes in wildlife distribution from the activities associated with the 2021 MMP and the RFFAs could decrease natural roadless character in Meadow Creek, Horse Heaven, and Sugar Mountain IRAs.

Blowout Creek rock drain, hazardous fuel reduction, and potential changes to the miles of roads could reduce sediment in streams within the cumulative impact analysis area. Reducing sediment would improve water quality and long-term fish habitat quality. The extent and locations of streams where fish habitat quality could improve is unknown; however, increases in fish habitat quality within IRAs would improve natural roadless character.

Outstanding Opportunities for Solitude and Primitive Recreation

The wilderness attribute of outstanding opportunities for solitude or primitive and unconfined recreation corresponds with the roadless area characteristic of primitive, semi-primitive non-motorized, semi-primitive motorized recreation opportunity spectrum classes of dispersed recreation. Noise from the 2021 MMP and the RFFAs would decrease outstanding opportunities for solitude within Sugar Mountain, Horse Heaven, and Meadow Creek IRAs and lands contiguous to unroaded areas. The intensity of the effect would vary depending upon the forest visitor's sensitivity. Human activity and noise during the 20 plus years of mine construction, operation, and closure and reclamation and the RFFAs decrease the area with outstanding opportunities for solitude. The extent where these effects could decrease roadless character within IRAs and lands contiguous to unroaded areas is unknown and influenced by topography, vegetation, and when activities for the RFFAs would be implemented.

5.23.3.3 Johnson Creek Route Alternative

Naturalness

The 2021 MMP could affect the wilderness attributes of naturalness and undeveloped character which inform impacts to roadless characteristics. Surface disturbance and vehicles from the Johnson Creek Route Alternative and implementation of the RFFAs could increase the potential for non-native plant species to spread into IRAs and lands contiguous to unroaded areas. Using Johnson Creek Route for mine access, combined with the RFFAs, could increase the vehicle traffic and increase the potential for non-native invasive plant species to spread. The extent where non-native invasive plant species could become established is unknown. Existing vegetation and site conditions would influence the spread of non-native invasive plant species. Surveys and treatments implemented for the Johnson Creek Route Alternative and the RFFAs would cumulatively reduce the effects on the natural roadless character.

Traffic on Johnson Creek Route during mine construction and operation, combined with the RFFAs, would increase habitat fragmentation and barriers to movement, noise, and potential vehicle-wildlife collisions. These actions could increase wildlife mortality and change the distribution of wildlife within Sugar Mountain and Horse Heaven IRAs. The potential for an increase in wildlife mortality and habitat fragmentation would be influenced by existing vegetation, site conditions, and wildlife sensitivity to disturbance. The extent where wildlife distribution and movement could change is unknown; however, areas within the IRAs and lands contiguous to unroaded areas that are avoided by wildlife would have less natural roadless character.

Outstanding Opportunities for Solitude and Primitive Recreation

The wilderness attribute of outstanding opportunities for solitude or primitive and unconfined recreation corresponds with the roadless area characteristic of primitive, semi-primitive non-motorized, semi-primitive motorized recreation opportunity spectrum classes of dispersed recreation. Forest visitors avoiding the SGP or areas of IRAs accessed from Johnson Creek Route and changes from access management plans could decrease outstanding opportunities for solitude within IRAs and lands contiguous to unroaded areas. The intensity of the effect would vary depending upon the forest visitor's sensitivity. Human activity and noise related to the and the RFFAs could decrease outstanding opportunities for solitude. The extent where these effects could decrease roadless character within IRAs and lands contiguous to unroaded areas is unknown and would be influenced by topography, vegetation, and timing of when RFFAs are implemented.

5.23.4 Research Natural Areas

The RFFAs that could contribute to cumulative changes in research values, ecological site conditions, or change ecological processes within the CEA are:

- South Fork RAMP, and
- Big Creek Hazardous Fuels Reduction Project.

The SGP and these RFFAs include surface disturbing activities or changes in human activity that could indirectly affect research values and vegetation communities' conditions within an RNA.

5.23.4.1 No Action Alternative

Under the No Action Alternative, the exploration and ASAOC activities at the SGP site and the RFFAs are over 6 miles from the RNAs. Belvidere Creek, the RNA nearest to the SGP, is approximately 6 miles north, reducing the potential for cumulative effects from the RFFAs and SGP reclamation and monitoring activities.

5.23.4.2 2021 MMP

The RFFAs would not impact the RNAs; therefore, no cumulative effects would occur in the RNAs.

5.23.4.3 Johnson Creek Route Alternative

Under the Johnson Creek Route Alternative, during mine construction and operation, recreation use could increase in other areas, such as the SFSR and Big Creek drainages.

Improvements and maintenance of Stibnite Road as part of the Johnson Creek Route could indirectly increase recreation use in the Big Creek drainage. Recreation use in the Big Creek drainage during the 20 years of mine construction and operation, combined with the implementation of the Big Creek Hazardous Fuels Reduction Project, could increase the potential for non-native invasive plant species to spread into Belvidere RNA, although this potential is low.

Increased recreation use from forest visitors avoiding the SGP, areas with increased traffic volumes and human activity, combined with surface disturbance associated with implementing the RFFAs, could increase the potential non-native invasive plant species to spread into Belvidere RNA. The potential for non-native plant species to spread into the RNA depends upon vegetation conditions and the non-native plant species characteristics.

Changes in vegetation community composition and structure within the Belvidere RNA would occur where non-native invasive plant species become established, soils compacted, or trails widen. Changes to vegetation community composition and structure would result in the long-term loss of research values, ecological site conditions, and ecological processes within the Belvidere RNA.

5.24 Tribal Rights and Interests

For tribal rights and interests, the CEA is larger than the analysis area for direct and indirect effects, encompassing lands administered by both the PNF and BNF, and other federal, state, and private lands within and adjacent to these National Forests (no figure). Cumulative effects to the Tribes extend well beyond NFS lands, and this larger area lends a broader landscape perspective to maintaining ecological sustainability in the National Forest, which support tribal rights and interests. The Nez Perce Tribe, Shoshone-Bannock Tribes, and the Shoshone-Paiute Tribes, and their traditional and cultural affiliations, trading networks, and other intertribal communication pathways existed long before current governmental and administrative boundaries and continue to exist irrespective of current delineations. For this reason, it is recognized that in addition to the SGP, other mining project developments expected to occur in the analysis area, Valley County, and possibly elsewhere in the region also may contribute to adversely affecting traditional tribal cultural practices and places that have significance to tribal cultural identities.

Past actions on federal, state, and private land have impacted tribal interests in the CEA. Mining and other activities on federal lands have impacted tribal rights and interests primarily by restricting access, but also by removing natural resources protected under treaties. Many of the past human activities (primarily historic mining in the analysis area) were conducted prior to statutory and regulatory protection measures for natural and cultural resources resulting in the loss of an unknown number of tribal resources and practices.

Descriptions of past, present, and RFFAs considered as part of the cumulative effects analysis are included in **Table 5.24-1** and presented to summarize impacts from these types of activities for tribal rights and interests.

Table 5.24-1 Potential Cumulative Effects to Tribal Rights and Interests

Cumulative Project Type	Potential Effects to Tribal Rights and Interests
Mineral exploration and mining activities	Historic mines in the analysis areas have changed the landscape over time through removal of vegetation and displacement of soils. Currently planned or future mine development would further alter the landscape from its natural state during exploratory drilling, development, and operations. During exploratory drilling, development, and operations, the increased ground disturbance may disturb tribal treaty rights, access to usual and accustomed fishing places and springs, tribal resources, historic properties, sacred sites or places, TCPs, and CLs.
Closure and Reclamation Projects/ Comprehensive Environmental Response, Compensation, and Liability Act Actions	Projects that are currently undergoing reclamation or will in the future would likely cause further damage to any tribal treaty rights, tribal resources, historic properties, sacred sites or places, TCPs, and CLs in the area. These projects would likely be closed and reclaimed, which involves the removal of some of the infrastructure and reclamation of the land to restore native wildlife and plant habitats that are important to Tribes. However, mature forest types would not be available for decades. Several Removal Actions were conducted by the Forest Service, EPA, and Exxon-Mobil Corporation in the mine site and nearby. Perpetua is currently conducting such activities under a current ASAOC with EPA and Forest Service. These actions have the potential to restore landscapes that can eventually restore traditional tribal resources by removing potentially hazardous wastes, mining tailings, and capping historic waste rock dumps.
Transportation projects	Road maintenance, improvement projects, and culvert replacements are likely in the analysis area. These types of improvements cause ground disturbance that represents a potential impact to tribal resources, historic properties, sacred sites or places, TCPs, and CLs. Maintenance of existing roadways would likely involve short-term construction activity, while new roadways would have a more permanent effect and would impact previously undisturbed areas. Also related to transportation projects are gravel quarry or gravel pit development to provide fill material for road construction. This activity would be a potential impact to any tribal resources present in those areas.
Infrastructure Development	Local communities perform upgrades in infrastructure such as electrical transmission lines. These development activities can cause ground disturbance that could impact tribal resources, access to usual and accustomed fishing places and springs, historic properties, sacred sites or places, TCPs, and CLs. These activities can introduce visual and solitude impacts to tribal religious sites.
Recreation and tourism	Recreational activities (i.e., camping, hiking, hunting, trapping, trail riding, firewood harvest, fishing, etc.) are likely to continue to impact traditional tribal resources and potentially place pressure or compete with tribal treaty rights such as access to traditional fishing locations in the future. Increased road and trail networks open new areas to additional human disturbance, which can lead to potential vandalism or accidental destruction of tribal resources, historic properties, sacred sites or places, TCPs, and CLs.
Wildfire and noxious weed control projects	Wildfires have affected tribal resources throughout the analysis areas either by burning vegetation or by increasing visibility of Native American archaeological sites. Additional wildfires are likely to affect tribal resources in the future in the same way. Control of invasive and noxious plant species could have a minimal effect on tribal resources as mechanical or hand-pulling would increase ground surface visibility and would cause ground disturbance.
Watershed Management	This can involve repairs and reclamation of roads and recreation site repairs to prevent erosion into watersheds, but many projects involve only monitoring of erosion of roadway sediments into watersheds and this would not have an impact on tribal resources.

5.24.1 No Action Alternative

Cumulative effects associated with the No Action Alternative could occur with approved activities associated with the Golden Meadows Exploration Project or the proposed Stallion Gold Horse Heaven Project, such as exploratory drilling for mineral resources and construction of support facilities either by Perpetua or other groups on private land. Surface water quality associated with the mine site would improve to an extent due to the removal of legacy mining materials in contact with surface waters in Meadow Creek and the East Fork SFSR under the ASAOC. Cumulative impacts in the analysis area to tribal resources would be minimal in comparison with those under the action alternatives.

5.24.2 Action Alternatives

The 2021 MMP, taken together with other concurrent actions and RFFAs would create an increase in ground disturbance, visual and noise intrusions, increased public access in some areas and restricted access in other areas within the CEA. These cumulative actions would cause disturbances that may impact tribal traditional practices, access to usual and accustomed fishing places and springs, fisheries restoration activities, and resources of concern within the CEA.

Cumulative effects to tribal rights and interests under the Johnson Creek Route Alternative would be similar to the 2021 MMP.