5.17 NOISE

5.17.1 Affected Environment

The ambient sound level of a region is defined by the total noise generated within the specific environment and is usually comprised of sound emanating from natural and artificial sources. At any location, both the magnitude and frequency of environmental noise may vary considerably over the course of the day and throughout the week. This variation is caused in part by changing weather conditions and the effects of seasonal vegetative cover. The existing noise levels in the proposed Project area are described below.

5.17.1.1 Acoustics Principles

Sound is mechanical energy transmitted by pressure waves in a compressible or incompressible medium such as air or water, respectively. When sound becomes excessive, annoying, or unwanted, it is referred to as noise. Noise may be continuous (constant noise with a steady decibel level), steady (constant noise with a fluctuating decibel level), impulsive (having a high peak of short duration), stationary (occurring from a fixed source), intermittent (occurring at the same rate), or transient (occurring at different rates). Noise levels are quantified using units of decibels (dB). The decibel is defined as ten times the base 10 logarithm of the ratio between the two quantities of sound pressure level (SPL) squared, or:

$$SPL = 10 \log (p^2/p_o^2) = 20 \log (p/p_o) \text{ dB}$$

Where p is the sound pressure being measured and p_o is the reference sound pressure (in air 0.0002 microbar (µbar) or 2×10^{-5} Newtons per square meter (N/m^2), in water 0.00001 µbar or 1×10^{-6} N/m^2). Sound pressure level (SPL, µbar, 0.1 N/m^2) attenuates with respect to the inverse distance law, where sound pressure is inversely proportional to the distance from the noise source (EPA 1974, Plog 1988).

Two measurements used by local, state, and federal agencies which relate the time-varying quality of environmental noise to its known effect on people are: (1) the 24-hour equivalent sound level ($L_{EQ}(24)$); and (2) the day-night sound level (LDN). The $L_{EQ}(24)$ quantifier is the level of steady sound with the same total (equivalent) energy as the time-varying sound of interest, averaged over a 24-hour period. The L_{DN} quantifier is the $L_{EQ}(24)$ with 10 decibels on the A-weighted decibel scale (dBA) added to nighttime sound levels between the hours of 10 p.m. and 7 a.m. to account for people's greater sensitivity to sound during nighttime hours. The 10th percentile-exceeded sound level, L_{10} (L_{50}, L_{90} can be used also), is the A-weighted sound level which happens 10 percent or more of the time of the measurement (or 50 percent, 90 percent in case of L_{50}, L_{90}, respectively [EPA 1974]).

In 1974, the Environmental Protection Agency (EPA) published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. This document provides information for state and local agencies to use in developing their ambient noise standards. However, the state of Alaska and cities in which the proposed Project is located have yet to establish any noise or vibration regulations that specify acceptable community levels.

The EPA document identified outdoor and indoor noise levels to protect public health and welfare. A L_{EQ}(24) of 70 dBA was identified as the level of environmental noise that would not result in any measurable hearing loss over a lifetime. A L_{DN} of 55 dBA outdoors and a L_{DN} of 45 dBA indoors was identified as noise thresholds that would prevent activity interference or annoyance. These levels are not “peak” levels but are 24-hour averages over several years. Occasional high levels of noise may occur. A L_{DN} of 55 dBA is equivalent to a continuous noise level of 48.6 dBA. Examples of typical noise levels measured at a typical distance from the source are as follows (EPA 1974):

- Quiet room: 28–33 dBA
- Computer: 37–45 dBA
- Refrigerator: 40–43 dBA
- Forced hot air heating system: 42–52 dBA
- Microwave: 55–59 dBA
- Clothes dryer: 56–58 dBA
- Clothes washer: 65–70 dBA
- Phone: 66–75 dBA
- Garbage disposal: 76–83 dBA
- Hair dryer: 80-95 dBA
- Weed whacker: 94–96 dBA

The following relationships occur with regard to increases in noise measured on the A-weighted decibel scale (EPA 1974):

- A change of 1 dBA cannot be perceived by humans, except in carefully controlled laboratory environments;
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference by humans;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness and can cause an adverse response.

According to the National Institutes of Health, National Institute on Deafness and Communication Disorder (NIDCD), Noise-Induced Hearing Loss (NIHL) can occur when one is exposed to harmful noise. Exposure to sounds that are too loud or loud sounds that last a long time can cause damage to sensitive structures, called hair cells, in the inner ear. Once damaged, the hair cells cannot grow back (NIDCD 2008).

Sources of noise that can cause NIHL include motorcycles, firecrackers, and small firearms, all emitting sounds from 120 to 150 dBA. In addition, long or repeated exposure to sounds at or above 85 dBA can cause hearing loss. The louder the sound, the shorter the time period before NIHL can occur. Sounds of less than 75 dBA, even after long exposure, are unlikely to cause hearing loss. Although being aware of decibel levels is an important factor in protecting one's hearing, distance from the source of the sound and duration of exposure to the sound are equally important (NIDCD 2008).

5.17.1.2 Ground Vibration

Ground-borne vibration consists of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of ground-borne vibrations typically cause a nuisance only to people, but at extreme vibration levels, damage to buildings may occur. Although ground-borne vibration can be felt outdoors, it is typically an annoyance only to people indoors, where the associated effects of the shaking of a building can be notable and because people are moving around less indoors (e.g., seated). Induced ground-borne noise is an effect of ground-borne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may consist of the rattling of windows or dishes on shelves. Although the perceptibility threshold is about 65 VdB (vibration decibels), human response to vibration is not usually significant unless the vibration exceeds 70 VdB with the threshold of potential architectural damage to fragile structures at about 100 VdB. Human response to different levels of ground-borne noise and vibration is as follows (FTA 2006):

- 65 VdB produces a noise level between 25 (low frequency) and 40 dBA (high frequency). Approximate threshold of perception for many humans. Low-frequency sound usually inaudible, mid-frequency sound excessive for quiet sleeping areas;
- 75 VdB produces a noise level between 35 (low frequency) and 50 dBA (high frequency). Approximate dividing line between barely perceptible and distinctly perceptible. Many people find transit vibration at this level annoying. Low-frequency noise acceptable for sleeping areas, mid-frequency noise annoying in most quiet occupied areas; and
- 85 VdB produces a noise level between 45 (low frequency) and 60 dBA (high frequency). Vibration acceptable only if there are an infrequent number of events per day. Low-frequency noise annoying for sleeping areas, mid-frequency noise annoying even for infrequent events with institutional land uses such as schools and churches.

5.17.1.3 Existing Noise Environment

The proposed Project would be constructed in Alaska from the North Slope to Cook Inlet. Most of the area adjacent to the proposed Project pipeline is undeveloped and sparsely populated and, therefore, ambient noise levels are generally low. However, other areas of the pipeline would be located in more urban and industrial areas with higher ambient noise levels. Consequently, it is estimated that the existing ambient noise level in the proposed Project area is in the range of 35 dBA (wilderness areas) to 51 dBA (wooded residential) and 59 dBA (urban residential) (EPA 1978). These are assumed noise levels. Furthermore, the background vibration velocity level is estimated to be less than 50 VdB (FTA 2006).

Sensitive receptors are those populations that are more susceptible to the effects of noise than the population at large and those located in close proximity to localized sources of noise. More than 95 percent of the proposed Project is located out of range of any sensitive receptor. Sensitive noise receptors within 5 miles of the proposed Project's pipeline facilities are shown in Table 5.17-1.

TABLE 5.17-1 Sensitive Noise Receptors within 5 Miles of Proposed Project Pipeline Facilities[a]

Town	Population	Mainline (miles)	Fairbanks Lateral (miles)	Denali National Park Route Variation (miles)
Wiseman	19	0.7	181.5	257.1
Livengood	27	4.4	43.5	124.0
Nenana	379	0.2	16.1	57.5
Ester	1931	20.3	3.9	80.9
College	12717	26.3	1.7	83.9
Anderson	319	0.9	30.9	42.9
Fairbanks	31053	29.3	4.8	83.8
Ferry	28	1.0	58.3	15.1
Healy	960	1.1	63.0	8.2
McKinley Park	136	3.5	73.6	2.3
Cantwell	213	0.9	94.9	12.0
Talkeetna	1112	4.1	174.0	94.9
Willow	2375	1.3	212.6	131.5
Prudhoe Bay	5	3.8	371.4	453.7

[a] Distances derived from spatial near analysis of cities/towns (ESRI 2000) located within 5 miles of the proposed pipeline.

Sensitive noise receptors within 5 miles of the proposed Project's aboveground facilities are shown in Table 5.17-2.

TABLE 5.17-2 Sensitive Noise Receptors within 5 Miles of Proposed Project Aboveground Facilities[a]

Town	Population	Gas Conditioning Facility (miles)	Compressor Stations (miles)	Straddle and Off-Take Facility (miles)	NGL Extraction Plant Facility (miles)	Mainline Valves (miles)
Wiseman	19	204.6	7.5	187.9	414.7	9.9
Livengood	27	331.7	53.2	53.6	287.6	14.5
Nenana	379	398.5	15.8	16.0	219.4	2.8
Ester	1931	379.0	23.0	23.5	245.3	25.4
College	12717	378.4	29.2	29.6	247.9	30.0
Anderson	319	413.8	30.6	30.8	203.9	1.0
Fairbanks	31053	379.9	31.7	32.1	247.5	33.2
Ferry	28	442.6	58.0	58.2	175.7	11.8
Healy	960	447.8	62.7	62.9	171.4	7.2
McKinley Park	136	458.5	73.3	73.5	161.2	4.3
Cantwell	213	479.7	94.5	94.7	140.6	9.2
Talkeetna	1112	555.8	173.7	173.9	61.3	6.6
Willow	2375	595.3	212.3	212.4	21.7	7.1
Prudhoe Bay	5	3.6	191.9	383.2	615.4	16.6

[a] Distances derived from spatial near analysis of cities/towns (ESRI 2000 Detailed Cities Point Locations) located within 5 miles of proposed aboveground facilities.

Sensitive noise receptors within 5 miles of the proposed Project's support facilities are shown in Table 5.17-3.

TABLE 5.17-3 Sensitive Noise Receptors within 5 Miles of Proposed Project Support Facilities[a]

Town	Population	Construction Camp and Laydown Locations (miles)	Material Sites (miles)
Wiseman	19	9.9	1.1
Livengood	27	4.8	2.1
Nenana	379	0.2	0.3
Ester	1931	7.8	0.0
College	12717	1.8	3.6
Anderson	319	15.4	0.2
Fairbanks	31053	1.3	4.5
Ferry	28	6.6	0.9

TABLE 5.17-3 Sensitive Noise Receptors within 5 Miles of Proposed Project Support Facilities[a]

Town	Population	Construction Camp and Laydown Locations (miles)	Material Sites (miles)
Healy	960	0.9	0.8
McKinley Park	136	10.8	3.6
Cantwell	213	0.1	0.8
Talkeetna	1112	10.7	0.8
Willow	2375	0.7	0.5
Prudhoe Bay	5	5.2	8.0

[a] Distances derived from spatial near analysis of cities/towns (ESRI 2000 Detailed Cities Point Locations) located within 5 miles of proposed support facilities.

5.17.2 Environmental Consequences

The environmental consequences for noise for the proposed Project and alternatives are described below.

5.17.2.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed or operational. Consequently, no effects to noise would occur.

5.17.2.2 Proposed Action

Noise effects for the proposed Project fall into two categories: temporary impacts resulting from construction, and long-term or permanent impacts resulting from operation of the facilities. The proposed action includes the following route variations: Yukon River and Denali National Park Route.

Pipeline Facilities

Mainline

Construction

Construction of the proposed Project would be similar to other pipeline projects in terms of schedule, equipment used, and types of activities. Construction would increase noise levels in the vicinity of proposed Project activities, and the noise levels would vary during the construction period, depending on the construction phase. Construction noise levels are rarely steady in nature but instead fluctuate depending on the number and type of equipment in use at any given time. There would be times when no large equipment is operating and noise would be at or near ambient levels. In addition, construction-related sound levels experienced by a noise sensitive receptor in the vicinity of construction activity would be a function of distance.

Table 5.17-4 lists noise levels produced by typical construction machinery at 50 feet in units of the A-weighted decibel scale (dBA).

TABLE 5.17-4 Estimated Maximum Noise Levels for Construction Equipment (dBA)

Equipment	50 feet
Pickup truck	55
Welding (or cutting) torch	73
Pump (dewatering)	77
Backhoe (with loader)	80
Compactor (ground)	80
Compressor (air)	80
Concrete pump truck	82
Generator (general purpose utility)	82
Excavator (hydraulic)	85
Dozer (crawler tractor)	85
Grader	85
Scraper	85
Concrete mixer truck	85
Crane	85
Pneumatic tool	85
Jackhammer	85
Rock drill	85
Paver (asphalt)	85
Pile driver (impact)	95

dBA = sound level from A-weighted decibel scale.
Source: DOT FHWA 2006.

Ground-borne vibration would also occur in the immediate vicinity of construction activities, particularly if rock drilling, pile driving, or blasting is required. Table 5.17-5 lists vibration levels produced by typical construction machinery and activities at 25 feet in units of vibration decibels (VdB).

TABLE 5.17-5 Vibration Source Levels for Construction Equipment (vdB)

Equipment	25 feet
Pile Driver (impact type)	104-112
Pile Driver (sonic or vibratory type)	93-105
Vibratory Roller	94
Large Bulldozer	87
Loaded Trucks	86
Jackhammer	79
Small Bulldozer	58

vdB = vibration decibels

Source: FTA 2006.

Due to weather and terrain features, the AGDC proposes only winter and summer construction for mainline construction. Furthermore, pipeline construction equipment would operate 24 hours per day for 6 winter months and 12 hours per day for 4 summer months. Construction would occur simultaneously on all 4 spreads lasting a total of 2 years, but would only last about 90 to 120 days (3 to 4 months) at any single point along the mainline. In general, because construction moves through an area relatively quickly, noise and vibration impacts typically would be localized, intermittent, and short term.

As shown in Table 5.17-1, the nearest sensitive receptor to mainline construction would be the city of Nenana, approximately 0.2 miles (1,145 feet) from the mainline. The estimated noise levels from construction activities at this receptor would be approximately 61 dBA (L_{EQ}) using a nominal existing ambient level of 55 dBA (adapted from Table 5.17-4). Maximum noise levels could reach up to 66 dBA (L_{MAX}) but would be temporary and intermittent. The calculations assume a terrain coefficient of 0.007 for brush, an integration loss of 3 for berm or rough terrain, and typical usage factors. The exact values would depend on the number of sources operating at this distance. These noise levels would be perceived as moderately loud, creating a moderate impact (i.e., increase of 6 dBA (L_{EQ}) over estimated ambient levels).

The estimated vibration level at this receptor from construction equipment would be less than 62 VdB, which would be well below the FTA damage threshold for buildings of 100 VdB (adapted from Table 5.17-5). This level is also below the human perceptibility threshold of about 65 VdB and thus, would not constitute an impact.

The Alaska Gasline Development Corporation (AGDC) would develop and implement a noise abatement program to mitigate noise impacts from construction, and a construction communications plan to inform adjacent residences of construction activities. Suggested mitigation measures to reduce moderate impacts from construction are identified in Section 5.23, Mitigation.

Yukon River Crossing Options

There are three options being considered for the proposed Project to cross the Yukon River (see construction details of these options in Section 2, Project Description):

- The Applicant's Preferred Option would be to cross the Yukon River via a new standalone pipeline suspension bridge.
- Option 2 would be to hang the pipeline below the surface of the existing E.L. Patton Bridge on the Dalton Highway.
- Option 3 would be to utilize a horizontal directional drill (HDD) crossing method to cross underneath the Yukon River. The feasibility of a HDD crossing is unknown at this time due to limited soils information. If feasible, the HDD crossing would be at the same location as the proposed suspension bridge.

There would potentially be reduced sources and duration of noise related to construction equipment if the existing bridge was utilized and construction of a new pipeline suspension bridge or HDD crossing method were not required. However, the differences would be negligible.

Operations and Maintenance

With respect to natural gas pipeline operations, gas traveling through a buried pipeline would not emit audible noise above the surface or a perceptible level of vibration. In addition, noise levels from routine inspection and maintenance activities associated with the proposed mainline would not result in perceptible noise or vibration level increases at the nearest sensitive receptor. Consequently, no impacts would occur.

Fairbanks Lateral

Construction

Pipeline construction equipment would operate 12 hours per day for 4 summer months on the Fairbanks Lateral construction. In general, because construction moves through an area relatively quickly, noise impacts typically would be localized, intermittent, and short term. According to Table 5.17-1, the nearest sensitive receptor to Fairbanks Lateral construction would be the city of College, approximately 1.7 miles (8,769 feet) from the Fairbanks Lateral. The estimated noise levels from construction activities at this receptor would be approximately 55 dBA (L_{EQ}) using a nominal existing ambient level of 55 dBA (adapted from Table 5.17-4). The calculation assumes a terrain coefficient of 0.007 for brush, an integration loss of 3 for berm or rough terrain, and typical usage factors. The exact value would depend on the number of sources operating at this distance. This noise level would be perceived as insignificant, thus creating no noise impact (i.e., increase of 0 dBA over estimated ambient levels).

The estimated vibration level at this receptor from construction equipment would be less than 36 VdB, which would be well below the FTA damage threshold for buildings of 100 VdB (adapted from Table 5.17-5). This level is also below the human perceptibility threshold of about 65 VdB and thus, would not constitute an impact.

Operations and Maintenance

With respect to natural gas pipeline operations, gas traveling through a buried pipeline would not emit audible noise above the surface or a perceptible level of vibration. In addition, noise levels from routine inspection and maintenance activities associated with the proposed Fairbanks Lateral would not result in perceptible noise or vibration level increases at the nearest sensitive receptor. Consequently, no impacts would occur.

Aboveground Facilities

Aboveground facilities consist of the following: gas conditioning facility (GCF), compressor stations, straddle and off-take facility, Cook Inlet natural gas liquids (NGL) extraction plant facility, and mainline valves and pig[1] launcher/receivers. In general, noise impacts from construction activities at these facilities would be localized, intermittent, and short term.

Once the aboveground facilities are commissioned and operating normally, the new ambient sound level at the sites would be measured as a logarithmic sum of background and proposed Project noise. Although noise levels from the industrial equipment at the aboveground facilities are currently unknown, it is estimated at approximately 85 to 95 dBA at 50 feet. Consequently, the estimated noise levels from operations at the nearest sensitive receptor from each of the aboveground facilities would be approximately 55 dBA (L_{EQ}) using a nominal existing ambient level of 55 dBA (adapted from Table 5.17-1), except as noted in the *Mainline Valves and Pig Launcher* section below. The calculation assumes a terrain coefficient of 0.007 for brush, an integration loss of 3 for berm or rough terrain, and typical usage factors. The exact value would depend on the number of sources operating at the facility's respective distance. This noise level would be perceived as insignificant, thus creating no noise impact (i.e., increase of 0 to 1 dBA over estimated ambient levels). Furthermore, vibration levels from operation at this distance would be insignificant.

Gas Conditioning Facility (GCF)

Construction

According to Table 5.17-2, the nearest sensitive receptor to the GCF construction would be the Prudhoe Bay Oil Field Complex (including the community of Deadhorse), approximately 3.6 miles (18,981 feet) from the facility. The estimated noise levels from construction activities at this receptor would be approximately 55 dBA (L_{EQ}) using a nominal existing ambient level of 55 dBA (adapted from Table 5.17-4). The calculation assumes a terrain coefficient of 0.007 for brush, an integration loss of 3 for berm or rough terrain, and typical usage factors. The exact value would depend on the number of sources operating at this distance. This noise level would be perceived as insignificant, thus creating no noise impact (i.e., increase of 0 dBA over estimated ambient levels).

[1] Pig refers to a pipeline inspection gage.

The estimated vibration level at this receptor from construction equipment would be less than 26 VdB, which would be well below the FTA damage threshold for buildings of 100 VdB (adapted from Table 5.17-5). This level is also below the human perceptibility threshold of about 65 VdB and, thus, would not constitute an impact.

Operations and Maintenance

The GCF would be installed on approximately 70 acres and would contain several modular buildings that would house equipment, utilities, workspaces, and personnel. Primary and backup power generation, natural gas compressors, and heating and refrigerant equipment in addition to other ancillary facilities would be located at this facility to drive the natural gas conditioning process. Noise and vibration levels from operations would be perceived as insignificant, as explained in the *Aboveground Facilities* section above.

Compressor Stations

Construction

According to Table 5.17-2, the nearest sensitive receptor to compressor station construction would be the city of Wiseman, approximately 7.5 miles (39,511 feet) from the station. The estimated noise levels from construction activities at this receptor would be approximately 55 dBA (L_{EQ}) using a nominal existing ambient level of 55 dBA (adapted from Table 5.17-4). The calculation assumes a terrain coefficient of 0.007 for brush, an integration loss of 3 for berm or rough terrain, and typical usage factors. The exact value would depend on the number of sources operating at this distance. This noise level would be perceived as insignificant, thus creating no noise impact (i.e., increase of 0 dBA over estimated ambient levels).

The estimated vibration level at this receptor from construction equipment would be less than 16 VdB, which would be well below the FTA damage threshold for buildings of 100 VdB (adapted from Table 5.17-5). This level is also below the human perceptibility threshold of about 65 VdB and, thus, would not constitute an impact.

Operations and Maintenance

Compressor stations are used to increase the pressure and keep the flow of natural gas moving through the pipeline at an appropriate rate and typically contain gas turbine-driven centrifugal compressors. Additional facilities would include gas and utility piping, a filter separator/scrubber, refrigerant condensers, a helicopter port, communication tower, tank farm, power generators, and various control and compressor buildings. Noise and vibration levels from operations would be perceived as insignificant, as explained in the *Aboveground Facilities* section above.

Straddle and Off-Take Facility

Construction

The nearest sensitive receptor to straddle and off-take facility construction would be the city of Nenana, approximately 16.0 miles (84,454 feet) from the facility (see Table 5.17-2). The estimated noise levels from construction activities at this receptor would be approximately 55 dBA (L_{EQ}) using a nominal existing ambient level of 55 dBA (see Table 5.17-4). The calculation assumes a terrain coefficient of 0.007 for brush, an integration loss of 3 for berm or rough terrain, and typical usage factors. The exact value would depend on the number of sources operating at this distance. This noise level would be perceived as insignificant, thus creating no noise impact (i.e., increase of 0 dBA over estimated ambient levels).

The estimated vibration level at this receptor from construction equipment would be less than 6 VdB, which would be well below the FTA damage threshold for buildings of 100 VdB (see Table 5.17-5). This level is also below the human perceptibility threshold of about 65 VdB and, thus, would not constitute an impact.

Operations and Maintenance

The straddle and off-take facility would be installed at the proposed Fairbanks Lateral tie-in to provide utility grade natural gas, primarily through the removal of NGLs, prior to sending natural gas into the Fairbanks Lateral. Noise and vibration levels from operations would be perceived as insignificant, as explained in the *Aboveground Facilities* section above.

Cook Inlet Natural Gas Liquids (NGL) Extraction Plant Facility

Construction

According to Table 5.17-2, the nearest sensitive receptor to NGL extraction plant facility construction would be the city of Willow, approximately 21.7 miles (114,354 feet) from the facility. The estimated noise levels from construction activities at this receptor would be approximately 55 dBA (L_{EQ}) using a nominal existing ambient level of 55 dBA (adapted from Table 5.17-4). The calculation assumes a terrain coefficient of 0.007 for brush, an integration loss of 3 for berm or rough terrain, and typical usage factors. The exact value would depend on the number of sources operating at this distance. This noise level would be perceived as insignificant, thus creating no noise impact (i.e., increase of 0 dBA over estimated ambient levels).

The estimated vibration level at this receptor from construction equipment would be less than 2 VdB, which would be well below the FTA damage threshold for buildings of 100 VdB (adapted from Table 5.17-5). This level is also below the human perceptibility threshold of about 65 VdB and, thus, would not constitute an impact.

Operations and Maintenance

A NGL extraction plant facility would remove propane, ethane, butane, and pentane NGLs using an inlet and liquid separators, glycol dehydrator, and potentially a storage facility. Noise and vibration levels from operations would be perceived as insignificant, as explained in the *Aboveground Facilities* section above.

Mainline Valves and Pig Launcher/Receivers

Construction

As shown in Table 5.17-2, the nearest sensitive receptor to mainline valve construction would be the city of Anderson, approximately 1.0 mile (5,055 feet) from the valve. Pig launcher/receivers would be installed at all aboveground facilities; therefore, impacts associated with construction would already be accounted for. The estimated noise levels from construction activities at this receptor would be approximately 55 dBA (L_{EQ}) using a nominal existing ambient level of 55 dBA (see Table 5.17-4). The calculation assumes a terrain coefficient of 0.007 for brush, an integration loss of 3 for berm or rough terrain, and typical usage factors. The exact value would depend on the number of sources operating at this distance. This noise level would be perceived as insignificant, thus creating no noise impact (i.e., increase of 0 dBA over estimated ambient levels).

The estimated vibration level at this receptor from construction equipment would be less than 42 VdB, which would be well below the FTA damage threshold for buildings of 100 VdB (see Table 5.17-5). This level is also below the human perceptibility threshold of about 65 VdB and, thus, would not constitute an impact.

Operations and Maintenance

The AGDC did not propose any noise or vibration producing stationary equipment for operation of the mainline valves. In addition, mobile sources used during facility operations and maintenance would not result in perceptible noise or vibration level increases at the nearest sensitive receptor. However, noise impacts would result from pressure relief valves and pipeline blowdowns. These activities can produce a noise level of over 120 dBA at 50 feet from the source each time the valve releases. Pressure relief valves are located at the aboveground facilities and are activated when pressure goes above a set limit. These are emergency relief valves and their operation would be in a “rare event” scenario (i.e., emergency). Pipeline blowdowns would be used in the “rare event” that a major repair needs to take place. A blowdown would occur in a segment of the pipe that would need the repair. Both of these scenarios are “rare events” that would not occur routinely as part of operations and management procedures.

The estimated noise level at the nearest sensitive receptor would be approximately 56 dBA (L_{EQ}) using a nominal existing ambient level of 55 dBA. Maximum noise levels could reach up to 66 dBA (L_{MAX}) but would be temporary and intermittent. The calculations assume a terrain coefficient of 0.007 for brush, an integration loss of 3 for berm or rough terrain, and typical usage factors. These noise levels would be perceived as insignificant, thus creating no noise impact (i.e., increase of 1 dBA (L_{EQ}) over estimated ambient levels). Mitigation measures to reduce peak noise levels are identified in Section 5.23, Mitigation.

Support Facilities

Operations and Maintenance Buildings

Construction

Operations and maintenance buildings would be installed at aboveground facilities; therefore, impacts associated with construction would already be accounted for.

Operations and Maintenance

Operations and maintenance buildings would be installed at aboveground facilities; therefore, impacts associated with operations would already be accounted for.

Construction Camps and Pipeline Yards

Construction

As shown in Table 5.17-3, the nearest sensitive receptor to construction camp and pipeline yard construction would be the city of Cantwell, approximately 0.1 mile (552 feet) from the camp/yard. The estimated noise levels from construction activities at this receptor would be approximately 68 dBA (L_{EQ}) using a nominal existing ambient level of 55 dBA (adapted from Table 5.17-1). Maximum noise levels could reach up to 73 dBA (L_{MAX}) but would be temporary and intermittent. The calculations assume a terrain coefficient of 0.007 for brush, an integration loss of 3 for berm or rough terrain, and typical usage factors. The exact values would depend on the number of sources operating at this distance. These noise levels would be perceived as significantly loud, creating a significant impact (i.e., increase of 13 dBA (L_{EQ}) over estimated ambient levels).

The estimated noise levels from camp operation at this receptor would be approximately 57 dBA (L_{EQ}) using a nominal existing ambient level of 55 dBA (adapted from Table 5.17-4). Maximum noise levels could reach up to 59 dBA (L_{MAX}) but would be temporary and intermittent. The calculations assume a terrain coefficient of 0.007 for brush, an integration loss of 3 for berm or rough terrain, and typical usage factors. The exact values would depend on the number of sources operating at this distance. These noise levels would be perceived as insignificant (i.e., increase of 2 dBA (L_{EQ}) over estimated ambient levels).

The estimated vibration level at this receptor from construction and camp operations equipment would be less than 72 VdB, which would be well below the FTA damage threshold for buildings of 100 VdB (adapted from Table 5.17-5). People may feel minor ground movement, but because the construction activities would be temporary and there would be negligible potential for damage to fragile structures, this would not constitute an effect.

The AGDC would develop and implement a noise abatement program to mitigate construction noise impacts and a construction communications plan to inform adjacent residences of construction activities. Additional mitigation measures to reduce significant impacts from construction are identified in Section 5.23, Mitigation.

Operations and Maintenance

Construction camps and pipeline yards would no longer be used during the operations phase of the proposed Project. Consequently, no noise or vibration impacts would occur.

Material Sites

Construction

According to Table 5.17-3, the nearest sensitive receptor to material site construction would be the city of Ester, approximately 0.04 mile (232 feet) from the site. The estimated noise levels from construction activities at this receptor would be approximately 76 dBA (L_{EQ}) using a nominal existing ambient level of 55 dBA (see Table 5.17-4). Maximum noise levels could reach up to 82 dBA (L_{MAX}) but would be temporary and intermittent. The calculations assume a terrain coefficient of 0.007 for brush, an integration loss of 3 for berm or rough terrain, and typical usage factors. The exact values would depend on the number of sources operating at this distance. These noise levels would be perceived as significantly loud, creating a significant impact (i.e., increase of 21 dBA (L_{EQ}) over estimated ambient levels).

The estimated vibration level at this receptor from construction equipment would be less than 83 VdB, which would be well below the FTA damage threshold for buildings of 100 VdB (adapted from Table 5.17-5). People may feel minor ground movement, but because the construction activities would be temporary and there would be negligible potential for damage to fragile structures; this would not constitute an effect.

The AGDC would develop and implement a noise abatement program to mitigate noise impacts, and construction communications plan to inform adjacent residences of construction activities. Additional mitigation measures that would reduce significant impacts are identified in Section 5.23, Mitigation.

Operations and Maintenance

Material sites would no longer be used during the operations phase of the proposed Project. Consequently, no noise or vibration impacts would occur.

5.17.2.3 Denali National Park Route Variation

Construction

Pipeline construction equipment would operate 12 hours per day for 4 winter months for Denali National Park Route Variation construction. In general, because construction moves through an area relatively quickly, noise impacts typically would be localized, intermittent, and short term. According to Table 5.17-1, the nearest sensitive receptor to Denali National Park Route Variation construction would be McKinley Park Village, approximately 2.3 miles (12,403 feet) from the route. The estimated noise levels from construction activities at this receptor would be approximately 55 dBA (L_{EQ}) using a nominal existing ambient level of 55 dBA (adapted from Table 5.17-4). The calculation assumes a terrain coefficient of 0.007 for brush, an integration loss of 3 for berm or rough terrain, and typical usage factors. The exact value would depend on the number of sources operating at this distance. During winter months, the McKinley Park Village is virtually shutdown; therefore, noise impact on humans would not be anticipated. These noise levels could be perceived as insignificant, thus creating no noise impact (i.e., increase of 0 dBA over estimated ambient levels).

The estimated vibration level at this receptor from construction equipment would be less than 31 VdB, which would be well below the FTA damage threshold for buildings of 100 VdB (see Table 5.17-5). This level is also below the human perceptibility threshold of about 65 VdB and, thus, would not constitute an impact.

Operations

With respect to natural gas pipeline operations, gas traveling through a buried pipeline would not emit audible noise above the surface or a perceptible level of vibration. In addition, noise levels from routine inspection and maintenance activities associated with the Denali National Park Route Variation would not result in perceptible noise or vibration level increases at the nearest sensitive receptor. Consequently, no impacts would occur.

5.17.3 References

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