3.12 Noise and Visual Resources

Noise and visual resource analyses address potential impacts from the proposed Rusk Permit Area on sensitive human "receptors," such as residences, churches, schools, and other public gathering places, in proximity to the proposed project. Issues may include the potential for substantial increases in noise levels in previously very quiet rural areas, or dramatic modifications to the local landscape in the viewsheds from public recreation areas. Specific concerns include the potential for adverse aesthetic effects on the town of Tatum.

The study area and cumulative effects study area for noise encompasses the area within the proposed permit boundary, plus an area from 2 to 5 miles outside the permit boundary. The study area and cumulative effects study area for visual resources encompasses the viewshed of the proposed Rusk Permit Area to a distance up to 5 miles beyond the permit boundary. The 5-mile limit for visual effects was based on the likely maximum distance that project-related activities would be visible with the terrain and vegetation types in the proposed project vicinity (i.e., the anticipated project viewshed). The cumulative effects study areas are based on potentially overlapping impact areas for the proposed project and for comparable distances from other potential cumulative activities in the vicinity.

3.12.1 Affected Environment

3.12.1.1 Noise

Characterizing the environment potentially affected by noise includes identifying existing noise sources, noise-sensitive receptors, terrain or other physical features that may affect noise transmission, and quantifying existing noise levels.

Transportation corridors, including two major roadways and a rail corridor, are the most prominent noise sources within the proposed permit boundary. SH 149 crosses through the southwestern portion of the Rusk Permit Area for a distance of approximately 4.3 miles, and SH 43 runs along the southeastern permit boundary for a distance of approximately 2.9 miles (see **Figure 3.12-1**). The BNSF crosses through the center of the proposed Rusk Permit Area for a distance of approximately 4.7 miles (see **Figure 3.9-2**). The network of county and private roads in the Rusk Permit Area carry much lower traffic volumes than the state highways and likely make only a small contribution to ambient noise in the area. Other noise sources in the study area include wind, local fauna, and industrial and agricultural activities. Existing industrial noise sources include oil and gas facilities scattered through the area and power plants near the proposed permit area, but outside the boundary. Noise from these industrial sources may be audible in parts of the study area under certain weather conditions. Agricultural noise sources primarily include mechanized field work, which occurs sporadically for relatively brief periods of time. Existing noise levels in areas of infrequent human activity are dominated by noise from wind and other natural sources.

Noise-sensitive receptors in the study area are predominantly residences. There are approximately 600 residences within 1,000 feet of the proposed Rusk Permit Area. Approximately 469 of the 600 residences are within the proposed permit boundary; 256 are in the proposed mine disturbance area. Other noise-sensitive receptors in the study area include two churches within the permit boundary and educational facilities the closest of which is Tatum Middle School in northern Tatum, approximately 1,000 feet from the permit boundary. Beyond the 1,000-foot range, the greatest numbers of potentially noise-sensitive receptors in the study area are in the towns of Tatum, just outside the southern boundary of the proposed Rusk Permit Area, and Easton, approximately 1.6 miles northwest of the permit boundary.

Terrain in the study area is generally flat to gently rolling, with elevations ranging from under 250 feet amsl in the bottom lands along the Sabine River to approximately 400 feet amsl on the higher ground near the southeastern portion of the proposed Rusk Permit Area. The most extreme grades are approximately 15 percent along incised creeks where they flow into Cherokee Bayou and Black Slough. There are no structures in the area large enough to have a significant effect on noise propagation. Vegetative cover is generally not a very effective noise barrier unless it has considerable horizontal depth. There are parts of

the study area where there are dense forests that could provide a barrier to noise propagation, if they remain intact between active mining activities and noise-sensitive receptors. These effects would be specific to local circumstances.

A baseline noise assessment was conducted by HDR (2010c) that included sound measurements taken at five locations within the study area (see **Figure 3.12-1**). Of the five monitoring locations, one was located within the proposed permit boundary near the southern edge, and four were located within approximately 0.6 mile outside the permit boundary (see **Figure 3.12-1**) (HDR 2010c). Monitoring locations were selected in an attempt to represent the ambient acoustical environment of the study area, which is mostly rural and generally expected to have quiet ambient daytime and nighttime noise levels.

Monitoring Site 1 was located in the new Jim Kuykendall Acres Subdivision. There are 5 houses in this area. Monitoring Site 2 was located at a residence on SH 43 approximately 0.8 mile northeast of the SH 149 intersection. Ambient noise at Monitoring Site 2 was dominated by vehicular traffic noise from SH 43. Monitoring Site 3 was located in a remote area with the majority of sound from crickets and the faint sound of heavy equipment operating at a pump station approximately 600 feet north of the monitoring site. Monitoring Site 4 was located at a secluded residence where nature-related sounds were the only notable background noise. Monitoring Site 5 was located in a remote area where there was a constant steady low rumble from a nearby pump station.

The sound level surveys attempted to collect sound pressure level (SPL) data every hour for a continuous 24-hour period at each monitoring location during the week of October 12 – 15, 2009. Equivalent average hourly noise levels (L_{eq}); maximum noise level; minimum noise level; and L_{10}, L_{50}, and L_{90} values were collected hourly on an A-weighted scale (see the Glossary for definitions). Measured and calculated noise levels are shown in **Table 3.12-1**.

Table 3.12-1 Existing Noise Level Summary

Monitoring Location	L_{eq} (day) (dBA)	L_{eq} (night) (dBA)	L_{dn} (dBA)
Site 1	52	48	56
Site 2	62	NA[1]	NA
Site 3	50	50[2]	56[3]
Site 4	51	46	55
Site 5	54	54[2]	60[3]
Average Ambient Noise Level for the Study Area	54	50	57

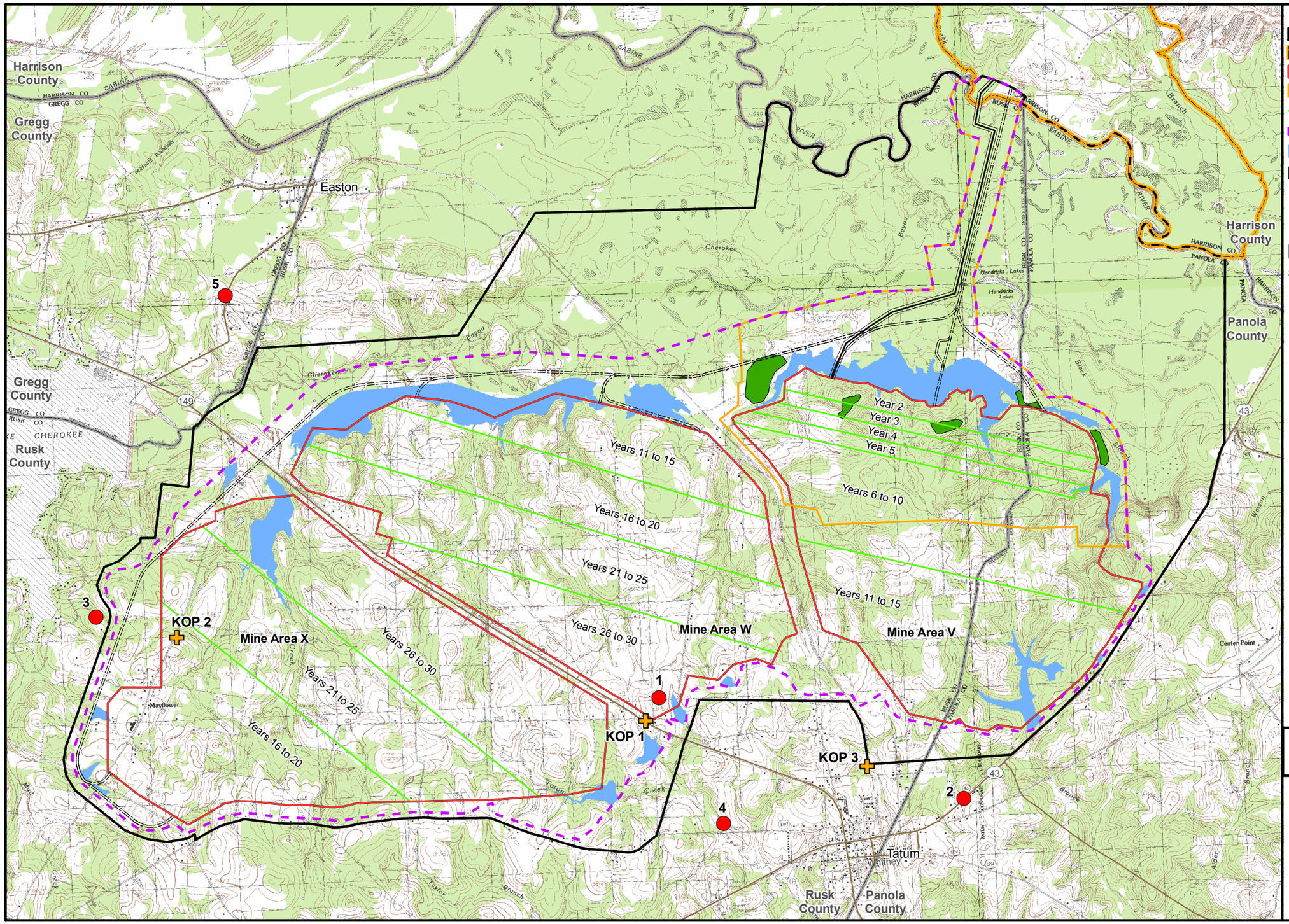
[1] Due to equipment failure, only daytime noise levels were recorded.

[2] Due to equipment failure only daytime noise levels were recorded; daytime noise levels were consistent and dominated by 24-hour pump station noise. Therefore, it was assumed that nighttime noise would be the same as daytime noise.

[3] Calculated based on measured daytime levels and estimated nighttime noise levels.

L_{dn} = day-night (average sound) level.

Both HUD and USEPA consider average outdoor noise levels in excess of 65 dBA to be “normally unacceptable” for residential areas and other noise-sensitive land uses (U.S. Department of Housing and Urban Development [HUD] 1996). None of the measurements taken at the five sites were above that standard, although equipment failures occurred during night measurements at Monitoring Sites 2, 3, and 5. Because of the equipment problems, L_{dn} could not be calculated for Monitoring Site 2, and L_{dn} for Monitoring Sites 3 and 5 had to be calculated using estimated nighttime levels (HDR 2010c).



Legend

- Proposed Rusk Permit Area Boundary
- Existing South Hallsville Permit Boundary
- Proposed Mine Areas
- Proposed First 5-year RCT Permit Term Disturbance Boundary
- End of Period Mining Extent
- Proposed Life-of-mine Disturbance Boundary
- Sediment Control Pond
- Oxidized Overburden Stockpiles (temporary)
- Noise Monitoring Locations
- Key Observation Points
- Main Haul Roads
- Dragline Walkway
- County Boundary

Source: HDR 2009, 2010; Sabine 2009a,b, 2010c.

N

0 0.5 1 Miles

Rusk Permit Area EIS

Figure 3.12-1

Key Observation Points and Noise Monitoring Locations

07/22/10

Average daytime and nighttime noise levels were consistent in a fairly narrow range throughout the proposed project area, with the exception of Monitoring Site 2. Noise levels at Monitoring Site 2 were dominated by traffic noise, which resulted in levels higher than for the other monitoring sites. Levels overall were higher than ordinarily would be expected in a rural area. Both average daytime levels and average nighttime levels in the study area were comparable to levels measured in urban residential areas by the USEPA (1971) (HDR 2010c).

3.12.1.2 Visual Resources

The dimensions and perimeter of a viewshed vary, depending on terrain and vegetation or structures that may screen views of a project area. Because there are potentially an infinite number of viewing locations within the viewshed of a project, analyses are typically conducted from a limited number of key observation points (KOPs) that are located at particularly sensitive locations to represent the most important views of the proposed project.

The visual affected environment is characterized by a combination of the quality of the existing landscape and the sensitivity of likely viewers to visual change. An additional factor is the capacity of the characteristic landscape to absorb visual changes. The visual effects of a proposed project typically are evaluated based on the degree to which project disturbance and facilities would contrast with the existing landscape.

Visual quality is somewhat subjective and dependent on context. For example, a small, tree-lined lake would have greater visual importance in the dry prairies of the Texas Panhandle, than in the Pineywoods region of east Texas. In general terms, visual quality is a function of scenic attractiveness, variety, and the uniqueness of the characteristic landscape. A landscape with greater variety in landform, linear features, color, or vegetation type generally is considered to be higher in quality than one with little variety. A particular landscape that is similar in character to a large portion of the surrounding lands is considered of lesser quality than one with unique, attractive features.

Visual sensitivity is generally a function of the number of people that will view a landscape, the duration of their views, their proximity to the subject landscape, and the reason they are in a position to observe the views. For example, tourists stopping for a leisurely lunch at a scenic overlook are considered to be more sensitive to the visual environment than commuters driving by the same location on their way to work. A viewpoint hosting 1,000 visitors per day throughout the summer and fall is considered more sensitive than one visited by just a few people on occasional holiday weekends. Viewers within 0.5 mile of a particular landscape (foreground) are considered to be more sensitive to visual effects than viewers 3 to 4 miles away (middleground). Visually sensitive areas are typically primary travel routes, residential communities, and designated recreation facilities.

Visual resources are a composite of basic topography, geologic features, water features, vegetative patterns, and land use that typify an area and influence the visual appeal that area landscape provides for viewers.

Generally, the proposed Rusk Permit Area and vicinity are typical of East Texas, with gently rolling hills cut by a complex of intermittent streams that are part of the Sabine River system. The Sabine River is contiguous with the northeastern edge of the proposed permit boundary. Numerous streams flow generally northerly in five shallow valleys, emptying into Cherokee Bayou or Black Slough, which are tributaries of the Sabine River. Emergent and forested wetlands are associated with these streams.

Historic land uses, including agriculture, forestry, and mining, have influenced the characteristic landscape seen today in or near the Rusk Permit Area. Areas managed for forestry have been cut and replanted several times, resulting in stands of similar age trees, while agricultural lands have been recontoured and planted with crops and pasture grasses. There are several operating lignite mines in the general area, three of which are near the Rusk Permit Area. The existing South Hallsville No. 1 Mine is located on the northeastern edge of the Rusk Permit Area. The Martin Lake Mine complex is located to the south and

east of the Rusk Permit Area, primarily in Panola County. The Oak Hill Mine is in Rusk County, approximately 10 miles southwest of Tatum. A fourth mine, the Darco Mine, located approximately 1 mile northeast of the Rusk Permit Area, is a small mine in the process of final reclamation and closure. All of the operating mines are surface mines using draglines to remove the overburden and expose the coal seams. Some previously mined areas have been reclaimed by grading to approximate original contours, placement of suitable growth media, and planting for future productive uses such as forestry or pastureland. There are numerous oil and gas wells dispersed throughout the proposed Rusk Permit Area.

The proposed Rusk Permit Area is located in the Pineywoods vegetational region, as classified by McMahon et al. (HDR 2010c). Vegetative forest cover consists of pine-hardwood forest interspersed with historic cleared areas. Dominant tree species of the Pineywoods include loblolly pine and sweetgum. There are numerous associated species, including shortleaf pine, water oak, southern red oak, winged elm, beech, blackgum, magnolia, American beautyberry, American hornbeam, flowering dogwood, yaupon, hawthorn, and several shrub and vine species (HDR 2010c). The northern portion of the proposed Rusk Permit Area is heavily forested; the landscape becomes more of a patchwork quilt of forest interspersed with open pastures and fields as one moves south and west through the study area.

During the late spring after deciduous forest species have leafed out and throughout the summer, the pine forest vegetation color ranges from the bright green of the sweetgum and deciduous shrubs to a pine green associated with the pine forest component. Understory forest vegetation includes yellow goldenrod, and green to reddish-tan colored grasses. The forest vegetation cover is dense, and views through it often are obscured. During late fall and winter months, when deciduous tree and shrub leaves are absent, views are more open, though still screened to some extent in many places. Colors are more muted in the gray tones.

Exposed soils in the Rusk Permit Area are generally rust-colored contrasting vividly with the green vegetation colors during the spring and summer months when deciduous trees and shrubs are leafed out.

The closest towns to the mine expansion area are Easton, Tatum, Hallsville, and Longview, Texas. Tatum (with a population of approximately 1,200) is located just outside the southern edge of the Rusk Permit Area. Easton (population 525) is located approximately 1.6 miles north of the northwestern corner of the Rusk Permit Area. The larger cities of Hallsville and Longview are approximately 8 miles and 11 miles, respectively, northwest of the proposed Rusk Permit Area.

Sensitive viewpoints in the study area include numerous residences and public roadways in and through the area. Residences within the proposed permit boundary are considered to be moderately sensitive with fairly high interest in the landscape. Their relevance to the visual analysis would depend on how long they would remain in place as mining progressed through the area. Most of the residences within the permit area would be displaced at some point in time prior to mining, but the schedule for displacement is not known at this writing. Several hundred residences are located outside the proposed disturbance area, but within the foreground-middleground viewing distance (approximately 3 miles) of the proposed disturbance area. Some of these residences may have views of permit area activities, although many are visually screened from the permit area by mature vegetation.

The roadways through the study area that represent the most visually sensitive viewpoints are SH 43, SH 149, and FM 782 because of the traffic volumes they carry. The level of interest in the landscape for most motorists is considered low to moderate, based on the assumption that a relatively small portion of the travelers are involved in recreational pursuits. The resultant level of visual sensitivity is considered to be moderate. There is a network of county roads and oil and gas development roads throughout much of the proposed Rusk Permit Area. Sensitivity of viewpoints along these roads is considered to be low, based on the small amount of traffic they carry and the likelihood that most travelers are engaged in commercial activities and day-to-day errands, rather than in recreational activities. Most of these roads would be removed in advance of mining and reconstructed on or near their original alignments as part of reclamation efforts (approximately 7 to 10 years following their removal). The proposed Rusk Permit Area is visible to a limited number of travelers along the BNSF railroad corridor.

3.12.2 Environmental Consequences

3.12.2.1 Proposed Action

Noise

Noise levels in the study area would increase as a result of the Proposed Action. Predicted noise increases would range from 0 to 22 dBA above ambient levels on an L_{dn} basis. The magnitude of increase in noise levels at any particular sensitive receptor would depend on the distance from project-related activities and the location, size, and type of any obstructions between the receptor and noise-producing equipment.

Potential noise effects associated with the Proposed Action are complex due to the variety of noise-generating activities and the large proposed disturbance area. Each phase of the mining operation would utilize different equipment and, therefore, would be characterized by unique noise emissions. The major noise-producing phases evaluated in HDR's (2010c) noise analysis of the proposed project included construction activities, daily mine operations, and reclamation.

The noise analysis examined construction noise, haul road traffic, and the different phases of operational noise using Cadna-A by DataKustik. Cadna-A is a three-dimensional noise model based on International Standards Organization (ISO) 9613, "Attenuation of Sound During Propagation Outdoors," adopted by the ISO in 1996. This standard provides a widely-accepted engineering method for the calculation of outdoor environmental noise levels from sources of known sound emission.

Cadna-A was used to calculate noise levels associated with each phase of the proposed mining operation using equipment rosters and estimated usage factors based on current operations at the South Marshall Permit Area of the South Hallsville No. 1 Mine. Due to the dynamic nature of mining activities and mobility of noise-producing elements, noise levels at any given noise-sensitive receptor can vary greatly throughout the course of a day. The noise analysis calculated project-related noise levels assuming equipment was stationary, with the center of activity located perpendicular to the noise-sensitive area. Maximum noise levels presented in this study would be experienced for a relatively short period of time ranging from an hour to several weeks, depending on the progression of the mine.

Noise Regulations

There are no federal, state, or local noise regulations applicable to the Rusk Permit Area or its immediate surroundings. Noise effects generally are characterized using two-tiered criteria: an absolute level and increase above existing conditions. Absolute noise limits represent the maximum noise level that is considered acceptable for a particular land use. Relative noise limits, or noise limits based on an increase over existing noise levels, are used to estimate the likelihood of community annoyance.

In the absence of applicable noise regulations, the noise analysis used 65 dBA L_{dn} as the absolute level criterion, and a 10 decibel (dB) increase as the relative criterion, to evaluate projected project-related noise. The 65 dBA L_{dn} criterion is based on HUD noise guidelines, that identify levels in excess of 65 dBA L_{dn} as "normally unacceptable" for exterior noise for residential areas (HUD 1996). The 10 dBA increase relative criterion is based on TXDOT guidelines, which consider a 10 dBA increase to be "substantial" (TXDOT 1997). A 10 dBA increase will be perceived as a doubling of sound and is considered a likely indicator of community annoyance.

Construction

Construction activities primarily would occur in the first year and continue at decreased levels throughout the life of the mine. Major construction-related activities would include construction of ancillary facilities and haul roads. Ancillary facilities that would be constructed include the transportation/utility corridor, inclusive of a 138-kV transmission line, dragline walkway, and haul road; an equipment fueling and parking area; a water truck fill station; non-coal storage areas; and a dragline workover area. The proposed Rusk Permit Area would utilize existing infrastructure at the South Hallsville No. 1 Mine for all other facilities.

Equipment required for construction of these facilities and their associated sound emissions are listed in **Table 3.12-2**.

Table 3.12-2 Transportation Corridor Construction Equipment Sound Levels

Equipment Description	Quantity	Usage[1] (hours)	Reference Sound Level[2] (dBA)
Dozers	2	<1	85
CAT Graders	4	1	75
Compactors	1	<1	88
Crawler Dozers	1	<1	85
Excavators	3	<1	85
Galion Graders	1	<1	85
Loaders	1	<1	85
Scrapers	2	<1	85
Shovels	1	<1	82
Combined hourly L_{eq} at 300 feet[3]			**52**

[1] Usage represents the average number of hours per day equipment would be operated.

[2] SPL measured over a reflecting plane at a distance of 15 meters in accordance with ISO 6393.

[3] Adjusted for usage and distance.

Source: HDR 2010c.

Noise produced by construction activities would result in a 52 dBA L_{eq} at 300 feet. **Table 3.12-3** summarizes the results of the construction noise analysis. Due to the intermittent nature of construction noise, modeled noise levels are substantially lower than for other noise-producing activities associated with the Proposed Action.

Table 3.12-3 Distance to Threshold Noise Levels – Construction

Activity	Sound Level[1] L_{dn} (dBA)	Distance to 65 dBA L_{dn} (feet)	Distance to 10 dBA Increase[2] (feet)
Construction	58	157	171

[1] Based on the modeled maximum noise level at a distance of 300 feet.

[2] Existing ambient level assumed to be the 55 dBA L_{dn} project study area average.

Source: HDR 2010c.

While construction activities would increase noise throughout the Rusk Permit Area, modeling results indicate no noise-sensitive receptors would be expected to experience a 10 dBA increase in noise level or project-related noise levels exceeding 65 dBA L_{dn} due to construction-related activities.

Mine Operations

The noise analysis examined noise associated with haul road traffic and the different phases of mine operations. Mining activities in the Rusk Permit Area would be sequenced in phases as shown in **Figure 2-2**. Each mine block would undergo four general phases of noise-producing activities: 1) clearing and grubbing; 2) overburden removal; 3) lignite mining; and 4) reclamation. Mining activities are not permitted within 300 feet of an occupied residence by RCT regulation unless the resident owner specifically agrees to an exception (Reed 2010). Consequently, the combined noise levels presented in the following tables refer to project-related noise at a distance of 300 feet.

The clearing and grubbing phase would involve removal of surface obstacles (e.g., vegetation, roads) in preparation for overburden removal. Two types of dozers would be utilized to remove existing vegetation and roads from the mining area. **Table 3.12-4** lists the major noise emissions sources that would be associated with clearing and grubbing activities.

Table 3.12-4 Clearing and Grubbing Equipment Sound Levels

Equipment Description	Quantity	Usage[1] (hours)	Reference Sound Level[2] (dBA)
CAT D8N dozer	1	<1	79
CAT D6T dozer	1	<1	73
Combined hourly L_{eq} at 300 feet[3]			**38**

[1] Usage represents the average number of hours per day equipment would be operated.

[2] SPL measured over a reflecting plane at a distance of 15 meters in accordance with ISO 6393.

[3] Adjusted for usage and distance.

Source: HDR 2010c.

The resulting hourly L_{eq} associated with clearing and grubbing would be 38 dBA at 300 feet. Because the minimum distance required by the RCT between mine operations and an occupied dwelling is 300 feet, 38 dBA L_{eq} would be the maximum project-related noise level predicted at any home as a result of clearing and grubbing activities. The distance to a 65 dBA L_{dn} noise contour for clearing and grubbing activities would be approximately 40 feet. Modeling results indicate, therefore, that no noise-sensitive receptors would be expected to experience a 10 dBA increase in noise level or project-related noise levels exceeding a day-night average noise level of 65 dBA from clearing and grubbing activities.

During overburden removal, several types of earth-moving equipment may be utilized, depending on the depth of material to be removed. The primary method of overburden removal would utilize a dragline and supporting equipment. A secondary method would utilize smaller, more mobile equipment (i.e., trucks, shovels, and dozers) to remove overburden. This second method also would be employed to remove thinner layers of interburden between lignite seams. Major noise sources involved in overburden removal include draglines, shovels, and bulldozers. **Table 3.12-5** lists all noise emissions sources modeled for overburden removal.

Table 3.12-5 Overburden Removal Equipment Sound Levels

Equipment Description	Quantity	Usage[1] (hours)	Reference Sound Level[2] (dBA)
CAT D6T	1	9	73
CAT D7R	1	11	85
CAT D8N	1	16	79
CAT D9T	2	2	87
CAT D10N	2	3	92
CAT D10T	2	11	92
CAT D11 Series	2	13	84
Crawler Dozers	2	12	85
Dragline	2	24	72
Komatsu PC1800 (2000)	3	7	85
Komatsu PC 300 (400)	2	<1	85
Galion Graders	1	1	85
CAT Graders	4	11	75
Scrapers	2	3	85
Shovels	1	15	82
Wheel loaders	2	<1	85
Combined hourly L_{eq} at 300 feet[3]			**73**

[1] Usage represents the average number of hours per day equipment would be operated.

[2] SPL measured over a reflecting plane at a distance of 15 meters in accordance with ISO 6393.

[3] Adjusted for usage and distance.

Source: HDR 2010c.

Noise emissions for all of the equipment modeled were adjusted for the estimated hours of usage. For example, a dragline with a reference sound level of 72 dBA that is utilized 24 hours a day would result in an hourly L_{eq} of 72 dBA at 50 feet, while a wheel loader with a reference level of 85 dBA, but utilized only 1 hour a day, also would result in an hourly L_{eq} of 72 dBA.

The combined hourly L_{eq} reflects adjustments for equipment usage and distance from a source. The average daily equipment utilization was assumed to occur equally over a 24-hour period; therefore, the combined hourly equivalent sound level reflects the total number of hours of utilization divided by 24. For example, a crawler dozer with an average utilization of 12 hours was modeled as running 30 minutes per hour.

Maximum noise levels associated with the removal of overburden were based on the simultaneous use of all 30 pieces of equipment. The calculated maximum hourly L_{eq} associated with this phase of operations would be 73 dBA at 300 feet. The distance to the 65 dBA L_{dn} noise contour for overburden removal activities would be approximately 1,300 feet.

Lignite mining also would be conducted 24 hours a day, 7 days a week. Lignite mining would take place at varying depths. Lower pit depths create a barrier between noise-producing sources and nearby noise-sensitive areas, resulting in less noise exposure at sensitive receptors. Dozers and other mobile equipment would be used to expose the lignite seams. Once a seam is exposed, a mobile loading machine would load lignite into bottom or end dump haulers. Blasting would not be utilized to mine lignite in the Rusk Permit Area. **Table 3.12-6** lists the major noise producing equipment associated with the proposed lignite mining.

Table 3.12-6 Lignite Mining Equipment Sound Levels

Equipment Description	Quantity	Usage[1] (hours)	Reference Sound Level[2] (dBA)
CAT D7R	1	1	85
CAT D9T	2	10	87
CAT D10N	2	12	92
CAT D10T	3	2	92
CAT D11 Series	2	1	84
CAT 834B	1	8	88
CAT 992C	1	12	92
Compactor	1	<1	85
Crane	1	1	85
Crawler Dozers	2	12	85
Easi-Miners	2	10	85
Galion Graders	1	1	85
CAT Graders	4	11	75
Komatsu PC1800 (2000) - Excavator	3	7	85
Komatsu PC 300 (400) - Excavator	2	3	85
Cable Tractors	4	5	84
Loaders Type 1	1	5	85
Pumps	31	1	77
Pump Tractor	5	4	84
Scrapers	2	1	85
Shovels	1	2	82
Wheel Loaders	2	6	85
Combined hourly L_{eq} at 300 feet[3]			**65**

[1] Usage represents the average number of hours per day equipment would be operated.

[2] SPL measured over a reflecting plane at a distance of 15 meters in accordance with ISO 6393.

[3] Adjusted for usage and distance.

Source: HDR 2010c.

All 74 individual pieces of equipment were modeled in association with mining activities. The resulting hourly L_{eq} associated with lignite mining would be 65 dBA at 300 feet. The distance to the 65 dBA L_{dn} noise contour for mining activities would be approximately 600 feet.

The reclamation process would begin once the initial pit has been mined and sequentially would continue through the life of the mine. Noise producing elements associated with reclamation include graders, scrapers, and dozers. **Table 3.12-7** lists all equipment included in modeling for the reclamation phase.

Table 3.12-7 Reclamation Equipment Sound Levels

Equipment Description	Quantity	Usage[1] (hours)	Reference Sound Level[2] (dBA)
Backhoe	1	5	80
CAT D6T	1	9	73
CAT D7R	1	11	85
CAT D8N	1	16	79
CAT D10T	3	12	92
CAT D11 Series	2	13	84
Crawler Dozers	2	12	85
Galion Graders	1	1	85
CAT Graders	4	11	75
Scrapers	2	3	85
Shovels	1	15	82
Wheel loaders	2	<1	85
Combined hourly L_{eq} at 300 feet[3]			**73**

[1] Usage represents the average number of hours per day equipment would be operated.

[2] SPL measured over a reflecting plane at a distance of 15 meters in accordance with ISO 6393.

[3] Adjusted for usage and distance.

Source: HDR 2010c.

The calculated hourly L_{eq} associated with reclamation would be 73 dBA at 300 feet. The distance to the 65 dBA L_{dn} noise contour for reclamation activities would be approximately 1,300 feet.

Haul road traffic would vary by operational phase. The largest amount of haul road traffic would be associated with transportation of lignite during the mining phase. Haul vehicles would make approximately 250 round trips per day from the mine site to the existing truck dump at the South Hallsville No. 1 Mine (see **Figure 2-1**) during peak operations. Additional haul road traffic would include water trucks for dust control and light vehicles, primarily pickup trucks. **Table 3.12-8** lists vehicle types and average trips per day modeled for haul road traffic.

Due to the intermittent nature of vehicular traffic on the haul roads, average noise levels would be substantially lower than other noise producing activities associated with the Proposed Action. Noise produced by vehicular traffic traveling on haul roads during peak operations was modeled at 35 dBA L_{eq} at 300 feet.

Based on the modeling results, the highest noise levels anticipated from the proposed mining operations would occur during overburden removal and reclamation. Noise levels associated with those two phases would be similar due to similarities in the processes involved and the equipment used.

Table 3.12-8 Haul Road Vehicle Sound Levels

Vehicle Description	Quantity	Trips/Day	Reference Sound Level[2] (dBA)
Water Truck	3	15	74
Dump Truck	9	15	73
Kress Coal Hauler	5	15	114
Passenger	41	5	71
Combined hourly L_{eq} at 300 feet[3]			**35**

[1] Usage represents the average number of hours per day equipment would be operated.

[2] SPL measured over a reflecting plane at a distance of 15 meters in accordance with ISO 6393.

[3] Adjusted for usage and distance.

Source: HDR 2010c.

Table 3.12-9 summarizes noise levels associated with the major mining operations phases of the proposed Rusk Permit Area.

Table 3.12-9 Distance to Threshold Noise Levels – Mine Operations

Activity	Sound Level[1] L_{dn} (dBA)	Distance to 65 dBA L_{dn} (feet)	Distance to 10 dBA Increase[2] (feet)
Clearing and grubbing	44	<300	<300
Overburden Removal	79	1,280	1,444
Lignite Mining	71	591	656
Reclamation	79	1,312	1,444
Haul Road Traffic	42	Less than 15 feet	Less than 15 feet

[1] Based on the modeled maximum noise level at a distance of 300 feet.

[2] Increases over existing noise levels were calculated assuming the lowest average day-night sound level measured for the Rusk Permit Area, 55 dBA L_{dn}.

Source: HDR 2010c.

Project-related activities would cause or contribute to an increase in noise in the study area. The anticipated increase would depend on the distance between mining activities and sensitive receptors and on the nature of the intervening terrain. **Table 3.12-10** presents a summary of the modeled effects of operational noise on the nearest noise-sensitive receptors based on the absolute and relative noise impact criteria.

Based on the modeled maximum project-related noise levels, 54 noise-sensitive receptors, not owned or leased by SWEPCO, would experience an increase in noise levels of 10 dBA or more above measured ambient levels. Modeling results indicate that 45 of these noise-sensitive receptors also would be expected to experience noise levels exceeding 65 dBA L_{dn}. Mitigation is being considered to minimize noise impacts to nearby noise-sensitive receptors (see mitigation measures N-1 and N-2 in Section 3.14.4, Monitoring and Mitigation Measures).

Table 3.12-10 Operational Noise Summary[1]

Mine Year or Activity	Nearest Receptor (feet)	Receptors Experiencing a 10 dBA Increase and 65 dBA L_{dn}	Receptors Experiencing Only a 10 dBA Increase[2]
2	>4,000	0	0
3	>4,000	0	0
4	>4,000	0	0
5	>4,000	0	0
6 to 10	>1,500	0	0
11 to 15	>1,500	0	0
16 to 20	≈850	18	4
21 to 25	≈700	13	1
26 to 30	≈850	14	4
Haul Road	≈ 900	0	0
Total Number of Receptors During the Life of the Mine		**45**	**9**

[1] Receptor counts and distances reflect noise-sensitive receptors not owned or leased by SWEPCO.

[2] Noise levels would increase by 10 dBA, or more, above existing noise levels, but remain below the 65 dBA L_{dn} criterion level.

Source: HDR 2010c.

Visual Resources

Visual effects of the Proposed Action would result from construction and operation of the mine and ancillary facilities. The main visual features of the proposed project would include:

- Introduction of new landforms, including mine pits, spoil piles, and road overpasses that would contrast with the existing characteristic landscape on the basis of form, line, color, or texture;
- Removal of vegetation, including some currently densely forested areas;
- Introduction of new structural elements associated with a new 138-kV transmission line;
- Operation of one to four draglines (depending on mine year) for overburden removal;
- Use of lighting during nighttime operating hours; and
- Generation of fugitive dust by earth moving and lignite transport, which would be visible outside of the permit boundary.

Due to the nature and scale of the proposed project, the location of activities and features that may affect visual resources would change throughout the life of the project. Evaluating the visual effects of such a dynamic process entails selecting a limited number of observation points to represent the many possible viewing points. These observation points, known as KOPs, were selected as locations where views of the characteristic landscape help identify and analyze potential visual effects within the geographically large area. Three KOPs were selected to represent views of the proposed mining operation; one along each of the two main travel routes within the proposed permit boundary (KOPs 1 and 2) and one near the high school in Tatum (KOP 3) (see **Figure 3.12-1**). The largest number of viewers would observe the mine from KOPs 1 and 2. KOPs 1 and 2 were selected at locations that would have unscreened, or at most partially screened, views of the mining area and from where a larger number of viewers may be able to see mining activities at different stages of mining. A description of each KOP is presented in **Table 3.12-11**.

Table 3.12-11 Visual Resource Key Observation Points

KOP	Location Description	View Descriptions
1	Intersection of SH 149 and CR 2187	Views from this KOP encompass more than 280 degrees, from east-southeast to south, at Mine Areas W and X, which would be mined in years 16 to 30. Existing agricultural and rural residential lands provide little, if any, screening. Several new homes presently are under construction, which would have an elevated view of the mine area during construction and operation. The proposed 138-kV transmission line would be visible from this KOP.
2	Off FM 782 at an existing RV park looking east to northeast	Views from KOP 2 include slightly over 180 degrees from north to south. The immediate foreground view is of the 125-space recreational vehicle (RV) park surrounded by forest. During mining of this portion of Mine Area X in mine years 16 to 20, FM 782 would be closed, and there would be no public access to this KOP. If the southern portion of FM 782 is re-established after mine year 20, there would be views of active mining and reclamation areas in the foreground-middleground distance.
3	Near Tatum, Texas, High School	Views from KOP 3 would be partially to mostly screened, looking northerly at Mine Area V, the closest portion of which would be mined in years 11 to 15. Vegetation that partially screens the views from this location is outside the mine permit area so it would not be affected by mine construction or mining. It is anticipated that the views would continue to be screened during the life of the mine unless land uses change in this location. Night lighting and dust plumes would be visible from this KOP during some phases of mining. The new 138-kV transmission line may be visible from this KOP.

Source: HDR 2010c.

Construction

Under the Proposed Action, major features that would be constructed include: a 70-foot-wide main haul road with a 1,040-foot-long bridge over the Sabine River, a dragline walkway, overpasses to separate mine and public traffic, water truck fill station, non-coal storage area, dragline workover area, equipment fueling station and parking area, sediment control ponds, and a 138-kV transmission line. Construction of these features would introduce new landforms, lines, colors, and textures into the characteristic landscape. Some of these features, such as mine haul roads, would be constructed and removed incrementally as mining advances, while other features would become permanent changes in the landscape, including some of the sediment control ponds, overpasses, and potentially the transmission line. An example of one type of overpass structure that would be constructed is presented in **Figure 2-9**. Overpass structures likely

would be designed and built by TXDOT, with funding from Sabine. These structures would remain in place after completion of mining and reclamation. Most of these facilities would be located near the Sabine River initially and would not be visible from any of the KOPs or from other areas frequented by large number of viewers. Construction of the haul road and the SH 149 overpass after mine year 15 would be visible to SH 149 travelers, introducing a new linear corridor feature into the landscape with moderate to strong color contrast due to the red color of the local soil materials.

During construction, mobile light plants would be used in the pit areas as required by MSHA to provide for night-time construction and pre-mining activity. Mobile equipment also would be used to provide lighting for the transportation and utility corridor (see **Figure 2-2**). These night operations would introduce lighting into what is now a rural and generally dark area. Although the lights used would be shielded and aimed downward consistent with safety and MSHA regulations, there would be an overall increase in ambient light levels in the area. In clear, dry weather, the additional light would be less visible, whereas low clouds or hazy conditions would tend to reflect the light outward to a greater degree. The effects would vary with the location of construction activity at any particular time in the life of the mine. The effects would be most noticeable when activities are near Tatum, Eason, or SH 149. The farther the construction activities are from these non-project-related activity centers, the less the lighting would be noticeable.

Mining and lignite hauling would generate a certain amount of fugitive dust; however, dust suppression measures would be employed throughout the life of the project, so visual effects from dust likely would be minor (see Section 3.8, Air Quality).

Mining Operations

Under the Proposed Action, vegetation removal together with pit development and associated stockpiles would be major physical changes influencing the visual environment. Except for vegetative changes in forested areas, which would take 20 or more years to reach maturity, visual resource effects from mining operations would be short-term in nature, moving directly from vegetation removal, stripping of overburden, placement of temporary overburden stockpiles, and sequential backfilling of pits. These activities would result in the exposure of soils that would contrast with the surrounding environment and the introduction of changes in existing topography. The most noticeable impacts primarily would involve changes in landforms, color, and texture. These visual impacts would be temporary, lasting until each mined area is progressively reclaimed. In general, the landform would be recontoured to near pre-mining topography within 2 years after mine pit excavation, and the area would be revegetated within an additional 2 to 3 years, with final reclamation completed within 12 years. During some phases of mining, viewers would be able to see mining operations from Tatum, Easton, and SH 149.

The initial mining area (Mine Area V), located in the northeastern portion of the proposed Rusk Permit Area, would involve approximately 4,000 acres in mine years 1 through 15. Mine Areas W and X would be mined during mine years 11 to 30 covering approximately 6,500 acres (see **Figure 2-2** and **Table 2-4**).

During mining, one to four large operating draglines would be visible to viewers at various locations ranging from close-up foreground views to several miles in the distance within the mine area. The draglines would be a dominant feature in the landscape when viewed at a distance of 300 feet up to 0.5 mile. From a distance of 0.5 to 2 miles, the draglines would be prominently visible but less dominant. Beyond 2 miles, the draglines still may be visible from some locations that have a superior view; however, they would be less dominant beyond 2 miles and likely would be partially screened by topography and forest vegetation.

Mining operations would be visible from KOPs 1 and 2. Changes in landform, color, and texture would be visible and present strong visual contrast as viewed from foreground to middleground distances from these locations. **Figures 3.12-2** and **3.12-3** present photo simulations that show what the views at these locations may look like during the mining phase. Mitigation is being considered to minimize visual impacts at sensitive viewpoints (see mitigation measure V-1 in Section 3.14.4, Monitoring and Mitigation Measures).

Existing View

Simulated View During Mining

Source: HDR 2009.

Rusk Permit Area EIS

Figure 3.12-2

Simulation of Visual Effects from KOP 1

04/27/10

Existing View

Simulated View During Mining

Source: HDR 2009.

Rusk Permit Area EIS

Figure 3.12-3

Simulation of
Visual Effects from
KOP 2

04/27/10

During mining, night lighting would introduce moderate to strong contrast with existing dark night skies. Even though lights would not be directed at any populated or other off-site areas, the lighting still would be visible from all three KOPs at some point in the life of the mine. Night operations would introduce night lighting into rural areas that are currently generally dark. Although the lights used to light the pit areas would be shielded and aimed downward, consistent with safety and MSHA regulations, there would be an overall increase in ambient light levels in the mining area. The lights would be least noticeable under clear skies, whereas during cloudy or hazy conditions, the lights would tend to reflect the light outward to a greater degree. The effects of night lighting would vary with the proximity to the active pit area and would change locations over the life of the mine.

Lighting for the transportation and utility corridor would be provided by headlight systems on the mobile equipment using the corridor, including lignite haulers, water trucks, and light vehicles. Although somewhat more intense than lighting on common road-going vehicles, the effect would be intermittent and essentially the same as one might experience from a highway at a distance of 0.25 mile or more from the viewer. This lighting would not be expected to have a noticeable effect on overall night light levels in the study area from most viewing perspectives.

Due to the size of the project area, the location of activities within the Rusk Permit Area that would affect visual resources would change over the life of the mine. Mining would begin on the northeastern portion of the mine area and progress southward and westward over time (see **Figure 2-2**).

Reclamation

As mining progresses, land uses would be incrementally reclaimed to support post-mining land uses primarily including pastureland, forestry, and developed water resources. Reclamation would involve recontouring the mined area to approximate original topography, blending slope transitions with existing landforms, seeding areas that are designed to return to pasture or grazing land uses, and replanting trees in areas designated for forestry.

After reclamation is completed in the areas surrounding retained sediment control ponds, they may be viewed in the long-term as beneficial scenic elements in the landscape as viewers are often attracted to water features. The water quality in the ponds is expected to be good, making the ponds an attractive feature in the post-mining landscape.

3.12.2.2 No Action Alternative

Under the No Action Alternative, the proposed Rusk Permit Area would not be developed, and the associated noise effects identified for the Proposed Action would not occur. Visual resources in the Rusk Permit Area would remain unchanged because no mining infrastructure would be constructed and no coal mining would occur. Local land owners would continue to manage their lands, and the quality of the visual environment would not likely change to any large degree in the foreseeable future.

Under this alternative, current operations at the South Marshall Permit Area of the South Hallsville No. 1 Mine would continue under existing authorizations until the lignite reserves are depleted in approximately 2027. Following the closure of the South Marshal Permit Area, associated noise levels would decrease. Visual quality of the South Marshall Permit Area gradually would improve as areas reclaimed with tree plantings would mature to forested areas over time.

3.12.3 Cumulative Impacts

The past and present actions and RFFAs are identified in Section 2.7 and shown in **Figure 2-12**.

3.12.3.1 Noise

Noise effects of past and present actions are included in the existing noise environment for the study area (Section 3.12.1.1). Consequently, the cumulative impacts of those activities and the Proposed Action are addressed under Section 3.12.2, Environmental Consequences.

Development of the reasonably foreseeable Marshall Lignite Mine would not be expected to have any cumulative noise effects with the Rusk Permit Area, because it would be approximately 8 miles from the nearest point on the eastern boundary of the Rusk Permit Area and would be even farther from any of the noise-sensitive receptors identified as potentially being impacted by the Proposed Action. Potential future construction of a conveyor for the Rusk Permit Area likely would terminate at least 3.5 miles from the nearest noise-sensitive receptor anticipated to be impacted by the Proposed Action. It is unlikely that either construction noise levels or noise levels from operation of the conveyor would be high enough to affect cumulative noise levels at this distance. Consequently, no further increase in cumulative noise effects for the sensitive receptors identified for the Proposed Action would be expected.

3.12.3.2 Visual Resources

Visual effects of past and present actions are included in the existing visual resources environment for the study area (Section 3.12.1.2). Consequently, the cumulative impacts of those activities and the proposed Rusk Permit Area are addressed under Section 3.12.2, Environmental Consequences.

There may be cumulative visual effects of the Rusk Permit Area with comparable mining activities ongoing at the existing Martin Lake Mine along SH 43 on the southeast edge of the proposed permit boundary. This portion of the proposed Rusk Permit Area would be mined in years 10 through 15. The effects would be similar to those described for the Proposed Action, but on a larger scale straddling both sides of SH 43. The degree of visual effect would depend on what stage of mining or reclamation the nearby portions of the Martin Lake Mine would be at during the years that area of the Rusk Permit Area would be mined, and on the extent of visual screening provided by forested areas left standing in the buffer areas within the proposed permit boundary, but outside the proposed disturbance area.

Of the two RFFAs identified in Section 2.7, only the potential future conveyor for the Rusk Permit Area would be in the same viewshed as the proposed project. However, its location and relatively low profile indicates that it would not be readily visible in foreground or middleground views from any public viewpoints. Consequently, there would be little or no cumulative visual effects with that project.

3.12.4 Monitoring and Mitigation Measures

Based on the EIS analysis, the USACE is considering the following additional mitigation for noise and visual resources.

3.12.4.1 Noise

N-1: Noise Mitigation. Noise effects at sensitive receptors would be reduced somewhat by minimizing the simultaneous operation of major noise sources in proximity to each other when operating near occupied residences. Care should be taken to ensure that all motorized equipment is operating in good condition with effective mufflers intact.

Effectiveness: This measure would be effective in reducing noise impacts of the proposed project.

N-2: Noise Barriers. To the degree possible, mine planning should use temporary spoil piles and topsoil stockpiles as berm-type noise barriers between mine activities and nearby residences. This would be particularly effective when equipment would be operating at or near the surface rather than deeper in pits, and whenever mining activity would be occurring near residential areas identified as being subject to project-related noise in excess of the applied criteria.

Effectiveness: This measure would be effective in reducing noise impacts of the proposed project.

3.12.4.2 Visual Resources

VR-1: Visual Screening. In addition to the proposed reclamation procedures included in plans for the proposed project, visual screening should be employed where the edges of active mining would be near the permit boundary and there are potentially sensitive public viewpoints nearby. In particular, existing vegetation should be preserved and augmented, as necessary, to maximize visual screening near Tatum and Easton and along SH 149. Planting should mimic natural vegetative patterns and plant materials to the degree possible to provide the most natural appearing screening effects. Existing groves of trees should be retained where possible to provide visual buffers.

Effectiveness: This measure would be effective in reducing the visibility of the proposed project.

3.12.5 Residual Adverse Effects

3.12.5.1 Noise

Following completion of mining and reclamation of disturbance areas, no residual adverse noise effects would exist. The rural character of the planned future land uses for the mine area indicates that long-term noise levels would return to pre-mine levels.

3.12.5.2 Visual Resources

Implementation of the proposed reclamation program and the recommended mitigation measure (VR-1) would minimize the residual adverse visual effects of the proposed Rusk Permit Area. Reforestation would take several years to mature; however, in the long term, the Rusk Permit Area largely would be visually indistinguishable from the surrounding area.