4.18 NOISE

4.18.1 Approach to Impacts Analysis

4.18.1.1 Region of Influence

The region of influence for noise impacts encompasses areas that include receptors potentially sensitive to noise during construction and operation of the Mesaba Generating Station. The region of influence is dependent on the magnitude of new noise emissions that would be generated and existing ambient noise levels, which would affect the extent of the noise impact. Noise receptor locations were chosen based on their land use category (e.g., residential and church) and proximity to the proposed plant site and associated transportation corridors (e.g., rail alignments and public roadways).

Recent aerial photographs of the proposed plant sites were reviewed to identify the locations of receptors that may be affected by noise resulting from the Proposed Action. Ambient noise levels were measured at receptor locations as discussed in Sections 3.18.2.1 and 3.18.2.2 for the West Range and East Range Sites, respectively. These baseline noise levels were then used as a basis to predict noise levels as a result of proposed construction, plant operations, rail, and traffic activities. The locations of the receptors are dependent on the type of noise analysis being performed (e.g., plant noise vs. traffic noise) and are identified in the respective analysis in this section.

4.18.1.2 Method of Analysis

The evaluation of potential impacts from noise or vibration considered whether the Proposed Action or an alternative would cause any of the following conditions:

- Conflict with a jurisdictional noise ordinance or Minnesota regulations (i.e., MPCA) during construction.
- Conflict with a jurisdictional noise ordinance or Minnesota regulations (i.e., MPCA) during operations.
- Permanently increase ambient noise levels at nearest residential neighborhoods in the region of influence.

To determine whether the Proposed Action would result in any of the above listed conditions for noise, a noise evaluation study for both sites was performed for noise generated from Mesaba Generating Station (i.e., Phases I and II) activities, including plant construction, operations, rail facilities, and traffic. Estimating techniques used to conduct these analyses, and key considerations with respect to these models, are described below. The full noise reports for both proposed sites are included in Appendix 5 of the Mesaba Energy Project Environmental Supplement (Excelsior, 2006b).

After publication of the Draft EIS, changes were made to various components at the West Range Site, including: plant footprint adjustment, the new Rail Alignment Alternative 3B, and new Access Road Alignment 3. Based on these new adjustments, revised noise analyses were conducted for construction activities, rail line operations, rail yard operations, rail line vibration effects, and plant operations at the West Range Site. Additionally, some errata in the Draft EIS were also corrected. In general, the revisions reflect minor differences from initial analyses discussed in the Draft EIS, either in A-weighted sound levels or in VdB vibration levels (AAC, 2009 and HDR, 2009). New text was added throughout this section to reflect the most recent noise analyses.

Construction Noise

Construction equipment typically utilized for this type of project were used to predict the noise levels during various construction phases as identified in Table 4.18-1. The noise levels presented in Table 4.18-1 reflect levels at a distance of 50 feet from the equipment source. Noise levels at the receptor locations as a result of the construction equipment were estimated by simply examining the rate of attenuation and distance between the noise source (assumed to be at the construction boundary) and the receptor.

Table 4.18-1. Noise Levels of Typical Construction Equipment at 50 feet from Source

Equipment	Noise Level at 50 feet from Source (dBA)
Trucks	91
Crane	83
Roller	89
Bulldozers	80
Pickup Trucks	60
Backhoes	85
Jack Hammers	88
Rock Drills	98
Pneumatic Tools	86
Air Compressors	81
Compactor	82
Grader	85
Loader	85

Source: Excelsior, 2006b

No specific local standards govern construction noise at either site locations. Therefore, the MPCA limits for residential receptor properties were used for comparison. As discussed in Section 3.18.1.2, the MPCA standards are grouped according to land activities by the noise area classification system. Thresholds for NAC-1 **and NAC-3** are shown in Table 4.18-2 **(updated for the Final EIS)**. **All of the receptors that were analyzed for this project are represented by NAC-1, except for R1, which is represented by thresholds under NAC-3.**

Table 4.18-2. Noise Area Classification (NAC) Thresholds

	NAC-1		NAC-3	
	L_{10}	L_{50}	L_{10}	L_{50}
Daytime (7:00 a.m. to 10:00 p.m.)	65 dBA	60 dBA	**80 dBA**	**75 dBA**
Nighttime (10:00 p.m. to 7:00 a.m.)	55 dBA	50 dBA	**80 dBA**	**75 dBA**

Source: MPCA, 1999**; Bold typeface indicates inclusion of new data for the Final EIS.**

Facility Operation Noise

The noise evaluation study was conducted to simulate the operation of the Mesaba Generating Station and predict the noise emissions by using a proprietary computerized noise prediction program. The modeling program uses industry-accepted propagation algorithms based on American National Standards Institute and International Standards Organization standards. The modeling program was used to predict future noise conditions during the combined operation of both Phase I and Phase II and to recommend mitigation methods, as needed. Noise acceptability was judged in terms of the MPCA standards for residential receiving properties as shown in Table 4.18-2.

Proposed project equipment noise level emissions were determined using vendor-supplied noise level information, reference data for similar equipment, and/or industry-accepted estimation techniques. These predicted equipment levels were modeled to synthesize the expected future noise conditions for the plant site and adjacent land uses (residential and church receptors). The project site plan drawings were used to establish the location of the noise sources and other relevant physical characteristics of the site. For conservatism, the modeling assumed stable atmospheric conditions suitable for reproducible measurements (i.e., under “standard-day” conditions of 59°F and 70 percent relative humidity), that are favorable for propagation. These inherent conservative factors and assumptions resulted in a noise model that tended to be biased to higher predicted values than would be expected in the actual environment around the proposed project. The modeling results were compared to the project criteria to assess potential impacts. Noise mitigation treatments were then applied to the individual noise contributors that were estimated to have the greatest influence on receptor locations.

The noise model was run for the base plant configuration. All currently planned, continuous-operation equipment items that were deemed to be significant noise sources at the Mesaba Generating Station (Phases I and II) were included in the noise model. The major process areas of the project include the ASU, the Feed Handling Unit, the Gasification Island, the Gas Treating Unit, the Sulfur Recovery and Tail Gas Recycling systems, the Power Block, and General Facilities (such as cooling, utilities, and auxiliary/support systems). The major process units would be used at either the West Range Site or East Range Site with only minor modifications to the equipment design and plant layout. Therefore, for the purposes of the noise impact assessment, both potential sites would be the same from an aggregate noise emissions standpoint.

The Mesaba Generating Station was assumed to operate 24 hours per day at its design capacity; consequently, its noise output would be constant, regardless of time of day and the statistical sound levels would all be the same (i.e., $L_{100}=L_{90}=L_{50}=L_{10}$). As a secondary information source, model inputs derived from generic industry reference information for construction equipment were used.

No special noise control options were initially assumed. The standard-design levels from the significant noise sources were converted into octave band sound power levels (abbreviated PWL or L_w) to serve as the initial inputs for the noise-modeling program. Major buildings, as well as stepped terracing, were included as barriers to account for propagation losses due to shielding between a given noise source and a receptor location. However, for a conservative worst-case analysis, low-lying buildings, such as power distribution centers and water treatment buildings, and the coal piles were not included in the model for shielding benefits.

Rail Noise and Vibration Levels

Noise from rail operations was estimated for the surrounding sensitive receptors using FRA and Federal Transit Administration methodologies. Additionally, the American Public Transportation Association provides guidelines that are based on maximum train pass-by noise (L_{max}). The noise levels generated by freight train operations were compared to the American Public Transportation Association threshold of 70 dBA for residential areas.

A maximum noise level guideline was used to evaluate the noise from freight train operations given the limited amount of daily rail operations. An L_{max} of 75 for single family residences was used as the maximum allowable single event noise level for this analysis.

There are no local standards for ground-borne vibration. However, the FRA and Federal Transit Administration provide ground-borne vibration impact criteria for various types of building uses. The residential category of vibration criteria was applied for assessing ground-borne vibration from rail operations. Table 4.18-3 lists the FRA criteria for residential land uses for both frequent and infrequent vibration events. The residences in proximity to the project sites fall under this residential land use classification. The maximum vibration of 80 VdB was used as vibration assessment criteria for this project. Adjustments were made to the vibration calculations to conservatively account for stiff rail car suspension systems, welded rail, train speed, and efficient soil propagation conditions.

Table 4.18-3. Ground-Borne Vibration Guideline for Residential Land Use

Land Use Category	Equivalent Ground-Borne Vibration Impact Velocity, inch/second
Residences and buildings where people normally sleep	80 VdB (infrequent events[a]) 72 VdB (frequent events[b])

Notes: [a]less than 70 vibration events per day, [b]greater than 70 vibration events per day; Source: SEH et al., 2005

The train and yard noise were estimated based on the operational data contained in Table 4.18-4. During operating hours, there would be one train either entering or leaving the project site and any instance.

Table 4.18-4. Proposed Train Operating Conditions

Train Data	Future Operations
Number of trains per week	6
Estimated Number of trains per day	1
Locomotives per train	3
Number of Cars per train	115 – 135
Train Speed	10 mph

Federal Highway Administration Noise Analysis

The FHWA does not have actual noise standards, but implements guidelines, which are used to trip a federal funding mechanism for noise abatement on highway projects; FHWA procedures for highway traffic noise analysis and abatement are contained in 23 CFR 772, "Procedures for Abatement of Highway Traffic Noise and Construction Noise." These procedures specify the requirements that state highway agencies must meet when using Federal-aid funds for highway projects. Thus, for a FHWA noise analysis to be required, a proposed roadway would have to include substantial realignment and additional lanes. Therefore, because the West Range Site includes a substantial realignment of CR 7 and the East Range Site does not require any new roadway project, the FHWA noise analysis was performed only for the West Range Site. The noise related to increased traffic in and around proposed neighborhoods affected by the proposed road improvements at the West Range Site was performed in accordance with the FHWA, Mn/DOT, and MPCA guidelines.

Specifically, the augmented FHWA noise prediction software MINNOISE was used to predict noise levels and identify potential noise impacts at 20 virtual receptor sites along the study corridor. Ten of the virtual receptors were placed in and around Big Diamond and Dunning Lakes to represent residences in close proximity to the proposed roadway. The MINNOISE model was used in conjunction with on-site measurement of traffic noise during peak hours. Additionally, MINNOISE calculates the amount of potential noise directly related to traffic speeds, traffic mix (percent of cars, trucks, heavy trucks), and peak hour percentages of predicted future traffic. On-site ambient measurement at the receptor locations discussed in Section 3.18 were used as a basis for modeled results and included into the virtual receptor sites. The measurement sites include areas of existing residential housing and common use areas regarded by the Federal standards as Federal Activity Category B, which includes residential, recreational, and church land uses. The FHWA NAC for Category B land uses is an hourly A-weighted sound level of L_{10} = 70 dBA.

In accordance with FHWA requirements, Mn/DOT has adopted a statewide noise policy that clarifies the FHWA terminologies of noise impacts. “Mn/DOT Noise Policy for Type I and Type II Federal-aid Projects as per 23 CFR 772” includes the following descriptions:

- *Noise Level Approaching the NAC* – Mn/DOT defines a level as “approaching” the criterion level when it is 1dB, or less, below the criterion level. For example, 69 dBA is considered “approaching” the FHWA NAC category B level of 70 dBA.
- *Substantial Increase in Noise* – Mn/DOT defines a substantial increase in noise as those future predicted noise levels that exceed the FHWA NAC category B level of 70 by 5dB or greater, or 75dBA.
- *Substantial Noise Reduction* – Mn/DOT identifies feasibility requirements for the use of abatement procedures such as noise walls and their associated costs. These requirements dictate that every reasonable effort be made to obtain a substantial noise reduction. Mn/DOT defines a substantial noise reduction as 5dBA or more from a noise impact.

Finally, all modeled results were judged using the L_{10} metric as both Federal and state guidelines specify only one metric used when determining impacts; L_{10} is common among both the Federal and state guidelines.

Receptor Locations

As discussed in Sections 3.18.2.1 and 3.18.2.2, receptor locations were chosen for ambient noise monitoring to provide baseline noise conditions and to use as base data for various noise analyses described above. In addition to these ambient noise receptor locations, some of the analyses required additional receptor locations to further supplement the noise impact analysis. The full set of receptor locations at the West Range and East Range Sites and the type of noise analysis performed at each receptor are identified in Tables 4.18-5 and 4.18-6, respectively **(see Figures 3.18-1 and 3.18-2 for graphical depiction of receptor locations listed in these tables; tables updated for the Final EIS)**.

Table 4.18-5. Receptor Locations for Noise Analyses at the West Range Site

Receptor Location	Approximate Distance from the nearest edge of West Range Site	Used for Analyses Type(s)
R1. County Landfill, south of proposed Plant	**1,870** ft south	Ambient Monitoring; Plant Operations Modeling; Construction Impacts; FHWA traffic modeling; Rail Operations Impacts
R2. Residence, North Big Diamond Lake	**4,025** ft southeast	Ambient Monitoring; Plant Operations Modeling; Construction Impacts; FHWA traffic modeling; Rail Operations Impacts
R3. Residence, along CR 7	**4,110** ft west	Ambient Monitoring; Plant Operations Modeling; Construction Impacts; FHWA traffic modeling; Rail Operations Impacts
R4. 32423 CR 7	**4,650** ft west	Ambient Monitoring; Plant Operations Modeling; Construction Impacts; FHWA traffic modeling; Rail Operations Impacts
R5. Dunning Lake Site	**4,300** ft southeast	Ambient Monitoring; Plant Operations Modeling; Construction Impacts; FHWA traffic modeling; Rail Operations Impacts
R6. Lutheran Church	**18,060** ft southeast	Plant Operations Modeling
R7. Catholic Church	**9,940** ft northwest	Plant Operations Modeling
AAC-6. Near Beasley Ave., City of Taconite	**9,100** ft southwest	Construction Impacts; Rail Operations Impacts
AAC-7. North side of Twin Lakes; near City of Marble	**15,000** ft southeast	Construction Impacts; Rail Operations Impacts
AAC-8. Between O'Reilly Lake & Island Lake (off Reilly Beach Rd.)	**11,050** ft northwest	Construction Impacts; Rail Operations Impacts

Table reflects changes due to readjustment of plant footprint (bold typeface denotes updated values for the Final EIS). See Figure 3.18-1 for graphical depiction of the receptor locations. Source: SEH et al, 2005; AAC, 2009

Table 4.18-6. Receptor Locations for Noise Analyses at the East Range Site

Location	Approximate Distance from the nearest edge of East Range Site	Used for Analyses Type(s)
R1. Access Road Southeast of Plant	800 ft northwest	Ambient Monitoring; Plant Operations Modeling; Construction Impacts; Rail Operations Impacts
R2. Boat Landing and Park	9,200 ft southwest	Ambient Monitoring; Plant Operations Modeling; Construction Impacts; Rail Operations Impacts
R3. Colby Ridge Development	8,300 ft southwest	Ambient Monitoring; Plant Operations Modeling; Construction Impacts; Rail Operations Impacts
R4. 321 Kent St, Hoyt Lakes	11,500 ft south	Ambient Monitoring; Plant Operations Modeling; Construction Impacts; Rail Operations Impacts
R5. Faith Lutheran Church	**8,400 ft south**	Plant Operations Modeling; Construction Impacts; Rail Operations Impacts
R6. Queen of Peace Catholic Church	**8,800 ft south**	Plant Operations Modeling; Construction Impacts; Rail Operations Impacts
R7. Trinity Methodist Church	**8,800 ft south**	Plant Operations Modeling; Construction Impacts; Rail Operations Impacts

See Figure 3.18-2 for graphical depiction of receptor locations (bold typeface indicates updated values for the Final EIS). Source: SEH et al, 2005; AAC, 2009

Note that the FHWA noise analysis was only required for the West Range Site because of the proposed realignment of CR 7. The virtual receptor locations for this analysis are discussed in the subsequent traffic noise impacts discussion for the West Range Site. **Following publication of the Draft EIS, Itasca County deferred its planned realignment of CR 7 due to changes in funding priorities at the state level. The proposed realignment of CR 7, as it was presented in the Draft EIS, is no longer anticipated to be available for the Mesaba Energy Project. Access Road 3, now Excelsior's preferred alternative, would directly connect the existing alignment of CR 7 to the southwestern corner of the property boundary as shown in Figure 2.3-2. A new traffic-related noise analysis was conducted for the new Access Road 3 at the West Range Site and is discussed in Section 4.18.2.2.**

4.18.2 Impacts of the Proposed Action

4.18.2.1 Impacts of Construction

The construction process for the Mesaba Generating Station and associated facilities would be expected to generate noise during the following construction phases:

- Site Preparation
- Excavation
- Foundation Placement
- Plant and Building Construction
- Exterior Finish and Cleanup

Equipment used during the construction process would differ from phase to phase. In general, heavy equipment (e.g., bulldozers, scrapers, dump trucks, and concrete mixers) would be used during excavation and concrete pouring activities. Most other phases would involve the delivery and erection of the building and equipment components. It is assumed that there would be no driven piles during the construction process; however, the necessity for such construction activity and applicable requirements would be fully determined after detailed engineering and design is completed.

Noise associated with the construction would be attenuated in a variety of ways. The most significant is the divergence of the sound waves with distance (attenuation by divergence). In general, this mechanism results in a 6-dBA decrease in the sound level with every doubling of distance from the source. For example, the 84-dBA average sound level at 50 feet associated with clearing and grading would be attenuated to 78 dBA at 100 feet, 72 dBA at 200 feet, and to 66 dBA at 400 feet. For a conservative worst-case analysis, noise attenuation from dampening due to ground effects was not included in the construction noise modeling.

During final construction, a method used for testing and cleaning steam piping called “steam blows” would create substantial noise, which would occur on a short-term, temporary basis. A steam blow results when high-pressure steam is allowed to escape into the atmosphere when cleaning the steam piping. A series of short steam blows, lasting 2 or 3 minutes each, would be performed several times daily over a period of 2 or 3 weeks during the final weeks of construction. Steam blows are necessary after erection and assembly of the feed water and steam systems because the piping and tubing that comprise the steam path accumulate dirt, rust, scale, and construction debris. The steam blows prevent debris from entering the steam turbine. Steam blows can produce noise as loud as 130 dBA at a distance of 100 feet. Subsequently, the resultant sound level at the nearby receptors would range from 86 to 103 dBA. To minimize the short-term temporary noise impacts from the steam blows, the steam piping would be equipped with silencers that would reduce noise levels by 20 dBA to 30 dBA at each receptor location.

Due to the nature of construction noise and common fluctuations in the background noise level, construction activity would be occasionally discernable at the nearest receptors. Given ideal atmospheric conditions with cold temperatures, winds, and variable humidity, construction noise could be discernable at the receptors located furthest from the project site because of inversion effects. Under certain circumstances, the construction noise could be a source of annoyance to noise sensitive individuals. In addition to implementing silencers on steam piping, Excelsior would develop a notification plan to alert nearby residents of impending activities that would result in abnormally loud noises. Furthermore, after the final site has been determined, Excelsior would notify nearby residences of the construction schedule and operating plan.

In general, short-term noise levels during construction would not be significant for the following reasons:

- The distance separating the residential areas from the site would result in substantial attenuation of construction noise.
- The construction equipment would not normally be operating simultaneously.
- During construction there would be periods of time when no equipment would be operating, and when noise would be at or near ambient levels.
- Construction activities are scheduled to occur during daytime hours, when many people are at work and away from home.
- To reduce construction noise to the greatest extent possible and practical, functional mufflers would be maintained on construction equipment.

Impacts During Construction at West Range Site

After publication of the Draft EIS, the footprint for the proposed Mesaba Generating Station was shifted approximately 280 feet to the northwest on the property along the same axis as the originally proposed footprint. Based on the new noise analysis, estimated construction-related noise levels at the receptors remained the same or decreased from values as stated in the Draft EIS. This section was revised to reflect the latest noise analysis based on the footprint adjustment. The modeled receptor locations for the West Range site are listed in Table 4.18-5. Note that R6 and R7 represent church receptors and were not used in the construction noise analysis. The predicted aggregate noise levels at the West Range Site during construction are shown in Table 4.18-7 **(revised in Final EIS)**.

The results shown in Table 4.18-7 indicate that noise from construction activities is not expected to exceed the MPCA residential daytime noise limits of 60 dBA (L_{50}) at any of the nearby receptor locations.

For the most part, rail line construction would be located further away from noise sensitive receptors, when compared to the construction of the power plant. However, rail line construction would encroach within 500 feet of receptors R2 and R5. Construction noise would be expected to range from 57 to 69 dBA during the short period that the railroad construction operation is nearest to the homes represented by each of these receptors. Due to the short-term nature of the linear construction operation, rail construction noise could potentially result in a short-term, temporary noise impact, which would be diminished as the construction operation moves away from receptors R2 and R5.

Table 4.18-7. Aggregate Estimated Noise Levels Generated by Construction Activities at the West Range Site

Construction Activity	Estimated Construction Operation Noise Level at Each Receptor Location, dBA							
	R1	**R2**	**R3**	**R4**	**R5**	**Receptor AAC-6**	**Receptor AAC-7**	**Receptor AAC-8**
Site Clearing	51	**44**	**45**	44	**43**	38	34	36
Excavation	56	**49**	**50**	49	**48**	43	39	41
Foundation	44	**37**	**38**	37	**36**	31	27	29
Building Construction	51	**44**	**45**	44	**43**	38	34	36
Finishing	56	**49**	**50**	49	**48**	43	39	41

This table reflects latest noise analysis based on plant footprint readjustment (bold typeface denotes updated values for the Final EIS). (Source: SEH et al., 2005**; AAC, 2009**)

Table 4.18-8 **(revised in Final EIS)** summarizes the estimated noise levels at the receptor locations resulting from steam blow at the West Range Site.

Table 4.18-8. Estimated Steam Blow Noise Levels at West Range Site

Receptor	Estimated Distance to Nearest Future Plant Steam Blow	Steam Blow Noise Level, dBA
R1	**2,990**	**100**
R2	**5,590**	**95**
R3	**5,375**	**95**
R4	**5,910**	**95**
R5	**6,130**	**94**
AAC-6	**10,250**	90
AAC-7	**16,480**	86
AAC-8	**12,525**	88

This table reflects latest noise analysis based on plant footprint readjustment. (Source: SEH et al., 2005**; AAC, 2009**)

To minimize the short-term temporary noise impacts from the steam blows, the steam piping would be equipped with silencers that would reduce noise levels by 20 dBA to 30 dBA at each receptor location.

The FHWA noise analysis that is required at the West Range site because of the proposed realignment of CR 7 also includes construction-related traffic noise and is discussed in Section 4.18.4.3. **Following publication of the Draft EIS, Itasca County deferred its planned realignment of CR 7 due to changes in funding priorities at the state level. A new traffic-related noise analysis was conducted for the new Access Road 3 at the West Range Site and is discussed in Section 4.18.2.2.**

As described in Sections 2.2.4.1 and 2.3.1.1, Excelsior would establish off-site construction staging and laydown areas on 85 acres of land selected from among four potential sites for Phase II construction. Figures 2.3-1 and 2.3-3 show the candidate locations for the West Range Site. All of the sites are located on lands that have been disturbed or cleared during prior uses by mineral extraction companies and all have access to local roadways. Additional traffic volumes (up to eight vehicle trips for each peak a.m. and p.m. hour) from construction truck deliveries would result in intermittent, increased noise levels on routes between the potential laydown areas and the construction site. However, these impacts are expected to be minor as this traffic increase would be short-term and intermittent and the routes between the laydown areas and the construction site do not traverse large towns. The 30-acre laydown area adjacent to CR 7 would present the least amount of noise impacts as the area is located in a fairly remote area near the project site and the route to the proposed site includes one residential property. A few residential areas located on US 169 in the community of Holman would experience minor noise impacts from the other three potential laydown areas as trucks travel between these areas and the project site. Residential properties located in the southwest corner of Taconite would experience minor noise impacts from the 30-acre laydown area located west of Taconite.

Impacts During Construction at East Range Site

The modeled receptor locations for the East Range Site are listed in Table 4.18-6. The predicted aggregate noise levels at the East Range site during construction are shown in Table 4.18-9.

The results shown in Table 4.18-9 indicate that noise from construction operations would not be expected to exceed the MPCA residential daytime noise limits of 60 dBA (L_{50}) at any of the nearby receptor locations.

Table 4.18-9. Aggregate Estimated Noise Levels during Construction at East Range Site

Construction Activity	Estimated Construction Operation Noise Level at Each Receptor Location, dBA						
	R1[1]	R2	R3	R4	R5[2]	R6[2]	R7[2]
Site Clearing	60	41	42	38	40	40	40
Excavation	65	46	47	43	45	45	45
Foundation	53	34	35	31	33	33	33
Building Construction	60	41	42	38	40	40	40
Finishing	65	46	47	43	45	45	45

[1] Receptor 1 is located at the boundary of the Buffer Land and is isolated from residential receptors.
[2] These 3 Receptors represent churches within the Hoyt Lakes Area
Source: SEH, 2005b

Table 4.18-10 **(revised for Final EIS)** summarizes the estimated noise levels at the receptor locations resulting from steam blow at the East Range Site.

Table 4.18-10. Estimated Steam Blow Noise Levels at East Range Site

Receptor	Estimated Distance to Nearest Steam Blow	Steam Blow Noise Level
R1*	1,900 ft	**104** dBA
R2	10,000 ft	**90** dBA
R3	9,200 ft	91 dBA
R4	12,800 ft	88 dBA
R5	10,700 ft	**89** dBA
R6	11,000 ft	**89** dBA
R7	11,000 ft	**89** dBA

* Receptor 1 is located at the boundary of the Buffer Land and is isolated from residential receptors.
Bold typeface denotes updated values for the Final EIS.
Source: SEH, 2005b

To minimize the short-term temporary noise impacts from the steam blows, the steam piping would be equipped with silencers that would reduce noise levels by 20 dBA to 30 dBA at each receptor location.

As described in Sections 2.2.4.1 and 2.3.2.1, Excelsior would establish off-site construction staging and laydown areas on 85 acres of land from two potential sites for Phase II construction. Figure 2.3-5 shows the candidate locations for the East Range Site. Both the sites are located on lands that have been disturbed during prior uses by mineral extraction companies and are accessible by mining roads or abandoned rail grades. The laydown areas are located about 2 to 3 miles from the project site and outside of any residential areas. Additional traffic volumes (up to eight vehicle trips for each peak a.m. and p.m. hour) from construction truck deliveries would result in intermittent noise level increases on routes between the potential laydown areas and the construction site. However, these impacts are expected to be minor as potential routes between the laydown areas and the construction site are located in fairly remote mining areas and no known sensitive receptors are located in the region.

4.18.2.2 Impacts of Facility Operation

<u>Plant Noise</u>

The dominant noise sources for the base plant configuration included the HRSG and ASU stack exits, large buildings with major process equipment inside (including the CTGs and STG) buildings, the ASU buildings, Rod Mill buildings, and Slurry Feed buildings), Acid and Tail Gas burners, the Power Block and ASU cooling towers, and several large water-handling pumps.

Once Phase I begins commercial operations, Excelsior would perform a noise survey to ensure that such operations are in compliance with applicable noise standards. The mechanism for conducting such measurements would depend upon the construction schedule for Phase II. Presuming that construction of Phase II would be concomitant with operation of Phase I, testing would be conducted in a manner to confirm that the combination of activities (i.e., simultaneous Phase I operation and Phase II construction) comply with state requirements. The measurements would be taken during evening and daytime hours to include routine and special operating circumstances, including facility start-ups and shut downs, full load operation, maintenance and testing activities (e.g., steam blows), and rail deliveries and associated unloading activities.

During the start-up process, either the initial commissioning start-up phase or during on-going operations, controlled venting of steam directly to the atmosphere during steam-cycle start-up can occur from vent valves. Also during start-ups, steam can be vented to blowdown tanks. These start-up steam venting/discharging operations are generally not referred to as ‘steam blows’ and typically generate lower noise emissions than steam blows that occur during construction (discussed in Section 4.18.2.1). Beyond the start-up process and during regular operations, the only potential ventings or discharges of steam would be associated with an unusual or emergency event wherein one or more plant systems would ‘trip’ off-line and necessitate a steam discharge to protect personnel and plant equipment; however, these ‘tripping’ discharges are expected to occur infrequently because of the sophisticated control systems at the proposed facility.

Plant Noise at the West Range Site

After publication of the Draft EIS, the footprint for the proposed Mesaba Generating Station was shifted approximately 280 feet to the northwest on the property along the same axis as the originally proposed footprint. In general, new noise analysis findings show that levels of impact at the receptors were reduced compared to the analysis presented in the Draft EIS. None of the receptor locations exhibited changes in noise levels that would be perceptible (all decibel increases were less than ±3 dB). This section was revised to reflect the latest noise analysis for plant-related noise at the West Range Site.

The noise modeling results **for combined Phases I and II** (without any assumed noise control treatments) at the seven nearest receptors are shown below in Table 4.18-11. **Predicted noise levels are well within the daytime limits for all locations.** For the community receptors **R3 and R4**, the predicted aggregate noise emissions from the proposed complete power plant project (Phases I and II) were above the indicated Minnesota L_{10} /L_{50} community limits during the nighttime. At R3 and R4, these noise levels exceeded the L_{10} threshold by 3.**2** and 1.**2** dBA, respectively. The nighttime noise levels exceedances above the L_{50} threshold **were predicted as 3.5** dBA (R**3**) **and** 3.**4** dBA (R4). Note**, however,** that although R3 and R4 are above the **nighttime** noise limits, existing ambient conditions at both residences already exceed the Minnesota regulations, because of their proximity to CR7**. Additionally**, these locations are expected to incrementally receive less than 1 dB from the combined plant **noise levels**, which is well below the commonly held threshold of a perceptible change in community noise levels (which is ±3 dB).

Table 4.18-11. Estimated Plant Noise Levels (without mitigation) at Receptors for West Range Site for Phases I and II

Receptor	Existing L_{10} /L_{50} Day (dBA)	Existing L_{10} /L_{50} Night (dBA)	Projected Plant Noise L_{10} /L_{50} (dBA)	Decibel Increase L_{10} /L_{50} Day (dBA)	Decibel Increase L_{10} /L_{50} Night (dBA)	Resultant L_{10} /L_{50} Day (dBA)	Resultant L_{10} /L_{50} Night (dBA)
R1	53/52	51/49	**45/45**	**0.6/0.8**	**1.0/1.5**	**53.6/52.8**	**52.0/50.5**
R2	54/53	50/49	**42/45**	**0.3/0.3**	**0.6/0.8**	**54.3/53.3**	**50.6/49.8**
R3	59/55	***<u>58/53</u>***	**44/44**	**0.1/0.3**	**0.2/0.5**	**59.1/55.3**	***<u>58.2/53.5</u>***
R4	59/52	***<u>56/53</u>***	**43/43**	**0.1/0.5**	**0.2/0.4**	**59.1/52.5**	***<u>56.2/53.4</u>***
R5	51/**50**	50/49*****	**42/42**	**0.5/0.6**	**0.6/0.8**	**51.5/50.6**	**50.6/49.8**
R6	52/50*****	50/49*****	**27/27**	0/0	0/0	**52.0/50.0**	**50.0/49.0**
R7	52/50*****	50/49*****	**35/35**	**0.1/0.1**	**0.1/0.2**	**52.1/50.1**	**50.1/49.2**

Note: **Table reflects new noise analysis based on adjusted footprint of proposed plant (bold typeface denotes updated values for the Final EIS).** Additionally, italicized and underlined typeface indicate levels exceeding state standards: 65/60 dBA (L_{10} /L_{50}) for daytime and 55/50 for nighttime at residential and church land uses (Source: SEH et al., 2005**; AAC, 2009**);
***Existing ambient conditions and levels were estimated based on information at locations with similar characteristics.**

The following techniques were evaluated to further reduce noise from plant operations, if needed:

- Using a mix of low-noise designs for some equipment items;
- Using available noise control technologies (such as stack silencers); and
- Applying external treatments such as enclosures or noise control panels on selected building walls.

The specific mitigation methods needed to reduce the noise levels of equipment to the desirable design criteria would depend on final design and selection of specific equipment. During the final design review process, Excelsior would evaluate noise reduction features and determine the best suite of mitigation measures that would be incorporated into the final plant design. A host of conceptual plant noise mitigation alternatives and the expected noise reduction potential associated with each feature is identified later in this section in Table 4.18-16.

Even without mitigation, it is expected that the facility would meet state noise standards (both L_{50} and L_{10}) at all sites, with the exception of the nighttime L_{10} noise standard for R3 and R4. Currently, the L_{10} noise levels at R3 and R4 are already above the MPCA nighttime limits due to roadway traffic on CR 7; however, the increased noise levels resulting from plant operations would not be detectable at these sites (less than 1 dBA for both sites). **Noise levels at receptors during the Phase I-only operation are not included in Table 4.18-11. Although, noise levels would not be halved during Phase I-only operation (in comparison to levels during the combined Phases I and II), the amount of decibel increase would be less than what is predicted in Table 4.18-11 and would be below perceptible changes.**

Plant Noise at East Range Site

The modeling results at the seven nearest receptors are shown below in Table 4.18-12. **Changes shown in this table are corrections based on Excelsior's latest supplemental filing (January 2008) for the project's Joint Application to the State of Minnesota (Excelsior, 2008).**

Table 4.18-12. Estimated Operational Noise Levels (without mitigation) at Receptors at East Range Site for Phases I and II

Receptor	Existing L_{10} /L_{50} Day (dBA)	Existing L_{10} /L_{50} Night (dBA)	Projected Plant Noise L_{10} /L_{50} (dBA)	Decibel Increase L_{10} /L_{50} Day (dBA)	Decibel Increase L_{10} /L_{50} Night (dBA)	Resultant L_{10} /L_{50} Day (dBA)	Resultant L_{10} /L_{50} Night (dBA)
R1[1]	50/50	49/49	58/58	**8.6/8.6**	**0.8/0.8**	**58.6/58.6**	**58.5/58.5**
R2	52/**51**	50/49	40/40	**0.3/0.3**	0.4/0.5	**52.3/52.3**	50.4/49.5
R3	53/**51**	50/49	**40/40**	**0.2/0.3**	**0.4/0.5**	**53.2/53.3**	**50.4/49.5**
R4	52/50	49/48	35/35	**0.1/0.1**	0.**2**/0.2	52.**1**/50.**1**	49.**2**/48.2
R5	53/50*****	50/49*****	**38/38**	0.**1**/0.3	0.3/**0.3**	53.**1**/50.3	50.3/**49.3**
R6	53/50*****	50/49*****	**38/38**	0.**1**/0. 3	0.3/**0.3**	53.**1**/50.3	50.3/**49.3**
R7	53/50*****	50/49*****	**38/38**	0.**1**/0. 3	0.3/**0.3**	53.**1**/50.3	50.3/**49.3**

Note: No receptor levels are predicted to exceed state standards: 65/60 dBA (L_{10} /L_{50}) for daytime and 55/50 for nighttime at residential and church land uses**;**
[1]**State threshold for R1, is 80/75 dBA (L_{10} /L_{50}) for daytime and nighttime at industrial land uses**.
***Existing ambient conditions and levels were estimated based on information at locations with similar characteristics.**
(Source: SEH, 2005b**; Excelsior, 2008; AAC, 2009);**
Bold typeface denotes updated values for the Final EIS - corrections in this table are based on Excelsior's latest supplemental filing (January 2008) for the project's Joint Application to the State of Minnesota (Excelsior, 2008)

During operation of the plant **during the combined Phases I and II** at the East Range Site, it is not anticipated that any of the receptors would receive levels above MPCA guidelines during either daytime or nighttime operation, as predicted in Table 4.18-12. This is attributable to the distances involved between the East Range Site and the nearest sensitive receptors. R1 exhibited the greatest predicted decibel increase for the daytime (**8.6** dBA for both L_{10} and L_{50}) **and for the** nighttime (0.8 for **both L_{10} and** L_{50}). **The 8.6-dBA increase at R1 exceeds ±3 dB, and thus, signifies a detectable change**; however, **R1 is located in a remote area at the boundary of the undeveloped East Range buffer land and isolated from any residential receptor. Also, R1 remains below the state threshold of 80/75 dBA (L_{10} /L_{50}) for daytime and nighttime at industrial land uses. All other** increases are well below the commonly-held threshold of a perceptible change in community noise levels (which is ±3 dB). **Noise levels at receptors during the Phase I-only operation are not included in Table 4.18-12. Although, noise levels would not be halved during Phase I-only operation (in comparison to levels during the combined Phases I and II), the amount of decibel increase would be less than what is predicted in Table 4.18-11, remain below perceptible changes with respect to any residential area, and remain within state thresholds.**

Rail Noise and Vibration

The Mesaba Energy Project would transport coal and related materials to and from the proposed project sites by way of a new rail line. Noise and vibration generated by the rail operations have the potential to impact nearby sensitive receptors. The rail noise analysis assumes the rail operating parameters as shown in Table 4.18-4.

The use of train horns is governed by the FRA per Federal requirements as found in 49 USC 20153 and 49 CFR, Parts 222 and 229 "Use of Locomotive Horns at Highway-Rail Grade Crossings, Final Rule (August 17, 2206). Train horns are must be sounded at public at-grade rail crossings. Further, these documents establish that locomotive horns should produce a minimum sound level of 96 dBA and a maximum sound level of 110 dBA, both measured at 100 feet forward of the locomotive in its direction of travel. Cumulative impacts as a result of train horns are discussed in Section 5.2.7.3.

Both rail yard noise levels and rail line noise levels were calculated for the Mesaba noise impact analysis using the methodologies, calculation procedures, and emissions ratings found in the industry-standard document "Transit Noise and Vibration Impact Assessment" (FTA, 1995). The methodologies of this assessment take into account the number of locomotives, the number of rail cars, the train speed, the type of tracks and wheels, and the number of trains per hour or day and use is made of standardized reference emissions factors for the various sources.

Rail Noise and Vibration at West Range Site

In response to concerns raised by USACE and other agencies about the need to avoid and minimize wetland impacts identified in the Draft EIS, Excelsior identified a new preferred rail alignment, Alternative 3B. The alignment would follow the same route as Alternative 1A from the point of interconnection with the CN and BNSF main line to the Mesaba plant site. However, Alternative 3B would begin its rail loop approximately at a point in between the footprints for Phases I and II (see Figure 2.3-2). The rail car unloading station was adjusted about 2,000 feet to the southeast and unit trains would extend beyond the West Range Site boundary at the start of unloading. Thus, under Alternative 3B, the train would be within about 1,000 feet of residential properties on the north end of Big Diamond Lake for approximately 1 hour longer than for Alternative 1A. However, because the train would not be under power during unloading and would be passively pulled through the unloading process, nearby residents would not be subject to additional rail noise during unloading under Alternative 3B. This section was revised to reflect the latest noise analysis for rail-related noise impacts at the West Range Site.

Table 4.18-13 lists the estimated future noise and vibration levels generated by train operations associated with the project in the West Range Site. Freight train noise levels would range from **36 to 56** dBA at the receptor locations during a train pass-by. Typical daytime background noise levels were measured to be in the low 50's dBA (L_{50}). Based on these levels, noise from freight train operations could be noticeable to residences represented by receptors R2, R5, and **AAC-**7 and may be considered an impact based on the FRA noise criteria (see Section 4.18.2.1). However, given the relatively small amount of future train operations **(up to two daily rail trips during Phase I and up to four daily rail trips during Phase II)** and the fact that very few train operations would occur on a daily basis, the incremental L_{dn} increase generated by freight train operations would not be considered significant when compared to background noise levels. Some instances of train pass-bys would be noticeable at receptors with quieter background noise levels, but the noise levels would not be expected to contribute appreciably to the ambient background on an hourly or 24-hour basis. The maximum noise levels generated by freight train operations would be below the ATPA guideline of 70 dBA at each residential receptor location.

Table 4.18-13. Estimated Freight Train and Yard Activity Noise Levels at West Range Site

Receptor	Estimated Distance to Nearest Track Segment (ft)	Estimated Train Noise (dBA)	Estimated RMS Vibration Velocity (dBV)	Estimated Distance to Rail Yard (Loading & Unloading) (ft)	Estimated Yard Noise (dBA)
R1	4,110	44	56	**3,835**	**25**
R2	**1,125**	**52**	**67**	**4,585**	**23**
R3	**6,895**	**40**	**51**	**7,490**	**19**
R4	**7,300**	**40**	**51**	**8,070**	**18**
R5	**630**	**56**	**72**	**4,800**	**23**
AAC-6	**2,130**	**48**	**61**	**10,950**	**15**
AAC-7	**1,480**	**51**	**65**	**15,575**	**12**
R8	**13,020**	**36**	**46**	**14,565**	**12**

Table reflects new noise analysis based on new rail alignment Alternative 3B (bold typeface denotes updated values for the Final EIS). (Source: SEH et al., 2005**; AAC, 2009**)

Noise generated by rail yard operations have also been estimated and summarized in Table 4.18-13. The noise from yard activities, involving loading and unloading of freight trains, would be greatly attenuated due to the distance between the nearby receptors and the yard. Rail yard noise is estimated to be between **12 to 25** dBA at the nearby residences. Noise generated by yard operations would not exceed the FRA and ATPA noise guidelines, and therefore, is not expected to be significant.

Horn soundings would be expected to be clearly audible to the nearest residential receptors. Because train horns are a requirement of the FRA, the noise impact would be considered an unavoidable adverse noise impact.

Since vibration effects from rail operations would be classified as “infrequent events” (per Table 4.18-4), the FRA guideline for vibration impacts would be 80 VdB. As all the receptors at the West Range Site are predicted to have train-related vibration levels of at least 8 VdB below this guideline level, it is expected that rail vibration impacts would not be significant at the West Range Site.

Rail Noise and Vibration at East Range Site

Table 4.18-14 lists the estimated future noise levels generated by train operations associated with the project at the East Range Site. **Changes shown in this table are corrections based on Excelsior’s latest supplemental filing (January 2008) for the project’s Joint Application to the State of Minnesota (Excelsior, 2008).**

Freight train noise levels would range from **39 to 50** dB at the receptor locations during a train pass-by. Typical daytime background noise levels were measured to be in the low 50s. Based on these levels, noise from freight train operations could be noticeable to R1. However, given the relatively small amount of future train operations and the fact that very few train operations would occur on a daily basis, the L_{dn} generated by freight train operations would not be considered significant when compared to background noise levels. Some instances of train pass-bys would be noticeable at receptors with quieter background noise levels, but the noise would not be expected to contribute appreciably to the ambient background on an hourly or 24-hour basis. Furthermore, the maximum noise levels generated by freight train operations would be below the ATPA guideline of 70 dBA at each receptor location and would not be considered significant.

Table 4.18-14. Estimated Freight Train and Yard Activity Noise Levels at East Range Site

Receptor	Estimated Distance to Nearest Track Segment (ft)	Estimated Train Noise (dBA)	Estimated RMS Vibration Velocity (dBV)	Estimated Distance to Rail Yard (Loading & Unloading) (ft)	Estimated Yard Noise (dBA)
R1	1,700	**50**	**63**	1,700	**32**
R2	5,800	**42**	**53**	9,500	**17**
R3	5,200	**43**	**53**	8,700	**18**
R4	9,300	**39**	**49**	12,000	15
R5	7,300	**40**	**51**	10,000	**17**
R6	8,000	**40**	**50**	10,200	**16**
R7	8,100	**40**	**50**	10,200	**16**

* Receptor 1 is located at the boundary of the Buffer Land and is isolated from residential receptors. (Source: SEH, 2005b; AAC, 2009); **Corrections in this table are based on Excelsior's latest supplemental filing (January 2008) for the project's Joint Application to the State of Minnesota (Excelsior, 2008)**

Noise generated by rail yard operations have also been estimated and summarized in Table 4.18-14. The noise from yard activities, involving loading and unloading of freight trains, would be greatly attenuated due to the distance between the nearby receptors and the yard. Rail yard noise is estimated to be between 15 to **32** dB at the **receptors**. When compared to the FRA and ATPA noise guidelines, noise generated by yard operations would not expected to be significant.

Horn soundings would be expected to be clearly audible to the nearest residential receptors. Because train horns are a requirement of the FRA, such noise impacts are an unavoidable adverse impact.

Since vibration effects from rail operations would be classified as "infrequent events" (per Table 4.18-4), the FRA guideline for vibration impacts would be 80 VdB. As all the receptors at the East Range Site are predicted to have train-related vibration levels of at least 17 VdB below this guideline level, it is expected that rail vibration impacts would not be significant at the East Range Site.

Federal Highway Administration Noise Analysis (West Range)

As previously mentioned, an FHWA noise analysis was conducted (using the augmented FHWA noise prediction software MINNOISE) for the West Range Site because this site initially consisted of a proposed roadway that would have included substantial realignment and additional lanes (realignment of CR7). Following publication of the Draft EIS, Itasca County deferred its planned realignment of CR 7 due to changes in funding priorities at the state level. The proposed realignment of CR 7 as it was presented in the Draft EIS is no longer anticipated to be available for the Mesaba Energy Project. Access Road 3, now Excelsior's preferred alternative, would directly connect the existing alignment of CR 7 to the southwestern corner of the property boundary as shown in Figure 2.3-2. An additional noise assessment was completed for Access Road 3. This section was revised to reflect the latest traffic-related noise levels at the West Range Site.

The noise levels at the virtual receptors at the West Range Site during the construction and operational phase are shown in Table 4.18-15 **(revised for Final EIS)**. **For the new analysis, two**

receptor points, MR 19 and MR 20, were removed due to their greater distance from Access Road 3. New receptors, MR 21 and MR 22, were added: MR 21 is a new location which was not affected by the original alignment and MR 22 has been identified as a new residential receptor. See Figure 4.18-1 (added in Final EIS) for location of receptors used for the traffic-related noise analysis. [Text regarding exceedances predicted for Draft EIS was deleted.]

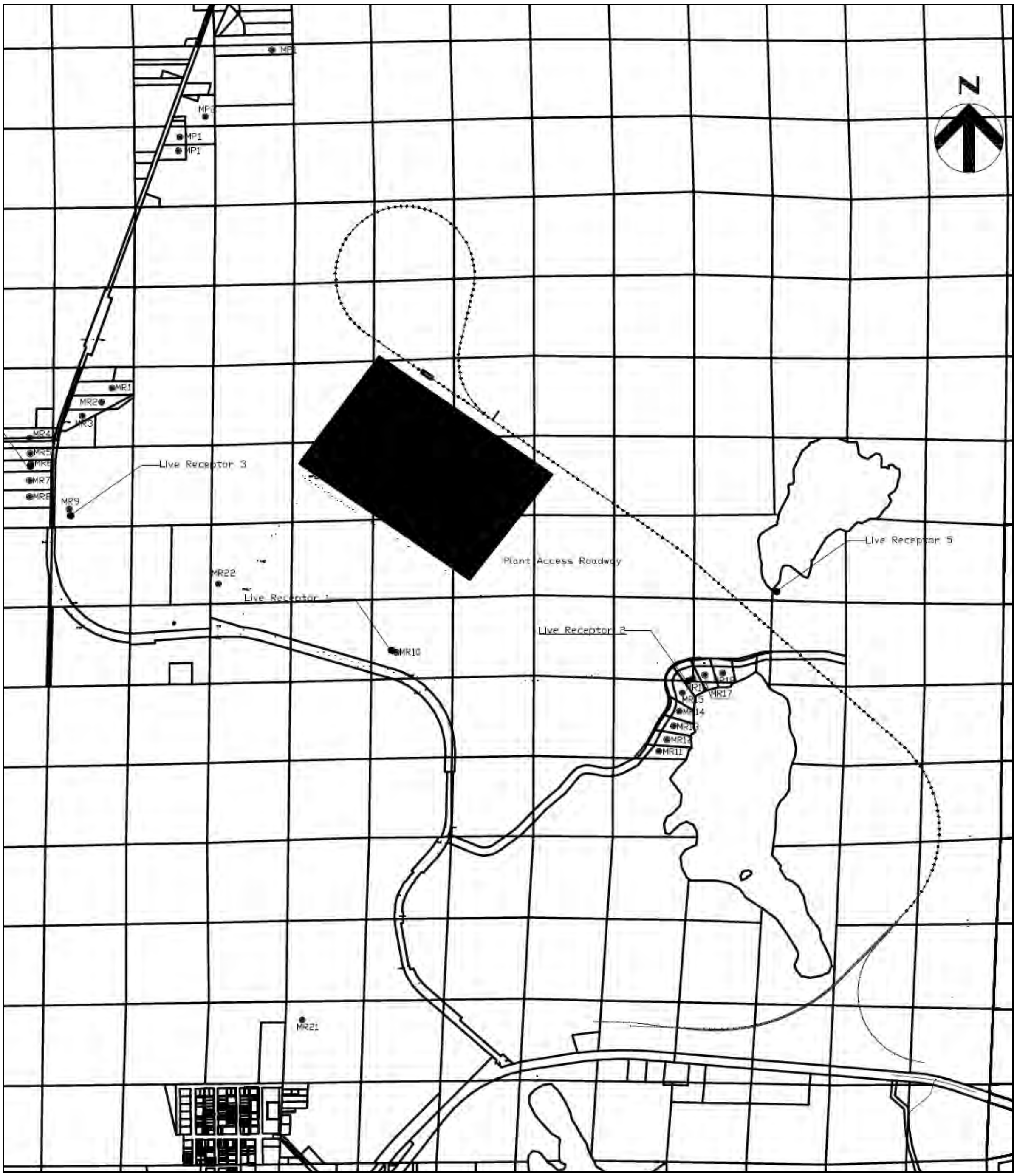

Figure 4.18-1. MINNOISE L_{10} Virtual Receptor Locations for West Range Site (HDR, 2009)

Table 4.18-15. MINNOISE L_{10} Noise Levels at Virtual Receptor Locations for West Range Site

Receptors/Distance to Roadway	"Nightime"[1] Construction L_{10}	"Daytime"[1] Construction L_{10}	"Nightime"[1] 2028 Plant Service L_{10}	"Daytime"[1] 2028 Plant Service L_{10}
MR1/5500'	**45** dBA	**48.8** dBA	**40.4** dBA	**40.4** dBA
MR2/5400'	**46.3** dBA	**50.2** dBA	**41.7** dBA	**41.7** dBA
MR3/5500'	**49.7** dBA	**53.9** dBA	**45.2** dBA	**45.2** dBA
MR4/5800'	**49.8** dBA	**52.9** dBA	**44.3** dBA	**45.6** dBA
MR5/5600'	**50.8** dBA	**53.8** dBA	**45.2** dBA	**45.7** dBA
MR6/5600' **(near R4)**	**51.3** dBA	**54.2** dBA	**45.6** dBA	**45.8** dBA
MR7/5450'	**51.3** dBA	**54.2** dBA	**45.6** dBA	**48.4** dBA
MR8/5300'	**51.5** dBA	**54.4** dBA	**45.8** dBA	**53.9** dBA
MR9/4600' **(near R3)**	**55.1** dBA	**57.2** dBA	**48.4** dBA	**35.8** dBA
MR10/320' **(near R1)**	**62.3** dBA	**60.8** dBA	**55.1** dBA	**35.3** dBA
MR11/1400'*	**41.9** dBA	**41.8** dBA	**36** dBA	**34.9** dBA
MR12/1250'*	**41.5** dBA	**41.3** dBA	**35.5** dBA	**34.6** dBA
MR13/1050'*	**41.1** dBA	**40.9** dBA	**35.1** dBA	**34.3** dBA
MR14/850'*	**40.7** dBA	**40.5** dBA	**34.7** dBA	**33.7** dBA
MR15/550'*	**40.4** dBA	**40.2** dBA	**34.4** dBA	**33.1** dBA
MR16/350'*	**39.8** dBA	**39.6** dBA	**33.8** dBA	**32.4** dBA
MR17/300'* **(near R2)**	**39.2** dBA	**39.1** dBA	**33.3** dBA	**40.9** dBA
MR18/300'*	**38.5** dBA	**38.4** dBA	**32.6** dBA	**32.4** dBA
MR21/1,880'	**46.8** dBA	**47,** dBA	**40.7** dBA	**40.9** dBA
MR22/520'	**58.4** dBA	**58.8** dBA	**51.8** dBA	**52.1** dBA

Notes: Shaded values represent L_{10} values above state standards **65/60 dBA (L_{10} /L_{50}) for daytime and 55/50 for nighttime at residential and church land uses**. * Represents residences at Big Diamond Lake. **[Note, MR 19 and 20 were deleted for the Final EIS.];**

[1] "Daytime" is defined by the MPCA as between 7:00 am – 10:00 pm; "nighttime" is defined as between 10:00 pm – 7:00 am

Source: SEH et al., 2005**; HDR, 2009**

The new analysis indicates that MPCA noise thresholds are potentially exceeded at three receptor points – MR 9, MR 10, and MR 22 – for the nighttime construction condition. However, these exceedances are only for construction-related traffic and only between the nighttime hours. Since no nighttime construction activities are currently planned, the nighttime noise standards would not be exceeded and, therefore, noise mitigation for increased traffic-related noise would not be required. In defining the impacted receptors, the FHWA, Mn/DOT, and MPCA regulations were examined and the following conclusions were made: **[Text regarding exceedances predicted for the Draft EIS was deleted.]**

- No receptors met the criteria for *Noise Level Approaching the NAC*. As stated, FHWA and Mn/DOT apply this classification when the predicted level is 1 dB below the criterion level.
- No receptors met the FHWA definition of *Substantial Increase in Noise* as defined by a 5-dB increase over the Federal NAC category B criteria of 70 dB, or a 75 dB prediction.

- “Nighttime” construction times (10:00 pm – 7:00 am) yielded **three** impacted receptors per MPCA definition. **However, construction is unlikely to occur during nighttime hours and these three receptors would not experience these projected noise levels.**
- “Nighttime” 20-year project plant service traffic levels revealed **no** impacted receptors **per FHWA or MPCA and Mn/DOT guidelines**.
- “Daytime” 20-year projected plant service traffic levels reveal no impacted receptors per FHWA or MPCA and Mn/DOT guidelines.

In general, results of the new noise study show that Access Road 3 would not generate any new noise impacts above MPCA guidance and, in fact, traffic-related noise impacts as discussed in the Draft EIS, primarily for receptors near Big Diamond Lake, are reduced. Based on the level of reduced impacts, a noise wall analysis is not required.

4.18.3 Impacts of No Action Alternative

For the purposes of this EIS, as explained in Section 2.1.1.2, the DOE No Action Alternative is assumed to be equivalent to a “No Build” Alternative. Since this alternative would most likely not involve introducing new noise sources, the No Action Alternative is projected to have no impact on the nearby noise sensitive receptors. Therefore, the noise levels would be substantially similar to existing conditions.

4.18.4 Summary of Impacts

Basis for Impact	No Action	West Range	East Range
Conflicts with a jurisdictional noise ordinance or Minnesota regulations (i.e., Minnesota Pollution Control Agency [MPCA]) or results in a permanent perceptible increase in ambient noise levels at residential areas during construction.	There would be no additional noise emissions and therefore, there would be no new conflicts with noise standards; however R3 and R4 at the West Range are currently above the MPCA noise thresholds.	Short-term adverse noise impacts would result from construction activities, including steam blows. Noise levels at nearby receptors from steam blows would range from **86 to 100** dBA; however, steam piping would be equipped with silencers that would reduce noise levels by 20 dBA to 30 dBA at each receptor location. **Predicted aggregate noise levels from construction activities range from 27 to 56 dBA -** MPCA residential daytime noise limits of 60 dBA (L_{50}) would not be exceeded at any of the residential receptors during construction. **Increased noise levels would occur at potential off-site staging areas, especially along construction vehicle routes; however, minor impacts are expected as increases would be short-term, intermittent, and transportation routes would not traverse large towns.** FHWA noise analysis: Nighttime L_{10} threshold would be exceeded at **three receptors locations (MR9, MR10, and MR22)** during construction**; however, construction not expected to take place during nighttime hours and, thus, no impacts would occur**.	Short-term adverse noise impacts would result from construction activities, including steam blows. Noise levels at nearby receptors from steam blows would range from 88 to **104** dBA; however, steam piping would be equipped with silencers that would reduce noise levels by 20 dBA to 30 dBA at each receptor location. **Predicted aggregate noise levels from construction activities range from 31 to 65 dBA -** MPCA residential daytime noise limits of 60 dBA (L_{50}) would not be exceeded at any of the residential receptors during construction **(65 dBA is predicted to occur at R1, which is located at the boundary of the Buffer Land and is isolated from residential areas)**. **Increased noise levels would occur at potential off-site staging areas, especially along construction vehicle routes; however, minor impacts are expected as increases would be short-term, intermittent, and staging areas and transportation routes are located in remote areas.**

Basis for Impact	No Action	West Range	East Range
Conflicts with a jurisdictional noise ordinance or Minnesota regulations (i.e., Minnesota Pollution Control Agency [MPCA]) during operations or results in a permanent perceptible increase in ambient noise levels at residential areas.	There would be no additional noise emissions and therefore, there would be no new conflicts with noise standards and no change in ambient noise conditions; note, however, that R3 and R4 at the West Range are currently above the MPCA noise thresholds.	Unmitigated plant noise (daytime): Without mitigation, MPCA noise thresholds would not be exceeded. Unmitigated plant noise (nighttime): Without mitigation, the nighttime noise levels would exceed the L_{50} threshold at R3 and R4 by **3.5** and **3.4** dBA, respectively. Note, however, that existing noise levels at R3 and R4 currently exceed state limits because of proximity to CR 7. **Additionally, note that no perceptible noise increases would occur at any receptor locations for the single and combined plant phases under an unmitigated scenario (i.e., predicted change in existing ambient noise levels would be less than 3 dB)**.	Unmitigated plant noise (daytime and nighttime): MPCA noise thresholds would not be exceeded. Predicted daytime and nighttime noise level increases were **greatest at R1 (8.6-dBA increase); however, R1 is an isolated area (not a residential area); no other perceptible changes in noise levels would occur at the other receptor locations**.
Conflicts with transportation-related noise guidelines (Federal Highway Administration, Federal Railroad Administration, and American Public Transportation Association).		Rail Noise: Freight train noise levels would range from **36 to 56** dBA at the modeled receptor locations during a train pass-by - noise from freight train operations could be noticeable to residences represented by receptors R2, R5, **and AAC-7** and may be considered an impact based on the FRA noise criteria, but would be short-term and relatively infrequent. Maximum noise levels generated by freight train operations would be below the ATPA guideline of 70 dBA at each receptor location and would not be considered significant. **All receptors are predicted to have train-related vibration levels of at least 8 VdB below the FRA guideline level of 80 VdB.** Train horns, as required under FRA regulations would be adverse unavoidable impacts for receptors near at-grade crossings. FHWA noise analysis: **All receptor locations were below state thresholds during plant operations (no receptors met the FHWA definition of *Substantial Increase in Noise*)**.	Rail Noise: Freight train noise levels would range from **39 to 50** dBA at the modeled receptor locations during a train pass-by - noise from freight train operations could be noticeable to residences represented by receptor R1. Maximum noise levels generated by freight train operations would be below the ATPA guideline of 70 dBA at each receptor location and would not be considered significant. **All receptors are predicted to have train-related vibration levels of at least 17 VdB below the FRA guideline level of 80 VdB.** Train horns, as required under FRA regulations would be adverse unavoidable impacts for receptors near at-grade crossings.

4.18.5 Plant Noise and Mitigation Issues

To ensure that appropriate noise attenuation features are included in the final facility design and layout, acceptable ambient noise levels for the proposed land use could be specified in contractor bid specifications. An acoustical analysis of the final design could be completed to ensure it is consistent with the MPCA guidelines.

Noise mitigation design features were identified in the noise evaluation reports. The reports recommended a prudent plant layout configuration, appropriate building acoustical features, low-noise specifications for selected item vendors, and silencing equipment on certain systems. With these proposed noise control designs, it is believed that compliance with the MPCA standards would be achieved at all nearby receptor locations and beyond in the adjacent land uses; both during full-load operations at any time of the day and night.

To ensure noise compliance, the amounts of equipment noise controls could be refined during the course of the project engineering, such that the as-built installation maintains the expected noise emissions and achieves the desired noise compliance. Following commissioning, the plant could be tested using a formalized acoustical survey procedure to demonstrate noise acceptability with the project requirements.

Table 4.18-16 lists the conceptual noise mitigation measures, identified in the noise evaluation studies included in Appendix 5 of the Mesaba Energy Project – Environmental Supplement (SEH et al., 2005), that could be incorporated into the final design of the power plant.

Table 4.18-16. Summary of Noise Mitigation Project Design Features

Noise Source (Original Noise Emissions Rating)	Conceptual Noise Mitigation Feature(s)
Power Block Cooling Tower (60 dBA at 400' from tower edge)	Reduced 6 dB to 54 dBA at 400' from tower edge. Tower vendors can use a combination of slower-speed fans with special blade design, low-noise drive systems, splash control features, and/or tower baffling materials.
Combustion Turbine, Steam Turbine, & HRSG 2-on-1 Power Island (70 dBA at 400' from island envelope)	(a) Include acoustical panel specifications for CTG and STG buildings walls in the detailed design such that interior space noise levels are adequately absorbed and encased within these building shells. (b) Specify CTG components that are outside buildings to be less than 90 dBA at 3 feet from the equipment surface envelope, as an aggregate.
HRSG Stack Exit (alone)(60 dBA at 400')	Reduced 10 dB to 50 dBA at 400' from stack base. Power Island vendor should use a stack silencer (either before or after the up-turn bend) to reduce HRSG stack noise.
Power Block Cooling Tower Pumps(94 dBA at 1')	Reduced 6 dB to ≤88 dBA at 1'. Can be accomplished via noise limit specification to equipment vendor (for a quiet design). As an alternative, install an acoustical enclosure around the pump and drive mechanics.
ASU System(varies)	(a) Include acoustical panel specifications for ASU building walls in the detailed design such that interior space noise levels are adequately absorbed and encased within the building shell. (b) Specify ASU components that are outside buildings to be less than 90 dBA at 3 feet from the equipment surface envelope, as an aggregate.
ASU Stack Exit (alone) (50 dBA at 400')	Reduced 10 dB to 40 dBA at 400' from stack base. ASU System vendor should use a stack silencer to reduce stack noise.
Rail Dumping Building(73 dBA at 50')	Assumes acoustical panel specifications for building walls in the detailed design such that interior space noise levels are adequately absorbed and encased within the building shell to meet the assumed emissions levels.
Slurry Feed and Slurry Prep Building(60 dBA at 50')	Same as immediately above.
Slag Handling Building(65 dBA at 50')	Same as immediately above.
Rod Mill Building(75 dBA at 50')	Reduced 10 dB to 65 dBA at 50' from any building facade. Specify acoustical panel specifications for Rod Mill building walls in the detailed design such that interior space noise levels are adequately absorbed and encased within the building shell to meet the reduced emissions levels.

Table 4.18-16. Summary of Noise Mitigation Project Design Features

Noise Source (Original Noise Emissions Rating)	Conceptual Noise Mitigation Feature(s)
SynGas and TailGas Burners(96 dBA at 3')	Reduced 10 dB to 86 dBA at 3' from the burner box. Specify low-noise burners to equipment vendors or use noise control enclosures/ plenums around burner systems.
Raw Water Pump Sets(91 dBA at 3')	Reduced 10 dB to 81 dBA at 3' from the pump set envelope. Noise limit specification to equipment vendor to supply either quiet-design pump sets or to utilize equipment enclosure.
All other Mechanical Equipment not specified above (various)	Noise limit specification to equipment vendor; no more than 85 dBA at 3'.
All building HVAC units and fans (various)	Noise limit specification to equipment vendor; no more than 85 dBA at 3'.

Source: SEH et al., 2005**; AAC, 2009**

The available mitigation methods needed to reduce the noise levels from specific equipment to the desirable design criteria would depend on final design and selection of specific equipment. Therefore, no commitment to specific noise mitigation methods has been made at this phase of the project. However, to ensure that noise levels would be below state-required thresholds, Excelsior would evaluate and select the best suite of noise reduction alternatives to be incorporated as part of the design basis.

With respect to noise resulting from activities other than plant equipment, additional noise reduction activities could include restricting the number and timing of coal train deliveries across a specific time period and restricting certain construction/maintenance activities to daytime hours.