DRAFT SUPPLEMENTAL FINAL ENVIRNMENTAL IMPACT STATEMENT

For

Trunk Highway 60 – St. James to Windom

Prepared by:

Minnesota Department of Transportation and
Federal Highway Administration – Minnesota Division Office

November 2011

Your Destination...Our Priority

TRUNK HIGHWAY 60
IN COTTONWOOD AND WATONWAN COUNTIES, MINNESOTA

DRAFT SUPPLEMENTAL FINAL ENVIRONMENTAL IMPACT STATEMENT (SFEIS)

Submitted Pursuant to 42 U.S.C. 4332 (2) (c), 49 U.S.C. 303, and Minn. Stat Chap. 116D
By the U.S. Department of Transportation – Federal Highway Administration
and the Minnesota Department of Transportation
State Project Number(s): S.P. No. 1703-69, 1703-70, and 8308-44

Cooperating Agencies

U.S. Army Corps of Engineers U.S. Fish & Wildlife Service

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ABSTRACT

Highway 60 is an important northeast-southwest highway that crosses through southwestern Minnesota. The highway provides vital links for agricultural goods that are shipped between regional trade centers such as Worthington, MN, Mankato, MN, the Twin Cities (via Highway 169), and Sioux City, Iowa. A Final Environmental Impact Statement (FEIS), dated 1983, for Highway 60 from St. James to Worthington, MN assessed a larger 52-mile segment of the corridor. Of this 52-mile stretch, most of the corridor has been constructed as a four-lane divided highway. This SFEIS focuses on the gaps in the four-lane divided highway sections between Windom and St. James.

REVIEWED AND RECOMMENDED:

9-26-11
Date

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APPROVED:

10/4/11
Date

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Date

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Comments on the SFEIS should be sent to the MnDOT Project Manager (address listed above).

This draft of the Highway 60 Gaps SFEIS is being distributed consistent with federal and state environmental review requirements. Following the Draft SFEIS comment period, a Final SFEIS will be issued.

To request this document in an alternative format, call Bruce Lattu at 651-366-4718 or 1-800-657-3774 (Greater Minnesota); 711 or 1-800627-3529 (Minnesota Relay). You may also send an e-mail to bruce.lattu@state.mn.us (Please request at least one week in advance.)

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List of Acronyms

ACHP – Advisory Council on Historic Preservation
AADT – Annual Average Daily Traffic
APE – Area of Potential Effect
AST – Aboveground Storage Tank
B/C – Benefit-Cost
BMPs – Best Management Practices
CAAA – Clean Air Act Amendments
CEQ – Council on Environmental Quality
C&NW – Chicago & Northwestern
CO – Carbon Monoxide
CR – County Road
CRP – Conservation Reserve Program
CSAH – County and State Aid Highway
CWA – Clean Water Act
dBA – A-weighted Decibel
EIS – Environmental Impact Statement
EPA – Environmental Protection Agency
ESA – Environmental Site Assessment
FEIS – Final Environmental Impact Statement
FEMA – Federal Emergency Management Agency
FHWA – Federal Highway Administration
FIRM – Flood Insurance Rate Map
Hwy - Highway
IRC – Interregional Corridor
IRIS – Integrated Risk Information System
JD – Jurisdiction Determination
LAWCON – Land and Water Conservation
LGU – Local Government Unit
MCBS – Minnesota County Biological Survey
MEPA – Minnesota Environmental Policy Act
MnCMAT – Minnesota Crash Mapping Analysis Tool
MnDOT – Minnesota Department of Transportation
MNDNR – Minnesota Department of Natural Resources
MP – Monitoring Point
MPCA – Minnesota Pollution Control Agency
MSAT – Mobile Source Air Toxics
MVM – Million Vehicle Miles
NAAQS – National Ambient Air Quality Standard
NAC – Noise Area Classification
NATA – National Air Toxics Assessment
NEPA – National Environmental Policy Act
NHPA – National Historic Preservation Act
NHIS – Natural Heritage Information System
NPDES – National Pollutant Discharge Elimination System
NRCS – Natural Resource Conservation Service
NRHP – National Register of Historic Places
OHW – Ordinary High Water
OMLS – Online Multiple Listing Service
RCIPs – Regional and Community Improvement Priorities
RDC – Regional Development Commission
RGU – Responsible Governmental Unit
ROD – Record of Decision
SFEIS – Supplemental Final Environmental Impact Statement
SHPO – State Historic Preservation Office
StP&SC – St. Paul & Sioux City Railroad Corridor
SWPPP – Stormwater Pollution Prevention Plan
T & E – Threatened & Endangered
THPO – Tribal Historic Preservation Officer
TMDL – Total Maximum Daily Load
UP – Union Pacific
USACE – US Army Corps of Engineers
USDOT – US Department of Transportation
USFWS – US Fish and Wildlife Service
VMT – Vehicle Miles Traveled
WCA – Wetland Conservation Act
WMA – Wildlife Management Area

1.0 EXECUTIVE SUMMARY

1.1 BACKGROUND INFORMATION: PROCESS LEADING TO THE CREATION OF THIS DOCUMENT

Since the Highway 60 Final Environmental Impact Statement (FEIS) was completed and the Record of Decision (ROD) released in 1984, several segments of the original preferred alternative between the cities of Worthington and St. James, Minnesota (a distance of approximately 52 miles) have been constructed. These transportation improvements were constructed over many years and completed through multiple project lettings. The past projects have involved capacity (four-lane sections), safety (divided sections, interchanges, etc.), and/or mobility (community bypasses) improvements. However, to date three highway segments between the cities of St. James and Windom were reconstructed only as two lane roads rather than four-lane divided highways as proposed in the FEIS. These three gaps in the four-lane, illus in Figure 1, are herein referred to as the following:

- East Gap – extends from just west of the City of St. James to the eastern edge of the City of Butterfield (approximately 5.3 miles);
- Middle Gap – extends from the western edge of the City of Butterfield to just east of the City of Mountain Lake (approximately 4.2 miles);
- West Gap – extends from just west of the City of Mountain Lake to the northeast edge of the City of Windom (approximately 7.5 miles).

This Draft Supplemental Final Environmental Impact Statement (SFEIS) focuses on documenting the environmental impacts and proposed mitigation associated with completing construction of the four-lane sections in the gaps described above. Where appropriate, some sections of this document also include a discussion of how the gap areas affect the total Highway 60 corridor; however the majority of the discussions focus on the specific effects of each of the three highway gaps.

The Draft EIS, Final EIS and ROD/Adequacy Determination remain unchanged and are incorporated by reference herein and made a part of this SFEIS. Relevant information from the previous documents has been incorporated into this SFEIS. Electronic copies of the original EIS documents and ROD are included on the CD-ROM provided with this SFEIS. Combined with the SFEIS, the previously completed environmental documents are intended to help public officials and agencies make decisions with a complete understanding of the environmental consequences and proposed mitigation commitments associated with the proposed action.

1.2 PURPOSE OF THE DRAFT SFEIS

The proposed reconstruction of Trunk Highway 60 (Highway 60) is considered a Federal Class I Action because of the potential for significant impacts on the natural and physical environment. The original Environmental Impact Statement (EIS) was completed in the early 1980's and the Record of Decision (ROD) was released in 1984.

HIGHWAY 60 GAPS PROJECT
SUPPLEMENTAL FINAL EIS

FIGURE 1
PROJECT LOCATION MAP

MAY 2011

This Supplemental Final Environmental Impact Statement (SFEIS) focuses on documenting the potential environmental impacts and proposed mitigation for completing four-lane divided sections in the gap segments between St. James and Windom.

This SFEIS has been prepared as part of the federal National Environmental Policy Act (NEPA) and Minnesota Environmental Policy Act (MEPA) environmental review processes to fulfill requirements of both 42 USC 4321 et seq. and Minnesota Statute 116D. Consistent with the requirements (Minnesota Rules 4410.3000, Subp. 5, C.), a draft version of the SFEIS will be circulated for public comment. Following the Draft SFEIS comment period, a final SFEIS and ROD will be issued, consistent with both state and federal environmental review process requirements.

1.3 DESCRIPTION OF THE PROPOSED ACTION

The Minnesota Department of Transportation (MnDOT), in cooperation with the Federal Highway Administration (FHWA), proposes completion of the expansion of Highway 60 in Cottonwood and Watonwan Counties, to a four-lane divided highway.

1.4 PURPOSE AND NEED OF THE HIGHWAY 60 PROJECT

The purpose of the Highway 60 project is to continue implementation of transportation system improvements, by addressing the three remaining two-lane roadway sections along Highway 60 between St. James and Windom.

The needs that led to initiation of the 1983 Highway 60 EIS included:

- Substandard Design Elements - *the existing highway corridor is characterized as having numerous design deficiencies (numerous no passing zones, hazardous intersection geometrics, deteriorating pavement and substandard land widths, shoulders, slopes and ditches) that create safety and mobility concerns.*
- Local and Regional Significance - *principal arterial and regional and local connections*
- System Linkages – *four-lane roadway continuity*
- Present and Projected Traffic Demand
- Safety – *over 450 crashes were reported along the study segment of Highway 60 between 1976-1979. Rural crash rates are highest in the Butterfield to St. James and Windom to Mountain Lake sections, particularly when considering the severity of the crashes.*
- Modal Interrelationships – *including freight*
- Economic and Social Considerations – *Agriculture, Economic Development, and Community Service Needs*

The needs for the three gap segments have not changed substantially from those stated in the original EIS, but have been refined to provide updated

information regarding the current needs of the highway corridor, especially focusing on the three gap segments. The refined need components include:

- Corridor Role in the Transportation System – Policies and Priorities
  - Interregional Corridor (IRC) System
  - Significant Freight Corridor
- Enhance System Continuity
- Safety
- Additional Considerations
  - Social Demand – Public Input Regarding Transportation Priorities
  - Access Management Policies
  - Environmental Considerations

1.5 ALTERNATIVES

This Highway 60 SFEIS considers only the three gap segments of Highway 60 between St. James and Windom. The potentially feasible and prudent alternatives for improving the gap segments of Highway 60 include:

- Alternative 1 – No-Build Alternative.
- Alternative 2 – Constructing a four-lane expressway.

1.6 PROJECT COST AND FUNDING SOURCE

Construction of the Highway 60 improvements will be funded from both federal and state sources. It is anticipated that federal funds will be the primary source of construction funding. Cost estimates for each gap of the preferred alternative are presented in Table 1 below. The estimate includes construction (pavement and structures) and right of-way acquisition costs.

Table 1 – Project Cost[1] Summary

Preferred Alternative	Construction Costs[2]	Right-of-Way Acquisition Costs	Total Costs
East Gap	$21.6 million	$1.4 million	$23.0 million
Middle Gap	$15.9million	$900,000	$16.8 million
West Gap[3]	$16.25-18.8 million	$1.7-2.6 million	$17.95-20.6 million

1 Cost estimates are inflated to the year of the midpoint of anticipated construction (i.e. 2014 for the East Gap, 2016 for the Middle Gap, 2018 for the West Gap)
2 Includes four-lane roadway, local/frontage road connections, and other mitigation costs.
3 West Gap construction and right-of-way costs will fluctuate depending on final alignment between the Clear Lake and Bingham Lake design options.

The current 2011-2014 State Transportation Investment Plan (STIP) includes approximately $20.07 million in funding for the East Gap improvements (fiscal year 2013 Seq. #1110 and fiscal year 2014 Seq. # 1142). In fiscal year 2014 there is also set aside funding ($3 million) for improvements within the remaining Highway 60 Gaps. Additional funding for the Middle and West Gaps will be identified and programmed in future fiscal years of the STIP.

1.7 POTENTIAL ENVIRONMENTAL EFFECTS

A summary of the potential beneficial and adverse effects associated with the Build Alternative and design options is presented in Tables 2 and 3.

Impact avoidance and minimization measures have been incorporated into the conceptual design and will be further discussed during agency coordination, final design, and permitting. For additional information regarding the impacts shown in Tables 2 and 3, the reader is referred to Section 4.0 of this document.

1.8 PERMITS, APPROVALS, AND CONCURRENCE

It is anticipated that federal, state, and local permits/approvals/concurrence may be required for the proposed action. The following actions may be required:

- Adequacy Determination – MnDOT
- Record of Decision – FHWA
- Section 404 Permit – United States Army Corps of Engineers (USACE)
- Section 401 Water Quality Certification – Minnesota Pollution Control Agency (MPCA)
- National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit – MPCA
- Minnesota Wetland Conservation Act (WCA) – MnDOT
- Public Waters Work Permit – Minnesota Department of Natural Resources (MNDNR)
- Orders for crossing drainage ditches from requisite ditch authorities

1.9 TYPE OF COORDINATION BEING CONDUCTED

MnDOT is committed to public and agency involvement/outreach at all levels in decision-making related to the Highway 60 Project. MnDOT has engaged community organizations; area property owners; business owners; residents; and local, county, regional, state, and federal agencies in the development of the project. See Draft SFEIS Section 7.0 – Coordination for additional information. Public involvement activities have included:

- Public Open House Meetings
- Project Website Updates

Informational and coordination meetings have also been held with representatives from local, state, and federal agencies to discuss appropriate analysis methodology for different resource areas.

1.10 OTHER MAJOR PROPOSED ACTIONS BY OTHERS

There are no other major projects being proposed by other agencies within the three gap segments of the Highway 60 project area.

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Table 2– Impact Summary

Subject	Build Alternative Impacts	Proposed Mitigation
Social And Community	No impacts to community resources (schools, churches, hospitals, etc.) are anticipated.	No mitigation proposed
Environmental Justice	No disproportionately high or adverse impacts to environmental justice populations.	No mitigation proposed
Right-Of-Way/Relocation		
Potential acquisitions/relocations*	No residential relocations; 1to 3 commercial relocations (see Table 3 below for a detailed summary of impacts associated with the West Gap design options)	All right-of-way impacts will follow the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and 49 CFR Part 24.
Additional right-of-way, acres*	Approximately 385 to 421 acres (see Table 3 below for a detailed summary of the West Gap design options)	
Traffic/Transportation System	The long-term impacts to traffic and the transportation system will be beneficial by improving safety and capacity along Highway 60. Short-term impacts may incurred during construction and involve traffic delays, lane closures, and detours.	A construction staging plan will be developed during the final design phase that will identify lane closures, detours, etc. Access to all properties will remain during construction.
Section 4(f)	No Section 4(f) properties will be affected by the project.	No Mitigation proposed
Indirect Impacts	Future land use patterns in the area will be determined by many factors, although most new commercial development is expected within close proximity of the highway corridor. It is anticipated that new development/redevelopment will continue along Highway 60.	In the context of the existing regulatory framework and the mitigation for project impacts, and with respect to simultaneous land use planning and local government regulations, indirect/cumulative impacts are expected to be minimal. Such impacts may be avoided and/or minimized through land use controls and roadway access restrictions.
Cumulative Impacts	No potentially significant cumulative impacts were identified.	No mitigation proposed
Farmland*	Approximately 320 to 350 acres (see Table 3 below for a detailed summary of the West Gap design options). Assessment based on soil types for the entire project area, including area of existing right-of-way. Impacts to existing drain tile systems are anticipated as a result of expanding the highway corridor.	All land acquired will follow the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and 49 CFR Part 24. Impacts to drain tile systems will be replaced and/or returned to pre-construction conditions.
Noise*	The number of receptors where state noise standards are exceeded varies greatly from “daytime” conditions to “nighttime” conditions. The number of receptors that are anticipated to experience noise levels above state “daytime” standards is 3, while the number of potential exceedances for “nighttime” standards is 23-33 receptors. The range for nighttime conditions depends on the design options for the Bingham Lake area.	A study of noise abatement was conducted and concluded that no noise walls meet both the acoustic effectiveness and cost reasonableness criteria. Therefore, no noise walls are proposed as mitigation.
Wetlands*	Approximately 6.2 to 7.87 acres of wetlands will be impacted (see Table 3 below for a detailed summary of the West Gap design options).	Replacement in accordance with WCA and USCOE regulations. Further design refinements will be considered to reduce potential wetland impacts.
Floodplains/Water Body Modifications*	No designated floodplain areas will be affected. The Build Alternative will potentially require water body modification at Clear Lake (0.23 to 1.17 acres) and Warren Pond (0.34 acres).	Two design options are being considered at Clear Lake including a “compressed” center median that reduces the potential impact area. Other design modifications will be considered during final design to minimize potential impacts to these water bodies.
Surface Water Drainage And Water Quality	The conversion of the highway from a two-lane facility to a four-lane facility will essentially double the amount of impervious surface, which will increase the rate and quantity of stormwater runoff.	A comprehensive stormwater management plan is being developed that includes the use of grass medians, ditch checks, and stormwater ponds to collect and treat stormwater runoff.
Geology/Groundwater	No impacts to municipal water supplies or private wells are anticipated. Information contained in the Geologic Atlas for the area indicates that groundwater acquires in the area are covered by confining layers of loam and clay. Therefore, impacts from the Build Alternative would be negligible.	Construction best management practices will be used during construction to minimize potential impacts to surface water and groundwater. Any abandoned wells will be sealed in accordance with State Department of Health requirements.
State/Federal Threatened And Endangered Species	No Federal T&E species will be impacted. Several prairie remnants existing adjacent to the highway and railroad right-of-way. These areas potentially contains state listed plant species.	During the design phase, efforts will be made to avoid and/or minimize impacts to prairie remnants. If state-listed species are impacted, the MNDNR will be consulted for plant salvage possibilities or other mitigation options such as salvaging topsoil and reseeding with native seeds.
Architectural/Historic & Archeological Resources	No Architectural/Historic or Archeological resources will be adversely impacted.	No mitigation proposed.
Contaminated Properties*	20 medium risk sites and 2 high risk sites have been identified in the project area. Several of these sites have elevated risk of contamination due to their historic land use and/or current operations. Design options in the West Gap have been developed to potentially avoid or minimize impacts at the two high risk sites.	Further environmental site investigations will occur prior to right-of-way acquisition in order to minimize MnDOT’s liability and costs associated with handling contaminated soil or groundwater. Any contamination encountered during construction will be properly handled and treated in accordance with state and federal regulations.

- Indicated areas where impacts may vary depending on the West Gap Design Options near Clear Lake and the City of Bingham Lake.

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Table 3 – West Gap: Clear Lake and Bingham Lake Design Options Summary of Impacts

Anticipated Impacts	*Criteria Description*	Clear Lake "Full" Centerline Spacing Option	Clear Lake "Compressed" Option	Bingham Lake Widen South On Existing Option	Bingham Lake Widen North On Existing	Bingham Lake North Bypass Option
Right-of-Way	*Acres of Right-of-way needed*	16.2 acres	14.1 acres	62.7 acres	43.6 acres	77.5 acres
Relocations	*Number of commercial business relocations*	0	0	3	1	1
Prairie Remnants	*Lineal feet of adjacent prairie remnants*	0	0	1,620 lineal feet	0	0
Contaminated Properties	*Number of high and medium risk sites in close proximity*	0	0	5 medium risk sites	1 medium/2 high risk sites	1 medium/1 high risk site
Noise	*Number of receptors that would experience noise levels above the State standards*	1	1	12	11	2
Wetlands	*Acres of wetland impacts*	1.17 acres	0.23 acres	0.15 acres	0.72 acres	0.88 acres
Farmlands	*Acres, Severance of fields and effects on farm operations.*	10.64 acres	8.5 acres	38.21 acres	36.1 acres	62.6 acres

Table Note: See corresponding documentation in Section 4.0 of this EIS for further detail.

1.11 PROJECT SCHEDULE

Completion Date	Task/Activity
June 14, 2011	Public Meeting/Open House
August 10, 2011	Federal Notice of Intent
November 2011	Distribute Draft SFEIS Document for agency/public comment, start of Draft SFEIS comment period
December 2011	Public Hearings on Draft SFEIS
Winter 2011	Identification of Preferred Alternative
April 2012	Prepare and Distribute Final SFEIS
May 2012	MnDOT Adequacy Determination, Federal Highway Administration Record of Decision
2013-2014	East Gap Construction (St. James to Butterfield)
2015-2016	Middle Gap Construction (Butterfield to Mountain Lake)
2017-2018 tentative	West Gap Construction (Mountain Lake to Windom)

2.0 PURPOSE AND NEED FOR PROPOSED ACTION

2.1 PROJECT BACKGROUND

Highway 60 is an important northeast-southwest highway that crosses through southwestern Minnesota. This principal arterial highway provides vital links for local traffic, regional traffic, and shipping agricultural goods grown by local producers to regional trade centers such as Worthington, Mankato, the Twin Cities (via Hwy 169), and Sioux City, Iowa (via Hwy 75). Figure 1 illustrates how this important freight corridor connects producers and markets in the intra-state and inter-state transportation system.

The local and regional importance of Highway 60 has been recognized for many years. A Final Environmental Impact Statement (FEIS), dated 1983, was prepared for a 52-mile segment of Highway 60 from St. James to Worthington. Highway 60, including the 52-mile project corridor, falls under the MnDOT classification of a Medium Priority Interregional Corridor (IRC).

The Preferred Alternative concept identified in the EIS/ROD consisted of constructing Highway 60 on new alignment from near St. James to approximately one-half mile southwest of Mountain Lake and to reconstruct on existing alignment from Mountain Lake to Worthington. The initial stages were to provide two-lane reconstruction to modern highway design standards and subsequent stages would provide added capacity with construction to a four-lane expressway. Nearly 35 miles of the Highway 60 corridor between St. James and Worthington has been constructed as a four-lane divided highway including community bypasses at St. James, Butterfield, and Mountain Lake. However, three segments (approximately 17 miles) of the original EIS study limits remain as two-lane highway sections between St. James and Windom.

three segments (approximately 17 miles) of the original EIS study limits remain as two-lane highway sections between St. James and Windom.

MnDOT is currently in the process of updating the evaluation of improvements in these two-lane highway gap sections since funding for implementation of roadway improvements was made available in 2008. Given the amount of time that has passed since the 1984 Record of Decision (ROD), MnDOT consulted with FHWA to determine the most appropriate course of action to maintain compliance with the National Environmental Policy Act (NEPA). The consultation focused on the specific circumstances of the project, the nature and type of potential impacts, and the need for interagency coordination. Based on this consultation, FHWA determined that a supplemental Final EIS (SFEIS) must be prepared.

2.2 DESCRIPTION OF PROJECT

The Highway 60 project area is located in southwestern Minnesota. The project corridor for the three remaining two-lane gap segments primarily traverses east to west between the cities of St. James and Windom through Watonwan County and Cottonwood County, Minnesota (see Figure 1 on page 3). Within the project area, four-lane highway bypasses have already been constructed near St. James, Butterfield, and Mountain Lake. However, three highway segments between St. James and Windom were built as two lane roadways instead of four-lane, divided highways as proposed in the 1983 Final EIS. These three gaps in the four-lane are herein referred to as the following:

- East Gap – extends from just west of the City of St. James to the eastern edge of the City of Butterfield (approximately 5.3 miles);
- Middle Gap – extends from the western edge of the City of Butterfield to just east of the City of Mountain Lake (approximately 4.2 miles);
- West Gap – extends from just west of the City of Mountain Lake to the northeast edge of the City of Windom (approximately 7.5 miles).

The proposed improvements include expanding these gap segments of Highway 60 to a four-lane divided expressway section. Other improvements will include minor intersection improvements and access management improvements.

2.3 RESPONSIBLE GOVERNMENTAL UNITS

MnDOT is the Responsible Governmental Unit for the development of and the environmental documentation for the Highway 60 Project. MnDOT is managing the project with the FHWA as a Joint Lead Agency. The contact persons for the project are:

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2.4 PURPOSE OF THE SUPPLEMENTAL FINAL ENVIRONMENTAL IMPACT STATEMENT

Since the Highway 60 Final Environmental Impact Statement (FEIS) was completed and the Record of Decision (ROD) released in 1984, the majority of segments of the original preferred alternative between the cities of Worthington and St. James, Minnesota (a distance of approximately 52 miles) have been constructed. These transportation improvements were constructed over many years and completed through multiple project lettings. The past projects have involved capacity (four-lane sections), safety (divided sections, interchanges, etc.), and/or mobility (community bypasses) improvements. However, to date three highway segments between the cities of St. James and Windom were reconstructed only as two lane roads instead of as four-lane, divided highways as proposed in the FEIS.

This Supplemental Final Environmental Impact Statement (SFEIS) focuses on documenting the environmental impacts and proposed mitigation for completion of the four-lane in the gaps described in Section 2.1 above. Where appropriate, some sections of this document also include a discussion of how the gap areas affect the total Highway 60 corridor impacts; however the majority of the discussions focus on the specific effects of each of the three highway gaps.

The 1982 Draft EIS, 1983 Final EIS and 1984 ROD/Adequacy Determination remain unchanged and are incorporated by reference herein and made a part of this SFEIS. Relevant information from the previous documents has been incorporated into this SFEIS, as necessary. Electronic copies of the original EIS documents and ROD are included on the CD-ROM provided with this SFEIS. Combined with the SFEIS, these environmental review documents are intended to help public officials and agencies make decisions with a complete understanding of the environmental consequences and proposed mitigation commitments associated with the proposed action.

This SFEIS has been prepared as part of the federal National Environmental Policy Act (NEPA) and Minnesota Environmental Policy Act (MEPA) environmental review processes to fulfill requirements of both 42 USC 4321 et seq. and Minnesota Statute 116D. Consistent with the requirements (Minnesota Rules 4410.3000, Subp. 5, C.), a draft version of the SFEIS will be circulated for public comment. Following the Draft SFEIS comment period, a final SFEIS will be issued, consistent with both state and federal environmental review process requirements.

2.5 PURPOSE AND NEED FOR PROPOSED ACTION

Project Purpose

The purpose of the Highway 60 project is to continue implementation of transportation system improvements in the corridor, by expanding the three remaining sections of two-lane roadway along Highway 60 between St. James and Windom to four lane divided highways.

Project Need

This section identifies key needs defined in the 1983-84 EIS process, and provides additional updated information regarding current needs identified in the study area, focusing on the three sections of Highway 60 where the 1984 Preferred Alternative has not yet been constructed.

The needs that resulted in initiation of the 1983 Highway 60 EIS included the following:

- Substandard Design Elements - *the existing highway corridor is characterized as having numerous design deficiencies (numerous no passing zones, hazardous intersection geometrics, deteriorating pavement and substandard land widths, shoulders, slopes and ditches) that create safety and mobility concerns.*
- Local and Regional Significance - principal arterial and regional and local connection
- System Linkages – four-lane roadway continuity
- Present and Projected Traffic Demand
- Safety - *over 450 crashes were reported along the study segment of Highway 60 between 1976-1979. Rural crash rates are highest in the Butterfield to St. James and Windom to Mountain Lake sections, particularly when considering the severity of the crashes*
- Modal Interrelationships – including freight
- Economic and Social Considerations – Agriculture, Economic Development, and Community Service Needs

In order to address the project needs, the original Final EIS (1983) identified a preferred alternative that would reconstruct Highway 60 on new and existing alignment from St. James to Worthington. The 1983 FEIS also acknowledged that due to funding and practical limitations that the entire 52-mile improvements could not be completed in a single, all inclusive construction effort. Therefore, the construction was proposed to be staged over a period of years, contingent on funding availability, with the initial stages providing two-lane reconstruction to modern highway standards and subsequent stages providing dualization of the travel lanes to a four-lane expressway. The initial two-lane design was to be fully compatible with the future four-lane design.

Over the past 25 years, numerous transportation system improvements have been made to Highway 60. In fact, the entire 52-mile study area has been upgraded to modern highway design standards and much of the study area has been expanded to a four-lane expressway. Only the three gap segments (East, Middle, and West Gaps) described in Section 2.1. remain as two-lane highway sections. The remainder of this purpose and need section documents the continued needs for transportation system improvements within the three gap segments. The need components discussed below have not changed substantially from those stated in the original EIS, but have been refined to

provide updated information regarding the current needs of the highway corridor.

Current Highway 60 Corridor Needs

Corridor Role in the Transportation System – Policies and Priorities

Interregional Corridor (IRC) System

In January 2000, MnDOT adopted an IRC System as part of the State Transportation Plan. According to IRC policies, the primary goal of the system is to "enhance the economic vitality of the state by providing safe, timely, and efficient movement of goods and people. The IRC System connects the 50 largest regional trade centers in Minnesota with each other and with neighboring states and Canada. Efficient connections provide competitive access to markets and services and facilitate recreational travel. Corridor performance goals are identified in the IRC document. Improvements should be directed at "maintaining performance, mitigating or halting performance degradation, or improving corridor performance".

Highway 60 has been designated as a Medium Priority IRC, which acknowledges the importance of Highway 60 as an interregional connection. As a Medium Priority IRC, Highway 60 has a minimum corridor performance speed target of 55 mph, which it currently meets.

Significant Freight Corridor

The IRC designation is indicative of the importance of this corridor for agricultural and commercial traffic. In fact, the Southwest Minnesota Regional Freight Study Final Report (September 2007) recognized Highway 60 as a "A Significant Freight Corridor" that serves as a Minneapolis-to-Omaha truck route, which has a very high concentration of ethanol plants and major grain elevators located in close proximity to the transportation corridor. Highway 60 is considered such an important freight corridor because it connects producers and markets both in the intra-state, inter-state, and international transportation system. As a result, there has been a heightened demand to maintain mobility along the corridor to accommodate growing freight traffic. Existing heavy commercial average daily traffic on this portion of Highway 60 is approximately 16 to 17 percent of the total daily traffic and the seasonal peaks during the spring and fall are even higher.

Enhance System Continuity

As stated in the 1983 FEIS/1984 ROD, the vision and preferred alternative for the Highway 60 corridor was a continuous four-lane expressway section. Upon completion of the programmed two- to four-lane reconstruction of Highway 60 from the Iowa state line to I-90, the three identified gap segments between St. James and Windom will be the only non-four lane sections of Highway 60 between Sioux City, IA and Mankato, MN. Construction is currently underway for the segment of Highway 60 between I-90 and the Iowa state line, as a four-lane divided expressway. Enhancing system continuity on Highway 60 would:

- Provide a logical, safe, and predictable system for highway users. A detailed discussion on the need to improve travel safety is provided in the next section.
- Maintain mobility to address growing freight traffic. According to the Southwest Minnesota Freight Study (2007), regional freight traffic is substantially outpacing that of Minnesota and the U.S. and if current trends persist could grow by 200 percent by 2030. Furthermore, the use of large farm equipment, including 5-axle semi-tractor trailers, is increasing.

Safety

The Transportation Commissioner at MnDOT has recognized the need to look at the design continuity of four- to two-lane sections statewide and develop a comprehensive approach for addressing safety concerns. This includes reviewing crash history, traffic volumes and interregional connectivity to identify needs and the potential for immediate safety enhancements. Crash data for the three Highway 60 gap segments for the years 2000 to 2009 was obtained through the Minnesota Crash Mapping Analysis Tool (MnCMAT). The 10-year crash history was reviewed and is presented in Table 4.

Table 4– Crash Type Summary (2000 – 2009)

Location	Type of Crashes											
	Rear End	Sideswipe Same Direction	Left Turn	Run-off Road Left Side	Right Angle	Right Turn	Run-off Road Right Side	Head On	Sideswipe Opposing Side	Collision with Deer	Other or Unknown	Total
East Gap	7	2	0	8	1	0	11	1	3	10	6	49
Middle Gap	5	3	0	7	3	0	9	3	5	16	8	59
West Gap	12	6	0	7	8	0	11	4	3	14	11	76
Totals	24	11	0	22	12	0	31	8	11	40	25	184

	Crash Rates				
	Average ADT	10-Year Crash Rate per MVM	10-Year Severity Rate per MVM	MnDOT D7 Crash Rate	MnDOT D7 Average Severity Rate
East Gap	4,500	0.55	0.71	0.7	1.0
Middle Gap	4,500	0.73	1.02	0.7	1.0
West Gap	5,200	0.52	0.89	0.6	1.0

For the 10-year study period, there were 184 crashes along the Highway 60 gap segments. The types and locations of crashes within each gap were reviewed. Nearly 40 percent of the crashes were higher severity crashes like head on, ran-off-road, and sideswipe opposite direction incidents. Furthermore, six fatal crashes occurred within the reporting period of which three were head on crashes, two were right angle crashes, and one was the result of a rear end crash. The crash rate per million vehicle miles (MVM) and severity rate per MVM were calculated for each segment, and these rates were compared to average rates for similar roadways in MnDOT District 7 (see Table 4). The crash rate and severity rate for the East and West gaps were found to be below the District 7

average rates, while the crash rate and severity rate for the Middle Gap were above the District 7 average rates.

The crash location review indicated crashes along the gap segments were not concentrated at any particular location(s), which indicates that spot safety improvements may not be effective.

As a result of a 2008 Public Outreach meeting held in Windom, MnDOT became further aware of the public's safety concerns along the three gap segments of Highway 60. Personal accounts of "near misses" were shared by dozens of meeting attendees including reports of several occasions where vehicles were observed traveling in the wrong direction on a four-lane section that occurs either between or following two-lane highway sections. The public also expressed concern that the changes between two-lane and four-lane sections create high risk situations because they can be confusing to non-local drivers that may be anticipating a continuous highway section.

Due to the slower operating characteristics of heavy commercial vehicles, the high percentage of truck traffic on Highway 60 can have a substantial impact on traffic operations and safety along the highway corridor as well as inhibit on-time delivery of agricultural goods. Road safety around the operation of heavy trucks is an important consideration for the project. As documented in the September 2007 Freight Study, business operators noted safety issues for heavy commercial truck operators associated with two-lane to four lane highway transitions.

Another safety concern is within areas where the highway has already been constructed as a rural four-lane divided section with a center grass median. The past improvements were completed using a 75-foot centerline spacing, which at intersections does not always provide for sufficient length for large trucks and modern farm equipment to take refuge in the center when trying to cross or turn left onto the highway.

Additional Considerations

In addition to the project needs listed above, the following issues have been identified as important to consider in the development and evaluation of alternatives for TH 60 improvements.

Social Demand – Public Input Regarding Transportation Priorities

MnDOT District 7 has benefited from an active and informed set of stakeholders from a variety of sectors, including farming, business, education, and government, as well as the interested public. For many years, District 7 has been working with these stakeholders in making improvements to IRC routes (US 169, US 14, and TH 60) and other trunk highways.

Local concerns expressed by the public and elected officials (city/county representatives and area legislators) regarding Highway 60 have played a key part in defining MnDOT's investment priorities. As part of the 2009 Minnesota Statewide Transportation Policy Plan Update, MnDOT District 7 updated its 20-

year highway investment plan[1]. The 20-year highway investment plan provides the link between the policies and strategies established in the Statewide Transportation Policy Plan and the capital improvements that are made to the state highway system. As part of this planning process, Regional and Community Improvement Priorities (RCIPs) are developed that represent system improvements identified by the District and regional or local communities and business groups as desirable and supportive of business or community development. District 7 compiled a list of improvements that reflects their understanding of regional and community priorities heard from stakeholders over the last five to ten years; the Windom to St. James section of Highway 60 was identified as a RCIP. These RCIPs were used by MnDOT during the process of updating the highway investment plan. The MnDOT District 7 highway investment plan, as endorsed by the MnDOT Transportation Commissioner, is a guide for future capital investments in the state trunk highway system for southwestern and south central Minnesota and includes transportation improvements within the three gap segments of Highway 60.

Because many improvements have been made on Highway 60 over the past 25 years, statewide performance targets are being met. Therefore further mobility improvements are not identified as needs solely based on performance measures. However, the local partners and stakeholders in the Highway 60 corridor still view the need for additional improvements to the corridor as a regional priority.

The Statewide Transportation Policy Plan/District Highway Investment Plan Outreach meetings held in 2008 captured substantial input from the public and local elected officials insisting that additional Highway 60 improvements be completed, including completion of the four-lane corridor concept envisioned in the 1983-4 EIS.

Access Management Policies

Access management is an effort to maintain the effective flow of traffic on a roadway so that it can provide its functional duties while accommodating access needs of adjacent land. Successful access management requires cooperation between land development and transportation interests in order to protect the public's investment in roads.

There is a direct correlation to the amount of access provided and the ability to move traffic safely and efficiently along a roadway. Higher levels of access reduce a roadways ability to move through-traffic. Principal arterials (e.g. Highway 60) have a high mobility function and therefore should have low levels of access. Furthermore, there is a direct relationship between increased levels of access and increased crash rates.

MnDOT's policy for Access Management on the trunk highway system is set forth in the MnDOT Access Management Manual, January 2008. As a "medium priority" IRC Highway 60 falls under Access Categories 2A and 2B (see Table 5). These subcategories are intended to manage access by recommending spacing

[1] Mn/DOT District 7 20-Year Highway Investment Plan 2009-2028, (August 2009).

guidelines for public street intersections, signal systems, and private driveways. Any future improvements to Highway 60 need to consider the IRC access guidelines.

Table 5 – Medium Priority IRC Category 2A & 2B Guidelines

MnDOT Access Category	Area or Facility Type	Intersection Spacing		Private Access
		Primary Full Movement Intersection	Conditional Secondary Intersection	
2A	Rural (Not Planned For Full Access Control)	1 mile	½ mile	Direct access to homes and farms should be provided by local roads when possible. When that is not possible, limited direct property access may be permitted.
2B	Urban/ Urbanizing	½ mile	¼ mile	Direct access to homes and businesses should be provided from the local supporting street network, and not from the state highway.

Source: MnDOT Access Management Manual

Environmental Concerns

While the three gap segments consist primarily of rural land use with limited development a number of important environmental factors were considered in the development and screening of alternatives. These include:

- Clear Lake: the existing Highway 60 corridor passes between the south shoreline of Clear Lake and the Union Pacific Railroad corridor. Any proposed improvements in this area need to address potential impacts on the lake and consider potential avoidance and/or minimization options.
- Site Contamination: an existing auto salvage business is located immediately north of the Highway 60 corridor in the community of Bingham Lake. Any proposed improvements in this area need to consider the potential liability of encountering contaminated soils and/or groundwater and consider potential avoidance and/or minimization options.
- Prairie Remnants: the Union Pacific Railroad corridor parallels the Highway 60 alignment through much of the project length. Several prairie remnants have been identified within and immediately adjacent to the railroad and highway right-of-way. Any proposed improvements should consider potential impacts on these areas and consider potential avoidance and/or minimization options.
- Water Resources: large areas of the landscape in rural southwestern Minnesota are characterized by agricultural production, which in some cases has resulted from the installation of artificial drainage systems (field tiling). However, several small to medium sized wetlands and lakes still exist and are found scattered throughout the project area. Any proposed improvements in the project area need to consider potential impacts on these water resources and consider potential avoidance and/or minimization options.

3.0 ALTERNATIVES

The environmental review process completed in the 1980's investigated several alternatives for improving Highway 60 between St. James and Worthington. A scoping process was used to identify preliminary alternatives, from which the most reasonable and practicable alternatives were selected for detailed study in the Draft EIS (approved in 1982). The Final EIS (approved in 1983) identified the preferred alternative which included expanding Highway 60 on its original alignment with the exception of several short realignments and community bypasses. The 1984 Record of Decision further describes the Highway 60 preferred alternative between St. James and Worthington. Electronic copies of all three documents are included on the CD-ROM provided with this SFEIS.

This Highway 60 SFEIS considers only the East Gap, Middle Gap, and West Gap segments of Highway 60 (see Figure 1 on page 3), as the remainder of Highway 60, including four-lane highway bypasses of St. James, Butterfield, and Mountain Lake have already been constructed.

3.1 ALTERNATIVES UNDER CONSIDERATION IN THIS SFEIS

Alternative 1 - No-Build Alternative

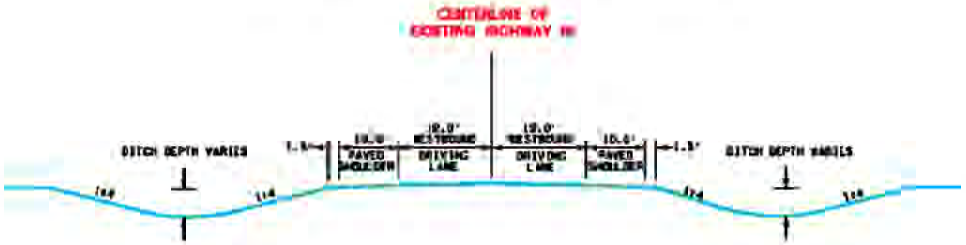
The No Build Alternative was not selected in the 1984 ROD for reasons of safety for motorists, local circulation, and roadway deficiencies. In accordance with federal and state regulations, the No-Build Alternative will be retained throughout the SFEIS analysis process even though it does not meet the current project purpose and need.

Alternative 2 - Build Alternative

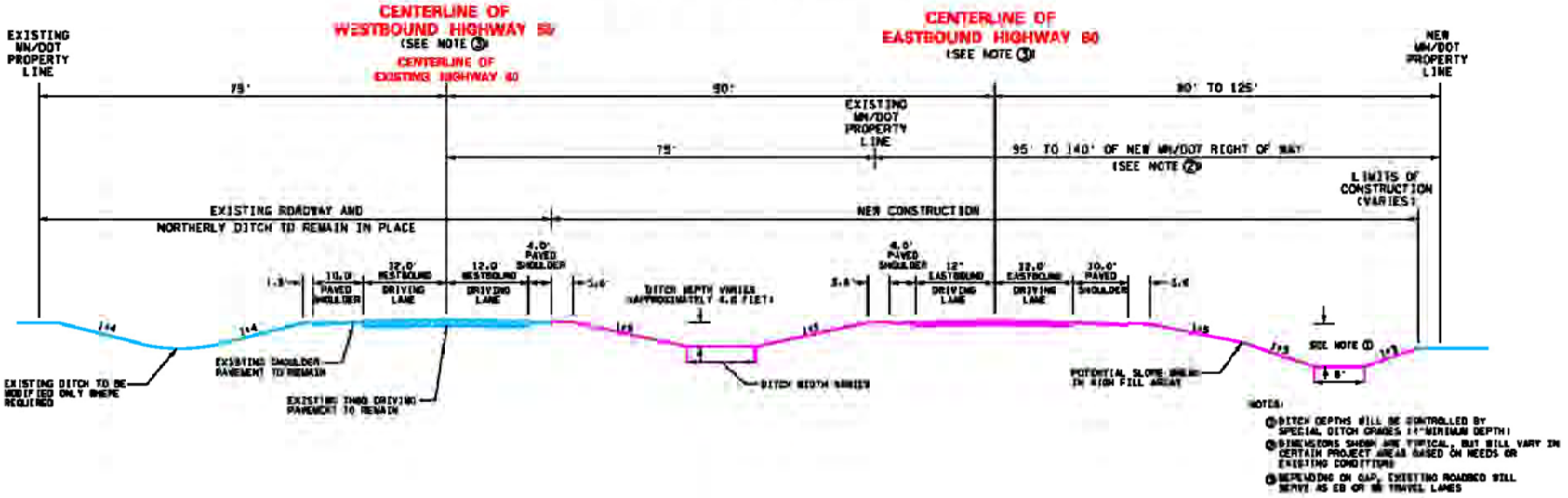
Much of the preferred alternative from the 1983 Highway 60 FEIS has been constructed and only three gaps remain that are subject to re-evaluation in this SFEIS. Following the completion of this SFEIS process, it is the intention of MnDOT to initiate the construction of the East Gap improvements. The expansion of Highway 60 within the East Gap is scheduled to begin construction in 2013. Appendix A contains conceptual layout figures that illustrate the proposed highway improvements.

The four lane highway will be completed by constructing two lanes adjacent to the existing highway with 90 feet between centerlines. A 70 mph design speed will be used for designing the improvements and a 65 mph posted speed is anticipated to match the posted speeds on existing four-lanes section of Highway 60. Figure 2 on the following page illustrates a typical highway section that will be used in the East, Middle, and West Gaps, whenever possible. Exceptions to the typical section may occur due to environmental constraints (e.g. Clear Lake) that reduce the centerline spacing or at certain high volume intersections (e.g. Cottonwood County Road 2) where a greater centerline spacing may be required.

EXISTING 2-LANE HIGHWAY 60



PROPOSED 4-LANE DIVIDED HIGHWAY 60



DATE: 6/21/2011	MINNESOTA DEPARTMENT OF TRANSPORTATION T.H. 60 FROM WINDOM TO ST. JAMES	BUILD ALTERNATIVE	TYPICAL SECTIONS	FIGURE 2

The typical 90 foot spacing is a design change from the 1984 ROD where a centerline spacing of 75 feet was proposed. This increased width in the roadway typical section is proposed to enhance safety, especially for farm equipment which is larger (5-axle semi-tractor trailers) today than when the original EIS was prepared. The wider median also provides a safer refuge when crossing Highway 60. The wider median also improves surface water drainage capacity. However, the wider median does create the potential for increase impacts. Section 4.0 of this Draft SFEIS discusses the anticipated social, economic, and environmental effects of the Build Alternative.

Intersections are proposed to be at-grade with two way stops on the intersecting local roads. Left and right turn lanes will be provided at all public roads. At non-public road median crossovers, left turn lanes will be constructed. Other improvements include minor reconstruction of cross street intersections and access/driveway modifications. In several areas, access modifications have been proposed that will shift access from Highway 60 to a local (county/township) road or will realign access points across from one another to reduce the number of median breaks along Highway 60. These access changes were considered reasonable if the new/realigned access point was less than ¼-mile from a local roadway and/or intersection.

East Gap

The east termini of the East Gap is a point where the existing four-lane bypass of St. James tapers to a two-lane section southwest of St. James. The west termini of the East Gap is located at the eastern edge of the four-lane bypass of Butterfield. The length of the East Gap is approximately 5.3 miles.

The East Gap includes the construction of two additional travel lanes immediately south of the existing alignment. The existing roadway would serve westbound traffic and the new lanes would serve eastbound traffic. An additional overpass bridge of the Union Pacific rail line near Butterfield will also be constructed.

Middle Gap

The east termini of the Middle Gap is a point where the existing four-lane bypass of Butterfield tapers to a two-lane section located approximately 900-feet west of Watonwan County Road 102. The west termini of the Middle Gap is located at the east end of the four-lane bypass south of Mountain Lake. The Middle Gap extends approximately 4.2 miles.

The Middle Gap includes the construction of two additional travel lanes immediately south of the existing alignment. The existing roadway would serve westbound traffic, while the new lanes would serve eastbound traffic. The social, economic, and environmental analysis completed for the Middle Gap (see Section 4.0) is based on preliminary right-of-way limits.

West Gap

The east termini of the West Gap begins where the existing four-lane bypass of Mountain Lake tapers to a two-lane section approximately 750-feet west of Cottonwood County Road 47/560th Avenue. The west termini of the West Gap is

located at the northeastern edge of Windom near the intersection of John Caldwell Drive. The length of the West Gap is approximately 7.5 miles.

The West Gap includes a single alignment with the exception of two areas where design options are being considered to minimize potential social and environmental impacts. The West Gap includes the construction of two additional travel lanes immediately north of the existing alignment. The existing roadway would serve eastbound traffic, while the new lanes would serve westbound traffic. The two areas where design options are being considered are discussed below. The identification of the preferred design options will occur following the public/agency comment period on this Draft SFEIS. The Final SFEIS will describe the reasons for identifying the preferred options and will disclose all potential impacts of the preferred alternative.

Bingham Lake Area

The Bingham Lake Area is located in the West Gap within the City of Bingham Lake. This area includes three design options for expanding Highway 60 to a four-lane section. These options are being considered to minimize potential impacts to existing commercial developments.

1. "Widen to the South on Existing Alignment" – This design option would construct a new set of travel lanes immediately south of the existing alignment (the existing Highway 60 would serve westbound traffic and the new lanes would serve eastbound traffic);
2. "Widen to the North on Existing Alignment" – This design option would construct a new set of travel lanes immediately north of the existing alignment (the existing Highway 60 would serve eastbound traffic and the new lanes would serve westbound traffic); and
3. "North Bypass" – This design option would construct a new four-lane alignment section approximately 400- to 800-feet north of existing Highway 60. This design option would begin at approximately Cottonwood County Road 2 on the west and extend east to a point just west of the Highway 60 crossing over Cottonwood County Judicial Ditch No. 2.

Clear Lake Area

The Clear Lake Area is located in the West Gap between the cities of Windom and Bingham Lake. The Clear Lake Area includes two design options for expanding Highway 60 to a four-lane divided section. These options are being considered to minimize direct impacts to the Clear Lake (17-8P) shoreline.

1. "Full 90-foot Centerline Spacing" – This design option would construct a new set of travel lanes immediately north of the existing alignment with a 90-foot centerline spacing where the existing Highway 60 roadbed would serve eastbound traffic and the new lanes would serve westbound traffic.
2. "Compressed Median" – This design option would construct a new set of travel lanes immediately north of the existing alignment with a compressed (approximately 46-foot centerline spacing) where the existing Highway 60 roadbed would serve eastbound traffic and the new

lanes would serve westbound traffic. This option would require the addition of a median barrier to separate the eastbound and westbound lanes.

The intersection of Cottonwood County Road 2 with Highway 60 occurs at the transition between the Bingham Lake Area and Clear Lake Area options. The alignment of the new lanes in this area will be either to the north or south, based on the Bingham Lake and Clear Lake options selected as well as a comparison of the cost effectiveness of expanding each way. In any case, the proposed design at this intersection will be 125 feet between centerlines on Highway 60 to allow trucks to wait comfortably in the median cross over. Following the identification of the preferred design options for the West Gap and as part of the final design phase, MnDOT will determine the appropriate intersection design and geometry that may include center acceleration lanes or a restricted crossing U-turn intersection (RCUT) design. Furthermore, 510th Avenue may be realigned to County Road 2 in order to consolidate intersections and route trucks headed to the POET bio-fuel facility to the widened intersection.

The social, economic, and environmental analysis completed for the West Gap (see Section 4.0) is based on preliminary right-of-way limits.

4.0 SOCIAL, ECONOMIC, AND ENVIRONMENTAL IMPACTS ANALYSIS

The purpose of this section is to present the anticipated social, economic, and/or environmental impacts associated with the three Highway 60 Gap Project build alternative(s) identified in Section 3.1.

4.1 WHAT ARE THE SOCIAL AND COMMUNITY IMPACTS?

Right-of-Way and Relocation

Affected Environment

The existing Highway 60 right-of-way in the areas of the three gaps ranges from approximately 150 feet to approximately 185 feet in some rural areas. The majority of the right-of-way corridor is 150 feet. Several existing developments (e.g. farmsteads, rural residential, commercial, etc.) are located throughout the study corridor. Higher density development is concentrated in the communities (St. James, Butterfield, Mountain Lake, Bingham Lake, and Windom).

Environmental Consequences

This evaluation was based on the potential right-of-way needs for each alternative. To the extent possible, the alternatives have been designed to utilize existing state and local government-owned right-of-way. The following guidelines were used in determining the right-of-way acquisition needs for the alternatives.

- Right-of-way acquisition was calculated by taking the total amount of land within the preliminary right-of-way corridor less any existing right-of-way.

- A typical 245 foot right-of-way corridor is proposed in the East Gap and a 290 foot right-of-way is proposed for the Middle and West Gap, except for the compressed highway section near Clear Lake. The wider distance is to allow for future relocation of the existing lanes farther from the railroad right of way if the need is identified in further design efforts.
- A 100-foot right-of-way corridor was assumed for all new/reconstructed county roads, which is typical for new construction on county roads in Cottonwood and Watonwan Counties.

Alternative 1 – No-Build

There would be no right-of-way acquisition required under the No-Build Alternative.

Alternative 2 – Build Alternative

East Gap, Middle Gap, and West Gap

All three gap Build Alternatives will require additional right-of-way to accommodate the proposed improvements. The amount of right-of-way needed is presented in Table 6.

Table 6– Potential Right-of-Way Acquisition

Alternative	Additional Right-of-Way Needed (acres)[1]
Alternative 1 – No-Build	0
East Gap Build Alternative	100.8 acres
Middle Gap Build Alternative	113.8 acres
West Gap Build Alternative – Common Areas	112.7 acres
Clear Lake – "Full" 90' centerline spacing	16.2 acres
Clear Lake – "Compressed" centerline spacing	14.1 acres
Bingham Lake – Expand Highway South of Existing	62.7 acres
Bingham Lake – Expand Highway North of Existing	43.6 acres
Bingham Lake – North Bypass Alignment	77.5 acres

[1] Right-of-way impacts are based on a preliminary right-of-way corridor and may change slightly once the preferred alternative is identified and additional design details are determined.

Relocation

Transportation improvements quite often require the relocation of residential, commercial, and farm properties. The acquisition of property is one of the most obvious impacts associated with highway construction. The number of properties impacted and, consequently, the total acquisition costs, varies with each alternative. The identification of potential relocations was completed by overlaying the proposed alignment onto aerial photographs. The right-of-way corridor widths noted above were used in the assessment of potential relocations. Properties where the required right-of-way impacts the building or requires a substantial portion of the lot were considered relocations. The results

of the estimated relocation assessment are presented in Table 7. Depending on the outcome of the right-of-way process, additional relocations may be considered if requested by the property owner and approved by MnDOT.

Table 7 – Highway 60 Gaps Project Relocations

Alternative	Number of Relocations		
	Residential	Commercial	Total
Alternative 1 – No-Build	0	0	0
East Gap Build Alternative	0	0	0
Middle Gap Build Alternative	0	0	0
West Gap Build Alternative – Common Areas	0	0	0
Clear Lake – "Full" 90' centerline spacing	0	0	0
Clear Lake – "Compressed" centerline spacing	0	0	0
Bingham Lake – Expand Highway South of Existing	0	3	3
Bingham Lake – Expand Highway North of Existing	0	1	1
Bingham Lake – North Bypass Alignment	0	1	1

Note: This table reflects the sum of potential relocations based on building sites that have structures that fall within the preliminary right-of-way corridor. Further avoidance measures could be considered during the final design phase of the preferred alternative that would further reduce the number of relocations.

As presented, there are potential relocations associated with the Build Alternatives. The assessment provides a worst case scenario and, to the extent practical, attempts will be made to limit relocation impacts through design measures, such as minor alignment shifts.

Business displacement under the West Gap Build Alternatives ranges from 1 to 3 potential relocations. These properties include a restaurant, ethanol accessory building, salvage yard, and excavating business. The total number of employees at these businesses is estimated to be relatively small (less than 25). The business operations noted are presently on sites that offer good highway access and visibility. A comparison of the characteristics of the sites to be acquired and the various existing commercial zoning districts indicate that there is a good chance of finding suitable replacement sites for these businesses. It is expected these businesses would be able to find new locations within the Highway 60 corridor. However, the distance from the highway, type of access and visibility may be somewhat different from their existing conditions.

An analysis of the real estate market in the project area was conducted to gain a preliminary understanding of the market's ability to absorb the relocations associated with construction of the preferred alternative. The research indicated as of May 2011, there were approximately 20 existing residential, farmstead, business, and vacant land listings for sale listed through the Online Multiple Listing Service (OMLS) in the following cities and townships:

- Cities – Bingham Lake, Butterfield, Mountain Lake, St. James, Windom.
- Townships – Butterfield, Lakeside, Midway, Mountain Lake, St. James.

The median price of these listings was approximately $137,000. While the majority of the listings were for residential property, it is anticipated that replacement property is available within the area real estate market to accommodate any residential or commercial relocations from the proposed project.

Access Modifications

The majority of the project area can be characterized as agricultural and a rural residential setting. Concern has been expressed about direct access to farmsteads and farm properties adjacent to the highway. As part of this improvement, access changes to rural building sites and farmland will be proposed in areas to improve safety and operations along the highway corridor. In some cases, direct access will be removed from the highway and redirected to a cross street (county or township road), while in other cases an access point may be restricted to right-in/right-out movements.

Typically, a residence within about 1,000 feet of a local road will have its access realigned to the local roadway. Also, field entrances will only be allowed where access from a side road is not available or the field is especially long such that hauling harvested grain through the field would be operationally difficult. Field entrances will only be allowed as right-in/right-out unless they are across from a residential entrance. In all cases, MnDOT will work with the affected property owners during the final design phase to ensure reasonable access to building sites and farm fields is provided.

Mitigation

Following the identification of a preferred alternative the design phase will continue efforts to minimize right-of-way and relocation impacts.

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and 49 CFR Part 24 provide that assistance be granted to persons, businesses, farms, and non-profit organizations that may be displaced by public improvements, such as this highway project.

MnDOT will provide relocation assistance for persons displaced by the project without discrimination. Advisors are available to explain relocation details, policies, and procedures with potentially displaced individuals. The advisors will work with a displacee in locating comparable replacement property and will work directly with property occupants to assist with their specific relocation plans.

Residential displacees are entitled to advisory services and the reimbursement of some of the costs associated with relocation. These may include moving expenses, replacement housing costs, increased rental or mortgage payments, closing costs, and other valid relocation costs. The replacement dwelling to which a displacee relocates must be “decent, safe, and sanitary”, meaning it must meet all the minimum requirements established by federal regulations and conform to all housing and occupancy codes.

While not expected for the Highway 60 Gaps Project, Last Resort Housing provisions can be implemented to ensure that comparable replacement housing

is available to any displacee. These provisions may include increased replacement housing payments or other alternate methods based on reasonable costs.

Relocation assistance will also be made available to businesses, farms, and non-profit organizations. In addition to advisory services, payment may be made for certain expenses pertaining to:

- Moving Costs
- Loss of tangible personal property as a result of relocation or discontinuance of a business
- Eligible reestablishment expenses
- Eligible costs incurred in searching for a replacement site
- Fixed payment in lieu of moving and reestablishment costs

Economic Environment

Affected Environment

The economies of Cottonwood County and Watonwan County are led primarily by the manufacturing, education/health/social services, and agricultural/natural resources/mining industries. Also, Government is a large employment sector in the two counties.

Cottonwood County is included in the state's Economic Development Region 9 (Southwest), while Watonwan County is located in Region 10 (South Central). According to the Minnesota Department of Employment and Economic Development's Regional Analysis & Outreach Unit, since April 2009 unemployment rates have been lower in southwest Minnesota than any other region in Minnesota, steadily about 1 percent below the state rate and about 2 percent lower than the national rate.

The project area served by Highway 60 is predominantly a manufacturing and agriculturally based economy. The cities of Bingham Lake, Mountain Lake, and Butterfield are communities that are surrounded by farmland and primarily consist of service businesses and agricultural industries. Ethanol production along the Highway 60 corridor conveys substantial net economic benefits in terms of economic diversification, job growth, and improved economic environments.

Business establishments located adjacent to the highway are primarily concentrated in the downtown districts of the communities. Businesses in the project corridor include, but are not limited to, restaurants, convenience stores/gas stations, specialty shops, and agri-business establishments, light industrial/manufacturing businesses, and other service-oriented and professional businesses.

Economic Consequences

Economic impacts (beneficial and adverse) are an inevitable result of highway construction. These impacts involve different sources, including the tax revenue loss to the communities, school districts, and counties as a result of property acquisitions. Other economic effects are associated with project construction,

which may include losses in revenue due to temporary changes in access to commercial establishments.

Highway improvements can create impacts on the economy at both the regional and local levels. At the regional level, the impacts relate to the relative accessibility of the area within the region, state, and nation and the ease of transporting both goods and persons to/from or within these areas. At the local level, highway improvements can impact the viability of individual businesses through location changes, right-of-way acquisitions, or modifications in property access. This in turn may impact employment opportunities at affected areas. Short-term economic benefits can also occur from roadway construction. Beneficial effects can include the purchase of supplies and construction materials and payment of skilled labor over the course of one or more construction seasons. The sale of local goods and services to construction workers from outside the community is also a short-term economic benefit.

Highway 60 serves as an important element of the transportation infrastructure system at both the regional and local level. Regionally, the highway functions as a medium priority interregional corridor and provides a vital link between the regional trade centers of Worthington, Mankato, the Twin Cities (via Highway 169), and Sioux City, Iowa (via Highway 75). Regionally, Highway 60 connects citizens and communities to jobs, retail centers, and recreational destinations.

This segment of Highway 60 has a relatively high percentage of regional truck traffic (16-17 percent), which is expected to increase in the future.

Alternative 1 – No-Build

The No-Build Alternative is not expected to pose any short-term negative impacts on the regional economy. The No-Build Alternative would maintain Highway 60 as it currently exists and would provide for the retention of all existing businesses along the highway in their present locations. Also, no current employees would be displaced because no business relocations would be necessary.

It is not possible to quantify the level to which the No-Build Alternative might affect long-term development potential. However, it is possible the No-Build Alternative may have an adverse effect on the local economy over time as traffic levels increase on Highway 60, which is an important link between regional trade centers, for movements within southwestern Minnesota and for access to existing nearby businesses. Commercial, industrial/manufacturing, and residential growth are expected to continue to occur in the project area, but some potential development may locate to another portions of the region or state if regional highway access and mobility were more favorable.

The current property tax base would not be directly affected under the No-Build Alternative because no additional right-of-way would be required.

Alternative 2 – Build Alternative

East Gap, Middle Gap, and West Gap

Reconstructing the existing alignment as a four-lane divided highway section through the Highway 60 Gaps area is not expected to pose any adverse economic impacts on the regional economy. A four-lane highway will improve the capacity of the roadway and accessibility of the area on a regional and statewide basis in terms of decreased travel times and improved safety, which would contribute toward maintaining a positive economic climate for regional growth.

The Build Alternative(s) for the East Gap, Middle, Gap, and West Gaps have the potential to result in beneficial and adverse local economic impacts to the existing businesses and communities in the project area. Adverse economic impacts associated with the proposed improvements in the three gap segments include potential temporary business access impacts during construction and the potential loss of property taxes through right-of-way acquisitions. Property tax loss may be offset through increased land value after the roadway improvement is completed.

The West Gap includes three design options in Bingham Lake that will result in varying levels of local economic impacts. The design option that proposes widening the highway to the south of the existing highway would potentially require the acquisition of three commercial properties (restaurant, ethanol accessory building, and excavating business). The option that widens to the north of the existing highway would impact an automobile salvage business and the option that relocates the highway on a new northern alignment would potentially impact one commercial property that previously contained several storage/accessory building, but appears to be vacant at this time. If these businesses decide to relocate within the project area, the impact would only be temporary.

Overall, the improvements in regional accessibility and safety should contribute toward maintaining a positive local economic climate for growth within the communities in the project area. Long-term positive economic effects may include new opportunities for local businesses, industry, and associated increases in jobs, sales, and consumer savings related to savings in transportation costs.

Mitigation

Relocation assistance is provided to businesses that need to be acquired. Potential temporary business access impacts during construction will be mitigated by minimizing detours and through the use of signage directing customers to businesses. No other economic mitigation measures are proposed.

Traffic Assessment

Summary of Existing Traffic Conditions

The existing (2010) average annual daily traffic (AADT) volumes along Highway 60 between St. James and Windom ranges from 4,850 in the east and middle gaps to 5,400 in the west gap near Windom. Localized traffic volumes on

Highway 60 are slightly higher in the communities located along the corridor including St. James, Butterfield, Mountain Lake, Bingham Lake, and Windom.

Existing heavy commercial average daily traffic on this portion of Highway 60 is approximately 16 to 17 percent of the total daily traffic and the seasonal peaks during the spring and fall are even higher. These segments of Highway 60 are also used routinely by farm operators for transporting heavy farm machinery to access points adjacent to the highway right-of-way and for traveling between farm fields on the north and south sides of the highway.

Summary of Forecast (Year 2033) Traffic Conditions

The forecast year for the Highway 60 project improvements is 2033. Based on historic trends within the region, the MnDOT District Traffic Engineer recommended a 1.3 percent per year annual growth rate be applied to existing (2010) traffic volumes to determine 2013 and 2033 traffic forecasts. The 2013 and 2033 AADT forecasts, as well as the existing AADT for the three segments of Highway 60 are shown in Table 8.

Table 8 – Existing and Forecast AADT for TH 60 Segments

Highway 60 Segments	Annual Average Daily Traffic (AADT)			
	1982 Draft EIS (1980 volume)	2010	2013	2033
East Segment - St. James to Butterfield	2,800-3,000	4,850	5,050	6,500
Middle Segment - Butterfield to Mountain Lake	3,200-3,300	4,850	5,050	6,500
West Segment - Mountain Lake to Windom	3,600-4,000	5,400	5,600	7,300

The vehicle miles traveled (VMT) for the Build Alternative is estimated to be higher than the No-Build Alternative (Alternative 1), because the additional capacity of the four-lane highway will increase efficiency and safety of the roadway therefore, would likely attract trips from alternative routes (county and township roads) within the transportation network.

Safety and Crashes

As discussed in Section 2.5 Need for the Proposed Action, an objective of the project is to improve the safety of the Highway 60 corridor. Over a ten-year period (2000-2009), the three segments of Highway 60 had 184 reported crashes (see Table 5 in Section 2.5), and nearly 40 percent of the crashes were higher severity crashes like head on, ran-off-road, and sideswipe opposite direction incidents. Furthermore, six fatal crashes occurred within the reporting period of which three were head on crashes, two were right angle crashes, and one was the result of a rear end crash.

Based on a review of the location of crashes along the three gaps on Highway 60 between St. James and Windom, it was determined that the crashes are distributed throughout the corridor and not concentrated at any particular location (specific intersections, curves, etc.), which indicates that spot safety improvements may not be effective.

Alternative 1- No-Build

While the two-lane section is able to handle the existing and forecast traffic adequately, the safety conditions under the No-Build Alternative are anticipated to decline resulting in the frequency and severity of crashes increasing as traffic volumes grow along the highway corridor. Furthermore, potential conflicts between farm machinery and vehicles would remain a safety concern.

Alternative 2 – Build Alternative

East Gap, Middle Gap, and West Gap

As discussed in Section 2.5 of this document, converting the three remaining segments of Highway 60 to a continuous four-lane divided rural section would accommodate future traffic volumes adequately and is expected to reduce the number of higher severity crashes (head on, ran-off-road, and sideswipe opposite direction incidents) that are more typical with a two-lane highway. Also, Highway 60 has been designated as a Medium Priority IRC, which acknowledges the highway's importance as an interregional connection. As a Medium Priority IRC, Highway 60 has a minimum corridor performance speed target of 55 mph, which it currently meets in part because the majority of the corridor serves travelers with four-lane, divided access and a 60 mile per hour (mph) speed limit. The completion of a continuous four-lane section along Highway 60 will provide a logical, safe, and predictable system for highway users.

Benefit-Cost Analysis

A benefit/cost analysis (B/C analysis) was completed for the proposed project in June 2011. The purpose of a benefit/cost analysis (B/C analysis) is to bring all of the direct effects of a transportation investment into a common measure (dollars), and to allow for the fact that benefits accrue over a long period of time while costs are incurred primarily in the initial years of the project. The primary elements that can be monetized for transportation projects are travel time, vehicle operating costs, crash costs, and remaining capital value. Projects are considered cost effective if the B/C ratio is greater than 1.0. The B/C Analysis can provide an indication of the economic desirability of an alternative, but results must be weighted by decision-makers along with the assessment of other effects and impacts. The B/C Analysis that was completed for this project evaluated the difference in transportation user costs against the No-Build Alternative and indicated that the Build Alternative(s) would result in a B/C ratio of 1.36 (existing alignment with widening to the north through Bingham Lake), 1.45 (existing alignment with widening to the south through Bingham Lake), and 1.40 (existing alignment with Bingham Lake north bypass alignment). Details are provided in the B/C Memorandum, which is included on the CD-ROM included with this Draft SFEIS document or is available for review by contacting the MnDOT contact listed on the signature page of this document.

Social and Community Environment

Affected Environment

Population

Between 2000 and 2010, Cottonwood County, Watonwan County and the cities of Bingham Lake and St. James experienced decreases in population, while the cities of Butterfield, Mountain Lake, and Windom experienced slight increases in population (see Table 9). The largest decline was in Watonwan County, which had a population decrease of 5.6 percent. The largest increase was in the City of Butterfield with a 3.9 percent increase in population. While these most recent population changes result in both percentage increases and decreases, the total population change for these areas between 2000 and 2010 was a decrease of approximately 1,100 people (-3.0 percent). Although population has declined for the past several decades, the amount of traffic on Highway 60 has increased as previously shown in Table 8.

A similar trend in population decline in southwestern Minnesota was documented in the 1982 Draft EIS that showed the population in both Cottonwood and Watonwan Counties declining between 1970 and 1980 (see the included CD-ROM for a copy of the 1982 Draft EIS, which contains population data in Table 16 of the original EIS).

Table 9 – Population and Percent Change

Jurisdiction	1990 Population	2000 Population	2010 Population	% Change 2000-2010
City of Bingham Lake	155	167	126	-24.6
City of Butterfield	509	564	586	3.9
City of Mountain Lake	1,906	2,082	2,104	1.1
City of St. James	4,364	4,695	4,605	-1.9
City of Windom	4,283	4,490	4,646	3.5
Cottonwood County	12,694	12,167	11,687	-3.9
Watonwan County	11,682	11,876	11,211	-5.6

Source: United States Census Bureau.

Community Resources

There are no community resources (e.g. churches, schools, cemeteries, libraries, etc) located in the immediate project area. These resources are found within the communities of St. James, Butterfield, Mountain Lake, Bingham Lake, and Windom.

Environmental Consequences

Alternative 1 – No-Build

Under Alternative 1, none of the existing community resources would be directly affected. This alternative would maintain the existing two-lane highway alignment and, therefore, would not create any direct effects.

Alternative 2 – Build Alternative

East Gap, Middle Gap, and West Gap

No direct impacts to community resources are anticipated since no facilities are located in the immediate project area of the build alternative being considered in the three gap segments.

Mitigation

No mitigation is required since no anticipated directs effects occur as a result of the Build Alternative.

Land Use

Affected Environment

The project area lies within two counties (Cottonwood and Watonwan) and five municipalities (St. James, Butterfield, Mountain Lake, Bingham Lake, and Windom). This area of southwestern Minnesota is renowned for its agricultural production. The portions of the project area outside the urban areas are primarily rural in nature with farmlands, woodlands, open space, and isolated single-family residential.

Environmental Consequences

The purpose of this section is to summarize the compatibility of the proposed transportation improvements with existing and future land use plans. Potential impacts to the built and natural environment as they relate to land use can be found throughout the social, economic, and environmental impact sections, such as Right-of-Way and Relocation, Vegetation, Wetlands, Economics, Social and Community Impacts, Farmlands, and several others.

Consistency and Compatibility With Existing Land Use Plans

The affected communities and counties have long been planning for the completion of the four-lane highway section, including a reference in the Cottonwood County Comprehensive Plan that identifies Highway 60 as being expanded to a continuous four-lane section throughout the county.

The original FEIS (1983) identified the preferred alternative, which included a vision for a continuous four-lane expressway and subsequent improvements have modified the highway alignment and/or improved the roadway to modern design standards. Based on the importance of Highway 60 to the region and affected communities, the proposed build alternative(s) for the three gap segments are consistent and compatible with existing land use plans.

Mitigation

Controlling potential land use changes that occur following implementation of the proposed improvements would be accomplished primarily through local government zoning authority and through highway access management. MnDOT has already coordinated with local units of government regarding the project and further discussions will occur to discuss land use and transportation planning efforts and any mitigation commitments. Mitigation commitments, if needed,

may include land use plan and zoning map modifications made by local governments. Furthermore, MnDOT encourages cities in the project area to use smart growth techniques and innovative best management practices for stormwater, such as those listed on the NEPA Stormwater Green Sheet, prepared by the Environmental Protection Agency.

Parks and Public Recreational Areas

Affected Environment

There are several parks and other public recreational areas in the Highway 60 study area. These resources include parklands, water resources, boat landings, hiking/walking trails, golf courses, and State Wildlife Management Areas (WMAs). The Carpenter WMA is located just northwest of Bingham Lake (north of Highway 60) along Cottonwood County Road 2. The site consists of 61 acres and offers hiking, hunting, and wildlife viewing opportunities.

Other recreational trails within and in close proximity to the project area are Department of Natural Resources (MNDNR) grant-in-aid snowmobile trails. According to the MNDNR Snowmobile Trail Map, the Cottonwood Trail (Trail #112) and Riverside Trail (Trail #217) are located within the project study area. These trails are generally used for recreational purposes only during winter months. The location of the trails can change as they require access easements through permission from property owners.

Environmental Consequences

Alternative 1 – No-Build

There would be no direct effects to parks and public recreational areas under the No-Build Alternative.

Alternative 2 – Build Alternative

East Gap, Middle Gap, and West Gap

There would be no direct effects (property acquisition) to parks and other public recreational areas under the build alternative. The Bingham Lake North Bypass Option would locate the highway corridor immediately south of the Carpenter WMA property, but not require any acquisition of property from the WMA.

The construction of a continuous four-lane highway may affect the current designated routes of grant-in-aid snowmobile trails (Cottonwood and Riverside Trail) since these trails parallel and/or cross over the highway in some locations. However, the route of these trails is fluid and dependent upon landowner agreements. Construction of the preferred alternative will not prohibit these trails and they will still be allowed to cross and parallel the highway corridor.

Mitigation

Further evaluation of potential impacts to snowmobile trails will be completed during final design and coordination with the MNDNR and other local snowmobile organizations may need to occur to ensure safety conditions for motorist and

snowmobile riders is maintained as a result of any changes to the design of the highway and trail alignments/crossing.

Section 4(f) and Section 6(f) Properties

Affected Environment

Section 4(f)

The Section 4(f) legislation, as established under the Department of Transportation Act of 1966 (49 USC 303, 23 USC 138) and as revised in 2005 by the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) [which included moving Section 4(f) regulations to 23 CFR 774], provides protection for publicly owned parks, recreation areas, public and privately owned historic sites, wildlife, and/or waterfowl refuges from conversion to a transportation use. The FHWA may not approve the use of land form a significant publicly owned park, recreation, or wildlife and waterfowl refuge, or any significant historic site unless a determination is made that:

- There is no feasible and prudent alternative to the use of land from the property; and
- The action includes all possible planning to minimize harm to the property resulting from such use (23 CFR 774.17).

As discussed in the Parks and Public Recreational Areas section of this SFEIS, there are several parks and other public recreational areas in the Highway 60 study area. These resources include parklands, boat landings, hiking/walking trails, golf courses, and State Wildlife Management Areas (WMAs). Furthermore, the Union Pacific (formally St. Paul and Sioux City) railroad corridor has been identified as a property eligible for listing on the National Register of Historic Places.

Section 6(f)

Additional protection is provided for outdoor recreational lands under the Section 6(f) legislation (16 USC 4602-8(f) (30)) where Land and Water Conservation funds were used for the planning, acquisition, or development of the property. These properties may be converted to highway use, but only if replacement land of the same fair market value and equal usefulness is made available. No Section 6(f) properties have been identified within the Highway 60 project area.

Environmental Consequences

Alternative 1 – No-Build

There would be no direct effects to Section 4(f)/6(f) resources under the No-Build Alternative.

Alternative 2 – Build Alternative

East Gap, Middle Gap, and West Gap

There would be no direct effects (property acquisition) to the Carpenter WMA, UP railroad corridor, or any other Section 4(f)/6(f) resources.

Mitigation

No mitigation is proposed since no direct impacts to Section 4(f)/6(f) resources is anticipated.

Pedestrian and Bicycle Movements

Affected Environment

There are no pedestrian or bicycle facilities currently located along the three two-lane segments of Highway 60. Future regional trail corridors within the Highway 60 study area are shown in the 2010 Trail Corridor Plan, which was prepared by the Southwest Regional Development Commission (RDC) in cooperation with the surrounding local units of government (cities, counties, and townships). The Plan identifies a trail corridor south of Highway 60 beginning at Windom and traversing northeast toward Mountain Lake and beyond. A second future trail corridor has be identified running north-south near Bingham Lake. These trail corridors appear to cross Highway 60 near Bingham Lake and Mountain Lake. No funding for these trail corridors has been programmed and the timing of construction has not been scheduled.

The 2001 MnDOT Bicycle Map shows that the majority of Highway 60 between St. James and Windom as having a "Medium Volume" Roadway Suitability Rating with short segments west of St. James and east of Mountain Lake having Low Volume ratings.

Environmental Consequences

Alternative 1 – No-Build

The No-Build Alternative will not have any direct effect on pedestrian and bicycle movements in the area. There are no known pedestrian or bicycle facilities along these segments of Highway 60.

Alternative 2 – Build Alternative

East Gap, Middle Gap, and West Gap

The Build Alternative will not have any direct effect on existing pedestrian and bicycle movements in the area. The proposed 10 foot shoulders along Highway 60 will be perpetuated and can be used by pedestrians/bicyclists. The four-lane divided section may improve safety of pedestrians/bicyclists crossing since these movements will no longer have to cross both directions of traffic at the same time. The center median can serve as a refuge for pedestrian/bicycle movements where they can cross one direction of traffic at a time. Also, the additional traffic lane in each direction allows vehicles to shy away from cyclists on the shoulder of the highway.

Mitigation

No mitigation for pedestrian and bicycle movements is anticipated. Coordination with the Southwest RDC will continue to occur to determine the status of the planned trail corridors and whether additional pedestrian/bicycle accommodations are needed along Highway 60.

Environmental Justice

This section has been prepared in accordance with Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, dated February 11, 1994. Executive Order 12898 requires each federal agency (i.e., FHWA) to the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review, to achieve "environmental justice as part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." The proposed project has federal funding and federal permit requirements and is, therefore, a federal project for purposes of compliance with the Executive Order.

The Final U.S. Department of Transportation (USDOT) Order on Environmental Justice, April 15, 1997 presents the following actions to address disproportionately high and adverse effects:

- Determine whether programs, policies, and activities will have an adverse impact on minority and low-income populations and whether that impact will be disproportionately high.
- Mitigation and enhancement measures and all offsetting benefits to the affected minority and low-income populations may be taken into account, as well as the design, comparative impacts, and the relevant number of similar existing system elements in non-minority and non-low-income areas.
- Programs, policies, or activities that will have a disproportionately high and adverse effect on minority populations or low-income populations will be carried out if further mitigation measures or alternatives that would avoid or reduce the impacts are not practicable, if a substantial need for the program, policy, or activity exists based on the overall public interest and alternatives that would have less adverse effects on protected populations either would have other adverse social, economic, or environmental or human health impacts that are more severe or would involve increased costs of extraordinary magnitude.

Affected Environment

Project Area Demographics

Demographic statistics from the 2010 U.S. Census were compiled at the most refined level practical and used to characterize the population in the project area. U.S. Census data is available in many different levels, including tracts, block groups, and blocks. However, not all levels of 2010 data were released at the time this SFEIS was prepared.

This assessment considered census data for the cities (Bingham Lake, Butterfield, Mountain Lake, Butterfield), townships (Butterfield, Lakeside, Midway, Mountain Lake, St. James), and counties (Cottonwood, Watonwan) within the three gaps areas along Highway 60. In many cases, the boundaries of these data sets extended beyond the individuals directly affected by the

proposed improvement; however, it was assumed that these larger areas generally represent the minority and low-income composition of the project area.

The information presented in Table 10 below describes the population characteristics for the 'project area', which for the purposes of this assessment is comprised of the city and township census data for Cottonwood and Watonwan Counties. The census data (2010) presented in the table indicates the potentially impacted residential portions of the project area include a low percentage of minority groups and low-income populations.

Table 10 – 2010 Population Census Data

Population	Project Area	Cottonwood County	Watonwan County
Total Population	4,129	11,687	11,211
White	86.0%	92.2%	86.9%
Black or African American	0.6%	0.7%	0.7%
American Indian and Alaska Native	0.2%	0.2%	0.4%
Asian	6.5%	2.7%	0.8%
Native Hawaiian & Other Pacific Islander	0.1%	0.1%	0.0%
Some Other Race	5.2%	2.7%	10.0%
Two or More Races	1.4%	1.3	1.2%
Median Household Income[1]	$33,150	$31,943	$35,441
Percent of Individuals Below Poverty Level[1]	12.4%	11.7%	9.8%

Source: U.S. Census Bureau, Census 2010
[1] Income Data from Census 2000

To supplement the minority and economic information provided by the U.S. Census Bureau, direct contacts were made with local government offices to assist in determining if there are any readily identifiable minorities and low-income populations living in close geographic proximity to the project area. Contacts included city and county offices within the project area. Furthermore, a field review was conducted of the project study area. Within the study area, only single family dispersed developments were observed immediately adjacent to the proposed improvements.

Based on the information obtained in this review, it is reasonable to conclude the project area contains no concentrations of minority and/or low-income populations.

Public Involvement/Outreach

MnDOT has been committed to public involvement efforts aimed at reaching all individuals and groups located within or having an interest in the project area. These efforts are detailed in Section 7.0.

Environmental Consequences

Environmental Justice Determination

Because there are no identifiable concentrations of minority and/or low-income populations as defined by the USDOT final order and based upon the information presented above, the Build Alternative will not result in disproportionately high or adverse effects to minority or low-income populations.

Mitigation

No mitigation for environmental justice affects is proposed.

Transit Services

Affected Environment

Both Cottonwood County and Watonwan County have public transit services available within the project area. These services are limited to dial-a-ride service available to persons of all ages. In 2010, ridership within both counties was approximately 18,000 rides, which was slightly lower than previous years. The MnDOT Office of Transit provides funding for dial-a-ride service operations within both Cottonwood and Watonwan Counties.

Environmental Consequences

The alternatives will impact transit services to the extent they may impair or improve the ability of the transit provider to efficiently and economically deliver services.

Alternative 1 – No-Build

The No-Build Alternative will not have any affects on the quality of transit service throughout the Highway 60 corridor.

Alternative 2 – Build Alternative

East Gap, Middle Gap, and West Gap

The build alternative will potentially have a positive impact on the quality of transit service in and beyond the corridor. The improved traffic operations over the No-Build Alternative could result in an improvement in transit travel times for trips that utilize the Highway 60 corridor.

Short-term adverse impacts to transit services may result from construction activities including minor detours or construction delays.

Mitigation

Once the preferred alternative is selected and designed, a construction staging plan will be prepared by MnDOT as part of the final design. The staging plan will be shared with all interested individuals, including transit providers, to minimize disruptions on transit routes and efficiency of transit service during construction.

Utilities

Affected Environment

There are several local and regional utility lines and distribution and/or transmission facilities that can be found within the project area. These utilities include local electric and telephone distribution lines, natural gas pipelines, and fiber optic communication lines.

Environmental Consequences

Construction of the additional lanes will cause the relocation of certain utilities currently located in or directly adjacent to the current right-of-way.

These relocations have the potential to result in some environmental impact through work needing to take place in wetlands, vegetation clearing, utility right of way maintenance requirements, or similar work. While MnDOT and FHWA recognize the possibility of such impacts, at this time it is not possible to estimate the nature and magnitude of such future impacts. It is not known where any rerouted lines may subsequently be relocated.

Alternative 1 – No-Build

There would be no effects to utilities as a result of the No-Build Alternative.

Alternative 2 – Build Alternative

East Gap, Middle Gap, and West Gap

Construction of the proposed improvements will require the relocation of some local and regional utility services. Temporary disruptions in service are possible as a result of these relocations.

Within the East Gap there is overhead electric power lines that cross Highway 60 in approximately five locations. In addition, an electric power line parallels the north right-of-way line of Highway 60 from approximately 670th Avenue to 685th Avenue. This line is located on the opposite side of the existing highway from where the new roadway is proposed to be constructed. A natural gas line is also located along the north side of Highway 60 for a short segment within the East Gap. No substantial utility relocations and/or impacts are anticipated.

Mitigation

Coordination with utility providers will occur during the final design phase of the project to ensure all utilities within the area are identified, so avoidance and minimization measures can be implemented. Minimization efforts may include minor alignment shifts of the preferred alternative or alterations to the typical roadway cross-section. Furthermore, as discussed above, environment analysis under the State of Minnesota environmental program (Minnesota Rules 4410.4300) is required for certain utilities currently administered by the Minnesota Department of Commerce and Minnesota Public Utilities Commission. In addition, Minnesota Statutes 85.415 requires utility companies to obtain permits from the MnDNR to cross state owned lands and waters. Such permits

include provision for environmental analysis and the minimization of adverse impacts on the environment.

Contaminated Properties

The presence of potentially contaminated properties (defined as properties where soil and/or groundwater is impacted with pollutants, contaminants, or hazardous materials) is a concern in the development of highway projects because of potential liabilities associated with ownership of such properties, potential cleanup costs, and safety concerns associated with construction personnel encountering unsuspected wastes or contaminated soil or groundwater. The primary step in recognizing and evaluating potentially contaminated properties is completing a Phase I Environmental Site Assessment (ESA).

Affected Environment

A Phase I ESA was completed in the spring 2011. The Phase I ESA analyses included a site visit, and a review of reasonably ascertainable federal and/or state records. These properties may have had a known or suspected release or spill of chemicals, or are identified as storing hazardous materials and/or other potential pollutants. The Phase I ESA analyses also included a review of historical aerial photographs, fire insurance maps, interviews with local government officials and property owners to obtain additional information regarding properties of concern, and site visits where allowed.

Using the resources described above, properties with known (or suspected) use or storage of hazardous substances were identified. In the Phase I ESA sites are categorized based on their potential level of risk of having impacted soil or groundwater. Sites are identified as "high", "medium" and "low" risk based on known and suspected impacts.

- High environmental risk sites are properties that have a documented release of chemicals or other strong evidence of potential contamination, such as soil staining or storage of large volumes of petroleum or other hazardous chemicals.
- Medium environmental risk sites may include properties where relatively smaller volumes of petroleum or other hazardous chemicals are stored, but there is no evidence of spills, releases, or properties with documented releases that have been "closed" (no further cleanup action deemed necessary) by the MPCA.
- Low environmental risk sites include properties where small volumes of hazardous chemicals have been used and/or stored.

Medium and high risk sites are given additional scrutiny when they are located in near proximity to the project corridor or contamination could migrate into the project corridor. The evaluation focuses on the potential for contamination to be encountered during construction activities or during the acquisition and relocation of a property.

A complete description of the sites and datasets used in the determination of potentially contaminated sites is included in the Phase I Environmental Assessment Report – Highway 60 Reconstruction: Windom to St. James, 2011, which is available for review at the MnDOT District 7 Office in Mankato, MN. The report includes a written summary of the file search and provides location maps of the identified sites. Table 11 provides a summary of the potentially contaminated sites in the project area and Figures A1 through A14, located in Appendix A, illustrate the locations of these sites.

Table 11 – Potential Contaminated Property of Concern

Site No.	Address/Location	Property Affected	Rank	Rank Rationale
1	2850 Hwy 60 East Windom	No property acquisition anticipated	Medium	Large beef slaughter/rendering plant. Surface disturbance potentially indicative of filling/dumping observed in the 1939 aerial photo.
2	49626 Hwy 60 Windom	No impacts to farm building site	Medium	Farmstead. According to Tax Assessor records, farmstead utilizes "oil" for heating [stored in either AST or UST.
3	496 2nd Avenue Bingham Lake	Impacted under Bingham Lake Widen South Option	Medium	Commercial/Industrial building with two oversized bay doors. Possible vehicle maintenance facility.
4	495 2nd Avenue Bingham Lake	Impacted under Bingham Lake Widen South Option	Medium	Farm implement dealership with four observed ASTs. Facility appears to have large interior shop/storage areas. Identified as a RCRA-Non-generator in the regulatory search.
5	2nd Ave and Hwy 60 Bingham Lake	Impacted under Bingham Lake Widen South Option	Medium	Former rural homestead/farmstead between 1939 and 1977; potential for buried demolition debris, private water well, septic system, and former fuel oil use associated with former homestead exists.
6	PIN#191680040 Bingham Lake	Impacted under Bingham Lake Widen North and Bypass Options	High	Commercial land formerly operated as a salvage yard at this location, utilizing the Quonset structure for storage. One small AST currently present.
7	919 Hwy 60 Bingham Lake	Impacted under Bingham Lake Widen North Option	High	Salvage yard since 1960, in process of being closed. Evidence of releases to ground surface.
8	52087 Hwy 60 Bingham Lake	Impacted under Bingham Lake Widen South Option	Medium	Commercial shop/garage building. Five ASTs, limited drum storage, and gravel stockpiles on the exterior portions of the parcel. The concrete floor in the building was added in 1995 (tax assessor).
9	52087 Hwy 60 Bingham Lake	Potential impact under Bingham Lake Widen South Option	Medium	Multi-tank storage of anhydrous ammonia ASTs. Former rural residential homestead/farmstead between 1939 and 1977(?); potential for buried demolition debris, private water well, septic system, and former fuel oil use associated with former homestead exists.
10	PIN#100100201 Bingham Lake	Potential impact under Bingham Lake Widen North Option	Medium	Farmstead with three ASTs observed.
11	55962 Hwy 60 Mountain Lake	No impacts to farm building site	Medium	Farmstead with three ASTs observed; 2 additional ASTs observed in tax assessor records.

Site No.	Address/Location	Property Affected	Rank	Rank Rationale
12	37308 County Road 8 Mountain Lake	No property acquisition anticipated	Medium	Grain Co-op along railroad track; one AST observed.
13	61681 Hwy 60 Butterfield	Potentially impacted building site and out-of-service vehicle storage areas	Medium	Farmstead with one AST and numerous out-of service/junked trucks on outdoor areas of the parcel.
14	62169 Hwy 60 Butterfield	No impacts to farm building site	Medium	Farmstead with one AST.
15	62806 Hwy 60 Butterfield	No property acquisition anticipated	Medium	Farmstead with one AST.
16	615 First St. South Butterfield	No property acquisition anticipated	Medium	Gas Station with five USTs.
17	135 Prairie Ave Butterfield	No property acquisition anticipated	Low	Commercial building with two bay doors. Signage indicates current use of screen printing, embroidery, and stickers; possibly involves the use of small quantities of hazardous substances.
18	SE of Hubbard Ave and Hwy 60 Butterfield	No impacts to former farm building site anticipated	Medium	Former rural residential homestead/farmstead between 1939 and 1977; potential for buried demolition debris, private water well, septic system, and former fuel oil use associated with former homestead exists.
19	67535 Hwy 60 St. James	No impacts to farm building site	Medium	Farmstead with four ASTs.
20	62169 Hwy 60 St. James	No property acquisition anticipated	Medium	Farmstead with one AST.
21	PIN#110290200 South of Hwy 60 St. James	No impacts to former farm building site anticipated	Medium	Former rural residential homestead/farmstead between 1939 and 1991; potential for buried demolition debris, private water well, septic system, and former fuel oil use associated with former homestead exists.
22	PIN#110210400 North of Hwy 60 St. James	No property acquisition anticipated	Medium	Former rural residential homestead/farmstead between 1939 and 1991; potential for buried demolition debris, private water well, septic system, and former fuel oil use associated with former homestead exists.
23	PIN#110280200 South of Hwy 60 St. James	No impacts to former building site anticipated	Medium	Former commercial building between 1939 and 1964; potential for buried demolition debris, private water well, septic system, and former fuel oil use associated with former commercial building exists. Former use of structure unknown.
24	Farmstead, St. James	No property acquisition anticipated	Medium	Farmstead with two ASTs.

Environmental Consequences

Contaminated materials encountered during highway construction projects must be properly handled and treated in accordance with state and federal

regulations. Improper handling of contaminated materials can worsen their impact on the environment. Contaminated materials also cause adverse impacts to highway projects by increasing costs and causing construction delays.

The following sections include a summary of identified sites most likely to adversely affect each proposed alternative. Sites that are directly on or adjacent to the proposed roads and right-of-ways are highlighted and discussed.

Alternative 1 – No-Build

The No-Build Alternative would have no direct impacts on existing contaminated properties. However, remaining sites could potentially affect groundwater beneath the existing Highway 60 alignment.

Alternative 2 – Build Alternative

East Gap, Middle Gap, and West Gap

According to the Phase I ESA, 23 medium and high risk sites were identified within close proximity of the Build Alternative and design options near Bingham Lake (see Table 11 for further details). Within the East and Middle Gaps, 7 medium risks sites and four medium risks sites have been identified, respectively. The West Gap contains 9 medium risk and 2 high risk sites. Many of these sites are located within 500 feet of the proposed alignment corridor(s), and groundwater at these sites could carry contamination, if present, beneath the project corridor.

The medium and high risk properties include existing and former commercial businesses (i.e. slaughter/rendering plan, farm implement sales, liquid fertilizer sales, vehicle salvage yard, grain elevator, farmsteads with above-ground storage tanks (ASTs) and a potential historic farm dumps). These properties have elevated risk of contamination due to their historic land use and/or current operations. In particular, the commercial vehicle salvage yard in Bingham Lake has the potential to cause extensive and persistent contamination with the potential for MnDOT to incur excessive costs or liability. As a result, several design options through the Bingham Lake Area have been developed to avoid and/or minimize impacts to this property. The Bingham Lake North Bypass design option appears to avoid potential contamination associated with the vehicle salvage yard. The design options that expand the highway on the existing alignment (either north or south of existing) have a greater potential for encountering contaminates associated with handling the contaminated soil and/or groundwater.

Mitigation

Prior to construction activities, properties identified as having the greatest potential to directly impact the preferred alternative will be further evaluated to determine if extensive liability exists in acquiring property for the highway improvements. Prior to completion of the final design and right-of-way process, potentially contaminated properties which impact the preferred alternative may be drilled and sampled, if necessary, to determine the extent and magnitude of contaminated soil or groundwater. The results of these investigations will be used to determine if the impact of contaminated materials on the preferred

alternative can be avoided and/or minimized through design modifications, right-of-way refinements, and determining if the improvements will be on a fill or cut section. Construction work will be conducted in compliance with all state and federal laws and regulations.

If necessary, a plan will be developed by MnDOT for properly handling and treating contaminated soil and/or groundwater. MnDOT will work with the Petroleum Brownfields Program and/or the Voluntary Investigation and Cleanup Programs at the MPCA, as appropriate.

Cultural Resources

Consultation

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, requires federal agencies to take into account the effects of their undertakings on historic properties. The Advisory Council on Historic Preservation (ACHP) issues regulations that implement Section 106 at 36 CFR Part 800, "Protection of Historic Properties." By definition, historic properties are buildings, sites, structures, objects and districts eligible for or listed in the NRHP. Federal undertakings refer to any federal involvement including funding, permitting, licensing, or approval. Section 106 establishes the review process whereby a federal agency consults with the ACHP, the Minnesota State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officers (THPOs), other interested parties, and the public to identify, evaluate, assess effects, and mitigate adverse impacts on any historic properties affected by their undertaking.

Affected Environment

In compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966 (36 CFR 800) and Section 4(f) of the Department of Transportation Act of 1966 (49 USC 303, 23 USC 138), a Phase I/II cultural resources investigation of the three gap segments of the Highway 60 corridor was conducted.

Archaeological

The Phase I survey was comprised of historical research and systematic pedestrian surface reconnaissance (walkover) in areas with moderate to high potential for containing archaeological sites. The area of potential effect (APE) for archaeological investigations was limited to areas of proposed highway right-of-way. No archaeological sites warranting further investigation were identified.

Historical

The project's geographical area of potential effects (APE) for standing structures and landscapes is broader than the APE for archaeological resources. The architectural APE encompasses land subject to the undertaking's potential right-of-way acquisition and construction activities, but also includes areas of visual and auditory effects and other possible direct and indirect impacts during and after construction. The APE was determined to be ¼-mile (approximately 1,320 feet) from the proposed centerline of the build alternative(s).

Properties at least 50 years of age within the APE were inventoried, and were evaluated if they met minimum thresholds for integrity (general retention of massing, fenestration, and materials). A total of 81 properties were surveyed. While a number of historic-period farmsteads were identified during the Phase I survey, no historic or precontact properties worthy of Phase II investigation were identified and no further work is recommended for the portions of the farmsteads located within the APE.

Of the 81 properties surveyed, only the St. Paul and Sioux City Railroad, now part of the Union Pacific Railway, is recommended as eligible for listing in the National Register of Historic Places (NRHP) as a railroad corridor historic district, as defined in the Multiple Property Documentation Form (MPDF): Minnesota Railroads, 1862-1956 (Schmidt et al. 2007).

- *St Paul and Sioux City Railroad Corridor (StP&SC)*

The portion of the StP&SC located within the APE for the proposed Highway 60 improvements is found in Section 24, T105N, R36W; Sections 1, 9, 10, 11, 12, 16, 17, 18, 19, T105N, R35W; Sections 6, T105N, R34W; Sections 24, 25, 26, 27, 29, 30,31, 36, 35, T106N, R33W; Section 19, T106N, R32W.

The single tracked corridor is an active railroad currently owned and operated by the Union Pacific (UP) Railroad. The railroad runs through Windom, Bingham Lake, Mountain Lake, Butterfield, and St. James in a northeasterly direction, mostly paralleling the current route of Highway 60 through the APE. The railroad is situated south of the highway from Windom to near Mountain Lake. Because of a shift in the highway alignment about twenty years ago, the highway crosses the railroad on a bridge west of Mountain Lake, and the railroad runs on the north side of the highway through Mountain Lake and eastward to St. James. Within the APE, the railroad is characterized by low fill flanked by shallow ditches.

The corridor includes three railroad bridges that cross streams or drainage ditches within the APE. Portions of the railroad corridor's setting have been redeveloped with modern buildings, and other portions retain the general historic characteristics. Generally, the location, design, feeling, and association of the railroad corridor within the APE are good. The integrity of materials and setting have been diminished but not entirely compromised by modern ballast and rails and by adjacent modern development.

Various segments of the larger railroad corridor were previously found to be eligible for listing in the NRHP (for example, Schmidt and Vermeer 2009), but the boundaries and contributing elements within the APE were not previously established. The corridor is important for its association with the St. Paul and Sioux City railroad, which built the first railroad through southwestern Minnesota, building up the Minnesota River valley during the late 1860s and continuing southwest to St. James in 1870 and Worthington in 1871. Railroad villages were platted at Mountain Lake, Bingham Lake, Butterfield, and Windom. In the Andreas atlas published in 1874, the railroad line is shown in virtually the same route it follows today (Andreas 1874). The StP&SC railroad was an important early transportation corridor, providing the first railroad access to southwestern

Minnesota and opening up the prairie lands to agricultural development. The StP&SC was merged into the Chicago St. Paul Minneapolis & Omaha Railway, better known as the Omaha Road, in 1881. The Chicago and North Western (C&NW) Railway took controlling interest in 1904, consolidating it into what became one of the largest railroads in Minnesota. The railroad corridor served as the Omaha railroad's main line between Omaha and Minneapolis-St. Paul during the late nineteenth century. During the first half of the twentieth century, the corridor was part of an important triangular route between Omaha, Minneapolis-St. Paul, and Chicago. C&NW railway retained control of the railroad until it was merged into the UP Railroad in 1995.

Environmental Consequences

Alternative 1 – No-Build

The No-Build Alternative will not affect any NRHP-eligible properties.

Alternative 2 – Build Alternative

East Gap, Middle Gap, and West Gap

Within the project APE, the proposed boundaries of the railroad corridor historic district are the railroad right of way. Contributing elements within the APE include the rail bed and three bridges. Therefore, since the proposed boundaries of the railroad corridor historic district are the railroad right of way, no adverse impacts are anticipated with the build alternative or any of the design option in the West Gap segment because no acquisition of railroad right of way is proposed and all contributing elements within the APE including the rail line and associated three bridges will not be impacted. Minor improvements (i.e. minor grading, resurfacing, and striping) to several local roadways at the approaches to existing railroad crossings may be needed, but no new crossings or changes in the location of the existing crossings are anticipated. Furthermore, all existing crossing control is proposed to be maintained during and after construction.

A determination was made by MnDOT's Cultural Resources Unit staff that there are no historic properties adversely affected by the project as it is currently proposed. This determination is included in a letter to the Minnesota SHPO, which is included in Appendix B. The SHPO has concurred with these findings (see Appendix B).

Mitigation

Based on the findings of the investigations, no NRHP-eligible historical, architectural, or archaeological sites will be impacted by the build alternatives. Therefore, no mitigation is necessary.

4.2 WHAT ARE THE NATURAL ENVIRONMENT IMPACTS?

Noise

Background/Methodology

A detailed analysis of noise impacts was completed for the three gap segments of Highway 60. The objective of this analysis was to quantify the potential impacts of the proposed improvements using a noise model that considers

alignments, locations of receptors, traffic conditions, and topography of the area. The results of the modeling analysis were used to determine the feasibility and cost effectiveness of using noise walls to provide mitigation for any identified impacts on receptors.

Noise Description

Noise is defined as any unwanted sound. Sound travels in a wave motion and produces a sound pressure level. This sound pressure level is commonly measured in decibels. Decibels (dB) represent the logarithmic increase in sound energy relative to a reference energy level. A sound increase of 3 dB is barely perceptible to the human ear, a 5 dB increase is clearly noticeable, and a 10 dB increase is heard as twice as loud. For example, if the sound energy is doubled (e.g., the amount of traffic doubles), there is a 3 dB increase in noise, which is just barely noticeable to most people. On the other hand, if traffic increases to where there is 10 times the sound energy level over a reference level, then there is a 10 dB increase and it is heard as twice as loud.

For highway traffic noise, an adjustment, or weighting, of the high- and low-pitched sounds, is made to approximate the way that an average person hears sounds. 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 hour of the day and night that has the heaviest traffic. These numbers are identified as the L_{10} and L_{50} levels. Federal noise standards consider the L_{10} value for noise abatement consideration.

The following chart provides a rough comparison of the noise levels of some common noise sources.

Sound Pressure Level (dBA)	Noise Source
140	Jet Engine (at 25 meters)
130	Jet Aircraft (at 100 meters)
120	Rock and Roll Concert
110	Pneumatic Chipper
100	Jointer/Planer
90	Chainsaw
80	Heavy Truck Traffic
70	Business Office
60	Conversational Speech
50	Library
40	Bedroom
30	Secluded Woods
20	Whisper

Source: "A Guide to Noise Control in Minnesota," Minnesota Pollution Control Agency, http://www.pca.state.mn.us/programs/pubs/noise.pdf and "Highway Traffic Noise," FHWA, http://www.fhwa.dot.gov/environment/htnoise.htm

State of Minnesota Noise Regulations

State noise standards are for a one-hour period and apply to outdoor areas. The standards are in terms of the L_{10} and L_{50} noise descriptors. The L_{10} is the sound level that is exceeded for 10 percent of the hour of interest (a total of six minutes). The L_{50} is the sound level that is exceeded for 50 percent of the hour of interest (a total of 30 minutes).

Table 12 provides the Minnesota State Noise Standards for three Noise Area Classifications (NAC), and for daytime, nighttime, L_{10}, and L_{50}. The standards for NAC-1 apply to residential areas and other uses intended for overnight sleeping (hotels, motels, mobile homes, etc.). The NAC-1 standards also apply to schools, churches, medical services, and park areas. The nighttime standards differ from the daytime standards only in areas intended for overnight sleeping. The NAC-1 daytime standards apply during nighttime hours at other NAC-1 land-use areas not intended for overnight sleeping. The NAC-2 standards are applicable to certain NAC-1 land uses if the following criteria are met:

- The building noise attenuation is at least 30 decibels (dBA);
- The building has year-round, indoor climate control;
- The building has no facilities for outdoor activities.

Table 12 – Minnesota State Noise Standards

Noise Area Classification	General Land Use Type	Sound Level (dBA)			
		Daytime		Nighttime	
		L_{10}	L_{50}	L_{10}	L_{50}
1	Residential	65	60	55	50
2	Commercial	70	65	70	65
3	Industrial	80	75	80	75

Federal Noise Abatement Criteria

In the Federal Noise Abatement criteria, a noise impact is defined as occurring when the predicted traffic noise levels:

- Approach or exceed the noise abatement criteria (see Table 13); and/or
- Substantially exceed the existing noise levels.

The Federal Noise Abatement Criteria (23 CFR, Procedures for Abatement of Highway Traffic Noise and Construction Noise) are in terms of the L_{eq} or L_{10} descriptor. L_{eq} is the constant, average sound level, which over a period of time contains the same amount of sound energy. The L_{eq} for typical traffic conditions is about 3dB less than the L_{10} for the same condition. In Minnesota, the L_{10} descriptor is used to identify impacts and has been used in this analysis. The criteria for activity category E (Table 13) are in terms of interior noise levels and are applied where there are no exterior activities to be affected by traffic noise. All other criteria are in terms of exterior noise levels.

The State of Minnesota has defined "approach or exceed" as being within 1 dBA or less of the activity category of the NAC, and "substantially exceed" as an increase of 5 dBA or more over existing noise levels.

Table 13 – FHWA Noise Abatement Criteria Hourly A-Weighted Sound Level in Decibels

Activity Category	L_{10} (h)	Description of Activity Category
A	60 dBA (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	70 dBA (Exterior)	Residential yards, picnic areas, recreation areas, playgrounds, active sports areas, parks, other outdoor areas (motels, hotels, schools, churches, libraries, and hospitals).
C	75 dBA (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	No Limit	Undeveloped Lands
E	55 dBA (Interior)	Interior of commercial businesses (motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums) and residences.

Application of State and Federal Regulations

MnDOT's Noise Policy was revised and re-issued effective July 2011. Since the Highway 60 SFEIS initiated prior to that date, MnDOT's previous Noise Policy was used as the basis for the SFEIS analyses. Projects without federal funding do not need to meet federal noise regulations, but do have to meet State noise regulations. On all major projects current noise levels are measured to develop forecasts of future noise for each alternative. At locations where noise levels are expected to approach or exceed standards or substantially exceed existing levels mitigation is considered. If modeling indicates that the proposed mitigation would be effective (result in at least a 5 dBA reduction in noise levels) the cost of mitigation is estimated to determine if it is reasonable (defined as costing less than $3250 per dBA per residence). Finally, if noise mitigation is cost effective, affected residents are consulted to ascertain whether the proposed mitigation is desirable from their perspective.

In this project, future noise levels will exceed both the Federal Noise Abatement Criteria and the State Noise Standards at several noise receptor sites. Therefore, noise abatement measures are included in this analysis. Noise mitigation measures were considered, but none are deemed reasonable and feasible. Therefore, a Noise Standards Exemption Request will be submitted to the Commissioners of the MPCA. This document is a means of demonstrating that all reasonably available noise mitigation measures are employed as part of the project.

Methodology

Existing (2011) and future (2033) noise levels were modeled using the Federal Highway Administration (FHWA) noise prediction model STAMINA 2.0, as

modified for use by MnDOT. Noise projections were based on 2010 traffic counts, 2033 forecasted peak-hour traffic volumes, vehicle speeds, mix of vehicles, roadway grades, and the distance from the roadway centerline to the receptor (horizontal and vertical). New roadway alignments were provided for the build alternatives; however roadway elevations were taken from the existing roadway.

The following assumptions were used in modeling project noise levels:

Traffic Volumes:

Nighttime hours are between 10:00 PM and 7:00 AM; Daytime hours are between 7:00 AM and 10:00 PM.

Evaluation of average daily traffic (ADT) volumes, from MnDOT traffic flow maps and a Vehicle Class Count within the study area showed the noisiest daytime and nighttime traffic volumes:

- The noisiest nighttime traffic volumes occur between 6:00 AM and 7:00 AM
- The noisiest daytime traffic volumes occur between 4:00 PM and 5:00 PM
- The 2010 and forecast 2030 ADT in the Gap segments were:
    - West Gap – 5,400 (2010) and 7,300 (2030)
    - Middle and East Gaps – 4,850 (2010) and 6,500 (2030)

Vehicle Speeds:

Highway 60 existing mainline sections were modeled using posted limits of 60 mph and the proposed Highway 60 build condition mainline sections were modeled using the proposed posted limits of 65 mph.

Fleet Composition (Vehicle Mix):

Fleet composition was based on a Vehicle Classification Site #1197. The site is located along Highway 60, west of St James; the data used was collected in July of 2005. Table 14, below, shows the assumptions for the vehicle mix.

Table 14 – Vehicle Mix

Roadway	Nighttime			Daytime		
	Car (%)	Medium Truck (%)	Heavy Truck (%)	Car (%)	Medium Truck (%)	Heavy Truck (%)
Highway 60 Both Directions	70	11	20	80	9	11
Highway 60 Eastbound	73	12	15	78	10	11
Highway 60 Westbound	67	9	23	81	8	11

Ground Cover:

Sound traveling through air attenuates 3 dBA for every doubling of distance. Ground cover can provide additional noise attenuation over that distance. MINNOISE has two default values for ground cover, either hard ground (0) or soft ground (0.5). Hard ground, an alpha value of 0, such as asphalt or open water will provide no additional attenuation. Soft ground, an alpha value of 0.5,

such as open, grassy, farmland areas will provide an additional attenuation of 1.5 dBA per doubling of distance.

This study is in a rural environment with a mixture of grassy areas, foliage, farmland, asphalt and concrete, the default value for mixed environments is soft ground

Shielding Factor:

Per MnDOT procedure, for second row residences or other shielded receptors, a shielding factor can be used to represent a receptor that is not 100 percent open to the roadway. A receptor with 40 to 65 percent of the line of sight blocked can be provided with a 3 dBA reduction. A receptor with 65 percent or more of blocked line of sight can have an additional 1.5 dBA reduction. If a receptor includes a shielding factor above 0 dBA, the ground cover should be changed to hard ground.

This study has no receptors that are blocked from Highway 60; therefore no additional shielding was used.

Affected Environment

Noise Monitoring

Noise level monitoring is commonly performed during a noise study to document existing noise levels. Monitored noise levels can also be used as a baseline of the possible ambient levels that can occur. The monitoring done for this project was completed without the collection of measured traffic volumes, speeds, vehicle mixes, and lane distribution of traffic. With the traffic volume variations that exist at the monitoring sites, noise modeling likely best describes the possible worst hour scenarios for both existing and future noise levels.

The noise levels along Highway 60 were monitored on June 8, 2011 in the vicinity of modeled noise receptor locations within the project area. Three noise monitoring point (MP1 through MP3) were chosen for monitoring sites within the project area. These sites are illustrated on the conceptual design layouts located in Appendix A. A description of the monitoring point locations and the results are provided in Table 15.

Table 15 – Monitored Noise Level

Location	General Location	Time	Monitored Noise Level (dBA)			
			L_{10}	L_{50}	L_{90}	L_{eq}
MP1	Highway 60 at Cty Rd. 19 east of Butterfield	10:18 AM to 10:48 AM	64.0	56.9	50.4	61.0
		3:55 PM to 4:25 PM	66.1	60.4	53.9	63.2
MP2	Cenex C-Store Butterfield	9:40 AM to 10:10 AM	66.7	56.6	49.9	64.2
		4:31 PM to 5:01 PM	65.8	56.1	48.8	63.1
MP3	Highway 60 at Cty. Rd. 2, east of Bingham Lake	8:52 AM to 9:25 AM	67.6	61.1	56.5	65.2
		3:04 PM to 3:34 PM	68.6	61.0	55.8	65.0

Environmental Consequences

The augmented FHWA noise prediction software MINNOISE was used to predict noise levels at 60 receptor sites. These receptors were placed in and around the locations where the noise monitoring took place and also represent residential housing in the project area. All field measurements at the monitoring locations are within 3 dBA of the model results, validating the modeling parameters.

Noise Areas

Due to the nature of the existing Highway 60 corridor and proposed improvements within the gap segments, the noise study area was divided into two separate areas and noise analyses.

In the West Gap, there are a total of 28 receptor locations, 6 commercial and 22 residential. Six of the residential receptors are single residential homes/farms. The south side of Highway 60 in the City of Bingham Lake holds the majority of the receptors in the West Gap; there are a total of 15 residential receptors and 3 commercial receptors. The conceptual layout figures located in Appendix A illustrate the noise receptor locations.

The Middle Gap and the East Gap segment have been combined for purposes of this noise analysis. There are a total of 32 receptors locations, 4 commercial and 28 residential. Eighteen of the residential receptors are single residential homes/farms. The north side of Highway 60 in the City of Mountain Lake holds the majority of the receptors in the Middle and East Gaps; there are a total of 11 residential receptors and 3 commercial receptors. A small portion of this area (bypass around Mountain Lake) has already been reconstructed as a four-lane expressway section. The conceptual layout figures in Appendix A illustrate the noise receptor locations.

Noise Analysis Results

The MINNOISE/STAMINA noise model applied six scenarios for comparison of noise levels. The scenarios are: 1) Existing conditions (2010); 2) No-Build Alternative (2033); 3) Build Alternative– Widen on Existing (2033); 4) Build Alternative – Bypass Bingham Lake (2033); 5) Build Alternative – Widen on Existing (2033) with noise walls at select locations; 6) Build Alternative – Bypass Bingham Lake (2033) with noise walls at select locations.

The noise analysis for the daytime and nighttime L_{10} and L_{50} noise levels is referred to in this discussion (See Tables 16 through Table 19).

Tables 16 and Table 17 present the results of the Build Alternative – Widen on Existing noise analysis and Tables 18 and 19 present the results of the Build Alternative – Bypass Bingham Lake noise analysis. All of the tables show a comparison to the Minnesota State Noise Standards and the Federal Noise Abatement Criteria for nighttime and daytime respectively.

Table 16 – Nighttime Noise Analysis – Build Scenario: (with West Gap Widen on Existing Option)

Receiver		MN State Standards (dBA)			FHWA Standards (dBA)		2010		2033		2033		2033		2033	
							Existing Conditions		No Build Conditions		Change - No Build and Existing		Build Conditions		Change - Build and Existing	
Number	Land Use	Code	L10	L50	Code	L10	L10	L50	L10	L50	L10	L50	L10	L50	L10	L50
B1	Commercial	NAC-2	70	65	E	75	58.8	51.3	60.1	53.2	1.3	1.9	59.6	52.6	0.8	1.3
B2	Commercial	NAC-2	70	65	E	75	59.5	51.9	60.8	53.7	1.3	1.8	60.2	53.1	0.7	1.2
B3	Commercial	NAC-2	70	65	E	75	59.1	51.4	60.4	53.2	1.3	1.8	62.5	54.5	3.4	3.1
B4	Commercial	NAC-2	70	65	E	75	61.2	53.2	62.5	55.0	1.3	1.8	62.0	54.5	0.8	1.3
B5	Commercial	NAC-2	70	65	E	75	65.4	56.3	66.8	58.2	1.4	1.9				
B6	Commercial	NAC-2	70	65	E	75	63.8	55.1	65.2	56.9	1.4	1.8	64.2	55.9	0.4	0.8
R1	Residential	NAC-1	55	50	B	70	**56.9**	49.9	**58.2**	**51.6**	1.3	1.7	**59.7**	**52.7**	2.8	2.8
R2	Residential	NAC-1	55	50	B	70	**56.8**	49.8	**58.1**	**51.6**	1.3	1.8	**59.3**	**52.4**	2.5	2.6
R3	Residential	NAC-1	55	50	B	70	52.1	46.5	53.2	48.2	1.1	1.7	53.4	48.3	1.3	1.8
R4	Residential	NAC-1	55	50	B	70	51.0	45.6	52.1	47.3	1.1	1.7	52.3	47.5	1.3	1.9
R5	Residential	NAC-1	55	50	B	70	50.7	45.4	51.8	47.1	1.1	1.7	52.1	47.3	1.4	1.9
R6	Residential	NAC-1	55	50	B	70	54.6	48.3	**55.8**	**50.0**	1.2	1.7	**55.9**	**50.1**	1.3	1.8
R7	Residential	NAC-1	55	50	B	70	53.3	47.3	54.5	49.0	1.2	1.7	54.6	49.1	1.3	1.8
R8	Residential	NAC-1	55	50	B	70	**56.2**	49.4	**57.4**	**51.2**	1.2	1.8	**57.4**	**51.1**	1.2	1.7
R9	Residential	NAC-1	55	50	B	70	53.7	47.6	54.9	49.3	1.2	1.7	55.0	49.4	1.3	1.8
R10	Residential	NAC-1	55	50	B	70	54.5	48.1	**55.7**	49.9	1.2	1.8	**55.8**	49.9	1.3	1.8
R11	Residential	NAC-1	55	50	B	70	**56.1**	49.3	**57.4**	**51.1**	1.3	1.8	**57.3**	**51.0**	1.2	1.7
R12	Residential	NAC-1	55	50	B	70	**58.3**	**50.9**	**59.6**	**52.7**	1.3	1.8	**59.4**	**52.5**	1.1	1.6
R13	Residential	NAC-1	55	50	B	70	**60.7**	**52.7**	**62.0**	**54.5**	1.3	1.8	**61.5**	**54.0**	0.8	1.3
R14	Residential	NAC-1	55	50	B	70	**55.2**	48.5	**56.4**	**50.3**	1.2	1.8	**56.4**	**50.3**	1.2	1.8
R15	Residential	NAC-1	55	50	B	70	**56.1**	49.2	**57.3**	**51.0**	1.2	1.8	**57.3**	**50.9**	1.2	1.7
R16	Residential	NAC-1	55	50	B	70	**56.5**	49.6	**57.8**	**51.3**	1.3	1.7	**57.7**	**51.2**	1.2	1.6
R17	Residential	NAC-1	55	50	B	70	**57.0**	49.9	**58.3**	**51.7**	1.3	1.8	**58.1**	**51.6**	1.1	1.7
R18	Residential	NAC-1	55	50	B	70	53.0	46.7	54.2	48.5	1.2	1.8	54.3	48.5	1.3	1.8
R19	Residential	NAC-1	55	50	B	70	**58.3**	**51.0**	**59.6**	**52.8**	1.3	1.8	**61.2**	**53.9**	2.9	2.9
R20	Residential	NAC-1	55	50	B	70	51.4	45.5	52.6	47.2	1.2	1.7	52.8	47.4	1.4	1.9
R21	Residential	NAC-1	55	50	B	70	**66.1**	**56.8**	**67.5**	**58.7**	1.4	1.9				
B7	Commercial	NAC-2	70	65	E	75	59.4	51.5	60.7	53.3	1.3	1.8	60.7	53.2	1.3	1.7
R22	Residential	NAC-1	55	50	B	70	49.9	44.1	51.1	45.8	1.2	1.7	50.8	45.2	0.9	1.1
R23	Residential	NAC-1	55	50	B	70	**58.4**	**50.8**	**59.6**	**52.5**	1.2	1.7	**59.5**	**51.3**	1.1	0.5
R24	Residential	NAC-1	55	50	B	70	**58.5**	**50.8**	**59.8**	**52.6**	1.3	1.8	**59.8**	**51.4**	1.3	0.6
R25	Residential	NAC-1	55	50	B	70	**61.4**	**53.0**	**62.8**	**54.8**	1.4	1.8	**60.3**	**52.0**	-1.1	-1.0
R26	Residential	NAC-1	55	50	B	70	**60.0**	**51.9**	**61.3**	**53.7**	1.3	1.8	**61.6**	**52.6**	1.6	0.7
R27	Residential	NAC-1	55	50	B	70	**55.3**	48.1	**56.5**	49.9	1.2	1.8	**55.6**	48.3	0.3	0.2
B8	Commercial	NAC-2	70	65	E	75	56.4	49.1	57.7	50.9	1.3	1.8	56.5	49.2	0.1	0.1
B9	Commercial	NAC-2	70	65	E	75	56.2	48.9	57.5	50.7	1.3	1.8	56.2	49.0	0.0	0.1
B10	Commercial	NAC-2	70	65	E	75	58.8	50.8	60.1	52.6	1.3	1.8	58.8	50.9	0.0	0.1
R28	Residential	NAC-1	55	50	B	70	**59.1**	**51.0**	**60.4**	**52.8**	1.3	1.8	**59.6**	**51.3**	0.5	0.3
R29	Residential	NAC-1	55	50	B	70	52.9	46.5	54.1	48.2	1.2	1.7	52.9	46.6	0.0	0.1
R30	Residential	NAC-1	55	50	B	70	53.7	47.1	54.9	48.8	1.2	1.7	53.8	47.2	0.1	0.1
R31	Residential	NAC-1	55	50	B	70	54.1	47.3	**55.3**	49.0	1.2	1.7	54.2	47.4	0.1	0.1
R32	Residential	NAC-1	55	50	B	70	54.5	47.6	**55.7**	49.4	1.2	1.8	54.6	47.7	0.1	0.1
R33	Residential	NAC-1	55	50	B	70	**55.3**	48.2	**56.5**	49.9	1.2	1.7	**55.4**	48.3	0.1	0.1
R34	Residential	NAC-1	55	50	B	70	**56.4**	49.1	**57.7**	**50.8**	1.3	1.7	**56.5**	49.2	0.1	0.1
R35	Residential	NAC-1	55	50	B	70	55.0	48.0	**56.2**	49.7	1.2	1.7	**55.1**	48.1	0.1	0.1
R36	Residential	NAC-1	55	50	B	70	**55.2**	48.1	**56.4**	49.9	1.2	1.8	**55.3**	48.3	0.1	0.2
R37	Residential	NAC-1	55	50	B	70	54.1	47.3	**55.3**	49.1	1.2	1.8	54.2	47.5	0.1	0.2
R38	Residential	NAC-1	55	50	B	70	**56.1**	48.8	**57.3**	**50.6**	1.2	1.8	**56.0**	48.8	-0.1	0.0
R39	Residential	NAC-1	55	50	B	70	**56.1**	48.9	**57.3**	**50.6**	1.2	1.7	**55.9**	48.7	-0.2	-0.2
R40	Residential	NAC-1	55	50	B	70	**55.1**	48.2	**56.3**	49.9	1.2	1.7	54.6	47.7	-0.5	-0.5
R41	Residential	NAC-1	55	50	B	70	53.3	46.8	54.5	48.5	1.2	1.7	53.9	47.1	0.6	0.3
R42	Residential	NAC-1	55	50	B	70	**60.0**	**51.9**	**61.3**	**53.7**	1.3	1.8	**61.4**	**52.4**	1.4	0.5
R43	Residential	NAC-1	55	50	B	70	**56.5**	49.3	**57.8**	**51.0**	1.3	1.7	**57.5**	49.7	1.0	0.4
R44	Residential	NAC-1	55	50	B	70	53.9	47.3	**55.1**	49.0	1.2	1.7	54.6	47.6	0.7	0.3
R45	Residential	NAC-1	55	50	B	70	**65.4**	**56.0**	**66.7**	**57.8**	1.3	1.8	**63.6**	**54.1**	-1.8	-1.9
R46	Residential	NAC-1	55	50	B	70	54.9	48.0	**56.1**	49.8	1.2	1.8	**55.6**	48.4	0.7	0.4
R47	Residential	NAC-1	55	50	B	70	**63.0**	**53.6**	**64.5**	**55.5**	1.5	1.9	**62.5**	**53.1**	-0.5	-0.5
R48	Residential	NAC-1	55	50	B	70	**60.1**	**51.5**	**61.4**	**53.4**	1.3	1.9	**60.8**	**52.0**	0.7	0.5
R49	Residential	NAC-1	55	50	B	70	**59.4**	**51.0**	**60.7**	**52.8**	1.3	1.8	**59.0**	**50.8**	-0.4	-0.2
R50	Residential	NAC-1	55	50	B	70	52.6	46.1	53.8	47.8	1.2	1.7	53.0	46.3	0.4	0.2
MP1	Commercial	NAC-2	70	65	E	75	60.1	52.0	61.4	53.8	1.3	1.8	61.8	52.8	1.7	0.8
MP2	Commercial	NAC-2	70	65	E	75	63.9	54.4	65.3	56.2	1.4	1.8	63.7	54.4	-0.2	0.0
MP3	Commercial	NAC-2	70	65	E	75	64.2	55.4	65.6	57.2	1.4	1.8	64.5	56.1	0.3	0.7

MN Standards		Night	Night
Land Use	Code	L10	L50
Residential	NAC-1	55	50
Commercial	NAC-2	70	65
Industrial	NAC-3	80	75

FHWA Standards		Night
Land Use	Code	L10
Parks	A	60
Residential	B	70
General	C	70
Commercial	E	75

NOTES:

XX	Approaching or Exceed FHWA
XX	Exceeds MN State Standards
XX	Exceeds MN and FHWA Standards
XX	Excess of 5db Change (FHWA, L10)
	B5 and R21 are Removed in the Build Scenario

Table 17 – Daytime Noise Analysis – Build Scenario: (with West Gap Widen on Existing Option)

Receiver		MN State Standards (dBA)			FHWA Standards (dBA)		2010 Existing Conditions		2033 No Build Conditions		2033 Change - No Build and Existing		2033 Build Conditions		2033 Change - Build and Existing	
Number	Land Use	Code	L10	L50	Code	L10	L10	L50	L10	L50	L10	L50	L10	L50	L10	L50
B1	Commercial	NAC-2	70	65	E	75	61.2	54.9	62.4	56.6	1.2	1.7	62.2	56.4	1.0	1.5
B2	Commercial	NAC-2	70	65	E	75	61.8	55.4	63.1	57.2	1.3	1.8	62.8	56.9	1.0	1.5
B3	Commercial	NAC-2	70	65	E	75	61.4	54.9	62.7	56.7	1.3	1.8	64.9	58.2	3.5	3.3
B4	Commercial	NAC-2	70	65	E	75	63.7	56.8	64.9	58.6	1.2	1.8	64.7	58.3	1.0	1.5
B5	Commercial	NAC-2	70	65	E	75	68.0	60.0	69.4	61.9	1.4	1.9				
B6	Commercial	NAC-2	70	65	E	75	66.4	58.8	67.7	60.6	1.3	1.8	67.1	59.9	0.7	1.1
R1	Residential	NAC-1	65	60	B	70	59.2	53.3	60.4	55.1	1.2	1.8	62.1	56.4	2.9	3.1
R2	Residential	NAC-1	65	60	B	70	59.1	53.2	60.3	54.9	1.2	1.7	61.6	55.9	2.5	2.7
R3	Residential	NAC-1	65	60	B	70	54.1	49.7	55.2	51.3	1.1	1.6	55.6	51.6	1.5	1.9
R4	Residential	NAC-1	65	60	B	70	53.0	48.8	54.1	50.4	1.1	1.6	54.5	50.8	1.5	2.0
R5	Residential	NAC-1	65	60	B	70	52.7	48.6	53.8	50.1	1.1	1.5	54.3	50.5	1.6	1.9
R6	Residential	NAC-1	65	60	B	70	56.8	51.6	57.9	53.3	1.1	1.7	58.2	53.6	1.4	2.0
R7	Residential	NAC-1	65	60	B	70	55.4	50.6	56.5	52.2	1.1	1.6	56.9	52.5	1.5	1.9
R8	Residential	NAC-1	65	60	B	70	58.4	52.8	59.6	54.5	1.2	1.7	59.8	54.7	1.4	1.9
R9	Residential	NAC-1	65	60	B	70	55.8	50.9	57.0	52.5	1.2	1.6	57.3	52.8	1.5	1.9
R10	Residential	NAC-1	65	60	B	70	56.7	51.5	57.8	53.1	1.1	1.6	58.1	53.4	1.4	1.9
R11	Residential	NAC-1	65	60	B	70	58.4	52.7	59.6	54.4	1.2	1.7	59.7	54.6	1.3	1.9
R12	Residential	NAC-1	65	60	B	70	60.7	54.4	61.9	56.2	1.2	1.8	61.9	56.2	1.2	1.8
R13	Residential	NAC-1	65	60	B	70	63.1	56.3	64.4	58.1	1.3	1.8	64.1	57.8	1.0	1.5
R14	Residential	NAC-1	65	60	B	70	57.4	51.9	58.5	53.6	1.1	1.7	58.8	53.8	1.4	1.9
R15	Residential	NAC-1	65	60	B	70	58.3	52.7	59.5	54.4	1.2	1.7	59.7	54.5	1.4	1.8
R16	Residential	NAC-1	65	60	B	70	58.8	53.0	60.0	54.7	1.2	1.7	60.1	54.9	1.3	1.9
R17	Residential	NAC-1	65	60	B	70	59.3	53.4	60.5	55.1	1.2	1.7	60.6	55.2	1.3	1.8
R18	Residential	NAC-1	65	60	B	70	55.2	50.1	56.3	51.7	1.1	1.6	56.6	52.0	1.4	1.9
R19	Residential	NAC-1	65	60	B	70	60.6	54.5	61.9	56.3	1.3	1.8	63.6	57.5	3.0	3.0
R20	Residential	NAC-1	65	60	B	70	53.5	48.8	54.6	50.4	1.1	1.6	55.0	50.8	1.5	2.0
R21	Residential	NAC-1	65	60	B	70	**68.7**	**60.5**	**70.1**	**62.4**	1.4	1.9				
B7	Commercial	NAC-2	70	65	E	75	61.8	55.1	63.0	56.8	1.2	1.7	63.1	56.8	1.3	1.7
R22	Residential	NAC-1	65	60	B	70	52.0	47.3	53.0	48.9	1.0	1.6	53.2	48.9	1.2	1.6
R23	Residential	NAC-1	65	60	B	70	60.7	54.3	61.9	56.0	1.2	1.7	63.0	56.2	2.3	1.9
R24	Residential	NAC-1	65	60	B	70	60.9	54.3	62.1	56.1	1.2	1.8	63.3	56.3	2.4	2.0
R25	Residential	NAC-1	65	60	B	70	63.9	56.6	**65.2**	58.4	1.3	1.8	63.8	56.9	-0.1	0.3
R26	Residential	NAC-1	65	60	B	70	62.4	55.5	63.7	57.3	1.3	1.8	**65.1**	57.5	2.7	2.0
R27	Residential	NAC-1	65	60	B	70	57.7	51.7	58.9	53.5	1.2	1.8	58.9	53.0	1.2	1.3
B8	Commercial	NAC-2	70	65	E	75	58.9	52.8	60.1	54.6	1.2	1.8	59.7	54.0	0.8	1.2
B9	Commercial	NAC-2	70	65	E	75	58.6	52.6	59.8	54.4	1.2	1.8	59.5	53.8	0.9	1.2
B10	Commercial	NAC-2	70	65	E	75	61.4	54.7	62.7	56.5	1.3	1.8	62.2	55.8	0.8	1.1
R28	Residential	NAC-1	65	60	B	70	61.9	55.0	63.2	56.8	1.3	1.8	63.1	56.2	1.2	1.2
R29	Residential	NAC-1	65	60	B	70	55.2	50.0	56.3	51.7	1.1	1.7	56.0	51.1	0.8	1.1
R30	Residential	NAC-1	65	60	B	70	56.1	50.7	57.2	52.4	1.1	1.7	56.9	51.8	0.8	1.1
R31	Residential	NAC-1	65	60	B	70	56.5	51.0	57.6	52.6	1.1	1.6	57.3	52.1	0.8	1.1
R32	Residential	NAC-1	65	60	B	70	56.9	51.3	58.1	53.0	1.2	1.7	57.7	52.4	0.8	1.1
R33	Residential	NAC-1	65	60	B	70	57.7	51.9	58.9	53.6	1.2	1.7	58.6	53.0	0.9	1.1
R34	Residential	NAC-1	65	60	B	70	59.0	52.9	60.2	54.6	1.2	1.7	59.8	54.0	0.8	1.1
R35	Residential	NAC-1	65	60	B	70	57.5	51.7	58.7	53.4	1.2	1.7	58.3	52.8	0.8	1.1
R36	Residential	NAC-1	65	60	B	70	57.7	51.9	58.9	53.6	1.2	1.7	58.5	53.0	0.8	1.1
R37	Residential	NAC-1	65	60	B	70	56.5	51.0	57.7	52.7	1.2	1.7	57.4	52.1	0.9	1.1
R38	Residential	NAC-1	65	60	B	70	58.6	52.6	59.8	54.3	1.2	1.7	59.3	53.5	0.7	0.9
R39	Residential	NAC-1	65	60	B	70	58.6	52.6	59.8	54.3	1.2	1.7	59.2	53.5	0.6	0.9
R40	Residential	NAC-1	65	60	B	70	57.3	51.6	58.5	53.2	1.2	1.6	57.8	52.4	0.5	0.8
R41	Residential	NAC-1	65	60	B	70	55.4	50.1	56.6	51.7	1.2	1.6	57.0	51.7	1.6	1.6
R42	Residential	NAC-1	65	60	B	70	62.4	55.4	63.6	57.2	1.2	1.8	65.0	57.4	2.6	2.0
R43	Residential	NAC-1	65	60	B	70	58.8	52.7	60.0	54.4	1.2	1.7	60.8	54.6	2.0	1.9
R44	Residential	NAC-1	65	60	B	70	56.1	50.6	57.2	52.3	1.1	1.7	57.8	52.3	1.7	1.7
R45	Residential	NAC-1	65	60	B	70	**68.0**	59.6	**69.3**	**61.5**	1.3	1.9	**67.3**	59.3	-0.7	-0.3
R46	Residential	NAC-1	65	60	B	70	57.2	51.5	58.3	53.1	1.1	1.6	58.9	53.1	1.7	1.6
R47	Residential	NAC-1	65	60	B	70	**65.6**	57.2	**66.9**	59.1	1.3	1.9	**66.2**	58.2	0.6	1.0
R48	Residential	NAC-1	65	60	B	70	62.9	55.4	64.2	57.3	1.3	1.9	64.3	56.9	1.4	1.5
R49	Residential	NAC-1	65	60	B	70	61.8	54.6	63.1	56.4	1.3	1.8	62.5	55.8	0.7	1.2
R50	Residential	NAC-1	65	60	B	70	55.0	49.6	56.1	51.3	1.1	1.7	56.1	50.9	1.1	1.3
MP1	Commercial	NAC-2	70	65	E	75	62.5	55.6	63.8	57.3	1.3	1.7	65.3	57.7	2.8	2.1
MP2	Commercial	NAC-2	70	65	E	75	66.8	58.4	68.1	60.3	1.3	1.9	67.4	59.5	0.6	1.1
MP3	Commercial	NAC-2	70	65	E	75	66.8	59.1	68.1	60.9	1.3	1.8	67.4	60.1	0.6	1.0

MN Standards		Day	Day
Land Use	Code	L10	L50
Residential	NAC-1	65	60
Commercial	NAC-2	70	65
Industrial	NAC-3	80	75

FHWA Standards		Day
Land Use	Code	L10
Parks	A	60
Residential	B	70
General	C	70
Commercial	E	75

NOTES:

XX	Approaching or Exceed FHWA
XX	Exceeds MN State Standards
XX	Exceeds MN and FHWA Standards
XX	Excess of 5db Change (FHWA, L10)

B5 and R21 are Removed in the Build Scenario

Table 18 – Nighttime Noise Analysis – Build Scenario: (with West Gap Bypass Option)

Receiver		MN State Standards (dBA)			FHWA Standards (dBA)		2010 Existing Conditions		2033 No Build Conditions		2033 Change - No Build and Existing		2033 Build Conditions		2033 Change - Build and Existing	
Number	Land Use	Code	L10	L50	Code	L10	L10	L50	L10	L50	L10	L50	L10	L50	L10	L50
B1	Commercial	NAC-2	70	65	E	75	58.8	51.3	60.1	53.2	1.3	1.9	59.6	52.6	0.8	1.3
B2	Commercial	NAC-2	70	65	E	75	59.5	51.9	60.8	53.7	1.3	1.8	60.0	52.9	0.5	1.0
B3	Commercial	NAC-2	70	65	E	75	59.1	51.4	60.4	53.2	1.3	1.8				
B4	Commercial	NAC-2	70	65	E	75	61.2	53.2	62.5	55.0	1.3	1.8	54.7	49.2	-6.5	-4.0
B5	Commercial	NAC-2	70	65	E	75	65.4	58.3	66.8	58.2	1.4	1.9	57.0	50.9	-8.4	-5.4
B6	Commercial	NAC-2	70	65	E	75	63.8	55.1	65.2	56.9	1.4	1.8	53.9	48.3	-9.9	-6.8
R1	Residential	NAC-1	55	50	B	70	**56.9**	49.9	**58.2**	**51.6**	1.3	1.7	**59.7**	**52.7**	2.8	2.8
R2	Residential	NAC-1	55	50	B	70	**56.8**	49.8	**58.1**	**51.6**	1.3	1.8	**59.3**	**52.4**	2.5	2.6
R3	Residential	NAC-1	55	50	B	70	52.1	46.5	53.2	48.2	1.1	1.7	52.4	47.4	0.3	0.9
R4	Residential	NAC-1	55	50	B	70	51.0	45.6	52.1	47.3	1.1	1.7	50.9	46.3	-0.1	0.7
R5	Residential	NAC-1	55	50	B	70	50.7	45.4	51.8	47.1	1.1	1.7	50.4	45.8	-0.3	0.4
R6	Residential	NAC-1	55	50	B	70	54.6	48.3	**55.8**	**50.0**	1.2	1.7	52.5	47.5	-2.1	-0.8
R7	Residential	NAC-1	55	50	B	70	53.3	47.3	54.5	49.0	1.2	1.7	51.6	46.9	-1.7	-0.4
R8	Residential	NAC-1	55	50	B	70	**56.2**	49.4	**57.4**	**51.2**	1.2	1.8	52.4	47.5	-3.8	-1.9
R9	Residential	NAC-1	55	50	B	70	53.7	47.6	54.9	49.3	1.2	1.7	51.4	46.7	-2.3	-0.9
R10	Residential	NAC-1	55	50	B	70	54.5	48.1	**55.7**	49.9	1.2	1.8	51.5	46.7	-3.0	-1.4
R11	Residential	NAC-1	55	50	B	70	**56.1**	49.3	**57.4**	**51.1**	1.3	1.8	51.8	47.0	-4.3	-2.3
R12	Residential	NAC-1	55	50	B	70	**58.3**	**50.9**	**59.6**	**52.7**	1.3	1.8	52.6	47.5	-5.7	-3.4
R13	Residential	NAC-1	55	50	B	70	**60.7**	**52.7**	**62.0**	**54.5**	1.3	1.8	53.2	48.0	-7.5	-4.7
R14	Residential	NAC-1	55	50	B	70	**55.2**	48.5	**56.4**	**50.3**	1.2	1.8	51.1	46.4	-4.1	-2.1
R15	Residential	NAC-1	55	50	B	70	**56.1**	49.2	**57.3**	**51.0**	1.2	1.8	51.4	46.5	-4.7	-2.7
R16	Residential	NAC-1	55	50	B	70	**56.5**	49.6	**57.8**	**51.3**	1.3	1.7	51.6	46.6	-4.9	-3.0
R17	Residential	NAC-1	55	50	B	70	**57.0**	49.9	**58.3**	**51.7**	1.3	1.8	51.7	46.7	-5.3	-3.2
R18	Residential	NAC-1	55	50	B	70	53.0	46.7	54.2	48.5	1.2	1.8	50.0	45.2	-3.0	-1.5
R19	Residential	NAC-1	55	50	B	70	**58.3**	**51.0**	**59.6**	**52.8**	1.3	1.8	**62.1**	**54.5**	3.8	3.5
R20	Residential	NAC-1	55	50	B	70	51.4	45.5	52.6	47.2	1.2	1.7	52.8	47.4	1.4	1.9
R21	Residential	NAC-1	55	50	B	70	**66.1**	**56.8**	**67.5**	**58.7**	1.4	1.9	**57.2**	**51.1**	-8.9	-5.7
B7	Commercial	NAC-2	70	65	E	75	59.4	51.5	60.7	53.3	1.3	1.8	60.7	53.2	1.3	1.7
R22	Residential	NAC-1	55	50	B	70	49.9	44.1	51.1	45.8	1.2	1.7	50.8	45.2	0.9	1.1
R23	Residential	NAC-1	55	50	B	70	**58.4**	**50.8**	**59.6**	**52.5**	1.2	1.7	**59.5**	**51.3**	1.1	0.5
R24	Residential	NAC-1	55	50	B	70	**58.5**	**50.8**	**59.8**	**52.6**	1.3	1.8	**59.8**	**51.4**	1.3	0.6
R25	Residential	NAC-1	55	50	B	70	**61.4**	**53.0**	**62.8**	**54.8**	1.4	1.8	**60.3**	**52.0**	-1.1	-1.0
R26	Residential	NAC-1	55	50	B	70	**60.0**	**51.9**	**61.3**	**53.7**	1.3	1.8	**61.6**	**52.6**	1.6	0.7
R27	Residential	NAC-1	55	50	B	70	**55.3**	48.1	**56.5**	49.9	1.2	1.8	**55.6**	48.3	0.3	0.2
B8	Commercial	NAC-2	70	65	E	75	56.4	49.1	57.7	50.9	1.3	1.8	56.5	49.2	0.1	0.1
B9	Commercial	NAC-2	70	65	E	75	56.2	48.9	57.5	50.7	1.3	1.8	56.2	49.0	0.0	0.1
B10	Commercial	NAC-2	70	65	E	75	58.8	50.8	60.1	52.6	1.3	1.8	58.8	50.9	0.0	0.1
R28	Residential	NAC-1	55	50	B	70	**59.1**	**51.0**	**60.4**	**52.8**	1.3	1.8	**59.6**	**51.3**	0.5	0.3
R29	Residential	NAC-1	55	50	B	70	52.9	46.5	54.1	48.2	1.2	1.7	52.9	46.6	0.0	0.1
R30	Residential	NAC-1	55	50	B	70	53.7	47.1	54.9	48.8	1.2	1.7	53.8	47.2	0.1	0.1
R31	Residential	NAC-1	55	50	B	70	54.1	47.3	**55.3**	49.0	1.2	1.7	54.2	47.4	0.1	0.1
R32	Residential	NAC-1	55	50	B	70	54.5	47.6	**55.7**	49.4	1.2	1.8	54.6	47.7	0.1	0.1
R33	Residential	NAC-1	55	50	B	70	**55.3**	48.2	**56.5**	49.9	1.2	1.7	**55.4**	48.3	0.1	0.1
R34	Residential	NAC-1	55	50	B	70	**56.4**	49.1	**57.7**	**50.8**	1.3	1.7	**56.5**	49.2	0.1	0.1
R35	Residential	NAC-1	55	50	B	70	55.0	48.0	**56.2**	49.7	1.2	1.7	**55.1**	48.1	0.1	0.1
R36	Residential	NAC-1	55	50	B	70	**55.2**	48.1	**56.4**	49.9	1.2	1.8	**55.3**	48.3	0.1	0.2
R37	Residential	NAC-1	55	50	B	70	54.1	47.3	**55.3**	49.1	1.2	1.8	54.2	47.5	0.1	0.2
R38	Residential	NAC-1	55	50	B	70	**56.1**	48.8	**57.3**	**50.6**	1.2	1.8	**56.0**	48.8	-0.1	0.0
R39	Residential	NAC-1	55	50	B	70	**56.1**	48.9	**57.3**	**50.6**	1.2	1.7	**55.9**	48.7	-0.2	-0.2
R40	Residential	NAC-1	55	50	B	70	**55.1**	48.2	**56.3**	49.9	1.2	1.7	54.6	47.7	-0.5	-0.5
R41	Residential	NAC-1	55	50	B	70	53.3	46.8	54.5	48.5	1.2	1.7	53.9	47.1	0.6	0.3
R42	Residential	NAC-1	55	50	B	70	**60.0**	**51.9**	**61.3**	**53.7**	1.3	1.8	**61.4**	**52.4**	1.4	0.5
R43	Residential	NAC-1	55	50	B	70	**56.5**	49.3	**57.8**	**51.0**	1.3	1.7	**57.5**	49.7	1.0	0.4
R44	Residential	NAC-1	55	50	B	70	53.9	47.3	**55.1**	49.0	1.2	1.7	54.6	47.6	0.7	0.3
R45	Residential	NAC-1	55	50	B	70	**65.4**	**56.0**	**66.7**	**57.8**	1.3	1.8	**63.6**	**54.1**	-1.8	-1.9
R46	Residential	NAC-1	55	50	B	70	54.9	48.0	**56.1**	49.8	1.2	1.8	**55.6**	48.4	0.7	0.4
R47	Residential	NAC-1	55	50	B	70	**63.0**	**53.6**	**64.5**	**55.5**	1.5	1.9	**62.5**	**53.1**	-0.5	-0.5
R48	Residential	NAC-1	55	50	B	70	**60.1**	**51.5**	**61.4**	**53.4**	1.3	1.9	**60.8**	**52.0**	0.7	0.5
R49	Residential	NAC-1	55	50	B	70	**59.4**	**51.0**	**60.7**	**52.8**	1.3	1.8	**59.0**	**50.8**	-0.4	-0.2
R50	Residential	NAC-1	55	50	B	70	52.6	46.1	53.8	47.8	1.2	1.7	53.0	46.3	0.4	0.2
MP1	Commercial	NAC-2	70	65	E	75	60.1	52.0	61.4	53.8	1.3	1.8	61.8	52.8	1.7	0.8
MP2	Commercial	NAC-2	70	65	E	75	63.9	54.4	65.3	56.2	1.4	1.8	63.7	54.4	-0.2	0.0
MP3	Commercial	NAC-2	70	65	E	75	64.2	55.4	65.6	57.2	1.4	1.8	54.0	48.4	-10.2	-7.0

MN Standards		Night	Night
Land Use	Code	L10	L50
Residential	NAC-1	55	50
Commercial	NAC-2	70	65
Industrial	NAC-3	80	75

FHWA Standards		Night
Land Use	Code	L10
Parks	A	60
Residential	B	70
General	C	70
Commercial	E	75

NOTES:

- XX — Approaching or Exceed FHWA
- **XX** — Exceeds MN State Standards
- XX — Exceeds MN and FHWA Standards
- *XX* — Excess of 5db Change (FHWA, L10)

B5 and R21 are Removed in the Build Scenario

Table 19 – Daytime Noise Analysis – Build Scenario: (with West Gap Bypass Option)

Receiver		MN State Standards (dBA)			FHWA Standards (dBA)		2010 Existing Conditions		2033 No Build Conditions		2033 Change - No Build and Existing		2033 Build Conditions		2033 Change - Build and Existing	
Number	Land Use	Code	L10	L50	Code	L10	L10	L50	L10	L50	L10	L50	L10	L50	L10	L50
B1	Commercial	NAC-2	70	65	E	75	61.2	54.9	62.4	56.6	1.2	1.7	62.1	56.3	0.9	1.4
B2	Commercial	NAC-2	70	65	E	75	61.8	55.4	63.1	57.2	1.3	1.8	62.6	56.7	0.8	1.3
B3	Commercial	NAC-2	70	65	E	75	61.4	54.9	62.7	56.7	1.3	1.8				
B4	Commercial	NAC-2	70	65	E	75	63.7	56.8	64.9	58.6	1.2	1.8	56.9	52.6	-6.8	-4.2
B5	Commercial	NAC-2	70	65	E	75	68.0	60.0	69.4	61.9	1.4	1.9	59.4	54.5	-8.6	-5.5
B6	Commercial	NAC-2	70	65	E	75	66.4	58.8	67.7	60.6	1.3	1.8	56.1	51.7	-10.3	-7.1
R1	Residential	NAC-1	65	60	B	70	59.2	53.3	60.4	55.1	1.2	1.8	62.1	56.4	2.9	3.1
R2	Residential	NAC-1	65	60	B	70	59.1	53.2	60.3	54.9	1.2	1.7	61.6	55.9	2.5	2.7
R3	Residential	NAC-1	65	60	B	70	54.1	49.7	55.2	51.3	1.1	1.6	54.6	50.7	0.5	1.0
R4	Residential	NAC-1	65	60	B	70	53.0	48.8	54.1	50.4	1.1	1.6	53.1	49.5	0.1	0.7
R5	Residential	NAC-1	65	60	B	70	52.7	48.6	53.8	50.1	1.1	1.5	52.5	49.0	-0.2	0.4
R6	Residential	NAC-1	65	60	B	70	56.8	51.6	57.9	53.3	1.1	1.7	54.7	50.8	-2.1	-0.8
R7	Residential	NAC-1	65	60	B	70	55.4	50.6	56.5	52.2	1.1	1.6	53.8	50.1	-1.6	-0.5
R8	Residential	NAC-1	65	60	B	70	58.4	52.8	59.6	54.5	1.2	1.7	54.6	50.8	-3.8	-2.0
R9	Residential	NAC-1	65	60	B	70	55.8	50.9	57.0	52.5	1.2	1.6	53.5	49.9	-2.3	-1.0
R10	Residential	NAC-1	65	60	B	70	56.7	51.5	57.8	53.1	1.1	1.6	53.6	50.0	-3.1	-1.5
R11	Residential	NAC-1	65	60	B	70	58.4	52.7	59.6	54.4	1.2	1.7	54.0	50.2	-4.4	-2.5
R12	Residential	NAC-1	65	60	B	70	60.7	54.4	61.9	56.2	1.2	1.8	54.8	50.8	-5.9	-3.6
R13	Residential	NAC-1	65	60	B	70	63.1	56.3	64.4	58.1	1.3	1.8	55.5	51.4	-7.6	-4.9
R14	Residential	NAC-1	65	60	B	70	57.4	51.9	58.5	53.6	1.1	1.7	53.3	49.6	-4.1	-2.3
R15	Residential	NAC-1	65	60	B	70	58.3	52.7	59.5	54.4	1.2	1.7	53.6	49.8	-4.7	-2.9
R16	Residential	NAC-1	65	60	B	70	58.8	53.0	60.0	54.7	1.2	1.7	53.7	49.9	-5.1	-3.1
R17	Residential	NAC-1	65	60	B	70	59.3	53.4	60.5	55.1	1.2	1.7	53.9	50.0	-5.4	-3.4
R18	Residential	NAC-1	65	60	B	70	55.2	50.1	56.3	51.7	1.1	1.6	52.2	48.4	-3.0	-1.7
R19	Residential	NAC-1	65	60	B	70	60.6	54.5	61.9	56.3	1.3	1.8	64.8	58.3	4.2	3.8
R20	Residential	NAC-1	65	60	B	70	53.5	48.8	54.6	50.4	1.1	1.6	55.0	50.8	1.5	2.0
R21	Residential	NAC-1	65	60	B	70	**68.7**	**60.5**	**70.1**	**62.4**	1.4	1.9	59.6	54.6	-9.1	-5.9
B7	Commercial	NAC-2	70	65	E	75	61.8	55.1	63.0	56.8	1.2	1.7	63.1	56.8	1.3	1.7
R22	Residential	NAC-1	65	60	B	70	52.0	47.3	53.0	48.9	1.0	1.6	53.2	48.9	1.2	1.6
R23	Residential	NAC-1	65	60	B	70	60.7	54.3	61.9	56.0	1.2	1.7	63.0	56.2	2.3	1.9
R24	Residential	NAC-1	65	60	B	70	60.9	54.3	62.1	56.1	1.2	1.8	63.3	56.3	2.4	2.0
R25	Residential	NAC-1	65	60	B	70	63.9	56.6	**65.2**	58.4	1.3	1.8	63.8	56.9	-0.1	0.3
R26	Residential	NAC-1	65	60	B	70	62.4	55.5	63.7	57.3	1.3	1.8	**65.1**	57.5	2.7	2.0
R27	Residential	NAC-1	65	60	B	70	57.7	51.7	58.9	53.5	1.2	1.8	58.9	53.0	1.2	1.3
B8	Commercial	NAC-2	70	65	E	75	58.9	52.8	60.1	54.6	1.2	1.8	59.7	54.0	0.8	1.2
B9	Commercial	NAC-2	70	65	E	75	58.6	52.6	59.8	54.4	1.2	1.8	59.5	53.8	0.9	1.2
B10	Commercial	NAC-2	70	65	E	75	61.4	54.7	62.7	56.5	1.3	1.8	62.2	55.8	0.8	1.1
R28	Residential	NAC-1	65	60	B	70	61.9	55.0	63.2	56.8	1.3	1.8	63.1	56.2	1.2	1.2
R29	Residential	NAC-1	65	60	B	70	55.2	50.0	56.3	51.7	1.1	1.7	56.0	51.1	0.8	1.1
R30	Residential	NAC-1	65	60	B	70	56.1	50.7	57.2	52.4	1.1	1.7	56.9	51.8	0.8	1.1
R31	Residential	NAC-1	65	60	B	70	56.5	51.0	57.6	52.6	1.1	1.6	57.3	52.1	0.8	1.1
R32	Residential	NAC-1	65	60	B	70	56.9	51.3	58.1	53.0	1.2	1.7	57.7	52.4	0.8	1.1
R33	Residential	NAC-1	65	60	B	70	57.7	51.9	58.9	53.6	1.2	1.7	58.6	53.0	0.9	1.1
R34	Residential	NAC-1	65	60	B	70	59.0	52.9	60.2	54.6	1.2	1.7	59.8	54.0	0.8	1.1
R35	Residential	NAC-1	65	60	B	70	57.5	51.7	58.7	53.4	1.2	1.7	58.3	52.8	0.8	1.1
R36	Residential	NAC-1	65	60	B	70	57.7	51.9	58.9	53.6	1.2	1.7	58.5	53.0	0.8	1.1
R37	Residential	NAC-1	65	60	B	70	56.5	51.0	57.7	52.7	1.2	1.7	57.4	52.1	0.9	1.1
R38	Residential	NAC-1	65	60	B	70	58.6	52.6	59.8	54.3	1.2	1.7	59.3	53.5	0.7	0.9
R39	Residential	NAC-1	65	60	B	70	58.6	52.6	59.8	54.3	1.2	1.7	59.2	53.5	0.6	0.9
R40	Residential	NAC-1	65	60	B	70	57.3	51.6	58.5	53.2	1.2	1.6	57.8	52.4	0.5	0.8
R41	Residential	NAC-1	65	60	B	70	55.4	50.1	56.6	51.7	1.2	1.6	57.0	51.7	1.6	1.6
R42	Residential	NAC-1	65	60	B	70	62.4	55.4	63.6	57.2	1.2	1.8	65.0	57.4	2.6	2.0
R43	Residential	NAC-1	65	60	B	70	58.8	52.7	60.0	54.4	1.2	1.7	60.8	54.6	2.0	1.9
R44	Residential	NAC-1	65	60	B	70	56.1	50.6	57.2	52.3	1.1	1.7	57.8	52.3	1.7	1.7
R45	Residential	NAC-1	65	60	B	70	**68.0**	59.6	**69.3**	**61.5**	1.3	1.9	**67.3**	59.3	-0.7	-0.3
R46	Residential	NAC-1	65	60	B	70	57.2	51.5	58.3	53.1	1.1	1.6	58.9	53.1	1.7	1.6
R47	Residential	NAC-1	65	60	B	70	**65.6**	57.2	**66.9**	59.1	1.3	1.9	**66.2**	58.2	0.6	1.0
R48	Residential	NAC-1	65	60	B	70	62.9	55.4	64.2	57.3	1.3	1.9	64.3	56.9	1.4	1.5
R49	Residential	NAC-1	65	60	B	70	61.8	54.6	63.1	56.4	1.3	1.8	62.5	55.8	0.7	1.2
R50	Residential	NAC-1	65	60	B	70	55.0	49.6	56.1	51.3	1.1	1.7	56.1	50.9	1.1	1.3
MP1	Commercial	NAC-2	70	65	E	75	62.5	55.6	63.8	57.3	1.3	1.7	65.3	57.7	2.8	2.1
MP2	Commercial	NAC-2	70	65	E	75	66.8	58.4	68.1	60.3	1.3	1.9	67.4	59.5	0.6	1.1
MP3	Commercial	NAC-2	70	65	E	75	66.8	59.1	68.1	60.9	1.3	1.8	56.2	51.8	-10.6	-7.3

MN Standards		Day	Day
Land Use	Code	L10	L50
Residential	NAC-1	65	60
Commercial	NAC-2	70	65
Industrial	NAC-3	80	75

FHWA Standards		Day
Land Use	Code	L10
Parks	A	60
Residential	B	70
General	C	70
Commercial	E	75

NOTES:

XX	Approaching or Exceed FHWA
XX	Exceeds MN State Standards
XX	Exceeds MN and FHWA Standards
XX	Excess of 5db Change (FHWA, L10)

B5 and R21 are Removed in the Build Scenario

Under the Build Alternative with the design option to widen on existing alignment through Bingham Lake would eliminate receptors B5 and R21 because of right-of-way requirements. Under this build condition, Receptors R1-R2, R6, R8, R10-R17, R19, R21-R28, R33-R36, R38, R39, R42, R43, and R45-49 are above the state nighttime standards. Receptors R45 and R47 also exceed the daytime state standards under the Build Alternative that widens the highway on the existing alignment through Bingham Lake.

The Build Alternative with the design option that bypasses Bingham Lake to the north would eliminate receptor B3 on the north side of Highway 60 in Bingham Lake. This receptor was removed from the analysis tables under this option. The data in the table indicates Receptors R1-R2, R19, and R21, R23-R28, R33-36, R38, R39, R42, R43, R45-R49 are above the state nighttime standards for the Build Alternative with the Bingham Lake Bypass design option. Also, R45 and R47 exceed the state daytime standards under this build condition.

Noise Barrier Evaluation

When noise impacts are identified, a noise barrier evaluation analysis must be performed. Noise barrier construction decisions are determined based on the evaluation of the feasibility and reasonableness of the noise barriers. The overall approach is outlined in MnDOT Noise Policy for Type I and Type II Federal-Aid Projects as per 23 CFR 772.

Feasibility of a noise barrier is determined by physical and/or engineering constraints (i.e., whether a noise barrier could feasibly be constructed on the site). The feasibility of noise barriers construction is sometimes dependant on design details that are not known until the final design of the project.

For the noise analysis, it is assumed that any utilities within the corridor can be relocated to accommodate the proposed noise barriers. The following analysis assumes that noise barriers could be feasibly constructed throughout the project area, up to 20 feet high, which is the maximum height allowed in accordance with MnDOT policy.

Reasonableness is based on a number of different factors and is more subjective. The first factor in the reasonableness of a noise wall is how cost effective the noise barrier will be, this is the economic reasonableness. MnDOT has created a cost effective index that directly connects the cost of the noise barrier with the acoustic effectiveness of the barrier.

A barrier must achieve a noise reduction of 5 dBA or more at one or more receptor locations to be considered acoustically effective. The cost per dBA of reduction per residence should be equal to, or less than $3,250 to be considered cost effective. The following formula is used to determine the cost effective index of the barrier.

The cost effective index is equal to the cost of the noise barrier (calculated using $15 per square foot of wall) divided by the average noise level reduction of those residences that had noise level reductions of 5 dBA or more.

Only receptor locations that experience a five or greater decibel reduction in noise following the construction of a noise barrier are considered in this analysis. The result of the above formula is a cost per decibel per residence represented.

Assessing the cost effectiveness of noise barriers includes several steps. First, the impacted noise areas are assessed to determine the probable location for an effective noise barrier. Second, the noise barriers are modeled to assess their acoustical effectiveness. For this study, three heights of potential noise barriers were analyzed: 20-, 15- and 10-feet. If a 20 foot high noise barrier is feasible and meets the reasonableness criteria, it would be proposed for construction. If the 20 foot high barrier does not meet the criteria, a 15 foot barrier would be evaluated. Likewise if a 15 foot high barrier does not meet the criteria, a 10 foot barrier would be evaluated.

Tables 16-19 indicate that State noise standards are currently and/or predicted to be exceeded throughout the study area. Noise barriers were evaluated at the 18 locations identified in the tables as exceeding noise standards. Tables 20 through Table 25 show the cost effectiveness results for each of the wall segments evaluated. The conceptual layout figures in Appendix A illustrate the barriers considered in this analysis.

Wall 1 – R1 Single Residential

This noise area contains a single residential receptor, R1, located north of Highway 60 in the West Gap. This receptor exceeds L_{10} and L_{50} state standards for nighttime. A noise barrier, approximately 1,960 feet long, was modeled along the highway right of way line. At 20 feet high, the noise barrier provides a decibel reduction of 3.8 dBA with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 15 feet high, the noise barrier provides a decibel reduction of only 2.0 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 10 feet high, the noise barrier provides a decibel reduction of only 0.5 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. No noise barrier would be reasonable to construct for this receptor.

Wall 2 – R2 Single Residential

This noise area contains a single residential receptor, R2, located north of Highway 60 in the West Gap. This receptor exceeds L_{10} and L_{50} state standards for nighttime. A noise barrier, approximately 1,775 feet long, was modeled along the Highway 60 right of way line. At 20 feet high, the noise barrier provides a decibel reduction of 6.2 dBA; however the cost effectiveness of the barrier is $85,887 per dBA of reduction per residence, which is above the maximum state criteria of $3,250. At 15 feet high, the noise barrier provides a decibel reduction of only 4.5 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 10 feet high, the noise barrier provides a decibel reduction of only 2.6 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. No noise barrier would be reasonable to construct for this receptor.

Table 20 – Noise Barrier Cost Effectiveness: 20 foot Barriers (West Gap Widen on Existing Option)

																	MnDOT Threshold $3,250
Barrier	Receptor	Land Use	Timeframe (Day or Night)	MnDOT Noise Standard (dBA)	FHWA Noise Standard (dBA)	Existing Noise Levels (dBA)	No Build Noise Levels (dBA)	Build Noise Levels: No Barriers	Build Noise Levels: Barriers (20 ft)	dBA Reduction	Affected Residence/ Commercial	Residence with 5dBA Reduction	Total dBA Reduction	Segment Length (ft)	Area of Barrier (SF)	Total Cost ($15/SF)	Cost Effectiveness (Cost/dBA/Res)
Wall 1	R1	Residential	Night	55	70	**56.9**	**58.2**	**59.7**	**55.9**	-3.8	1	0	0.0	1,960	39,200	$588,000	NOT ACOUSTICALLY EFFECTIVE
Wall 2	R2	Residential	Night	55	70	**56.8**	**58.1**	**59.3**	53.1	**-6.2**	1	1	-6.2	1,775	35,500	$532,500	$85,887
Wall 3A	R3	Residential	Night	55	70	52.1	53.2	53.4	52.6	-0.8	1	0	0.0	4,050	81,000	$1,215,000	NOT ACOUSTICALLY EFFECTIVE
	R4	Residential	Night	55	70	51.0	52.1	52.3	51.4	-0.9	1	0	0.0				
	R5	Residential	Night	55	70	50.7	51.8	52.1	51.0	-1.1	1	0	0.0				
	R6	Residential	Night	55	70	54.6	**55.8**	**55.9**	54.0	-1.9	1	0	0.0				
	R7	Residential	Night	55	70	53.3	54.5	54.6	52.8	-1.8	1	0	0.0				
	R8	Residential	Night	55	70	**56.2**	**57.4**	**57.4**	54.3	-3.1	1	0	0.0				
	R9	Residential	Night	55	70	53.7	54.9	55.0	53.0	-2.0	1	0	0.0				
	R10	Residential	Night	55	70	54.5	**55.7**	**55.8**	53.4	-2.4	1	0	0.0				
	R11	Residential	Night	55	70	**56.1**	**57.4**	**57.3**	54.3	-3.0	1	0	0.0				
	R12	Residential	Night	55	70	**58.3**	**59.6**	**59.4**	**55.5**	-3.9	1	0	0.0				
	R13	Residential	Night	55	70	**60.7**	**62.0**	**61.5**	**56.8**	-4.7	1	0	0.0				
	R14	Residential	Night	55	70	**55.2**	**56.4**	**56.4**	53.8	-2.6	1	0	0.0				
	R15	Residential	Night	55	70	**56.1**	**57.3**	**57.3**	54.7	-2.6	1	0	0.0				
	R16	Residential	Night	55	70	**56.5**	**57.8**	**57.7**	**55.9**	-1.8	1	0	0.0				
	R17	Residential	Night	55	70	**57.0**	**58.3**	**58.1**	**56.2**	-1.9	1	0	0.0				
Wall 4A	R19	Residential	Night	55	70	**58.3**	**59.6**	**61.2**	**56.1**	**-5.1**	1	1	-5.1	2,175	43,500	$652,500	$127,941
Wall 5	R23	Residential	Night	55	70	**58.4**	**59.6**	**59.5**	53.4	**-6.1**	1	1	-6.1	1,300	26,000	$390,000	$63,934
Wall 6	R24	Residential	Night	55	70	**58.5**	**59.8**	**59.8**	54.2	**-5.6**	1	1	-5.6	850	17,000	$255,000	$45,536
Wall 7	R25	Residential	Night	55	70	**61.4**	**62.8**	**60.3**	53.6	**-6.7**	1	1	-6.7	1,600	32,000	$480,000	$71,642
Wall 8	R26	Residential	Night	55	70	**60.0**	**61.3**	**61.6**	52.6	**-9.0**	1	1	-9.0	850	17,000	$255,000	$28,333
Wall 9	R27	Residential	Night	55	70	**55.3**	**56.5**	**55.6**	50.7	-4.9	1	0	0.0	2,650	53,000	$795,000	NOT ACOUSTICALLY EFFECTIVE
Wall 10	R28	Residential	Night	55	70	**59.1**	**60.4**	**59.6**	54.9	-4.7	1	0	0.0	1,325	26,500	$397,500	NOT ACOUSTICALLY EFFECTIVE
Wall 11	B8	Commercial	Night	70	75	56.4	57.7	56.5	53.4	-3.1	1	0	0.0	4,350	87,000	$1,305,000	NOT ACOUSTICALLY EFFECTIVE
	B9	Commercial	Night	70	75	56.2	57.5	56.2	53.4	-2.8	1	0	0.0				
	B10	Commercial	Night	70	75	58.8	60.1	58.8	54.7	-4.1	1	0	0.0				
	R29	Residential	Night	55	70	52.9	54.1	52.9	51.1	-1.8	1	0	0.0				
	R30	Residential	Night	55	70	53.7	54.9	53.8	51.7	-2.1	1	0	0.0				
	R31	Residential	Night	55	70	54.1	**55.3**	54.2	51.8	-2.4	1	0	0.0				
	R32	Residential	Night	55	70	54.5	**55.7**	54.6	52.2	-2.4	1	0	0.0				
	R33	Residential	Night	55	70	**55.3**	**56.5**	**55.4**	52.9	-2.5	1	0	0.0				
	R34	Residential	Night	55	70	**56.4**	**57.7**	**56.5**	53.6	-2.9	1	0	0.0				
	R35	Residential	Night	55	70	55.0	**56.2**	**55.1**	52.2	-2.9	1	0	0.0				
	R36	Residential	Night	55	70	**55.2**	**56.4**	**55.3**	52.9	-2.4	1	0	0.0				
	R37	Residential	Night	55	70	54.1	**55.3**	54.2	52.1	-2.1	1	0	0.0				
	R38	Residential	Night	55	70	**56.1**	**57.3**	**56.0**	**55.2**	-0.8	1	0	0.0				
	R39	Residential	Night	55	70	**56.1**	**57.3**	**55.9**	**55.6**	-0.3	1	0	0.0				
Wall 12	R42	Residential	Night	55	70	**60.0**	**61.3**	**61.4**	53.7	**-7.7**	1	1	-7.7	1,300	26,000	$390,000	$50,649
Wall 13	R43	Residential	Night	55	70	**56.5**	**57.8**	**57.5**	52.7	-4.8	1	0	0.0	2,100	42,000	$630,000	NOT ACOUSTICALLY EFFECTIVE
Wall 14	R45	Residential	Night	55	70	**65.4**	**66.7**	**63.6**	54.8	**-8.8**	1	1	-8.8	875	17,500	$262,500	$29,830
	R45	Residential	Day	65	70	**68.0**	**69.3**	**67.3**	57.9	**-9.4**	1	1	-9.4	875	17,500	$262,500	$27,926
Wall 15	R46	Residential	Night	55	70	54.9	**56.1**	**55.6**	51.9	-3.7	1	0	0.0	3,500	70,000	$1,050,000	NOT ACOUSTICALLY EFFECTIVE
Wall 16	R47	Residential	Night	55	70	**63.0**	**64.5**	**62.5**	52.9	**-9.6**	1	1	-9.6	725	14,500	$217,500	$22,656
	R47	Residential	Day	65	70	**65.6**	**66.9**	**66.2**	56.1	**-10.1**	1	1	-10.1	725	14,500	$217,500	$21,535
Wall 17	R49	Residential	Night	55	70	**59.4**	**60.7**	**59.0**	52.9	**-6.1**	1	1	-6.1	1,475	29,500	$442,500	$72,541
Wall 18	R48	Residential	Night	55	70	**60.1**	**61.4**	**60.8**	53.8	**-7.0**	1	1	-7.0	3,900	78,000	$1,170,000	$167,143
	R50	Residential	Night	55	70	52.6	53.8	53.0	52.8	-0.2	1	0	0.0				

MN Standards		Day	Night
Land Use	Code	L10	L10
Residential	NAC-1	65	55
Commercial	NAC-2	70	70
Industrial	NAC-3	80	80

FHWA Standards		
Land Use	Code	L10
Parks	A	60
Residential	B	70
General	C	70
Commercial	E	75

XX Exceeds MN and FHWA Standards
XX Approaching or Exceed FHWA
XX Exceeds MN State Standards
XX Excess of 5db Change (FHWA)

$X.XX is both Acoustically Beneficial and Cost Effective

Table 21 – Noise Barrier Cost Effectiveness: 15 foot Barriers (West Gap Widen on Existing Option)

								Build Noise Levels								MnDOT Threshold
																$3,250
Barrier	Receptor	Land Use	Timeframe (Day or Night)	MnDOT Noise Standard (dBA)	FHWA Noise Standard (dBA)	Existing Noise Levels (dBA)	No Build Noise Levels (dBA)	No Barriers	Barriers (15 ft)	dBA Reduction	Affected Residence/ Commercial	Residence with 5dBA Reduction	Total dBA Reduction	Segment Length (ft)	Area of Barrier (SF)	Total Cost ($15/SF)	Cost Effectiveness (Cost/dBA/Res)
Wall 1	R1	Residential	Night	55	70	**56.9**	**58.2**	**59.7**	**57.7**	-2.0	1	0	0.0	1,960	29,400	$441,000	NOT ACOUSTICALLY EFFECTIVE
Wall 2	R2	Residential	Night	55	70	**56.8**	**58.1**	**59.3**	54.8	-4.5	1	0	0.0	1,775	26,625	$399,375	NOT ACOUSTICALLY EFFECTIVE
Wall 3A	R3	Residential	Night	55	70	52.1	53.2	53.4	53.2	-0.2	1	0	0.0	4,050	60,750	$911,250	NOT ACOUSTICALLY EFFECTIVE
	R4	Residential	Night	55	70	51.0	52.1	52.3	52.1	-0.2	1	0	0.0				
	R5	Residential	Night	55	70	50.7	51.8	52.1	51.8	-0.3	1	0	0.0				
	R6	Residential	Night	55	70	54.6	**55.8**	**55.9**	**55.4**	-0.5	1	0	0.0				
	R7	Residential	Night	55	70	53.3	54.5	54.6	54.1	-0.5	1	0	0.0				
	R8	Residential	Night	55	70	**56.2**	**57.4**	**57.4**	**56.4**	-1.0	1	0	0.0				
	R9	Residential	Night	55	70	53.7	54.9	55.0	54.5	-0.5	1	0	0.0				
	R10	Residential	Night	55	70	54.5	**55.7**	**55.8**	**55.1**	-0.7	1	0	0.0				
	R11	Residential	Night	55	70	**56.1**	**57.4**	**57.3**	**56.4**	-0.9	1	0	0.0				
	R12	Residential	Night	55	70	**58.3**	**59.6**	**59.4**	**57.8**	-1.6	1	0	0.0				
	R13	Residential	Night	55	70	**60.7**	**62.0**	**61.5**	**59.4**	-2.1	1	0	0.0				
	R14	Residential	Night	55	70	**55.2**	**56.4**	**56.4**	**55.6**	-0.8	1	0	0.0				
	R15	Residential	Night	55	70	**56.1**	**57.3**	**57.3**	**56.5**	-0.8	1	0	0.0				
	R16	Residential	Night	55	70	**56.5**	**57.8**	**57.7**	**57.2**	-0.5	1	0	0.0				
	R17	Residential	Night	55	70	**57.0**	**58.3**	**58.1**	**57.6**	-0.5	1	0	0.0				
Wall 4A	R19	Residential	Night	55	70	**58.3**	**59.6**	**61.2**	**58.1**	-3.1	1	0	0.0	2,175	32,625	$489,375	NOT ACOUSTICALLY EFFECTIVE
Wall 5	R23	Residential	Night	55	70	**58.4**	**59.6**	**59.5**	**55.8**	-3.7	1	0	0.0	1,300	19,500	$292,500	NOT ACOUSTICALLY EFFECTIVE
Wall 6	R24	Residential	Night	55	70	**58.5**	**59.8**	**59.8**	**56.3**	-3.5	1	0	0.0	850	12,750	$191,250	NOT ACOUSTICALLY EFFECTIVE
Wall 7	R25	Residential	Night	55	70	**61.4**	**62.8**	**60.3**	**56.1**	-4.2	1	0	0.0	1,600	24,000	$360,000	NOT ACOUSTICALLY EFFECTIVE
Wall 8	R26	Residential	Night	55	70	**60.0**	**61.3**	**61.6**	54.9	**-6.7**	1	1	-6.7	850	12,750	$191,250	$28,545
Wall 9	R27	Residential	Night	55	70	**55.3**	**56.5**	**55.6**	52.7	-2.9	1	0	0.0	2,650	39,750	$596,250	NOT ACOUSTICALLY EFFECTIVE
Wall 10	R28	Residential	Night	55	70	**59.1**	**60.4**	**59.6**	**57.3**	-2.3	1	0	0.0	1,325	19,875	$298,125	NOT ACOUSTICALLY EFFECTIVE
Wall 11	B8	Commercial	Night	70	75	56.4	57.7	56.5	55.2	-1.3	1	0	0.0	4,350	65,250	$978,750	NOT ACOUSTICALLY EFFECTIVE
	B9	Commercial	Night	70	75	56.2	57.5	56.2	55.1	-1.1	1	0	0.0				
	B10	Commercial	Night	70	75	58.8	60.1	58.8	56.9	-1.9	1	0	0.0				
	R29	Residential	Night	55	70	52.9	54.1	52.9	52.3	-0.6	1	0	0.0				
	R30	Residential	Night	55	70	53.7	54.9	53.8	53.0	-0.8	1	0	0.0				
	R31	Residential	Night	55	70	54.1	**55.3**	54.2	53.2	-1.0	1	0	0.0				
	R32	Residential	Night	55	70	54.5	**55.7**	54.6	53.7	-0.9	1	0	0.0				
	R33	Residential	Night	55	70	**55.3**	**56.5**	**55.4**	54.4	-1.0	1	0	0.0				
	R34	Residential	Night	55	70	**56.4**	**57.7**	**56.5**	**55.4**	-1.1	1	0	0.0				
	R35	Residential	Night	55	70	55.0	**56.2**	**55.1**	54.0	-1.1	1	0	0.0				
	R36	Residential	Night	55	70	**55.2**	**56.4**	**55.3**	54.4	-0.9	1	0	0.0				
	R37	Residential	Night	55	70	54.1	**55.3**	54.2	53.4	-0.8	1	0	0.0				
	R38	Residential	Night	55	70	**56.1**	**57.3**	**56.0**	**56.0**	0.0	1	0	0.0				
	R39	Residential	Night	55	70	**56.1**	**57.3**	**55.9**	**55.9**	0.0	1	0	0.0				
Wall 12	R42	Residential	Night	55	70	**60.0**	**61.3**	**61.4**	**56.1**	**-5.3**	1	1	-5.3	1,300	19,500	$292,500	$55,189
Wall 13	R43	Residential	Night	55	70	**56.5**	**57.8**	**57.5**	55.0	-2.5	1	0	0.0	2,100	31,500	$472,500	NOT ACOUSTICALLY EFFECTIVE
Wall 14	R45	Residential	Night	55	70	**65.4**	**66.7**	**63.6**	**57.8**	**-5.8**	1	1	-5.8	875	13,125	$196,875	$33,944
	R45	Residential	Day	65	70	**68.0**	**69.3**	**67.3**	61.1	**-6.2**	1	1	-6.2	875	13,125	$196,875	$31,754
Wall 15	R46	Residential	Night	55	70	54.9	**56.1**	**55.6**	54.3	-1.3	1	0	0.0	3,500	52,500	$787,500	NOT ACOUSTICALLY EFFECTIVE
Wall 16	R47	Residential	Night	55	70	**63.0**	**64.5**	**62.5**	**55.7**	**-6.8**	1	1	-6.8	725	10,875	$163,125	$23,989
	R47	Residential	Day	65	70	**65.6**	**66.9**	**66.2**	58.9	**-7.3**	1	1	-7.3	725	10,875	$163,125	$22,346
Wall 17	R49	Residential	Night	55	70	**59.4**	**60.7**	**59.0**	**55.5**	-3.5	1	0	0.0	1,475	22,125	$331,875	NOT ACOUSTICALLY EFFECTIVE
Wall 18	R48	Residential	Night	55	70	**60.1**	**61.4**	**60.8**	**56.5**	-4.3	1	0	0.0	3,900	58,500	$877,500	NOT ACOUSTICALLY EFFECTIVE
	R50	Residential	Night	55	70	52.6	53.8	53.0	52.9	-0.1	1	0	0.0				

MN Standards		Day	Night
Land Use	Code	L10	L10
Residential	NAC-1	65	55
Commercial	NAC-2	70	70
Industrial	NAC-3	80	80

FHWA Standards		
Land Use	Code	L10
Parks	A	60
Residential	B	70
General	C	70
Commercial	E	75

XX Exceeds MN and FHWA Standards
XX Approaching or Exceed FHWA
XX Exceeds MN State Standards
XX Excess of 5db Change (FHWA)

$X.XX is both Acoustically Beneficial and Cost Effective

Table 22 – Noise Barrier Cost Effectiveness: 10 foot Barriers (West Gap Widen on Existing Option)

								Build Noise Levels								Mn/DOT Threshold $3,250
Barrier	Receptor	Land Use	Timeframe (Day or Night)	MnDOT Noise Standard (dBA)	FHWA Noise Standard (dBA)	Existing Noise Levels (dBA)	No Build Noise Levels (dBA)	No Barriers	Barriers (10 ft)	dBA Reduction	Affected Residence/ Commercial	Residence with 5dBA Reduction	Total dBA Reduction	Segment Length (ft)	Area of Barrier (SF)	Total Cost ($15/SF)	Cost Effectiveness (Cost/dBA/Res)
Wall 1	R1	Residential	Night	55	70	**56.9**	**58.2**	**59.7**	**59.2**	-0.5	1	0	0.0	1,960	19,600	$294,000	NOT ACOUSTICALLY EFFECTIVE
Wall 2	R2	Residential	Night	55	70	**56.8**	**58.1**	**59.3**	**56.7**	-2.6	1	0	0.0	1,775	17,750	$266,250	NOT ACOUSTICALLY EFFECTIVE
Wall 3A	R3	Residential	Night	55	70	52.1	53.2	53.4	53.4	0.0	1	0	0.0	4,050	40,500	$607,500	NOT ACOUSTICALLY EFFECTIVE
	R4	Residential	Night	55	70	51.0	52.1	52.3	52.3	0.0	1	0	0.0				
	R5	Residential	Night	55	70	50.7	51.8	52.1	52.1	0.0	1	0	0.0				
	R6	Residential	Night	55	70	54.6	**55.8**	**55.9**	**55.8**	-0.1	1	0	0.0				
	R7	Residential	Night	55	70	53.3	54.5	54.6	54.6	0.0	1	0	0.0				
	R8	Residential	Night	55	70	**56.2**	**57.4**	**57.4**	**57.2**	-0.2	1	0	0.0				
	R9	Residential	Night	55	70	53.7	54.9	55.0	55.0	0.0	1	0	0.0				
	R10	Residential	Night	55	70	54.5	**55.7**	**55.8**	**55.7**	-0.1	1	0	0.0				
	R11	Residential	Night	55	70	**56.1**	**57.4**	**57.3**	**57.2**	-0.1	1	0	0.0				
	R12	Residential	Night	55	70	**58.3**	**59.6**	**59.4**	**59.0**	-0.4	1	0	0.0				
	R13	Residential	Night	55	70	**60.7**	**62.0**	**61.5**	**60.8**	-0.7	1	0	0.0				
	R14	Residential	Night	55	70	**55.2**	**56.4**	**56.4**	**56.3**	-0.1	1	0	0.0				
	R15	Residential	Night	55	70	**56.1**	**57.3**	**57.3**	**57.2**	-0.1	1	0	0.0				
	R16	Residential	Night	55	70	**56.5**	**57.8**	**57.7**	**57.7**	0.0	1	0	0.0				
	R17	Residential	Night	55	70	**57.0**	**58.3**	**58.1**	**58.1**	0.0	1	0	0.0				
Wall 4A	R19	Residential	Night	55	70	**58.3**	**59.6**	**61.2**	**59.8**	-1.4	1	0	0.0	2,175	21,750	$326,250	NOT ACOUSTICALLY EFFECTIVE
Wall 5	R23	Residential	Night	55	70	**58.4**	**59.6**	**59.5**	**58.1**	-1.4	1	0	0.0	1,300	13,000	$195,000	NOT ACOUSTICALLY EFFECTIVE
Wall 6	R24	Residential	Night	55	70	**58.5**	**59.8**	**59.8**	**58.3**	-1.5	1	0	0.0	850	8,500	$127,500	NOT ACOUSTICALLY EFFECTIVE
Wall 7	R25	Residential	Night	55	70	**61.4**	**62.8**	**60.3**	**58.5**	-1.8	1	0	0.0	1,600	16,000	$240,000	NOT ACOUSTICALLY EFFECTIVE
Wall 8	R26	Residential	Night	55	70	**60.0**	**61.3**	**61.6**	**57.8**	-3.8	1	0	0.0	850	8,500	$127,500	NOT ACOUSTICALLY EFFECTIVE
Wall 9	R27	Residential	Night	55	70	**55.3**	**56.5**	**55.6**	54.6	-1.0	1	0	0.0	2,650	26,500	$397,500	NOT ACOUSTICALLY EFFECTIVE
Wall 10	R28	Residential	Night	55	70	**59.1**	**60.4**	**59.6**	**58.9**	-0.7	1	0	0.0	1,325	13,250	$198,750	NOT ACOUSTICALLY EFFECTIVE
Wall 11	B8	Commercial	Night	70	75	56.4	57.7	56.5	56.2	-0.3	1	0	0.0	4,350	43,500	$652,500	NOT ACOUSTICALLY EFFECTIVE
	B9	Commercial	Night	70	75	56.2	57.5	56.2	56.1	-0.1	1	0	0.0				
	B10	Commercial	Night	70	75	58.8	60.1	58.8	58.3	-0.5	1	0	0.0				
	R29	Residential	Night	55	70	52.9	54.1	52.9	52.9	0.0	1	0	0.0				
	R30	Residential	Night	55	70	53.7	54.9	53.8	53.7	-0.1	1	0	0.0				
	R31	Residential	Night	55	70	54.1	**55.3**	54.2	54.1	-0.1	1	0	0.0				
	R32	Residential	Night	55	70	54.5	**55.7**	54.6	54.5	-0.1	1	0	0.0				
	R33	Residential	Night	55	70	**55.3**	**56.5**	**55.4**	**55.3**	-0.1	1	0	0.0				
	R34	Residential	Night	55	70	**56.4**	**57.7**	**56.5**	**56.4**	-0.1	1	0	0.0				
	R35	Residential	Night	55	70	55.0	**56.2**	**55.1**	54.9	-0.2	1	0	0.0				
	R36	Residential	Night	55	70	**55.2**	**56.4**	**55.3**	**55.3**	0.0	1	0	0.0				
	R37	Residential	Night	55	70	54.1	**55.3**	54.2	54.2	0.0	1	0	0.0				
	R38	Residential	Night	55	70	**56.1**	**57.3**	**56.0**	**56.0**	0.0	1	0	0.0				
	R39	Residential	Night	55	70	**56.1**	**57.3**	**55.9**	**55.9**	0.0	1	0	0.0				
Wall 12	R42	Residential	Night	55	70	**60.0**	**61.3**	**61.4**	**58.7**	-2.7	1	0	0.0	1,300	13,000	$195,000	NOT ACOUSTICALLY EFFECTIVE
Wall 13	R43	Residential	Night	55	70	**56.5**	**57.8**	**57.5**	**56.7**	-0.8	1	0	0.0	2,100	21,000	$315,000	NOT ACOUSTICALLY EFFECTIVE
Wall 14	R45	Residential	Night	55	70	**65.4**	**66.7**	**63.6**	**61.1**	-2.5	1	0	0.0	875	8,750	$131,250	NOT ACOUSTICALLY EFFECTIVE
	R45	Residential	Day	65	70	**68.0**	**69.3**	**67.3**	64.5	-2.8	1	0	0.0	875	8,750	$131,250	NOT ACOUSTICALLY EFFECTIVE
Wall 15	R46	Residential	Night	55	70	54.9	**56.1**	**55.6**	**55.5**	-0.1	1	0	0.0	3,500	35,000	$525,000	NOT ACOUSTICALLY EFFECTIVE
Wall 16	R47	Residential	Night	55	70	**63.0**	**64.5**	**62.5**	**59.0**	-3.5	1	0	0.0	725	7,250	$108,750	NOT ACOUSTICALLY EFFECTIVE
	R47	Residential	Day	65	70	**65.6**	**66.9**	**66.2**	62.4	-3.8	1	0	0.0	725	7,250	$108,750	NOT ACOUSTICALLY EFFECTIVE
Wall 17	R49	Residential	Night	55	70	**59.4**	**60.7**	**59.0**	**57.6**	-1.4	1	0	0.0	1,475	14,750	$221,250	NOT ACOUSTICALLY EFFECTIVE
Wall 18	R48	Residential	Night	55	70	**60.1**	**61.4**	**60.8**	**59.2**	-1.6	1	0	0.0	3,900	39,000	$585,000	NOT ACOUSTICALLY EFFECTIVE
	R50	Residential	Night	55	70	52.6	53.8	53.0	53.0	0.0	1	0	0.0				

MN Standards		Day	Night
Land Use	Code	L10	L10
Residential	NAC-1	65	55
Commercial	NAC-2	70	70
Industrial	NAC-3	80	80

FHWA Standards		
Land Use	Code	L10
Parks	A	60
Residential	B	70
General	C	70
Commercial	E	75

XX Exceeds MN and FHWA Standards
XX Approaching or Exceed FHWA
XX Exceeds MN State Standards
XX Excess of 5db Change (FHWA)

$X.XX is both Acoustically Beneficial and Cost Effective

Table 23 – Noise Barrier Cost Effectiveness: 20 foot Barriers (West Gap Bypass Option)

								Build Noise Levels								MnDOT Threshold $3,250
Barrier	Receptor	Land Use	Timeframe (Day or Night)	MnDOT Noise Standard (dBA)	FHWA Noise Standard (dBA)	Existing Noise Levels (dBA)	No Build Noise Levels (dBA)	No Barriers	Barriers (20 ft)	dBA Reduction	Affected Residence/ Commercial	Residence with 5dBA Reduction	Total dBA Reduction	Segment Length (ft)	Area of Barrier (SF)	Total Cost ($15/SF)	Cost Effectiveness (Cost/dBA/Res)
Wall 1	R1	Residential	Night	55	70	**56.9**	**58.2**	**59.7**	**55.9**	-3.8	1	0	0.0	1,960	39,200	$588,000	NOT ACOUSTICALLY EFFECTIVE
Wall 2	R2	Residential	Night	55	70	**56.8**	**58.1**	**59.3**	53.1	**-6.2**	1	1	-6.2	1,775	35,500	$532,500	$85,887
Wall 3B	R6	Residential	Night	55	70	54.6	**55.8**	52.5	50.8	-1.7	1	0	0.0	3,950	79,000	$1,185,000	NOT ACOUSTICALLY EFFECTIVE
	R7	Residential	Night	55	70	53.3	54.5	51.6	50.1	-1.5	1	0	0.0				
	R8	Residential	Night	55	70	**56.2**	**57.4**	52.4	50.4	-2.0	1	0	0.0				
	R9	Residential	Night	55	70	53.7	54.9	51.4	49.8	-1.6	1	0	0.0				
	R10	Residential	Night	55	70	54.5	**55.7**	51.5	49.8	-1.7	1	0	0.0				
	R11	Residential	Night	55	70	**56.1**	**57.4**	51.8	50.0	-1.8	1	0	0.0				
	R12	Residential	Night	55	70	**58.3**	**59.6**	52.6	50.5	-2.1	1	0	0.0				
	R13	Residential	Night	55	70	**60.7**	**62.0**	53.2	51.1	-2.1	1	0	0.0				
	R14	Residential	Night	55	70	**55.2**	**56.4**	51.1	49.6	-1.5	1	0	0.0				
	R15	Residential	Night	55	70	**56.1**	**57.3**	51.4	50.0	-1.4	1	0	0.0				
	R16	Residential	Night	55	70	**56.5**	**57.8**	51.6	50.4	-1.2	1	0	0.0				
	R17	Residential	Night	55	70	**57.0**	**58.3**	51.7	50.4	-1.3	1	0	0.0				
	R21	Residential	Night	55	70	**66.1**	**67.5**	**57.2**	52.8	-4.4	1	0	0.0				
	B4	Commercial	Night	70	75	61.2	62.5	54.7	52.0	-2.7	1	0	0.0				
	B5	Commercial	Night	70	75	65.4	66.8	57.0	52.7	-4.3	1	0	0.0				
Wall 4B	R19	Residential	Night	55	70	**58.3**	**59.6**	**62.1**	**55.6**	**-6.5**	1	1	-6.5	2,400	48,000	$720,000	$110,769
Wall 5	R23	Residential	Night	55	70	**58.4**	**59.6**	**59.5**	53.4	**-6.1**	1	1	-6.1	1,300	26,000	$390,000	$63,934
Wall 6	R24	Residential	Night	55	70	**58.5**	**59.8**	**59.8**	54.2	**-5.6**	1	1	-5.6	850	17,000	$255,000	$45,536
Wall 7	R25	Residential	Night	55	70	**61.4**	**62.8**	**60.3**	53.6	**-6.7**	1	1	-6.7	1,600	32,000	$480,000	$71,642
Wall 8	R26	Residential	Night	55	70	**60.0**	**61.3**	**61.6**	52.6	**-9.0**	1	1	-9.0	850	17,000	$255,000	$28,333
Wall 9	R27	Residential	Night	55	70	**55.3**	**56.5**	**55.6**	50.7	-4.9	1	0	0.0	2,650	53,000	$795,000	NOT ACOUSTICALLY EFFECTIVE
Wall 10	R28	Residential	Night	55	70	**59.1**	**60.4**	**59.6**	54.9	-4.7	1	0	0.0	1,325	26,500	$397,500	NOT ACOUSTICALLY EFFECTIVE
Wall 11	B8	Commercial	Night	70	75	56.4	57.7	56.5	53.4	-3.1	1	0	0.0	4,350	87,000	$1,305,000	NOT ACOUSTICALLY EFFECTIVE
	B9	Commercial	Night	70	75	56.2	57.5	56.2	53.4	-2.8	1	0	0.0				
	B10	Commercial	Night	70	75	58.8	60.1	58.8	54.7	-4.1	1	0	0.0				
	R29	Residential	Night	55	70	52.9	54.1	52.9	51.1	-1.8	1	0	0.0				
	R30	Residential	Night	55	70	53.7	54.9	53.8	51.7	-2.1	1	0	0.0				
	R31	Residential	Night	55	70	54.1	**55.3**	54.2	51.8	-2.4	1	0	0.0				
	R32	Residential	Night	55	70	54.5	**55.7**	54.6	52.2	-2.4	1	0	0.0				
	R33	Residential	Night	55	70	**55.3**	**56.5**	**55.4**	52.9	-2.5	1	0	0.0				
	R34	Residential	Night	55	70	**56.4**	**57.7**	**56.5**	53.6	-2.9	1	0	0.0				
	R35	Residential	Night	55	70	55.0	**56.2**	**55.1**	52.2	-2.9	1	0	0.0				
	R36	Residential	Night	55	70	**55.2**	**56.4**	**55.3**	52.9	-2.4	1	0	0.0				
	R37	Residential	Night	55	70	54.1	**55.3**	54.2	52.1	-2.1	1	0	0.0				
	R38	Residential	Night	55	70	**56.1**	**57.3**	**56.0**	**55.2**	-0.8	1	0	0.0				
	R39	Residential	Night	55	70	**56.1**	**57.3**	**55.9**	**55.6**	-0.3	1	0	0.0				
Wall 12	R42	Residential	Night	55	70	**60.0**	**61.3**	**61.4**	53.7	**-7.7**	1	1	-7.7	1,300	26,000	$390,000	$50,649
Wall 13	R43	Residential	Night	55	70	**56.5**	**57.8**	**57.5**	52.7	-4.8	1	0	0.0	2,100	42,000	$630,000	NOT ACOUSTICALLY EFFECTIVE
Wall 14	R45	Residential	Night	55	70	**65.4**	**66.7**	**63.6**	54.8	**-8.8**	1	1	-8.8	875	17,500	$262,500	$29,830
	R45	Residential	Day	65	70	**68.0**	**69.3**	**67.3**	57.9	**-9.4**	1	1	-9.4	875	17,500	$262,500	$27,926
Wall 15	R46	Residential	Night	55	70	54.9	**56.1**	**55.6**	51.9	-3.7	1	0	0.0	3,500	70,000	$1,050,000	NOT ACOUSTICALLY EFFECTIVE
Wall 16	R47	Residential	Night	55	70	**63.0**	**64.5**	**62.5**	52.9	**-9.6**	1	1	-9.6	725	14,500	$217,500	$22,656
	R47	Residential	Day	65	70	**65.6**	**66.9**	**66.2**	56.1	**-10.1**	1	1	-10.1	725	14,500	$217,500	$21,535
Wall 17	R49	Residential	Night	55	70	**59.4**	**60.7**	**59.0**	52.9	**-6.1**	1	1	-6.1	1,475	29,500	$442,500	$72,541
Wall 18	R48	Residential	Night	55	70	**60.1**	**61.4**	**60.8**	53.8	**-7.0**	1	1	-7.0	3,900	78,000	$1,170,000	$167,143
	R50	Residential	Night	55	70	52.6	53.8	53.0	52.8	-0.2	1	0	0.0				

MN Standards		Day	Night
Land Use	Code	L10	L10
Residential	NAC-1	65	55
Commercial	NAC-2	70	70
Industrial	NAC-3	80	80

FHWA Standards		
Land Use	Code	L10
Parks	A	60
Residential	B	70
General	C	70
Commercial	E	75

XX Exceeds MN and FHWA Standards
XX Approaching or Exceed FHWA
XX Exceeds MN State Standards
XX Excess of 5db Change (FHWA)

$X,XX is both Acoustically Beneficial and Cost Effective

Table 24 – Noise Barrier Cost Effectiveness – 15 foot Barriers (West Gap Bypass Option)

																Mn/DOT Threshold $3,250
Barrier	Receptor	Land Use	Timeframe (Day or Night)	MnDOT Noise Standard (dBA)	FHWA Noise Standard (dBA)	Existing Noise Levels (dBA)	No Build Noise Levels (dBA)	Build Noise Levels: No Barriers	Build Noise Levels: Barriers (15 ft)	dBA Reduction	Affected Residence/ Commercial	Residence with 5dBA Reduction	Total dBA Reduction	Segment Length (ft)	Area of Barrier (SF)	Total Cost ($15/SF)	Cost Effectiveness (Cost/dBA/Res)
Wall 1	R1	Residential	Night	55	70	**56.9**	**58.2**	**59.7**	**57.7**	-2.0	1	0	0.0	1,960	29,400	$441,000	NOT ACOUSTICALLY EFFECTIVE
Wall 2	R2	Residential	Night	55	70	**56.8**	**58.1**	**59.3**	54.8	-4.5	1	0	0.0	1,775	26,625	$399,375	NOT ACOUSTICALLY EFFECTIVE
Wall 3B	R6	Residential	Night	55	70	54.6	**55.8**	52.5	52.0	-0.5	1	0	0.0	3,950	59,250	$888,750	NOT ACOUSTICALLY EFFECTIVE
	R7	Residential	Night	55	70	53.3	54.5	51.6	51.2	-0.4	1	0	0.0				
	R8	Residential	Night	55	70	**56.2**	**57.4**	52.4	51.9	-0.5	1	0	0.0				
	R9	Residential	Night	55	70	53.7	54.9	51.4	51.0	-0.4	1	0	0.0				
	R10	Residential	Night	55	70	54.5	**55.7**	51.5	51.0	-0.5	1	0	0.0				
	R11	Residential	Night	55	70	**56.1**	**57.4**	51.8	51.3	-0.5	1	0	0.0				
	R12	Residential	Night	55	70	**58.3**	**59.6**	52.6	52.0	-0.6	1	0	0.0				
	R13	Residential	Night	55	70	**60.7**	**62.0**	53.2	52.6	-0.6	1	0	0.0				
	R14	Residential	Night	55	70	**55.2**	**56.4**	51.1	50.7	-0.4	1	0	0.0				
	R15	Residential	Night	55	70	**56.1**	**57.3**	51.4	51.0	-0.4	1	0	0.0				
	R16	Residential	Night	55	70	**56.5**	**57.8**	51.6	51.2	-0.4	1	0	0.0				
	R17	Residential	Night	55	70	**57.0**	**58.3**	51.7	51.4	-0.3	1	0	0.0				
	R21	Residential	Night	55	70	**66.1**	**67.5**	**57.2**	**55.1**	-2.1	1	0	0.0				
	B4	Commercial	Night	70	75	61.2	62.5	54.7	53.9	-0.8	1	0	0.0				
	B5	Commercial	Night	70	75	65.4	66.8	57.0	54.9	-2.1	1	0	0.0				
Wall 4B	R19	Residential	Night	55	70	**58.3**	**59.6**	**62.1**	**58.3**	-3.8	1	0	0.0	2,400	36,000	$540,000	NOT ACOUSTICALLY EFFECTIVE
Wall 5	R23	Residential	Night	55	70	**58.4**	**59.6**	**59.5**	**55.8**	-3.7	1	0	0.0	1,300	19,500	$292,500	NOT ACOUSTICALLY EFFECTIVE
Wall 6	R24	Residential	Night	55	70	**58.5**	**59.8**	**59.8**	**56.3**	-3.5	1	0	0.0	850	12,750	$191,250	NOT ACOUSTICALLY EFFECTIVE
Wall 7	R25	Residential	Night	55	70	**61.4**	**62.8**	**60.3**	**56.1**	-4.2	1	0	0.0	1,600	24,000	$360,000	NOT ACOUSTICALLY EFFECTIVE
Wall 8	R26	Residential	Night	55	70	**60.0**	**61.3**	**61.6**	54.9	**-6.7**	1	1	-6.7	850	12,750	$191,250	$28,545
Wall 9	R27	Residential	Night	55	70	**55.3**	**56.5**	**55.6**	52.7	-2.9	1	0	0.0	2,650	39,750	$596,250	NOT ACOUSTICALLY EFFECTIVE
Wall 10	R28	Residential	Night	55	70	**59.1**	**60.4**	**59.6**	**57.3**	-2.3	1	0	0.0	1,325	19,875	$298,125	NOT ACOUSTICALLY EFFECTIVE
Wall 11	B8	Commercial	Night	70	75	56.4	57.7	56.5	55.2	-1.3	1	0	0.0	4,350	65,250	$978,750	NOT ACOUSTICALLY EFFECTIVE
	B9	Commercial	Night	70	75	56.2	57.5	56.2	55.1	-1.1	1	0	0.0				
	B10	Commercial	Night	70	75	58.8	60.1	58.8	56.9	-1.9	1	0	0.0				
	R29	Residential	Night	55	70	52.9	54.1	52.9	52.3	-0.6	1	0	0.0				
	R30	Residential	Night	55	70	53.7	54.9	53.8	53.0	-0.8	1	0	0.0				
	R31	Residential	Night	55	70	54.1	**55.3**	54.2	53.2	-1.0	1	0	0.0				
	R32	Residential	Night	55	70	54.5	**55.7**	54.6	53.7	-0.9	1	0	0.0				
	R33	Residential	Night	55	70	**55.3**	**56.5**	**55.4**	54.4	-1.0	1	0	0.0				
	R34	Residential	Night	55	70	**56.4**	**57.7**	**56.5**	**55.4**	-1.1	1	0	0.0				
	R35	Residential	Night	55	70	55.0	**56.2**	**55.1**	54.0	-1.1	1	0	0.0				
	R36	Residential	Night	55	70	**55.2**	**56.4**	**55.3**	54.4	-0.9	1	0	0.0				
	R37	Residential	Night	55	70	54.1	**55.3**	54.2	53.4	-0.8	1	0	0.0				
	R38	Residential	Night	55	70	**56.1**	**57.3**	**56.0**	**56.0**	0.0	1	0	0.0				
	R39	Residential	Night	55	70	**56.1**	**57.3**	**55.9**	**55.9**	0.0	1	0	0.0				
Wall 12	R42	Residential	Night	55	70	**60.0**	**61.3**	**61.4**	**56.1**	**-5.3**	1	1	-5.3	1,300	19,500	$292,500	$56,189
Wall 13	R43	Residential	Night	55	70	**56.5**	**57.8**	**57.5**	55.0	-2.5	1	0	0.0	2,100	31,500	$472,500	NOT ACOUSTICALLY EFFECTIVE
Wall 14	R45	Residential	Night	55	70	**65.4**	**66.7**	**63.6**	**57.8**	**-5.8**	1	1	-5.8	875	13,125	$196,875	$33,944
	R45	Residential	Day	65	70	**60.0**	**69.3**	**67.3**	61.1	**-6.2**	1	1	-6.2	875	13,125	$196,875	$31,754
Wall 15	R46	Residential	Night	55	70	54.9	**56.1**	**55.6**	54.3	-1.3	1	0	0.0	3,500	52,500	$787,500	NOT ACOUSTICALLY EFFECTIVE
Wall 16	R47	Residential	Night	55	70	**63.0**	**64.5**	**62.5**	**55.7**	**-6.8**	1	1	-6.8	725	10,875	$163,125	$23,989
	R47	Residential	Day	65	70	**65.6**	**66.9**	**66.2**	58.9	**-7.3**	1	1	-7.3	725	10,875	$163,125	$22,346
Wall 17	R49	Residential	Night	55	70	**59.4**	**60.7**	**59.0**	**55.5**	-3.5	1	0	0.0	1,475	22,125	$331,875	NOT ACOUSTICALLY EFFECTIVE
Wall 18	R48	Residential	Night	55	70	**60.1**	**61.4**	**60.8**	**56.5**	-4.3	1	0	0.0	3,900	58,500	$877,500	NOT ACOUSTICALLY EFFECTIVE
	R50	Residential	Night	55	70	52.6	53.8	53.0	52.9	-0.1	1	0	0.0				

MN Standards		Day	Night
Land Use	Code	L10	L10
Residential	NAC-1	65	55
Commercial	NAC-2	70	70
Industrial	NAC-3	80	80

FHWA Standards		
Land Use	Code	L10
Parks	A	60
Residential	B	70
General	C	70
Commercial	E	75

XX Exceeds MN and FHWA Standards
XX Approaching or Exceed FHWA
XX Exceeds MN State Standards
XX Excess of 5db Change (FHWA)

X.XX is both Acoustically Beneficial and Cost Effective

Table 25 – Noise Barrier Cost Effectiveness – 10 foot Barriers (West Gap Bypass Option)

								Build Noise Levels									Mn/DOT Threshold $3,250
Barrier	Receptor	Land Use	Timeframe (Day or Night)	MnDOT Noise Standard (dBA)	FHWA Noise Standard (dBA)	Existing Noise Levels (dBA)	No Build Noise Levels (dBA)	No Barriers	Barriers (10 ft)	dBA Reduction	Affected Residence/ Commercial	Residence with 5dBA Reduction	Total dBA Reduction	Segment Length (ft)	Area of Barrier (SF)	Total Cost ($15/SF)	Cost Effectiveness (Cost/dBA/Res)
Wall 1	R1	Residential	Night	55	70	**56.9**	**58.2**	**59.7**	**59.2**	-0.5	1	0	0.0	1,960	19,600	$294,000	NOT ACOUSTICALLY EFFECTIVE
Wall 2	R2	Residential	Night	55	70	**56.8**	**58.1**	**59.3**	**56.7**	-2.6	1	0	0.0	1,775	17,750	$266,250	NOT ACOUSTICALLY EFFECTIVE
Wall 3B	R6	Residential	Night	55	70	54.6	**55.8**	52.5	52.4	-0.1	1	0	0.0	3,950	39,500	$592,500	NOT ACOUSTICALLY EFFECTIVE
	R7	Residential	Night	55	70	53.3	54.5	51.6	51.6	0.0	1	0	0.0				
	R8	Residential	Night	55	70	**56.2**	**57.4**	52.4	52.4	0.0	1	0	0.0				
	R9	Residential	Night	55	70	53.7	54.9	51.4	51.4	0.0	1	0	0.0				
	R10	Residential	Night	55	70	54.5	**55.7**	51.5	51.4	-0.1	1	0	0.0				
	R11	Residential	Night	55	70	**56.1**	**57.4**	51.8	51.8	0.0	1	0	0.0				
	R12	Residential	Night	55	70	**58.3**	**59.6**	52.6	52.5	-0.1	1	0	0.0				
	R13	Residential	Night	55	70	**60.7**	**62.0**	53.2	53.2	0.0	1	0	0.0				
	R14	Residential	Night	55	70	**55.2**	**56.4**	51.1	51.1	0.0	1	0	0.0				
	R15	Residential	Night	55	70	**56.1**	**57.3**	51.4	51.4	0.0	1	0	0.0				
	R16	Residential	Night	55	70	**56.5**	**57.8**	51.6	51.5	-0.1	1	0	0.0				
	R17	Residential	Night	55	70	**57.0**	**58.3**	51.7	51.7	0.0	1	0	0.0				
	R21	Residential	Night	55	70	**66.1**	**67.5**	**57.2**	**56.7**	-0.5	1	0	0.0				
	B4	Commercial	Night	70	75	61.2	62.5	54.7	54.6	-0.1	1	0	0.0				
	B5	Commercial	Night	70	75	65.4	66.8	57.0	56.6	-0.4	1	0	0.0				
Wall 4B	R19	Residential	Night	55	70	**58.3**	**59.6**	**62.1**	**60.7**	-1.4	1	0	0.0	2,400	24,000	$360,000	NOT ACOUSTICALLY EFFECTIVE
Wall 5	R23	Residential	Night	55	70	**58.4**	**59.6**	**59.5**	**58.1**	-1.4	1	0	0.0	1,300	13,000	$195,000	NOT ACOUSTICALLY EFFECTIVE
Wall 6	R24	Residential	Night	55	70	**58.5**	**59.8**	**59.8**	**58.3**	-1.5	1	0	0.0	850	8,500	$127,500	NOT ACOUSTICALLY EFFECTIVE
Wall 7	R25	Residential	Night	55	70	**61.4**	**62.8**	**60.3**	**58.5**	-1.8	1	0	0.0	1,600	16,000	$240,000	NOT ACOUSTICALLY EFFECTIVE
Wall 8	R26	Residential	Night	55	70	**60.0**	**61.3**	**61.6**	**57.8**	-3.8	1	0	0.0	850	8,500	$127,500	NOT ACOUSTICALLY EFFECTIVE
Wall 9	R27	Residential	Night	55	70	**55.3**	**56.5**	**55.6**	54.6	-1.0	1	0	0.0	2,650	26,500	$397,500	NOT ACOUSTICALLY EFFECTIVE
Wall 10	R28	Residential	Night	55	70	**59.1**	**60.4**	**59.6**	**58.9**	-0.7	1	0	0.0	1,325	13,250	$198,750	NOT ACOUSTICALLY EFFECTIVE
Wall 11	B8	Commercial	Night	70	75	56.4	57.7	56.5	56.2	-0.3	1	0	0.0	4,350	43,500	$652,500	NOT ACOUSTICALLY EFFECTIVE
	B9	Commercial	Night	70	75	56.2	57.5	56.2	56.1	-0.1	1	0	0.0				
	B10	Commercial	Night	70	75	58.8	60.1	58.8	58.3	-0.5	1	0	0.0				
	R29	Residential	Night	55	70	52.9	54.1	52.9	52.9	0.0	1	0	0.0				
	R30	Residential	Night	55	70	53.7	54.9	53.8	53.7	-0.1	1	0	0.0				
	R31	Residential	Night	55	70	54.1	**55.3**	54.2	54.1	-0.1	1	0	0.0				
	R32	Residential	Night	55	70	54.5	**55.7**	54.6	54.5	-0.1	1	0	0.0				
	R33	Residential	Night	55	70	**55.3**	**56.5**	**55.4**	**55.3**	-0.1	1	0	0.0				
	R34	Residential	Night	55	70	**56.4**	**57.7**	**56.5**	**56.4**	-0.1	1	0	0.0				
	R35	Residential	Night	55	70	55.0	**56.2**	**55.1**	54.9	-0.2	1	0	0.0				
	R36	Residential	Night	55	70	**55.2**	**56.4**	**55.3**	**55.3**	0.0	1	0	0.0				
	R37	Residential	Night	55	70	54.1	**55.3**	54.2	54.2	0.0	1	0	0.0				
	R38	Residential	Night	55	70	**56.1**	**57.3**	**56.0**	**56.0**	0.0	1	0	0.0				
	R39	Residential	Night	55	70	**56.1**	**57.3**	**55.9**	**55.9**	0.0	1	0	0.0				
Wall 12	R42	Residential	Night	55	70	**60.0**	**61.3**	**61.4**	**58.7**	-2.7	1	0	0.0	1,300	13,000	$195,000	NOT ACOUSTICALLY EFFECTIVE
Wall 13	R43	Residential	Night	55	70	**56.5**	**57.8**	**57.5**	**56.7**	-0.8	1	0	0.0	2,100	21,000	$315,000	NOT ACOUSTICALLY EFFECTIVE
Wall 14	R45	Residential	Night	55	70	**65.4**	**66.7**	**63.6**	**61.1**	-2.5	1	0	0.0	875	8,750	$131,250	NOT ACOUSTICALLY EFFECTIVE
	R45	Residential	Day	65	70	**68.0**	**69.3**	**67.3**	64.5	-2.8	1	0	0.0	875	8,750	$131,250	NOT ACOUSTICALLY EFFECTIVE
Wall 15	R46	Residential	Night	55	70	54.9	**56.1**	**55.6**	**55.5**	-0.1	1	0	0.0	3,500	35,000	$525,000	NOT ACOUSTICALLY EFFECTIVE
Wall 16	R47	Residential	Night	55	70	**63.0**	**64.5**	**62.5**	**59.0**	-3.5	1	0	0.0	725	7,250	$108,750	NOT ACOUSTICALLY EFFECTIVE
	R47	Residential	Day	65	70	**65.6**	**66.9**	**66.2**	62.4	-3.8	1	0	0.0	725	7,250	$108,750	NOT ACOUSTICALLY EFFECTIVE
Wall 17	R49	Residential	Night	55	70	**59.4**	**60.7**	**59.0**	**57.6**	-1.4	1	0	0.0	1,475	14,750	$221,250	NOT ACOUSTICALLY EFFECTIVE
Wall 18	R48	Residential	Night	55	70	**60.1**	**61.4**	**60.8**	**59.2**	-1.6	1	0	0.0	3,900	39,000	$585,000	NOT ACOUSTICALLY EFFECTIVE
	R50	Residential	Night	55	70	52.6	53.8	53.0	53.0	0.0	1	0	0.0				

MN Standards		Day	Night
Land Use	Code	L10	L10
Residential	NAC-1	65	55
Commercial	NAC-2	70	70
Industrial	NAC-3	80	80

FHWA Standards		
Land Use	Code	L10
Parks	A	60
Residential	B	70
General	C	70
Commercial	E	75

XX Exceeds MN and FHWA Standards
XX Approaching or Exceed FHWA
XX Exceeds MN State Standards
XX Excess of 5db Change (FHWA)

$X,XX is both Acoustically Beneficial and Cost Effective

Wall 3A - Bingham Lake Area – South Side of Highway 60
This noise barrier is for the Build Alternative Widen on Existing only through Bingham Lake. This noise area contains 1 commercial receptor (B4) and 15 residential receptors (R3 through R17) located south of Highway 60. Receptor R6, R8 and R10 through R17 exceeds L_{10} and L_{50} state standards for nighttime. Receptor R3 through R5, R7, and R9 do not exceed state standards; however they are provided some benefit from the noise barrier.

A noise barrier, approximately 4,050 feet long, was modeled along the south right of way line of Highway 60. At 20 feet high, the noise barrier provides decibel reductions between 0.8 and 4.7 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 15 feet high, the noise barrier provides decibel reductions between 0.2 and 2.1 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 10 feet high, the noise barrier provides decibel reductions between 0.0 and 0.7 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. No noise barrier would be reasonable to construct for this area.

Wall 3B - Bingham Lake Area – South Side of Highway 60
This wall is for the Build Alternative Bypass Bingham Lake only. This noise area contains 2 commercial receptors (B4 and B5) and 13 residential receptors (R6 through R17, and R21) located south of Highway 60. In this build alternative, only Receptor R21 exceeds L_{10} and L_{50} state standards for nighttime. The remaining receptors do not exceed state standards; however they are provided some benefit from the noise barrier.

A noise barrier, approximately 3,950 feet long, was modeled along the south right of way line of Highway 60. At 20 feet high, the noise barrier provides decibel reductions between 1.2 and 4.4 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 15 feet high, the noise barrier provides decibel reductions between 0.4 and 2.1 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 10 feet high, the noise barrier provides decibel reductions between 0.0 and 0.5 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. No noise barrier would be reasonable to construct for this area.

Wall 4A – R19 Single Residential
This noise wall is for the Build Alternative Widen on Existing only through Bingham Lake. This noise area contains a single residential receptor, R19, located north of Highway 60 in the West Gap. This receptor exceeds L_{10} and L_{50} state standards for nighttime. A noise barrier, approximately 2,175 feet long, was modeled along the Highway 60 right of way line. At 20 feet high, the noise barrier provides a decibel reduction of 5.1 dBA; however the cost effectiveness of the barrier is $127,941 per dBA of reduction per residence, which is above the maximum state criteria of $3,250. At 15 feet high, the noise barrier provides a decibel reduction of only 3.1 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 10 feet high, the noise barrier provides a decibel reduction of only 1.4 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. No noise barrier would be reasonable to construct for this receptor.

Wall 4B – R19 Single Residential

This noise wall is for the Build Alternative Bypass Bingham Lake only. This noise area contains a single residential receptor, R19, located south of the new Highway 60 Bingham Lake bypass alignment in the West Gap. This receptor exceeds L_{10} and L_{50} state standards for nighttime. A noise barrier, approximately 2,400 feet long, was modeled along the Highway 60 right of way line. At 20 feet high, the noise barrier provides a decibel reduction of 6.5 dBA; however the cost effectiveness of the barrier is $110,796 per dBA of reduction per residence, which is above the maximum state criteria of $3,250. At 15 feet high, the noise barrier provides a decibel reduction of only 3.8 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 10 feet high, the noise barrier provides a decibel reduction of only 1.4 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. No noise barrier would be reasonable to construct for this receptor.

Wall 5 – R23 Single Residential

This noise area contains a single residential receptor, R23, located south of Highway 60 in the Middle Gap. This receptor exceeds L_{10} and L_{50} state standards for nighttime. A noise barrier, approximately 1,300 feet long, was modeled along the Highway 60 right of way line. At 20 feet high, the noise barrier provides a decibel reduction of 6.1 dBA; however the cost effectiveness of the barrier is $63,934 per dBA of reduction per residence, which is above the maximum state criteria of $3,250. At 15 feet high, the noise barrier provides a decibel reduction of only 3.7 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 10 feet high, the noise barrier provides a decibel reduction of only 1.4 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. No noise barrier would be reasonable to construct for this receptor.

Wall 6 – R24 Single Residential

This noise area contains a single residential receptor, R24, located south of Highway 60 in the Middle Gap. This receptor exceeds L_{10} and L_{50} state standards for nighttime. A noise barrier, approximately 850 feet long, was modeled along the Highway 60 right of way line. At 20 feet high, the noise barrier provides a decibel reduction of 5.6 dBA; however the cost effectiveness of the barrier is $45,536 per dBA of reduction per residence, which is above the maximum state criteria of $3,250. At 15 feet high, the noise barrier provides a decibel reduction of only 3.5 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 10 feet high, the noise barrier provides a decibel reduction of only 1.5 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. No noise barrier would be reasonable to construct for this receptor.

Wall 7 – R25 Single Residential

This noise area contains a single residential receptor, R25, located north of Highway 60 in the Middle Gap. This receptor exceeds L_{10} and L_{50} state standards for nighttime. A noise barrier, approximately 1,600 feet long, was modeled along the Highway 60 right of way line. At 20 feet high, the noise barrier provides a decibel reduction of 6.7 dBA; however the cost effectiveness of the barrier is $71,642 per dBA of reduction per residence, which is above the maximum state

criteria of $3,250. At 15 feet high, the noise barrier provides a decibel reduction of only 4.2 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 10 feet high, the noise barrier provides a decibel reduction of only 1.8 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. No noise barrier would be reasonable to construct for this receptor.

Wall 8 – R26 Single Residential

This noise area contains a single residential receptor, R26, located south of Highway 60 in the Middle Gap. This receptor exceeds L_{10} and L_{50} state standards for nighttime. A noise barrier, approximately 850 feet long, was modeled along the Highway 60 right of way line. At 20 feet high, the noise barrier provides a decibel reduction of 9.0 dBA; however the cost effectiveness of the barrier is $28,333 per dBA of reduction per residence, which is above the maximum state criteria of $3,250. At 15 feet high, the noise barrier provides a decibel reduction of only 6.7 dBA; however the cost effectiveness of the barrier is $28,545 per dBA of reduction per residence. At 10 feet high, the noise barrier provides a decibel reduction of only 3.8 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. No noise barrier would be reasonable to construct for this receptor.

Wall 9 – R27 Single Residential

This noise area contains a single residential receptor, R27, located south of Highway 60 in the Middle Gap. This receptor exceeds L_{10} state standards for nighttime. A noise barrier, approximately 2,650 feet long, was modeled along the Highway 60 right of way line. At 20 feet high, the noise barrier provides a decibel reduction of 4.9 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 15 feet high, the noise barrier provides a decibel reduction of only 2.9 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 10 feet high, the noise barrier provides a decibel reduction of only 1.0 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. No noise barrier would be reasonable to construct for this receptor.

Wall 10 – R28 Single Residential

This noise area contains a single residential receptor, R28, located south of Highway 60 in Butterfield. This receptor exceeds L_{10} and L_{50} state standards for nighttime. A noise barrier, approximately 1,325 feet long, was modeled along the TH 60 right of way line. At 20 feet high, the noise barrier provides a decibel reduction of 4.7 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 15 feet high, the noise barrier provides a decibel reduction of only 2.3 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 10 feet high, the noise barrier provides a decibel reduction of only 0.7 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. No noise barrier would be reasonable to construct for this receptor.

Wall 11 - Butterfield Area – North Side of Highway 60

This noise area contains 3 commercial receptors (B8, B9, and B10) and 11 residential receptors (R29 through R39) located north of Highway 60. Receptors

R33 through 36 and R38 through R39 exceed L_{10} and L_{50} state standards for nighttime. Receptor R29 through R32, and R37 do not exceed state standards; however they are provided some benefit from the noise barrier.

A noise barrier, approximately 4,350 feet long, was modeled along the south right of way line of Highway 60. At 20 feet high, the noise barrier provides decibel reductions between 0.3 and 4.1 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 15 feet high, the noise barrier provides decibel reductions between 0.0 and 1.9 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 10 feet high, the noise barrier provides decibel reductions between 0.0 and 0.5 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. No noise barrier would be reasonable to construct for this area.

Wall 12 – R42 Single Residential

This noise area contains a single residential receptor, R42, located south of Highway 60 in the East Gap. This receptor exceeds L_{10} and L_{50} state standards for nighttime. A noise barrier, approximately 1,300 feet long, was modeled along the Highway 60 right of way line. At 20 feet high, the noise barrier provides a decibel reduction of 7.7 dBA; however the cost effectiveness of the barrier is $50,649 per dBA of reduction per residence, which is above the maximum state criteria of $3,250. At 15 feet high, the noise barrier provides a decibel reduction of only 5.3 dBA; however the cost effectiveness of the barrier is $55,189 per dBA of reduction per residence. At 10 feet high, the noise barrier provides a decibel reduction of only 2.7 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. No noise barrier would be reasonable to construct for this receptor.

Wall 13 – R43 Single Residential

This noise area contains a single residential receptor, R43, located south of Highway 60 in the East Gap. This receptor exceeds L_{10} state standards for nighttime. A noise barrier, approximately 2,100 feet long, was modeled along the Highway 60 right of way line. At 20 feet high, the noise barrier provides a decibel reduction of 4.8 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 15 feet high, the noise barrier provides a decibel reduction of only 2.5 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 10 feet high, the noise barrier provides a decibel reduction of only 0.8 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. No noise barrier would be reasonable to construct for this receptor.

Wall 14 – R45 Single Residential

This noise area contains a single residential receptor, R45, located north of Highway 60 in the East Gap. This receptor exceeds L_{10} and L_{50} state standards for nighttime and L_{10} for daytime. A noise barrier, approximately 875 feet long, was modeled along the Highway 60 right of way line. At 20 feet high, the noise barrier provides a decibel reduction of 9.4 dBA; however the cost effectiveness of the barrier is $27,926 per dBA of reduction per residence, which is above the maximum state criteria of $3,250. At 15 feet high, the noise barrier provides a decibel reduction of only 6.2 dBA; however the cost effectiveness of the barrier is

$31,754 per dBA of reduction per residence. At 10 feet high, the noise barrier provides a decibel reduction of only 2.8 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. No noise barrier would be reasonable to construct for this receptor.

Wall 15– R46 Single Residential

This noise area contains a single residential receptor, R46, located south of Highway 60 in the East Gap. This receptor exceeds L_{10} standards for nighttime. A noise barrier, approximately 3,500 feet long, was modeled along the Highway 60 right of way line. At 20 feet high, the noise barrier provides a decibel reduction of 3.7 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 15 feet high, the noise barrier provides a decibel reduction of only 1.3 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 10 feet high, the noise barrier provides a decibel reduction of only 0.1 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. No noise barrier would be reasonable to construct for this receptor.

Wall 16 – R47 Single Residential

This noise area contains a single residential receptor, R45, located north of Highway 60 in the East Gap. This receptor exceeds L_{10} and L_{50} state standards for nighttime and L_{10} for daytime. A noise barrier, approximately 725 feet long, was modeled along the TH 60 right of way line. At 20 feet high, the noise barrier provides a decibel reduction of 10.1 dBA; however the cost effectiveness of the barrier is $21,535 per dBA of reduction per residence, which is above the maximum state criteria of $3,250. At 15 feet high, the noise barrier provides a decibel reduction of only 7.3 dBA; however the cost effectiveness of the barrier is $22,346 per dBA of reduction per residence. At 10 feet high, the noise barrier provides a decibel reduction of only 3.8 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. No noise barrier would be reasonable to construct for this receptor.

Wall 17 – R49 Single Residential

This noise area contains a single residential receptor, R49, located north of Highway 60 in the East Gap. This receptor exceeds L_{10} state standards for nighttime. A noise barrier, approximately 1,475 feet long, was modeled along the Highway 60 right of way line. At 20 feet high, the noise barrier provides a decibel reduction of 6.1 dBA; however the cost effectiveness of the barrier is $72,541 per dBA of reduction per residence, which is above the maximum state criteria of $3,250. At 15 feet high, the noise barrier provides a decibel reduction of only 3.5 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 10 feet high, the noise barrier provides a decibel reduction of only 1.4 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. No noise barrier would be reasonable to construct for this receptor.

Wall 18 – R49 and R50 Single Residential

This noise area contains two single residential receptors, R49 and R50, located south of Highway 60 in the East Gap. These receptors exceed L_{10} and L_{50} state standards for nighttime. A noise barrier, approximately 3,900 feet long, was

modeled along the Highway 60 right of way line. At 20 feet high, the noise barrier provides a decibel reduction of 7.0 dBA; however the cost effectiveness of the barrier is $167,143 per dBA of reduction per residence, which is above the maximum state criteria of $3,250. At 15 feet high, the noise barrier provides a decibel reduction of only 4.3 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. At 10 feet high, the noise barrier provides a decibel reduction of only 1.6 dBA; with no receptor with a 5 or more dBA reduction, the barrier is not acoustically effective. No noise barrier would be reasonable to construct for this receptor.

Evaluation of other Noise Abatement Criteria

Noise walls have been chosen as the most cost-effective noise mitigation measure available for this project. Other noise mitigation measures have been considered, as listed in 23 CFR 772.13(c). They are addressed below:

a) Traffic management measures: The primary purpose of the facility is to move people and goods. Restrictions of certain vehicles or speeds would be inconsistent with the purpose of the project.

b) Alteration of horizontal and vertical alignments: The project was realigned for practical reasons based on grade and safety. Redesigning the horizontal and vertical alignments to minimize noise impacts would be impractical for this project because it would require substantial grading (lowering the roadway grade). This would expand the constructions limits and area of potential impacts and greatly increase the cost of the project.

c) Acquisition of real property or interests therein (predominantly unimproved property) to serve as a buffer zone to preempt development that would be adversely impacted by traffic noise: Exclusive land use designations or acquisition of property to serve as a buffer zone between the roadway and adjacent lands would not be feasible because land has already been developed along the project corridor.

d) Noise insulation of public use or nonprofit institutional structures: Noise insulation does not address the outside environment. Therefore, noise insulation is not proposed as a part of the project. Under MnDOT and FHWA guidelines, only public buildings such as schools and hospitals should be considered for acoustical insulation. No facilities of this nature impacted by highway traffic noise in the study area.

Noise Conclusion

Traffic noise impacts currently exist and are predicted to increase along the three Highway 60 two-lane segments with or without the proposed improvements. Mitigation in the form of noise barriers was analyzed. No barriers that achieved a 5 dBA reduction were found to be cost-effective; therefore no barriers are proposed with the proposed improvements.

Air Quality

The improvements are not anticipated to have substantial air quality impacts or cause air quality related concerns. This project is not located in an area where

conformity requirements apply, and the scope of the project does not indicate that air quality impacts would be expected. Furthermore, the United States Environmental Protection Agency has approved a screening method to determine which intersections need hot-spot analysis. MnDOT demonstrates by the results of the screening procedure that there are no signalized intersections included in this project area that require hot-spot analysis. Therefore, no further air quality analysis is necessary.

Mobile Source Air Toxics (MSATS)

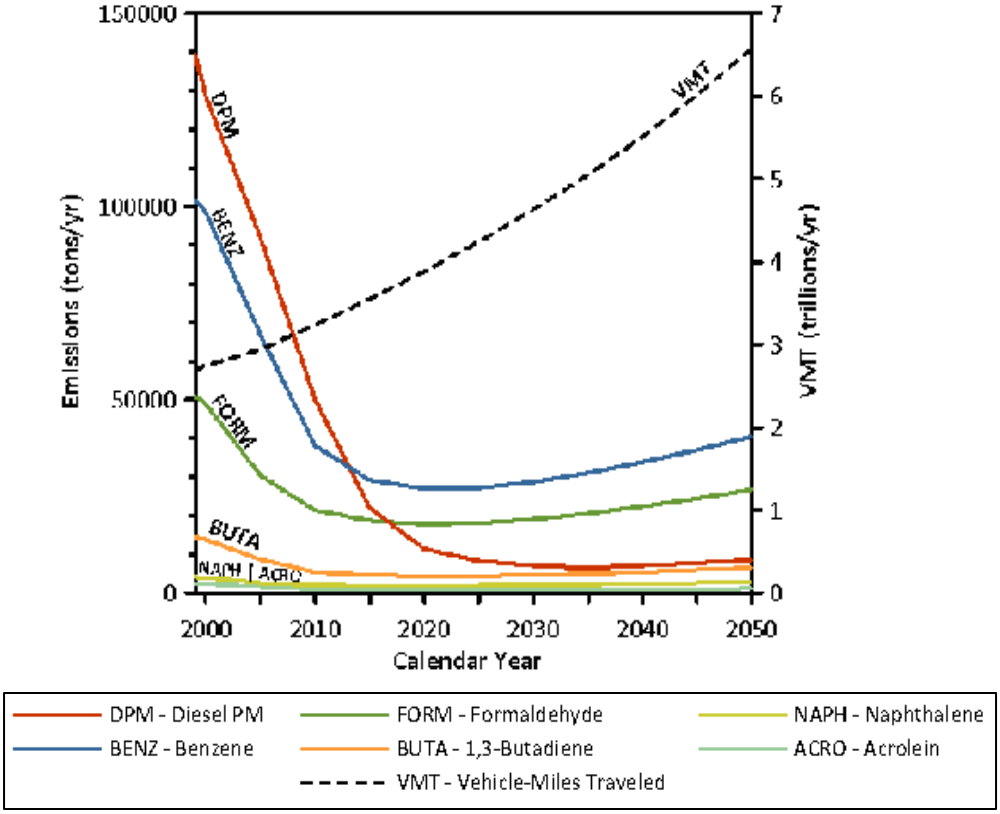
The Highway 60 Project has a low potential for creating substantial mobile source air toxic effects. As a result, this SFEIS includes a basic analysis of potential MSAT emission impacts.

In addition to controlling 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).

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the U.S. Environmental Protection Agency (EPA) regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) http://www.epa.gov/ncea/iris/index.html. In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their National Air Toxics Assessment (NATA) http://www.epa.gov/ttn/atw/nata1999/. These are acrolein, benzene, 1,3-butadiene, diesel particulate matter, plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules.

The 2007 EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOBILE6.2 model, even if vehicle activity (vehicle-miles travelled, VMT) increases by 145 percent as assumed, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050, as shown in the graph below.

NATIONAL MSAT EMISSION TRENDS 1999 – 2050 FOR VEHICLES OPERATING ON ROADWAYS USING EPA's MOBILE6.2 MODEL



Air toxics analysis is a continuing area of research. While work has been done to assess the health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how the potential health risks posed by MSAT exposure should be factored into project-level decision-making within the context of the National Environmental policy Act (NEPA).

Nonetheless, air toxics concerns continue to be raised on highway projects during the NEPA process. Even as the science emerges, we are duly expected by the public and other agencies to address MSAT impacts in environmental documents. The FHWA, EPA, the Health Effects Institute, and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this emerging field.

Unavailable Information for Project Specific MSAT Impact Analysis. This SFEIS includes a basic analysis of the likely MSAT emission impacts of the proposed improvements. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the alternatives in this EIS. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

Incomplete or Unavailable Information

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts - each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

- 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 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.

- 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 NCHRP 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.

- Exposure Levels and Health Effects: Finally, 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.

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

Research into the health impacts of MSATs is ongoing. 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 non-cancer 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[2]. 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 us to perform a more comprehensive evaluation of the health impacts specific to this project.

[2] 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, MnDOT has provided a qualitative assessment of MSAT emissions relative to the various design alternatives and has acknowledged that the build 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.

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. 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. This qualitative assessment 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, found at: http://www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm

For each of the Highway 60 alternatives and/or design options, the amount of MSATs emitted would be proportional to the vehicle miles traveled (VMT). This assumes that other variables such as fleet mix are the same for each alternative and/or design option. The VMT estimated for the build alternative is slightly higher than that of the No-Build Alternative. The primary reason for this is related to the increased capacity and efficiency of the build alternative (four-lane section) over the existing (two-lane section) highway. An increase in VMT would lead to slightly higher MSAT emissions for the build alternative, along with a corresponding decrease in MSAT emissions along surrounding and/or parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to reduced congestion and increased speeds; according to EPA's MOBILE6 emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases. The extent to which these

speed-related emissions decreases will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

Because the estimated VMT under the build alternative design options (near Clear Lake and Bingham Lake) are nearly the same, it is expected there would be no appreciable difference in overall MSAT emissions. Also, regardless of the design option(s) chosen, emission 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 72 percent from 1999 and 2050. 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 cases.

Any potential for localized levels of MSAT emissions increasing with the construction of a four-lane divided facility when compared to the No-Build Alternative will be offset by increases in speed and reductions in congestion (which are associated with lower MSAT emissions). On a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions in MSAT emissions.

In sum, under the build alternative condition 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 EPA's MSAT reduction programs.

Water Quality and Surface Water Drainage

Affected Environment

Throughout the project area there are several water resources (e.g. lakes small wetlands, and drainage ditches) located in close proximity to the Highway 60 corridor. Roadway drainage either infiltrates into the ground or eventually flows to some of these water resources.

Surface water from the project area drains toward the Des Moines River, Butterfield Creek and branches of the Watonwan River. All three waterways are listed as Impaired Water by MPCA for aquatic life based on turbidity. Turbidity is a measurement of the amount of solid particles (e.g. silt) that are suspended in water that result in a loss of clarity or transparency.

Warren Pond (associated with Warren Lake (17-21P) and Clear Lake (17-8P) are located adjacent to the Highway 60 corridor near Windom at the west end of the West Gap segment. Other lakes found near the highway in the west gap segment include Cottonwood Lake (17-22P), Warren Lake (17-21P), Bingham Lake (17-7P), and Mountain Lake (17-3P). Butterfield Lake (83-56P) and St. James Lake (83-43P) are located in close proximity to the middle gap segment and the east gap segment, respectively.

In addition to these bodies of water, several wetlands are present in the vicinity of the existing corridor. Many wetlands in the project area are buffered from

direct pollutant discharge by the vegetated road ditches. The Wetlands section of this Draft SFEIS further discusses these water resources.

The existing water quality impacts that occur directly from Highway 60 are associated with maintenance of the roadway surface, deicing during the winter, and stormwater runoff. In large part, pollutants from deicing and stormwater are transported to vegetated road ditches prior to reaching receiving water bodies. However, in areas where the road is close to a water resource, such as bridges or culvert over creeks or drainage ditches there is limited area for treatment and any existing buffers are narrow.

Environmental Consequences

Alternative 1 – No-Build

The No-Build Alternative would result in no increase of impervious surface. The drainage system would continue the present drainage patterns for surface water.

Alternative 2 – Build Alternative

East Gap, Middle Gap, and West Gap

- *Water Quality*

Temporary and permanent changes in land use can lead to impacts on receiving waters. The build alternative and design options near Bingham Lake, Clear Lake, and Warren Pond include the construction of a four-lane divided highway. The proposed improvements in the East Gap, Middle Gap, and West Gap would increase the impervious surface area of Highway 60 by approximately 28.7 acres, 20.8 acres, and 23.3 to 39.8 acres, respectively. The range of impacts in the West Gap reflects the various design options.

An elevated level of highway runoff and associated contaminants such as sediments, nutrients, heavy metals, oil, grease, and deicing chemicals could result from the project on a more permanent basis. The addition of impervious surface would also increase the runoff volumes and discharge rates.

The build alternative has the potential to affect the local hydrology by altering the existing drainage patterns for surface water within the project area. Culverts and/or bridges will be incorporated into the design of the preferred alternative to allow surface water from outside the project area to maintain its existing path in the surrounding watersheds.

The majority of highway runoff from the project improvements will travel through grass ditches and into drainage-ways or storage basins (stormwater ponds) prior to flowing into receiving water resources.

The need for surface water quality treatment strategies stem from research that indicates that stormwater contains a series of pollutants, some tied to sediment particles and some dissolved in the water. However, the concentration of these pollutants in highway stormwater runoff is relatively small. Based on the preliminary and conceptual design of the proposed improvements, a number of treatment ponds have been proposed adjacent to the highway that will serve to collect and treat stormwater runoff from the existing and proposed impervious

surfaces of the highway. The exact number, location, and size of ponds have not been fully determined at this time, but will be further considered during the detailed design phase once the preferred alternative is identified.

Phosphorous is a contaminant of particular concern in stormwater runoff because increased levels of the nutrient can lead to increased algae growth and associated water quality concerns (i.e. declines in wildlife and wildlife habitat due to low levels of dissolved oxygen). Impervious surfaces tend to generate higher loads of suspended sediment and associated pollutants than pervious, undeveloped surfaces. The runoff from farmland or chemically treated lawns, however, can have much higher concentrations of phosphorus and other nutrients as compared to roadway runoff. Therefore, water quality impacts from the Highway 60 improvements are expected to be minimal in part due to the permitting and mitigation requirements that will be included as part of the Section 404 Permit, Section 401 Water Quality Certification, and NPDES Construction Stormwater Permit Program. The NPDES permit requirements are further discussed in the mitigation section below.

- *Surface Water Drainage*

The Build Alternative will affect some portion of the existing drainage system. Several new/replacement culverts and ditches associated with the highway will need to be constructed in order to maintain drainage patterns. If increased capacity is needed for a culvert(s), this could be achieved by larger or multiple culverts, increased grade on culverts, and/or more hydraulically efficient inlets. Any culvert improvements would need to consider stream slope, erosion potential, upstream and downstream conditions, and watercourse capacity. This area of southwestern Minnesota has an extensive drainage ditch system. The Build Alternative (and design options) has the potential of impacting existing Cottonwood County Judicial Ditch No.2 and other minor drainage systems. The existing judicial ditch section in this area has very steep slopes and crosses under the highway via a large culvert. It is anticipated that the culvert crossing will be lengthened to accommodate the wider highway corridor. Other minor ditch realignments (see Figure A10) may be necessary to constructed the proposed improvements. A more detailed assessment of drainage patterns, ditch sections, and culvert impacts will be conducted as part of the final design phase and will be completed in accordance with the Section 404 permit requirements.

Mitigation

The proposed rural four-lane divided highway design will include roadside ditches, as well as a center grassed median between the eastbound and westbound lanes. The Best Management Practices (BMPs) best suited for containing and treating the stormwater runoff on rural design projects are the grassed swales with separating berms and the vegetated filter/infiltration strips and areas. Most of the runoff from the roadway will drain to a grassed median, roadside ditch, or stormwater treatment pond. Some of the low points along the corridor will serve as points of discharge to the surrounding areas. Following the identification of the preferred alternative, the topographic and hydrographic information will be analyzed in detail and drain passages across the proposed highway (i.e., bridges and culverts) will be determined.

The EPA led the efforts in establishing guidelines and regulations to address stormwater runoff treatment at the national level. In Minnesota, more specific guidelines have been developed by the MPCA. Detention basins (ponds) are the most widespread method of retaining the suspended particles and improving the quality of the stormwater runoff from project areas with a high percentage of impervious surfaces. However, other treatment methods have been developed and found to be highly effective. The methods to route, contain, and treat the stormwater in order to limit its adverse impact on the surrounding environment are referred to as BMPs.

Grassed swales or vegetated swales are densely vegetated drain ways with slightly sloped bottoms. The role of the vegetation is to reduce flow velocity and provide sediment settling and filtration. Typically, tall rigid grasses with extensive root systems are desirable. The grassed swales can be implemented along the median and along the roadside ditches.

Berms, perpendicular to the direction of flow, are commonly installed at prescribed intervals to slow the flow velocity and retain the runoff. The berms allow for slow and complete drainage as the rainfall recedes. A drain system may be built at the bottom of each berm to ensure proper drainage and prevent permanent accumulation of standing water. The slopes of the berms tend to be relatively flat to allow for mowing and other maintenance operations. It is important to notice that separating berms cause grass swales to function essentially as retention basins and can virtually retain all of the sediment washed away by stormwater runoff. Thus, the grassed swales can simultaneously provide excellent runoff control and stormwater treatment. Swales can also provide additional benefits, such as erosion control and pleasant aesthetics.

Filter strips may be used in low areas where the topography of the adjacent terrain does not allow for construction of a roadside ditch. Occasionally referred to as vegetated strips, filter strips are densely vegetated areas with generally flat slopes designed to treat sheet flow runoff from nearby impervious surfaces. Although filter strips alone do not provide a high sediment and pollutant removal rate, their use can be effective in treating low levels of runoff. To enhance the efficiency of filter strips, if the topography of the terrain permits, a short (i.e., 1-foot high) berm should be constructed at some distance down gradient. Filter strips should be implemented in areas of uniform slope where sheet flow occurs. Filter strips reduce the flow velocity of runoff and promote filtration and infiltration of sediment particles and associated pollutants. Filter strips consist of sod-forming vegetation, primarily tall, thick, dense native grasses with extensive roots. Besides the runoff control and stormwater treatment benefits, filter strips also provide erosion control, pleasant aesthetics, and promote bio-diversity.

The grassed swales together with filter strips have the potential to contain and treat the majority of the roadway runoff once the vegetation is established. The capacity of grassed swales with berms can be designed to accommodate the runoff generated by large rainfall events. The vegetated filter strips can retain a portion of the suspended sediment associated with the remaining fraction of the runoff that cannot be contained in the median area or the roadside ditches.

Stormwater detention ponds will also be used for the Highway 60 improvements. These detention ponds will be used as end of the line runoff control and stormwater treatment and will be placed accordingly to protect lakes and other sensitive water resources (e.g. wetlands, ditches).

BMPs will be implemented to mitigate impacts affecting water quality, runoff volumes and discharge rates, where practicable. The plan will be to identify the type and location of BMPs, which will then be incorporated into the final design of the preferred alternative. A Stormwater Pollution Prevention Plan (SWPPP), which is required as part of the National Pollutant Discharge Elimination System (NPDES) Permit, will be prepared outlining the practices to be used for this project to prevent impacts to the quality of the receiving waters. The SWPPP would be incorporated and made part of the construction documents. A more detailed discussion of water quality related permit requirements is provided below:

MPCA-NPDES Construction Stormwater Permit

The project will involve disturbing one or more acres of land area, which requires that an NPDES Construction Stormwater Permit (#MN R110000) be obtained from the MPCA. A permit application must be submitted 7 days prior to conducting any construction activity.

This permit has both temporary directives used primarily during construction, as well as permanent requirements the project must meet. The requirements of the permit are intended to minimize the erosion and sedimentation caused by construction activities and impervious surfaces. The following is a brief summary of the most notable requirements:

- Develop a Stormwater Pollution Prevention Plan (SWPPP)

    1. Address the potential for discharge of sediment and/or other potential pollutants from the site.
    2. Identify a person knowledgeable and experienced in the application of erosion prevention and sediment control BMPs to oversee SWPPP implementation.
    3. A narrative describing the timing for installation of all erosion prevention and sediment control BMPs required by the permit.
    4. Location and type of all temporary and permanent erosion prevention and sediment control BMPs.
    5. Site maps showing existing and final grades, pre and post-construction stormwater runoff drainage areas and directions, and impervious surfaces and soil types.
    6. Identify areas not to be disturbed and areas of phased construction to minimize duration of exposed soils.
    7. Identify surface waters and existing wetlands.
    8. Identify stormwater mitigation measures required.

- Erosion Control

1. Use of horizontal slope grading, construction phasing, and other techniques designed to reduce erosion.
2. Implementation of temporary protection controls to protect exposed soil areas such as temporary wood chip cover, seeding and mulching, straw bale checks, silt fences, and stabilization of steep slopes.
3. Ditch bottoms must be stabilized within 100 feet of any Water of the State within 24 hours.
4. Prior to any connection of a pipe or outfall structure to a Water of the State, temporary energy dissipation methods to control the outfall water must be implemented.
5. Implementation of permanent stabilization such as turf establishment.
6. Implementation of energy dissipation practices in areas of concentrated flow.

- Sediment Control

1. Sediment control BMPs shall be in place on all down gradient perimeters before up gradient construction disturbance begins.
2. There shall be minimization of vehicle soil tracking on to paved surfaces.
3. Implementation of temporary and permanent stormwater ponds.
4. Implementation of bio-retention and infiltration practices.

- MPCA-Total Maximum Daily Load (TMDL)

If runoff from the site discharges to an impaired water than additional BMPs may be required. If a TMDL is complete, the BMPs shall be consistent with the assumption and requirements of the TMDL as reflected through the NPDES permit requirements. Floodplains and Water Body Modifications

Floodplains and Water Body Modifications

Affected Environment

Floodplain

Presidential Executive Order 11988 – "Floodplain Management" and Minnesota Statutes 103F.101 to 103F.155 require federal and state agencies, in carrying out their proposed projects, to provide leadership and action to reduce the risk of flood loss and minimize the impacts of floods on human safety by floodplains. Floodplains have been designated and mapped for the Federal Emergency Management Agency as part of the National Flood Insurance Program.

The most recent Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for the study area were used for this assessment: Cottonwood County map 270622; Panels 150B, 180B, and 185B dated January 2, 1981 and Watonwan County map 270649; Maps 16 and 17 dated July 3, 1985. These delineated floodway areas and flood hazard areas shown on the maps represent areas inundated by the 100-year flood. According to the FIRMs there are no designated floodplain areas within the Highway 60 study area.

Water Body Modifications

The purpose of this section is to identify potential impacts to fish and wildlife, potential problems such as erosion, bank instability (which may lead to erosion), aesthetic intrusion, flooding, and impediments to navigation which may arise due to water body modifications. Several of these issues are discussed in greater detail in other sections of this SFEIS (i.e. wetlands, water quality and surface water drainage, and geology/groundwater).

Warren Pond (associated with Warren Lake 17-21P) and Clear Lake (17-8P) are located adjacent to the Highway 60 corridor near Windom at the west end of the West Gap segment (See Figures A1 and A2 located in Appendix A). An existing stormwater management pond is located near the intersection of Highway 60 and Cottonwood County Road 2 in Bingham Lake. Other lakes found near the highway in the west gap segment include Cottonwood Lake (17-22P), Warren Lake (17-21P), Bingham Lake (17-7P), and Mountain Lake (17-3P). Butterfield Lake (83-56P) and St. James Lake (83-43P) are located in the project study area for the middle gap segment and the east gap segment, respectively.

Environmental Consequences

Alternative 1 – No-Build

Under Alternative 1, no floodplain and/or water body modifications would occur. The existing Highway 60 would remain unchanged.

Alternative 2 – Build Alternative

East Gap, Middle Gap, and West Gap

The proposed Build Alternative improvements to Highway 60 will not encroach within any designated floodplain areas. Therefore, no impacts to a designated floodplain are anticipated.

The improvements within the West Gap segment will potentially require water body modifications, including alterations to the natural boundary of Warren Pond and Clear Lake, requiring fill to be placed below the ordinary high water (OHW) level of these water bodies. Furthermore, the design options near Bingham Lake will potentially place fill material within the existing stormwater pond located near the intersection of Highway 60 and County Road 2.

The build alternative involves widening the roadway to the north in the area of Warren Pond. Because the level of design detail is limited in this area, the potential impacts were calculated based on the proposed right-of-way limits. The proposed right-of-way extends into the southern portion of Warren Pond and approximately 0.34 acres of potential impact is shown (Wetland #146). However, the detailed design phase will define the construction limits, which is expected to reduce and/or avoid potential impacts to Warren Pond.

Alternatives to avoid or minimize impacts to Clear Lake were considered. Design options for widening the roadway to the south in the area of Clear Lake were considered to completely avoid impacts to Clear Lake, but were dismissed due to impacts on prairie vegetation and the UP railroad corridor, which is eligible for

listing on the NRHP as a historic railroad district. Design options to the south would require relocating up to one-mile of the UP rail line and would impact approximately the same distance of a prairie remnant located between the existing highway and the railroad. Relocation of the rail line would result in an adverse impact resulting in Section 106 and Section 4(f) implications. As a result, options for widening the highway to the north were developed. The full 90-foot centerline spacing option proposes adding a new roadbed north on the existing alignment that would maintain the rural four-lane divided typical section. This design option requires modifying the existing water body by filling approximately 1.17 acres of Clear Lake. A compressed centerline line spacing design option was also developed that would limit the width of the center median. A center median barrier (i.e. cable guardrail) would be needed to ensure safety standards are maintained. The compressed centerline spacing design option would potentially create minor modifications to the water body and would potentially impact approximately 0.23 acres of Clear Lake. Coordination with the MNDNR and design refinements will be pursued during the final design phase to minimize and/or avoid direct impact to Clear Lake.

The existing stormwater pond located near the Highway 60/County Road 2 intersection may be impacted depending on the design alternative selected for this area. Several design options are being considered in this area, which include widening the existing highway alignment to the north, to the south, or creating a new alignment that would bypass the existing alignment to the north of a salvage yard business. These design options have varying levels of impact on the built environment (businesses) and natural environment (farmland, water resources, etc.). Widening the existing alignment to the north for the entire length of Bingham Lake design option study area or constructing a new bypass alignment to the north would potentially impact the stormwater pond. Additional design considerations may include a combination of widening to the north and south of the existing alignment through Bingham Lake in order to balance impacts on the build and natural environments. If the existing stormwater ponds are impacted, MnDOT has identified additional acreage within the area to accommodate runoff from the existing highway and expanded roadway surface. The conceptual layout figures contained in Appendix A depict potential stormwater pond/treatment locations.

Mitigation

Upon the identification of the preferred alternative, including design options near Clear Lake and the existing stormwater ponds near Bingham Lake, MnDOT will reassess potential impacts to these water bodies and determine if further design refinements can be made to avoid and/or minimize potential impacts. If impacts are unavoidable, coordination with the MNDNR, US Corps of Engineers, and MPCA will occur. A MNDNR Public Waters Work Permit may be required.

Wetlands

Affected Environment

Wetland regulations in effect for the project area are as follows.

- Section 404 of the federal Clean Water Act as administered by the U.S. Army Corps of Engineers (USACE)
- Section 401 of the Clean Water Act water quality certification as administered by the Minnesota Pollution Control Agency (MPCA)
- The Minnesota Wetland Conservation Act (WCA) administered by the Board of Water and Soil Resources through a designated Local Government Unit (LGU).In accordance with WCA requirements, MnDOT will act as its own LGU for activities within MnDOT right-of-way.
- Wetlands that are designated as Minnesota Department of Natural Resources (MNDNR) Public Waters.
- Federal Executive Order 11990 on No Net Loss.

Methods – Wetland Determinations

A detailed wetland delineation process was undertaken using the methodology of the Corps of Engineers Wetlands Delineation Manual, 1987, and the Midwest Regional Supplement. This delineation was completed on April 14-26, 2011. A Level 2 Routine Onsite Determination Method (RODM) was used for the delineation. Field notes, samples, and photographs were taken at representative locations in each basin and transferred to RODM data sheets. The results of the analysis are summarized below, and the delineation methodology, process, and detailed results are described further in the Highway 60 Wetlands Delineation Report, which is available for review at the MnDOT District 7 Office in Mankato, Minnesota. A copy of this report was forwarded to the U.S. Army Corps of Engineers and is included on the CD-ROM accompanying this Draft SFEIS.

The wetland delineation evaluated all areas that met wetland criteria near the proposed right-of-way of the Build Alternative, including design options near Clear Lake and Bingham Lake. Areas that are clearly natural wetlands or are within the right-of-way and contain remnant wetland vegetation have been identified as wetlands. Within the project area, particularly along the existing Highway 60 right-of way, the Union Pacific railroad right-of-way, and the various connecting roadways there are many areas of roadside ditch. These roadside ditches often meet some wetland criteria, but may have been created to convey road runoff, and may not have been wetland prior to road construction.

A total of 31 wetlands were identified and mapped within the project area. Not all wetlands are potentially impacted (see Figures A1 through A14, located in Appendix A). Several wetlands are located within agricultural areas, and often have row crop agriculture up to the edge of the wetland. In some instances, wetlands are being farmed, at least in part. The larger basins tend to be shallow marshes that are a part of a larger drainage system and are too wet to farm. All of the wetlands delineated exhibited some signs of disturbance, mostly through drainage or dominance of invasive vegetation, such as reed canary grass (*Phalaris arundinacea*). Table 26 is a summary of the wetlands delineated, and the area of impact based on the proposed construction limits (for the East Gap) or the proposed right-of-way limits (Middle and West Gaps). The ranges of impact for Wetland #26 are a result of varying levels of potential impact associated with the Clear Lake design options.

Table 26 – Summary of Wetland Characteristics

Basin ID	Cowardin Classification[1]	Circular 39 Classification[2]	Wetland Community	Basin Size (acres)	Area of Impact (acres)
East Gap (Wetlands #1 through #11)					
1	PEMA	Type 1	Seasonally Flooded Basin	0.97	
2	PEMA	Type 1	Seasonally Flooded Basin	0.27	
3	PEMA	Type 1	Seasonally Flooded Basin	0.41	0.36
4	PEMA	Type 1	Seasonally Flooded Basin	0.23	0.23
5	PEMB	Type 2	Fresh Meadow	0.11	
6	PEMA	Type 1	Seasonally Flooded Basin	0.38	
7	PEMA	Type 1	Seasonally Flooded Basin	0.21	
8	PEMB	Type 2	Fresh Meadow	0.24	
9	PEMB	Type 2	Sedge Meadow	0.11	
10	PEMA	Type 1	Seasonally Flooded Basin	0.17	0.17
11	PEMA	Type 1	Seasonally Flooded Basin	0.12	
				East Gap Subtotal	0.76 acres
Middle Gap (Wetlands #12 through #19)					
12	PEMA	Type 1	Seasonally Flooded Basin	0.10	0.10
13	PEMB	Type 2	Fresh Meadow	0.23	
14	PEMB	Type 2	Sedge Meadow	0.05	0.05
15	PEMB	Type 2	Fresh Meadow	0.15	
16	PEMB	Type 2	Fresh Meadow	1.70	0.48
17	PEMB	Type 2	Fresh Meadow	0.05	0.05
18	PEMB	Type 2	Sedge Meadow	0.42	
19	PEMA	Type 1	Seasonally Flooded Basin	2.96	1.13
				Middle Gap Subtotal	1.81 acres
West Gap (Wetlands #20 through #31)					
20	PEMA	Type 1	Seasonally Flooded Basin	0.29	0.29
21	PEMA	Type 1	Seasonally Flooded Basin	3.00	1.57
22	PEMA	Type 1	Seasonally Flooded Basin	0.70	
23	PFOA	Type 1	Seasonally Flooded Basin	0.06	0.15[3]
24	PEMA	Type 1	Seasonally Flooded Basin	0.16	0.16[5]

Basin ID	Cowardin Classification[1]	Circular 39 Classification[2]	Wetland Community	Basin Size (acres)	Area of Impact (acres)
25	PUBH	Type 5	Shallow Open Water (Stormwater ponds)	0.66	0.72[4,5]
26	L1UBH	Type 5	Open Water - Clear Lake, (DNR PWI #17-8P)	1.88	1.17[6] & 0.23[7]
27	PEMA	Type 1	Seasonally Flooded Basin	0.17	0.17[6,7]
28	PEMA	Type 1	Seasonally Flooded Basin	0.62	0.47
29	PEMB	Type 2	Sedge Meadow	1.17	0.58
30	PUBH	Type 5	Shallow Open Water - Warren Pond, (DNR PWI #17-21P)	0.73	0.34
31	PEMC	Type 3	Shallow Marsh	0.02	
				West Gap Subtotal	3.63 – 5.3 acres
				Project-wide Total (East, Middle, and West Gaps)	**6.2–7.87 acres**

[1] *Classification of Wetlands and Deepwater Habitats of the United States.* (Cowardin *et al.*, December 1979).
[2] *Wetlands of the United States, Circular 39.* (Shaw and Fredine, United States Fish and Wildlife Service, 1956).
[3] Impact associated with the Bingham Lake design option that widens the highway to the south of the existing alignment.
[4] Impact associated with the Bingham Lake design option that widens the highway to the north of the existing alignment.
[5] Impact associated with the Bingham Lake North Bypass design option.
[6] Impact associated with the Clear Lake "Full" 90-foot centerline spacing design option.
[7] Impact associated with the Clear Lake "Compressed" centerline spacing design option.

Environmental Consequences

Alternative 1 – No-Build

No wetland impacts will occur under the No-Build Alternative.

Alternative 2 – Build Alternative

East Gap, Middle Gap, and West Gap

It is anticipated that the Build Alternative improvements would necessitate the filling of an estimated 6.2 to 7.87 acres of wetland throughout the entire project corridor. The range of impacts is a result of the design options being considered near Clear Lake and Bingham Lake located within the West Gap (see description below).

Within the West Gap segment, the Clear Lake design option that compresses the roadbed centerline spacing of the four-lane divided highway section in the area of Clear Lake would potentially impact an estimated 0.23 acres of the lake as compared to 1.17 acres of impact under the standard 90-foot centerline spacing design option. The Bingham Lake design option in the West Gap would have varying impacts on Wetlands #22 through #25. The design option that widens Highway 60 to the south of the existing alignment would result in the least potential wetland impacts (0.15 acres), while the bypass design option would result in the greatest impacts with 0.88 acres of potential wetland impacts.

Table 27 summarizes the estimated wetland impacts by type for the entire Build Alternative(s) corridor, including the design option near Clear Lake and Bingham Lake.

Table 27 - Summary of Wetland Impacts by Wetland Community

Wetland Classification	Number of Basins Potentially Impacted	Total Area of Potential Impact (acres)[1]
Seasonally Flooded Basin	11 basins	4.8 acres
Fresh Meadow	2 basins	0.53 acres
Sedge Meadow	2 basins	.063 acres
Shallow Open Water	2 basins	1.06 acres

[1] Acres of impact will vary depending on design options identified as part of the preferred alternative.

Wetland Jurisdiction

The jurisdiction wetland determinations will be performed as part of the permitting process under the rules in place at that time. Based on current rules it is anticipated that the following agencies would have jurisdiction over project area wetlands:

- The United States Army Corps of Engineers (USACE) regulates all wetlands and ditches, provided they meet the criteria of the 1987 Manual and the subsequent regional supplements. This includes drainage ditches, as there is no recognition of incidental wetlands. Currently, the USACE has no authority over isolated wetlands. Many of the wetlands in the project areas appear to be isolated, but a Jurisdictional Determination (JD) will need to be completed to establish which basins are regulated by USACE and which are not. The majority of the wetlands appear to connect through overland flow, culvert connections, or drain tile.
- The Minnesota Wetland Conservation Act (WCA) also regulates wetlands, and is administered by MnDOT when impacts occur within its existing and/or proposed right-of-way. The WCA regulates all wetlands, regardless of isolation. This process recognizes created areas as incidental, which could include many of the roadside drainage ditches.
- The Minnesota Pollution Control Agency (MPCA) also regulates wetlands through two primary mechanisms. The first is through review of the project with regards to compliance with Section 401 of the Clean water Act. This project is anticipated to require a letter of permission from the USACE, which currently waives the 401 water quality certification process. The MPCA also regulates wetlands through Minnesota Rules 7050.0186, which attempts to prevent degradation of wetlands and waters, requires sequencing to avoid and minimize impacts, and provides compensatory mitigation if impacts cannot be avoided.
- The Minnesota Department of Natural Resources (MNDNR) regulates Public Waters, and is a participant if projects occur within 1,000 feet of a Public Water. The proposed project includes improvements in the area of Clear Lake and Warren Pond, which are both Public Waters and will require a Public Water Work Permit if construction occurs below the

ordinary high water level of these wetlands/water bodies. The WCA does not administer jurisdiction over Public waters, although the MNDNR can waive jurisdiction to WCA.

Sequencing

Wetland impact sequencing includes three steps: impact avoidance, impact minimization, and impact compensation/mitigation.

Avoidance

The No-Build Alternative is the only alternative that can avoid all wetland effects; however it would not be consistent with the identified purpose and need of the project. The preliminary design of the Build Alternative alignment, including Clear Lake and Bingham Lake design options, were developed to avoid as many wetlands as possible while still meeting highway design standards. Reasons for not avoiding impacts to a specific wetland included one or more of the following:

- Need to provide safe roadway geometrics;
- Shifting the alignment would isolate the wetland in the median; and
- Shifting the alignment would create impacts to other wetlands and/or to other social, environmental, or natural resources

Minimization

Minimization measures have been incorporated into the conceptual layout of the Build Alternative alignment including the use of the existing roadway alignments wherever possible, Clear Lake design option to reduce the centerline spacing (narrower median), the Bingham Lake design options, and minor shifts in the alignment. As the design is further developed and refined, additional measures will be used in the design process to minimize wetland impacts including:

- Increase in ditch slopes in wetland areas. Increasing the slope of the ditch adjacent to the outside lanes would reduce the footprint of the roadway. The typical rural cross section calls for 1:6 (vertical: horizontal) slopes. Thus, either a 1:5 or 1:4 slope with additional unpaved shoulder width are strategies to minimize wetland impacts. In many instances, steeper slopes are not acceptable because of the hazard presented to drivers running off the road or hitting guard rail. Also, the slope near culverts will be gentle so as to cover the culvert.
- Reduction in the elevation of the road profile in wetland areas. Lowering the road profile can reduce the footprint of the roadway. This strategy has limited application because the roadway should be at least 5 feet above the water level to prevent water damage to the roadbed, and in some areas, the roadway should be at least 4 feet above the adjacent ground to allow snow to blow off the road to decrease the hazard posed by drifting snow. Also, there must be sufficient cover over culverts.
- Construction of bridges. Bridging over wetlands is applicable only where there are exceptional wetlands because of the cost of bridging and the reduction in safety. Only the area near Clear Lake was considered for

bridging to avoid and/or minimize impacts. MnDOT determined that the unknown geotechnical conditions, high construction costs, and maintenance costs of a bridge structure was not an appropriate minimization strategy for this area.

In order to minimize water quality impacts to wetlands, water quality treatment best management practices (BMPs) have been designed and incorporated into the preliminary layout (see Water Quality and Surface Water Drainage section in this SFEIS).

Compensation/Mitigation

A Combined Wetland Permit Application and Replacement Plan will be prepared and submitted for the preferred alternative prior to construction. Replacement of lost wetlands functions and values will be in accordance with WCA criteria, MNDNR Public Waters requirements (where applicable), and federal Clean Water Act Section 404 regulations.

Currently, pre-approved bank sites are the preferable replacement method since credits are already certified and approved by the permitting agencies. However, if viable replacement sites are identified within the Highway 60 corridor, they will also be pursued as potential mitigation sites, subject to regulatory approval.

In accordance with the USACE Minnesota policy, wetland replacement sites are sought first within the area of effect (project specific), next within the same watershed, and finally within the same Bank Service Area before considering options beyond the project's Bank Service Area. MnDOT's existing bank system may meet these conditions to provide eligible credit. The appropriate method(s) for mitigating impacts to wetlands will be determined during the final design phase and permitting process of the project.

Geology/Groundwater

Affected Environment

The surface topography in the project area is typically flat to slightly rolling hills. The geology and soils information gathered for the project area indicates that the water table is generally shallow at 1.5 feet to 10 feet. The predominately clayey/loam soils in the shallow groundwater table area are not highly permeable and limit surface recharge to the underlying aquifers. The depth to bedrock along the corridor ranges from approximately 80 to over 200 feet below the surface. There are no known bedrock outcrops in the project area. The uppermost bedrock generally consists of shale and/or sandstone.

Wellhead Protection Zones, Sole Source Aquifer, Wells

The Minnesota Department of Health (MDH) Wellhead Area Protection Program defines a groundwater recharge area for a municipal well (or well field) and establishes protective measures against potential groundwater contaminants. The City of Windom has a designated Wellhead Protection Area that includes a portion of Highway 60 in the West Gap segment. The designated boundary extends east of Clear Lake nearly to the City of Bingham Lake. The delineated

"Groundwater Capture Zone" for Windom's primary wells is not located within the proposed limits of the highway improvements.

An inventory of private wells in the project area was not completed. However, it is likely that there are private wells in the project area that are associated with existing and past development in the project area. Improperly abandoned wells may exist within the project area.

Environmental Consequences

Alternative 1 – No-Build

This alternative will not impact site geology or groundwater.

Alternative 2 – Build Alternative

East Gap, Middle Gap, and West Gap

Impacts to acquirers that supply water to municipal or private water wells are not anticipated. Impacts to aquifers from construction of the Build Alternative would be negligible due to the confining layers of loam to clay loam overlying the aquifers. According to the MDH records, drinking water aquifers in the area are covered by one or more layers of fine-grained material that would likely protect it from any potential source of contamination. Potential impacts could occur as a result of accidental spills, dewatering, or near areas where streams and/or other surface waters, such as wetlands, may have connections to surficial sand and gravel aquifers. The Highway 60 improvements are not expected to require the dewatering of groundwater on any permanent basis. Localized and temporary dewatering may occur during construction activities, such as mucking poor soils and installing deeper pipe utilities in trenches. Construction BMPs will be used during construction to minimize potential impacts to surface water and ground water.

It is possible that the Build Alternative would require the abandonment of private wells within the project area due to possible commercial property and right-of-way acquisition.

Mitigation

Construction BMPs will be used during construction to minimize potential impacts to surface water and ground water.

The abandonment of any wells will be conducted in accordance with Minnesota Department of Health requirements.

The State of Minnesota recognized the need to implement a statewide emergency response system for reporting, assessing, containing, and cleaning up spills of pollutants, contaminants, and/or hazardous materials that can adversely affect groundwater. Minnesota Statute §115.061 requires responsible parties to immediately notify the state duty officer of spills. Minnesota Statute §115E.09 and §299K.07 established a number of controls and programs, including but not limited to, the following:

- A 24-hour State One-Call System to report spills

- A State Hazardous Materials Preparedness Coordination Committee
- State Chemical Emergency Response Teams
- Chemical Assessment Teams.

Vegetation

Affected Environment

Vegetation is addressed in accordance with Minnesota Environmental Policy Act (MEPA), NEPA, and FHWA policy and guidance. Federal Executive Order 13112 establishes that federal agencies, through their actions, implement measures and means to prevent the spread of invasive species, in particular vegetative species. Other important vegetative issues include native prairies, high valued trees and landscaping, and areas subjected to vegetation management activities such as roadway right-of-way corridors.

Existing Conditions

The original vegetation in Cottonwood County and Watonwan County consisted mainly of prairie, wet prairie, and brushland prior to extensive settlement. Currently, the project setting is predominantly rural farmland with the exception of urban areas (Windom, Bingham Lake, Mountain Lake, Butterfield, and St. James). The present day vegetation within the Highway 60 study area is dominated by agricultural row crops and hay fields. Much of the farmland in the area is classified as prime and/or unique farmland and is discussed in further detail in the Farmland section of this Draft SFEIS.

Native vegetation can be found in limited areas including areas of remnant prairie, which is typically found along roadside ditches that parallel the Union Pacific railroad tracks. Prairie remnants are further discussed in the State Threatened & Endangered Species section of this Draft SFEIS.

There is no state and/or national forestlands, large tree farms, or other large areas of unique vegetative features that are potentially affected by the Build Alternative. The more highly forested areas within the project area occur as windbreaks around scattered rural residential developments and farmsteads.

Several wetlands are located along the corridor as discussed in the Wetlands section of this Draft SFEIS. Some of the areas also contain invasive plant species such as reed canary grass, leafy spurge and wild parsnips.

Environmental Consequences

Alternative 1 – No-Build

The No-Build Alterative would not impact vegetation, except for routine vegetation management within the existing road rights-of-way.

Alternative 2 – Build Alternative

East Gap, Middle Gap, and West Gap

Impacts to farmland, remnant prairies, and wetlands may occur and are discussed in their respective sections of this Draft SFEIS. Minor impacts to

woodlands, generally associated with wind breaks, are expected. The only varying of potential impacts will occur with the design options near Bingham Lake. No substantial vegetation impacts are associated with these design options.

Mitigation

During the design process, all efforts will be made to minimize potential impacts on native vegetation. Measures for vegetation protection will be based on the MnDOT Standard Specification for Construction 2572 (Protection and Restoration of Vegetation). In order to protect vegetation that lies outside of the construction limits, special attention will be paid to Construction Specification 2572.3A. Areas mapped as remnant prairie vegetation have been identified and will be avoided to the extent practical. Specific measures may include slight alignment shifts, changes to the typical roadway cross section that can reduce construction impacts, and appropriately locating staging areas that will be needed during the construction phase of the project and through the use of protective fencing for sensitive areas within the right-of-way that occur outside the limits of construction.

As indicated during early coordination with the MNDNR, invasive species are known to exist in the project area. Both Bingham Lake and Mountain Lake have Curly Pondweed. While these lakes are not close enough to the project to be directly impacted, they are close enough for the possibility of temporary water appropriations during construction. Use of water (dust control, etc.) from these two lakes will be prohibited. Purple loosestrife is also known to exist in the Highway 60 road ditch east of the City of Mountain Lake. Construction best management practices will be implemented for the prevention and control of spreading any invasive species in the project area.

MnDOT's integrated roadside management planning guidelines will assist in minimizing the potential spread of invasive plant species through reestablishment of native plant communities in all disturbed areas as well as routine maintenance of the state highway right-of-way corridor.

Fish and Wildlife

Affected Environment

Wildlife habitats in the project area are generally comprised of agricultural land, wetlands, minor stream courses (drainage ditches) and urban landscapes.

The majority of the landscape has been converted to agricultural, residential, and commercial land uses. Wetland wildlife habitats are scattered throughout the project area and further discussed in the Wetlands section of this Draft SFEIS. Wildlife species present are those typically found in rural agricultural environments.

The Carpenter Wildlife Management Area (managed by the MNDNR), located immediately north of the Bingham Lane North Bypass design option is the only state or federally identified wildlife area within the project corridor. This property

and any project related affects are discussed in more detail in the Parks and Recreational Areas section of this Draft SFEIS.

There are fishery resources and spawning areas within the project corridor in the area lakes and streams. Clear Lake and Warren Lake located just east of Windom have been used in the past by the MNDNR for fish rearing.

Environmental Consequences

Alternative 1 – No-Build

The No-Build Alternative will have no impacts on fish and wildlife habitats.

Alternative 2 – Build Alternative

East Gap, Middle Gap, and West Gap

There will be impacts on fish and wildlife habitat in the three remaining two-lane segments of Highway 60 including impacts to wetlands and associated wildlife habitats.

The Bingham Lake north bypass design option will pass immediately to the south of the Carpenter WMA, but no direct impacts are anticipated.

The Build Alternative is not anticipated to affect any streambeds and stormwater runoff BMPs will incorporated as part of the project design.

The proposed improvements within the West Gap segment will potentially require alterations to the natural boundary of Warren Pond and Clear Lake requiring fill to be placed below the ordinary high water (OHW) level of these water bodies. The Build Alternative involves widening the roadway to the north in the area of Warren Pond. Because the level of design detail is limited in this area, the potential impacts were calculated based on the proposed right-of-way limits. The proposed right-of-way extends into the southern portion of Warren Pond and approximately 0.34 acres of potential impact is shown (Wetland #30). However, the detailed design phase will define the construction limits, which is expected to reduce and/or avoid potential impacts to Warren Pond and therefore will not adversely impact fish habitat.

The design options near Clear Lake will require varying levels of modifications to the lake and shoreline area. Design options for widening the roadway to the south in the area of Clear Lake were considered, but dismissed due to impacts on prairie vegetation and the Union Pacific railroad corridor, which is eligible for listing on the National Register of Historic Places as a historic railroad district. Design options to the south would require relocating up to one-mile of the rail line and would impact approximately the same distance of a prairie remnant located between the existing highway and the railroad. Relocation of the rail line would result in an adverse impact resulting in Section 106 and Section 4(f) implications. As a result, options for widening the highway to the north were developed. The full 90-foot centerline spacing design proposes adding a new roadbed north on the existing alignment that would maintain the rural four-lane divided typical section. This design option requires modifying the existing water body by filling approximately 1.17 acres of Clear Lake. A compressed centerline

line spacing design option was also developed that would limit the width of the center median. A center median barrier (i.e. cable guardrail) would be needed to ensure safety standards are maintained. The compressed centerline spacing design option would create minor modifications to the water body and would potentially impact approximately 0.23 acres of Clear Lake. Coordination with the MNDNR and design refinements will be pursued during the final design phase.

Sequencing/Mitigation

Impacts to wetlands will be mitigated as required by state and federal regulations, which are described in the Wetlands Section of this document. MnDOT has been and will continue to closely coordinate with the MNDNR to identify and resolve any fisheries issues that may arise.

State/Federal Threatened and Endangered Species

Affected Environment

The MNDNR was contacted as the part of the early coordination process. The MNDNR queried the Minnesota Natural Heritage Information System to determine if any rare plant or animal species, native plant communities or other important natural features are known to occur within approximately a one-mile radius of the project area.

State Listed Species

As a result of this search several prairie remnants along Highway 60 were noted in both highway and railroad right of way. A few of these remnants were identified as Sites of Biodiversity. In addition, Sullivant's Milkweed (*Asclepias sullivantii*) a state-listed threatened species is known to occur within some of these prairie remnants. The MNDNR also noted that Mn/DOT has previously done some prairie mapping that should be included in any planning efforts. The MNDNR correspondence letter is included in Appendix B.

Federal Listed Species

Section 7 of the Endangered Species Act of 1973, as amended (Act), requires each Federal agency to review any action that it funds, authorizes or carries out to determine whether it may affect threatened, endangered, proposed species or listed critical habitat. Federal agencies (or their designated representatives) must consult with the Service if any such effects may occur as a result of their actions. Consultation with the U.S. Fish and Wildlife Service (Service) is not necessary if the proposed action will not directly or indirectly affect listed species or critical habitat. If a federal agency finds that an action will have no effect on listed species or critical habitat, it should maintain a written record of that finding that includes the supporting rationale.

According to the official County Distribution of Minnesota's Federally-Listed Threatened, Endangered, Proposed, and Candidate Species list provided by the Service, Cottonwood County is within the distribution ranged of the prairie bush clover (*Lespedeza leptostachya*), a federally-listed threatened species. According to the Service, there are no known occurrences of federally-listed species in

Watonwan County. Critical habitat has not been designated in either of the project counties.

Mn/DOT's Office of Environmental Stewardship (OES) in acting as the non-federal representative for the Federal Highway Administration has made the determination that the proposed action will not affect federally-listed threatened, endangered proposed or candidate species. In addition the project will not result in the adverse modification of designated critical habitat (See Appendix B).

Environmental Consequences

State Listed Species

The MNDNR correspondence letter indicates that several prairie remnants were identified within both Highway 60 and railroad right of way. In addition, occurrences of Sullivant's Milkweed (*Asclepias sullivantii*), a state-listed threatened species have been documented in some of these native prairie remnants. A follow-up field reconnaissance was conducted on May 19, 2011 by a professional staff botanist to field verify the remnant boundaries.

The findings gathered from the review of existing data and the field reconnaissance and the potential for impacts associated with the design options summarized below:

Alternative 1 – No-Build

No effects on state-listed species are anticipated.

Alternative 2 – Build Alternative

East Gap, Middle Gap, and West Gap

The MNDNR NHIS records and field reviews identified several prairie remnant occurrences adjacent to the three gap segments of Highway 60. The potential for impacting these sites is low and a final determination will be made during the final design phase.

No impacts are anticipated within the East and Middle Gaps because all construction activities are being proposed along the side of the highway opposite of the Union Pacific Railroad where the prairie remnants have been identified.

Within the West Gap, existing prairie remnants are found along the south side of the road within the right-of-way of the existing highway alignment. These remnants are found on both the east and west sides of Bingham Lake. The design option that widens the highway to the south of the existing alignment through Bingham Lake would potentially impact approximately 800 lineal feet of a prairie remnant on the west side of Bingham Lake and approximately 820 lineal feet of a prairie remnant on the east side of Bingham Lake.

Sequencing/Mitigation

Efforts will be made to avoid minimize or if necessary mitigate impacts to prairie remnants during the detail design phase. If state-listed species are encountered within construction limits or staging areas, the MNDNR will be consulted for plant salvage possibilities. MnDOT and the MNDNR have an established plant salvage

program to implement when there are unavoidable impacts to native plants. Other additional measures (e.g. adjusting grading plans, salvaging topsoil, and reseeding with native seeds from a local source) may be incorporated as coordination continues between the MNDNR and MnDOT through final design and project construction.

Federally Listed Species

As state previously the proposed action will not affect federally-listed threatened, endangered proposed or candidate species. In addition the project will not result in the adverse modification of designated critical habitat. Therefore, measures to avoid, minimize or mitigate impacts are not necessary.

Prime and Statewide Important Farmland

Affected Environment

The Federal Farmland Protection and Policy Act 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 to agricultural lands and operations are integrated into the decision making process under NEPA and MEPA. The project and its alternatives were evaluated to identify farmland classified as prime, unique, or of statewide importance under the above-referenced acts and related policies.

The Cottonwood County Soil Survey and the Watonwan County Soil Survey were consulted in conjunction with Natural Resources Conservation Service (NRCS) references to determine any areas of prime or unique farmlands, or soils of statewide importance potentially affected by the project and its alternatives. As described in the Environmental Consequences section below, a Farmland Conversion Impact Rating Form (CPA 106), which estimates the prime and unique farmland in the project area has been completed and submitted to the local NRCS office. Correspondence letters from the County NRCS offices are anticipated and will be incorporated in the Final SFEIS.

The three gap segments of Highway 60 were evaluated to identify the total amount of farmland, prime and unique farmland, and farmland of statewide and/or local importance as classified by the NRCS. The NRCS National Soil Survey Handbook, Title 430-VI, 1993, establishes definitions, purpose, rules, and policy for determining prime farmland soils.

The soil surveys for both Cottonwood and Watonwan Counties were consulted in conjunction with local NRCS staff to verify the presence of prime, unique and important farmland soils in the study area. Acres of prime and unique, statewide, or local important farmlands are present in the study area. However, the vast majority, greater than 90 percent of the farmland in the study area, has been classified as prime farmland.

It is worth noting that a number of soil types present in the study area are classified as prime farmland soils only under artificially drained conditions and that areas of farmland within the study area have been system tiled and drained.

Therefore, for the purposes of this study, all soils classified as prime only under drained conditions were assumed to be prime farmland.

The majority of the production farmland in the project area is cropped on a corn-soybean rotation. Relatively small areas of specialty crops and/or small grains may also exist.

Environmental Consequences

Farmland impacts associated with this project are separated into direct, indirect, and other potential impacts. Direct and indirect impacts are based on established criteria and are consistent with the topics typically addressed in similar EISs. The section on potential other impacts is intended to cover several specific topics related to farm operations in southwestern Minnesota and additional issues that have been identified as important to this assessment.

Direct Impacts

For the purposes of this analysis, direct farmland impacts are defined as impacts that result in a direct loss (acquisition) of farmland in the project area. Other direct impacts include severance, triangulation and isolation of farmland, and relocation or displacement of farmsteads. Each of these impacts was evaluated for the build alternative and the design options. This was done by overlaying the alignments on a land use map and aerial photograph of the project area and making an assessment of potential impacts.

In addition to farmland impacts resulting from improvements to Highway 60, some additional farmland acreage losses will result from minor realignments of local roads and construction of stormwater ponding areas. To the extent practical, these impacts were considered and accounted for in this assessment.

Farmland and Prime Farmland

Alternative 1 – No-Build

The No-Build Alternative would have no direct effects on prime, unique, or statewide important farmland.

Alternative 2 – Build Alternative

East Gap, Middle Gap, and West Gap

As described above, prime, unique, and statewide important farmlands are present throughout most of the project area. The Build Alternative through the Middle and East Gaps consist of a single alignment and therefore do not allow for a comparative assessment. The design options in the West Gap near Clear Lake and Bingham Lake were reviewed and the range of farmland impacts (acreages) shown in Table 28 represent the greatest possible impact and possible design modifications or combinations of the design options listed would potentially reduce the acres of impact.

Prime and statewide important farmlands affected by the project alternatives and design options are shown in Table 28. These acreages were calculated for the additional right-of-way needed for the proposed improvements using all soil classifications in the soil surveys that were classified as prime, unique, and/or

important soils, including areas not currently being used for agricultural purposes (i.e. existing right-of-way, developments, and open space).

Table 28 – Summary of Direct Farmland Impacts

Alternative	Farmland Impacts	Prime/Unique Farmland Loss	Statewide/Local Important Farmland Loss
Alternative 1 (No-Build)	N/A[1]	N/A[1]	N/A[1]
Build Alternative – East Gap	103.76 acres	95.12 acres	0 acres
Build Alternative – Middle Gap	90.36 acres	86.31 acres	0.92 acres
Build Alternative – West Gap (areas not including Clear Lake or Bingham Lake)[2]	84.41 acres	76.10 acres	3.23 acres
Clear Lake – "Full" 90' centerline spacing	10.64 acres	4.90 acres	5.48 acres
Clear Lake – "Compressed" centerline spacing	8.50 acres	4.22 acres	4.28 acres
Bingham Lake – Expand Highway South of Existing	38.21 acres	35.74 acres	1.98 acres
Bingham Lake – Expand Highway North of Existing	36.10 acres	33.43 acres	2.11 acres
Bingham Lake – North Bypass Alignment	62.60 acres	58.90 acres	2.71 acres

[1] The No-Build Alternative has no associated farmland impacts because no specific improvements have been identified.
2 Areas outside of Bingham Lake and Clear Lake design options.

Severed and Triangulated Farms

For the purposes of this analysis, a severed farm is defined as a parcel of land that is split by the proposed roadway into separate parcels of farmland making it more difficult to farm, in part because an additional crossing or multiple crossings of the new roadway would be required for farm equipment. Furthermore, farm drainage systems may be impacted as a result of severing a once continuous piece of farmland into two or more parcels of land. If the farmland was already severed by a roadway and the proposed project simply moved the location of the severance, then this would not be considered a newly severed parcel. To the extent possible at this conceptual design phase, realignments of local roads were also considered when evaluating severed farms.

A triangulated farm is defined as a severed parcel that becomes too small to farm efficiently. For the purposes of this assessment, farmland parcels that are severed and one parcel becomes less than 10 acres in size were also considered triangulated. The specific geometry of the parcel was also considered for this evaluation. For example, it may still be economically feasible to farm a 5-acre rectangular parcel using a 16-row implement, but not with a 24-row implement. Using the same 16-row or 24-row implement on a 9-acre triangular shaped parcel would most likely not be feasible.

The north bypass design option near Bingham Lake results in slightly greater impacts than maintaining the highway on its existing alignment. The north bypass option would potentially result in the severance of four parcels and triangulation of one farmland parcel, while the options that expand the highway to a four-lane section on the existing alignment would result in none.

Isolated Farms

Isolated farms occur when a farmstead is physically separated from its associated farmland. Impacts can also occur as a result of land that is rented/leased by another operator. Essentially, the farm operator would need to cross the roadway when traveling from the farmstead to the severed parcel. The result of this type of impact includes the inconvenience, increased transportation costs for moving machinery back and forth across the highway, and safety risks in crossing the highway with slow moving machinery.

Only newly isolated parcels were considered in this study. That is, if the farmland was already isolated from the farmstead and the proposed highway improvements simply changed the location of the isolation, it would not be considered a newly isolated parcel. Cases where a farmer rents or leases land were not considered in this assessment due to the unknown nature and terms of these agreements. There were no isolated farms that resulted from the proposed alternatives.

Farmstead Displacement and Access Restrictions

Farmstead displacements result when the proposed right-of-way infringes on an existing building site such that the farm home must be permanently removed or relocated. Based on the proposed right-of-way limits for the build alternative and design options, there are no farmstead displacements anticipated as a result of the proposed highway improvements.

The majority of the project area can be characterized as agricultural and a rural residential setting. Concern has been expressed about direct access to farmsteads and farm properties adjacent to the highway. Access changes to rural building sites and farm fields are proposed to improve safety and operations along the highway corridor. In some cases, direct access will be removed from the highway and redirected to a cross street (county or township road), while in other cases an access point may be restricted to right-in/right-out movements rather than full access. The East Gap has four building sites and the Middle Gap has two building sites that have been identified for possible modifications to their existing access point. In all cases, MnDOT will work with the affected property owners during the final design phase to ensure reasonable access to building sites and farm fields is provided.

Other Potential Impacts

Other impacts considered in this farmland study include the potential effects on land values, impacts on farmland drainage systems, and potential impacts on feedlots and/or livestock operations.

Land Values

Questions are commonly raised as to how farmers and farmland owners will be compensated for losses of farmland and/or farm structures. In general, MnDOT compensates owners of property lost to right-of-way acquisition based on the fair market value of the property. MnDOT has an appraisal of the property completed and also encourages the owner to have an independent appraisal completed. If necessary, the differences in the appraisals are resolved through

negotiation. If acquisition of a farmstead is necessary relocation assistance is also available for owners that will have home and/or building relocation costs.

Another factor relating to land values is the proximity of the land to developing areas such as the cities of St. James, Mountain Lake, Windom, etc. Land values can vary not only on the basis of crop production potential, but also on whether land closer to these urban areas are more likely to see development pressure. Given these considerations, the question of "whether a farmer/landowner will experience a gain or loss from selling their land to the State of Minnesota for right-of-way" cannot be answered with any certainty. Land values typically experience similar increases or decreases to housing prices. As stated previously, only general conclusions can be drawn regarding individual experiences and the answer is not only dependent on the factors listed above, but also on what the landowner does with proceeds from the land sale.

Farmland Drain Tile Systems

The proposed improvements associated with the build alternative are anticipated to result in some impacts to existing farmland drain tile systems. When comparing the design options near Bingham Lake, the north bypass option has a higher risk of impacting drain tile because this design option is proposed to impact greater amounts of farmland and severe more farm fields than the options that propose to expand the highway on the existing alignment.

These artificial drainage systems range from minor systems draining a small area of farmland to extensive system tiling where entire fields are artificially drained. Further analysis and preliminary design of the preferred alternative will identify potential impacts. During project final design, MnDOT will continue to coordinate with local property owners/farmers on potential impacts to existing drainage systems and methods to ensure systems are replaced and/or returned to pre-construction condition prior to completion of the project.

Livestock Operations

Both Cottonwood County and Watonwan County have large numbers of feedlots/livestock operations. These operations range in size from a few animals to several thousand animals. The potential impacts associated with the highway project on these livestock operations varies from minor changes in access, loss of agricultural land used for spreading manure, to total acquisition if the operation/buildings falls within the proposed right-of-way.

Based on a review of the alignment for the Build Alternative and design options, no direct impacts to existing livestock operations are anticipated.

NRCS Farmland Impacts Rating Form

The NRCS Cottonwood Field Office was contacted in May 2011 to obtain information on the types and extent of prime and unique farmland in the project area and to submit the Farmland Conversion Impact Rating Form for processing. The Farmland Conversion Impact Rating form has been completed for this project. Based on this evaluation the project will potentially convert approximately 323 to 379 acres of prime, unique, or statewide/locally important farmland. A copy of the Farmland Conversion Impact Rating forms can be found

in Appendix C. Based on estimates in the NRCS Farmland Conversion Impact Rating Form the design options that utilize the existing alignment through Bingham Lake have less potential impact on farmland as compared to the north bypass alignment.

Mitigation

At the conceptual design phase, all practical measures to minimize harm to prime and important statewide farmlands have been applied. Special consideration during the detailed design phase will be given to avoid potential triangulation and severance of agricultural lands. Safe and convenient access to farmland will be considered as part of the final design for the preferred alternative. Furthermore, the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, will be followed with regards to farmland acquisition.

MnDOT recognizes that farm drainage systems are vitally important to area farmers. The final design phase will utilize available information from local property owners to protect the integrity of each field tile drainage system as much as possible. Continuity of existing farmland drain tile systems will be sustained during and after construction. Special attention will also be given to construction activities to ensure soils characteristics are not compromised through soil compaction.

Visual Quality

A visual inventory of the natural and human resources is the first step to understanding the potential visual impacts and mitigation possibilities associated with a proposed project. The process developed by MnDOT, Visual Impact Assessment: A Six-step Process for Evaluating Transportation Projects, was used to identify the existing resources and describe the potential visual effects of the proposed project.

Affected Environment

Natural Environment

The existing Highway 60 alignment between St. James and Windom travels through a varied and rich environment, and the agricultural landscape is a strong and dominant feature. At the west end of the project is the City of Windom, where there is higher density development. East of Windom, the corridor is primarily rural in nature with farmlands dominating the landscape. Scattered woodlands, open space, and sparse single-family residential/farmsteads speckle the landscape. The corridor also passes through Bingham Lake and bypasses the communities of Mountain Lake and Butterfield before reaching St. James at the eastern limits of the project study area.

Cultural Environment

Cultural resources (i.e., historic buildings or features) are primarily limited to historic farmstead/structures and the railroad corridor. These features are discussed in the Architectural and Archaeological section of this Draft SFEIS.

Highway Environment

Road width and the width of the cleared area adjacent to the road affect the visual quality of the traveler's experience. The three gap segments of the Highway 60 corridor are presently two-lane, undivided rural highway sections. Within these segments, the road right-of-way is narrow, but the type of vegetation adjacent to the highway is predominately agricultural related (corn and soy beans). The highway sections both east and west of the project limits and bypass sections around Mountain Lake and Butterfield are comprised of four-lane divided rural expressway sections with at-grade intersections.

Viewers

Travelers

Travelers are people who currently use or will use the highway. Most travelers in the corridor are commuters who regularly use the road to get to home, work, or market; commercial haulers who use the road to move goods and services; or tourists who use the highway as a route to recreational destinations. Different types of travelers focus their attention on different types of visual resources. Commuters and haulers often focus on existing landmarks that guide them to their destination while tourists are concerned with views of scenic beauty and entertainment venues.

Neighbors

Neighbors are people who use property adjacent to the existing or proposed highway. Within the three gap segment of Highway 60, neighbors are residential/farmsteads and a small number of businesses.

Environmental Consequences

Alternative 1 - No-Build

The visual impacts (adverse or beneficial) resulting from the No-Build Alternative are expected to be minimal because only minor safety and maintenance improvements would occur along these segments of Highway 60.

Alternative 2 – Build Alternative

East Gap, Middle Gap, and West Gap

The proposed Build Alternative will have an effect on the existing visual scene and resources for both travelers and neighbors. The proposed highway improvements will require additional pavement and clearing of some natural areas. The reconstruction and capacity expansion of Highway 60 as a rural four-lane divided expressway will convert farmlands, grasslands, and open space areas to highway right-of-way.

Improvements along the alignment could also adversely and beneficially affect views for the traveler, as well as neighbors residing in the project area. The clear zones adjacent to the existing highway would be wider and some of the existing vegetation will need to be removed to ensure safe conditions for highway users.

The design alternatives being considered near Clear Lake and Bingham Lake will result in differences in impacts to the natural and built environments. The design

options that widen the highway on its existing alignment through Bingham Lake will result in the removal of buildings/structures that are close to the existing road. The extent of right-of-way and relocation impacts is further discussed in Section 4.1 Right-of-Way and Relocation. The proposed bypass alignment also impacts a single structure that would have to be relocated. The removal and/or relocation of buildings may be considered an adverse impact by travelers and neighbors since it changes their familiar landmarks. Overall, the type of traveler or neighbor will determine if the visual impact is perceived as being either adverse or beneficial.

Mitigation

No mitigation is required for visual impacts. However, during the final design phase, a corridor landscaping plan will be prepared.

Indirect Impacts

The Highway 60 Project will result in both direct and indirect (secondary) impacts. Direct impacts (discussed in the previous sections) are well defined, occur within the proposed highway corridor, and are a specific result from the proposed improvements (i.e., right-of-way acquisition/relocations, loss of vegetation, and removing agricultural land from production). Indirect impacts are defined by the Council on Environmental Quality (CEQ) as the following:

> Indirect Effects: "Effects that are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induce changes in the pattern of land use, population density or growth rate, and related effects on air and water on other natural systems, including ecosystems." (40 CFR 1508.8(b))

In order to ensure a project's total benefits, impacts, and costs are evaluated, direct and secondary impacts must be evaluated. The following potential short-term and long-term indirect impacts may result from direct impacts that may be attributed to the project's alternatives:

- Potential for changes in land use patterns resulting from road realignments and/or access changes.

Environmental Consequences

Potential indirect impacts in the project area are related to land use changes occurring within the counties, cities, and townships. These land use changes involve infrastructure planning and construction to accommodate new developments/redevelopments, which may affect the amount of traffic using a highway corridor. Land use changes such as new residential, commercial, industrial, and manufacturing developments are anticipated over the long-term even without the proposed improvements to Highway 60.

Current growth rates suggest that new traffic growth will erode the interregional corridor safety and mobility goals if no improvements are made and the No-Build Alternative is the chosen action. The build alternative for the proposed project is

therefore responsive to planning for future land uses as an integrated measure to accommodate future traffic growth that is forecast in the Highway 60 corridor.

Land Use Changes

Alternative 1 – No-Build

Under Alternative 1, little change would occur to existing land uses in the project study area. Minor safety improvements could require the need to acquire some new right-of-way, but the No-Build Alternative would not create a substantial change in existing land use patterns.

Alternative 2 - Build Alternative

East Gap, Middle Gap, and West Gap

Future land use patterns in the project area will be determined by many factors, including the availability of municipal services (sewer and water), environmental amenities, and economic conditions. Construction of a new or improved highway can also result in realigning local roads or changes in access for properties adjoining these roadways that could result in changes in development patterns. However, highway construction by itself does not cause new development if there are not market forces that support new development and changes in land use. Furthermore, in order for potential land use changes to occur, the development plans have to be consistent with local land use and zoning regulations.

Although most new commercial development is expected within close proximity of the highway within the communities located along Highway 60, the desire to occupy a site may precede the ability to extend orderly municipal services to the site. This may result in longer utility lines until contiguous development can "catch up" to the property desiring services. The desire to occupy these locations can also artificially raise land prices adjacent to the highway and may affect property values of undeveloped adjoining parcels. Potential development will be regulated by City and/or County zoning regulations.

Under the Build Alternative, there would be impacts to the existing land use. Implementing the continuous four-lane highway would require the expansion of the existing right-of-way as documented in the Right-of-Way and Relocation section of this Draft SFEIS. Right-of-way acquisition would potentially necessitate the relocation of residential/commercial structures. It is anticipated that commercial development will continue to occur along Highway 60 near the communities.

Mitigation

In the context of the existing regulatory framework and the mitigation activities for project impacts, and with respect to simultaneous land use planning and local government regulatory activities, indirect impacts of the project are expected to be minimal. Such potential indirect impacts may be avoided and/or minimized through land use controls and roadway access restrictions.

Cumulative Impacts

Minnesota Rule part 4410.2300, Item H requires that regulatory governmental units include a discussion of cumulative impacts in an EIS document. Cumulative impacts are also defined by the federal Council on Environmental Quality (CEQ) as *"impacts on the environment that result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions"* (40 CFR 158.7).

Cumulative impacts are not necessarily causally linked to the reconstruction of Highway 60 and related improvements. Rather, they are the total effect of all known actions (past, present, and future) in the vicinity of the proposed project with impacts on the same types of resources. The purpose of cumulative impacts analysis is to look for impacts that may be individually minimal, but which could accumulate and become significant and adverse when combined with the effects of other actions.

Scope of Cumulative Impacts Analysis

The cumulative impacts analysis is limited to those resources, ecosystems, and human communities directly affected by the proposed project, i.e., right-of-way, vegetation, farmland, wetlands, stormwater quality and quantity, and contaminated properties.

The geographic scope of this analysis varies by the resource under examination, as described in each sub-section below. The temporal scope of the analysis attempts to consider previous impacts to the resources that occur over time. The year 2030 is considered the current limit of comprehensive planning activities for the area, as the extent of transportation and land use planning projections are generally available up to that date. Thus, year 2030 is used as the temporal horizon for assessing future cumulative impacts.

Past Actions

Past actions in the project area include decades of agricultural, residential, industrial, and commercial development. In addition, there has been highway and heavy rail infrastructure development. These have resulted in the current state of built environment in the vicinity of the Highway 60 corridor.

Future Actions Anticipated

The projects listed below that were considered as future actions in this analysis were used because they: 1) are either existing, actually planned for, or for which a basis of expectation has been laid; 2) are located in the surrounding area; and 3) might reasonably be expected to affect the same natural resource.

The following list of future actions is the currently known planned projects/actions in the Highway 60 corridor:

- Anticipated future actions: Although no specific future development proposals have been identified, for the purposes of this cumulative impacts assessment it is assumed that commercial and residential

development will continue to occur in the future adjacent to the Highway 60 corridor and within the communities of Windom, Bingham Lake, Mountain Lake, Butterfield, and St. James.

Impacts from the reconstruction of the Highway 60 gap segments have been discussed previously. The main project impacts are summarized below and include right-of-way, wetlands, stormwater runoff, contaminated properties, farmland, and vegetation. Cumulative impacts to these resources from the proposed project and anticipated future projects listed above are discussed in the following sections.

Right-of-Way and Relocation

Existing Conditions

The existing Highway 60 right-of-way ranges from 150-feet to 185-feet with the majority of the corridor having 150-feet of public right-of-way. Several local roadways (County, City, and Township roads) intersect Highway 60 along the corridor and these roadways have existing right-of-way that ranges between 60-feet to approximately 100-feet.

Impacts from Proposed Action

The need for additional private land for right-of-way purposes was assessed for the proposed improvements to Highway 60 in the three gap segments. This assessment, described in Section 4.1, identified potential right-of-way needs of approximately 311 acres to 348 acres, depending of the design options near Clear Lake and Bingham Lake. The Bingham Lake design options will also require the relocation of one to three business developments.

Impacts from Other Actions

The known foreseeable future development projects in the vicinity of the Highway 60 improvements would potentially require additional private land to be converted to a public use (roads, utilities, parks, etc.) to service those developments. Future developments will be subject to local and state environmental reviews, including assessment of potential impacts and identification of public right-of-way needs.

Cumulative Impacts

Based on the assessment of the potential for impacts above, adverse cumulative impacts to private property are not anticipated to result from the proposed project and foreseeable future actions.

Wetlands

Existing Conditions

Wetlands in the vicinity of the project area have been affected directly or indirectly over time as a result of past human settlement/development.

Impacts from Proposed Action

The proposed highway improvements, and dependant on the design options selected near Clear Lake and Bingham Lake, will require the partial filling of 16 to 18 wetland basins resulting in an estimated 9.72 to 11.63 acres of permanent wetland impacts. These impacts will be mitigated in accordance with state and federal regulatory requirements either through banking and/or on-site mitigation.

Impacts from Other Actions

Wetlands in the project vicinity may be affected by anticipated future development projects. However, these impacts will be mitigated according to applicable laws and regulations.

Cumulative Impacts

Wetlands in Minnesota are protected by Federal law (the Clean Water Act – Section 404) and State law (Minnesota Wetland Conservation Act and Executive Orders) that mandate "no net loss" of wetland functions and values. These federal and state laws require the avoidance of wetland impacts when possible, and when avoidance is not possible, impacts must be minimized and compensated. Both federal and state laws require permits. The Minnesota Wetland Conservation Act requires mitigation of wetland impacts be provided at a minimum 2:1 ratio. Therefore, no substantial cumulative wetland impacts are anticipated to result from the Highway 60 Project plus other foreseeable actions.

Stormwater Quality and Quantity

Existing Conditions

Under existing conditions stormwater runoff from impervious surfaces in developed areas drains to surrounding water resources (area lakes, wetlands, streams, and drainage ditches). Recent developments have been required to provide vary levels of stormwater treatment. However, some older developments (including the existing Highway 60 corridor) do not include sufficient treat of stormwater prior to discharge to these water resources.

Impacts from Proposed Action

The proposed project will result in additional areas of impervious surface due to expanding the existing roadway from a two-lane highway section to a four-lane highway section. The proposed project will pre-treat stormwater runoff and/or provide infiltration through best management practices being incorporated into the project design. These BMPs help mitigate the adverse effects of the increased impervious surfaces. They will improve the quality of stormwater being discharged compared to existing (untreated) condition.

Impacts from Other Actions

Future developments and other land use changes may result in increased impervious surfaces and/or stormwater quality/quantity (discharge rate) effects. However, these projects will be required to provide mitigation in conformance with NPDES and/or watershed regulations, minimizing surface water impacts.

Cumulative Impacts

Federal, state, and local surface and groundwater management regulations require mitigation be provided in conjunction with proposed development and projects that impact water quality/quantity. Given the design standards and management controls available for protecting the quality of surface waters, it is likely that potential impacts of the project, along with other foreseeable actions, will be minimized or mitigated to a substantial degree. Therefore, adverse cumulative effects on water quality and quantity rates are not anticipated.

Contaminated Properties

Existing Conditions

Under existing conditions there are several potentially contaminated sites, which were identified in the Phase I ESA, that are located adjacent to the Highway 60 corridor. These sites include a slaughter/rendering operation, farm implement business, liquid fertilizer business, vehicle salvage yard, grain elevator, farmsteads with above-ground storage tanks (ASTs), and a potential historic farm dumps.

Impacts from Proposed Action

The proposed project may impact these sites requiring the appropriate handling and disposal of any contaminated material. If necessary, a plan will be developed by MnDOT for properly handling and treating contaminated soil and/or groundwater. MnDOT will work with the Petroleum Brownfields Program and/or the Voluntary Investigation and Cleanup Programs at the MPCA, as appropriate, to obtain assurances that MnDOT's contaminated site cleanup work and/or contaminated site acquisition will not associate it with long-term environmental liability for the contamination.

Impacts from Other Actions

Future developments and other land use changes may involve properties with potential soil and/or groundwater contamination. These sites will be subject to further environmental review and environmental investigations (soil borings and/or groundwater sampling). Future actions will be subject to local, state, and federal laws and regulations.

Cumulative Impacts

Federal, state, and local environmental hazard/contaminated property regulations require appropriate handling and disposal of contaminated material. Given MnDOT's construction standards and management controls, it is likely that potential impacts resulting from encountering contaminated properties during construction of the highway improvements, along with other foreseeable actions, will be minimized or mitigated to a substantial degree. Therefore, adverse cumulative effects on soil and groundwater are not anticipated.

Farmland

Existing Conditions

Farmland and agricultural land uses dominate the landscape in the three gap segments of Highway 60. The vast majority of farmland is cropped in a corn-soybean rotation with scattered amounts of farmland being used to grow specialty crops and/or small grains.

Impacts from Proposed Action

The proposed Build Alternative(s) is anticipated to require the conversion of an estimated 323 to 353 acres of farmland to a transportation use (roadway and highway right-of-way). The U.S Department of Agricultural Farmland Conversion Impact Rating Form (CPA 106) was completed and submitted to the local NRCS office.

Impacts from Other Actions

Future developments and land use changes may result in additional farmland being converted to another land use. However, based on relatively low development demand in this area of the state, substantive conversions of farmland are not anticipated.

Cumulative Impacts

Based on the assessment of the potential for impacts above, adverse cumulative impacts to farmland are not anticipated to result from the proposed project and foreseeable future actions.

Vegetation

Existing Conditions

As described above, the present day vegetation within the Highway 60 study area is dominated by agricultural row crops. However, native vegetation can be found in limited areas including areas of prairie remnants, which is typically found along roadside ditches that parallel the UP Railroad corridor. There are no state and/or national forestlands, large tree farms, or other large areas of unique vegetative within the study area.

Impacts from Proposed Action

Existing prairie remnants are found along the south right-of-way of the existing highway alignment on both the east and west sides of Bingham Lake. Therefore, the design option of the Build Alternative that widens Highway 60 to the south of the existing alignment through Bingham Lake would potentially impact approximately 800 lineal feet of a prairie remnant on the west side of Bingham Lake and approximately 820 lineal feet of a prairie remnant on the east side of Bingham Lake. If this design option is identified as part of the preferred alternative, additional design considerations will be made to avoid and minimize impacts on prairie remnants. Furthermore, the MNDNR will be consulted for plant salvage possibilities where unavoidable impacts to native plants occur.

Impacts from Other Actions

Future developments and other land use changes could result in impacts to existing vegetation and potentially prairie remnants. However, most of the remnants are located along old highway and rail corridors which would likely be subject to state and/or federal environmental review if substantial changes are proposed. Therefore, potential impacts, avoidance measures, and mitigation would be assessed during project development and environmental review.

Cumulative Impacts

The final design phase will further evaluate potential impacts to vegetation (prairie remnants). If necessary, MnDOT will implement a topsoil and replacement salvage program, along with seeding disturbed prairie remnants with native seed from a local source. Therefore, substantial adverse impacts to vegetation are not anticipated to result from the proposed project and foreseeable future actions.

Conclusion

The potential impacts to resources identified can be avoided or minimized through existing regulatory controls, as described above. During the development of this SFEIS, no potentially significant cumulative impacts to the resources affected by the Highway 60 project have been identified.

4.3 WHAT ARE THE CONSTRUCTION IMPACTS?

Precautions will be taken to limit impacts connected with highway construction activities. Potential environmental effects associated with construction can include traffic congestion, traffic detours, economic (business access), noise, water quality and soil erosion, borrow and excess materials, utility disruption, and farmland impacts. The potential impacts along with applicable mitigation measures for each of these areas are discussed below.

Traffic Congestion

Construction of the three highway segments is projected to occur under separate construction lettings with one segment being completed before construction on the next segment begins. As a result, traffic delays, travel difficulty to adjacent properties, and increased congestion within the specific project segments are anticipated to occur only on a short-term or temporary basis. A construction staging plan will be developed for each segment and will be completed during the final design phase of that particular segment. The staging plans will further assess potential traffic congestion impacts associated with construction and will attempt to address the need for property access, while minimizing the total length of construction time.

Traffic Detours

As mentioned, a construction staging plan will be completed during the final design stage of each highway segment and will identify potential detours. Efforts will be made to minimize disruptions to traffic patterns while maximizing directness of detoured routes. This would minimize short-term impacts on

emergency services (police, fire, and rescue) and transit services throughout the individual project segments. Furthermore, the existing 2-lane highway will remain in-place during construction, which will minimize disruptions in traffic and reduce the likelihood of lengthy detours.

Economic (Business Access)

The proposed project is expected to generate both direct construction jobs and indirect jobs to support construction related activities. The exact number of jobs cannot be determined at this time. A recent calculation prepared by the Federal Highway Administration shows that for every million dollars spent on highway and bridge construction, approximately 27 jobs could be supported throughout the economy.

The proposed improvements may alter access to properties along the corridor. However, alternative access will be provided in all cases. Existing businesses within the project area may experience negative short-term impacts during construction due to traffic disturbances/detours. The proposed improvements will limit potential adverse economic impacts since a large portion of the improvements will be constructed on an alignment adjacent to the existing highway, which will continue to be used during construction to ensure that traffic movements and access to businesses are maintained.

Construction Noise

The construction activities associated with implementation of the proposed improvements will result in increased noise levels relative to existing conditions. Noise levels due to construction activities in the three gap segments of Highway 60 will vary depending on the types of equipment used, the location of the equipment, and the operating mode. During a typical work cycle, construction equipment may be idling, preparing to perform tasks, or operating under a full load. Equipment may be congregated in a specific location or spread out over a larger area. Some construction could potentially occur in close proximity to existing noise-sensitive land uses. Adverse impacts resulting from construction noise are expected to be localized and temporary. All construction equipment will be properly equipped to minimize potential construction noise impacts.

Table 29 shows peak noise levels monitored at 50 feet from various types of construction equipment. This equipment is primarily associated with site grading/site preparation, which is generally the roadway construction phase associated with the greatest noise levels.

Table 29 – Typical Construction Equipment Noise Levels at 50 feet

Equipment Type	Manufacturers Sampled	Number of Models in Sample	Peak Noise Level (dBA)	
			Range	Average
Backhoes	5	6	74-92	83
Front Loaders	5	30	75-96	85
Dozers	8	41	65-95	85
Graders	3	15	72-92	84
Scrapers	2	27	76-98	87
Pile Drivers	N/A	N/A	95-105	101

Source: US EPA and FHWA

Elevated noise levels are, to a degree, unavoidable for this type of project. MnDOT will require that construction equipment be properly muffled and in proper working order. While MnDOT and its contractor(s) are exempt from local noise ordinances, it is the practice to require contractor(s) to comply with applicable noise restrictions and ordinances to the extent reasonable. Advanced notice will be provided to affected communities of any planned abnormally loud construction activities. Night construction may sometimes be required to minimize traffic impacts and to improve safety, but construction will be limited to daytime hours as much as possible. Construction is expected to last at least two construction seasons for each gap segment.

Any associated high-impact equipment noise, such as pile driving, pavement sawing, or jack hammering, will be unavoidable with construction of the proposed project. Pile-driving noise is associated with any bridge construction and sheet piling necessary for retaining wall construction. While pile-driving equipment results in the highest peak noise level, as shown in Table 29, it is limited in duration to the activities noted above (e.g., bridge construction). The use of pile drivers will be prohibited during nighttime hours.

Water Quality and Soil Erosion

The potential for soil erosion and impacts on water quality are greatest at the time a project requires the removal of vegetation and topsoil for initial clearing, grubbing, and grading activities. Areas adjacent to water resources have the highest potential for adverse impacts. Erosion control measures as suggested by the MPCA will be installed to minimize potential soil erosion impacts from construction activities. These practices may include, but are not limited to, the following, sedimentation basins, silt control devices (silt fences, hay bales), slope drains, and rapid revegetation of exposed construction areas. As part of the final design of the preferred alternative an erosion control plan, also known as a Stormwater Pollution Prevention Plan (SWPPP), will be prepared and submitted as part of the NPDES Construction Stormwater permit.

Borrow or Excess Material

The selection of borrow material for the construction of the proposed improvements will be the responsibility of the construction contractor(s). Existing gravel/borrow sites, in some instances, are identified in the contract special provisions. Due to the cost of hauling aggregate resources, it is assumed that the potential area of effect would be within close proximity of the corridor. The haul distance could be shorter or longer because it is highly dependent upon the location from the borrow site.

MnDOT has no authority over land use outside the state's right-of-way. Such matters, including gravel mining, generally fall under the jurisdiction of local units of government as part of land use ordinances. The State of Minnesota has designated local units of government as the RGU for environmental review and analysis of gravel mining operations. Any new sites would be subject to environmental reviews under Minnesota Rule Chapter 4410.4300, Subp. 12 and will require an archaeological survey of the site. At the time of construction,

MnDOT will be notifying the Planning and Zoning Department of both Cottonwood County and Watonwan County informing them of the potential gravel needs for the proposed action. The extraction of gravel resources could affect sensitive environmental resources in the area. Both counties have existing land use regulations that ensure appropriate environmental reviews occur for any gravel mining requests.

The disposal of excess material will be conducted in accordance with MnDOT specifications, environmental regulations, and according to a project disposal plan that will be prepared by the Contractor and approved by MnDOT.

Utility Disruption

Construction activities may result in temporary impacts to local utilities. Coordination and cooperation with the local service providers has been and will continue to be maintained throughout the project development process.

Farmland Impacts

Within the study area, construction activities may temporarily disrupt farm operations and/or farm businesses such as planting, growing, and harvesting of crops. Temporary impacts could also result from loss of productivity of croplands directly adjacent to construction activities or loss of customers to a farm-related business during construction of the highway improvements.

Temporary farm-related impacts may include soil compaction from construction equipment, removal and replacement of drain tile, and the removal of crops and topsoil for staging areas and construction. Some loss in yield will occur from soil compaction in these areas or from loss of drain tile efficiencies. Soil compaction impacts are expected to last no more than one to two years following completion of construction and field drain tile systems will be replaced or restored to pre-construction effectiveness.

Relationship Between Local Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity

All highway projects require the investment or commitment of some portion of resources found in the existing environment. Short-term refers to the immediate consequences of the project whereas long-term relates to its direct or secondary effects on future generations.

Potential Adverse Use

Reduction of Energy and Material Resources

The materials consumed in the construction of the proposed improvements will be unavailable for other uses. These include the construction of other non-highway related facilities. The energy consumed in the construction (in the short-term), maintenance, and operation of the facility is slightly higher than the energy consumed by the No-Build Alternative.

Loss of Vegetation

In addition to permanent vegetation loss as a result of an expanded highway, construction activities will result in additional short-term losses of vegetation adjacent to the roadway improvements. If necessary, MnDOT and MNDNR staff will consider and coordinate plant salvage of important or rare native vegetation (prairie remnants) that could be affected by the preferred alternative. Revegetation design will be coordinated with visual quality, erosion control, and shoreline and embankment stabilization components of the project to ensure minimal impacts as a result of temporary vegetation loss.

Loss of Wetlands

The build alternative is expected to directly impact existing wetlands. Due to the scattered distribution of wetlands, the impact on wetlands cannot be completely avoided. See Final EIS Section 4.2 Wetlands for a discussion of avoidance and minimization efforts as well as compensatory mitigation commitments.

Impacts on Water Resources

The build alternative has the potential to create temporary impacts on water resources due to the close proximity of drainage ditches, wetlands, and lakes. All practical efforts will be made to minimize impacts on water resources.

Short-Term Economic Impacts

The construction of the expanded highway will require the acquisition of property and will remove this land from the tax rolls resulting in some short-term loss of property tax revenues. This short-term loss is anticipated to be offset due to the increased value of land served by the improved highway.

Also, the build alternative may require a number of residential/business relocations. Depending on the availability and location of replacement land, such acquisitions could affect the tax base for local units of government through a short-term loss in tax revenues. Short-term construction detours may require that typical business relationships be temporarily altered. This may include short-term changes in the conduct of business and trade activities until the highway improvements are fully integrated.

Inconveniences from Construction

Construction will cause minor traffic delays and short-term inconveniences for motorists in the area. Construction detours and higher levels of congestion may result due to construction activities.

Significant Capital Investment

Financial commitments to the project include acquisition, relocation, and construction costs. These public dollars will not be available for other uses. In addition, the land converted to highway use represents a reduction in tax base. These costs are to be recovered through more efficient travel and reduced user costs and an increase in the overall tax base due to the improved accessibility and mobility within the project area and region.

Long-Term Gains in Productivity

Reduction in Travel Time and Cost of Travel

A continuous four-lane highway has the ability to accommodate high volumes of traffic and increased volumes of heavy commercial traffic. The presence of free flowing traffic will reduce motorist travel times and fuel consumption, which will reduce the overall cost of travel.

Economic Benefit

The economic advantage lies in the long-term efficiencies that an improved transportation system will provide. These efficiencies include travel time savings, increased safety, business expansion opportunities, and increased tourism. The build alternative has some degree of beneficial economic impacts. The travel time savings will be a benefit to trucking companies, shippers, salespeople, tourists, and to commuters going to and from work. The travel time saved by shippers and salespeople will result in reduced costs for businesses, making them more competitive in the marketplace.

Reduction of Crashes

The construction of a continuous four-lane divided expressway will improve safety for motorists using the highway and will reduce the severity of crashes (i.e., head-on and side-swipe collisions).

Improvements in Surface Water Drainage

Within the project study area of the three gap segments of Highway 60, there are currently very few stormwater management techniques being practiced. The proposed highway improvements will incorporate stormwater treatment facilities that will collect and treat highway runoff prior to discharging to receiving water bodies.

Irreversible and Irretrievable Commitment of Resources

Land Consumption

The build alternative will require the acquisition of undeveloped and developed land for the purpose of roadway construction. Within the foreseeable future, this commitment of property to roadway use is considered irreversible and irretrievable as long as the facility continues to serve the public good. However, if a greater need arises for use of the land or if the highway facility is no longer needed, the land could be converted to another use. At present, there is no reason to believe such a conversion would ever be necessary or desirable.

Social and Cultural Resources

The displacement and relocation of residences and other resources (including historic properties) of the built environment (public and private) are considered to be irreversible and irretrievable. The potential number of relocations, including potentially eligible historic properties, for the build alternative was based on structures (historic property boundaries) that fall within the proposed right-of-way. Avoidance measures will be further considered during the final design phase of the preferred alternative that may reduce the number of relocation or right-of-way impacts. No impacts to historic properties were identified.

Construction Materials

The project will result in the commitment of such materials as steel, cement, aggregate, and bituminous. These resources are largely irretrievable except for those items that have some salvage value and can be recycled. A benefit-cost analysis was completed and presented in the Benefit-Cost Analysis section (see Section 4.1). Part of the analysis considered the cost of construction materials as well as the value of material that could be salvaged sometime in the future. Therefore, all construction materials needed for the build alternative are not considered to be fully irretrievable resources.

Financial Resources

The improvements will require a considerable amount of federal and state financial commitment. The total cost for the build alternative, including the design options in the West Gap segment is estimated to be approximately $48 to $50.5 million. While these public funds are not directly retrievable, the investment will enhance the safety of the users of Highway 60, the cost of travel along the roadway, and the economic vitality of the region.

Natural Resources

The proposed improvements may require the commitment of natural resources including the loss of vegetation, wetland functions and values, and other wildlife habitat. The commitment of these resources may in part be irreversible and irretrievable. Avoidance and minimization measures will be incorporated into the final design of the preferred alternative. Mitigation measures will be employed in an attempt to counter all remaining impacts.

5.0 WHAT PERMITS AND APPROVALS ARE REQUIRED FOR THE PROJECT?

It is anticipated that federal, state, and other local permits/approvals/ concurrence may be required for the proposed action. The following permits/approvals/concurrence will likely be required prior to construction of the proposed action:

- SFEIS Adequacy Determination – MnDOT
- SFEIS Record of Decision – FHWA
- Section 404 Permit – United States Army Corps of Engineers (USACE)
- Section 401 Water Quality Certification – Minnesota Pollution Control Agency (MPCA)
- National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit – MPCA
- Minnesota Wetland Conservation Act (WCA) – MnDOT
- Public Waters Work Permit – Minnesota Department of Natural Resources (MNDNR)
- Orders for crossing drainage ditches from requisite ditch authorities

6.0 WHO RECEIVED COPIES OF THE DRAFT SFEIS?

6.1 FEDERAL AGENCIES

- U.S. Environmental Protection Agency
- U.S. Fish & Wildlife Service
- U.S. Army Corps of Engineers
- Natural Resources Conservation Service/U.S. Department of Agriculture
- U.S. Department of Interior

6.2 STATE AGENCIES/ORGANIZATIONS

- Environmental Quality Board
- Board of Water & Soil Resources
- Minnesota Department of Public Service
- Minnesota Department of Commerce
- Minnesota State Historic Preservation Office
- Minnesota Department of Natural Resources
- Legislative Reference Library
- Minnesota Department of Health
- Minnesota Department of Agriculture
- Minnesota Pollution Control Agency

6.3 LOCAL AGENCIES/ORGANIZATIONS

- City of Bingham Lake
- City of Butterfield
- City of Mountain Lake
- City of St. James
- City of Windom
- Cottonwood County
- Watonwan County
- Cottonwood County Soil and Water Conservation District
- Watonwan County Soil and Water Conservation District
- Butterfield Township
- Lakeside Township
- Midway Township
- Mountain Lake Township
- St. James Township

6.4 OTHER

- Butterfield Library
- Mountain Lake Library
- St. James Library
- Windom Library
- Highway 60 Coalition Group

7.0 PROJECT COORDINATION AND PUBLIC INVOLVEMENT

MnDOT is committed to public involvement at all levels in decision-making related to the Highway 60 Project. MnDOT has engaged area property owners, business owners, residents, and local, county, regional, and state agencies in the development of the project in the past, and this engagement continues as part of the SFEIS process. The public and agency involvement/outreach efforts associated with the SFEIS include the following:

- Public Open House Meetings
- Draft SFEIS Public Hearing
- Agency Coordination Meetings/Workshops
- Project Mailings
- Project Website Updates

7.1 PUBLIC OPEN HOUSES

Since the FEIS was completed in 1984, several coordination meetings have been conducted with each of the affected communities and counties. In July 2008, an open house meeting was held to discuss the ongoing improvements being made to Highway 60 and to listen to public concerns over the remaining two-lane highway sections between St. James and Windom.

On June 14, 2011 an open house was held to provide an update on the project development process and provide information to the public regarding the SFEIS.

During the agency/public comment period for the draft SFEIS document, MnDOT will conduct two public hearings to engage project stakeholders and address their comments, questions, and concerns.

7.2 AGENCY/PUBLIC COORDINATION

MnDOT has regularly involved resource, regulatory agencies, and local units of government in the project development process. Coordination meetings and workshops with the various resource/regulatory agencies and local units of government are anticipated throughout the planning and design phases for the proposed project improvements.

7.3 PROJECT MAILINGS

Informational mailings have been periodically prepared and distributed to affected property owners and business owners in the project area with the intent of providing up-to-date project related information.

7.4 PROJECT WEB PAGE

A project web page has been established at that provides up-to-date information. The site provides an additional means of distributing information such as new project developments, and planning/design changes. The site is located at: http://www.dot.state.mn.us/d7/projects/hwy60stjames/

8.0 PREPARERS

Agency/Organization and Name	Final Environmental Impact Statement Responsibility
Federal Highway Administration	
Phil Forst	Review of SFEIS; Assure Compliance with Federal Regulations
Minnesota Department of Transportation – District 7	
Peter Harff	MnDOT District 7 Project Manager, Review of Final EIS, Special Studies, Technical Memoranda
Shanna Kent	Wetlands
Minnesota Department of Transportation – Central Office	
Jennie Ross	Final EIS review; Assure Compliance with MnDOT Guidance/Procedures
Jason Alcott	Section 7 (Federal Threatened & Endangered Species); Wildlife
David Liverseed	Contaminated Properties
Craig Johnson	Cultural Resources
Ken Graeve	Roadside Vegetation Management Unit
Short Elliott Hendrickson (SEH) Inc.	
Mark Benson	Consultant Project Manager
Bob Rogers	SFEIS Coordination and Preparation
Chris Hiniker	Quality Management
George Calebaugh	Traffic Analysis and Forecasting
Nathan Blanchard	Layouts, Alignment Impact Assessment
Graham Johnson	Noise Analysis and Benefit/Cost Analysis
Steve Hack	GIS: Alignment Impact Assessment, Graphics

Appendix A

Preliminary Layout Sheets of the Build Alternative and West Gap Design Options

LEGEND

- Proposed Centerline Alignments
- Proposed Storm Water Pond
- Proposed Right of Way
- Existing Right of Way
- Existing Railroad Right of Way
- Historic Railroad
- Property Relocation
- Wetland Boundary
- Wetland Impact
- Prairie Remnant Location
- Noise Monitoring & Receptor Sites
- Analyzed Noise Barrier
- CLOSE Access Closure

Potentially Contaminated Properties

- = High Risk
- = Medium Risk
- = Low Risk

WARREN POND

Wetland #29
Type 2
Area = 0.58 acres

2

R1

ANALYZED NOISE WALL 1

MINNESOTA 60

Wetland #30
Type 5
Area = 0.34 acres

1

TO WINDOM

UNION PACIFIC RAILROAD

Wetland #147

WEST TERMINI OF WEST GAP SEGMENT

MATCH LINE-SEE SHEET 2

500TH AVE

DATE: 9/8/2011		200 0 500 scale feet	MINNESOTA DEPARTMENT OF TRANSPORTATION T.H. 60 FROM WINDOM TO ST. JAMES	BUILD ALTERNATIVE	WEST GAP	FIGURE A1

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DESIGN OPTION RIGHT-OF-WAY IMPACTS

"A"	=	BINGHAM LAKE WIDEN NORTH
"B"	=	BINGHAM LAKE WIDEN SOUTH
"C"	=	BINGHAM LAKE BYPASS
"D"	=	CLEAR LAKE FULL
"E"	=	CLEAR LAKE COMPRESSED

500TH AVE

Wetland #28
Type 1
Area = 0.47 acres

500TH AVE.
ALIGNMENT

Wetland #27
Type 1
Area = 0.17 acres
("D") ("E")

CLEAR
LAKE

Wetland #26
Type 5
Area = 0.23 acres
("E")

Wetland #26
Type 5
Area = 1.17 acres
("D")

PROPOSED STORM WATER POND
("D") ("E")

TH60(WB)
ALIGNMENT "D"

R2

ANALYZED
NOISE WALL 2

MINNESOTA
60

PROPOSED STORM WATER POND
("D") ("E")

TH60(EB)
ALIGNMENT "E"

prairie impact
800 feet
("B")

TH60(EB)
ALIGNMENT "B"

TH60(WB)
ALIGNMENT "B"

TH60(WB)
ALIGNMENT
"A" & "C"

COTTONWOOD
44
COUNTY

Wetland #25
Type 5
Area = 0.72 acres
("A") ("C")

R
B1
3

MATCH LINE-SEE SHEET 3

MATCH LINE-SEE SHEET 1

UNION PACIFIC RAILROAD

510TH AVE.
ALIGNMENT

510TH AVE

COTTONWOOD
2
COUNTY

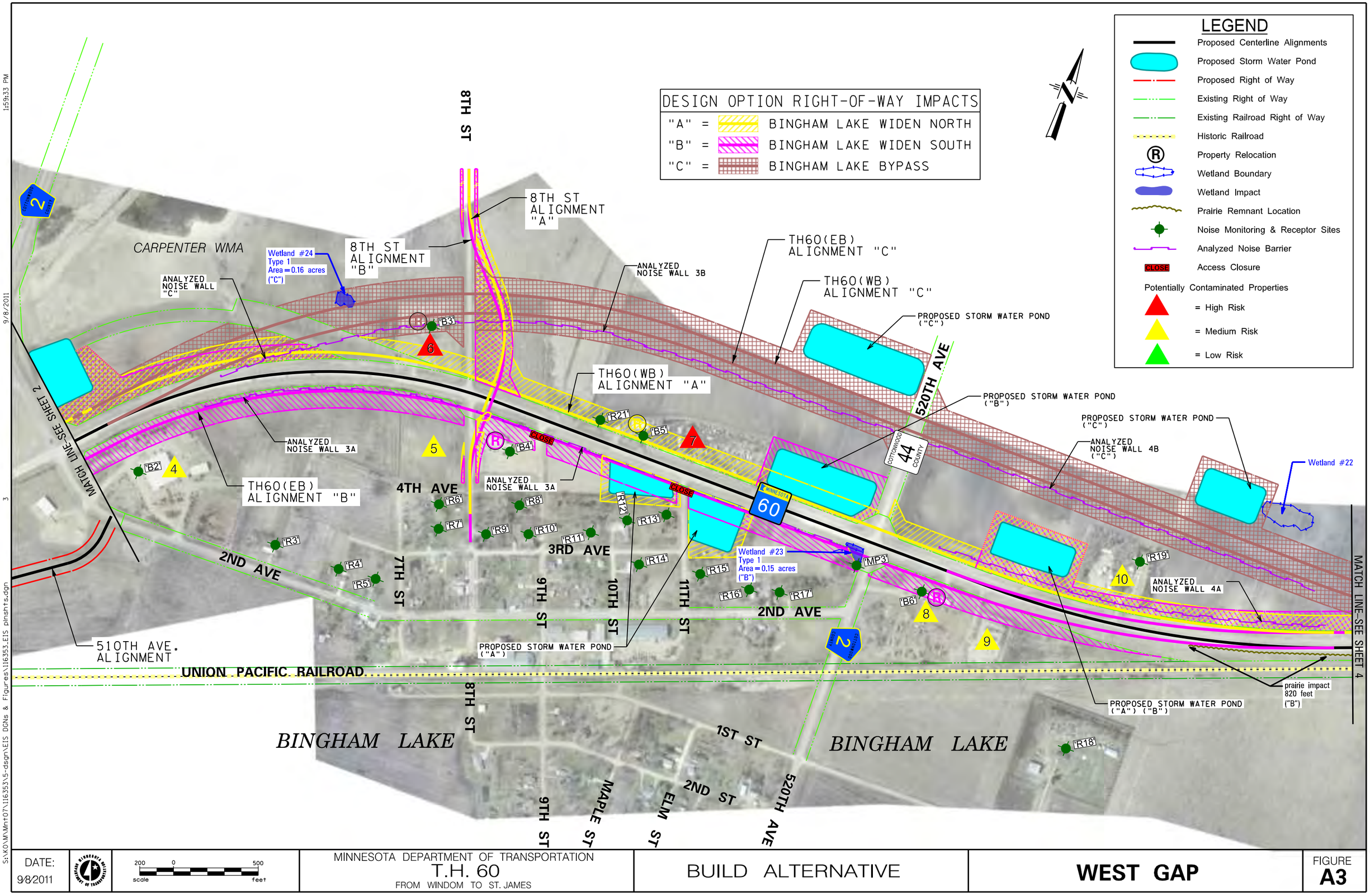
LEGEND

- Proposed Centerline Alignments
- Proposed Storm Water Pond
- Proposed Right of Way
- Existing Right of Way
- Existing Railroad Right of Way
- Historic Railroad
- Property Relocation
- Wetland Boundary
- Wetland Impact
- Prairie Remnant Location
- Noise Monitoring & Receptor Sites
- Analyzed Noise Barrier
- CLOSE Access Closure

Potentially Contaminated Properties

- = High Risk
- = Medium Risk
- = Low Risk

DATE:					
9/8/2011		200 0 500 scale feet	MINNESOTA DEPARTMENT OF TRANSPORTATION T.H. 60 FROM WINDOM TO ST. JAMES	BUILD ALTERNATIVE	**WEST GAP** FIGURE **A2**



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DATE: 9/8/2011	200 0 500 scale feet	MINNESOTA DEPARTMENT OF TRANSPORTATION T.H. 60 FROM WINDOM TO ST. JAMES	BUILD ALTERNATIVE	WEST GAP	FIGURE A3

DESIGN OPTION RIGHT-OF-WAY IMPACTS	
"A" =	BINGHAM LAKE WIDEN NORTH
"B" =	BINGHAM LAKE WIDEN SOUTH
"C" =	BINGHAM LAKE BYPASS

LEGEND

- Proposed Centerline Alignments
- Proposed Storm Water Pond
- Proposed Right of Way
- Existing Right of Way
- Existing Railroad Right of Way
- Historic Railroad
- Property Relocation
- Wetland Boundary
- Wetland Impact
- Prairie Remnant Location
- Noise Monitoring & Receptor Sites
- Analyzed Noise Barrier
- CLOSE — Access Closure

Potentially Contaminated Properties

- = High Risk
- = Medium Risk
- = Low Risk

TH60(EB) ALIGNMENT "C")

TH60(WB) ALIGNMENT "C"

TH60(WB) ALIGNMENT "A" & "B"

COUNTY DITCH NO.2

COUNTY DITCH NO.2

MINNESOTA 60

UNION PACIFIC RAILROAD

MATCH LINE-SEE SHEET 3

MATCH LINE-SEE SHEET 5

46 COUNTY

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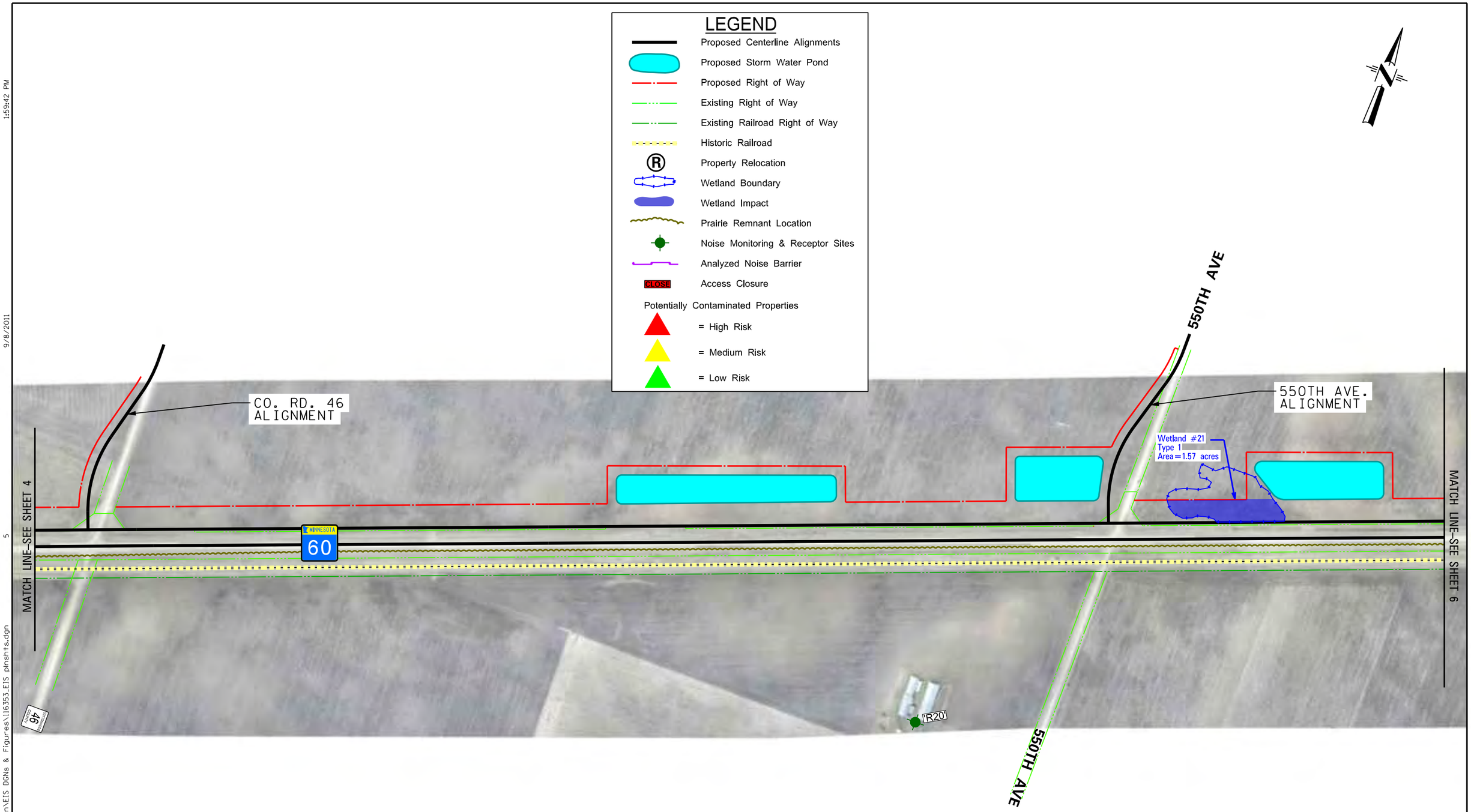
DATE: 9/8/2011	scale 200 0 500 feet	MINNESOTA DEPARTMENT OF TRANSPORTATION T.H. 60 FROM WINDOM TO ST. JAMES	BUILD ALTERNATIVE	**WEST GAP**	FIGURE **A4**



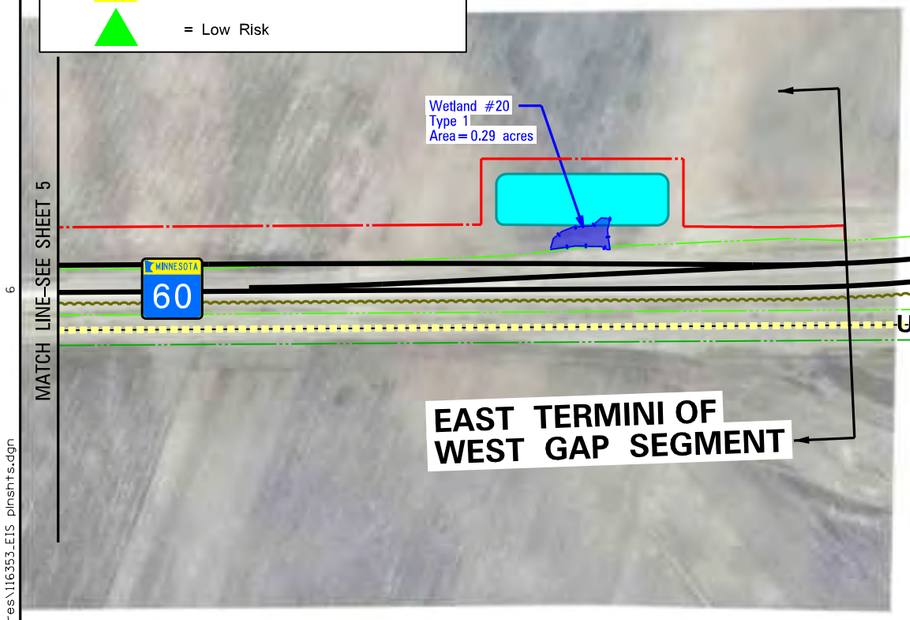
DATE: 9/8/2011		200 0 500 scale feet	MINNESOTA DEPARTMENT OF TRANSPORTATION T.H. 60 FROM WINDOM TO ST. JAMES	BUILD ALTERNATIVE	**WEST GAP**	FIGURE **A5**

LEGEND

- Proposed Centerline Alignments
- Proposed Storm Water Pond
- Proposed Right of Way
- Existing Right of Way
- Existing Railroad Right of Way
- Historic Railroad
- Property Relocation
- Wetland Boundary
- Wetland Impact
- Prairie Remnant Location
- Noise Monitoring & Receptor Sites
- Analyzed Noise Barrier
- CLOSE Access Closure

Potentially Contaminated Properties

- = High Risk
- = Medium Risk
- = Low Risk



MATCH LINE-SEE SHEET 5

11

UNION PACIFIC RAILROAD

CITY OF
MOUNTAIN LAKE

CITY OF
MOUNTAIN LAKE

660TH AVE

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DATE: 9/8/2011		200 0 500 scale feet	MINNESOTA DEPARTMENT OF TRANSPORTATION T.H. 60 FROM WINDOM TO ST. JAMES	BUILD ALTERNATIVE	**WEST GAP**	FIGURE **A6**

LEGEND

- Proposed Centerline Alignments
- Proposed Storm Water Pond
- Proposed Right of Way
- Existing Right of Way
- Existing Railroad Right of Way
- Historic Railroad
- Property Relocation
- Wetland Boundary
- Wetland Impact
- Prairie Remnant Location
- Noise Monitoring & Receptor Sites
- Analyzed Noise Barrier
- Access Closure

Potentially Contaminated Properties

- = High Risk
- = Medium Risk
- = Low Risk

600TH AVE

UNION PACIFIC RAILROAD

Wetland #18

B7

12

MINNESOTA 60

MATCH LINE-SEE SHEET 8

Wetland #19
Type 1
Area = 1.13 acres

WEST TERMINI OF
MIDDLE GAP SEGMENT

600TH AVE

DATE: 9/8/2011	scale 200 0 500 feet	MINNESOTA DEPARTMENT OF TRANSPORTATION T.H. 60 FROM WINDOM TO ST. JAMES	BUILD ALTERNATIVE	**MIDDLE GAP**	FIGURE **A7**

LEGEND

- Proposed Centerline Alignments
- Proposed Storm Water Pond
- Proposed Right of Way
- Existing Right of Way
- Existing Railroad Right of Way
- Historic Railroad
- Property Relocation
- Wetland Boundary
- Wetland Impact
- Prairie Remnant Location
- Noise Monitoring & Receptor Sites
- Analyzed Noise Barrier
- CLOSE Access Closure

Potentially Contaminated Properties

- = High Risk
- = Medium Risk
- = Low Risk

DATE: 9/8/2011

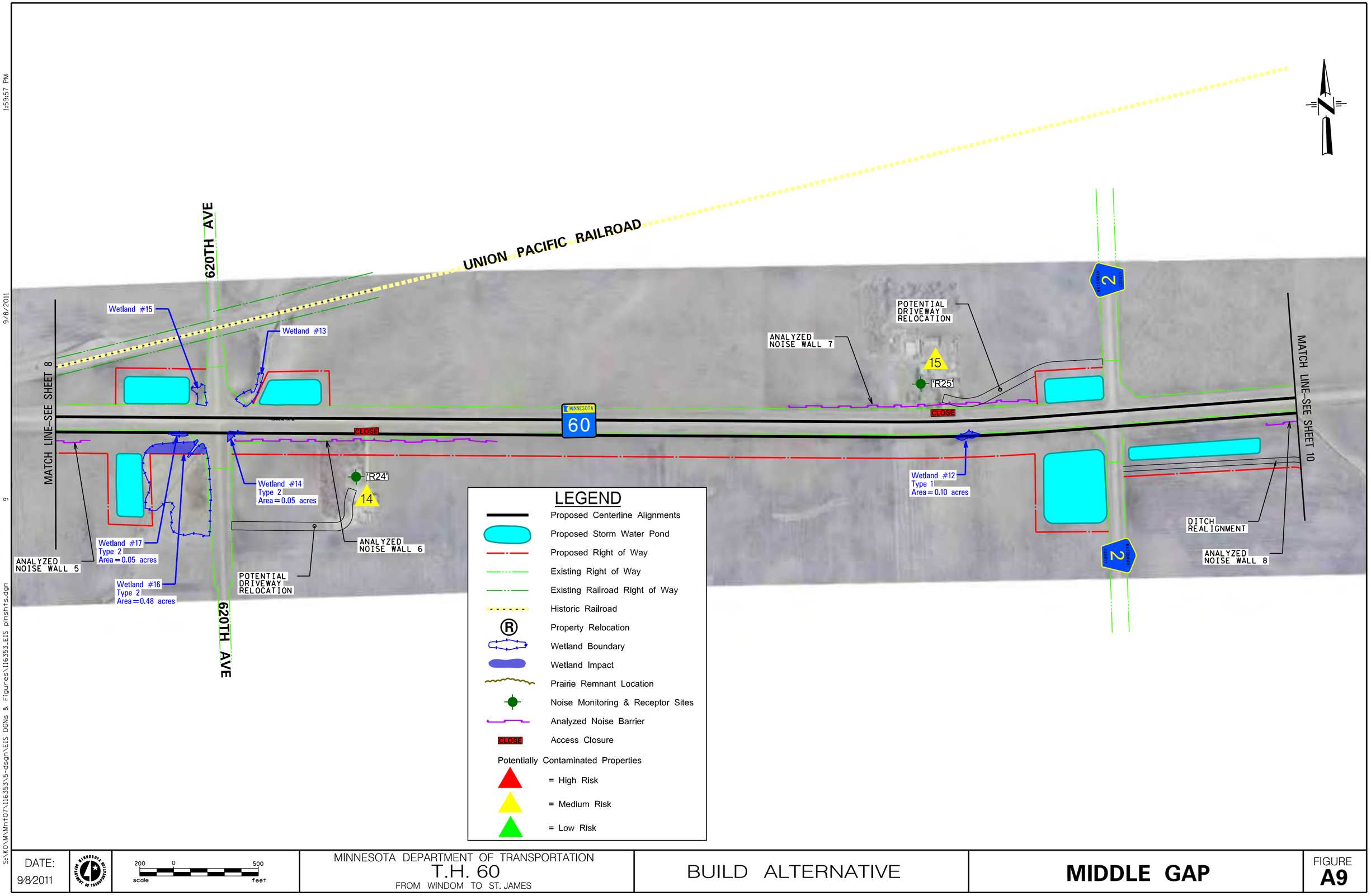
200 0 500
scale feet

MINNESOTA DEPARTMENT OF TRANSPORTATION
T.H. 60
FROM WINDOM TO ST. JAMES

BUILD ALTERNATIVE

MIDDLE GAP

FIGURE **A8**



DATE: 9/8/2011

200 0 500
scale feet

MINNESOTA DEPARTMENT OF TRANSPORTATION
T.H. 60
FROM WINDOM TO ST. JAMES

BUILD ALTERNATIVE

MIDDLE GAP

FIGURE **A9**

LEGEND

- Proposed Centerline Alignments
- Proposed Storm Water Pond
- Proposed Right of Way
- Existing Right of Way
- Existing Railroad Right of Way
- Historic Railroad
- Property Relocation
- Wetland Boundary
- Wetland Impact
- Prairie Remnant Location
- Noise Monitoring & Receptor Sites
- Analyzed Noise Barrier
- CLOSE Access Closure

Potentially Contaminated Properties

- = High Risk
- = Medium Risk
- = Low Risk

UNION PACIFIC RAILROAD

4TH ST S

WEST TERMINI OF EAST GAP SEGMENT

MATCH LINE-SEE SHEET 9

MATCH LINE-SEE SHEET 11

PRAIRIE AVE

Wetland #11

[R39] [R38] [R37] [R33] [R35] [R31] [R29] [R36] [R30] [R32] [R34] [B9] [B8] [B10] [MP2] [R28] [R26] [R27]

16 17

ANALYZED NOISE WALL 11

ANALYZED NOISE WALL 10

ANALYZED NOISE WALL 9

ANALYZED NOISE WALL 8

DITCH REALIGNMENT

EAST TERMINI OF MIDDLE GAP SEGMENT

MINNESOTA 60

WATONWAN COUNTY 2

WATONWAN COUNTY 5

DATE: 9/8/2011	scale 200 0 500 feet	MINNESOTA DEPARTMENT OF TRANSPORTATION T.H. 60 FROM WINDOM TO ST. JAMES	BUILD ALTERNATIVE	MIDDLE GAP / EAST GAP	FIGURE A10

650TH AVE

WATONWAN COUNTY 2

Wetland #9

Wetland #8

Wetland #7

MINNESOTA 60

UNION PACIFIC RAILROAD

EXISTING BRIDGE NO. 83037

ANALYZED NOISE WALL 11

PROPSED BRIDGE NO. 83040

18

Wetland #10
Type 1
Area = 0.17 acres

WATONWAN COUNTY 2

MATCH LINE-SEE SHEET 10

MATCH LINE-SEE SHEET 12

660th AVE

LEGEND

- Proposed Centerline Alignments
- Proposed Storm Water Pond
- Proposed Right of Way
- Existing Right of Way
- Existing Railroad Right of Way
- Historic Railroad
- Property Relocation
- Wetland Boundary
- Wetland Impact
- Prairie Remnant Location
- Noise Monitoring & Receptor Sites
- Analyzed Noise Barrier
- CLOSE Access Closure

Potentially Contaminated Properties

- = High Risk
- = Medium Risk
- = Low Risk

DATE: 9/8/2011

200 0 500
scale feet

MINNESOTA DEPARTMENT OF TRANSPORTATION
T.H. 60
FROM WINDOM TO ST. JAMES

BUILD ALTERNATIVE

EAST GAP

FIGURE **A11**

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660th AVE

361st Lane

'R40'

UNION PACIFIC RAILROAD

Wetland #6

Wetland #5

MINNESOTA 60

MATCH LINE-SEE SHEET 11

'MP1'

CLOSE

'R42'

MATCH LINE-SEE SHEET 13

ANALYZED NOISE WALL 12

'R41'

MINNESOTA 19

670th AVE

POTENTIAL DRIVEWAY RELOCATION

LEGEND

- Proposed Centerline Alignments
- Proposed Storm Water Pond
- Proposed Right of Way
- Existing Right of Way
- Existing Railroad Right of Way
- Historic Railroad
- Property Relocation
- Wetland Boundary
- Wetland Impact
- Prairie Remnant Location
- Noise Monitoring & Receptor Sites
- Analyzed Noise Barrier
- CLOSE Access Closure

Potentially Contaminated Properties

- = High Risk
- = Medium Risk
- = Low Risk

DATE: 9/8/2011

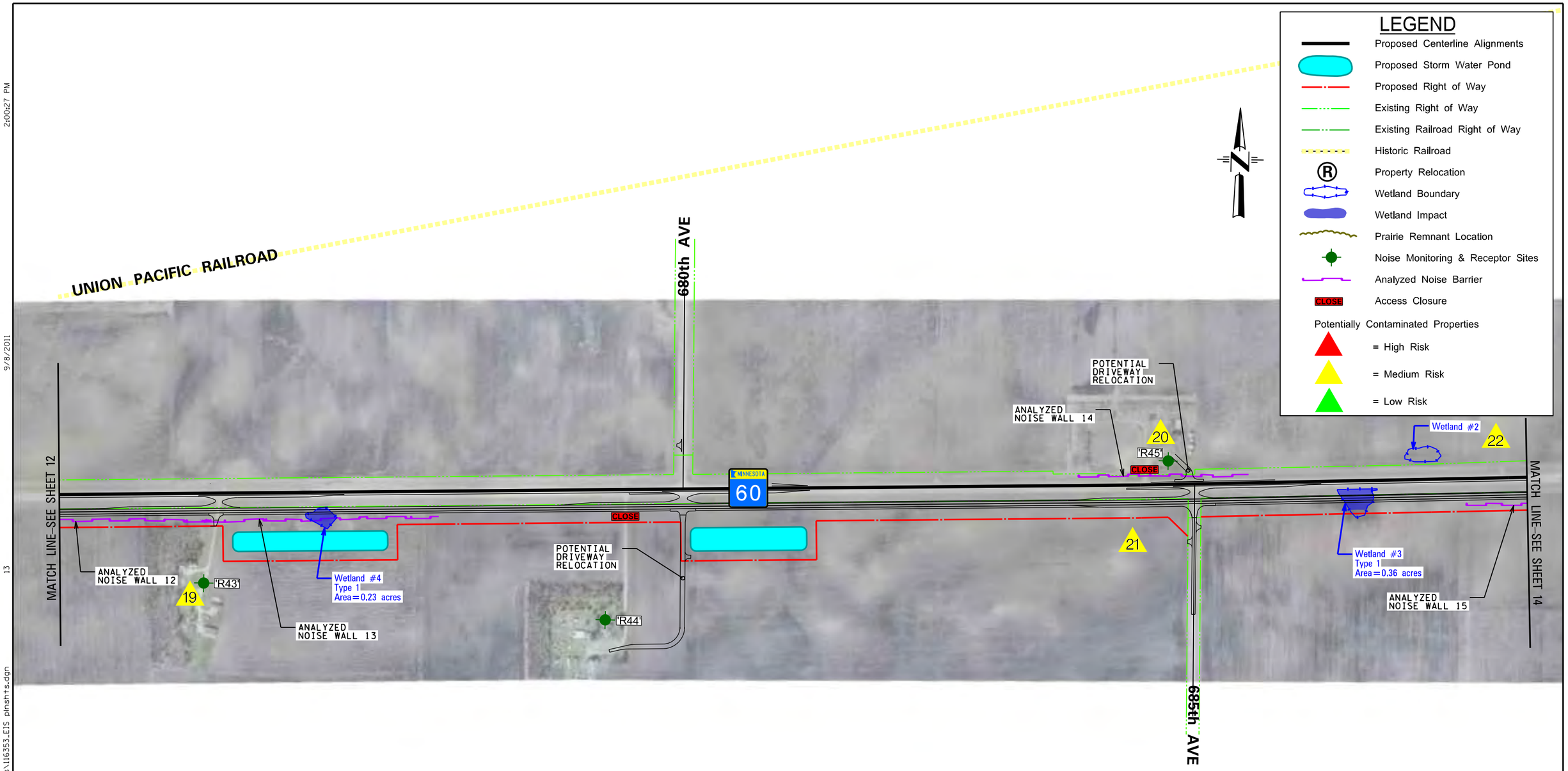
200 0 500
scale feet

MINNESOTA DEPARTMENT OF TRANSPORTATION
T.H. 60
FROM WINDOM TO ST. JAMES

BUILD ALTERNATIVE

EAST GAP

FIGURE **A12**



DATE: 9/8/2011		200 0 500 scale feet	MINNESOTA DEPARTMENT OF TRANSPORTATION T.H. 60 FROM WINDOM TO ST. JAMES	BUILD ALTERNATIVE	EAST GAP	FIGURE A13

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LEGEND

- Proposed Centerline Alignments
- Proposed Storm Water Pond
- Proposed Right of Way
- Existing Right of Way
- Existing Railroad Right of Way
- Historic Railroad
- Property Relocation
- Wetland Boundary
- Wetland Impact
- Prairie Remnant Location
- Noise Monitoring & Receptor Sites
- Analyzed Noise Barrier
- CLOSE — Access Closure

Potentially Contaminated Properties

- = High Risk
- = Medium Risk
- = Low Risk

EAST TERMINI OF
EAST GAP SEGMENT

MATCH LINE-SEE SHEET 13

MINNESOTA 60

CO RD 114

690th AVE

700th AVE

TO ST. JAMES

ANALYZED NOISE WALL 16

ANALYZED NOISE WALL 17

ANALYZED NOISE WALL 15

ANALYZED NOISE WALL 15

ANALYZED NOISE WALL 18

POTENTIAL DRIVEWAY RELOCATION

Wetland #1

CLOSE

24

23

'R47'

'R49'

'R48'

'R46'

'R50'

DATE: 9/8/2011		200 0 500 scale feet	MINNESOTA DEPARTMENT OF TRANSPORTATION T.H. 60 FROM WINDOM TO ST. JAMES	BUILD ALTERNATIVE	EAST GAP	FIGURE A14

Appendix B

MNDNR Early Coordination and Natural Heritage Database Review Letter

MnDOT Federal Section 7 (T&E Species) Review Letter

MnDOT Cultural Resources Unit Determination Letter

SHPO Concurrence Letter

Minnesota Department of Natural Resources

500 Lafayette Road
St. Paul, Minnesota 55155-4010

June 1, 2011
(updated September 14, 2011)

Peter Harff
MnDOT District 7
2151 Bassett Drive
Mankato, MN 56001

RE: Response to MnDOT Early Notification Memo Requesting Information and Early Coordination Regarding TH60 2-lane to 4-lane Gaps (SP1703-69, 1703-70, 8308-44), Cottonwood & Watonwan County

Dear Mr. Harff:

The Minnesota Department of Natural Resources (DNR) has completed review of the information request for three segments of TH60 between Windom and St. James. This project proposes to complete the 4-lanes between the two cities. Our understanding is that this information will be utilized in a supplemental EIS that is being required for this project. We offer the following comments:

1. Several Public Waters are located in the project area. There are both Public Watercourses and basins in the existing TH60 right of way. See the maps attached to the cover email. Should plans develop to include work at or near any of these locations, please contact me as further review may be required. If no work is proposed at Public Waters, adherence to the MPCA Stormwater Program for Construction Activity (General Stormwater Permit for Construction Activity (MNR100001)] will suffice for DNR erosion and sediment concerns.

   UPDATE (9/14/11): On September 12, 2001, DNR personnel met with MnDOT project managers and designers regarding potential impacts to Clear Lake and Warren pond. This meeting was called since other than a 'no-build' determination, the project will impact portions of these Public Waters. Actual designs and impacts are not known, thus this meeting was to discuss the DNR permit approval process and associated potential mitigation measures. The meeting minutes are attached. In short the DNR will consider impacts to these lake(s) as long as suitable mitigation measures are also designed into the project. As the project moves forward, the following mitigation measures should be considered:

   a. Any new shoreline shall be vegetated with native species suitable to the local habitat. Design should also mimic existing conditions such that vegetation may grow to the waters edge. One such design that meets MnDOT design requirements and DNR interests is 'compost grouting' in which any riprap placed along the toe of the slope is filled with soil or compost and seeded. A guidance sheet for this practice may be found on Page 28 of Chapter 1 of the manual "Best Practices for Meeting DNR General Public Waters Work Permit GP 2004-0001". I have also attached this page to the cover email. A pdf version of the entire manual may be found at: http://www.dnr.state.mn.us/waters/watermgmt_section/pwpermits/gp_2004_0001_manual.html

   b. Clear Lake is utilized as a rearing pond by the DNR. Installing a water elevation control structure at the outlet located in the southwestern portion of the lake (the culvert under TH60) would assist the DNR in drawing down the water level for their fishery operations that occur on Clear Lake.

   c. The inlet stream may be able to be routed into new stormwater ponds in order to capturing and treat water flowing into Clear Lake from the agricultural drainage ditch located in the southeastern portion of the lake. Thus improving lake water quality.

   d. Utilize a multi-basin approach to the stormwater ponds, which may allow for infiltration and/or temporary ponding of water in a primary pond area, and a secondary ponding area may connect with the surface area of the lake with open water or marshy/wetland conditions.

   e. Consider improvements to the access at the Northwest corner of the lake. This is not an official DNR Public Access, though is on local road right of way and may have opportunities for improvements.

f. Native vegetation management throughout the project corridor. A native vegetation management plan to protect the existing native vegetation and to establish or enhance areas that are not currently comprised of native vegetation would be considered as a mitigation measure as well. This is already being done in part to preserve the native prairie remnants in the project corridor, though additional efforts would be considered beneficial.

It is not known if any or all of these measures will be designed into the project, but this is the starting point we established for consideration of mitigation measures for impacts to Public Waters that this project may impact.

2. The Minnesota Natural Heritage Information System (NHIS) has been queried to determine if any rare plant or animal species, native plant communities, or other significant natural features are known to occur within an approximate one-mile radius of the project area. Based on this query, the Minnesota County Biological Survey (MCBS) has identified several mesic prairie remnants along TH 60. These are identified as either Sites of Biodiversity or as Railroad ROW prairie remnants (see the cover email for map of locations). Individual state threatened species (Sullivants Milkweed) are known to exist in prairie remnants in Section 25 T106N R33W. I am also aware that MnDOT has mapped the remnants within the TH60 right of way. All of these should be included as the project moves along the environmental processes.

   a. Activities in road rights-of-way can negatively affect adjacent native plant communities, especially through the introduction of exotic plant species. Actions to minimize disturbance to these sites of ecological significance should be taken. We also encourage the expanding of these areas by planting suitable compatible native vegetation in adjacent areas. A standard guidance sheet for the protection of Areas of Environmental Sensitivity is included (Chapter 1page 10) in the manual "Best Practices for Meeting DNR General Public Waters Work Permit GP 2004-0001". I have attached page 1-10 to the cover email. This page may be used in your projects documents. A pdf version of the entire manual may be found at:
   http://www.dnr.state.mn.us/waters/watermgmt_section/pwpermits/gp_2004_0001_manual.html

      In summary, page 1-10 states; 1) Locate field offices, store equipment and supplies at least 25 feet away from the identified sensitive area in accordance with Mn/DOT spec 2572.3, and 2) Label identified "Area of Environmental Sensitivity" on all plans. In addition, should grading outside the PI (Point of Intersect) be proposed; 3) Walk the perimeter of the sensitive area with the grading foreman so that all personnel understand and agree on the edge of the area. 4) Redundant Best Management practices may be required for protection of the area, and 5) Revegetate disturbed areas with native species suitable to the local habitat. In addition, precautions should be taken to ensure that borrow and disposal areas are not located within native plant communities, and that, if adjacent to native plant communities, the above actions are taken to minimize disturbance. These protection measures are very similar to MnDOT's Standard Specifications for Construction #2572.

   The Natural Heritage Information System (NHIS) is not an exhaustive inventory and thus does not represent all of the occurrences of rare features within the state. If information becomes available indicating additional listed species or other rare features, further review may be necessary.

3. Carpenter Wildlife Management Area (WMA) is located on the west side of the City of Bingham Lake.

4. Local Grant-in-Aid snowmobile trails utilize the right of way at various locations. Design of the project should not preclude its continued use.

5. Invasive species are known to exist in the project area.

   a. Bingham Lake and Mountain Lake have Curly Pondweed. While these lakes are not close enough to the project to be directly impacted, they are close enough for temporary water appropriations by contractors. A Prohibited Invasive Species Permit may be required for use of water from these lakes. It is preferred that water from these two lakes not be utilized for this project (dust control, etc).
   b. Purple loosestrife is known to exist in the TH60 road ditch east of the City of Mountain Lake. Suitable precautions should be taken to prevent its spread.

6. Maps attached to the cover email for this letter show approximate locations of the above items (MCBS sites, Public Waters, Trails, WMA lands, invasive species). For exact locations, either contact me or download GIS shapefiles from the DNR's Data Deli website at http://deli.dnr.state.mn.us/.

If you have questions regarding this letter, please e-mail me at peter.leete@state.mn.us or call at (651) 366-3634.

On behalf of the DNR, Sincerely,

Peter Leete
Transportation Hydrologist
DNR Ecological & Water Resources

Office location:
MnDOT Office of Environmental Stewardship
395 John Ireland Blvd., mail stop 620, St. Paul, MN 55155

C: ERDB file 20100713

"Harff, Peter (DOT)" <peter.harff@state.mn.us>
04/12/2011 03:14 PM

To "Bob Rogers (brogers@sehinc.com)" <brogers@sehinc.com>, Mark Benson <mbenson@sehinc.com>
cc
bcc
Subject FW: S.P. 1703-69, 1703-70. 8308-44- ESA (Section 7) - Determination of No Effect

History: This message has been forwarded.

From: Alcott, Jason (DOT)
Sent: Tuesday, April 12, 2011 2:57 PM
To: Harff, Peter (DOT)
Cc: Ross, Jennie (DOT)
Subject: S.P. 1703-69, 1703-70. 8308-44- ESA (Section 7) - Determination of No Effect

Endangered Species Act of 1973, as amended – Section 7 - Determination of No Effect
S.P. 1703-69, 1703-70, 8308-44, Trunk Highway 60
Roadway Expansion (2-4 Lanes)
Cottonwood and Watonwan Counties

In response to your request, the proposed action has been reviewed for potential effects to federally-listed threatened, endangered, proposed, candidate species and listed critical habitat. As a result of this review, a determination of **no effect** has been made.

Section 7 of Endangered Species Act of 1973, as amended, requires each Federal agency to review any action that it funds, authorizes or carries out to determine whether it may affect threatened, endangered, proposed species or listed critical habitat. Federal agencies, or their designated non-federal representatives (FHWA has delegated Mn/DOT) as their non-federal representative) must consult with the Service if any such effects may occur as a result of their actions. Consultation with the Service is not necessary if the proposed action will not directly or indirectly affect listed species or critical habitat. If a federal agency finds that an action will have no effect on listed species or critical habitat, it should maintain a written record of that finding that includes the supporting rationale.

Based on the information you have provided, it has been determined that no further action under Section 7 of the Act is required. However, if information becomes available indicating that federally-listed species or designated critical habitat may be affected, please contact this office and consultation with the Service will be initiated, if necessary.

Jason Alcott
Minnesota Department of Transportation
Office of Environmental Services
Mail Stop 620
395 John Ireland Boulevard
St. Paul, MN 55155-1899
Phone: 651-366-3605
Email: jason.alcott@state.mn.us

Minnesota Department of Transportation

395 John Ireland Boulevard
Saint Paul, Minnesota 55155-1899

June 29, 2011

Dr. Mary Ann Heidemann
State Historic Preservation Office
Minnesota Historical Society
345 Kellogg Blvd. W.
St. Paul, MN 55101-1906

Regarding: S.P. 8308-44 (TH 60, Cottonwood & Watonwan counties)
Addition of two new lanes in three separate segments

Dear Dr. Heidemann:

We have reviewed the above-referenced undertaking pursuant to our FHWA-delegated responsibilities for compliance with Section 106 of the National Historic Preservation Act, as amended (36 CFR 800), and as per the terms of the Programmatic Agreement (PA) between the FHWA and the Minnesota State Historic Preservation Office (SHPO) (June 2005).

The project consists of adding two eastbound lanes adjacent to and south of the existing two lane road. When completed, the existing road will become the two westbound lanes. The two lanes will be added at three locations from Windom to Mountain Lake (about 7.5 miles), Mountain Lake to Butterfield (about 4 miles), and Butterfield to St. James (about 7.3 miles). There are currently four lane sections already built to bypass Mountain Lake and Butterfield.

Two (2) copies of a cultural resources report for this project, entitled *Phase I and II Cultural Resources Investigations for the Trunk Highway 60 Project, Cottonwood and Watonwan Counties, Minnesota* by Summit Envirosolutions (2011) are enclosed for your review. The archaeological survey focused on farmstead archaeology since the current area of potential effect (APE) was surveyed in 1981 by the Minnesota Trunk Highway Archaeological Reconnaissance Survey, with negative results. The Summit survey did not locate any archaeological sites that are potentially eligible and therefore requiring evaluation. If the project changes and is expanded into portions of Farmstead A/G, then additional archaeological work will be required.

The architectural survey and evaluation identified a segment of the St. Paul and Sioux City Railroad (now Union Pacific Railway) as eligible for listing in the National Register of Historic Places as a railroad corridor historic district. This railroad largely parallels TH 60, either on the north or south side of the existing road. Current plans (enclosed) do not require the railroad to be realigned or any new crossings by the additional TH 60 lanes, although there will be four county and township roads that do cross the railroad which may require installation of crossing gates (CSAH 2), stop signs (TR 42, TR 151), or an upgrade of existing flashing lights/gates (CSAH 8). We feel that the addition of these crossing controls and the two additional TH 60 lanes will not adversely affect the St. Paul and Sioux City Railroad.

If you have any questions regarding this part of the project, please contact me at (651) 366-3614.

Sincerely,

Craig Johnson
Archaeologist
Cultural Resource Unit

cc: Joe Hudak, MnDOT CRU
Mn/DOT CRU Files
Peter Harff, MnDOT D. 7

Minnesota
Historical Society

STATE HISTORIC PRESERVATION OFFICE

July 28, 2011

Craig Johnson
MnDOT Cultural Resources Unit
Transportation Building, MS620
395 John Ireland Boulevard
St. Paul, MN 55155-1899

RE: SP 8308-44, add two eastbound lanes to Trunk Hwy. 60
Cottonwood and Watonwan Counties
SHPO Number: 2011-2784

Dear Mr. Johnson:

Thank you for the opportunity to review and comment on the above-referenced project. It has been reviewed per the responsibilities given the State Historic Preservation Officer by the National Historic Preservation Act of 1966 and the Procedures of the Advisory Council on Historic Preservation (36CFR800), and to the responsibilities given the Minnesota Historical Society by the MN Historic Sites Act and the Field Archaeology Act.

We concur in your determination of the Area of Potential Effect for this project. We also concur with your determination that the St. Paul and Sioux City Railroad segment surveyed for the project is eligible for listing in the National Register of Historic Places, and that the other properties surveyed are not eligible. Finally, we concur that the project will have **no adverse effect** on the St. Paul and Sioux City Railroad.

We have reviewed the survey report and inventory forms prepared for the project. Overall, the work seems well researched and presented. However, one aspect of the inventory forms troubled me. In the "Recommendations" section of the form, virtually every form repeated the same pat phrase, saying that the property was not recommended as Register eligible "due to poor integrity;" with little or no reference made to the National Register criteria. The "poor integrity" phrase was used even when the significance statement explained a different reason for non-eligibility, or where the photo indicated fair to good integrity, or where no access was permitted and buildings could not even be inspected. Overuse of this pat phrase undermined the credibility of what was otherwise a sound research product.

In the future, we would request that the "integrity" reference be made more carefully, additional discussion provided in the inventory form to support any integrity statement, and more reference made (as applicable) to National Register criteria.

Feel free to call me at (651) 259-3456 if you have any questions regarding our review of this project.

Sincerely,

Mary Ann Heidemann, Manager
Government Programs and Compliance

cc: Summit Envirosolutions

Appendix C

NRCS – Farmland Impact Rating Form CPA 106

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
339 9th Street
Windom, MN 56101-1639

Phone: (507) 831-1153 ext 3
FAX: (507) 831-2928

August 15, 2011

Robert Rogers, AICP, Senior Planner
SEH, Inc.
3535 Vadnais Center Drive
St. Paul, MN 55110-5196

Dear Mr. Rogers:

I received your request to provide information on the project on HWY 60 that is currently being discussed in Cottonwood County. I completed the form for inclusion in the Supplemental Final (SFEIS) Form CPA 106.

If you have any questions please let me know. I can be reached at the above information.

Sincerely,

Kelly A. Heather
District Conservationist

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request 5/20/11	4. Sheet 1 of 1
1. Name of Project **Highway 60 Gaps**	5. Federal Agency Involved **Federal Highway Administration**	
2. Type of Project **Transportation Corridor Imporvements**	6. County and State **Cottonwood & Watonwan Counties, MN**	

PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS	2. Person Completing Form
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☑ NO ☐		4. Acres Irrigated / Average Farm Size
5. Major Crop(s)	6. Farmable Land in Government Jurisdiction Acres: %	7. Amount of Farmland As Defined in FPPA Acres: %
8. Name Of Land Evaluation System Used	9. Name of Local Site Assessment System	10. Date Land Evaluation Returned by NRCS

PART III *(To be completed by Federal Agency)*	Alternative Corridor For Segment ____ Corridor A	Corridor B	Corridor C	Corridor D
A. Total Acres To Be Converted Directly	379.34 - 323.13 ac.			
B. Total Acres To Be Converted Indirectly, Or To Receive Services	—	923.13		
C. Total Acres In Corridor Exist right-of-way = 600 ac.	979.34 -	0	0	0
PART IV *(To be completed by NRCS) Land Evaluation Information*				
A. Total Acres Prime And Unique Farmland	352.17 - 295.18 ac.			
B. Total Acres Statewide And Local Important Farmland	11.74 - 8.84 ac.			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value				
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*				
PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))* — Maximum Points				
1. Area in Nonurban Use — 15	14			
2. Perimeter in Nonurban Use — 10	9			
3. Percent Of Corridor Being Farmed — 20	18			
4. Protection Provided By State And Local Government — 20	4			
5. Size of Present Farm Unit Compared To Average — 10	7			
6. Creation Of Nonfarmable Farmland — 25	2			
7. Availablility Of Farm Support Services — 5	5			
8. On-Farm Investments — 20	10			
9. Effects Of Conversion On Farm Support Services — 25	8			
10. Compatibility With Existing Agricultural Use — 10	2			
TOTAL CORRIDOR ASSESSMENT POINTS — 160	079	0	0	0
PART VII *(To be completed by Federal Agency)*				
Relative Value Of Farmland (From Part V) — 100				
Total Corridor Assessment (From Part VI above or a local site assessment) — 160	079	0	0	0
TOTAL POINTS *(Total of above 2 lines)* — 260	0	0	0	0

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used?
The design options in the West Gap will be selected following the SEIS	379.34 - 323.13 ac.		YES ☐ NO ☒

5. Reason For Selection:

Signature of Person Completing this Part: — DATE 5/20/11

NOTE: Complete a form for each segment with more than one Alternate Corridor

East Gap

FrmlndCls		SUM_ACRES
All areas are prime farmland		35.78
Not prime farmland		8.63
Prime farmland if drained		59.34
	TOTAL	**103.76**

Middle Gap

FrmlndCls		SUM_ACRES
All areas are prime farmland		37.12
Farmland of statewide importance		0.92
Not prime farmland		3.12
Prime farmland if drained		40.65
Prime farmland if protected from flooding or not frequently flooded during the growing season		8.54
	TOTAL	**90.36**

West Gap

FrmlndCls		SUM_ACRES
All areas are prime farmland		28.90
Farmland of statewide importance		3.23
Not prime farmland		5.07
Prime farmland if drained		47.20
	TOTAL	**84.41**

West Gap Bingham Lake 90 North

FrmlndCls		SUM_ACRES
All areas are prime farmland		15.29
Farmland of statewide importance		2.11
Not prime farmland		0.56
Prime farmland if drained		18.14
	TOTAL	**36.10**

West Gap Bingham Lake 90 South

FrmlndCls		SUM_ACRES
All areas are prime farmland		17.54
Farmland of statewide importance		1.98
Not prime farmland		0.50
Prime farmland if drained		18.20
	TOTAL	**38.21**

West Gap Bingham Lake Bypass

FrmlndCls		SUM_ACRES
All areas are prime farmland		32.41
Farmland of statewide importance		2.71
Not prime farmland		0.99
Prime farmland if drained		26.49
	TOTAL	**62.60**

West Gap Clear Lake Compressed

FrmlndCls		SUM_ACRES
All areas are prime farmland		1.74
Farmland of statewide importance		4.28
Not prime farmland		0.01
Prime farmland if drained		1.68
Prime farmland if protected from flooding or not frequently flooded during the growing season		0.80
	TOTAL	**8.50**

West Gap Clear Lake Full

FrmlndCls		SUM_ACRES
All areas are prime farmland		1.83
Farmland of statewide importance		5.48
Not prime farmland		0.26
Prime farmland if drained		2.08
Prime farmland if protected from flooding or not frequently flooded during the growing season		0.99
	TOTAL	**10.64**