

4.6 NOISE

This section addresses impacts on human noise-sensitive receivers during construction, operation, and closure of the Stibnite Gold Project (SGP). Potential noise impacts on recreational users are included; however, potential indirect impacts on recreational or other social resources that may occur due to changes in the noise environment are discussed in the relevant resource sections of this environmental impact statement as applicable. Potential noise impacts on biological resources, such as fish and wildlife, and threatened and endangered species are discussed in Sections 4.12, Fish Resources and Fish Habitat, and Section 4.13, Wildlife and Wildlife Habitat.

4.6.1 Effects Analysis Indicators and Methodology of Analysis

The analysis of effects of noise includes the following issue and indicators:

Issue: The SGP may cause disturbance to Noise Sensitive Receivers (NSRs) such as occupied residences and campgrounds.

Indicators:

- SGP-attributed noise exceeds 55 decibels on the A-weighted scale (dBA) day-night noise level (L_{DN}) at the exterior use area of an NSR, or 55 dBA average hourly noise level (L_{EQ1h}) at any time at an exterior use area.
- SGP-attributed noise exceeds 45 dBA L_{DN} at the interior portion of a residential NSR.
- SGP-attributed noise causes the baseline outdoor ambient (i.e., existing) noise level to increase by more than 5 dBA in the vicinity of an NSR.
- SGP-attributed noise causes the resulting indoor or outdoor ambient noise level to exceed 60 dBA equivalent sound level (L_{EQ}).

Predicted increases in outdoor noise levels due to the SGP are calculated at a given sensitive receiver using reference sound levels of typical equipment, with typical acoustical usage factors (i.e., its loudest condition) for each type of equipment (Federal Highway Administration [FHWA] 2006), and baseline ambient noise data. Except where otherwise specified, noise levels are calculated using the noise analysis tool developed by the U.S. Department of Transportation, FHWA Roadway Construction Noise Model (RCNM) version 1.1 (FHWA 2006), using the following equations:

- To add equal sound pressure levels (SPLs):

$$SPL_{Total} = SPL1 + 10\log_{10}(N)$$

Where: SPL_{Total} = total sound pressure level produced by multiple identical sources

$SPL1$ = SPL of one source

N = number of identical sources to be added (must be more than 0)

- To add unequal sound pressure levels:

$$\text{SPL}_{\text{Total}} = 10\log_{10}[10^{\text{SPL}_1/10} + 10^{\text{SPL}_2/10} + 10^{\text{SPL}_n/10}]$$

Where: $\text{SPL}_{\text{Total}}$ = total sound pressure level produced.

SPL_1 , SPL_2 , and SPL_n represent the first, second, and nth SPL, respectively.

- To calculate a noise level from a point source at a receiver:

$$\text{dBA}_2 = \text{dBA}_1 + 20\log_{10}(D_1/D_2)$$

Where: dBA_1 = noise level at a distance D_1 from the point source.

dBA_2 = noise level at distance D_2 from the same point source.

- To calculate a noise level from a line source at a receiver:

$$\text{dBA}_2 = \text{dBA}_1 + 10\log_{10}(D_1/D_2)$$

Where: dBA_1 = noise level at a distance D_1 from the point source.

dBA_2 = noise level at distance D_2 from the same point source.

Traffic noise levels are calculated using the noise analysis guidance provided in the Federal Transit Administration's (FTA's) Transit Noise and Vibration Assessment Guidance, using the following equations (FTA 2018):

- To calculate average hourly traffic noise levels:

$$L_{\text{EQ}}(h) = \text{SEL}_{\text{ref}} + 10\log(V) + C_s\log(S/50) - 35.6$$

Where: SEL = Sound exposure level and SEL_{ref} = Source exposure reference level at 50 feet from roadway, at 50 miles per hour (mph).

V = hourly volume of vehicle type, in vehicles per hour.

C_s = Speed constant.

S = average vehicle speed, in mph.

- SEL_{ref} s provide in Table 4-11 of the FTA guidance (2018) for diesel-powered buses (82 dBA) and for automobiles and vans (74 dBA) is used to represent heavy and light trucks and light vehicles, respectively.

Blasting noise levels are calculated using guidance provided in Dyno Nobel 2010.

The following assumptions and approaches were used in the noise impact analyses:

- SGP-related noise levels and noise level increases at NSR locations are predicted by considering noise generated by major SGP-related noise sources (e.g., the mine site, access roads, utilities, and off-site facilities) during construction, operations, and closure activities, as well as the existing ambient or background noise levels at NSR locations. Generally, predicted noise levels conservatively apply only three attenuation

(i.e., reduction) factors: geometric divergence (i.e., distance), ground absorption, and atmospheric absorption.

- The estimate of total average hourly noise levels from a noise source is considered to be conservative, assuming the simultaneous operation of all the equipment listed in the respective equipment list tables for a particular SGP component and/or SGP phase.
- L_{DN} levels are considered to be the baseline ambient noise levels at residential sites and campgrounds due to the sensitivity of these NSRs to nighttime noise levels. The average daytime ambient L_{EQ1h} level is considered to be the baseline ambient noise level at non-residential sites, and other recreational areas.
- SGP-related noise levels at NSRs would depend upon the type and number of equipment operating at the same time in specific locations or areas, the exact distance between the noise source or sources and the NSR, in addition to atmospheric conditions and intervening ground, vegetation, and terrain conditions.
- The predicted SGP-related noise levels at NSRs are compared to the noise indicators listed above to assess the intensity of the noise impact.
- For purposes of this noise analysis, and because the distance between the mine site and the nearest NSR is considerably greater than the largest dimension of the area that encompasses the mine pits, development rock storage facilities, tailings storage facility, and processing facilities associated with the mine site, the entire mine site is represented by a single aggregate acoustical point source that is co-located with the rock crushing plant (in the Ore Processing Plant Area) exposed to the outdoors (**Figure 2.3-2**, Alternative 1 Mine Site Layout).

4.6.2 Direct and Indirect Effects

4.6.2.1 Alternative 1

4.6.2.1.1 CONSTRUCTION

Noise generated during the construction phase would include noise from construction activities at the mine site, in addition to noise from the construction of off-site access roads, utilities, and facilities. Noise levels generated by these activities are described below, followed by a discussion of noise impacts on identified NSRs.

4.6.2.1.1.1 Mine Site

Construction activities at the mine site would require the use of a variety of heavy industrial-type equipment. **Table 4.6-1** lists noise levels for construction equipment that would likely be used at the mine site during the construction phase.

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Table 4.6-1 Major Noise Sources and Estimated Maximum Noise Levels at the Mine Site During the Construction Phase

Equipment¹	Total Number of Units (max)²	Acoustical Usage Factor (%)³	Maximum Noise Levels per Unit, L_{MAX} at 50 feet (dBA)⁴	Predicted Total Noise Level, L_{EQ} at 50 feet (dBA)⁵
Front-end wheel loader (Cat 994 or equivalent)	1	40	79	75
Front-end loader (Cat 990 or equivalent)	1	40	79	75
Haul trucks (Cat 789 or equivalent w/200-ton capacity)	3	40	76	77
Haul Trucks (Cat 740 or equivalent)	3	40	76	77
Dozers (D10 or equivalent)	2	40	82	81
Dozers (D6 or equivalent)	1	40	82	78
Water trucks (Cat 777 chassis or equivalent)	1	40	76	72
Motor Graders (Cat 160M or equivalent)	2	40	85	84
Excavator (Cat 349 or equivalent)	1	40	81	77
Low-boy tractor (Cat 777 chassis or equivalent)	1	40	84	80
Vibratory compactor (Cat CS76 or equivalent)	1	20	83	76
Mobile Light Plants	6	50	81	86
Fuel Service Truck	1	40	76	72
Mechanics Service Truck	2	40	75	74
Lube Service Truck	1	40	76	72
Welding Service Truck	2	40	74	73
Boom Truck	2	40	74	70
Skid Steer Truck	1	40	79	75
Tire Handler Truck	1	40	79	75
Crew vans	7	40	75	77
Pickups	25	40	75	83

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Equipment¹	Total Number of Units (max)²	Acoustical Usage Factor (%)³	Maximum Noise Levels per Unit, L_{MAX} at 50 feet (dBA)⁴	Predicted Total Noise Level, L_{EQ} at 50 feet (dBA)⁵
ATVs & UTVs	20	50	75	85
Front end loader (Cat 992 or equivalent)	1	40	79	75
Small wheel loader (Cat 930 or equivalent)	1	40	79	75
Off-road extended boom forklift	2	20	75	71
Standard forklifts	2	20	75	71
Skid steer loader (S160 Bobcat or equivalent)	2	40	79	78
Mobile crane	1	16	81	73
Flatbed supply and stake trucks (flatbed truck)	2	40	74	73
Service trucks with compressors and welders	2	40	74	73
Trash truck	1	40	76	72
Total Average Hourly Noise Level				94

Table Source: AECOM 2020

Table Notes:

- 1 Equipment lists as provided in Midas Gold Idaho, Inc. (Midas Gold) 2016, Table 9-2 and Table 10-1, assuming the minimum number of units of each equipment type would be operating at the mine site during the construction phase.
- 2 The total number of equipment units represents an estimated total number of units that would be operating at the mine site during different stages of construction.
- 3 The acoustical usage factor is used to estimate the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during equipment operation. Acoustical usage factor provided in the table are equivalent to default values in FHWA RCNM version 1.1.
- 4 The noise levels listed represent A-weighted maximum sound level (L_{MAX}) (per equivalent measured level provided in FHWA RCNM version 1.1,) measured at a distance of 50 feet from the equipment. The provided L_{MAX} reference values are for general categories of equipment, not specific models.
- 5 Estimated total noise levels emitted by multiple units of the same type, using the equation in Section 4.6.1 for adding equal sound pressure levels.

ATV = All-terrain vehicle; N/A = not applicable; UTV = utility task vehicle.

The estimated total average hourly noise levels from the mine site during the construction phase would be 94 dBA L_{EQ} at the reference distance of 50 feet. Noise from the mine site would attenuate to the threshold of 55 dBA approximately 0.8 mile from the source of activity based on

distance alone. Accounting for ground absorption and atmospheric absorption, noise from the mine site would attenuate to 55 dBA approximately 0.38 mile from the source of activity. Mine development and associated noise during the construction phase would be limited to daytime hours (between 7:00 a.m. and 10:00 p.m.).

4.6.2.1.1.2 Access Roads

Access roads associated with the SGP include the Yellow Pine Route and Burntlog Route. The Yellow Pine Route is the current summer access and includes access from State Highway 55 via Warm Lake Road (County Road [CR] 10-579). The actual Yellow Pine Route is defined as the Johnson Creek Road (CR 10-413) (in summer) or South Fork Salmon River Road (National Forest System Road [FR] 50674) (in winter), and then Stibnite Road portion of the McCall-Stibnite Road (CR 50-412). The Burntlog Route includes a combination of existing roads and a new road connector segment. The Burntlog Route includes access from State Highway 55 via Warm Lake Road (CR 10-579). Additionally, for the Burntlog Route, Burnt Log Road (FR 447) and Thunder Mountain Road (FR 50375) would be upgraded, and Burnt Log Road would be extended to connect to Thunder Mountain Road. The Yellow Pine Route would be used to access the mine site during the first one to two years of construction only, while the proposed Burntlog Route is being constructed. After which, all SGP-related traffic would use the Burntlog Route to access the mine site.

The evaluation of noise impacts from the access roads includes separate analyses for road construction activities along the Burntlog Route, for SGP-related traffic on both the Yellow Pine Route (during the first year of construction) and on the Burntlog Route once it is completed, and from borrow areas along the Burntlog Route.

Road Construction

Road construction activities along the Burntlog Route would involve upgrading existing roads (Burnt Log Road [FR 447] and Thunder Mountain Road [FR 50375]) and constructing a new section of roadway to connect the Burnt Log Road to Thunder Mountain Road. Road construction would include cut and fill; embankment stabilization; laying road base and surfacing material; installing new bridges, drainage channels and culverts; replacing or upgrading existing bridges, culverts, and drainages; and associated activities. Construction activities along the Burntlog Route would be limited to the first year of the construction phase. Construction noise would be short-term, intermittent, and transitory in any one location. **Table 4.6-2** lists noise levels for construction equipment that would likely be used along the Burntlog Route during the construction phase. In the absence of a detailed schedule of equipment for road construction, it was assumed that equipment used would be similar to road maintenance mobile equipment detailed for use during the operations phase, along with a dozer, crane, and two haul trucks.

Table 4.6-2 Major Noise Sources and Estimated Maximum Noise Levels at the Mine Access Road (Burntlog Route) during the Construction Phase

Equipment¹	Total Number of Units (max)²	Acoustical Usage Factor (%)³	Maximum Noise Levels per Unit, L_{MAX} at 50 feet (dBA)⁴	Predicted Total Noise Level, L_{EQ} at 50 feet (dBA)⁵
Motor Graders (Cat 160M or equivalent)	2	40	85	84
Plow Trucks	2	40	85	84
Snow Blower	1	50	85	82
Water trucks (Cat 725 or equivalent)	2	40	76	75
Binding Agent Application Truck	1	40	76	72
Vibratory compactor (Cat CS76 or equivalent)	1	20	83	76
Fuel Service Truck	1	40	76	72
Light Vehicles	2	40	75	74
Rock Rakes (all other equip.)	2	50	84	84
Dozer	1	40	82	78
Crane	1	16	81	73
Haul trucks	2	40	76	75
Total Average Hourly Noise Level				91

Table Source: AECOM 2020

Table Notes:

- 1 Equipment list as provided in Midas Gold 2016, Table 7-1, with the addition of a dozer, crane, and two haul trucks. Assumes the maximum number of units of each equipment type listed in Table 7-1 would be operating along the access road during the construction phase.
- 2 The total number of equipment units represents an estimated total number of units that would be operating along the access road during different stages of construction.
- 3 The acoustical usage factor is used to estimate the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during equipment operation. Acoustical usage factor provided in the table are equivalent to default values in FHWA RCNM version 1.1.
- 4 The noise levels listed represent L_{MAX} (per equivalent specifications provide in FHWA RCNM version 1.1, except as noted) measured at 50 feet from the equipment. The provided L_{MAX} reference values are for general categories of equipment, not specific models.
- 5 Estimated total noise levels emitted by multiple units of the same type, using the equation in Section 4.6.1 for adding equal sound pressure levels.

N/A = not applicable.

The estimated total average hourly noise levels from construction on the Burntlog Route would be 91 dBA L_{EQ} at the reference distance of 50 feet. Noise from access road construction would

attenuate to the threshold of 55 dBA approximately 0.57 mile from the source of activity based on distance alone. Accounting for ground absorption and atmospheric absorption, noise from access road construction would attenuate to 55 dBA approximately 0.28 mile from the source of activity. Road construction and associated noise would be limited to daytime hours (between 7:00 a.m. and 10:00 p.m.).

SGP-Related Traffic During Construction

During the first year of construction, while the Burntlog Route is being built, access to the mine site would be via the Yellow Pine Route. Once construction of the Burntlog Route is completed, SGP-related traffic is assumed to be on the mine access road 24 hours per day.

During the first year of the construction phase, SGP-related traffic volumes on the Yellow Pine Route access roads are estimated at 65 average annual daily traffic (AADT). Heavy vehicles are estimated at 45 AADT and light vehicles at 20 AADT (Midas Gold 2016). Vehicles per peak hour were assumed to be 10 percent of AADT (Washington State Department of Transportation 2018). Based on the estimated traffic volumes and vehicle mix, and typical vehicle speeds of 25 mph, estimated average hourly noise levels from SGP-related traffic on the mine access route during the construction phase would be 48 dBA L_{EQ} at 50 feet from the roadway. This is well below the impact threshold level of 55 dBA.

After it is completed, SGP-related traffic will move from the Yellow Pine Route to the Burntlog Route. SGP-related traffic volumes during this portion of the construction phase are estimated at 68 AADT (48 heavy vehicles and 20 light vehicles; vehicles per hour is assumed to be 10 percent of AADT for peak hour traffic). Estimated average hourly traffic noise levels would be approximately 49 dBA L_{EQ} at 50 feet from the roadway, also below the impact threshold of 55 dBA.

Borrow Areas

The extraction and processing of various types of granular material at borrow sites during the construction phase would require an excavator, loader, and portable rock crusher. **Table 4.6-3** lists noise levels for construction equipment that would likely be used at the borrow sites.

Table 4.6-3 Major Noise Sources and Estimated Maximum Noise Levels from Borrow Sources during the Construction Phase

Equipment¹	Total Number of Units (max)²	Acoustical Usage Factor (%)³	Maximum Noise Levels per Unit, L_{MAX} at 50 ft (dBA)⁴	Predicted Total Noise Level, L_{EQ} at 50 feet (dBA)⁵
Front-end loader	1	40	79	75
Excavator	1	40	81	77
Mobile/portable rock crusher	1	50	85	82
Total Average Hourly Noise Levels				84

Table Source: AECOM 2020

Table Notes:

- 1 Equipment lists as provided in Midas Gold 2016.
- 2 The total number of equipment units represents an estimated total number of units that would be operating at the borrow site during different stages of construction.
- 3 The acoustical usage factor is used to estimate the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during equipment operation. Acoustical usage factor provided in the table are equivalent to default values in FHWA RCNM version 1.1.
- 4 The noise levels listed represent L_{MAX} (per measured levels provided in FHWA RCNM version 1.1, except as noted) measured at 50 feet from the equipment. The provided L_{MAX} reference values are for general categories of equipment, not specific models.
- 5 Estimated total noise levels emitted by multiple units of the same type, using the equation in Section 4.6.1 for adding equal sound pressure levels.

The estimated total average hourly noise levels from each borrow site during the construction phase would be 84 dBA L_{EQ} at the reference distance of 50 feet. Noise from the borrow sites during construction would attenuate to the threshold of 55 dBA approximately 0.26 mile from the source based on distance alone. Accounting for ground absorption and atmospheric absorption, noise from the borrow sites during construction would attenuate to 55 dBA approximately 0.15 mile from the source of activity. Facilities construction and associated noise would be limited to daytime hours (between 7:00 a.m. and 10:00 p.m.).

4.6.2.1.1.3 Utilities

Utilities associated with the SGP include transmission lines, substations, and radio and cell phone communications towers. The SGP involves upgrading 63 miles of Idaho Power Company's existing transmission lines from its Lake Fork Substation south of McCall along its existing right-of-way (ROW) to the Warm Lake Substation to 138 kilovolts (kV) and constructing 8.5 miles of transmission line from the new Johnson Creek substation to the mine site. Transformers would reduce the voltage to 24.9 kV for distribution to facilities within the mine

site. The SGP also would involve upgrades to the existing microwave relay tower located atop a 9,000-foot peak to the east of the mine site and installing radio repeaters and cell phone towers at existing communications sites, including the Meadow Creek Lookout, the Thunderbolt Lookout, the new Landmark Maintenance Facility, and on additional private parcels as needed. Noise impacts associated with utilities would occur primarily during the construction phase. Construction activity associated with the transmission line upgrade and new transmission line construction work is expected to generate the highest noise levels. Substations and communications tower upgrades and construction work is expected to generate lower noise levels; therefore, these are not assessed as separate subcomponents.

Upgrading the existing 63 miles of transmission lines between Lake Fork and the Johnson airstrip would involve replacing existing utility poles and associated equipment (e.g., transformers, cross arms, guy wires, fuses, switches, insulators, etc.). Tree removal and incidental brush and tree trimming also may be required. Constructing the 8.5-mile transmission line between the Johnson Creek Substation to the mine site would involve construction of new permanent and temporary access roads, improvements to existing access roads, removal of danger trees, and the placement of utility poles, conductor, and associated equipment. Helicopters may be used to install utility poles and conductor. Construction noise associated with material and equipment staging, site preparation, brush and danger tree removal, ROW clearing, construction of access roads, installation of transmission line structures including tensioning, and construction-related traffic would be short-term, intermittent, and localized, as construction proceeds along the transmission line corridor.

In the absence of a detailed schedule of equipment for utility construction, it was assumed that the equipment used would be similar to other transmission line projects. **Table 4.6-4** lists equipment for typical construction projects, and associated noise levels. Equipment and noise levels for the construction of permanent or temporary access roads to the transmission line are the same as provided in **Table 4.6-4** for construction of the mine access road.

The estimated total average hourly noise levels for the Lake Fork to Johnson Creek substations transmission line upgrade and Johnson Creek Substation to the mine site transmission line construction would be 84 dBA L_{EQ} at the reference distance of 50 feet. Noise from transmission line construction would attenuate to the threshold of 55 dBA approximately 0.28 mile from the source of activity based on distance alone. Accounting for ground absorption and atmospheric absorption, noise from transmission line construction would attenuate to 55 dBA approximately 0.15 mile from the source of activity.

Johnson Creek Substation to the mine site construction may require helicopter use, which would temporarily increase average hourly noise levels up to 100 dBA L_{EQ} for short periods of time. Noise from transmission line construction with helicopter use would attenuate to the threshold of 55 dBA approximately 1.70 miles from the source of activity based on distance alone. Accounting for ground absorption and atmospheric absorption, noise from transmission line construction with helicopter use would attenuate to 55 dBA approximately 0.66 mile from the source of activity.

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Assuming similar equipment usage as for the Burntlog Route construction, the estimated total average hourly noise levels from transmission line access road construction or upgrades would be 91 dBA L_{EQ} at the reference distance of 50 feet. Noise from transmission line access road construction would attenuate to the threshold of 55 dBA approximately 0.57 mile from the source of activity based on distance alone. Accounting for ground absorption and atmospheric absorption, noise from utility access road construction would attenuate to 55 dBA approximately 0.28 mile from the source of activity. The Lake Fork to Johnson Creek substations transmission line upgrade is not expected to include new access road work. Transmission line work and associated noise would be limited to daytime hours (between 7:00 a.m. and 10:00 p.m.).

Table 4.6-4 Major Noise Sources and Estimated Maximum Noise Levels for Transmission Line Upgrade and Construction during the Construction Phase

Equipment¹	Total Number of Units (max)²	Acoustical Usage Factor (%)³	Maximum Noise Levels per Unit, L_{MAX} at 50 feet (dBA)⁴	Predicted Total Noise Level, L_{EQ} at 50 feet (dBA)⁵
Bucket Truck	1	20	75	68
Backhoe	1	40	78	74
Auger Drill	1	20	84	77
Excavator	1	40	81	77
Tensioner/Puller Truck	1	40	76	72
Boom crane	2	16	81	76
Flatbed supply trucks	2	40	74	73
Crew vans	2	40	75	74
Pickup trucks	2	40	75	74
Total Average Hourly Noise Level without Helicopter Use				84
Total Average Hourly Noise Level with Helicopter Use				100

Table Source: AECOM 2020

Table Notes:

- 1 Equipment list based on similar transmission line projects.
- 2 The total number of equipment units represents an estimated total number of units that would be operating along the transmission line corridor during different stages of construction.
- 3 The acoustical usage factor is used to estimate the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during equipment operation. Acoustical usage factor provided in the table are equivalent to default values in FHWA RCNM version 1.1.
- 4 The noise levels listed represent L_{MAX} (per measured levels provided in FHWA RCNM version 1.1, except as noted) measured at 50 feet from the equipment. The provided L_{MAX} reference values are for general categories of equipment, not specific models.
- 5 Estimated total noise levels emitted by multiple units of the same type, using the equation in Section 4.6.1 for adding equal sound pressure levels.

4.6.2.1.1.4 Off-Site Facilities

Off-site facilities associated with Alternative 1 include the Stibnite Gold Logistics Facility (SGLF) on Warm Lake Road and the Landmark Maintenance Facility near the intersection of Warm Lake (CR 10-579) and Johnson Creek (CR 10-413) roads.

Construction of the off-site facilities would require the use of a variety of heavy construction equipment. **Table 4.6-5** lists noise levels for construction equipment that would likely be used over the course of the off-site facility construction.

Table 4.6-5 Major Noise Sources and Estimated Maximum Noise Levels from Off-site Facilities during the Construction Phase

Equipment¹	Total Number of Units (max)²	Acoustical Usage Factor (%)³	Maximum Noise Levels per Unit, L_{MAX} at 50 ft (dBA)⁴	Predicted Total Noise Level, L_{EQ} at 50 feet (dBA)⁵
Dozer	1	40	82	78
Dump Truck	1	40	77	73
Grader	1	40	85	81
Man Lift	1	20	85	68
Paver	1	50	85	74
Flat Bed Truck	1	40	84	70
Generator	1	50	82	78
Pickup Trucks	3	40	75	76
Total Average Hourly Noise Levels				85

Table Source: AECOM 2020

Table Notes:

- 1 The total number of equipment units represents an estimated total number of units that would be operating at the off-site facilities during different stages of construction.
- 2 The acoustical usage factor is used to estimate the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during equipment operation. Acoustical usage factor provided in the table are equivalent to default values in FHWA RCNM version 1.1.
- 3 The noise levels listed represent L_{MAX} (per equivalent measured level provided in FHWA RCNM version 1.1, except as noted) measured at 50 feet from the equipment. The provided L_{MAX} reference values are for general categories of equipment, not specific models.
- 4 Estimated total noise levels emitted by multiple units of the same type, using the equation in Section 4.6.1 for adding equal sound pressure levels.

N/A = not applicable.

The estimated total average hourly noise levels from each facility during the construction phase would be 85 dBA L_{EQ} at the reference distance of 50 feet. Noise from facility construction would attenuate to the threshold of 55 dBA approximately 0.67 mile from the source based on distance alone. Accounting for ground absorption and atmospheric absorption, noise from facility

construction would attenuate to 55 dBA approximately 0.32 mile from the source of activity. Facilities construction and associated noise would be limited to daytime hours (between 7:00 a.m. and 10:00 p.m.).

4.6.2.1.1.5 Noise Impacts

Table 4.6-6 provides predicted noise levels at NSR locations during the construction phase under Alternative 1, followed by a discussion of predicted noise levels and source-specific impacts at each NSR.

Table 4.6-3 Alternative 1 – Estimated SGP-Attributed Noise Levels at Analysis Locations During the Construction Phase

NSR ID	NSR Name	Ambient Background Noise Level (dBA L_{EQ})	Ambient Background Noise Level (dBA L_{DN})	SGP-Attributed Daytime Noise Level (dBA L_{EQ})¹	SGP-Attributed Day-Night Noise Level (dBA L_{DN})
Site 2	Miller Residence	N/A	50	84 / 84²	82 / 82²
Site 3	Meadow Creek Lookout	45	N/A	41 / 25	39 / 23
Site 5	Forest Service Camp at Landmark	N/A	34	53/47	51/45
Site 6	Forest Service Summer Camp/Warm Lake Recreation Areas	N/A	34	21 / 21	19 / 19
Site 7	Warm Lake Road/Warm Lake Camp	N/A	47	21 / 21	19 / 19
Site 8	Granite Excavation Shop in Cascade	N/A	61	48 / 49	46 / 47
Site 9	Southern Pines Plantation Property	N/A	51	64 / 64²	62 / 62²
Site 10	Yellow Pine	N/A	50	33 / 6	31 / 4
Site 11	Ice Hole Campground/Boise National Forest	N/A	50	63 / 63²	61 / 61²
Site 12	Mule Hill Trailhead	40	N/A	40 / 31	38 / 29

Table Source: AECOM 2020

Table Notes:

1 Noise level with SGP-related traffic on Yellow Pine Route / Burntlog Route.

2 Temporary Short-term exceedances of the recommended noise level.

N/A = not available.

Site 2. Miller Residence adjacent to Johnson Road

Transmission line upgrade work is the only SGP-related activity that would contribute to the noise environment at Site 2 during the construction phase. Noise from the mine site, access road construction along the Burntlog Route, utility access road construction, off-site buildings, and borrow sites would not contribute to noise levels at Site 2 during the construction phase due to distance. SGP-related traffic on the Yellow Pine Route would generate average hourly noise levels of approximately 41 dBA at Site 2. This is below background ambient levels at the site and would have no effect on noise levels at Site 2.

Daytime noise levels at Site 2 could temporarily reach as high as 84 dBA when work is occurring at the closest location along the transmission line but would be lower as the distance increases. The closest distance between Site 2 and transmission line work is 53 feet. Noise levels at Site 2 would fall below the 55-dBA impact threshold when transmission line work is approximately 800 feet away. Helicopter use is not anticipated in this area. Average L_{DN} at Site 2 would be 82 L_{DN} and would fall to 53 dBA L_{DN} when transmission line work is at least 800 feet away.

Absent transmission line work, daytime noise levels at Site 2 are estimated at 41 dBA and average L_{DN} are estimated at 39 dBA L_{DN} during the construction phase, both below existing ambient noise levels.

Alternative 1 would have a temporary impact on the noise environment at Site 2 during the construction phase while transmission line work is occurring in the immediate vicinity. Noise levels at Site 2 would fall below the 55 dBA L_{DN} impact threshold when transmission line work is approximately 800 feet away.

Site 3. Meadow Creek Lookout

Construction activity on the Burntlog Route would be the greatest contributor of SGP noise at Site 3 during the construction phase. However, combined noise levels would still be well below the 55-dBA threshold and background ambient noise levels. Alternative 1 would have no impact on the noise environment at Site 3 during the construction phase.

Site 5. Forest Service Camp at Landmark

Access road construction on the Burntlog Route, facilities construction at the Landmark Maintenance Facility, and SGP-related traffic on the Yellow Pine Route would be the greatest contributors of SGP noise at Site 5 during the construction phase. Noise from all SGP-related activities combined would attenuate to approximately 56 dBA at Site 5, resulting in a temporary increase in noise levels above the 55-dBA threshold.

SGP-related noise would decrease to approximately 54 dBA once construction activity on the Burntlog Route and Landmark Maintenance Facility is completed and SGP-related traffic moves from the Yellow Pine Route to the Burntlog Route. This is below the threshold of 55 dBA.

Alternative 1 would have a temporary impact on the noise environment at Site 5 during the construction phase while access road work is occurring nearby. The closest distance between Site 5 and the access road is approximately 0.4 mile. When access road work is approximately 0.5 mile away, noise levels from all SGP-related activities combined would fall to the 55-dBA impact threshold.

Site 6. Forest Service Summer Camp at Warm Lake

Transmission line upgrade work is the only SGP-related activity that would contribute to the noise environment at Site 6 during the construction phase. However, daytime noise levels would still be well below the 55-dBA threshold and background ambient noise levels at the site. Alternative 1 would have no impact on the noise environment at Site 6 during the construction phase.

Site 7. Warm Lake Camp

Transmission line upgrade work and construction activity on the Burnt Log Road (FR 447) are the only SGP-related activities that would contribute to the noise environment at Site 7 during the construction phase. However, combined noise levels would still be well below the 55-dBA threshold and background ambient noise levels at the site. Alternative 1 would have no impact on the noise environment at Site 7 during the construction phase.

Site 8. Granite Excavation Shop in Cascade

Transmission line upgrade work is the only SGP-related activity that would contribute to the noise environment at Site 8 during the construction phase. Noise from the mine site, access road construction along the Burntlog Route, utility access road construction, off-site buildings and borrow sites would not contribute to noise levels at Site 8 during the construction phase due to distance. However, combined noise levels would still be well below the 55-dBA threshold and background ambient noise levels at the site. Alternative 1 would have no impact on the noise environment at Site 8 during the construction phase.

Site 9. Southern Pine Plantations Property

Transmission line upgrade work and facilities construction at the SGLF are the only SGP-related activities that would contribute to the noise environment at Site 9 during the construction phase. Noise from the mine site, access road construction along the Burntlog Route, utility access road construction, and borrow sites would not contribute to noise levels at Site 9 during the construction phase due to distance.

Transmission line upgrade work would be the primary contributor of SGP noise. Daytime noise levels at Site 9 could reach as high as 64 dBA when transmission line work is occurring at the closest location along the transmission line but would be lower as the distance increases. The closest distance between transmission line work and Site 9 is 317 feet. When transmission line work is 800 feet away, SGP-related noise levels would fall to 55 dBA. Helicopter use is not anticipated in this area. Average L_{DN} at Site 9 would be 62 L_{DN} when transmission line work is the closest and would fall to 53 L_{DN} when transmission line work is at least 800 feet away.

Absent transmission line work, noise from facilities construction would attenuate to approximately 38 dBA at Site 9 and average L_{DN} are estimated at 36 L_{DN} during the construction phase, well below the 55-dBA threshold and background ambient levels.

Alternative 1 would have a temporary impact on the noise environment at Site 9 during the construction phase while transmission line work is occurring in the immediate vicinity. Noise levels at Site 9 would fall below the 55 dBA L_{DN} impact threshold when transmission line work is approximately 800 feet away.

Site 10. Yellow Pine

SGP-related traffic on the Yellow Pine Route access road would be the greatest contributor of SGP noise at Site 10 during the construction phase. However, combined noise from all SGP-related activities would attenuate to approximately 33 dBA at Site 10, well below the 55-dBA threshold and background ambient noise levels. Alternative 1 would have no impact on the noise environment at Site 10 during the construction phase.

Site 11. Ice Hole Campground in Boise National Forest

Transmission line upgrade work and SGP-related traffic on the Yellow Pine Route are the only SGP-related activities that would contribute to the noise environment at Site 11 during the construction phase. Noise from the mine site, access road construction along the Burntlog Route, utility access road construction, off-site buildings, and borrow sites would not contribute to noise levels at Site 11 during the construction phase due to distance.

Transmission line upgrade work would be the primary contributor of SGP noise. Daytime noise levels at Site 11 could reach as high as high as 63 dBA at Site 11 when work is occurring at the closest location along the transmission line but would be lower as the distance increases. The closest distance between Site 11 and transmission line work is 370 feet. When transmission line work is at approximately 850 feet away, noise levels will fall to below 55 dBA. Average L_{DN} at Site 11 would be 61 dBA L_{DN} when transmission line work is closest and would fall to 53 dBA L_{DN} .

Absent transmission line work, noise from SGP-related traffic on the Yellow Pine Route noise from would attenuate to approximately 45 dBA L_{EQ} and 43 dBA L_{DN} at Site 11, well below the 55-dBA threshold and background ambient levels.

Alternative 1 would have a temporary impact on the noise environment at Site 11 during the construction phase while transmission line work is occurring in the immediate vicinity. Noise levels at Site 11 would fall below the 55 dBA L_{DN} impact threshold when transmission line work is approximately 800 feet away.

Site 12. Mule Hill Trailhead

SGP-related noise at Site 12 during the construction phase would be highest during the first year when construction is occurring on Burnt Log Road (FR 447). Noise from access road construction on the Burntlog Route, the nearest borrow site, and the mine site would be the

greatest contributors of SGP noise at Site 12 during the construction phase. Noise from the transmission line upgrade work, and SGP-related traffic on the Yellow Pine Route would not contribute to noise levels at Site 12 during the construction phase due to distance. However, combined noise levels would still be well below the 55-dBA threshold and background ambient noise levels at the site. Alternative 1 would have no impact on the noise environment at Site 12 during the construction phase.

Frank Church-River of No Return Wilderness Areas

To evaluate potential noise impacts at dispersed recreational resource areas in the Frank Church-River of No Return Wilderness (FCRNRW) east of the Burntlog Route, noise levels from three construction-related scenarios/sources at a range of distances from the roadway were calculated (**Table 4.6-7** through **Table 4.6-9**). Based on sound levels measured at the Meadow Creek Lookout and along Burnt Log Road (FR 447), ambient sound levels within the FCRNRW are estimated at 40 to 45 dBA L_{EQ1h} .

In these and subsequent tables regarding FCRNRW, noise levels are calculated at incremental distances of 500 up to 8,000 feet into the area since there are no discrete NSRs identified within the FCRNRW. The baseline ambient is assumed to be 40 to 45 dBA L_{EQ} throughout the FCRNRW. The 'SGP-Attributed Noise Level' column is the calculated SGP only noise level; the 'SGP Plus Baseline Level' column is the energy sum of the assumed baseline (40 to 45 dBA L_{EQ1h}) and the calculated SGP level; and the 'Increase above Baseline Noise Level' column is the difference between the assumed baseline noise level and the energy sum of SGP plus baseline level. For the 8,000-foot distance from Burntlog Route in **Table 4.6-7** for example, the lower range of the baseline ambient is 40 dBA, the predicted SGP-only level is 34 dBA, the energy sum of 40 and 34 dBA is 41 dBA, resulting in the difference between the combined SGP + background ambient as 41 minus 40, or 1 dBA.

Road construction activities (**Table 4.6-7**) along the Burntlog Route would result in noise level increases ranging from 10 to 26 dBA above ambient noise levels approximately 500 to 1,500 feet from the roadway and would be at or above the recommended noise level of 55 dBA L_{EQ1h} for outdoor use areas. Roadway construction noise would dominate the noise environment at these distances and would be similar to noise levels in a busy commercial or urban environment. Resulting noise levels approximately 1,500 to 2,000 feet from the roadway would be below the recommended noise level of 55 dBA L_{EQ1h} for outdoor use areas; however, noise increases above ambient sound levels would be readily noticeable to twice as loud, depending upon actual distance. Direct effects on recreationists could include general annoyance or sleep annoyance at campsites in wilderness areas. Indirect effects could include a reduction in the overall quality of the remote wilderness experience. Resulting noise levels would attenuate to ambient levels at approximately 8,000 feet (**Table 4.6-7**).

Overall, the greatest potential noise impacts from road construction would occur where the Burntlog Route closely borders the FCRNRW Area. These potential noise impacts would be temporary (lasting only through the first year of the construction phase), and local (would impact a discrete area of the FCRNRW that is within approximately 4,000 feet of the Burntlog Route).

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In the vicinity of the Meadow Creek Lookout, a section of the Burnt Log Road (FR 447) closely borders the FCRNRW Area. To evaluate potential noise impacts at dispersed recreational resource areas in this region of the FCRNRW, noise levels at a range of distances from the roadway also were estimated (Table 4.6-8). SGP-related traffic noise from the Burntlog Route would attenuate to well below the average ambient daytime sound levels within the FCRNRW Area, within 500 feet from the roadway.

Table 4.6-4 Estimated Noise Levels from the Mine Access Road Construction (Burntlog Route)

Distance from Access Route (feet)	SGP-Attributed Noise Level (dBA L_{EQ})	SGP Plus Baseline Level¹ (dBA L_{EQ})	Increase above Baseline Noise Level² (dBA L_{EQ})
500	66	66	21-26
1,000	59	59	14-19
1,500	55	55	10-15
2,000	52	52-53	8-12
4,000	44	45-48	3-5
8,000	34	41-45	0-1

Table Source: AECOM 2020

Table Notes:

- 1 Based on ambient sound levels measured at the Meadow Creek Lookout and along Burnt Log Road, average ambient daytime sound levels within the FCRNRW Area are estimated at 40 to 45 dBA L_{EQ1h}.
- 2 Reported increase over baseline is increase in combined SGP + baseline over baseline.

Table 4.6-5 Estimated Noise Levels from Traffic on the Mine Access Road (Burntlog Route) During the Construction Phase

Distance from Access Route (feet)	SGP-Related Traffic Noise Level (dBA L_{EQ})	SGP Plus Baseline Level¹ (dBA L_{EQ})	Increase above Baseline Noise Level² (dBA L_{EQ})
500	34	41-45	0-1
1,000	30	40-45	0
2,000	26	40-45	0
3,000	23	40-45	0
4,000	20	40-45	0

Table Source: AECOM 2020

Table Notes:

- 1 Based on ambient sound levels measured at the Meadow Creek Lookout and along Burnt Log Road, average ambient daytime sound levels within the FCRNRW Area are estimated at 40 to 45 dBA L_{EQ1h}.
- 2 Reported increase over baseline is increase in combined SGP + baseline over baseline.

Several potential borrow areas are located along the Burntlog Route close to the FCRNRW. To evaluate potential noise impacts at dispersed recreational resource areas in the FCRNRW east of the Burntlog Route and the potential borrow areas, noise levels at a range of distances from the borrow areas also were calculated (**Table 4.6-9**).

Borrow area activities along the Burntlog Route would result in noise level increases ranging from 8 to 19 dBA above baseline noise levels within approximately 1,000 feet from a borrow area. SGP-related noise levels would be at or above the recommended noise level of 55 dBA for outdoor use areas within 500 feet, but below this level farther way. Resulting noise levels approximately 3,000 feet from the roadway would be within the range of average ambient L_{EQ} levels in the area, and below the recommended noise level of 55 dBA for outdoor use areas. Direct effects on recreationists within 1,000 to 2,000 feet of borrow areas could include general annoyance or sleep disturbance at campsites in wilderness areas. Indirect effects could include a reduction in the overall quality of the remote wilderness experience.

Overall, potential noise impacts on recreationists from borrow areas would be limited to a discrete area within approximately 1,000 to 2,000 feet of borrow areas located along the Burntlog Route where it closely borders the adjacent wilderness area. Noise from these borrow areas would likely be periodic or intermittent, but ongoing throughout the construction phase.

Table 4.6-6 Estimated Noise Levels from Borrow Areas along the Burntlog Route During the Construction Phase

Distance from Access Route (feet)	SGP-Related Borrow Area Noise Level (dBA L_{EQ})	SGP Plus Baseline Level¹ (dBA L_{EQ})	Increase above Ambient Noise Level² (dBA L_{EQ})
500	59	59	14-19
1,000	52	52-53	8-12
2,000	45	46-48	3-6
3,000	41	44-46	1-3
6,000	31	41-45	0-1

Table Source: AECOM 2020

Table Notes:

- 1 Based on ambient sound levels measured at the Meadow Creek Lookout and along Burnt Log Road, average ambient daytime sound levels within the FCRNRW Area are estimated at 40 to 45 dBA L_{EQ1h} .
- 2 Reported increase over baseline is increase in combined SGP + baseline over baseline.

4.6.2.1.2 OPERATIONS

Noise generated during the operations phase would include noise from the mine site, in addition to noise from traffic and maintenance activities on the mine access road, utility operations, and off-site facilities and borrow site operations. Noise levels generated by these activities are described below, followed by a discussion of noise impacts on identified NSRs.

4.6.2.1.2.1 Mine Site

Operations at the mine site would involve development rock and legacy tailings removal, ore mining, materials loading and transport, ore processing and legacy tailings reprocessing, and routine maintenance of mine-site support facilities and infrastructure. Major noise-generating activities would include: the operation of heavy industrial-type earth moving equipment; drilling and blasting activities to extract rock from the ground; materials loading, hauling, and unloading activities; and rock crushing and grinding at the Process Plant Area. The Primary Rock Crusher would be located outside at the Process Plant Area, while rock grinding and other ore processing activities would be located inside a series of buildings. **Table 4.6-10** lists noise levels for equipment that would be used at the mine site during the operations phase.

Table 4.6-7 Major Noise Sources and Estimated Maximum Noise Levels at the Mine Site during the Operations Phase

Equipment¹	Total Number of Units (max)²	Acoustical Usage Factor (%)³	Maximum Noise Levels per Unit, L_{MAX} at 50 feet (dBA)⁴	Predicted Total Noise Level, L_{EQ} at 50 feet (dBA)⁵
Primary crusher	1	100 ⁶	95 ⁷	95
Front end loader	1	100 ⁶	79	79
Blast-hole drills (Cat MD6290 or equivalent)	5	20	84	84
Pioneer drill (Cat MD 5150 or equivalent)	3	20	84	82
Front-end wheel loader (Cat 994 or equivalent)	4	40	79	81
Front-end loader (Cat 990 or equivalent)	3	40	79	80
Haul trucks (Cat 789 or equivalent w/200-ton capacity)	20	40	76	85
Haul Trucks (Cat 740 or equivalent)	5	40	76	79
Dozers (D10 or equivalent)	5	40	82	85
Dozers (D6 or equivalent)	2	40	82	81
Water trucks (Cat 777 chassis or equivalent)	2	40	76	75
Motor Graders (Cat 160M or equivalent)	3	40	85	86
Excavator (Cat 349 or equivalent)	2	40	81	80
Low-boy tractor (Cat 777 chassis or equivalent)	2	40	84	83

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Equipment¹	Total Number of Units (max)²	Acoustical Usage Factor (%)³	Maximum Noise Levels per Unit, L_{MAX} at 50 feet (dBA)⁴	Predicted Total Noise Level, L_{EQ} at 50 feet (dBA)⁵
vibratory compactor (Cat CS76 or equivalent)	2	20	83	79
Mobile Light Plants	10	50	81	88
Fuel Service Truck	2	40	76	75
Mechanics Service Truck	3	40	75	76
Lube Service Truck	2	40	76	75
Welding Service Truck	3	40	74	75
Boom Truck	2	40	74	73
Skid Steer Truck	3	40	79	80
Tire Handler Truck	2	40	79	78
Crew vans	8	40	75	80
Pickups	25	40	75	85
ATVs & UTVs	25	50	75	86
Front end loader (Cat 992 or equivalent)	2	40	79	78
Small wheel loader (Cat 930 or equivalent)	2	40	79	78
Off-road extended boom forklift	3	50	75	77
Standard forklifts	3	50	75	77
Skid steer loader (S160 Bobcat or equivalent)	3	40	79	80
Boom truck	2	40	74	73
Mobile crane	2	16	81 ⁸	76
Flatbed supply and stake trucks	3	40	74	75
Service trucks with compressors and welders	2	40	74	73
Trash truck	2	40	76	75
Crew vans	5	40	75	78

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Equipment¹	Total Number of Units (max)²	Acoustical Usage Factor (%)³	Maximum Noise Levels per Unit, L_{MAX} at 50 feet (dBA)⁴	Predicted Total Noise Level, L_{EQ} at 50 feet (dBA)⁵
Pickup trucks	15	40	75	83
Blasting	1	0.0035 ⁹	144 ¹⁰	99
Total Average Hourly Noise Level (L_{EQ1h}) without Blasting				99
Total Average Hourly Noise Level (L_{EQ1h}) with Blasting Included¹¹				102

Table Source: AECOM 2020

Table Notes:

- 1 Equipment lists as provided in Midas Gold 2016, Table 9-2 and Table 10-1, assuming the maximum number of units of each equipment type will be operating at the mine site during the construction phase.
 - 2 The total number of equipment units represents an estimated total number of units that would be operating at the mine site during different stages of construction.
 - 3 The acoustical usage factor is used to estimate the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during equipment operation. Acoustical usage factor provided in the table are equivalent to default values in FHWA RCNM version 1.1.
 - 4 The noise levels listed represent L_{MAX} (per measured levels provided in FHWA RCNM version 1.1, except as noted) measured at 50 feet from the equipment. The provided L_{MAX} reference values are for general categories of equipment, not specific models.
 - 5 Estimated total noise levels emitted by multiple units of the same type, using the equation in Section 4.6.1 for adding equal sound pressure levels.
 - 6 Acoustical factors for primary crusher and front-end loader at the ore processing facility as provided in Midas Gold 2016, pp. 10-4.
 - 7 Reference noise level for primary crusher as provided in Chuitna Coal Project Supplemental Environmental Impact Statement (U.S. Environmental Protection Agency 1990).
 - 8 Reference noise level as provided in FHWA Noise Construction Handbook, Table 9.9, FTA Construction Equipment Noise Levels (FHWA 2006).
 - 9 Acoustical usage factors as provided in Midas Gold 2016.
 - 10 Estimated noise level from blasting event calculated using airblast calculation method as provided in Dyno Nobel 2010.
 - 11 Blasting events are impulsive noise events that would be initiated near midday or during mid to later afternoon.
- ATV = All-terrain vehicle; N/A = not applicable; UTV = utility task vehicle.

The estimated total average hourly noise levels from the mine site during the operations phase would be 99 dBA L_{EQ} at the reference distance of 50 feet. Noise from the mine site would attenuate to the threshold of 55 dBA at approximately 1.5 miles away based on distance alone. Accounting for ground absorption and atmospheric absorption, noise from the mine site would attenuate to 55 dBA approximately 0.60 mile from the source of activity.

During blasting, noise levels could temporarily increase to 102 dBA L_{EQ}. Noise from the mine site with the addition of blasting would attenuate to the threshold of 55 dBA at approximately 2.2 miles based on distance alone. Accounting for ground absorption and atmospheric absorption, noise from the mine with the addition of blasting would attenuate to 55 dBA at

approximately 0.78 mile from the source of activity. Mine operations and associated noise would occur 24 hours per day. Blasting noise would occur intermittently for short periods of time.

4.6.2.1.2.2 Access Roads

The evaluation of noise impacts from the access roads during the operations phase includes road maintenance and SGP-related traffic along the Burntlog Route.

Road Maintenance

Table 4.6-11 shows a typical list of road maintenance equipment that would be operating on the Burntlog Route periodically during the operations phase.

The estimated total average hourly noise levels from road maintenance activity on the Burntlog Route would range from 88 dBA L_{EQ} at the reference distance of 50 feet during the summer months to 90.2 dBA L_{EQ} during the winter months when snow removal is required. Noise from access road summer maintenance would attenuate to the threshold of 55 dBA at approximately 0.42 mile based on distance alone and noise from access road winter maintenance would attenuate to the threshold of 55 dBA approximately 0.54 mile from the source of activity. Accounting for ground absorption and atmospheric absorption, noise from summer access road maintenance would attenuate to 55 dBA approximately 0.22 mile away and noise from winter access road maintenance would attenuate to 55 dBA approximately 0.27 mile from the source of activity. Access road maintenance and associated noise would be limited to daytime hours (between 7:00 a.m. and 10:00 p.m.).

Table 4.6-8 Major Noise Sources and Estimated Maximum Noise Levels from Maintenance of the Mine Access Road (Burntlog Route) during the Operation Phase

Equipment¹	Total Number of Units (max)²	Acoustical Usage Factor (%)³	Maximum Noise Levels per Unit, L_{MAX} at 50 feet (dBA)⁴	Predicted Total Noise Level, L_{EQ} at 50 feet (dBA)⁵
Motor Graders (Cat 160M or equivalent)	2	40	85	84
Water trucks (Cat 725 or equivalent)	2	40	76	75
Binding Agent Application Truck	1	40	76	72
vibratory compactor (Cat CS76 or equivalent)	1	20	83	76
Fuel Service Truck	1	40	76	72
Light Vehicles	2	40	75	74
Rock Rakes (all other equip.)	2	50	84	84

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Equipment¹	Total Number of Units (max)²	Acoustical Usage Factor (%)³	Maximum Noise Levels per Unit, L_{MAX} at 50 feet (dBA)⁴	Predicted Total Noise Level, L_{EQ} at 50 feet (dBA)⁵
Plow Trucks	2	40	85	84
Snow Blower	1	50	85	82
Total Average Hourly Noise Level – Summer				88
Total Average Hourly Noise Level – Winter				90

Table Source: AECOM 2020

Table Notes:

- 1 Equipment list as provided in Midas Gold 2016, Table 7-1. Assumes the maximum number of units of each equipment type listed in Table 7-1 would be operating periodically along the access road during the operations phase.
- 2 The total number of equipment units represents an estimated total number of units that would be operating along the access road during different stages of construction.
- 3 The acoustical usage factor is used to estimate the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during equipment operation. Acoustical usage factor provided in the table are equivalent to default values in FHWA RCNM version 1.1.
- 4 The noise levels listed represent L_{MAX} (per measured noise levels provided in FHWA RCNM version 1.1, except as noted) measured at 50 feet from the equipment. The provided L_{MAX} reference values are for general categories of equipment, not specific models.
- 5 Estimated total noise levels emitted by multiple units of the same type, using the equation in Section 4.6.1 for adding equal sound pressure levels.

N/A = not applicable.

SGP-Related Traffic During Operation

During the operations phase, SGP-related traffic volumes on the mine access road (the Burntlog Route) are estimated at 68 AADT (average annual daily traffic). Heavy vehicles are estimated at 49 AADT and light vehicles at 19 AADT (Midas Gold 2016). Based on the estimated traffic volumes and vehicle mix, and assuming typical vehicle speed of 25 mph and 10 percent of AADT traffic volume at peak hours conditions, estimated average hourly noise levels from SGP-related traffic on the Burntlog Route during the operations phase would be 49 dBA L_{EQ}. This is well below the threshold of 55 dBA. SGP-related traffic is assumed to be on the mine access road 24 hours per day.

Borrow Areas

Activity, equipment, and noise levels at borrow areas would be the same as during the construction phase (**Table 4.6-3**). The estimated total average hourly noise levels from each borrow site would be 84 dBA L_{EQ} at the reference distance of 50 feet. Noise from the borrow sites during operations would attenuate to the threshold of 55 dBA approximately 0.26 mile from the source based on distance alone. Accounting for ground absorption and atmospheric absorption, noise from the borrow sites would attenuate to 55 dBA approximately 0.15 mile from the source of activity.

4.6.2.1.2.3 Utilities

The existing transmission lines and substations that would be used to serve the SGP are not new sources of noise within the affected environment. New sources of noise associated with the operation of utilities would be limited to the Johnson Creek substation to the mine site transmission line and new substations. During stormy or very humid weather, audible corona noise from a wetted transmission line operating at 230 kV or greater can contribute to ambient noise and, under the right conditions and at distances close enough to the conductors, be audible to a listener on the ground. But under such poor weather conditions (e.g., precipitation) that cause corona noise to be more audible, other acoustical contributors to the outdoor ambient sound environment like rainfall on leafy vegetation, road surfaces, and structure surfaces (rooves) also rise in magnitude. Under fair weather conditions, audible corona noise is much less and likely inaudible under most conditions. Hence, audible corona noise from the Johnson Creek-mine site transmission line operating at 138 kV would likely not increase ambient levels beyond the transmission line ROW.

A typical operating substation might be expected to generate combined noise levels (due to on-site transformer hum, cooling fans, etc.) of up to 80 dBA L_{EQ1h} at 3 feet from a geographic acoustical center-point position. Substation noise would attenuate to the 55-dBA threshold approximately 53 feet from the substation.

4.6.2.1.2.4 Off-Site Facilities

Operational noise sources associated with off-site facilities (Landmark Maintenance Facility and SGLF) would generally be limited to vehicles entering and leaving these facilities, and heating, ventilation, and air conditioning equipment associated with facility buildings, but no heavy equipment routinely operating at these facilities. The combined noise generated by these sources would be substantially less than SGP traffic and/or the road maintenance noise presented in **Table 4.6-11**, which would occur along the access roads that these facilities would be located immediately adjacent to.

4.6.2.1.2.5 Noise Impacts

Table 4.6-12 provides estimated noise levels at noise receiver locations during the operations phase under Alternative 1, followed by a discussion of estimated noise levels and impacts at each NSR.

Table 4.6-9 Alternative 1 - SGP-Attributed Noise Levels at Analysis Locations during the Operations Phase

ID	Name	Baseline Noise Level (dBA L_{EQ})	Baseline Noise Level (dBA L_{DN})	SGP-Attributed Daytime Noise Level (dBA L_{EQ}) ¹	SGP-Attributed Day-Night Noise Level (dBA L_{DN}) ²
Site 2	Miller Residence	N/A	50	14 / 14	12
Site 3	Meadow Creek Lookout	45	N/A	40 / 40	38

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ID	Name	Baseline Noise Level (dBA L_{EQ})	Baseline Noise Level (dBA L_{DN})	SGP-Attributed Daytime Noise Level (dBA L_{EQ})¹	SGP-Attributed Day-Night Noise Level (dBA L_{DN})²
Site 5	Forest Service Camp at Landmark	N/A	34	51 / 51 ⁵	49
Site 6	Forest Service Summer Camp/Warm Lake Recreation Areas	N/A	34	<1 / <0	<1
Site 7	Warm Lake Road/Warm Lake Camp	N/A	47	5 / 5	3
Site 8	Granite Excavation Shop in Cascade	N/A	61	25 / 25	23
Site 9	Southern Pines Plantation Property	N/A	51	25 / 25	23
Site 10	Yellow Pine	N/A	50	<1/<1	<1
Site 11	Ice Hole Campground/Boise National Forest	N/A	50	35 / 35	33
Site 12	Mule Hill Trailhead	40	N/A	33 / 33	31

Table Source: AECOM 2020

Table Notes:

- 1 Noise levels without blasting / noise levels with blasting.
- 2 Noise level without blasting.
- 3 Temporary short-term exceedance of the recommended noise level.
- 4 Short-term exceedance of the recommended noise level.
- 5 Long-term, periodic or intermittent exceedance of the recommended noise level.
- 6 Long-term, continuous exceedance of the recommended noise level.

N/A = not available.

Site 2. Miller Residence adjacent to Johnson Road

Average hourly noise from all SGP-related activities combined, both without and with blasting, would attenuate to approximately 14 dBA at Site 2, and would have no effect on background ambient noise levels. Alternative 1 would have no impact on the noise environment at Site 2 during the operations phase.

Site 3. Meadow Creek Lookout

Average hourly noise from all SGP-related activities combined, both without and with blasting, would attenuate to approximately 40 dBA at Site 3, and would have no effect on the background ambient noise levels. Access road maintenance on the Burntlog Route would be the greatest contributor of SGP noise at Site 3 during the operations phase. However, combined noise levels would still be well below the 55-dBA threshold and background ambient noise levels at the site.

Alternative 1 would have no impact on the noise environment at Site 3 during the operations phase.

Site 5. Forest Service Camp at Landmark

In the absence of blasting, access road maintenance on the Burntlog Route is the greatest contributor of SGP-related noise at Site 5 during the operations phase. Average hourly noise from all SGP-related activities combined, both without and with blasting, would attenuate to approximately 51 dBA at Site 5 during access road maintenance, below the 55-dBA threshold, but well above background ambient noise levels.

In the absence of access road maintenance activity, SGP-related noise would attenuate to approximately 26 dBA at the site, well below background ambient noise levels. Access road maintenance is expected to be temporary in any single location and intermittent throughout the year, though more frequent during the winter.

Alternative 1 would have long-term, periodic impacts at Site 5 during road maintenance activity throughout the operations phase.

Site 6. Forest Service Summer Camp at Warm Lake

Average hourly noise from all SGP-related activities combined, both without and with blasting, would attenuate to 0 dBA at Site 6 during the operations phase, and would have no effect on background ambient noise levels. Alternative 1 would have no impact on the noise environment at Site 6 during the operations phase.

Site 7. Warm Lake Camp

In the absence of blasting, access road winter maintenance on the Burntlog Route is the only SGP-related activity that would contribute to the noise environment at Site 7 during the operations phase. However, average hourly noise from all SGP-related activities combined, both without and with blasting, would attenuate to 5 dBA at Site 7, well below the 55-dBA threshold and background ambient noise levels, and would have no effect on existing noise levels. Alternative 1 would have no impact on the noise environment at Site 7 during the operations phase.

Site 8. Granite Excavation Shop in Cascade

Substation noise is the only SGP-related noise that would contribute to the noise environment at Site 8 during the operations phase. However, average hourly noise from all SGP-related activities combined, both without and with blasting, would attenuate to 25 dBA at Site 8 due to distance, and would have no effect on background ambient noise levels. Alternative 1 would have no impact on the noise environment at Site 8 during the operations phase.

Site 9. Southern Pine Plantation

Substation noise is the only SGP-related noise that would contribute to the noise environment at Site 9 during the operations phase. However, average hourly noise from all SGP-related activities combined, including blasting, would attenuate to 25 dBA at Site 9 due to distance, and would have no effect on background ambient noise levels. Alternative 1 would have no impact on the noise environment at Site 9 during the operations phase.

Site 10. Yellow Pine

Average hourly noise from all SGP-related activities combined, including blasting would attenuate to 0 dBA at Site 10 during the operations phase, and would have no effect on background ambient noise levels. Alternative 1 would have no impact on the noise environment at Site 10 during the operations phase.

Site 11. Ice Hole Campground in Boise National Forest

Substation noise is the only SGP-related noise that would contribute to the noise environment at Site 11 during the operations phase. However, average hourly noise from all SGP-related activities combined, including blasting, would attenuate to 33 dBA at Site 11, and would have no effect on background ambient noise levels. Alternative 1 would have no impact on the noise environment at Site 11 during the operations phase.

Site 12. Mule Hill Trailhead

Noise from all SGP-related activities combined, including blasting would attenuate to approximately 33 dBA at Site 12 during the operations phase, below the 55-dBA threshold and background ambient sound levels. Alternative 1 would have no impact on the noise environment at Site 12 during the operations phase.

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Noise levels at a range of distances from the Burntlog Route also were estimated to evaluate SGP-related noise from road maintenance activity in portions of the adjacent FCRNRW Area east of the Burntlog Route that closely borders the roadway (**Table 4.6-13**).

Based on ambient sound levels measured at the Meadow Creek Lookout and along Burnt Log Road (FR 477), average ambient daytime sound levels within the FCRNRW Area are estimated at 40 to 45 dBA L_{EQ} . Road maintenance noise from the Burntlog Route would result in maximum noise level increases of 24 to 26 dBA (summer-winter) above ambient sound levels 500 feet from the roadway (higher winter levels due to assumed additional equipment used for roadway snow removal). Areas within approximately 4,000 feet from the roadway would experience increases approximately 5 dBA L_{EQ1h} or greater. Direct effects on recreationists within approximately 4,000 feet from the roadway could include general annoyance. Indirect effects could include a reduction in the overall quality of the remote wilderness experience. Noise level impacts would be lower farther from the access road and would attenuate to a less than perceptible difference (1 to 2 dBA) at approximately 6,000 feet.

Table 4.6-10 Estimated Road Maintenance Noise Levels from the Mine Access Road (Burntlog Route) during the Operations Phase

Distance from Access Route (feet)	SGP-Related Road Maintenance Noise Level (dBA L_{EQ}, summer-winter)	SGP plus Baseline Noise Level¹ (dBA L_{EQ}, summer-winter)	Increase above Baseline Noise Level (dBA L_{EQ}, summer-winter)
500	64-66	64-66	24-26
1,000	57-59	57-59	17-19
2,000	49-52	50-52	10-12
3,000	45-47	46-48	6-8
4,000	41-43	44-45	4-5
5,000	38-40	42-43	3-4
6,000	36-38	41-42	1-2

Table Source: AECOM 2020

Table Notes:

- 1 Based on ambient sound levels measured at the Meadow Creek Lookout and along Burnt Log Road, average ambient daytime sound levels within the FCRNRW Area are estimated at 40 dBA L_{EQ1h}.
- 2 Reported increase over baseline is increase in combined SGP + baseline over baseline.

Overall, the greatest potential noise impacts from road maintenance would occur where the Burntlog Route closely borders the FCRNRW Area. These potential noise impacts would be long-term, but periodic or intermittent, and local (would impact a discrete area of the FCRNRW that is within approximately 4,000 feet of the Burntlog Route).

Noise levels at a range of distances from the Burntlog Route also were estimated to evaluate SGP-related traffic noise in portions of the adjacent FCRNRW Areas that closely border the roadway (**Table 4.6-14**). Based on ambient sound levels measured at the Meadow Creek Lookout and along Burnt Log Road, average ambient daytime sound levels within the FCRNRW Area are estimated at 40 to 45 dBA L_{EQ1h}. SGP-related traffic noise from the Burntlog Route would attenuate to well below the average ambient daytime sound levels within the FCRNRW Area 500 feet from the roadway. Overall, aside from the noise impact predicted for Site 5, SGP-related traffic during the operations phase would have negligible to no effect on the ambient sound environment at nearby NSRs.

If the borrow areas along the Burntlog Route adjacent to the FCRNRW Area are utilized during the operations phase, potential impacts to recreationists within approximately 1,000 to 2,000 feet of these borrow areas would be the same as during the construction phase (**Table 4.6-9**).

Table 4.6-11 Estimated SGP-Related Traffic Noise Levels from the Mine Access Road (Burntlog Route) During the Operations Phase

Distance from Access Route (feet)	SGP-Related Traffic Noise Level (dBA, L_{EQ})	SGP Plus Baseline Noise Level¹ (dBA, L_{EQ})	Increase above Baseline Noise Level² (dBA, L_{EQ})
500	34	41-45	0-1
1,000	30	40-45	0
2,000	26	40-45	0
3,000	23	40-45	0
4,000	21	40-45	0

Table Source: AECOM 2020

Table Notes:

- 1 Based on ambient sound levels measured at the Meadow Creek Lookout and along Burnt Log Road, average ambient daytime sound levels within the FCRNRW Area are estimated at 40 to 45 dBA L_{EQ1h}.
- 2 Reported increase over baseline is increase in combined SGP + baseline over baseline.

4.6.2.1.3 CLOSURE AND RECLAMATION

4.6.2.1.3.1 Mine Site

Major noise-generating activities at the mine site during the closure phase would include the operation of heavy industrial-type earth moving equipment for the placement of materials, grading, contouring, and similar activities associated with reclamation. In the absence of a detailed list of equipment to be used during the closure phase, a conservative assumption was made that equipment and numbers of each equipment type would be the same or similar to the construction phase, as listed in **Table 4.6-1**.

The estimated total average hourly noise levels from the mine site during the closure and reclamation phase would be 94 dBA L_{EQ} at the reference distance of 50 feet. Noise from the mine site would attenuate to the threshold of 55 dBA approximately 0.8 mile from the source based on distance alone. Accounting for ground absorption and atmospheric absorption, noise from the mine site would attenuate to 55 dBA approximately 0.38 mile from the source of activity. Mine closure and reclamation activities, during this phase would be limited to daytime hours (between 7:00 a.m. and 10:00 p.m.).

4.6.2.1.3.2 Access Roads

During the closure phase, the mine access road would continue to be in use. Potential noise sources from the access road during the closure phase would include road maintenance, SGP-related traffic, borrow areas, and road decommissioning of the Burnt Log Road-Thunder Mountain Road Connector.

Road Maintenance

Road maintenance activity and equipment are assumed to be the same as during the operation phase. The estimated total average hourly noise levels from road maintenance activity on the Burntlog Route would range from 88 dBA L_{EQ} at the reference distance of 50 feet during the summer months to 90.2 dBA L_{EQ} during the winter months when snow removal is required. Noise from access road summer maintenance would attenuate to the threshold of 55 dBA approximately 0.42 mile from the source of activity based on distance alone and noise from access road winter maintenance would attenuate to the threshold of 55 dBA approximately 0.54 mile from the source of activity. Accounting for ground absorption and atmospheric absorption, noise from summer access road maintenance would attenuate to 55 dBA approximately 0.22 mile and noise from winter access road maintenance would attenuate to 55 dBA approximately 0.27 mile from the source of activity. Access road maintenance and associated noise would be limited to daytime hours (between 7:00 a.m. and 10:00 p.m.).

SGP-Related Traffic During the Access Road Closure Phase

During the closure phase, SGP-related traffic would continue to utilize the Burntlog Route. Traffic volumes would be lower than during the operation phase. Total average annual daily traffic is estimated at 26 AADT (versus 68 AADT during the operation phase). Heavy vehicle volumes are estimated to be 14 AADT (versus 49 AADT during the operation phase) and light vehicle volumes are estimated to be 12 AADT (versus 19 AADT during the operation phase) (Midas Gold 2016). Assuming 10 percent of AADT at peak hour and vehicle speeds of 25 mph, traffic noise levels 50 feet from the mine access road would be 43 dBA L_{EQ} , 5 dBA lower than during the operations phase, primarily due to the substantially lower volume of heavy vehicles on the roadway.

Borrow Areas

Activity, equipment, and noise levels at borrow areas are expected to be similar to the construction and operations phases. It is unknown which borrow areas would be active within each SGP phase.

Road Decommissioning

Decommissioning the Burnt Log Road-Thunder Mountain Road Connector section of the Burntlog Route would likely involve the same or similar set of equipment as construction, and would generate similar noise levels, 91 dBA L_{EQ} at the reference distance of 50 feet. Noise from access road decommissioning activity would attenuate to the threshold of 55 dBA approximately 0.57 mile from the source of activity based on distance alone. Accounting for ground absorption and atmospheric absorption, noise from access road decommissioning would attenuate to 55 dBA approximately 0.28 mile from the source of activity. However, road decommissioning activity would be limited to just this section of the mine access road.

4.6.2.1.3.3 Utilities

After closure of the mine site, when the need for substantial on-site electrical power requirements has ceased, the transmission line from the Johnson Creek substation to mine site would be disassembled. **Table 4.6-15** lists noise levels for construction equipment that would likely be used at the transmission line during the closure phase. In the absence of a detailed schedule of equipment operated at the transmission line during closure, it was assumed that equipment during this phase would be similar to equipment detailed in environmental documents for other transmission line projects. The estimate of total average hourly noise levels is considered conservative, assuming the simultaneous operation of all the equipment listed in **Table 4.6-15**.

Table 4.6-12 Major Noise Sources and Estimated Maximum Noise Levels from Disassembly of the Johnson Creek Substation to Mine Site Transmission Line During the Closure Phase

Equipment¹	Total Number of Units (max)²	Acoustical Usage Factor (%)³	Maximum Noise Levels per Unit, L_{MAX} at 50 feet (dBA)⁴	Predicted Total Noise Level, L_{EQ} at 50 feet (dBA)⁵
Reel truck	1	40	76	72
Boom crane	2	16	81	76
Flatbed supply trucks	2	40	74	73
Crew vans	2	40	75	74
Pickup trucks	2	40	75	74
Total Average Hourly Noise Level				81

Table Source: AECOM 2020

Table Notes:

- 1 Equipment list based on similar transmission line projects.
- 2 The total number of equipment units represents an estimated total number of units that would be operating at the mine site during different stages of construction.
- 3 The acoustical usage factor is used to estimate the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during equipment operation. Acoustical usage factor provided in the table are equivalent to default values in FHWA RCNM version 1.1.
- 4 The noise levels listed represent L_{MAX} (per equivalent specifications provide in FHWA RCNM version 1.1, except as noted) measured at 50 feet from the equipment.
- 5 Estimated total noise levels emitted by multiple units of the same type, using the equation in Section 4.6.1 for adding equal sound pressure levels.

The estimated total average hourly noise levels generated from the transmission line decommissioning would be 81 dBA L_{EQ} at the reference distance of 50 feet, slightly lower than noise levels generated during the construction phase. Noise from transmission line decommissioning would attenuate to the threshold of 55 dBA approximately 0.19 mile from the source of activity based on distance alone. Accounting for ground absorption and atmospheric

absorption, noise from transmission line decommissioning would attenuate to 55 dBA approximately 0.11 mile from the source of activity.

4.6.2.1.3.4 Off-Site Facilities

The sound sources associated with the closure and reclamation of the Landmark Maintenance Facility was conservatively assumed to be similar to those associated with construction activities, as listed in **Table 4.6-5**. There would be no reclamation-related noise associated with the SGLF. The facility has a post-mining land designated as light industry, where it would remain un-reclaimed after mining operations and transferred to a third-party for light industrial uses.

4.6.2.1.3.5 Noise Impacts

Table 4.6-16 provides estimated noise levels at noise receiver locations during the closure and reclamation phase under Alternative 1, followed by a discussion of estimated noise levels and impact at Site 5.

Table 4.6-13 Alternative 1 - SGP-Attributed Noise Levels at Analysis Locations During the Closure and Reclamation Phase

ID	Name	Ambient Background Noise Level (dBA L _{EQ})	Ambient Background Noise Level (dBA L _{DN})	SGP-Attributed Daytime Noise Level (dBA L _{EQ})	SGP-Attributed Day-Night Noise Level (dBA L _{DN})
Site 2	Miller Residence	N/A	50	6	4
Site 3	Meadow Creek Lookout	45	N/A	41	39
Site 5	Forest Service Camp at Landmark	N/A	34	56¹	54
Site 6	Forest Service Summer Camp/Warm Lake Recreation Areas	N/A	34	18	16
Site 7	Warm Lake Road/Warm Lake Camp	N/A	47	18	16
Site 8	Granite Excavation Shop in Cascade	N/A	61	<1	<1
Site 9	Southern Pines Plantation Property	N/A	51	<1	<1
Site 10	Yellow Pine	N/A	50	54	52

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ID	Name	Ambient Background Noise Level (dBA L_{EQ})	Ambient Background Noise Level (dBA L_{DN})	SGP-Attributed Daytime Noise Level (dBA L_{EQ})	SGP-Attributed Day-Night Noise Level (dBA L_{DN})
Site 11	Ice Hole Campground/Boise National Forest	N/A	50	38	36
Site 12	Mule Hill Trailhead	40	N/A	40	38

Table Source: AECOM 2020

Table Notes:

- 1 Temporary Short-term exceedance of the recommended noise level.
- 2 Short-term exceedance of the recommended noise level.
- 3 Long-term, periodic or intermittent exceedance of the recommended noise level.
- 4 Long-term, continuous exceedance of the recommended noise level.

N/A = not available.

Site 5. Forest Service Camp at Landmark

Access road decommissioning work on the Burntlog Route and facilities decommissioning at the Landmark Maintenance Facility would be the greatest contributors of SGP noise at Site 5 during the closure phase. Noise from all SGP-related activities combined would attenuate to approximately 56 dBA at Site 5, resulting in a temporary increase in noise levels above the 55-dBA threshold.

Alternative 1 would have a temporary impact on the noise environment at Site 5 during the closure phase while access road decommissioning and facilities decommissioning work is occurring in the immediate vicinity.

4.6.2.2 Alternative 2

4.6.2.2.1 CONSTRUCTION

4.6.2.2.1.1 Mine Site

Construction activities, equipment, and associated noise levels from the mine site would be the same as Alternative 1. Distances from the assumed acoustical center of activity at the mine to noise receivers would be the same as Alternative 1.

4.6.2.2.1.2 Access Roads

Construction activities, equipment and associated noise levels from access road work would be the same as Alternative 1, except that a 5.3-mile segment of the Burntlog Route would be re-routed. The re-route would move the segment of roadway eastward, which would increase the distance to Site 2 (26,136 feet for Alternative 1 vs. 27,157 for Alternative 2), Site 3 (5,069 feet

vs. 5,100 feet), and Site 11 (30,360 feet vs. 33,638 feet), but decrease the distance to the FCRNRW (up to 1 mile closer). Traffic volumes on access roads would be the same as Alternative 1.

Borrow sites along the Burntlog Route, borrow sites activities, and associated noise levels from borrow sites would be the same as Alternative 1.

4.6.2.2.1.3 Utilities

Construction activities, equipment, and associated noise levels from transmission line work and the construction of utility access roads would be the same as Alternative 1. However, under Alternative 2, the Cascade Switching Station would be closer to Site 8 (1,217 feet vs. 1,479 feet under Alternative 1), affecting estimated noise levels at the site. Additionally, approximately 1 mile east of Cascade Alternative 2 includes the Thunder Mountain Estates Bypass as part of the upgraded transmission line, which would relocate a 5.4-mile segment of the transmission line to avoid the Thunder Mountain Estates Subdivision.

4.6.2.2.1.4 Off-Site Facilities

The location of the SGLF would be the same as for Alternative 1; however, the maintenance facility would be located along Burntlog Route, approximately 4.4 miles east of the junction of Johnson Creek Road and Warm Lake Road, approximately midway between Sites 4 and 5.

4.6.2.2.1.5 Noise Impacts

Under Alternative 2, the Cascade switching station would be moved to the west, closer to Site 8. Average hourly daytime noise levels at Site 8 are estimated at 51 dBA during the construction phase, compared to 49 dBA under Alternative 1. However, noise levels at Site 8 would still be well below the 55-dBA threshold and background ambient noise levels.

While a 5.3-mile segment of the Burntlog Route increases the distance between access road construction work and Site 2, Site 3, and Site 11, the difference has no effect on SGP-related levels or overall noise impacts at these receivers during the construction phase. **Table 4.6-17** provides estimated noise levels at noise receiver locations during the construction phase under Alternative 2.

Alternative 2 would have temporary impacts on the noise environment at Site 2, Site 9, and Site 11 during transmission line work, including utility access roads, in the immediate vicinity, and at Site 5 during access road and facilities construction.

Table 4.6-14 Alternative 2 - SGP-Attributed Noise Level at Analysis Locations During the Construction Phase

ID	Name	Baseline Ambient Noise Level (dBA L_{EQ})	Baseline Ambient Noise Level (dBA L_{DN})	SGP-Attributed Daytime Noise Level (dBA L_{EQ})¹	SGP-Attributed Day-Night Noise Level (dBA L_{DN})
Site 2	Miller Residence	N/A	50	84 / 84²	82 / 82²
Site 3	Meadow Creek Lookout	45	N/A	41 / 25	39 / 23
Site 5	Forest Service Camp at Landmark	N/A	34	52/51²	50/49
Site 6	Forest Service Summer Camp/Warm Lake Recreation Areas	N/A	34	21 / 21	19 / 19
Site 7	Warm Lake Road/Warm Lake Camp	N/A	47	21 / 21	19 / 19
Site 8	Granite Excavation Shop in Cascade	N/A	61	51 / 51	49 /49
Site 9	Southern Pines Plantation Property	N/A	51	64 / 64²	62 / 62²
Site 10	Yellow Pine	N/A	50	33 / 6	31 / 4
Site 11	Ice Hole Campground/Boise National Forest	N/A	50	63 / 63²	61 / 61²
Site 12	Mule Hill Trailhead	40	N/A	40 /31	38 / 29

Table Source: AECOM 2020

Table Notes:

1 Noise level with SGP-related traffic on Yellow Pine Route / Burntlog Route.

2 Temporary Short-term exceedance of the recommended noise level.

N/A = not available.

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The potential noise impacts at dispersed recreational resource areas within the FCRNRW Area would be the same as reported for Alternative 1 (see **Tables 4.6-7, 4.6-8, and 4.6-9**), provided in terms of predicted noise level and noise level increases over existing at distances between 500 and 8,000 feet. However, the alignment of the 5.3-mile section of the Burntlog Route (Riordan Creek Segment) would be up to 1 mile closer to the FCRNRW in some areas, resulting in the potential for elevated noise levels to extend further into the FCNRNW Area along this segment.

4.6.2.2.2 OPERATIONS

4.6.2.2.2.1 Mine Site

Operations, equipment, and associated noise levels from the mine site would be similar to Alternative 1. Distances from the assumed acoustical center of activity at the mine to noise receivers would be the same as Alternative 1.

4.6.2.2.2.2 Access Roads

Access road maintenance activities, SGP-related traffic and associated noise levels from the access road would be the same as Alternative 1, except that a 5.3-mile segment of the Burntlog Route would be re-routed. The re-route would move the segment of roadway eastward, which would increase the distance to Site 2, Site 3, and Site 11, but decrease the distance to the FCRNRW

Borrow site locations, activities, and associated noise levels from borrow sites would be the same as Alternative 1.

4.6.2.2.2.3 Utilities

Operations, equipment, and associated noise levels from transmission lines, substations, and utility access roads would be the same as Alternative 1. However, under Alternative 2, the Cascade Switching Station west of the station would be closer to Site 8.

4.6.2.2.2.4 Off-Site Facilities

The location of the SGLF would be the same as for Alternative 1; however, the maintenance facility would be located along Burntlog Route, approximately 4.4 miles east of the junction of Johnson Creek Road and Warm Lake Road approximately midway between Sites 4 and 5.

4.6.2.2.2.5 Noise Impacts

Under Alternative 2, the Cascade Switching Station would be closer to Site 8 than under Alternative 1 (1,242 feet for Alternative 2 vs. 6,970 feet for Alternative 1). The average hourly daytime noise level at Site 8 is estimated to be 46 dBA under Alternative 2. However, this is still well below the 55-dBA threshold and background ambient noise levels at the site. The estimated noise levels at all other noise receivers would be the same as Alternative 1.

Table 4.6-18 provides estimated noise levels at noise receiver locations during the operations phase under Alternative 2.

Table 4.6-15 Alternative 2 - SGP-Attributed Noise Levels at Analysis Locations During the Operations Phase

ID	Name	Baseline Ambient Noise Level (dBA L_{EQ})	Baseline Ambient Noise Level (dBA L_{DN})	SGP-Attributed Daytime Noise Level (dBA L_{EQ})	SGP-Attributed Day-Night Noise Level (dBA L_{DN})
Site 2	Miller Residence	N/A	50	14	12
Site 3	Meadow Creek Lookout	45	N/A	40	38
Site 5	Forest Service Camp at Landmark	N/A	34	51 / 51¹	49
Site 6	Forest Service Summer Camp/Warm Lake Recreation Areas	N/A	34	<1	<1
Site 7	Warm Lake Road/Warm Lake Camp	N/A	47	5	3
Site 8	Granite Excavation Shop in Cascade	N/A	61	46	44
Site 9	Southern Pines Plantation Property	N/A	51	25	23
Site 10	Yellow Pine	N/A	50	0	7
Site 11	Ice Hole Campground/Boise National Forest	N/A	50	35	33
Site 12	Mule Hill Trailhead	40	N/A	33	31

Table Source: AECOM 2020

Table Note:

1 Long-term, periodic or intermittent exceedance of the recommended noise level.

N/A = not available.

Frank Church-River of No Return Wilderness Areas

The potential noise impacts at dispersed recreational resource areas within the FCNRW Area would be the same as reported for Alternative 1 (see **Tables 4.6-13** and **4.6-14**), provided in terms of predicted noise level and noise level increases over existing at distances between 500 and 8,000 feet. However, the alignment of the 5.3-mile section of the Burntlog Route (Riordan Creek Segment) would be up to 1 mile closer to the FCNRW, resulting in the potential for elevated noise levels to extend further into the FCNRW Area along this segment.

4.6.2.2.3 CLOSURE AND RECLAMATION

4.6.2.2.3.1 Mine Site

Operations, equipment, and associated noise levels from the mine site would be similar to Alternative 1. Distances from the assumed acoustical center of activity at the mine to noise receivers would be the same as Alternative 1.

4.6.2.2.3.2 Access Roads

Access road decommissioning activities, SGP-related traffic and associated noise levels from the access road would be the same as Alternative 1, except that a 5.3-mile segment of the Burntlog Route would be along a different alignment and would be farther from Site 2, Site 3, and Site 11 (as discussed in Section 4.6.2.2.2 and reported in **Table 4.6-19**), affecting estimated SGP-attributed noise levels at these sites during the decommissioning phase. Borrow site locations, activities, and associated noise levels from borrow site would be the same as Alternative 1.

4.6.2.2.3.3 Utilities

Under Alternative 2 the new transmission line into the mine site would not be decommissioned and reclaimed, as this facility would remain in perpetuity to provide power to the Centralized Water Treatment Plant at the mine site as part of the post-closure Water Quality Management Plan. Continued noise associated with the retained transmission line would be the same as described under Alternative 1 for operations: audible corona noise from the transmission line would likely not increase ambient levels beyond the transmission line ROW.

4.6.2.2.3.4 Off-Site Facilities

The maintenance facility would be located along Burntlog Route, approximately 4.4 miles east of the junction of Johnson Creek Road and Warm Lake Road approximately midway between Sites 4 and 5.

4.6.2.2.3.5 Noise Impacts

Table 4.6-19 provides estimated noise levels at noise receiver locations during the closure and reclamation phase under Alternative 2.

Alternative 2 would have temporary impacts on the noise environment at Site 5 during access road and facilities decommissioning.

Table 4.6-16 Alternative 2 - SGP-Attributed Noise Levels at Analysis Locations During the Closure and Reclamation Phase

ID	Name	Baseline Ambient Noise Level (dBA L_{EQ})	Baseline Ambient Noise Level (dBA L_{DN})	SGP-Attributed Daytime Noise Level (dBA L_{EQ})	SGP-Attributed Day-Night Noise Level (dBA L_{DN})
Site 2	Miller Residence	N/A	50	6	4
Site 3	Meadow Creek Lookout	45	N/A	41	39
Site 5	Forest Service Camp at Landmark	N/A	34	47 ¹	45
Site 6	Forest Service Summer Camp/Warm Lake Recreation Areas	N/A	34	18	16
Site 7	Warm Lake Road/Warm Lake Camp	N/A	47	18	16
Site 8	Granite Excavation Shop in Cascade	N/A	61	<1	<1
Site 9	Southern Pines Plantation Property	N/A	51	<1	<1
Site 10	Yellow Pine	N/A	50	54	52
Site 11	Ice Hole Campground/Boise National Forest	N/A	50	38	36
Site 12	Mule Hill Trailhead	40	N/A	40	38

Table Source: AECOM 2020

Table Notes:

1 Temporary Short-term exceedance of the recommended noise level.

N/A = not available.

4.6.2.3 Alternative 3

4.6.2.3.1 CONSTRUCTION

4.6.2.3.1.1 Mine Site

Construction activities, equipment, and associated noise levels from the mine site would be the same as Alternative 1. Despite mine site configuration changes, the distances from the assumed acoustical center of activity at the mine to noise receivers would remain the same as Alternative 1.

4.6.2.3.1.2 Access Roads

Construction activities, equipment and associated noise levels from access road work would be similar to Alternative 1, except that a section of the Burntlog Route (approach into the mine site) would be re-routed through Blowout Creek valley. This would increase the distance between Burntlog Route access road construction work and Site 12 (5,597 feet for Alternative 1 vs. 12,776 feet for Alternative 3), reducing estimated noise levels at Site 12. Traffic volumes on access road would be the same as Alternative 1. However, Alternative 3 also includes public access around the mine site by improving Meadow Creek Lookout Road (FR 51290) to provide public access from Burntlog Route to Monumental Summit and Thunder Mountain Road. This would involve constructing improvements along approximately 7.6 miles of Meadow Creek Lookout Road, including at Site 12.

4.6.2.3.1.3 Utilities

Construction activities, equipment, and associated noise levels from transmission line work and the construction of utility access roads would be the same as Alternative 1.

4.6.2.3.1.4 Off-Site Facilities

Off-site facilities and equipment used to construct off-site facilities would be the same as Alternative 1.

4.6.2.3.1.5 Noise Impacts

Under Alternative 3, estimated noise levels at Site 12 would be substantially higher than under Alternative 1 due to the improvements to Meadow Creek Lookout Road (FR 51290) to provide public access from Burntlog Route to Monumental Summit and Thunder Mountain Road. **Table 4.6-20** provides estimated noise levels at noise receiver locations during the construction phase under Alternative 3, including the noise level of public access road construction within approximately 100 feet of Site 12.

Alternative 3 would have temporary impacts on the noise environment at Site 2, Site 9, and Site 11 during transmission line work in the immediate vicinity, at Site 5 during access road and facilities construction work in the immediate vicinity, and at Site 12 during access road construction along Meadow Creek Lookout Road.

Table 4.6-17 Alternative 3 – SGP-Attributed Noise Level at Analysis Locations During the Construction Phase

ID	Name	Baseline Ambient Noise Level (dBA L_{EQ})	Baseline Ambient Noise Level (dBA L_{DN})	SGP-Attributed Daytime Noise Level (dBA L_{EQ})	SGP-Attributed Day-Night Noise Level (dBA L_{DN})
Site 2	Miller Residence	N/A	50	84	82
Site 3	Meadow Creek Lookout	45	N/A	41	39
Site 5	Forest Service Camp at Landmark	N/A	34	53 ¹	51
Site 6	Forest Service Summer Camp/Warm Lake Recreation Areas	N/A	34	21	19
Site 7	Warm Lake Road/Warm Lake Camp	N/A	47	21	19
Site 8	Granite Excavation Shop in Cascade	N/A	61	48	46
Site 9	Southern Pines Plantation Property	N/A	51	64 ¹	62 ¹
Site 10	Yellow Pine	N/A	50	33	31
Site 11	Ice Hole Campground/Boise National Forest	N/A	50	63 ¹	61 ¹
Site 12	Mule Hill Trailhead	40	N/A	85 ¹	83 ¹

Table Source: AECOM 2020

Table Notes:

1 Temporary Short-term exceedance of the recommended noise level.

N/A = not available.

Frank Church-River of No Return Wilderness Areas

The potential noise impacts at dispersed recreational resource areas within the FCRNRW Area would be the same as reported for Alternative 1 (see **Tables 4.6-7, 4.6-8, and 4.6-9**), provided in terms of predicted noise level and noise level increases over existing at distances between 500 and 8,000 feet. The differences being that for Alternative 3, the approach of the Burntlog Route into the mine site would be routed through Blowout Creek drainage, further east and away from the FCRNRW than if routed through the EFSFSR drainage. However, the public access improvements along approximately 7.6 miles of Meadow Creek Lookout Road would occur along the border of the FCRNRW, bringing construction noise much closer to the area, and thus extending further in to the FCRNRW.

4.6.2.3.2 OPERATIONS

4.6.2.3.2.1 Mine Site

Operations, equipment, and associated noise levels from the mine site would be similar to Alternative 1. Distances from the assumed acoustical center of activity at the mine to noise receivers would be the same as Alternative 1.

4.6.2.3.2.2 Access Roads

Access road maintenance activities, SGP-related traffic, and associated noise levels from the access road would be the same as Alternative 1, except that traffic noise from the Burntlog Route would be lower, resulting in lower SGP traffic-related noise levels at Site 12.

4.6.2.3.2.3 Utilities

Operations, equipment, and associated noise levels from transmission lines, substations, and utility access roads would be the same as Alternative 1. While the transmission line is closer to Site 2 than under Alternative 1, it does not affect noise levels at this site during the operations phase.

4.6.2.3.2.4 Off-Site Facilities

Operation of off-site facilities would be the same as Alternative 1.

4.6.2.3.2.5 Noise Impacts

Under Alternative 3, the nearest borrow site would be farther from Site 12 than under Alternative 1 (6,230 feet for Alternative 1 vs. 16,590 feet for Alternative 3). The average hourly daytime noise level at Site 12 is estimated to be 27 dBA under Alternative 3. This is well below the 55-dBA threshold and background ambient noise levels at the site. The estimated noise levels and noise impacts at all other noise receivers would be the same as Alternative 1.

Table 4.6-21 provides estimated noise levels at noise receiver locations during the operations phase under Alternative 3.

Table 4.6-18 Alternative 3 – SGP-Attributed Noise Levels at Analysis Locations During the Operations Phase

ID	Name	Baseline Ambient Noise Level (dBA L _{EQ})	Baseline Ambient Noise Level (dBA L _{DN})	SGP-Attributed Daytime Noise Level (dBA L _{EQ})	SGP-Attributed Day-Night Noise Level (dBA L _{DN})
Site 2	Miller Residence	N/A	50	14	12
Site 3	Meadow Creek Lookout	45	N/A	40	38
Site 5	Forest Service Camp at Landmark	N/A	34	51	49

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ID	Name	Baseline Ambient Noise Level (dBA L_{EQ})	Baseline Ambient Noise Level (dBA L_{DN})	SGP-Attributed Daytime Noise Level (dBA L_{EQ})	SGP-Attributed Day-Night Noise Level (dBA L_{DN})
Site 6	Forest Service Summer Camp/Warm Lake Recreation Areas	N/A	34	<1	<1
Site 7	Warm Lake Road/Warm Lake Camp	N/A	47	5	3
Site 8	Granite Excavation Shop in Cascade	N/A	61	25	23
Site 9	Southern Pines Plantation Property	N/A	51	25	23
Site 10	Yellow Pine	N/A	50	<1	<1
Site 11	Ice Hole Campground/Boise National Forest	N/A	50	35	33
Site 12	Mule Hill Trailhead	40	N/A	27	25

Table Source: AECOM 2020

Table Notes:

N/A = not available.

4.6.2.3.3 CLOSURE AND RECLAMATION

4.6.2.3.3.1 Mine Site

Equipment and associated noise levels from the mine site would be similar to Alternative 1. Distances from the assumed acoustical center of activity at the mine to noise receivers would be the same as Alternative 1.

4.6.2.3.3.2 Access Roads

Access road decommissioning activities, SGP-related traffic, and associated noise levels from the access road would be the same as Alternative 1, except for the decommissioning of public access improvements to Meadow Creek Lookout Road (FR 51290), which would substantially increase the noise levels at Site 12 similar to as during construction.

4.6.2.3.3.3 Utilities

Decommissioning activities, equipment, and associated noise levels from transmission line work and the decommissioning of utility access roads would be the same as Alternative 1.

4.6.2.3.3.4 Off-Site Facilities

Off-site facilities and equipment used to decommission off-site facilities would be the same as Alternative 1.

4.6.2.3.3.5 Noise Impacts

Table 4.6-22 provides estimated noise levels at noise receiver locations during the closure and reclamation phase under Alternative 3.

Alternative 3 would have temporary impacts on the noise environment at Site 2 while transmission line decommissioning work is occurring in the immediate vicinity, and at Sites 5 and 12 during access road and facilities decommissioning.

Table 4.6-19 Alternative 3 – SGP-Attributed Noise Levels at Analysis Locations During the Closure and Reclamation Phase

ID	Name	Baseline Ambient Noise Level (dBA L_{EQ})	Baseline Ambient Noise Level (dBA L_{DN})	SGP-Attributed Daytime Noise Level (dBA L_{EQ})	SGP-Attributed Day-Night Noise Level (dBA L_{DN})
Site 2	Miller Residence	N/A	50	6	4
Site 3	Meadow Creek Lookout	45	N/A	41	39
Site 5	Forest Service Camp at Landmark	N/A	34	56¹	54
Site 6	Forest Service Summer Camp/Warm Lake Recreation Areas	N/A	34	18	16
Site 7	Warm Lake Road/Warm Lake Camp	N/A	47	18	16
Site 8	Granite Excavation Shop in Cascade	N/A	61	<1	<1
Site 9	Southern Pines Plantation Property	N/A	51	<1	<1
Site 10	Yellow Pine	N/A	50	54	52
Site 11	Ice Hole Campground/Boise National Forest	N/A	50	38	36
Site 12	Mule Hill Trailhead	40	N/A	85¹	83¹

Table Source: AECOM 2020

Table Notes:

1 Temporary Short-term exceedance of the recommended noise level.

N/A = not available.

4.6.2.4 Alternative 4

4.6.2.4.1 CONSTRUCTION

4.6.2.4.1.1 Noise Impacts

Under Alternative 4, the Burntlog Route would not be constructed or used to access the mine site and no road improvements or road construction would take place in that area. The Yellow Pine Route would be improved and used to access the mine site through construction operations, and closure and reclamation. Road widening and straightening, along with drainage and bridge improvements would be required for the Johnson Creek Road (CR 10-413) portion of the Yellow Pine Route. The Stibnite Road (CR 50-412) portion would be improved by straightening curves, constructing retaining walls, and installing culverts. During the construction phase, SGP-related traffic volumes on the Yellow Pine Route access road is estimated at 65 AADT. Heavy vehicles are estimated at 45 AADT and light vehicles at 20 AADT (Midas Gold 2016). Vehicles per peak hour were assumed to be 10 percent of AADT (Washington State Department of Transportation 2017). Based on the estimated traffic volumes and vehicle mix, and typical vehicle speeds of 25 mph, estimated average hourly noise levels from SGP-related traffic on the mine access route during the construction phase would be 48 dBA L_{EQ} at a distance of 50 feet from the roadway. This is well below the impact threshold level of 55 dBA.

Table 4.6-23 provides estimated noise levels at noise receiver locations during the construction phase under Alternative 4.

Alternative 4 would have temporary impacts on the noise environment at Site 2, Site 9, Site 10, and Site 11 during transmission line work in the immediate vicinity.

Table 4.6-20 Alternative 4 – SGP-Attributed Noise Level at Analysis Locations During the Construction Phase

ID	Name	Baseline Ambient Noise Level (dBA L_{EQ})	Baseline Ambient Noise Level (dBA L_{DN})	SGP-Attributed Daytime Noise Level (dBA L_{EQ})	SGP-Attributed Day-Night Noise Level (dBA L_{DN})
Site 2	Miller Residence	N/A	50	84¹	82¹
Site 3	Meadow Creek Lookout	45	N/A	24	22
Site 5	Forest Service Camp at Landmark	N/A	34	48	46
Site 6	Forest Service Summer Camp/Warm Lake Recreation Areas	N/A	34	21	19
Site 7	Warm Lake Road/Warm Lake Camp	N/A	47	21	18

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ID	Name	Baseline Ambient Noise Level (dBA L_{EQ})	Baseline Ambient Noise Level (dBA L_{DN})	SGP-Attributed Daytime Noise Level (dBA L_{EQ})	SGP-Attributed Day-Night Noise Level (dBA L_{DN})
Site 8	Granite Excavation Shop in Cascade	N/A	61	48	46
Site 9	Southern Pines Plantation Property	N/A	51	64¹	62¹
Site 10	Yellow Pine	N/A	50	64¹	62¹
Site 11	Ice Hole Campground/Boise National Forest	N/A	50	63¹	61¹
Site 12	Mule Hill Trailhead	40	N/A	20	18

Table Source: AECOM 2020

Table Notes:

1 Temporary Short-term exceedance of the recommended noise level.

N/A = not available.

Frank Church-River of No Return Wilderness Areas

The potential noise impacts at dispersed recreational resource areas within the FCRNRW Area would be the same as reported for Alternative 1 (see **Tables 4.6-7, 4.6-8, and 4.6-9**), provided in terms of predicted noise level and noise level increases over existing at distances between 500 and 8,000 feet. The difference for Alternative 4 is that the primary access road would access the mine site from the north along the existing Stibnite Road (CR 50-412) and would approach close to the FCRNRW area for a very limited distance about midway between the mine site and Yellow Pine, which would represent a much more limited exposure than under Alternatives 1, 2, or 3.

4.6.2.4.2 OPERATIONS

4.6.2.4.2.1 Noise Impacts

Under Alternative 4, SGP-related traffic and road maintenance activities would occur along the Yellow Pine Route instead of the Burntlog Route. SGP-related traffic would not substantially contribute to noise levels during the operations phase. However, road maintenance activities would temporarily increase daytime noise levels at Site 2, Site 5, Site 10, and Site 11 as high as 75 to 84 dBA.

Alternative 4 would have periodic impacts on the noise environment at Site 2, Site 5, and Site 11 during road maintenance throughout the operations phase. The estimated noise levels and noise impacts at all other noise receivers would be the same as Alternative 1.

Table 4.6-24 provides estimated noise levels at noise receiver locations during the construction phase under Alternative 4.

Table 4.6-21 Alternative 4 – SGP-Attributed Noise Levels at Analysis Locations During the Operations Phase

ID	Name	Baseline Ambient Noise Level (dBA L_{EQ})	Baseline Ambient Noise Level (dBA L_{DN})	SGP-Attributed Daytime Noise Level (dBA L_{EQ})	SGP-Attributed Day-Night Noise Level (dBA L_{DN})
Site 2	Miller Residence	N/A	50	78 ¹	76 ¹
Site 3	Meadow Creek Lookout	45	N/A	40	38
Site 5	Forest Service Camp at Landmark	N/A	34	75 ¹	73 ¹
Site 6	Forest Service Summer Camp/Warm Lake Recreation Areas	N/A	34	<1	<1
Site 7	Warm Lake Road/Warm Lake Camp	N/A	47	6	4
Site 8	Granite Excavation Shop in Cascade	N/A	61	25	23
Site 9	Southern Pines Plantation Property	N/A	51	25	23
Site 10	Yellow Pine	N/A	50	61 ¹	59 ¹
Site 11	Ice Hole Campground/Boise National Forest	N/A	50	84 ¹	82 ¹
Site 12	Mule Hill Trailhead	40	N/A	27	25

Table Source: AECOM 2020

Table Notes:

1 Temporary Short-term exceedance of the recommended noise level.

N/A = not available.

4.6.2.4.3 CLOSURE AND RECLAMATION

4.6.2.4.3.1 Noise Impacts

Table 4.6-25 provides estimated noise levels at noise receiver locations during the closure and reclamation phase under Alternative 4. The Yellow Pine Route would not be decommissioned and would remain as built under Alternative 4.

Table 4.6-22 Alternative 4 – SGP-Attributed Noise Levels at Analysis Locations During the Closure and Reclamation Phase

ID	Name	Baseline Ambient Noise Level (dBA L_{EQ})	Baseline Ambient Noise Level (dBA L_{DN})	SGP-Attributed Daytime Noise Level (dBA L_{EQ})	SGP-Attributed Day-Night Noise Level (dBA L_{DN})
Site 2	Miller Residence	N/A	50	37	35
Site 3	Meadow Creek Lookout	45	N/A	21	19
Site 5	Forest Service Camp at Landmark	N/A	34	54	52
Site 6	Forest Service Summer Camp/Warm Lake Recreation Areas	N/A	34	18	16
Site 7	Warm Lake Road/Warm Lake Camp	N/A	47	18	16
Site 8	Granite Excavation Shop in Cascade	N/A	61	<1	<1
Site 9	Southern Pines Plantation Property	N/A	51	<1	<1
Site 10	Yellow Pine	N/A	50	54	52
Site 11	Ice Hole Campground/Boise National Forest	N/A	50	42	40
Site 12	Mule Hill Trailhead	40	N/A	20	17

Table Source: AECOM 2020

Table Notes:

N/A = not available.

4.6.2.5 Alternative 5

Under Alternative 5, there would be no large-scale mining operations by Midas Gold, and existing noise from currently permitted Midas Gold drilling activities for exploration would continue. Midas Gold would continue to implement surface exploration and associated activities that have been previously approved on National Forest System lands as part of the Golden Meadows Exploration Project, per the Golden Meadows Exploration Project Plan of Operations and the Golden Meadows Exploration Project Environmental Assessment (Forest Service 2015). These 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 National Forest System and private lands at and in the vicinity of the mine site. The continuation of approved exploration activities at the mine site by Midas Gold would result in the continued use of the existing man camp, office

trailers, truck maintenance shop area, potable water supply system, wastewater treatment facility, helipad and hangar, and airstrip.

4.6.3 Mitigation Measures

Mitigation measures required by the Forest Service and measures committed to by Midas Gold as part of design features of the SGP are described in **Appendix D**, Mitigation Measures and Environmental Commitments; see **Table D-1**, Preliminary Mitigation Measures Required by the Forest Service, and **Table D-2**, Mitigation Measures Proposed by Midas Gold as SGP Design Features, respectively. The preceding impact analysis has taken these mitigation measures into consideration, as well as measures routinely required through federal, state or local laws, regulations or permitting, such that the identified potential impacts of the SGP are those that remain after their consideration.

Mitigation measures may be added, revised, or refined based on public comment, agency comment, or continued discussions with Midas Gold and will be finalized in the Final EIS.

4.6.4 Cumulative Effects

Cumulative noise impacts typically occur when sensitive receivers are exposed to multiple noise sources at approximately the same time, such as cumulative noise from residential uses, industrial and commercial activities, agriculture, forestry, mining activities, highway traffic, and construction traffic and activities. The mine site, access roads, utilities (transmission lines), and off-site facilities would each contribute to the noise environment at varying levels, durations, and locations during each SGP phase.

Reasonably foreseeable future projects in the vicinity of the SGP area that could affect the noise environment are described in **Tables 4.6-26** and **4.6-27**. These include road projects, mining projects, and forestry projects. Each of these activities would contribute to noise levels in the area. 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 reasonably foreseeable future action; the impacts from noise are not expected to be additive because the SPG would not occur in the same place or the same time as most reasonably foreseeable future actions.

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 4.6-23 Foreseeable Activities Considered Regarding Cumulative Noise Emissions – Specific Planned Projects

Project Type	Project Names/Description	Nature of Noise Contribution to Cumulative Effects
Exploratory Drilling for Mineral Resources	<ul style="list-style-type: none"> • Morgan Ridge Exploratory Drilling Plan of Operations Environmental Assessment Project involves exploratory drilling for locatable minerals from remote drill pads approximately 10 miles north of the mine site. Project is reportedly on hold.	Local noise from drilling equipment (e.g., compressor engines), and vehicles.
Forest Maintenance and Fire Risk Reduction	<ul style="list-style-type: none"> • Big Creek fuels reduction project, approximately 10 miles north of mine site • South Fork Restoration and Access Management Plan Environmental Assessment, 25 miles southwest of mine site • East Fork Salmon River Restoration and Access Management Plan, approximately 5 miles northwest of mine site Projects to reduce wildfire risk and fire severity/intensity on National Forest System lands and private property using commercial timber harvest, understory treatment, and prescribed burning.	Local noise generation from portable generators equipment (e.g., compressor engines), and vehicles.

Table 4.6-24 Foreseeable Activities Considered Regarding Cumulative Noise Emissions – Ongoing Projects and Foreseeable Emission 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	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 noise from drilling equipment (e.g., compressor engines), and vehicles. Known mining operations are of small size (50 tons per day or less) or are inactive.
Recreation and tourism	Recreation and Tourist activities: <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 	Collectively substantial noise from vehicles on unpaved roads and trails, boats, and generators.

Project Type	Project Names/Description	Nature of Noise Contribution to Cumulative Effects
	<ul style="list-style-type: none"> • Tourist Services – Big Creek Lodge • OHV use • Tourist Services – e.g., Big Creek Lodge 	

4.6.5 Irreversible and Irretrievable Commitments of Public Resources

The SGP would not contribute to irretrievable and irreversible commitment of public resources as it relates to the ambient noise environment. All noise sources and noise impacts associated with the SGP would cease upon final closure of the SGP and noise levels would return to ambient conditions without acoustical contribution of the SGP. The future non-SGP ambient sound environment is likely to be similar to the reported baseline, adjusted only by changes in non-SGP acoustical contributors such as roadway traffic flows and the potential for new residential, commercial, and industrial development in the SGP vicinity.

Under Alternative 5, the SGP would not be undertaken. Consequently, there would be no irretrievable and irreversible commitment of public resources as it relates to the ambient noise environment.

4.6.6 Short-term Uses versus Long-term Productivity

Modeled noise levels did not rise beyond threshold of concern under most conditions, and the noise related to mining and associated activities would be short term (during the estimated 20-year life of the mine between construction and reclamation) and are expected to end with mine reclamation.

Under Alternative 5, the SGP would not be undertaken. Consequently, there would be no short-term use that would affect the ambient noise environment, and no effect on long-term productivity.

4.6.7 Summary

Table 4.6-28 provides a summary comparison of noise impacts by issues and indicators for each alternative. All four action alternatives would create some short-term periodic impacts to up to four NSRs during SGP mine site, access road, and transmission line construction. Construction of access roads (Burntlog Route and Yellow Pine Route) for all four alternatives also would impact areas of the FCRNRW Area – noise would gradually attenuate to not noticeable up to 8,000 feet into the wilderness. Differing impacts to the FCRNRW Area are due to the distance of the access road to the wilderness boundary – Alternative 2 is the closest for the longest length and Alternative 4 is closest for the shortest length.

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Impacts to NSRs during operations would be long term and periodic for all four action alternatives due mainly to road maintenance activities. Alternative 2 would impact the least number of NSRs and Alternative 4 would impact the most. Access road traffic and maintenance for all action alternatives would impact some areas of the FCRNRW Area, with impacts diminishing with distance from the wilderness boundary. Impacts from operations would not extend as far into the wilderness area as they would during construction.

During closure activities, there would be short-term impacts from transmission line and access road decommissioning to one or two NSRs, depending on the alternative. There would be no irreversible impacts; all noise would cease upon final closure and reclamation.

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Table 4.6-25 Comparison of Noise Impacts by Alternative

Issue	Indicator	Baseline Conditions	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
<p>The SGP may cause disturbance to NSRs (such as occupied residences and campgrounds).</p>	<p>Area affected by noise that exceeds Outdoor Ambient Sound Level and U.S. Environmental Protection Agency Indoor and Outdoor Standards.</p>	<p>Baseline Ambient sound levels vary by location and range between 34 and 64 dBA, L_{DN} over the 12 identified NSRs as summarized Tables 3.6-2, and 3.6-3.</p>	<p><u>Construction:</u> Temporary impacts at Site 2, Site 5, Site 9, and Site 11 while transmission line work is within approximately 800-850 feet. Temporary impact at Site 5 while access road work is within approximately 0.5 mile.</p> <p><u>Operations:</u> Long-term, periodic impacts at Site 5 during road maintenance activity.</p> <p><u>Closure:</u> Temporary impact at Site 5 while access road decommissioning and facilities decommissioning work is within approximately 0.5 mile.</p>	<p><u>Construction:</u> Impacts would be similar to Alternative 1, except for slightly reduced noise at Site 5 due to relocation of maintenance facility and some increase at some parts of FCRNRW Area due to Burntlog Route re-alignment.</p> <p><u>Operations:</u> Long-term, periodic impacts at Site 5 during road maintenance activity. Impacts would be similar to Alternative 1, except for reduced noise at Site 5 due to relocation of maintenance facility.</p> <p><u>Closure:</u> Impacts would be similar to Alternative 1, except for reduced noise at Site 5 due to relocation of maintenance facility. No decommissioning-related noise of the transmission line into the mine site.</p>	<p><u>Construction:</u> Impacts would be similar to Alternative 1 but noise increase at Site 12 due to public access road along Meadow Creek Lookout Road (FR 51290), and in FCRNRW Area along Meadow Creek Lookout Road upgrades.</p> <p><u>Operations:</u> Impacts would be same as Alternative 1.</p> <p><u>Closure:</u> Impacts would be similar to Alternative 1, except for access road decommissioning noise at Site 12 and along FCRNRW.</p>	<p><u>Construction:</u> Impacts would be similar to Alternative 1, but with some noise increase at Site 10 and some parts of FCRNRW Area due to Yellow Pine Route construction.</p> <p><u>Operations:</u> Long-term, periodic impacts at Site 2, Site 5, Site 10, and Site 11 during road maintenance activity due to use of Yellow Pine Route.</p> <p><u>Closure:</u> No impacts above recommended noise level. Yellow Pine Route would not be decommissioned and would remain as built.</p>	<p>No impacts</p>

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