6.0 PHYSICAL AND NATURAL ENVIRONMENTAL IMPACTS

This Chapter describes the natural resources in the Preferred Alternative corridor and the potential impacts that could result from the project. Information provided in this chapter has been updated to reflect the post-DEIS design modifications outlined in Section 3.1.3 of the FEIS. Table 1.1 in Chapter 1 provides an overview of the change in impacts. Where relevant, potential measures to mitigate identified impacts are also discussed. Topics addressed in this chapter include: air quality; noise; "prime" and "statewide important" farmland; contaminated properties; vegetation, wildlife, and fisheries; state/federal threatened and endangered species; visual impact; parks, trails, recreational areas and natural areas/Section 4(f)/Section 6(f) lands; geology/soils; and wild and scenic rivers and canoe/boating routes.

6.1 AIR QUALITY

6.1.1 Regulatory Overview and Affected Environment

The Clean Air Act of 1970 set National Ambient Air Quality Standards (NAAQS) for particulates, lead, ozone, nitrogen dioxide, sulfur dioxide, and carbon monoxide. In 1999, the U.S. Environmental Protection Agency (EPA) issued final rules on transportation conformity (amended as 40 CFR 93) which describe the methods required to demonstrate State Implementation Plan (SIP) compliance for transportation projects. These guidelines indicate that non-exempt transportation projects such as the proposed I-94/TH 10 Interregional Connection project may need to be included in a regional emissions analysis to demonstrate that the project would not increase regional CO emissions and would not increase the frequency or severity of existing violations. The regional analysis must be part of the metropolitan planning organization's long-range plan and the three-year Transportation Improvement Program (TIP). After this project is included in the TIP, it will be included in a regional analysis of emissions performed by the Metropolitan Council to show whether emissions are below the EPA-established emissions budget for the region and whether the project interferes with implementation of any transportation control measures included in the SIP.

Of the six criteria pollutants established by the Clean Air Act of 1970, carbon monoxide was identified as the pollutant of most concern for this project. As a means of estimating potential project-specific air quality impacts for the DEIS, an air quality analysis of "worst-case" conditions was performed to estimate the effect of project alternatives on future CO concentrations at key freeway segments in the project area. The analysis found that air quality is not expected to be a concern for the Preferred Alternative.

Refer to the DEIS for further background and history on the regulation of air quality.

6.1.2 Environmental Consequences

6.1.2.1 Carbon Monoxide Analysis—Results and Analysis

Carbon monoxide concentrations for Build conditions were calculated for year 2040 for Alternative B within the City of Clearwater, because it is the area expected to have worst-case CO concentrations due to the density of receptor sites (i.e., residential yards and commercial

parking lots) and their proximity to the roadway. The Preferred Alternative is expected to have lower CO levels than Alternative B (the worst-case scenario) because of its location in areas of less dense development where the receptors would be farther from the roadway. MPCA staff reviewed and concurred with the area selected for analysis. Results of the CO modeling are presented in Table 6.1. The results are compared to federal and state standards for CO, presented at the bottom of the table.

TABLE 6.1
CARBON MONOXIDE MODELING RESULTS – WORST CASE ANALYSIS

Receptor	2040 Build		
	One-Hour Average Total[(1)] Concentration	Eight-Hour Average Total[(1)] Concentration	Wind Angle
1	8.0	5.4	50
2	8.1	5.4	50
3	8.1	5.4	40
4	7.2	4.8	80
5	8.3	5.6	80
6	8.4	5.7	230
State Standard	**30**	**9**	
Federal Standard	**35**	**9**	

Note: All concentrations are in parts-per-million (ppm).
(1) Total concentrations include background (6.9 ppm and 4.6 ppm for 1-hour and 8-hour, respectively) and modeled CO concentrations.

Based on the predicted concentration levels and the fact that a worst-case scenario was analyzed, air quality is not expected to be a concern for the Preferred Alternative.

6.1.3 Mitigation

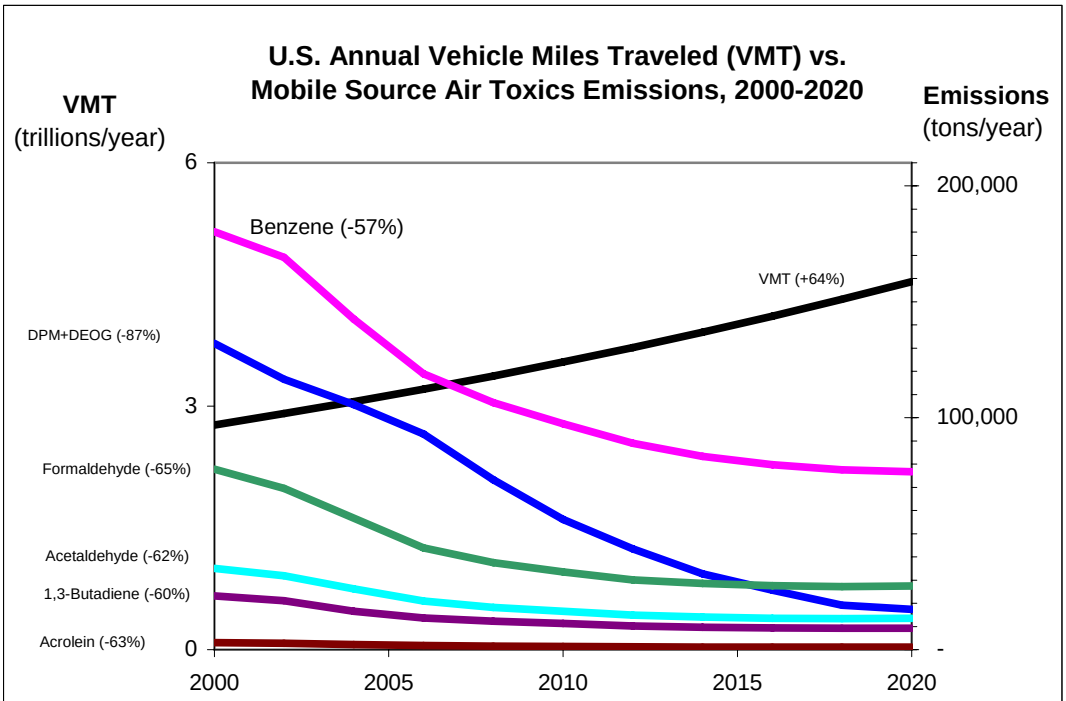
No specific long-range mitigation measures for this project are necessary to maintain air quality standards because projected CO levels for the worst-case conditions (Alternative B in Clearwater) are below state and federal standards. Temporary construction-related impacts on air quality are discussed in Chapter 9 (Construction Impacts).

6.1.4 Mobile Source Air Toxics

In addition to the criteria air pollutants for which there are National Ambient Air Quality Standards (NAAQS), EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead federal agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources, 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the Clean Air Act. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in vehicle miles traveled (VMT), these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and will reduce on-highway diesel PM emissions by 87 percent, as shown in the following graph.



Notes: For on-road mobile sources. Emissions factors were generated using MOBILE6.2. Methyl tertiary-butyl ether proportion of market for oxygenates is held constant, at 50%. Gasoline Reid Vapor Pressure and oxygenate content are held constant. VMT: *Highway Statistics 2000*, Table VM-2 for 2000, analysis assumes annual growth rate of 2.5%. "Diesel Particulate + Diesel Exhaust Gas" is based on MOBILE6.2-generated factors for elemental carbon, organic carbon and SO4 from diesel-powered vehicles, with the particle size cutoff set at 10.0 microns.

As a result, EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 202(l) that will address these issues and could make adjustments to the full 21 and the primary six MSATs.

Unavailable Information for Project Specific MSAT Impact Analysis

This FEIS includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the project addressed by this FEIS. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information.

Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

1. Emissions. The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model—emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For particulate matter, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with MOBILE6.2 as an obstacle to quantitative analysis.

   These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE6.2 is an adequate tool for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

2. Dispersion. The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of dispersion

models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The National Cooperative Highway Research Program is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

3. Exposure Levels and Health Effects. Even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

6.1.4.1 Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs

Research into the health impacts of MSATs is on-going. For different emission types, there are a variety of studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or state level.

The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is

located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs was taken from the IRIS database Weight of Evidence Characterization summaries. This information is taken verbatim from EPA's IRIS database and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- **Benzene** is characterized as a known human carcinogen.
- The potential carcinogenicity of **acrolein** cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- **Formaldehyde** is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.
- **1,3-butadiene** is characterized as carcinogenic to humans by inhalation.
- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.
- **Diesel exhaust** (DE) is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases.
- **Diesel exhaust** also represents chronic respiratory effects, possibly the primary noncancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes, particularly respiratory problems[1]. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable a more comprehensive evaluation of the health impacts specific to this project.

[1] South Coast Air Quality Management District, Multiple Air Toxic Exposure Study-II (2000); Highway Health Hazards, The Sierra Club (2004) summarizing 24 Studies on the relationship between health and air quality); NEPA's Uncertainty in the Federal Legal Scheme Controlling Air Pollution from Motor Vehicles, Environmental Law Institute, 35 ELR 10273 (2005) with health studies cited therein.

Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and Evaluation of impacts based upon theoretical approaches or research methods generally accepted in the scientific community.

Because of the uncertainties outlined above, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. While available tools do allow us to reasonably predict relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from each of the project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. (As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

In this document, Mn/DOT has provided a qualitative analysis of MSAT emissions relative to the No-Build and Preferred Alternative, and has acknowledged that the Preferred Alternative may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

6.1.4.2 Qualitative Assessment

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions—if any—from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*.

For both the No-Build and the Preferred Alternative, the amount of MSATs emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. Because the VMT estimated for the No-Build Alternative is higher than for the Preferred Alternative, higher levels of regional MSATs are not expected from the Preferred Alternative compared to the No-Build. Also, regardless of the alternative, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent from 2000 to 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in virtually all locations.

Because of the specific characteristics of the Preferred Alternative, there will be localized areas where VMT and VHT will increase, and other areas where they will decrease. Therefore, it is

possible that localized increases or decreases in MSAT emissions may occur. However, even if those increases do occur, they too will be substantially reduced in the future due to implementation of EPA's vehicle and fuel regulations.

In conclusion, under the Preferred Alternative in the design year it is expected there would be reduced MSAT emissions in the immediate area of the project, relative to the No-Build Alternative, due to the reduced VMT associated with more direct routing, and due to EPA's MSAT reduction programs. In comparing project alternatives, MSAT levels could be higher in some locations than others, but current tools and science are not adequate to quantify them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause reductions that, in almost all cases, will cause region-wide MSAT levels to be substantially lower than today.

6.2 NOISE

6.2.1 Affected Environment

6.2.1.1 Traffic Noise

This section provides an analysis of the noise impacts that will result from the Preferred Alternative. A detailed noise analysis was completed to assess existing traffic noise levels in the project area and to determine what effect the Preferred Alternative will have on future noise levels. The Preferred Alternative will create a new traffic noise source in the study area and will change traffic volumes along existing roadways. Increases in traffic can result in increased noise levels, which, in some instances, may be perceived as a disturbance by adjacent residents.

Since publication of the DEIS, modifications have been incorporated into the Preferred Alternative design as described in Section 3.3 of this FEIS. As a result, additional analysis has been completed to evaluate the traffic noise impacts that would result from the construction of the Preferred Alternative. This analysis included the identification of receptors that were previously not modeled as part of the noise analysis included in the DEIS.

Additional analyses have also been completed since the DEIS to evaluate the feasibility and reasonableness of traffic noise mitigation, in accordance with Mn/DOT policy. Results of this analysis are presented in Section 6.2.3.

6.2.1.2 Noise Analysis

Noise is defined as any unwanted sound. To approximate the way that an average person hears sound, an adjustment, or weighting, of the high- and low- pitched sounds is made. The adjusted sound levels are stated in units of "A-weighted decibels" (dBA).

In Minnesota, traffic noise impacts are evaluated by measuring and/or modeling the traffic noise levels that are exceeded 10 percent and 50 percent of the time during the hours of the day and/or night that have the heaviest traffic. These numbers are identified as the L_{10} and L_{50} levels,

respectively. For example, an L_{10} value of 65 decibels means that the noise level was at or greater than 65 decibels during 10 percent of the measurement period (i.e., more than six minutes per hour).

Refer to the DEIS for further background regarding the measurement of noise and for a list of common noise levels from various indoor and outdoor sources.

6.2.1.3 Regulatory Framework

Traffic is a common source of noise near high-volume roadways and is regulated in Minnesota by the MPCA under Minnesota Statute 116.07 Subdivisions 2 and 4. Minnesota state noise standards have been established for daytime and nighttime periods. Traffic noise analyses are conducted for the peak noise hour during both daytime and nighttime. The peak daytime traffic noise hour typically corresponds to the morning or evening rush hour, while the peak nighttime noise hour is almost always from 6 a.m. to 7 a.m.

State noise standards apply to the Preferred Alternative river crossing. For residential land uses (identified as Noise Area Classification 1 or NAC-1), the Minnesota state standards for L_{10} are 65 decibels for daytime and 55 decibels for nighttime; the standards for L_{50} are 60 decibels for daytime and 50 decibels for nighttime. Designated canoe sites along the Mississippi River also fall under the state NAC-1 classification.

For residential and parkland uses (Federal Land Use Category B), the federal L_{10} noise abatement criterion is 70 dBA for both daytime and nighttime. Locations where noise levels are "approaching" (defined as being within one decibel of the criterion threshold, i.e., 69 dBA) or exceeding the criterion level must be evaluated for noise abatement feasibility.

In addition to the identified noise criteria, the FHWA also defines a noise impact as a "substantial increase" in the future noise levels over the existing noise levels. Mn/DOT considers an increase of 5 dBA or greater a substantial noise level increase. Because federal funds are anticipated to be used as part of this project, the federal noise criteria would apply to all roads associated with the Preferred Alternative.

It is important to note that traffic noise increases or decreases of 3 dBA or less are not typically detectable by the average human ear. An increase of 5 dBA is generally noticeable by the average person. For a 3 dBA increase in traffic noise levels to occur at a particular receptor, either the traffic levels would need to double or the roadway carrying the traffic would need to be half as far from the receptor. Traffic would need to increase at least three times to result in a readily noticeable (5 dBA) increase in noise.

Refer to Section 6.2.1.3 of the DEIS for further background on state and federal noise regulations.

6.2.1.4 Monitoring

Noise level monitoring was performed for the noise study documented in the DEIS. Existing noise levels were monitored at 28 locations within the project area, chosen to represent areas of outdoor human activity (i.e., residential yards). A trained noise monitoring technician

was present at each session for the entire monitoring session to ensure correct operation of the instrumentation. Monitoring locations were chosen at residential sites adjacent to existing traffic noise sources as well as sites not currently affected by traffic noise. Monitored noise levels adjacent to existing traffic noise sources documented in the DEIS ranged from 52 dBA to 71 dBA (L_{10}), and 43 dBA to 64 dBA (L_{50}).

One additional monitoring receptor location (Receptor R5B) was added near I-94 and Fish Lake with identification of the Preferred Alternative alignment. Existing noise levels were monitored on June 28, 2006 and June 29, 2006 at this location. Monitored daytime and nighttime L_{10} levels at Receptor R5B were 62 dBA. The monitored levels are within 3 dBA of the existing conditions modeled levels at Receptor R5B (see Table 6.2).

Residences not currently affected by traffic noise are identified in Table 6.2 and Table 6.3 as "A," or ambient. Existing dominant noise at these receptors originates from non-traffic sources. Ambient noise levels measured in the study area were averaged and used to characterize the background noise levels at receptors located in areas not affected by traffic noise. The average ambient noise levels at these receptors are 48 dBA (L_{10}) and 45 dBA (L_{50}).

Refer to Section 6.2.1.4 of the DEIS for additional information regarding noise monitoring activities.

6.2.2 Environmental Consequences

6.2.2.1 Modeled Receptor Sites

Traffic noise impacts were assessed by modeling noise levels at receptor sites (i.e., residences) likely to be most affected by construction of the Preferred Alternative. With modifications to the Preferred Alternative design, eight additional receptor locations were included in the traffic noise models. These receptor locations are illustrated in Figures 6A-6C (at the end of this chapter) and described below:

- Receptor R5A was added east of the Preferred Alternative alignment to represent residences along the north side of CSAH 75;
- Receptor R5B was added southeast of the Preferred Alternative interchange with I-94 at the southbound to eastbound I-94 ramp taper in response to concerns expressed by Fish Lake residents;
- Receptors R5C, R5D, and R5F were added southeast of the Preferred Alternative interchange with I-94 to represent residences between the interchange and Fish Lake;
- Receptor R5E was added east of the Preferred Alternative alignment to represent residences between the Preferred Alternative interchange with I-94 and CSAH 75;
- Receptor R20A was added north of the Preferred Alternative interchange with TH 10 at the northbound to westbound TH 10 ramp taper; and
- Receptor 22A was added east of the Preferred Alternative interchange with TH 24 to represent Clearview Elementary School.

TABLE 6.2
NOISE MODELING RESULTS (PREFERRED ALTERNATIVE) – DAYTIME

Receptor	Modeled Existing (2002)		2040 No-Build		Difference Between 2040 No-Build and Existing (2002)		2040 Build		Difference Between 2040 Build and Existing (2002)		Difference Between 2040 Build and 2040 No-Build	
	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
R5 (1)	57	52	65	**61**	8	9	**71**	**67**	14	15	6	6
R5A (5)	57	51	65	**61**	8	10	**70**	**65**	13	14	5	4
R5B (4)	65	**61**	**70**	**67**	5	6	**71**	**68**	6	7	1	1
R5C (3)	**66**	**63**	**71**	**69**	5	6	**71**	**70**	5	7	0	1
R5D (1)	**68**	**65**	**73**	**70**	5	5	**73**	**71**	5	6	0	1
R5E (6)	59	53	**67**	**63**	8	10	**67**	**65**	8	12	0	2
R5F (1)	**70**	**65**	**74**	**71**	4	6	**74**	**72**	4	7	0	1
R6 (3)	55	49	64	60	9	11	**67**	**62**	12	13	3	2
R20 (1)	55	52	59	57	4	5	61	59	6	7	2	2
R20A (4)	**66**	**61**	**70**	**66**	4	5	**73**	**70**	7	9	3	4
R21 (1)	61	57	65	**62**	4	5	65	**62**	4	5	0	0
R22 (10)	**70**	**61**	**73**	**64**	3	3	**73**	**64**	3	3	0	0
R22A (1)	54	50	56	53	2	3	60	59	6	9	4	6
R23 (1)	57	49	62	57	5	8	63	59	6	10	1	2
R30 (4)	48 (A)	45 (A)	48 (A)	45 (A)	0	0	57	56	9	11	9	11
R31 (1)	48 (A)	45 (A)	48 (A)	45 (A)	0	0	61	59	13	14	13	14
R32 (1)	48 (A)	45 (A)	48 (A)	45 (A)	0	0	57	56	9	11	9	11
State Standards	**65**	**60**	**65**	**60**			**65**	**60**				
Federal Criteria	**70**	**-**	**70**	**-**			**70**	**-**				

Note: **Bold** numbers are above state standards.

(1) Number in () is the number of residences represented by the receptor.

(A) = ambient noise levels. Noise at these receptors is dominated by non-traffic sources. Listed ambient noise level is the average level monitored at such receptors.

TABLE 6.3
NOISE MODELING RESULTS (PREFERRED ALTERNATIVE) – NIGHTTIME

Receptor	Modeled Existing (2002)		2040 No-Build		Difference Between 2040 No-Build and Existing (2002)		2040 Build		Difference Between 2040 Build and Existing (2002)		Difference Between 2040 Build and 2040 No-Build	
	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
R5 (2)	55	50	**64**	**60**	9	10	**71**	**67**	16	17	7	7
R5A (5)	55	48	**64**	**59**	9	11	**70**	**65**	15	17	6	6
R5B (4)	**64**	**59**	**68**	**65**	4	6	**70**	**68**	6	9	2	3
R5C (3)	**64**	**60**	**70**	**66**	6	6	**71**	**69**	7	9	1	3
R5D (1)	**67**	**62**	**71**	**68**	4	6	**73**	**70**	6	8	2	2
R5E (6)	**57**	**51**	**66**	**61**	9	10	**67**	**65**	10	14	1	4
R5F (1)	**68**	**62**	**72**	**69**	4	7	**73**	**71**	5	9	1	2
R6 (3)	54	47	**63**	**58**	9	11	**66**	**62**	12	15	3	4
R20 (1)	54	**51**	**58**	**56**	4	5	**61**	**59**	7	8	3	3
R20A (4)	**65**	**60**	**69**	**65**	4	5	**73**	**70**	8	10	4	5
R21 (1)	**61**	**56**	**64**	**61**	3	5	**65**	**62**	4	6	1	1
R22 (10)	**69**	**59**	**72**	**63**	3	4	**72**	**62**	3	3	0	-1
R22A (1)	53	49	55	**52**	2	3	**60**	**58**	7	9	5	6
R23 (1)	**56**	48	**61**	**55**	5	7	**63**	**59**	7	11	2	4
R30 (4)	48 (A)	45 (A)	48 (A)	45 (A)	0	0	**57**	**56**	9	11	9	11
R31 (1)	48 (A)	45 (A)	48 (A)	45 (A)	0	0	**61**	**59**	13	14	13	14
R32 (1)	48 (A)	45 (A)	48 (A)	45 (A)	0	0	**57**	**56**	9	11	9	11
State Standards	**55**	**50**	**55**	**50**			**55**	**50**				
Federal Criteria	**70**	**-**	**70**	**-**			**70**	**-**				

Note: **Bold** numbers are above state standards.
(1) Number in () is the number of residences represented by the receptor.
(A) = ambient noise levels. Noise at these receptors is dominated by non-traffic sources. Listed ambient noise level is the average level monitored at such receptors.

The average existing ambient noise levels are listed as the Modeled Existing and No-Build noise levels for those residences where traffic noise is not the dominant noise source. Forecast No-Build traffic volumes were used to model noise for those residences that are near existing traffic noise sources (I-94, TH 10, TH 24, etc.). Forecast Build traffic volumes were used to model traffic noise levels at all receptors. If the modeled noise for an isolated receptor was equal to or lower than the ambient level, it was assumed that the proposed roadway alignment had no noise impact and the ambient noise level was reported.

Noise modeling was done for the Preferred Alternative using the noise prediction program "MINNOISE", a version of the FHWA "STAMINA" model adapted by Mn/DOT. This model uses vehicle numbers, speed, class of vehicle, and the typical characteristics of the roadway being analyzed. The vehicle class percentages used for all roads except the I-94 mainline were as follows: automobiles and light trucks, 97 percent; medium trucks, two percent; and heavy trucks, one percent. Vehicle class percentages used for I-94 were as follows: automobiles and light trucks, 93 percent; medium trucks, three percent; and heavy trucks, four percent. Posted and proposed speed limits were used to model all roadways.

Noise monitoring and modeling results for existing residential receptors for existing (year 2002) conditions and for the year 2040 are presented in Table 6.2 and Table 6.3. Both daytime and nighttime L_{10} and L_{50} are shown for the existing condition and for year 2040 for both the No-Build Alternative and the Preferred Alternative. While both L_{10} and L_{50} descriptors are shown on the tables, the discussions of modeling results presented below only reference the L_{10} values, since the L_{10} descriptor is used to define both the state and federal noise level regulatory thresholds.

Fish Lake residents expressed a concern that the "existing conditions" noise modeling data is based on year 2002 data and asked that the noise modeling data be updated to reflect 2006 conditions. Year 2002 data was used for "existing conditions" in the DEIS when it was prepared in 2003-2004. Because traffic volumes have not increased substantially since 2002 (approximately 10 percent increase on I-94), there is no need to update the data for "existing conditions." As previously noted, a doubling of traffic (100 percent increase) would be needed to increase noise levels by 3 dBA. Because 2040 No-Build and Build conditions are based on traffic forecasts for that time period (year 2040), the "existing conditions" data would have no bearing on the 2040 results.

Modeling Results

Preferred Alternative

Noise levels were modeled at 17 receptor locations adjacent to the Preferred Alternative alignment. Noise modeling results for the Preferred Alternative are shown in Table 6.2 (daytime) and Table 6.3 (nighttime). Figures 6A-6C shows the location of noise modeling receptor sites. The following discussion references only the L_{10} noise levels.

Due to projected increases in traffic, No-Build 2040 daytime noise levels in the vicinity of the Preferred Alternative will increase by up to 9 dBA (daytime and nighttime L_{10}) over existing levels.

The Preferred Alternative results in daytime L_{10} state noise standards being exceeded by 2 to 9 dBA at 10 receptors (R5, R5A, R5B, R5C, R5D, R5E, R5F, R6, R20A, and R22); nighttime L_{10} state noise standards will be exceeded at all modeled receptor locations. Daytime noise levels at isolated residential receptors will increase by 9 to 13 dBA (L_{10}) over existing noise levels with construction of the Preferred Alternative. Daytime noise at receptors close to TH 10 (R20 and R21) will increase by approximately 4 to 6 dBA (L_{10}) over existing levels with construction of the Preferred Alternative. Receptors R5, R5A, R5E and R6 are located along CSAH 75 near the Preferred Alternative alignment. Traffic noise will increase by 8 to 14 dBA (daytime L_{10}) at these receptors by year 2040 under the Preferred Alternative; however, increased traffic along CSAH 75 by the year 2040 accounts for much of the increase in noise experienced at these locations. Traffic noise impacts are summarized in Table 6.4.

TABLE 6.4
NOISE IMPACT SUMMARY TABLE – PREFERRED ALTERNATIVE

Type of Impact	Year 2040 No-Build Alternative	Year 2040 Preferred Alternative
Receptors Over State Daytime Standards (L_{10})	7	10
Receptors Over State Nighttime Standards (L_{10})	13	17
Receptors Approaching/Exceeding Federal Standard	6	8
Receptors Meeting Federal Abatement Criteria (Increase $\geq$ 5 dBA over existing)	8	14

Residences along the River

Noise modeling results for one residence (Receptor R31) along the Mississippi River adjacent to the Preferred Alternative is included in Tables 6.2 and 6.3. Figure 6A shows the location of this noise modeling receptor site. Receptor R31 represents an existing residence on the Mississippi River banks that currently is not exposed to traffic noise. This receptor is located in an area that would experience a substantial increase in traffic noise with the Preferred Alternative river crossing. Receptor R31 will experience a 13 dBA increase in daytime L_{10} noise and a 13 dBA increase in nighttime L_{10} noise over existing levels with construction of the Preferred Alternative river crossing. Although the residence at Receptor R31 will experience a substantial increase in traffic noise, daytime noise levels will be below the L_{10} daytime state noise standard under year 2040 conditions; nighttime noise levels will be above the L_{10} nighttime state noise standard under year 2040 conditions.

6.2.2.2 Noise on the River

Construction of a new bridge over the Mississippi River will introduce traffic noise to portions of the river surface that currently do not experience it, and people using non-motorized boats could be expected to hear this traffic noise as they pass beneath the bridge. Modeling was done for the Preferred Alternative alignment with regard to noise impacts experienced by boaters on the river itself. Analysis results for daytime L_{10} and L_{50} noise on the river at different distances away from the proposed bridge are shown in Table 6.5. This data shows that noise levels (L_{10}) will exceed state daytime noise standards within 800 feet of the Preferred Alternative river crossing on the river surface. Noise levels (L_{10}) approach Federal noise abatement criteria between 400 and 800 feet from the Preferred Alternative river crossing on the river surface.

TABLE 6.5
NOISE MODELING RESULTS ON THE RIVER
(PREFERRED ALTERNATIVE) – DAYTIME

Horizontal Distance from Bridge (feet)	Modeled Build (2040)	
	L_{10}	L_{50}
50	**80**	**75**
100	**78**	**73**
200	**75**	**71**
400	**71**	**69**
800	**67**	**66**
1,600	64	**63**
State Standards (NAC-1)	**65**	**60**
Federal Criteria (Activity Category B)	**70**	**-**

Bold numbers are above state daytime L_{10} and L_{50} standards.

6.2.3 Mitigation

Because year 2040 modeled Preferred Alternative traffic noise levels are predicted to exceed state standards (daytime or nighttime) along the entire corridor, noise mitigation was analyzed at all areas where residences are adjacent to the Preferred Alternative alignment. FHWA-approved noise abatement measures, identified in 23 CFR 772.13(c), were considered, including:

- Traffic management measures (e.g., traffic control devices and signing for prohibition of certain vehicle types, time-use restrictions for certain vehicle types, modified speed limits, and exclusive land use designations);
- Alteration of horizontal and vertical alignments;
- Acquisition of property rights (either in fee or lesser interest) for construction of noise barriers;
- Construction of noise barriers (including landscaping for aesthetic purposes) whether within or outside the highway right of way;
- Acquisition of real property or interests therein (predominately unimproved property) to serve as a buffer zone to preempt development [that] would be adversely impacted by traffic noise; and
- Noise insulation of public use or nonprofit institutional structures.

Additional discussion of these noise abatement measures is provided below.

Traffic Management Measures. This would include a partial or total ban on trucks, time-use restrictions for certain vehicle types, and reduced speed limits. To limit the vehicle types, time of use, and speeds on the Preferred Alternative would not be consistent with the function of the Preferred Alternative as an interregional connection between I-94 and TH 10. Therefore, traffic management measures are not considered reasonable or feasible.

Horizontal and Vertical Alignment. The alignment of the Preferred Alternative is restricted to its proposed location because of constraints caused by developed areas (City of Clearwater, downtown Clear Lake), surrounding topography, natural resources, and connections to existing roadways. The Preferred Alternative alignment was modified following the DEIS based on new surveys and mapping, input from the local communities and additional guidance received from Mn/DOT Central Office regarding the centerline spacing and interchange designs. Further substantial shifts in the Preferred Alternative alignment to reduce noise at residential receptors adjacent to the Preferred Alternative are not feasible because of other resulting impacts, such as impacts to residential properties, golf course, farmland, and irrigated agricultural areas on both sides of the proposed roadway.

Landscaping/Natural Noise Screening. The use of vegetation as a noise screen can be effective only if at least 200 feet of dense, evergreen vegetation (evergreen vegetation maintains its foliage year around) is provided between the source and receptor. There is not enough right of way between the Preferred Alternative and receptors along existing roadways where future noise impacts are anticipated to provide an adequate vegetative noise screen. At other receptor locations, providing a vegetative screen would impact existing land uses (e.g., farmland) and existing natural vegetation along the river, and would also require substantial additional right of way. Therefore, vegetation as a noise mitigation measure is not a feasible and reasonable alternative.

Noise Reducing Pavement. At the time of project construction, Mn/DOT will study the feasibility of noise-reducing pavement options.

Acquisition of Property. While the project corridor is largely undeveloped, acquisition of property beyond the proposed right of way would result in greater and more costly impacts to adjacent residential and agricultural properties.

Noise Barrier Analysis. State standards (daytime or nighttime) will be exceeded through the entire project area; therefore noise barriers (i.e., noise walls) were evaluated at all areas where residences are adjacent to the Preferred Alternative corridor. Noise barriers were evaluated based on feasibility and reasonableness considerations. Feasibility is determined by physical and/or engineering constraints (i.e., whether or not a noise wall could feasibly be constructed on site). Reasonableness considers the effectiveness, including cost effectiveness, of a noise wall. It is Mn/DOT's noise mitigation policy that, for construction of a noise barrier to be considered reasonable, **it must provide receptors a minimum 5 dBA reduction and must have cost-effectiveness that does not exceed $3,250/dBA/residence**.

The locations of modeled noise barriers are illustrated in Figures 6A-6C. Table 6.6 shows the dBA reduction achieved by 10-foot, 15-foot, and 20-foot modeled noise barriers. Additional receptors were added to the noise model where necessary for the noise barrier analysis. The reduction in dBA ranged from 0 to 8 dBA (daytime L_{10}) for a 20-foot modeled noise barrier. Reductions in nighttime L_{10} noise levels with modeled noise walls were within 1 dBA of daytime L_{10} noise level reductions.

TABLE 6.6
NOISE MITIGATION ANALYSIS RESULTS: DAYTIME

	Build 2040 - No Wall	Build 2040 - 10' Wall		Build 2040 - 15' Wall		Build 2040 - 20' Wall	
Receptor	**L10**	**L10**	**Difference**	**L10**	**Difference**	**L10**	**Difference**
CSAH 75 east of Preferred Alternative [1]							
R5A	**70**	**69**	1	**69**	1	**69**	1
R5E	**67**	**67**	0	**66**	1	**65**	2
CSAH 75 west of Preferred Alternative [1]							
R5	**71**	**71**	0	**70**	1	**70**	1
R6	**67**	**67**	0	**67**	0	**67**	0
I-94 south of Preferred Alternative							
R5B	**71**	**70**	1	68	3	65	6
R5C	**71**	**71**	0	**70**	1	**68**	3
R5D	**73**	**72**	1	**70**	3	**67**	6
R5F	**74**	**70**	4	**68**	6	**66**	8
TH 10 west of Preferred Alternative							
R20 [2]	61	61	0	61	0	60	1
TH 10 north of Preferred Alternative							
R20A	**73**	**71**	2	**68**	5	65	8
TH 10 east of Preferred Alternative							
R21 [2]	65	64	1	63	2	61	4
TH 24 east of Preferred Alternative							
R22A [2]	60	59	1	58	2	57	3
CSAH 8 west of Preferred Alternative							
R23 [2]	63	63	0	63	0	63	0
West of Preferred Alternative, north of river crossing							
R30 [2]	57	56	1	55	2	55	2
R31 [2]	61	60	1	59	2	59	2
East of Preferred Alternative, north of river crossing							
R32 [2]	57	57	0	56	1	56	1

Bold numbers are above state daytime noise standards.

[1] A gap is created in the barrier adjacent to these residences by CSAH 75, reducing the barrier's effectiveness.

[2] While these receptors do not exceed state daytime noise standards, the nighttime L_{10} noise levels for these receptors exceed the state L_{10} nighttime noise standard of 55 dBA for residential uses.

None of the 10-foot modeled barriers met the minimum 5 dBA reduction threshold (see Table 6.6 above). Cost effectiveness results are shown in Table 6.7A (15-foot barrier) and Table 6.7B (20-foot barrier) for only those analyzed locations that met the minimum 5 dBA reduction threshold (south of I-94 near Fish Lake and north of TH 10 near the Preferred Alternative interchange). As noted previously, noise barriers must have a cost-effectiveness that does not exceed $3,250/dBA/residence. None of the analyzed locations met the cost-effectiveness threshold of $3,250/dBA/residence.

TABLE 6.7A
NOISE MITIGATION ANALYSIS: COST EFFECTIVENESS RESULTS (15-FOOT WALLS)

Receptors	Daytime L_{10} Noise (dBA)		Reduction (in dBA) with 15 ft noise wall	Number of residences	Number of affected residences	Length of wall (feet)	Total cost of 15 ft wall $15/sq ft	Cost/dBA/ residence
	Pref. Alt. year 2040 (no wall)	Pref. Alt. year 2040 (15 ft wall)						
I-94 south of Preferred Alternative								
R5B	**71**	**68**	3	4	0			
R5C	**71**	**70**	1	3	0			
R5D	**73**	**70**	3	1	0	5,500	$1,237,500	$206,250
R5F	**74**	**68**	6	1	1			
TH 10 north of Preferred Alternative								
R20A	**73**	**68**	5	4	4	1,784	$401,400	$20,070

Bold numbers are above state daytime noise standards.

TABLE 6.7B
NOISE MITIGATION ANALYSIS: COST EFFECTIVENESS RESULTS (20-FOOT WALLS)

Receptors	Daytime L_{10} Noise (dBA)		Reduction (in dBA) with 20 ft noise wall	Number of residences	Number of affected residences	Length of wall (feet)	Total cost of 20 ft wall $15/sq ft	Cost/dBA/ residence
	Pref. Alt. year 2040 (no wall)	Pref. Alt. year 2040 (20 ft wall)						
I-94 south of Preferred Alternative								
R5B	**71**	65	6	4	4			
R5C	**71**	**68**	3	3	0			
R5D	**73**	**67**	6	1	1	5,500	$1,650,000	$43,421
R5F	**74**	**66**	8	1	1			
TH 10 north of Preferred Alternative								
R20A	**73**	65	8	4	4	1,784	$535,200	$16,725

Bold numbers are above state daytime noise standards.

The following summarizes the feasibility and effectiveness of noise barriers at receptor locations along the Preferred Alternative corridor.

Receptors R5, R5A, R5E, R6

Receptors R5, R5A, and R6 are located along CSAH 75, south of the Preferred Alternative river crossing. Receptors R5 and R6 are located along CSAH 75 west of the Preferred Alternative alignment. Receptors R5A and R5E are located along CSAH 75 east of the Preferred Alternative alignment. Receptor R5E was added to the noise barrier analysis to represent residences along the south side of CSAH 75, between CSAH 75 and the Preferred Alternative I-94 interchange. Much of the increase in noise at Receptors R5, R5A, R5E, and R6 is the result of background traffic growth on CSAH 75. This is evident in the noise barrier analysis results; when noise barriers were modeled along the Preferred Alternative, there was only a small (0 to 2 dBA) noise reduction. Driveways along CSAH 75 prevent construction of a continuous barrier along CSAH 75; these gaps created by driveways would make a barrier ineffective. Consequently, a noise barrier at Receptors R5, R5A, R5E, and R6 is not considered reasonable and is not proposed.

Receptors R5B, R5C, R5D, R5F

Receptor R5B represents residences south of I-94 and the Preferred Alternative interchange with I-94. Receptors R5C and R5D represent residences at the northwest corner of Fish Lake, between the Preferred Alternative interchange with I-94 and Fish Lake, and Receptor R5F represents a residence south of the Preferred Alternative interchange with I-94. The ramp taper into eastbound I-94 is located north of the residences along Fish Lake. Noise levels at these receptors currently exceed state noise standards. Increased traffic on I-94 from existing to future (year 2040 No-Build and Preferred Alternative conditions) accounts for much of the increase in traffic noise at these residences. There is a 4 to 6 dBA increase from existing to future conditions (daytime L_{10}), and no perceptible difference in traffic noise between year 2040 No-Build and Build conditions.

A 5,500-foot long wall was modeled from the Gowan Avenue overpass to the Preferred Alternative I-94 interchange. A 10-foot high noise wall results in a decrease of up to 4 dBA (daytime L_{10}) whereas a 15-foot noise wall results in a decrease of 6 dBA (daytime L_{10}) at Receptor R5F. The 10-foot modeled noise wall does not meet the minimum 5 dBA reduction threshold to be considered acoustically effective. The 15-foot modeled noise wall meets the minimum 5 dBA reduction threshold at Receptor R5F; however, the cost-effectiveness of this wall was $206,250/dBA/residence, greater than Mn/DOT's minimum cost-effectiveness threshold of $3,250/dBA/residence.

A 5,500-foot long, 20-foot high noise wall results in a decrease of 3 to 8 dBA (daytime L_{10}) at the Fish Lake area receptors. The cost effectiveness of this modeled wall is $43,421/dBA/residence. This modeled wall does not meet Mn/DOT's minimum cost effectiveness threshold of $3,250/dBA/residence. Therefore, this noise barrier is considered not reasonable and is not proposed.

The 20-foot noise wall model was re-evaluated at each individual modeled receptor in the Fish Lake area in an effort to maximize the wall cost-effectiveness. The results of this analysis are shown in Table 6.7C. None of these modeled walls meet Mn/DOT's minimum cost effectiveness threshold of $3,250/dBA/residence.

TABLE 6.7C
FISH LAKE NOISE MITIGATION RE-ANALYSIS: COST EFFECTIVENESS RESULTS (20-FOOT WALLS)

Receptors	Daytime L_{10} Noise (dBA)		Reduction (in dBA) with 20 ft noise wall	Number of residences	Number of affected residences	Length of wall (feet)	Total cost of 20 ft wall $15/sq ft	Cost/dBA/ residence
	Pref. Alt. year 2040 (no wall)	Pref. Alt. year 2040 (20 ft wall)						
Fish Lake Area at Receptor R5B								
R5B	**71**	66	5	4	4	853	$255,900	$12,795
Fish Lake Area at Receptor R5C								
R5C	**71**	**68**	3	3	0	1,940	$582,000	N/A
Fish Lake Area at Receptor R5D								
R5D	**73**	**67**	6	1	1	1,322	$396,600	$66,100
Fish Lake Area at Receptor R5F								
R5F	**74**	**68**	6	1	1	707	$212,100	$35,350

N/A = Not applicable.
Numbers in **bold** exceed Minnesota State nighttime noise standards.

The feasibility of raising Gowan Avenue was also investigated as a noise mitigation measure. However, Gowan Avenue is approximately five feet lower in elevation than I-94. Therefore, Gowan Avenue could not be raised to an elevation that would provide noise reduction without substantial fill into the area the Fish Lake residents wished to preserve for water quality and without substantial impacts to driveways.

Receptor R20

Receptor R20 is located south of TH 10 approximately 800 feet west and south of the Preferred Alternative. Increased traffic on TH 10 accounts for much of the increase in traffic noise between existing and future (year 2040 No-Build and Preferred Alternative) conditions. Noise barriers are most effective in reducing traffic noise when receptor locations are within approximately 500 feet of a roadway. A noise barrier must be high enough and long enough to block the view of a road. Because of the large distance between these receptors and the Preferred Alternative, a noise barrier would not be effective as shown in Table 6.6 (a 20-foot barrier results in a 1 dBA decrease in traffic noise at Receptor R20). For these reasons, noise barriers along the Preferred Alternative at Receptor R20 are not reasonable and are not proposed.

Receptor R20A

Receptor R20A represents residences north of TH 10, west of the Preferred Alternative interchange with TH 10. The ramp taper into westbound TH 10 is located south of the residences at R20A. Increased traffic on TH 10 accounts for much of the increase in traffic noise at R20A. A 15-foot noise wall results in a decrease of 5 dBA (daytime L_{10}) at Receptor R20A; however, the cost per dBA per residence is $20,070. A 20-foot noise wall results in a decrease of 8 dBA (daytime L_{10}) at Receptor R20A; however, the cost per dBA per residence is $16,725. This 20-foot wall is more than 5 times the cost effectiveness threshold of $3,250/dBA/residence. Therefore, noise barriers are not considered reasonable and are not proposed.

Receptor R21

Receptor R21 represents a single residence south of TH 10 and the Preferred Alternative. Realignment of TH 10 to the north to accommodate the Preferred Alternative interchange results in an increase in traffic noise of 4 dBA from existing to Build conditions. Receptor R21 also did not achieve the minimum 5 dBA reduction (see Table 6.6) for a noise barrier to be considered reasonable. Therefore, a noise barrier is not proposed.

Receptor R22

Receptor R22 is located in downtown Clear Lake along TH 24. Driveways and side streets accessing TH 24 prevent the construction of a continuous barrier. The numerous access points would result in gaps in the noise barrier, making it ineffective. In addition, the residences represented by Receptor R22 are located within approximately 50 feet of the roadway. Construction of a barrier could require additional right of way acquisition, and the potential acquisition of residences. These receptors are already above state noise standards and are not near the construction of the Preferred Alternative. Therefore, noise barriers are not reasonable and are not proposed.

Receptor R22A

Receptor R22A represents Clearview Elementary School and is located north of TH 24 and east of the Preferred Alternative. A 6,977-foot noise wall was modeled along TH 24 and the Preferred Alternative between the TH 24 interchange and CR 76. As shown in Table 6.6, the 20-foot modeled noise wall resulted in a 3 dBA reduction. This reduction does not meet the Mn/DOT minimum threshold of a 5 dBA reduction for a noise barrier to be considered acoustically effective. Therefore, this noise barrier is not considered reasonable and is not proposed.

Receptor R23

Receptor R23 is located along CSAH 8 approximately 1,200 feet northwest of the Preferred Alternative. Increased traffic on CSAH 8 accounts for much of the increase in traffic noise at R23. As noted with Receptor R20, noise barriers are most effective in reducing traffic noise when receptors are within 500 feet of a roadway. As shown in Table 6.6, a modeled noise barrier along the Preferred Alternative adjacent to Receptor R23 results in no decrease in traffic noise. For these reasons, noise barriers along the Preferred Alternative are not reasonable and are not proposed.

Receptors R30, R31, R32

Receptors R30, R31, and R32 are located between 900 and 1,600 feet from the Preferred Alternative corridor north of the river crossing. As noted with Receptor R20, noise barriers are most effective in reducing traffic noise when receptors are within 500 feet of a roadway. Because of the distance between these receptors and the Preferred Alternative corridor, a noise barrier will result in up to a 2 dBA decrease in traffic noise. In order for a noise barrier to be considered reasonable, it must decrease noise by 5 dBA. Therefore, noise barriers along the Preferred Alternative near Receptors R30, R31, and R32 are not reasonable and are not proposed.

Other Noise Mitigation

FHWA encourages local governments to use their power to regulate land uses and land development adjacent to roadways, such that future development adjacent to a roadway is planned and constructed in such as way as to minimize traffic noise impacts. As a part of this, traffic noise was evaluated from the project roadways to determine at what point noise standards are approached. Traffic noise levels were studied at four general areas within the project corridor: along the Preferred Alternative alignment north and south of CSAH 8, along I-94 southwest of the Preferred Alternative interchange, and along TH 10 west of the Preferred Alternative interchange. At each of these areas, noise levels were modeled at sites 50, 100, 200, 400, 800, 1,000, and 1,500 feet from the roadway centerline.

Results show that along the Preferred Alternative alignment near CSAH 8, state daytime standards (L_{10}) are exceeded by 1 to 2 dBA at 400 feet from the roadway. State daytime standards (L_{10}) are met at 800 feet from the eastbound I-94 centerline southwest of the Preferred Alternative interchange. State daytime standards (L_{10}) are met between 400 and 800 feet north of TH 10 west of the Preferred Alternative interchange. State nighttime standards (L_{10}) are either met or exceeded at all modeled locations along I-94, TH 10, and the Preferred Alternative corridor.

These results show that in order to meet state daytime noise standards (L_{10}), any new residential areas should be placed at least 400 feet from the Preferred Alternative roadway and TH 10, and up to 800 feet from I-94, if no mitigation such as berms or barriers is incorporated into the development. Noise barriers or berms, as well as commercial buildings directly adjoining the roadway, would block some traffic noise and result in levels meeting state daytime standards at areas closer to the roadway.

6.2.4 Conclusions

Existing A-weighted noise levels vary from the high 40s in isolated areas away from existing traffic noise sources, to the 70s along TH 24 in the cities of Clearwater and Clear Lake. Increases in traffic volumes by the year 2040 will result in No-Build daytime noise levels increasing by up to 9 dBA (L_{10}) over existing noise levels for receptors adjacent to the Preferred Alternative corridor. Construction of the Preferred Alternative will result in an increase of L_{10} daytime noise levels from 3 to 14 dBA over existing conditions in areas adjacent to existing roadways near the Preferred Alternative corridor, and up to 13 dBA during the daytime in isolated areas currently not exposed to traffic noise.

Mitigation measures were evaluated and found to be not feasible or reasonable. The modeling conducted for this FEIS indicates that noise barriers would either: 1) not meet the minimum 5 dBA decrease in noise to be considered reasonable; or 2) not meet the minimum $3,250/dBA/residence cost effectiveness threshold to be considered reasonable. Residences are currently present along the Preferred Alternative alignment but are sparsely scattered outside the cities of Clearwater and Clear Lake. While there are no currently known platted developments adjacent to the Preferred Alternative alignment, the amount of development adjacent to it is anticipated to increase over the next 40 years. Future residential development should consider recommended set back distances described in Section 6.2.3 to avoid and minimize traffic noise impacts. This information will be provided to local land use officials for consideration in land use planning strategies.

6.3 PRIME AND STATEWIDE IMPORTANT FARMLAND

The Federal Farmland Protection and Policy Act (FPPA) of 1981 and the Minnesota Agricultural Land Preservation and Conservation Policy Act (M.S. 17.80-17.84) have been enacted to ensure that impacts on agricultural lands and operations are integrated into the decision-making process, and that impacts upon agricultural land are minimized to a reasonable extent. The project area was evaluated to identify any soils classified by the Natural Resources Conservation Service (NRCS) as being "prime and unique farmland" or "statewide and local important" farmland. In addition, the study area was reviewed for land held under state and/or federal easement or protection programs.

6.3.1 Affected Environment

As discussed in other sections (e.g., Chapter 5), the study area is dominated by agricultural land uses. To refine and update farmland information, and because the alignment of the Preferred Alternative has been modified slightly since completion of the DEIS, the Sherburne and Wright County NRCS offices of the U.S. Department of Agriculture were contacted to obtain information on the location of "prime and unique" and "statewide and local important" farmland within the revised alignment area. The Wright County NRCS office did not identify any issues with the revision of the Preferred Alternative; the Sherburne County NRCS office identified that the shift of the corridor to the east at its south end has put it within range of land enrolled in the Conservation Reserve Program (CRP). Refer to Figure 3A (proposed right of way crosses the northwestern tip of the CRP land).

6.3.2 Environmental Consequences

As identified in Section 6.3.1, the two local NRCS offices were asked to provide assistance with completion of the NRCS-CPA-106 form (the Federal Farmland Conversion Impact Rating for Corridor Type Projects form used for proposed conversions of farmland to non-agricultural uses). Table 6.8 provides a summary of the information received from the NRCS (see Appendix A for complete information on the CPA-106 results for the modified Preferred Alternative). The acreage provided in this table summarizes impacts to land formally designated by the NRCS as "prime and unique" or "statewide and local important" farmland within the project area.

TABLE 6.8
"PRIME AND UNIQUE" & "STATEWIDE AND LOCAL IMPORTANT" FARMLAND TO BE CONVERTED FOR PREFERRED ALTERNATIVE

County	Acres to be Converted [(1)]	Percent Impact to County or Local Government Farmland
Sherburne	0/19.2	0.06
Wright	0.2/132.7	0.04
TOTAL—152.1 acres	**0.2/151.9**	—

[(1)] Acres of "Prime and Unique" Farmland / "Statewide and Local Important" Farmland to be converted.

The results summarized in Table 6.8 indicate that the impacts of the Preferred Alternative to the area's "prime and unique" and "statewide and local important" farmland (152.1 acres) have increased slightly as a result of the alignment modification (Alternative C's original alignment would have required the conversion of 148.5 acres of "prime and unique" and "statewide and local important" farmland). These additional impacts do not represent a substantial increase in the impact to this resource in either of the two counties. It should be noted that the "prime and unique" and "statewide and local important" farmland identifier is based on soil types, not on zoning classifications.

In addition to estimating total acres of "prime and unique" and "statewide and local important" farmland acquisition required for construction of the Preferred Alternative, an estimate was made of the number of farmed fields that would experience disturbance of the existing irrigation system (including center pivot irrigation). Estimates of these potential impacts on farmed fields were determined based on review of existing aerial photos for the project area. It appears as though nine of the agricultural properties will experience impacts to their center pivot irrigation systems. Modifications to the Preferred Alternative alignment during FEIS preparation shifted the proposed roadway to align with property lines so fewer irrigated fields will be bisected or disrupted.

The Preferred Alternative, as redesigned and reanalyzed since the DEIS, will remove four agricultural parcels from the project area; remove five residential/agricultural parcels from the project area; impact 13 additional agricultural parcels with partial acquisitions; and partially impact 10 residential/agricultural parcels, for a total of 32 impacted agricultural and residential/agricultural properties; nine of these acquisitions are anticipated to be total acquisitions for the Preferred Alternative. The DEIS estimated that 18 agricultural parcels would require total acquisition. This FEIS used more definitive property information to determine the number of affected agricultural parcels; the DEIS estimated impacts based on aerial maps. Furthermore, the DEIS did not estimate the number of partial acquisitions that would be required. Refer to Section 5.2.2.3 of this FEIS for additional information on parcel acquisitions.

6.3.3 Mitigation

Farmland impacts, including those to "prime and unique" and "statewide and local important" farmland, were considered during revisions to the Preferred Alternative. The Preferred Alternative was developed with consideration of existing farm field boundaries to minimize bisecting farm fields to the greatest extent possible. Although not all impacts were avoided, efforts were made to revise the alignment with the least impact to farm parcels. For those parcels

for which acquisition is required, all right of way acquisition and relocation will be in accordance with the Uniform Relocation and Real Property Acquisition Act of 1970, as amended by the Surface Transportation and Uniform Relocation Assistance Act of 1987 and 49 Code of Federal Regulations, Part 24. Refer to Section 5.2.3 for additional details on mitigation of acquisitions.

As mentioned in Section 6.3.1 above, the post-DEIS modification of the Preferred Alternative results in a minor impact to land enrolled in the CRP. Whereas this CRP land was approximately 400 feet east of Alternative C in the DEIS, 0.005 acre of this CRP land is now within the 300-foot right of way corridor of the Preferred Alternative. In other words, the impact is within the right of way corridor but will not result in permanent physical impacts to the CRP land (refer to Figure 3A). Based on conversations with the Sherburne County Farm Service Agency (the agency responsible for CRP contracts), this impact is not a concern and does not require further action.

The overall impact of the redesign of the Preferred Alternative has resulted in a slight increase in impacts to NRCS-designated "prime and unique" and "statewide and local important" farmland within the project area. However, the project's design modifications have resulted in decreased impacts to agriculturally-zoned land within the project area, both in terms of number of parcels and acreage impacted. Additional efforts to avoid and minimize impacts to farmland within the project area will include use of Best Management Practices (BMPs) to control erosion and sedimentation during construction, as well as designing drainage to avoid runoff impacts from the new roadway.

6.4 CONTAMINATED PROPERTIES

The presence of potentially contaminated properties is a concern in the development of highway projects because of potential cleanup costs and public health concerns associated with encountering unexpected wastes or contaminated soil or groundwater. Potentially contaminated sites are identified early during project development to avoid and/or minimize impacts.

6.4.1 Affected Environment

A Phase I Environmental Site Assessment (ESA) was conducted for all Build Alternatives to assess presence of potential or known contaminated properties within or directly adjacent to (within 300 feet of) the corridor.

6.4.2 Environmental Consequences

One potential contaminant site (an open dump along TH 10 in Clear Lake) was identified along the Preferred Alternative corridor in the DEIS, in the area of the TH 10 interchange ramp. The dump was categorized as having low potential for environmental risk. Since completion of the DEIS, conversations with the MPCA have established that that agency does not plan to conduct any additional investigation at this site. Dewatering of contaminated groundwater, if present, could bring contaminants in contact with construction workers.

6.4.3 Mitigation

As discussed in Section 6.4.2, the open dump identified along the Preferred Alternative has been eliminated as an environmental risk concern, and is not a superfund site. A Phase II Environmental Site Assessment (ESA) will be completed as part of final design, and Mn/DOT

will perform any cleanup measures identified as necessary. Excavation in this area will be minimized to the greatest extent possible. During construction, all areas of excavation will be observed for contamination and any incidence of contamination will be handled according to MPCA guidelines and requirements.

In the event that impacts from contamination are identified within the construction area (either from existing sources or from spills related to construction activity), assessment and response actions will comply with MPCA guidelines for handling potentially hazardous materials releases. Construction contractors involved with petroleum and/or hazardous materials response actions must comply with all applicable state and federal health and safety training requirements, including OSHA requirements pertaining to hazardous waste site activities.

6.5 VEGETATION, WILDLIFE AND FISHERIES

6.5.1 Affected Environment

The project area is located in an area of central Minnesota historically occupied by prairies and oak woodlands. The major topographical feature in the study area is the Mississippi River valley. Outside the river valley, the study area is relatively flat and includes scattered wetlands, lakes and woodlands. Development in the study area is generally limited to agricultural land uses, scattered areas of large lot residences and development associated with the cities of Clearwater and Clear Lake. Much of the river corridor includes numerous wooded islands; the river floodplain and bluffs have been relatively unscathed by development and are commonly wooded. Various grass and shrub species are present in the non-forested floodplain areas. Floodplain and bluff forests form a relatively continuous corridor along the Mississippi River, providing habitat and a migration corridor for many wildlife species. Remnants of upland forests, savannahs and prairies that once occupied this area are scattered and typically separated by large tracts of agricultural land, which provide seasonal habitat for a variety of animal species. Several large areas of oak woodland are present in non-farmed upland areas.

Refer to the DEIS for additional detail on the project area's affected environment.

6.5.1.1 Vegetation

Native plant communities in the project area were identified through a query of the MnDNR Natural Heritage Program, examination of Sherburne County Biological Survey mapping and a field inspection of each corridor. Biological surveys were not available for Wright County. The following natural communities were identified as occurring within the Preferred Alternative study area:

- A contiguous area of floodplain forest was identified approximately ¼ mile east of the river crossing. This community is assigned a state ranking of S3*.
- An Oak Woodland-Brushland was identified at the top of the east bluff and was assigned a state ranking of S4*.

*S = State Ranking (1-5: 1 = in greatest need of conservation, 5 = secure under present conditions). Although natural communities have no legal protection in Minnesota, they are identified, tracked, and ranked by the MnDNR according to their relative rarity and endangerment throughout their range.

6.5.1.2 Wildlife

A heron rookery was identified during the DEIS public comment period and is located approximately 1,600 feet east of the Preferred Alternative's (or approximately 2,325 feet east of DEIS Alternative C's) construction limits on the north shore of the river (the comment is attached in Appendix D). The rookery was confirmed during a follow-up field visit by a Mn/DOT biologist; 10-30 herons were observed during the site visit, and it was estimated that there are 50-100 nests—many of which were actively being used—in the rookery. In general, herons nest in colonies at the same location each year. Nesting typically begins in early spring; herons remain in their nests, which are usually in trees off the ground, until they depart (by the end of October) to migrate south for the winter, although a few may stay behind longer (sometimes all winter) if there are open areas of water. Herons lay eggs in April and May and incubation lasts 25-29 days (Cuthrell 2004). The birds rely on wetland habitats as a food source and are known to concentrate their foraging activity within approximately 1-3 miles of the colony, although they may forage up to 18 miles from it (Quinn and Milner 2004). In order to protect heron habitat, wildlife biologists recommend that disturbances to nesting colonies be minimized by prohibiting human activity for a 300-meter buffer (approximately 984 feet) in the early season before eggs are laid.

The area's woodlands, savannah and prairie provide habitat for a variety of animals such as deer, fox, woodchuck, rabbit and coyote. Smaller mammals in the study area include chipmunk, squirrel, weasel and pocket gopher. The Mississippi River valley provides abundant habitat for various songbirds, waterfowl and raptors and serves as a migratory flyway for hundreds of species of birds.

The river is also home to dozens of fish species. Game fish such as channel catfish, walleye, muskellunge, smallmouth bass and northern pike are present in the river with moderate to high abundance. Fish habitat at the proposed river crossing site is discussed below.

Scattered wetlands are present in the area; however, many have been degraded by surrounding agricultural land uses and are typically dominated by reed canary grass and cattails. Waterfowl use open water wetlands as their primary habitat. Wetlands also are used as habitat by species such as muskrats, turtles, frogs and many species of invertebrates, and are a primary food source for the area's herons. See Section 7.5 for additional wetland information.

6.5.1.3 Fisheries (Aquatic Life)

The river near the Preferred Alternative appears to be a relatively unstable area with steep banks and erosion evident at the sharp bend downstream from the alignment. No major fish habitat is present at the river crossing site. Approximately one mile downstream of the alignment, a prominent wintering hole exists at a sharp bend in the river. Fish Creek, an outlet channel from Fish Lake to the Mississippi River, provides high quality fish habitat, but does not provide amphibian habitat.

Several species of mussels are known to inhabit the Mississippi River in the study area. In August 2001, the MnDNR completed a mussel survey of all potential bridge crossings. The survey was performed 300 meters upstream and downstream of the proposed crossing; MnDNR

staff has concluded that the original survey covered a large enough area that another survey is not necessary after the alignment modification. While the river provides good physical habitat, few mussels were found in the study area, and no threatened or endangered mussel species were noted. Approximately four species of mussels were identified during this survey. All mussels encountered near the Preferred Alternative's river crossing were collected and moved out of the corridor to avoid any future impacts from bridge construction.

6.5.2 Environmental Consequences

Construction of the Preferred Alternative will directly impact some wildlife habitat and potentially create a barrier to wildlife movement. The post-DEIS modification of the Preferred Alternative brings it approximately 725 feet closer to a heron rookery that has been identified in the area; the rookery is approximately 1,600 feet east of the Preferred Alternative (or approximately 2,325 feet east of the original alignment). This distance is outside the typical buffer area of 300 meters (984 feet) that scientists have identified as important for minimizing impacts to heron habitat. In addition, scientists recommend that the foraging areas of herons be considered; most herons concentrate their food search within 1-3 miles of the colony, although they may forage up to 18 miles from it. Finally, because herons rely largely on wetlands for food, project impacts to wetlands could impact the herons as well. Discussion of wetland impacts is provided in more detail in Section 7.5.

The majority of the Preferred Alternative will be constructed through farmlands, pastures and existing roadways. However, converting existing roadway corridors to a high-speed, four-lane roadway increases the potential for wildlife mortality when crossing the roadway corridor. The portion of the alignment near the river crosses through areas of relatively undisturbed river valley and an oak woodland atop the east bluff. Impacts will include an approximately 0.7-acre strip of floodplain forest along the east river shore. The Preferred Alternative will also be constructed through approximately 4.8 acres of the 120-acre oak woodland on the top of the east bluff. Impacts to this woodland will be minimized by constructing the road through its narrowest portion, but fragmentation of the remaining woodland is difficult to avoid.

Impacts to the river and fish habitat (including the deep wintering area downstream from the crossing described in Section 6.5.1.3) could occur from sedimentation caused by construction activities, and permanent impacts could result from changes in flow characteristics due to the placement of piers in the river channel and increased sedimentation downstream from the bridge. Bridge pier placement and storm water ponding locations have been designed in order to minimize impacts to sedimentation and flow of the river. With direction from the Mn/DOT Bridge Office, storm water ponds designed in association with the Preferred Alternative have been planned within the floodplain (north bank) on the downstream side of the river, in response to the general course of the river and its typical flow pattern. In addition, appropriate measures will be taken to control the surface water flow near the river, including the above-referenced ponding and a pond that will catch storm water on the south side of the river before it reaches the river. River bottom/channel survey work has been completed to inform the appropriate siting of the bridge piers.

6.5.3 Mitigation

The Preferred Alternative was designed in order to reduce impacts to crucial wildlife habitat where possible, and was reconfigured to minimize direct impacts to the oak woodland atop the

east bluff, leaving as large a contiguous forest area as possible. Mitigation measures will be provided, such as provision for wildlife crossings under the river crossing bridge, revegetation of disturbed areas with native plants, and management of right of way areas with diverse grassy vegetation and trees and shrubs outside of the clear zone.

As discussed in Section 6.5.2 above, the Preferred Alternative is approximately 725 feet closer to the heron rookery that was identified in the public comment period of the DEIS than the original Alternative C alignment. It appears as though negative impacts to the heron rookery will be minimal because the alignment is past the recommended 300-meter (984 foot) buffer area; the Preferred Alternative is approximately 1,600 feet west of the rookery. Mitigation of impacts to wetlands, which are an important food source for herons, is discussed in detail in Section 7.5.

Mn/DOT will conduct another mussel survey at the time of project construction and will relocate any mussels in the project area that are identified by that survey. Where impacts to wildlife are unavoidable, the effect of the impacts will be minimized through design features such as provision of wildlife crossing areas below the proposed river crossing. Discussions with MnDNR staff confirmed that the river crossing's 20-foot height is sufficient to allow wildlife movement underneath it (see February 7, 2006 meeting minutes attached in Appendix A). Disturbed areas will be re-vegetated with native plants and land in the right of way will be managed to provide diverse grassy vegetation with trees and shrubs outside the required roadway clear zone.

During construction, best management practices will be implemented to control erosion and sediment discharge to water bodies. Construction activities within the river will not occur until after the river exclusion date (June 15). Bridge piers have been planned to avoid changes to river flow patterns. Permanent storm water treatment will be included in project design to avoid long-term impacts to water quality and will be placed throughout the study area in order to minimize negative impacts. As outlined in Section 7.5, impacts to wetlands will be mitigated through the creation of new wetlands.

6.6 STATE/FEDERAL THREATENED AND ENDANGERED SPECIES

6.6.1 Regulatory Overview

Refer to the DEIS for a summary of Federal Endangered Species Act, the State Endangered Species Act of 1974, the Migratory Bird Treaty Act (MBTA) of 1918, and the implementation of associated regulations.

6.6.2 Affected Environment

To evaluate whether rare or endangered species are present in the study area, coordination with various federal, state and local agency personnel was initiated. Refer to the DEIS for details on these coordination efforts. The USFWS has indicated that the project is unlikely to impact any federal endangered species (see October 31, 1997 letter in Appendix A). Based on results of the MnDNR database search (see DEIS Appendix A), no state endangered species were identified as present in the study area (MnDNR identified a Blanding's Turtle—a state-listed threatened species—sighting near Clearwater, approximately four miles west of the Preferred Alternative). In addition to this agency coordination, residents of the Fish Lake area contacted the Mn/DOT

project manager in 2006 and reported a potential sighting of a Blanding's Turtle in Fish Creek. Additional coordination with USFWS and MnDNR staff will continue in the future, closer to construction, to determine if additional or revised information on sensitive species should be considered in project planning/implementation. As described in Section 6.5.1, a mussel survey was performed, and no Threatened or Endangered mussel species were found within the Preferred Alternative corridor. See Section 6.5.1 for a discussion of non-listed species that may be found within the project area.

6.6.3 Environmental Consequences

A bald eagle nest was reported approximately three-quarters of a mile downstream from the Preferred Alternative's proposed river crossing, and although the nest was not observed during a field visit, the existence of the nest has not been ruled out. As mentioned above in Section 6.6.2, there has been a potential sighting of a Blanding's Turtle (a state-listed threatened species) in Fish Creek. Although no Blanding's Turtles were observed during staff field visits, the existence of the turtles has not been ruled out. No other federal or state listed species have been observed in the vicinity of the Preferred Alternative. No adverse impact to any Threatened and Endangered Species is anticipated.

6.6.4 Mitigation

Measures to avoid, minimize, or mitigate impacts to threatened/endangered or other protected species were considered during the design process. No adverse effects on state or federal threatened and endangered species are anticipated. As a precautionary measure, and in order to ensure that the project does not result in adverse impacts to Blanding's Turtles, the Fish Creek area will be reviewed with a biologist for existence of the species prior to construction. In addition, at the time of project construction, project contractors will be provided with MnDNR's environmental review fact sheets about Blanding's Turtles if it is determined that the species exists in the project area at that time.

6.7 VISUAL IMPACTS

6.7.1 Affected Environment

6.7.1.1 Visual Elements and Landscapes

This section itemizes the existing visual elements and general types of landscapes found in the project area and vicinity. Refer to the DEIS for a more detailed discussion of these elements.

Visual Elements

- Natural Elements
- Cultural Elements

Landscapes

- General Rural Landscape
- Small City Landscape
- Mississippi River Corridor/Mississippi Scenic Riverway
- Highway Landscape

6.7.1.2 Description of Existing Environment

The southernmost portion of the Preferred Alternative originates at I-94 (southeast of the existing I-94/TH 24 intersection) where there are some rural residential homes situated on large acreage lots and along the shore of Fish Lake (south of I-94) and agricultural lands. North of I-94, the alignment crosses CSAH 75, where more rural residential homes are located. The alignment continues north and bisects the natural environment associated with the Mississippi River, including the wide wooded floodplain along the northern shore. From the river north to the proposed local interchange near the Clearview Elementary School (TH 24), the alignment follows the section lines as closely as possible in an area of relatively few rural residential properties and county roads. At the northern terminus of the Preferred Alternative along TH 10, the landscape continues to be primarily rural with the exception of a few commercial and agricultural businesses, with the existing TH 10 mainline dominating the otherwise natural environment.

6.7.2 Affected Viewers

Viewers are those persons who experience the natural and cultural visual elements of the study area. Three groups of viewers were identified for the study area:

- Neighbors
- Travelers
- Riverway users

6.7.3 Visual Consequences

This section describes how the Preferred Alternative will affect existing landscapes from the perspective of neighbors, travelers and Mississippi River users, including both adverse and beneficial visual impacts. Refer to Chapter 3 of the DEIS and FEIS for discussion of the main design features of the Preferred Alternative.

At the southern terminus of the Preferred Alternative, a new I-94 interchange will be constructed (refer to Figure 3A for the interchange configuration). The highest elevation of the interchange and associated ramps will be approximately 40 feet above the adjacent land surface. No impacts are anticipated to result for travelers, as the interchange will be congruous with the existing I-94 highway landscape. Because the Preferred Alternative results in the acquisition of several of the most directly impacted properties in this area, and because the closest remaining rural properties that may view this interchange will be approximately 170 feet away from the roadway, impacts to neighbors are expected to be limited. Fish Lake residents (approximately 2400 feet away from elevated ramps) have raised concerns about the visual impacts of project lighting. Mn/DOT has determined that tower lighting (typically about 100 feet tall) will not be required. It is anticipated that either standard cobra-head lighting or light boxes, whichever has less visual impact, will be used for the project. Further analysis will be done at the time of project design to determine which lighting option will meet project needs while minimizing visual impacts for nearby residents.

The bridge and bridge approaches will alter this segment of the Mississippi River corridor, identified in the 2003 *Mississippi Scenic Riverway Management Plan* for its high scenic value

along the northern shore. This section of the Riverway is designated as 'recreational' in the state Wild and Scenic River System. Neighbors will view the bridge as a strong structural visual element in an otherwise natural landscape. Mississippi Riverway users will be able to view the bridge from approximately one-half mile upstream amongst the dominantly natural landscape. In the immediate vicinity of the bridge, the bridge and piers will dominate the landscape, with the bridge approximately 30 feet above the top of the riverbank. However, because this area is designated as part of a "rural residential" land use district (in which limited vegetative clearing will be permitted in the future), part of the existing visual value of the area near the river may be protected. In addition, the project's piers have been designed and placed in order to minimize their visual impact on riverway users. A long-span bridge was identified preliminarily as the preferred river crossing concept; this concept would decrease the number of piers required in the river (refer to minutes of February 7, 2006 meeting with MnDNR staff in Appendix A). Additional alterations to the existing landscape will result from the required 10-foot cut in the northern bluff for the bridge approach. Travelers on the new roadway will benefit from the opportunity to view this segment of the river.

From I-94 to the Mississippi River and from the Mississippi River north to the CR 57 intersection with existing TH 24 and a new local interchange at existing TH 24, the Preferred Alternative will result in visual impacts due to the addition of two new overpasses at CSAH 75 and CSAH 8. These structures will result in the addition of structural elements elevated above the adjacent land surfaces. The roadway itself will add a highway visual element to an otherwise rural landscape. Although the most directly impacted residences in these areas will be acquired, impacts to remaining neighbors will result from these alterations of the environment. Travelers will not experience adverse impacts but will benefit from views of a rural landscape.

With the addition of a local interchange at TH 24 (west of the elementary school), neighbors will experience the impacts of a new highway and the structural visual element of the elevated interchange. One of the most directly impacted residences in this area will be acquired as part of the right of way acquisition for the project. Travelers will not be impacted by the new roadway or the interchange; again, they will benefit from access to the pleasant rural landscape characteristic of the area. The residents and businesses along the existing TH 24 corridor through Clear Lake may perceive a visual benefit from lower traffic levels and less congestion in the TH 24 corridor after much of the traffic moves to the Preferred Alternative corridor.

At the northern terminus of the Preferred Alternative along TH 10, neighbors will be able to see the new interchange from a distance, since it will be approximately 40 feet above the adjacent land surface. Travelers will not experience an impact, as the landscape would continue to be a highway landscape. As in the other corridor areas, acquisition is recommended for the most directly impacted residences.

6.7.3.1 Summary of Environmental Consequences

The Preferred Alternative will affect the visual quality for neighbors and Mississippi Riverway users by adding highway, bridge and interchange structures to predominantly rural, small town or natural riverway landscapes. Neighbors in the rural and river corridor landscapes will experience the greatest change in visual quality with the freeway and associated structural elements that will convert a portion of the existing landscape to a highway landscape.

In addition to the adverse impacts that may result for neighbors along the river corridor, river users may also experience adverse impacts to their river experience with the addition of river crossings, bridge piers and bluff cuts.

No adverse impacts to visual quality are anticipated to result for travelers in the project area. Travelers on the new roadway will experience the benefit of rural and river corridor landscapes not previously accessible or easily accessible. The highway facilities will also be less congested, offering a better driving experience.

6.7.3.2 River Corridor Agency Coordination

Coordination with appropriate agency representatives has been ongoing since publication of the DEIS, in order to minimize impacts to the river corridor to the greatest extent possible. Meetings between Mn/DOT and MnDNR were held on August 26, 2004 and February 7, 2006 to discuss measures to avoid and minimize visual impacts to the river corridor. Mitigation measures determined during these meetings are discussed in Section 6.7.4 of this FEIS below.

6.7.4 Mitigation

Mitigation of visual impacts has been a focus of discussions regarding the Preferred Alternative's revision, as well as its general design. While specific design measures will be finalized during the final design stage, this section of the FEIS discusses general mitigation measures.

While the alignment of the Preferred Alternative seeks to minimize impacts altogether to project area residents, interchange design elements such as bridge structures and landscaping are additional mitigation measures that can further reduce impacts to neighbors. Landscaping along the entire project area will be appropriate for the generally rural landscape, and will be maintained in order to minimize the roadway's impacts to neighbors.

Minimizing visual impacts to riverway users has been addressed with a number of measures: a long-span bridge concept type is preferred by MnDNR staff because it minimizes the number of bridge piers that would impact river users' visual experience (and is therefore in keeping with M.R. 6115.0230, Subpart 5); bridge design and treatments will be as nonintrusive as possible; bluff cuts will be kept to 10 feet in order to prevent further impact; and vegetation clearing will be minimized, while cleared vegetation will be replaced with native vegetation as appropriate (refer to February 7, 2006 meeting minutes in Appendix A). Mn/DOT will continue to coordinate with MnDNR regarding bridge design to minimize the visual impacts of the river crossing. Section 6.10 describes mitigation for potential riverway impacts in more detail.

6.8 PARKS, TRAILS, RECREATIONAL AREAS AND NATURAL RESOURCE AREAS

This section provides information about public recreational and natural resource areas within the project area. Section 4(f) and Section 6(f) applicability is addressed for the area's parks, recreation and natural areas; however, the discussion of Section 4(f) applicability related to

historic sites is addressed in Chapter 8. The primary recreational resource within the Preferred Alternative's project area is the Mississippi River, which is designated as a part of the state Wild and Scenic River System and as a state Canoe/Boating Route from Anoka to St. Cloud. Impacts to the river as a recreational resource are identified in Section 6.10. In addition to the river, there are several other recreational amenities within the Preferred Alternative's project area. Following is a description of these resources and potential impacts that may result from the Preferred Alternative, as well as potential mitigation measures to minimize impacts.

6.8.1 Affected Environment

Since completion of the DEIS, Sherburne County released the *Sherburne County Parks, Trails, and Open Space Policy Plan* (June 2005). That plan identifies CSAH 8, including its location in the Preferred Alternative corridor, as a future trail corridor which would constitute part of a river corridor connecting St. Cloud to Elk River. Although this trail is a priority for Sherburne County, it has not received funding yet.

There is a state Grant-in-Aid (GIA) snowmobile trail currently designated on an abandoned railroad bed that parallels CSAH 75 from St. Cloud to Monticello. GIA trails utilize easements across private and public land and are managed and maintained by local organizations, with some funding provided by the MnDNR. Since the trail corridors are located on easements, the location of these trails can vary over time as easement agreements change.

In addition, cooperative trail planning efforts among local governments have resulted in the development of concept plans for a future multi-use (pedestrian/bike, in-line skate and undergroomed cross country skiing) trail corridor south of the Mississippi River. The City of Clearwater's *River Country Regional Trail Concept Plan* (January 2002) identifies the River Country Regional Trail as a potential extension of the Beaver Island Regional Trail along CSAH 75 from Warner Lake Park west of Clearwater to Monticello. The River Country Regional Trail would traverse the Preferred Alternative project area and is envisioned as an off-road trail. Although funding has been awarded for portions of the trail in Clearwater, the earliest anticipated design start date for the section that traverses the river crossing corridor is 2010.

No additional resources are located in the Preferred Alternative project area, other than the Mississippi Scenic Riverway. See Section 6.10 for a detailed discussion of potential impacts to the riverway.

6.8.2 Environmental Consequences

The Preferred Alternative will impact the Mississippi Scenic Riverway. Section 6.10.2 describes those impacts in detail. In addition, the Preferred Alternative could potentially affect the GIA snowmobile trail, the multi-use River Country Regional Trail, and/or the potential trail corridor along CSAH 8 if they exist at the time of project construction (see Section 6.8.1).

6.8.3 Section 4(f)/Section 6(f) Impacts

The project has been reviewed for potential applicability of Section 4(f). The Preferred Alternative was identified in part because it will not result in impacts to publicly owned parklands, waterfowl or wildlife refuges, recreation areas, land from other historic sites or any other property determined to be subject to the provisions of Section 4(f). Refer to Appendix E for the Final Section 4(f) Evaluation for the Preferred Alternative.

The project has also been reviewed for potential Section 6(f) involvement. The Preferred Alternative will not cause the conversion of any land acquired, planned or developed with funds from the Land and Water Conservation Act of 1965 (LAWCON). Therefore, Section 6(f) is not applicable to this project.

6.8.4 Mitigation

As discussed above, the Preferred Alternative will impact the Mississippi Scenic Riverway; Section 6.10 describes mitigation for potential riverway impacts. Twelve-foot trails have been incorporated on the north/west side of the proposed TH 24 interchange bridge, on the north side of the CSAH 75 overpass over the interregional connection, and on the south side of the CSAH 8 overpass over the interregional connection. These trails have been included in the Preferred Alternative's design in order to accommodate bicycles and pedestrians, and in recognition of local governments' proposals to increase the number of trails in the area. If it still exists in its current location at the time of project construction, provisions for the existing MnDNR GIA snowmobile trail (adjacent to CSAH 75) will be provided. Continued coordination with the appropriate agencies (e.g., Sherburne County Parks, Clearwater, Wright County, MnDNR) will be conducted.

6.9 GEOLOGY/SOILS

6.9.1 Affected Environment

The project area is characterized by a relatively flat outwash plain formed during the Wisconsin glaciation period (75,000 to 12,000 years ago) and is divided by the Mississippi River Valley. Soils in the project area are generally sandy and have low water holding capacity; organic soils are present in wetland areas. Steep slopes are present only in the bluff areas of the Mississippi River Valley. Sandy and gravelly loam is present on the steep bluffs of the proposed river crossing. Bluff slope angles range from 12 to 35 percent; these soils are vulnerable to erosion if the vegetation is disturbed. Igneous and metamorphic bedrock, consisting primarily of granite, is present below the unconsolidated deposits, approximately 150 feet below the average outwash plain surface.

Groundwater occurs at depths generally ranging from 20 to 40 feet in the sandy outwash in the project area. Groundwater is present at or near the surface in wetland areas and near lakes. See Section 7.4 for additional details regarding groundwater.

6.9.2 Environmental Consequences

Construction of the Preferred Alternative will require excavation and/or disturbance in the vicinity of steep river bluffs. Disturbance to the vegetative cover that occurs during construction could result in erosion of temporarily bare soils. Erosion of the river bluffs is of special concern because eroded sediment could be washed into the Mississippi River.

The bridge approach for the Preferred Alternative will intersect with the steep bluff. Construction of the Preferred Alternative will require excavation in the east bluff to a depth of approximately 10 feet. Access roads and temporary construction disturbance will also occur related to the Preferred Alternative.

Construction of roadways over unstable organic soils requires correction of the soils in the form of compaction or excavation. Organic soils are present in several of the wetlands in the area of the Preferred Alternative. The approximate area of organic soils in the construction limits for the Preferred Alternative is six acres.

The potential for impacts to bedrock and impacts from earthborn vibration has been considered, but due to the nature of the planned work and affected environment (i.e., no rock cuts, no blasting, no sensitive structures, etc.), no impacts are anticipated. Therefore, no monitoring activities are planned at this time.

6.9.3 Mitigation

The proposed road profiles have been designed to minimize disturbance to steep bluffs. As the design for the Preferred Alternative is carried forward, it will be further refined to avoid or minimize impacts to steep slopes and organic soils.

Best management practices (BMPs) such as erosion control blankets, fast growing cover crops and silt fences (similar to those outlined in the MPCA's manual "Protecting Water Quality in Urban Areas") will be implemented in accordance with the National Pollutant Discharge Elimination System (NPDES) permit that is required for the project. After construction is complete, disturbed areas will be re-vegetated to control erosion on a permanent basis.

Correction of organic soils is minimized by avoiding wetland areas as described in Section 7.5. If organic soil correction is needed, methods such as compaction (surcharging) and the use of lightweight fill will be evaluated to minimize disturbance to the soil and surrounding wetlands. As discussed in Section 6.3.3, the Preferred Alternative was designed in part to minimize impacts to "prime and unique" and "statewide and local important" farmland soils; these impacts have been limited to a total of 152.1 acres.

6.10 WILD AND SCENIC RIVERS AND CANOE/BOATING ROUTES

6.10.1 Affected Environment

In 1976 the Mississippi River was designated as a state Wild and Scenic River, an important state recreation and natural resource protection program, for the 53-mile length from St. Cloud to the western border of the Cities of Anoka and Champlin at the northwest corner of the Twin Cities metropolitan area. Refer to the DEIS for a detailed summary of this resource and the regulations managing it.

6.10.2 Environmental Consequences

This section summarizes the impacts of the Preferred Alternative on the historic, scenic, recreational and natural/scientific 'values' related to Mississippi Scenic Riverway uses. The description of riverway recreational values impacts also reflects impacts to river use as a Canoe/Boating Route.

Since recreational users move throughout the riverway (i.e., not just at the location of the Preferred Alternative), the potential cumulative impacts to the riverway from anticipated future development and from other potential river crossings also need to be considered. Chapter 11 assesses these potential cumulative impacts to the Mississippi Scenic Riverway.

The Preferred Alternative is located in a new river crossing corridor in an area identified by MnDNR's 2003 *Riverway Management Plan* as having high to moderate scenic quality, just above Boynton's Island. This section of the river is within the 'recreational' designation. There are more existing breaks in forest vegetation in the vicinity of the Preferred Alternative corridor than in the vicinity of Build Alternatives A and D (Alternative B is an existing river crossing); however, much of the area has retained vegetative cover along the river banks and bluff. The existing character is likely to continue in the future, since this section of the river is designated in MnDNR's 2003 *Riverway Management Plan* as part of the 'rural residential' land use district, which minimizes visual impacts by limiting vegetation clearing. Construction of a bridge across the riverway at this location would be visible to recreational users coming downriver for a distance of approximately 0.5 mile.

The Preferred Alternative creates a new river crossing approximately 1.6 miles downstream from the current TH 24 bridge, with the next bridge structure across the river located at the TH 25 crossing in Monticello, approximately 15 miles downstream. The existing TH 24 and Preferred Alternative bridge intrusions will be relatively close together, allowing for longer distances to the next bridge (TH 25). However, for river users traveling downstream, the close proximity of the TH 24 and Preferred Alternative crossings could result in a perception that noise and visual impacts continue for a relatively long time, compared to noise/visual impacts of a single, isolated crossing. Refer to Section 6.2.2.2 for discussion of the noise impacts of the Preferred Alternative's new river crossing.

The Preferred Alternative project area is located approximately four miles downstream from the Greenwoods' Island campsite (upstream from TH 24) and approximately five miles upstream from the campsite at Oak Island just north of Snuffy's Landing. The other Build Alternatives studied in the DEIS would have been closer to such public use areas (with a range of ½-mile to three miles from riverway canoe campsites). The Preferred Alternative has the least noise and light impacts on campers of any of the Build Alternatives which were considered in the DEIS.

The potential impacts of the Preferred Alternative on natural/scientific values of the riverway in the project vicinity have been considered throughout the post-DEIS redesign efforts. These impacts include indirect impacts to the riverway (i.e., siltation from erosion at the 10-foot bluff cut—although no good fisheries habitat areas are identified in the vicinity), and potential impacts to two native communities (oak woodland at the north bluff and floodplain forest in the river bottom). No threatened/endangered species, species of concern, or special riverway wildlife concerns are identified within the riverway management area for the Preferred Alternative. No cultural resources are impacted by the Preferred Alternative.

6.10.3 Mitigation

The Preferred Alternative was selected in part for its ability to minimize impacts to the Mississippi Scenic Riverway and Canoe/Boating Route, relative to the other evaluated alternatives. Potential impacts of the Preferred Alternative on the visual quality of the river,

particularly due to vegetative covering, have been avoided in part by the fact that the impacted section of the river is designated in the 2003 *Riverway Management Plan* as within the "rural residential" land use district; limited vegetative clearing will be permitted within this district in the future, so the visual value of this area will be protected. Mitigation measures related to the visual quality of the river are addressed in Section 6.7.4.

The new river crossing for the Preferred Alternative is approximately 1.6 miles downstream from the existing TH 24 bridge, and about 15 miles from the next closest bridge (in Monticello). The crossing's proximity to the TH 24 bridge may extend the noise and visual impacts in the immediate area for river users. However, its distance from the next bridge, the Monticello bridge, maximizes the sense of wilderness between the Preferred Alternative crossing and the Monticello bridge.

Impacts to river camping sites have been minimized by locating the Preferred Alternative's river crossing at least four miles from such uses (in comparison, the river crossings of the other Build Alternatives considered in the DEIS were ½-mile to three miles from such camping sites).

The redesign of the Preferred Alternative minimizes siltation, plant community impacts, and erosion to the greatest extent possible. Bridge pier placement has taken river survey work into account in order to minimize siltation impacts. Where impacts to native plant communities and other vegetative coverings are unavoidable, replanting with native species as appropriate will be performed. As discussed in Section 6.5.2 of this FEIS, appropriate storm water ponds have been planned in association with the Preferred Alternative.

Chapter 6 References

Cuthrell, D.L. 2004. Michigan natural features inventory. Special animal abstract for *Ardea herodias* (great blue heron rookery). Michigan Natural Features Inventory: Lansing, Michigan.

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