US Highway 53 Virginia to Eveleth

STATE PROJECT SP 6918-80

DRAFT ENVIRONMENTAL IMPACT STATEMENT

DECEMBER 2014

U.S. Department of Transportation
Federal Highway Administration

MINNESOTA DEPARTMENT OF TRANSPORTATION

US 53
From 2nd Avenue West in Virginia
To Cuyuna Drive
St. Louis County, Minnesota

Minnesota State Project Number SP 6918-80

DRAFT ENVIRONMENTAL IMPACT STATEMENT

Submitted Pursuant to 42 U.S.C. 4332 (2)(c), 49 U.S.C. 303,
and Minnesota Statutes, Chapter 116D

Submitted by:
U.S. Department of Transportation, Federal Highway Administration (Lead Federal Agency)
and Minnesota Department of Transportation

COOPERATING AGENCIES
US Army Corps of Engineers
US Environmental Protection Agency

This Draft Environmental Impact Statement (EIS) describes and evaluates alternatives associated with the pending termination of easement rights on which a segment of US 53 is located. The project is located in St. Louis County.

It is the intent of the Federal Highway Administration (FHWA) to issue a single document that consists of the Final EIS and Record of Decision pursuant to Pub. L. 112-141, 126 Stat. 405, Section 1319(b) unless it is determined that statutory criteria or practicability considerations preclude issuance of such a combined document.

REVIEWED AND RECOMMENDED:

12-5-2014
Date

Duane R. Hill
Duane R. Hill, PE
Transportation District Engineer

APPROVED:

12-8-2014
Date

Lynn Clarkowski, PE
MnDOT Chief Environmental Officer

12-8-2014
Date

Brenda L. Red Wing
Acting Division Administrator - Brenda L. Red Wing
Federal Highway Administration

The following persons may be contacted for more information regarding this document:

Phil Forst, Environmental Specialist
Federal Highway Administration
380 Jackson Street, Suite 500
St. Paul, MN 55101
(651) 291-6110
Phil.Forst@dot.gov

Pat Huston, Project Manager
MnDOT District 1
1123 Mesaba Avenue
Duluth, MN 55811
(218) 725-2707
Patrick.Huston@state.mn.us

Comments concerning this Draft EIS should be addressed to Pat Huston (address above). Project information can also be found on the project website:
http://www.dot.state.mn.us/d1/projects/hwy53relocation/.

Abstract

This Draft Environmental Impact Statement (Draft EIS) describes the transportation and environmental impacts associated with the termination of easement rights for a one and a half mile segment of the US 53 corridor where it crosses the United Taconite open-pit mine between Virginia and Eveleth, Minnesota. On May 5, 2010, United Taconite (UTAC) and RGGS provided notice to the Minnesota Department of Transportation (MnDOT) that the 1960 easement rights would be terminated. Under the original easement terms, MnDOT must vacate the US 53 easement within three years of notification. In response to the notice, MnDOT requested a seven-year timeframe for relocation of US 53. The two parties have signed an agreement to modify the easement vacation date to May 2017. MnDOT is conducting this project process to make decisions on how to best address the pending termination of easement rights.

The project is located within the Mesabi Range of the "Iron Range" of northeastern Minnesota and is set in the middle of the Quad Cities area, which includes the cities of Eveleth, Gilbert, Mountain Iron, and Virginia. This segment of US 53 is an important local and interregional transportation connection. The land use characteristics within the project area consist of large mining operations, forested land, wetlands, open space, residential areas, and commercial developments.

Five potential alignments are evaluated in this Draft EIS: No Build Alternative, Existing US 53 Alternative, Alternative M-1, Alternative E-1A, and Alternative E-2. All potentially significant environmental, social, economic, and transportation benefits and impacts of the proposed alternatives are evaluated in the Draft EIS. Documentation regarding Section 4(f) recreational resource impacts is also included.

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List of Acronyms

AADT	Annual Average Daily Traffic
AEOA	Arrowhead Economic Opportunity Agency
APE	Area of Potential Effect
ASDD	Amended Scoping Decision Document
ASTM	American Society for Testing and Materials
ATVs	All-Terrain Vehicles
BMPs	Best Management Practices
BWSR	Minnesota Board of Water and Soil Resources
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CN	Canadian National Railway
CWA	Clean Water Act
dB	Decibels
dBA	A-weighted decibels
DNR	Minnesota Department of Natural Resources
Draft EIS	Draft Environmental Impact Statement
DOT	Department of Transportation
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ESA	Environmental Site Assessment
Final EIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
GHG	Greenhouse Gases
GPM	Gallons Per Minute
HPC	High Priority Corridor
HPDP	Highway Project Development Process
IRC	Inter-regional Corridor
IRRRB	Iron Range Resources and Rehabilitation Board
ISD	Independent School District
kW	kilowatt
LAWCON	Land and Water Conservation Fund Act
LGU	Local Governmental Unit
LOS	Level of Service
LRTPP	Long Range Transportation Policy Plans
LVP	Laurentian Vision Partnership
MDH	Minnesota Department of Health
mg/l	milligrams per liter
MGD	Million Gallons per Day
MN	Minnesota
MnDOT	Minnesota Department of Transportation
MnDOT CRU	Minnesota Department of Transportation Cultural Resources Unit
MnDOT OES	Minnesota Department of Transportation Office of Environmental Stewardship
MPCA	Minnesota Pollution Control Agency
mph	miles per hour
MSATs	Mobile Source Air Toxics
msl	mean sea level
N/A	Not Applicable
NAAQS	National Ambient Air Quality Standards
NAC	Noise Area Classification
NATA	National Air Toxics Assessment
NB	North Bound
NEPA	National Environmental Policy Act
NHIS	Natural Heritage Information System
NHS	National Highway System
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
ORVs	Off-Road Vehicles
OVHRA	Off-Highway Vehicle Recreation Area
PAC	Project Advisory Committee
PM	Particulate Matter
PM2.5	Particulate matter with a diameter of 2.5 micrometers or less

PM10	Particulate matter with a diameter of 10 micrometers or less
psi	pounds per square inch
PWI	Public Water Inventory
RAP	Response Action Plan
RGGS	RGGS Land and Minerals Co.
ROD	Record of Decision
ROW	Right-of-Way
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SB	South Bound
SDD	Scoping Decision Document
SDWA	Safe Drinking Water Act
SEE	Social, Economic, and Environmental
SHPO	State Historical Preservation Office
SIP	State Implementation Plan
SLLCRRA	St. Louis and Lake Counties Regional Rail Authority
SWPPP	Storm Water Pollution Prevention Plan
TCM	Transportation Control Measures
TIP	Transportation Improvement Program
TMDL	Total Maximum Daily Load
USACE	US Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USEPA	US Environmental Protection Agency
USFWS	United States Fish & Wildlife Service
USGS	United States Geological Survey
UTAC	United Taconite
VIC	Voluntary Petroleum Investigation and Cleanup
VMT	Vehicle Miles Traveled
vpd	vehicles per day
VPU	Virginia Department of Public Utilities
WCA	Wetland Conservation Act

Executive Summary

ES.1 Project Background

Since May 1960, the Minnesota Department of Transportation (MnDOT) has operated a segment of US 53 on an easement granted by United States Steel Corporation (now RGGS Land and Minerals Co., or RGGS). This roughly one and a half-mile segment of US 53, from approximately 2nd Avenue West to Cuyuna Drive in Virginia, Minnesota, is subject to iron ore mining rights held by RGGS and Cliffs Natural Resources (United Taconite Division, herein referred to as UTAC), the mine's owner and operator, respectively. At its east end, the US 53 easement segment connects with Minnesota Trunk Highway 135 (MN 135), which provides the inter-regional link toward Gilbert and other communities to the east. Under the 1960 easement terms, MnDOT agreed to relocate US 53 upon notice from the mine owner/operator.

On May 5, 2010, UTAC[1] and RGGS provided notice to MnDOT that the 1960 easement rights would be terminated (see copies of the 1960 easement and the letter of termination in Appendix A). Under the original easement terms, MnDOT must vacate the US 53 easement within three years of notification. In response to the notice, MnDOT requested a seven-year timeframe for relocation of US 53. The two parties have signed an agreement to modify the easement vacation date to May 2017.

MnDOT is conducting this project development and environmental review process to make decisions on how to best address the pending termination of easement rights. Accordingly, the approximate project termini are on US 53 at 2nd Avenue West and Cuyuna Drive.

ES.2 Document Purpose

The Federal Highway Administration (FHWA) and MnDOT are the joint lead agencies for environmental review for this project. MnDOT is the state Responsible Governmental Unit (RGU) for the proposed project and is required to comply with the requirements of the Minnesota Environmental Policy Act (MEPA) (Minnesota Statutes, sections 116D.04 and 116D.045). The project will also use federal funding from FHWA, and, as a result, FHWA is required to undertake environmental review in compliance with the National Environmental Policy Act (NEPA). FHWA and MnDOT have prepared this Draft Environmental Impact Statement (EIS) to satisfy both MEPA and NEPA.

The intent of the NEPA and MEPA processes is to ensure that potential environmental impacts are identified and considered in the decision-making process. Prior to the preparation of the Draft EIS, a Scoping process was used to obtain stakeholder input and assess a range of alternatives and potential environmental impacts. This information was used to inform decisions on the range of alternatives and level of detail for analysis of significant issues in the EIS, consistent with federal (23 CFR 771.123(b) and 40CFR 1501.7) and state (Minnesota Rules, part 4410.2100) Scoping requirements. Chapter 2: Alternatives and Section 8.1.1 of the Draft EIS describe the activities and findings of the Scoping process in greater detail.

The primary purpose of the Draft EIS is to assist decision-makers in the assessment of impacts associated with the proposed project. The Draft EIS documents the Purpose and Need for the project; describes the alternatives under consideration; addresses the anticipated social, economic, and environmental impacts of the alternatives being considered for this project; defines appropriate mitigation measures; and identifies a preferred alternative. The Final EIS will summarize the public involvement during the Draft EIS process; respond to substantive comments received on the Draft EIS; and, if necessary, provide additional details on the environmental impacts of the preferred alternative and describe mitigation measures.

[1] United Taconite (UTAC) is a division of Cliffs Natural Resources, Inc. UTAC leases the property from the land and mineral owner, RGGS Land and Minerals Co. For brevity, most references in this document will refer simply to "UTAC."

ES.3 Project Purpose and Need

The need for undertaking this project is derived from the following transportation system needs:

- Respond to the roadway easement terms; address the requirements set forth in agreements between the State of Minnesota and the land owner
- Provide a facility that meets regional and inter-regional system connectivity needs and inter-regional highway corridor performance targets
- Maintain local connectivity to the regional system and maintain efficiency of local connections
- Provide a facility that serves current and future capacity needs, while maintaining system mobility and safety

ES.4 Alternatives

ES.4.1 Alternatives Considered and Dismissed During the Scoping Process

MnDOT initiated Scoping of alternatives in 2011. A range of project alternatives was developed based on several data sources and stakeholder feedback, including the project Purpose and Need (see Chapter 1: Purpose and Need), previous MnDOT and UTAC design concepts, and consideration of applicable technical data.

The February 2012 Scoping Document/Draft Scoping Decision Document (SDD) and September 2012 Final SDD documents describe the process of developing and evaluating the Scoping alternatives in detail. The evaluation process included consideration of issues such as how well each alternative met the Purpose and Need; potential for social, economic, and/or environmental impacts; relative estimated costs; and potential engineering feasibility issues. Stakeholder input was also an important factor in the evaluation process.

After the SDD was distributed in September 2012, more detailed study of the Draft EIS alternatives and their potential impacts was performed. The initial findings regarding the cost and feasibility of some of the Build Alternatives led MnDOT to 1) reconsider some Scoping alternative alignments (i.e., Alternatives W-1 and E-1) that had been dismissed from further consideration during the 2012 Scoping process and 2) assess whether minor alignment modifications to some alternatives (i.e., Alternative E-2) would make them more feasible/cost-effective. In order to add or amend alternatives to be studied in the Draft EIS, an Amended Scoping Decision Document had to be prepared (Minnesota Rules, part 4410.2100, subpart 8). The September 2013 Amended Scoping Decision Document (ASDD) and the Alternatives Development Report (Kimley-Horn, 2014) provide details of the Scoping reassessment and the resulting decisions regarding alternatives that would be carried forward for study in the Draft EIS. The amended Scoping process alternatives and the amended Scoping decisions regarding alternatives to be carried forward for study in the Draft EIS are summarized in Section 2.2.2 of the Draft EIS and include five alternatives:

- No Build Alternative (Existing Easement Agreement Area Closed)
- Existing US 53 Alternative (Existing Easement Agreement Area Remains Open)
- Alternative M-1
- Alternative E-1A
- Alternative E-2

As the Draft EIS analysis continued, design details were refined as new information was obtained and decisions were made regarding construction options. These design assumptions and decisions are documented in the Alternatives Development Report (Kimley-Horn, 2014) which is included in Appendix K of the Draft EIS.

Agencies and key stakeholders continued to be engaged during the preparation of the Draft EIS in the development of information for the evaluation of impacts and mitigation.

The following section provides a detailed description of each alternative evaluated in this Draft EIS. All alternatives that have been carried forward for further study are shown on Figure 2.3-1.

ES.4.2 Alternatives Studied in the Draft EIS

ES.4.2.1 No Build Alternative (Easement Agreement Area Closed)

The No Build Alternative would respond to the easement terms by closing the segment of US 53 within the existing easement agreement area, resulting in traffic being rerouted to existing highways. Signage would be used to officially mark the rerouting of US 53, which would follow existing MN 37, Co. 7, and US 169 (see Figure 2.1-3). No transportation systems management (TSM) elements (i.e., maintenance or operation improvements) are included in this alternative in order to represent a true No Build Alternative and because TSM improvements on the existing roadways would not provide the needed traffic capacity given the closure of the existing easement agreement area.

The following existing roadways would be designated as the official reroute of US 53 in their current condition:

- The south interchange of MN 37 and existing US 53 would remain in place, marking the location where northbound traffic would depart from existing US 53 to the newly signed route (existing MN 37)
- The four-mile segment of existing MN 37 to be used as US 53 is a two-lane highway with left and right turn lanes located at the intersection with Co. 7. Existing at-grade railroad crossings in this corridor would remain at-grade.
- Northbound US 53 traffic would make a right turn from MN 37 to Co. 7, a two-lane highway, traveling 8.75 miles before making a right turn at the signalized intersection with US 169. Existing at-grade railroad crossings in this corridor would remain at-grade.
- Less than a half-mile segment (0.4 miles) of four-lane US 169 would be used to the east to make the connection back to existing US 53 at the US 169 interchange

MN 135 is currently routed from Gilbert through the existing easement agreement area and into Virginia. The designation for MN 135 would be rerouted to the south using the existing US 53 alignment (starting at the existing US 53 northbound ramp to MN 135) to the south MN 37 interchange where it would follow the new US 53 route west along MN 37 (Figure 2.1-3).

US 53 within Virginia, between the US 169 interchange and the 2nd Avenue interchange, would be turned back to local government jurisdiction.

This alternative does not meet project Need #3 (connectivity/travel times) or #4 (capacity/mobility) described in Section 1.3.3 and 1.3.4, respectively. To meet Need #2 (constitutional route connectivity) as described in Section 1.3.2, signing and road designation changes would be needed to maintain the road connection from Eveleth to Virginia. However, it is an important baseline for the comparison of alternatives and is required to be evaluated in the Draft EIS for comparison purposes under NEPA and the Minnesota Environmental Review program.

Area of Evaluation

Under the No Build Alternative, no construction would occur, and traffic would be rerouted to other roads. Therefore, the area evaluated includes the existing right-of-way of those reroute roads.

ES.4.2.2 Existing US 53 Alternative (Easement Agreement Area Remains Open)

The Existing US 53 Alternative, though not in compliance with the terms of the existing easement agreement, would keep US 53 in place and open to traffic by addressing the economic, legal, and engineering issues associated with resolving the terms of the existing

easement agreement. The State of Minnesota would not vacate US 53 but would keep the highway open (Figure 2.1-4).

Keeping the highway open in its current location would require condemnation by the State of Minnesota to oppose termination of the existing easement agreement knowing that the owner and lessee are not willing sellers. Even with the use of eminent domain, this alternative may require a large payment from the State to the owners and operators of the minerals and mining/lease rights (RGGS and UTAC).

Under this alternative, no roadway modifications would be made. While it was noted in the SDD (September 2012) that this alternative may include construction of a grade separation and other highway modifications to allow for the mine to function as one operation from both sides of US 53, it did not present details. As described in the Alternatives Development Report (Kimley-Horn, 2014; provided in Appendix K), consolidation of right-of-way and constructing a bridge for mine access were considered but determined to not provide a meaningful reduction in overall project costs or provide the mine with access to much of the existing easement agreement area to mine to offset reconstruction costs; therefore, these elements are not being further evaluated.

This alternative was found in the SD/Draft SDD (February 2012) to meet all four need criteria. This alternative would indirectly honor the terms of the existing easement agreement (Need #1) by compensating the landowner and operator for land and mineral rights.

Area of Evaluation

Under the Existing US 53 Alternative, no construction would occur, and traffic would remain on existing US 53. Therefore, the area evaluated includes the existing right-of-way/easement agreement area of existing US 53.

ES.4.2.3 Alternative M-1

All of the Build Alternatives under consideration in this Draft EIS assume construction of a new four-lane US 53 alignment. Alternative M-1 is routed through the active UTAC mine. The following details for this alternative have been refined since Scoping based on considerations of providing mine access to both sides of the new US 53 alignment, existing fill material stability, depth of current and future mining activity, embankment design in blasting zone, and structural options (bridge vs. engineered slopes).

- New Alignment

From south to north, this alternative would depart from existing US 53 approximately at Cuyuna Drive in the Midway area of Virginia. Approximately one mile of new four-lane roadway would be constructed to mostly follow the grade created by the partially-backfilled[2] Auburn Pit through the UTAC mine. As shown on Figure 2.1-5, the new alignment would connect back to existing US 53 approximately 1,000 feet east of the existing 12th Avenue traffic signal.

- Local Access

Existing highway connections at MN 135 and 2nd Avenue would be reconstructed to maintain community access, reusing portions of the US 53 roadway to the extent possible. The MN 135 connection would require right-of-way acquisition or a new easement with RGGS and UTAC for the retained portion of existing US 53 within the mine setback area (Figure 2.3-2).

The MN 135 connection would be made by routing MN 135 on to a portion of the existing northbound US 53 highway segment south of the current US 53/MN 135 interchange. The new access would be at-grade, with the primary turning movement (westbound MN 135 to northbound US 53) facilitated with a free right turn lane. A left turn lane would be provided for the southbound US 53 to eastbound MN 135 turning movement. This intersection would be signalized (intersection geometry shown in Figure 3.1-4).

[2] Backfilled material is from local sources within the mine boundary. See Section 5.12 for more detail.

Due to the proximate location of Cuyuna Drive and the US 53/MN 135 intersection, local street access at Cuyuna Drive would be modified to provide adequate intersection spacing. Instead of providing Cuyuna Drive direct access from US 53, access would be provided from MN 135 to accommodate intersection spacing guidelines. As shown in Figure 2.3-2, Cuyuna Drive would be connected to MN 135 by extending Midway Drive north near the new intersection with US 53. An interchange option for this US 53 connection to MN 135 is not feasible in this location because there is not adequate space necessary for an interchange above the mine wall without involving substantial business and residential relocations in Midway. There is approximately 800 feet between the edge of the Auburn Pit wall and Cuyuna Drive, so a compressed diamond interchange (assumed to be approximately 2,000 feet long) would either have 1,200 feet of the interchange supported by structure in the pit or would require the acquisition of multiple residential and business properties in the Midway neighborhood. Given the extent of impacts and constructability concerns, an interchange at MN 135/US 53 was determined to not be feasible.

The connection to 2nd Avenue would be made by using a portion of the existing US 53 highway between 2nd and 12th Avenues, which is outside of the existing easement agreement area segment that would be vacated. 2nd Avenue would be extended to create a new at-grade intersection approximately at the present location of Southern Drive in Virginia. This new Southern Drive intersection would be spaced approximately 1,000 feet east of the 12th Avenue traffic signal. The northbound segment of US 53 to be used for extension of 2nd Avenue currently features four bridge structures (a pair over 6th Avenue and a pair over a now vacated railroad corridor). The northbound bridges would remain in use, whereas the southbound bridges would be removed along with the southbound traffic lanes. Coordination with the local jurisdictions (County and City) would be necessary to make a determination regarding future ownership of these local connection roadways.

The local street connection of 6th Avenue and Southern Drive, which provides access to the Ridgewood area south of US 53, would be improved by the Alternative M-1 alignment by adding direct access to US 53 via the new Southern Drive intersection (which would also provide access to 2nd Avenue as described above). New street connections in Alternative M-1 would be made by retaining the 6th Avenue underpass of northbound US 53 as shown in Figure 2.3-2. Southern Drive would be connected to US 53 at the Southern Drive at-grade intersection, with continued connectivity to the 6th Street underpass. This design would provide new access to US 53 for the Ridgewood neighborhood, while maintaining through traffic to 6th Avenue via the underpass.

Design Features

Alternative M-1 would cross a mine area that will remain active for many years. In order to reduce the potential conflict with remaining ferrous resource reserves, a constrained highway cross section (Figure 2.3-3) was assumed for US 53 through the mine for approximately one mile (4,950 feet). The constrained cross section assumed median and outside barriers and steep side slopes. The depth of the active mine south of this alignment currently ranges from 100 to 200 feet deep. Future mining along the west side of the mine may extend down 500 feet or more. The proposed right-of-way through the mine would encompass the full road footprint. Standard blasting best practices by the mine include a 300 foot setback from the edge of right-of-way. If this setback encumbers ferrous resources, the loss of access to these resources would be expected to be included in the negotiation for acquisition of right-of-way for this alternative.

Earthwork and/or structures (bridges) would be incorporated into the alignment design to allow for mine operations on both sides of the new alignment. The depth of the fill and compaction was important in determining whether the crossing could be on fill or if a structural solution would be required. Borings were conducted by MnDOT to confirm the condition of existing fill.[3] A seismic study was also conducted to determine the potential effects of blasting on fill slopes and bridge structures within the mine area.[4] As a result it was determined that an engineered fill could be used across most of the mine with bridges

[3] Preliminary Geotechnical Engineering Report for the TH 53 Relocation: M-1 Foundations (Gale-Tec Engineering, 2013); available at http://www.dot.state.mn.us/d1/projects/hwy53relocation/TechnicalReports.html

[4] Proposed TH 53 M-1 (and E-2) Alignment, Virginia, MN: Report of Seismic Study of Mine Blast Induced Vibrations (HDR, 2013); available at http://www.dot.state.mn.us/d1/projects/hwy53relocation/TechnicalReports.html

constructed in two locations to accommodate mining access needs. An all fill section would not allow mine equipment to cross the road, and an all bridge section would be more costly with no additional benefit gained.

The engineered fill could be constructed with 1:2 slopes, minimizing the footprint of the fill section in the mine. The depth of the active mine south of this alignment currently ranges from 100 to 200 feet deep. Future mining along the west side of the mine may extend down 500 feet or more.

To address potential mine business risks (air quality compliance issues), a covering over a portion of the Auburn Pit crossing (an elevated tunnel concept) was evaluated as a potential mitigation strategy. This tunnel could be constructed with concrete barrier walls on each side supporting a three-sided concrete box structure to enclose the road and air handling equipment. Details of the tunnel construction assumptions can be found in Highway 53 M-1 Alignment Air Quality Mitigation Assessment (CH2M Hill, 2013) and the Structural Cost Estimate for Elevated Tunnel for US 53 Alternative M-1 Air Quality Mitigation (Kimley-Horn, 2013) provided in Appendix E.

This alternative was found in the SD/Draft SDD (February 2012) to meet all four need criteria.

Area of Evaluation

The potential physical impacts from this alternative were evaluated for the area shown in Figure 2.1-5. Physical impacts can be defined as areas where ground disturbance is likely to occur under one or more construction option. As noted above, this alternative would require fill across much of the Auburn Pit. The area of evaluation for Alternative M-1 represents the assumed alignment and extends to the bottom of the fill slope or the estimated limits of construction. It also includes areas anticipated for stormwater management and local road connections.

ES.4.2.4 Alternative E-1A

Alternative E-1A is routed through the UTAC permit to mine and environmental setting boundaries, north of existing US 53 (see Figure 2.2-1). This alternative was added through the amended Scoping process described in Section 2.2.

Alternative E-1 was initially not carried forward because of the potential for mine business risks due to air quality compliance concerns (compared to other East Corridor alternatives), higher right-of-way costs due to conflicts with the existing UTAC permit to mine area and environmental setting boundary, and construction costs due to crossing the widest portion of the Rouchleau Pit. However, additional assessment of construction options and modification of this alternative determined that Alternative E-1A could reduce the business risk impacts from mine air quality compliance concerns. The features of this alternative assumed for analysis in this Draft EIS are described below.

- New Alignment

From south to north, this alternative diverges from existing US 53 just north of Cuyuna Drive. The alignment crosses MN 135 between the existing US 53 interchange and Bourgin Road. The new alignment then continues parallel to Bourgin Road before turning to the northwest to cross the Rouchleau Pit along an existing submerged haul road embankment.[5] After crossing the pit, the alignment turns to the southwest to reconnect with existing US 53 near 2nd Avenue. The road cross section was assumed to be constrained across the Rouchleau Pit (four lanes with a two-foot wide median barrier). A barrier would be considered on the south side of the roadway for safety and screening reasons. All stormwater would be treated and/or removed from the roadway and not discharged directly into the Rouchleau Pit. The storm sewer system would also allow containment of any potential spills on the roadway.

Two construction design options for crossing the Rouchleau Pit are evaluated for this alternative. The first is a reinforced soil slope (RSS) causeway/fill section (RSS Option). The second option is a bridge crossing of the pit (Bridge Option). Both options would follow the existing submerged haul road across the Rouchleau Pit.

[5] Backfilled material in this haul road is from local sources within the mine boundary. See Section 5.12 for more detail.

- RSS Option: This option would require the placement of fill below the existing water level and extending up to 160 feet in elevation above the water line. To minimize the fill footprint, a steep fill slope (up to 60% slope) would be required, and the height of the road would be kept as low as possible across the pit, resulting in a low point near the middle of the crossing. (Construction methods [i.e., dry vs. wet fill placement] for this design option are described in Section 5.3.3.2.) This option may require a future bridge (75 feet by 165 feet) to be constructed east of the Rouchleau Pit to allow for mining access to the north of the new alignment.
- Bridge Option: This option would place the road on a bridge structure across the pit, eliminating the need for fill within the Rouchleau Pit and allowing the road elevation to be increased and drain to the west side of the pit. This bridge would allow for future mine access to the north but may restrict distance from the bridge that mining/blasting activity may occur.

Any trail (pedestrian, bicycle, ATV, snowmobile) access to the south side of the highway would be prohibited due to mine safety concerns. The Mesabi Trail and utilities may be allowed within MnDOT right-of-way (with the trail on the north side of the highway, away from the mine activity) via a permit (may be constructed in conjunction with the project but funded by the trail and utility owners/operators; the St. Louis and Lake Counties Regional Railroad Authority (SLLCRRA) and the utility owners have received state bond funds for utility and trail relocation).

Local Access

The 2nd Avenue interchange would be replaced with a full access, at-grade, signalized intersection, similar to Alternative E-2 (Figure 2.3-4). This improves access (currently no southbound to westbound movement available) while eliminating the right-of-way and maintenance needed for the existing interchange loop and bridges.

There are two intersection options evaluated for MN 135 at US 53.

- Intersection Option: An unsignalized, ¾ intersection[6] would be used at the US 53/MN 135 intersection, with no left turns allowed from westbound MN 135 to US 53 (intersection geometry shown in Figure 2.3-5).
- Interchange Option: A compressed diamond interchange would provide full access between US 53 and MN 135, as shown in Figure 2.3-5.

The Landfill Road intersection with MN 135 would remain at its current location. A short segment of Landfill Road would need to be shifted east due to elevation differences between it and the new US 53 alignment.

Design Features

This alternative is within the UTAC permit to mine and environmental setting boundaries, although little further conflict with remaining ferrous resources is anticipated. In order to reduce the amount of fill within the Rouchleau Pit, a constrained highway cross section (Figure 2.3-3) was assumed for US 53 through the pit for approximately one-half mile (2,800 feet). The constrained cross section assumed median and outside barriers under both the RSS and Bridge Options.

- RSS Option: This option would allow for a shallower crossing of the Rouchleau Pit along an existing submerged haul road embankment. The pit may be partially dewatered or local construction dewatering (e.g., coffer dam) may be used, and the road would be constructed via a fill section through the pit. A mine access bridge southeast of the Rouchleau Pit could eventually be constructed in the future, if needed, to allow for mine vehicle passage under US 53 above the current water line.

[6] A ¾ intersection (also known as a right-in/right-out/left-in-only intersection) permits access from the through approach (US 53) and the stop-controlled approach (MN 135) via right-turn movements and allows the left-turn movement from the through approach (US 53) to the stop-controlled approach (MN 135).

A number of dewatering discharge options have been evaluated to inform potential construction impact analysis. Details regarding the options assessed can be found in the TH 53 Relocation Alternative E-1A RSS Construction Option Water Management Study (HDR, 2014; provided in Appendix G). The effects of constructing the Rouchleau Pit crossing in the dry (via pit drawdown or localized dewatering) and in the wet (fill placed below water) condition are evaluated in Sections 5.2 and 5.3, providing a summary of the recommended options for dewatering discharge and their potential impacts.

- Bridge Option: The pit is approximately five to 25 feet deep at the crossing location, and the bridge would span approximately 3,000 feet. The alignment would follow the submerged haul road embankment to minimize pier height. This option must consider design criteria to withstand blasting operations in the adjacent mine and areas of potential unstable fill.

This alternative was found in the ASDD (September 2013) to meet all four need criteria.

- Area of Evaluation

The potential physical impacts from this alternative were evaluated for the area shown in Figure 2.2-1. Physical impacts can be defined as areas where ground disturbance is likely to occur under one or more construction option. As noted above, this alternative includes two options for crossing the Rouchleau Pit generally following the submerged haul road. The area of evaluation was widened across the Rouchleau Pit for Alternative E-1A in areas where there is potential for design adjustments in the alignment to accommodate currently undefined solutions to known engineering challenges (e.g., existing areas of unstable fill and bridge type). The intent of evaluating the wider area was to identify potential impacts and determine if there were any environmental resources that could limit implementation of the design options being considered. As determined by analysis of aerial photography and data collection within the widened area of evaluation, it generally has consistent vegetation/cover types (i.e., mostly forested with some wetlands, or rock pit walls and water) and has no existing development or noise receptors. Since most of the widened area is within the previously mined area in and adjacent to the Rouchleau Pit, the alignment adjustments should result in little difference in impacts to resources except for ferrous resources and right-of-way. Impacts to vegetation and wetlands were determined to be similar regardless of where the final alignment would be oriented within the widened area (see Chapter 4: Community and Social Analysis and Chapter 5: Physical and Environmental Analysis for more details). To calculate potential impacts without overestimating them due to the widened area of evaluation, a corridor averaging 200-400 feet wide was assumed for Alternative E-1A within the area of evaluation.

ES.4.2.5 Alternative E-2

Alternative E-2 is routed around the UTAC permit to mine and environmental setting boundaries. The following details for this alternative have been refined since Scoping based on considerations of crossing the Rouchleau Pit, structural vs. fill options, bridge design in blasting zone, depth of pit, lands permitted or leased for mine operations, and construction staging considerations.[7]

- New Alignment

From south to north, Alternative E-2 generally follows existing US 53 from the Midway area to the MN 135 exit ramp for the start of new four-lane construction. As shown in Figure 2.1-6, the new alignment then continues on a northeasterly track on the present day Landfill Road corridor before turning to the west to cross over the Rouchleau Pit. Upon crossing the pit, Alternative E-2 turns to the southwest following an abandoned railroad corridor that runs between the pit and residential neighborhoods before reconnecting to existing US 53 at 2nd Avenue. Areas of roadway that would be removed are shown in Figure 2.3-6.

[7] Alignment development details are further described in the Alternatives Development Report available in Appendix K. Permitted and leased mining operations are defined in Section 4.2.

Two alignments are being considered for Alternative E-2 between Midway and roughly MN 135.[8] Both options extend from a point just north of Cuyuna Drive on the south end to approximately the point where the Mesabi Trail crosses existing Landfill Road just north of the MN 135.

- Straight Option: This is a westerly route that follows existing US 53 and the exit ramp to MN 135. This option minimizes new disturbance by following existing roads to the extent possible. The area of evaluation for this option includes a wider section just south of MN 135 to allow for design flexibility to shift the alignment east of the existing easement agreement area, if needed, to minimize mining setback and wetland impacts.
- Curved Setback Option: This route shifts east of existing US 53, similar to the alignment of Alternative E-1A south of MN 135. The purpose of this option is to facilitate staging of project construction and to minimize or potentially avoid encroachment on the mine setback from the road, shifting the alignment to the east at least 300 feet. The actual alignment shift exceeds 300 feet to also minimize impacts to the wetland that is located between US 53 and this option.

Local Access

The 2nd Avenue access would be converted from the existing partial interchange to an at-grade intersection. The existing 2nd Avenue interchange does not allow for turns from southbound US 53 to 2nd Avenue or from 2nd Avenue to northbound US 53. The new 2nd Avenue intersection would provide access to and from US 53 in all directions. Both intersections would be signalized (intersection geometry shown in Figure 3.1-5).

There are two intersection options evaluated for MN 135 at US 53.

- Intersection Option: With this option, as shown in Figure 2.3-7, MN 135 would be slightly realigned to accommodate a new at-grade intersection with US 53, replacing the existing interchange. An unsignalized, ¾ intersection would be used at the US 53/MN 135 intersection, with no left turns allowed from westbound MN 135 to US 53 (intersection geometry shown in Figure 3.1-5).
- Interchange Option: With this option, a compressed diamond interchange would be constructed to provide full access between US 53 and MN 135, as shown in Figure 2.3-7.

Access to Landfill Road would be maintained with a new at-grade connection approximately one-half mile north of the new US 53/MN 135 intersection. A median break in the US 53 corridor would allow for access to Landfill Road for travelers from both directions on US 53.

Design Features

A constrained highway cross section between the new Landfill Road access and 2nd Avenue, approximately one mile (5,500 feet) long, was assumed in order to reduce the potential impacts of the Alternative E-2 route along the west side of and across the Rouchleau Pit. The constrained cross section assumed median and outside barriers and steep side slopes (Figure 2.3-3). East of the Rouchleau Pit a continuation of the existing cross section from the south is planned. The new Landfill Road access median break was assumed to be located outside of the constrained cross section. The US 53 median at Landfill Road would provide a refuge for vehicles making turning movements across US 53 at Landfill Road.

The most feasible pit crossing method for this alternative was determined to be a bridge; a fill option was eliminated based on constructability issues. A fill section across the pit is not expected to be feasible due to the depth of the water and pit and the width of the fill footprint at this location. At 1:2 slopes the fill footprint at the bottom of the fill would be at least 950 feet wide and require nearly 10 million cubic yards of fill material; with more reasonable slopes of 1:4, the footprint and fill material needed would double. Additionally, given the depth of water to be contained on the north side of the fill (125 feet currently), the

[8] The Alternative E-2 Curved Setback Option was developed after the completion of the Alternatives Development Report and, therefore, is not discussed in that document.

fill would require engineering for a dam to support the water pressure as well as blasting vibration. The dam design would also need to consider future water level fluctuations as dewatering changes occur. Given the extent of constructability concerns and costs compared to a bridge, the fill option was dropped from further consideration for this alternative.

Therefore, a bridge would be used to cross the Rouchleau Pit. The pit is approximately 250 feet deep at the crossing location, and the bridge would span approximately 1,350 feet. Crossing primarily on structure would minimize potential fill quantity and stability concerns. This alternative must consider design criteria to withstand blasting operations in the adjacent mine. Constructability assessments have indicated that a bridge crossing of the pit represents comparable constructability issues and cost impacts as other alternatives.

This alternative was found in the SD/Draft SDD (February 2012) to meet all four need criteria.

- Area of Evaluation

The potential physical impacts from this alternative were evaluated for the area shown in Figure 2.1-6. Physical impacts can be defined as areas where ground disturbance is likely to occur under one or more construction option. As noted above, this alternative includes a bridge crossing over the Rouchleau Pit. The area of evaluation was widened across the Rouchleau Pit for Alternative E-2 in areas where there is potential for design adjustments in the alignment to accommodate currently undefined solutions to known engineering challenges (e.g., existing areas of unstable fill and bridge type). The intent of evaluating the wider area was to identify potential impacts and determine if there were any environmental resources that could limit implementation of the design options being considered. As determined by analysis of aerial photography and data collection within the widened area of evaluation near the Rouchleau Pit, it generally has consistent vegetation/cover types (i.e., mostly forested with some wetlands, or rock pit walls and water) and has no existing development or noise receptors. Since most of the widened area is within the previously mined area in and adjacent to the Rouchleau Pit, the alignment adjustments should result in little difference in impacts to resources except for ferrous resources and right-of-way. Impacts to vegetation and wetlands were determined to be similar regardless of where the final alignment would be oriented within the widened area (see Chapter 4: Community and Social Analysis and Chapter 5: Physical and Environmental Analysis for more details). To calculate potential impacts without overestimating them due to the widened area of evaluation, a corridor averaging 150-300 feet wide was assumed for Alternative E-2 within the area of evaluation.

ES.5 Potential Impacts

The effects of the No Build, Existing US 53, M-1, E-1A, and E-2 Alternatives, including options, were evaluated and compared across a range of subject areas related to the built and natural environment. The Existing US 53 Alternative essentially resulted in no impacts except right-of-way and economic/business impacts, which are summarized in the following paragraph. A summary of impacts from the other alternatives is provided in Table ES-1.

The Existing US 53 Alternative requires the fee acquisition of 77 acres of land to maintain the existing easement agreement area, including mineral rights. The mitigation to the landowner is fair compensation under the Uniform Relocation Act. Encumbering the ferrous resources in this area also requires potential compensation for impacts to the mine operator for lost production. These expenditures would be considered a long-term investment but an irreversible and irretrievable commitment of financial resources. The total capital cost of construction is estimated to be $400-600 million.

Table ES-1. Summary of Environmental Impacts (with mitigation)

Note: The Existing US 53 Alternative is not included in this table because it essentially resulted in no impacts except right-of-way and economic/business impacts, which are summarized on page ES-10.

Impact		No Build Alternative	Alternative M-1	Alternative E-1A RSS Option	Alternative E-1A Bridge Option	Alternative E-2
Traffic Volumes		**Impact:** Substantial increase in traffic volumes on designated reroute roadways and local roadways **Mitigation:** None proposed	Daily traffic volumes expected to be similar to the traffic volumes on the easement segment	Daily traffic volumes expected to be similar to the traffic volumes on the easement segment	Daily traffic volumes expected to be similar to the traffic volumes on the easement segment	Daily traffic volumes expected to be similar to the traffic volumes on the easement segment.
Traffic Operations		**Impact:** Four segments would operate at LOS E/F by 2017. Three existing at-grade railroad crossings were not factored into the operations model. **Mitigation:** None proposed	Southern Drive intersection would operate at LOS E/F by 2037 with turning volumes of 400 or 600 vehicles	The 2nd Avenue intersection and the MN 135 intersection/interchange options would operate at acceptable LOS through 2037	The 2nd Avenue intersection and the MN 135 intersection/interchange options would operate at acceptable LOS through 2037	The 2nd Avenue intersection and the MN 135 intersection/interchange options would operate at acceptable LOS through 2037
Travel Times		**Impact:** Increase in travel time doubles between Virginia and Eveleth (+9 minutes), and nearly quadruples (+21 minutes) from Virginia to Gilbert **Mitigation:** None proposed	Negligible change	Negligible change	Negligible change	Negligible change
Safety		**Impact:** Increased safety concerns on reroute roadways due to railroad crossings, increased congestion, and roadways over capacity **Mitigation:** None proposed	No impact	*Intersection Option:* Steeper (6%) grade at the east approach would increase the potential for semi-truck/vehicle conflict at the US 53/MN 135 intersection, increasing crash risk over the Interchange Option *Interchange Option*: Flatter grade (2%) at the east approach would result in a lower crash risk than the Intersection Option	*Intersection Option:* Steeper (6%) grade at the east approach would increase the potential for semi-truck/vehicle conflict at the US 53/MN 135 intersection, increasing crash risk over the Interchange Option *Interchange Option*: Flatter grade (2%) at the east approach would result in a lower crash risk than the Intersection Option	*Intersection Option:* Steeper (6%) grade at the east approach would increase the potential for semi-truck/vehicle conflict at the US 53/MN 135 intersection, increasing crash risk over the Interchange Option *Interchange Option*: Flatter grade (2%) at the east approach would result in a lower crash risk than the Intersection Option
Intermodal	Bicycles and Pedestrians	**Impact**: Trails would continue until landowner removes them **Mitigation:** None proposed; Mesabi Trail would need to be realigned (by others) to a new corridor	**Impact**: Trails would continue until landowner removes them **Mitigation:** None proposed; Mesabi Trail would need to be realigned (by others) to a new corridor	**Impact:** Crosses Mesabi Trail several times **Mitigation**: A permit for the Mesabi Trail could be allowed along the east side of the alignment	**Impact:** Crosses Mesabi Trail several times **Mitigation**: A permit for the Mesabi Trail could be allowed along the east side of the alignment	**Impact:** Crosses Mesabi Trail several times **Mitigation:** A permit for the Mesabi Trail could be allowed along the east side of the alignment
	Bus Transit	**Impact:** Substantially lengthened routes (as noted under Travel Times above) **Mitigation:** None proposed	Negligible change	Negligible change	Negligible change	Negligible change
	Rail	**Impact:** Three existing at-grade rail crossings would be part of the designated US 53 reroute, increasing the safety risk to travelers at these crossings **Mitigation:** None proposed	No impact	No impact	No impact	No impact
	Aviation	**Impact:** No direct impacts to the airport; travel time to/from the airport may be increased for some users **Mitigation:** None proposed	No impact	No impact	No impact	No impact
	Other	**Impact:** Adverse impacts to school bus and emergency service routes (see Travel Time) **Mitigation:** None proposed	No impact	No impact	No impact	No impact

Note: The Existing US 53 Alternative is not included in this table because it essentially resulted in no impacts except right-of-way and economic/business impacts, which are summarized on page ES-10.

Impact	No Build Alternative	Alternative M-1	Alternative E-1A RSS Option	Alternative E-1A Bridge Option	Alternative E-2
Right-of-Way	No impact	**Impact:** Right-of-way required from 13 parcels (no relocations) with majority from RGGS property; access modification on up to 3 parcels; up to 132 acres of right-of-way needed Total acquisition of up to 1 parcel **Mitigation**: Compensate landowners via federal Uniform Relocation Act; use constrained cross section where possible to minimize roadway footprint in mine	**Impact:** Right-of-way acquired from 19 parcels (2 relocations) with majority from RGGS and State of Minnesota property; access modification on up to 5 parcels *Intersection Option:* Up to 195 acres of right-of-way needed; total acquisition of up to 4 parcels *Interchange Option:* Up to 197 acres of right-of-way needed; total acquisition of up to 6 parcels **Mitigation**: Compensate landowners via federal Uniform Relocation Act; use constrained cross section where possible to minimize roadway footprint in Rouchleau Pit and on School Trust lands	**Impact:** Right-of-way acquired from 19 parcels (2 relocations) with majority from RGGS and State of Minnesota property; access modification on up to 5 parcels *Intersection Option:* Up to 195 acres of right-of-way needed; total acquisition of up to 4 parcels *Interchange Option:* Up to 197 acres of right-of-way needed; total acquisition of up to 6 parcels **Mitigation**: Compensate landowners via federal Uniform Relocation Act; use constrained cross section where possible to minimize roadway footprint in Rouchleau Pit and on School Trust lands	**Impact:** *Straight Option:* Right-of-way required from 8 parcels (1 relocation) with majority from RGGS and State of Minnesota property; access modification on up to 3 parcels; up to 151 acres with *Intersection Option* and up to 156 acres of right-of-way needed with the *Interchange Option* Total acquisition of up to 3 parcels for both *Intersection and Interchange Options* *Curved Setback Option:* Impacts are the same as for the Straight Option, except 1 additional parcel is impacted **Mitigation**: Compensate landowners via federal Uniform Relocation Act; use constrained cross section where possible to minimize roadway footprint in Rouchleau Pit and on School Trust lands
Economic and Business	**Impact:** Substantial increase (adding 9 to 21 minutes) of travel times between destinations that cross mine; substantial loss of retail sales and local jobs in East Range and Quad Cities; increased community costs for emergency services, school transportation, and general public services **Mitigation:** None proposed	**Impact:** Potential economic impact to mine operations to the extent that the mine operator has raised numerous concerns and opposition to this alternative Moderate conflict with ferrous resources High risk for air quality compliance to impact mine operations **Mitigation**: Use constrained cross section where possible to minimize roadway footprint in mine; provide elevated tunnel to separate receptors on road from PM10 exceedances	**Impact:** No identified local/regional economic impact due to this alignment Minor conflict with ferrous and non-ferrous metallic resources Moderate risk for air quality compliance to impact mine operations **Mitigation**: Use constrained cross section where possible to minimize roadway footprint in permit to mine area with RSS Option; future mine access bridge location identified for mine access under US 53 in RSS Option	**Impact:** No identified local/regional economic impact due to this alignment Minor conflict with ferrous and non-ferrous metallic resources Little risk for air quality compliance to impact mine operations **Mitigation**: Use constrained cross section where possible to minimize roadway footprint in permit to mine area	**Impact:** No identified local/regional economic impact due to this alignment Potential future conflict with ferrous and non-ferrous metallic resources No risk for air quality compliance to impact mine operations **Mitigation**: Use constrained cross section where possible to minimize roadway footprint in resource rich areas

Note: The Existing US 53 Alternative is not included in this table because it essentially resulted in no impacts except right-of-way and economic/business impacts, which are summarized on page ES-10.

Impact	No Build Alternative	Alternative M-1	Alternative E-1A RSS Option	Alternative E-1A Bridge Option	Alternative E-2
Parks/Section 4(f)	**Parkland Impact**: Trails would continue until landowner removes them **Parkland Mitigation**: None required Note: Trails (Mesabi and snowmobile) may be relocated along No Build alignment (by others) **Section 4(f) Impact:** None	**Parkland Impact:** Introduces new crossing of snowmobile trail near Cuyuna Drive. Trails would continue until landowner removes them. **Parkland Mitigation**: Provide safe crossing for trail, as long as trail persists Note: Snowmobile trail to be relocated by others; likely along MN 37 and Co. 7 in conjunction with Mesabi Trail **Section 4(f) Impact:** None	**Parkland Impact:** Introduces new crossings of Mesabi and snowmobile trails. Trails would continue until landowner removes them. **Parkland Mitigation:** Provide safe crossing for trail, as long as trail persists Note: Trail may be relocated along the east side of alignment by permit, if funding is obtained by the SLLCRRA **Section 4(f) Impacts** *Intersection Option*: Negligible impact to OHVRA activities, features or attributes (4.6 acres along west edge; anticipated de minimis Section 4(f) impact) *Interchange Option*: Negligible impact to OHVRA activities, features or attributes (5.1 acres along west edge; anticipated de minimis Section 4(f) impact) **Section 4(f) Mitigation:** OHVRA impacts minimized to extent possible; mitigation measures coordinated by FHWA with the DNR	**Parkland Impact:** Introduces new crossings of Mesabi and snowmobile trails. Trails would continue until landowner removes them. **Parkland Mitigation:** Provide safe crossing for trail, as long as trail persists Note: Trail may be relocated along the east side of alignment by permit, if funding is obtained by the SLLCRRA **Section 4(f) Impacts** *Intersection Option*: Negligible impact to OHVRA activities, features or attributes (4.6 acres along west edge; anticipated de minimis Section 4(f) impact) *Interchange Option*: Negligible impact to OHVRA activities, features or attributes (5.1 acres along west edge; anticipated de minimis Section 4(f) impact) **Section 4(f) Mitigation:** OHVRA impacts minimized to extent possible; mitigation measures coordinated by FHWA with the DNR	**Parkland Impact:** Introduces new crossings of Mesabi and snowmobile trails. Trails would continue until landowner removes them. **Parkland Mitigation**: Provide safe crossing for trail, as long as trail persists Note: Trail may be relocated along the east side of alignment by permit, if funding is obtained by the SLLCRRA **Section 4(f) Impacts** *Intersection Option*: Negligible impact to OHVRA activities, features or attributes (4.3 acres along west edge; anticipated de minimis Section 4(f) impact) *Interchange Option*: Negligible impact to OHVRA activities, features or attributes (4.3 acres along west edge; anticipated de minimis Section 4(f) impact) **Section 4(f) Mitigation:** OHVRA impacts minimized to extent possible; mitigation measures coordinated by FHWA with the DNR
Cultural Resources	No impact	No impact	No impact	No impact	No impact
Land Use	**Impact:** May result in intensified land uses associated with re-route roadways **Mitigation:** None proposed	No impact	No impact	No impact	No impact
Environmental Justice	No disproportionately high or adverse impacts to minority or low income populations	No disproportionately high or adverse impacts to minority or low income populations	No disproportionately high or adverse impacts to minority or low income populations	No disproportionately high or adverse impacts to minority or low income populations	No disproportionately high or adverse impacts to minority or low income populations
Social, Neighborhood, and Community	**Impact:** Substantial impacts to connections among Quad Cities and other localities; necessitates rerouting of school bus routes; emergency response times lengthened **Mitigation:** None proposed	Negligible impact. At-grade intersections at US 53 with 2nd Avenue and MN 135 would increase access to US 53 over what is currently provided by the interchanges at these locations.	Negligible impact At-grade intersection at US 53 with 2nd Avenue would increase access to US 53 over what is currently provided by the existing interchange *Intersection Option:* At-grade intersection at US 53 with MN 135 would increase access to US 53 over what is currently provided by the existing interchange *Interchange Option:* A new interchange at MN 135 may increase access to US 53 compared to the existing interchange	Negligible impact At-grade intersection at US 53 with 2nd Avenue would increase access to US 53 over what is currently provided by the existing interchange *Intersection Option:* At-grade intersection at US 53 with MN 135 would increase access to US 53 over what is currently provided by the existing interchange *Interchange Option:* A new interchange at MN 135 may increase access to US 53 compared to the existing interchange	Negligible impact At-grade intersection at US 53 with 2nd Avenue would increase access to US 53 over what is currently provided by the existing interchange *Intersection Option:* At-grade intersection at US 53 with MN 135 would increase access to US 53 over what is currently provided by the existing interchange *Interchange Option:* A new interchange at MN 135 may increase access to US 53 compared to the existing interchange.

Note: The Existing US 53 Alternative is not included in this table because it essentially resulted in no impacts except right-of-way and economic/business impacts, which are summarized on page ES-10.

Impact		No Build Alternative	Alternative M-1	Alternative E-1A RSS Option	Alternative E-1A Bridge Option	Alternative E-2
Visual and Aesthetics	Natural	**Impact:** Minor beneficial change with views for travelers of more natural/open space	No impact	**Impact:** New views of open space from US 53	**Impact:** New views of open space from US 53	**Impact:** New views of open space from US 53
	Cultural	**Impact:** Minor changes from residential, commercial, mine, and Mineview in the Sky properties	**Impact:** Views of mine and Virginia would be blocked if elevated tunnel is constructed	**Impact**: New view of Rouchleau Pit from US 53	**Impact**: New view of Rouchleau Pit from US 53	**Impact:** Change in views to/from UTAC mine and of Rouchleau Pit
	Highway	**Impact:** Replacement signing for reroute; change from 4-lane divided to 2-lane undivided **Mitigation:** None proposed	**Impact:** Views to and from highway would be blocked if elevated tunnel is constructed **Mitigation**: MnDOT will develop visual quality guidelines for the project and take input from a Visual Quality Review Committee	**Impact:** Views to and from highway would be partially blocked by median and safety barriers; Landfill Road more visible from highway **Mitigation**: MnDOT will develop visual quality guidelines for the project and take input from a Visual Quality Review Committee	**Impact:** Views to and from highway would be partially blocked by median and safety barriers; Landfill Road more visible from highway **Mitigation**: MnDOT will develop visual quality guidelines for the project and take input from a Visual Quality Review Committee	**Impact::** Views to and from highway would be partially blocked by median and safety barriers **Mitigation**: MnDOT will develop visual quality guidelines for the project and take input from a Visual Quality Review Committee
Utilities		**Impact:** Existing utility permits would be terminated and utilities would need to relocate **Mitigation:** None proposed	**Impact:** Existing utility permits would be terminated and utilities would need to relocate **Mitigation:** MnDOT will coordinate with utility owners to find alternate utility route	**Impact:** Existing utility permits would be terminated and utilities would need to relocate **Mitigation**: MnDOT will coordinate with utility owners to find alternate utility route	**Impact:** Existing utility permits would be terminated and utilities would need to relocate **Mitigation**: MnDOT will coordinate with utility owners to find alternate utility route	**Impact:** Existing utility permits would be terminated and utilities would need to relocate **Mitigation**: MnDOT will coordinate with utility owners to find alternate utility route
Water Supply		No impact	No impact	**Impact:** Alignment within Virginia Inner Emergency Response Area; roadway runoff and spill containment important considerations in design to prevent water quality impacts Potential drawdown of Rouchleau Pit and adjacent Enterprise Pit **Mitigation**: Direct water to ArcelorMittal for mine operations and diversions to Sauntry Creek system from MnDOT dewatering (see Section 5.3), and/or modify ArcelorMittal's appropriation permit; stormwater conveyance/treatment and spill containment provisions; turbidity controls during construction; specifications for the source and nature of any fill material used (i.e., use of clean fill; use of mining by-products only if low in sulfides)	**Impact:** Alignment within Virginia Inner Emergency Response Area; roadway runoff and spill containment important considerations in design to prevent water quality impacts; localized dewatering **Mitigation**: Turbidity controls during construction; stormwater conveyance/treatment and spill containment provisions; specifications for the source and nature of any fill material used (i.e., use of clean fill; use of mining by-products only if low in sulfides)	**Impact:** Alignment within Virginia Inner Emergency Response Area; roadway runoff and spill containment important considerations in design to prevent water quality impacts; localized dewatering **Mitigation**: Turbidity controls during construction; stormwater conveyance/treatment and spill containment provisions; specifications for the source and nature of any fill material used (i.e., use of clean fill; use of mining by-products only if low in sulfides)
Water Body Modification		No impact	No impact	**Impact:** New road crossing of Rouchleau Pit on engineered fill slopes with RSS Option; possible temporary drawdown (up to 30 feet) of Rouchleau Pit during construction; options for dewatering discharge identified **Mitigation**: Standard erosion control/construction BMPs	**Impact:** New bridge crossing over Rouchleau Pit; minor impacts from bridge piers **Mitigation**: Standard erosion control/construction BMPs	**Impact:** New bridge crossing over Rouchleau Pit; minor impacts from bridge piers **Mitigation**: standard erosion control/construction BMPs

Note: The Existing US 53 Alternative is not included in this table because it essentially resulted in no impacts except right-of-way and economic/business impacts, which are summarized on page ES-10.

Impact	No Build Alternative	Alternative M-1	Alternative E-1A RSS Option	Alternative E-1A Bridge Option	Alternative E-2
Wetlands	No impact	**Impact:** Fill/excavation impacts of up to 9 acres of wetland, affecting 7 wetland areas **Mitigation**: Minimum 1:1 replacement wetland credit to be provided via withdrawal of banked credits per state and federal regulations	**Impact:** Fill/excavation impacts of up to 11 acres of wetland, affecting 17 wetland areas; negligible (less than 1 acre) difference between *Intersection and Interchange Options* **Mitigation**: Minimum 1:1 replacement wetland credit to be provided via withdrawal of banked credits per state and federal regulations	**Impact:** Fill/excavation impacts of up to 11 acres of wetland, affecting 17 wetland areas; negligible (less than 1 acre) difference between *Intersection and Interchange Options* **Mitigation**: Minimum 1:1 replacement wetland credit to be provided via withdrawal of banked credits per state and federal regulations	**Impact:** *Straight Option:* Fill/excavation impacts of up to 7 acres of wetland, affecting 15 wetland areas; negligible (less than 1 acre) difference between *Intersection and Interchange Options* *Curved Setback Option:* Potential to impact an additional 2.4 acres of wetland compared to the *Straight Option* **Mitigation**: Minimum 1:1 replacement wetland credit to be provided via withdrawal of banked credits per state and federal regulations
Surface Water/Water Quantity and Quality	**Impact:** 23 acre reduction in impervious area due to road removal **Mitigation**: Implementation of standard BMPs for erosion control and handling taconite containing material during road removal	**Impact:** Net 11 acre reduction in impervious area **Mitigation**: Implementation of stormwater BMPs within project area	**Impact:** Requires pumping system for stormwater collected at fill low point to west side of Rouchleau Pit *Intersection Option:* Net 4 acre reduction in impervious area *Interchange Option:* Net 0.5 acre reduction in impervious area **Mitigation**: Implementation of stormwater BMPs within project area	**Impact:** Gravity drains stormwater to west side of Rouchleau Pit *Intersection Option:* Net 4 acre reduction in impervious area Interchange Option: Net 0.5 acre reduction in impervious area **Mitigation**: Implementation of stormwater BMPs within project area	**Impact:** *Intersection Option:* Net 3 acre reduction in impervious area *Interchange Option:* Net zero reduction in impervious area *Straight and Curved Setback Options* would have essentially the same impacts as noted for the Interchange Option **Mitigation**: Implementation of stormwater BMPs within project area
Geology and Soils/Soil Erosion	No impact	**Impact:** Alignment crosses Biwabik Iron Formation Slope stability and erosion issues associated with fill placement/ bridge(s) in Auburn Pit **Mitigation**: Implementation of erosion control BMPs within project area	**Impact:** Alignment crosses Biwabik Iron Formation Slope stability and erosion issues associated with fill placement in Rouchleau Pit for the RSS fill **Mitigation**: Implementation of erosion control BMPs within project area	**Impact:** Alignment crosses Biwabik Iron Formation Slope stability and erosion issues associated with bridge abutments at edge of Rouchleau Pit **Mitigation**: Implementation of erosion control BMPs within project area	**Impact:** Alignment crosses Biwabik Iron Formation Slope stability and erosion issues associated with bridge abutments at edge of Rouchleau Pit **Mitigation**: Implementation of erosion control BMPs within project area

Note: The Existing US 53 Alternative is not included in this table because it essentially resulted in no impacts except right-of-way and economic/business impacts, which are summarized on page ES-10.

Impact	No Build Alternative	Alternative M-1	Alternative E-1A RSS Option	Alternative E-1A Bridge Option	Alternative E-2
Noise	**Impact:** Substantial noise level increases exceeding state noise standards along existing reroute roadways (MN 37, Co. 7, and Co. 101) **Mitigation:** None proposed	**Impact:** State noise standards would be exceeded at residential locations along the project corridor, specifically at Area D (Ridgewood north), Area E (Ridgewood east), and Area F (Midway) **Mitigation:** A noise wall is preliminarily cost effective at Area F (Midway)	**Impact:** State noise standards would be exceeded at residential locations along the project corridor, specifically at Area C (residential area north of US 53 and east of 2nd Avenue), Area F (Midway), and Area G (Bourgin Road) Noise increase is essentially the same for the Intersection and Interchange Options (less than 1 dBA difference) **Mitigation:** A noise wall is preliminarily cost effective at Area F (Midway)	**Impact:** State noise standards would be exceeded at residential locations along the project corridor, specifically at Area C (residential area north of US 53 and east of 2nd Avenue), Area F (Midway), and Area G (Bourgin Road) Noise increase is essentially the same for the Intersection and Interchange Options (less than 1 dBA difference) **Mitigation:** a noise wall is preliminarily cost effective at Area F (Midway)	**Impact:** *Straight Option:* State noise standards would be exceeded at residential locations along the project corridor, specifically in Area C (residential area north of US 53 and east of 2nd Avenue); noise increase is essentially the same for the Intersection and Interchange Options (less than 1 dBA difference) *Curved Setback Option:* State noise standards would be exceeded at residential locations along the project corridor, specifically in Area C (residential area north of US 53 and east of 2nd Avenue), Area F (Midway), and Area G (Bourgin Road) Noise increase is essentially the same for the Intersection and Interchange Options (less than 1 dBA difference) **Mitigation:** *Straight Option:* A noise wall is preliminarily cost effective at Area C (residential area north of US 53 and east of 2nd Avenue) *Curved Setback Option:* A noise wall is preliminarily cost effective at Area C (residential area north of US 53 and east of 2nd Avenue) and Area F (Midway)
Transportation-Related Air Quality	No impact	No impact	No impact	No impact	No impact
Vegetation and Cover Types	No impact	**Impact:** Converts up to 8 acres of forest and 9 acres of wetland to right-of-way **Mitigation:** See Wetlands	**Impact:** *Intersection Option:* Converts up to 28 acres of forest and 10 acres of wetland to right-of-way *Interchange Option*: Converts up to 33 acres of forest and 11 acres of wetland to right-of-way **Mitigation:** See Wetlands. BMPs for control of weeds and invasive species would be followed near sensitive areas.	**Impact:** *Intersection Option:* Converts up to 28 acres of forest and 10 acres of wetland to right-of-way *Interchange Option*: Converts up to 33 acres of forest and 11 acres of wetland to right-of-way **Mitigation:** See Wetlands. BMPs for control of weeds and invasive species would be followed near sensitive areas.	**Impact:** *Intersection Option (with Straight Option):* Converts up to 33 acres of forest and 7 acres of wetland to right-of-way *Interchange Option (with Straight Option)*: Converts up to 37 acres of forest and 7 acres of wetland to right-of-way *Curved Setback Option:* Converts an additional 10 acres of forest and 2 acres of wetland compared to the Straight Option **Mitigation:** See Wetlands. BMPs for control of weeds and invasive species would be followed near sensitive areas.

Note: The Existing US 53 Alternative is not included in this table because it essentially resulted in no impacts except right-of-way and economic/business impacts, which are summarized on page ES-10.

Impact	No Build Alternative	Alternative M-1	Alternative E-1A RSS Option	Alternative E-1A Bridge Option	Alternative E-2
Fish and Wildlife	No impact	No impact	**Impact:** Negligible to minor impacts **Mitigation**: Peregrine falcon survey to be coordinated with DNR if needed	**Impact:** Negligible to minor impacts **Mitigation**: Peregrine falcon survey to be coordinated with DNR if needed	**Impact:** Negligible to minor impacts **Mitigation**: Peregrine falcon survey to be coordinated with DNR if needed
Threatened & Endangered Species	No impact	No impact MnDOT is coordinating with the USFWS and DNR to assess the potential for impacts to the northern long-eared bat, proposed for listing as an endangered species. Based on current information, the impacts of this alternative are not anticipated to jeopardize the continued existence of the species.	No impact MnDOT is coordinating with the USFWS and DNR to assess the potential for impacts to the northern long-eared bat, proposed for listing as an endangered species. Based on current information, the impacts of this alternative are not anticipated to jeopardize the continued existence of the species.	No impact MnDOT is coordinating with the USFWS and DNR to assess the potential for impacts to the northern long-eared bat, proposed for listing as an endangered species. Based on current information, the impacts of this alternative are not anticipated to jeopardize the continued existence of the species.	No impact MnDOT is coordinating with the USFWS and DNR to assess the potential for impacts to the northern long-eared bat, proposed for listing as an endangered species. Based on current information, the impacts of this alternative are not anticipated to jeopardize the continued existence of the species.
Hazardous Materials and Contaminated Properties	No impact	**Impact:** 17 contamination risk properties within area of evaluation; 2 were evaluated in Phase II assessment; 2 sites recommended for further investigation or consideration **Mitigation**: A Response Action Plan will be prepared prior to right-of-way acquisition for handling of contaminants; standard BMPs for handling taconite-containing materials and spills will be followed	**Impact:** 16 contamination risk properties within area of evaluation; 6 were evaluated in Phase II assessment; 3 sites recommended for further investigation or consideration There are no differences between the Intersection Option and Interchange Option **Mitigation**: A Response Action Plan will be prepared prior to right-of-way acquisition for handling of contaminants; standard BMPs for handling taconite-containing materials and spills will be followed	**Impact:** 16 contamination risk properties within area of evaluation; 6 were evaluated in Phase II assessment; 3 sites recommended for further investigation or consideration There are no differences between the Intersection Option and Interchange Option **Mitigation**: A Response Action Plan will be prepared prior to right-of-way acquisition for handling of contaminants; standard BMPs for handling taconite-containing materials and spills will be followed	**Impact:** 9 contamination risk properties within area of evaluation; 4 were evaluated in Phase II assessment; 2 sites recommended for further investigation or consideration There are no differences between the Straight and Curved Setback Options or the Intersection and Interchange Options **Mitigation**: A Response Action Plan will be prepared prior to right-of-way acquisition for handling of contaminants; standard BMPs for handling taconite-containing materials and spills will be followed

Note: The Existing US 53 Alternative is not included in this table because it essentially resulted in no impacts except right-of-way and economic/business impacts, which are summarized on page ES-10.

Impact		No Build Alternative	Alternative M-1	Alternative E-1A RSS Option	Alternative E-1A Bridge Option	Alternative E-2
Excess Material		No impact	**Impact:**: Net import: 2.8 million cubic yards Export: 80,000 cubic yards Import: 2,900,000 cubic yards **Mitigation**: None proposed	**Impact:** *Intersection Option*: Net import: 1,700,000 cubic yards Export: 3,300,000 cubic yards Import: 5,000,000 cubic yards *Interchange Option*: Net import: 220,000 cubic yards Export: 3,100,000 cubic yards Import: 5,300,000 cubic yards **Mitigation**: Fill placed within the Rouchleau Pit will be reviewed with MPCA and will meet specifications for the source and nature of the fill (i.e., use of clean fill; use of mining by-products only if low in sulfides)	**Impact:** *Intersection Option*: Net export: 480,000 cubic yards Export: 650,000 cubic yards Import: 170,000 cubic yards *Interchange Option*: Net export: 255,000 cubic yards Export: 625,000 cy Import: 370,000 cy **Mitigation**: Fill placed within the Rouchleau Pit will be reviewed with MPCA and will meet specifications for the source and nature of the fill (i.e., use of clean fill; use of mining by-products only if low in sulfides)	**Impact:** Straight Option *Intersection Option*: Net export: 95,000 cubic yards Export: 725,000 cubic yards Import: 630,000 cubic yards *Interchange Option*: Net import: 150,000 cubic yards Export: 700,000 cubic yards Import: 850,000 cubic yards Curved Setback Option *Intersection Option*: Net export: 0 cubic yards Export: 700,000 cubic yards Import: 700,000 cubic yards *Interchange Option*: Net import: 245,000 cubic yards Export: 680,000 cubic yards Import: 925,000 cubic yards **Mitigation**: Fill placed within the Rouchleau Pit will be reviewed with MPCA and will meet specifications for the source and nature of the fill (i.e., use of clean fill; use of mining by-products only if low in sulfides)
Geotechnical and Earthborne Vibration		No impact	**Impact:** Stability and settlement of existing fill material a concern; proximity to mine blasting (located within active mine) **Mitigation**: Special design would be required for slope stability	**Impact:** Stability and settlement of existing submerged haul road a concern; future proximity to mine blasting **Mitigation**: Special design would be required for slope stability	**Impact:** Potential settlement issues; bridge may be susceptible to vibrations from nearby blasting **Mitigation**: Special design would be required for bridge stability	**Impact:** Potential settlement issues; bridge may be susceptible to vibrations from nearby blasting **Mitigation**: Special design would be required for bridge stability
Climate Change		No impact	No impact	No impact	No impact	No impact
Construction Impacts	Visual and Aesthetics	**Impact:** Temporary impacts related to visibility of construction workers and equipment when removing existing US 53 pavement **Mitigation**: None proposed	**Impact:** Temporary impacts related to visibility of construction workers and equipment **Mitigation**: None proposed			
	Economics and Business	**Impact:** Temporary access restrictions during construction **Mitigation**: Manage business impacts during construction	**Impact:** Temporary access restrictions during construction **Mitigation**: Manage business impacts during construction			
	Utilities	**Impact:** Temporary interruptions in service **Mitigation**: Provide notice to utility operators early	**Impact:** Temporary interruptions in service **Mitigation**: Provide notice to utility operators early			
	Wetlands	No impact	No additional impact			

Note: The Existing US 53 Alternative is not included in this table because it essentially resulted in no impacts except right-of-way and economic/business impacts, which are summarized on page ES-10.

Impact		No Build Alternative	Alternative M-1	Alternative E-1A RSS Option	Alternative E-1A Bridge Option	Alternative E-2
	Noise	**Impact:** Unavoidable noise impacts related to construction equipment **Mitigation**: Standard MnDOT construction noise practices	**Impact:** Unavoidable noise impacts related to construction equipment **Mitigation**: Standard MnDOT construction noise practices			
	Air Quality	**Impact:** Temporary increase in dust/airborne particles; minimal impacts related to emissions from construction equipment **Mitigation:** Standard dust control BMPs such as watering would be implemented	**Impact:** Temporary increase in dust/airborne particles; minimal impacts related to emissions from construction equipment **Mitigation:** Standard dust control BMPs such as watering would be implemented			
	Hazardous and Regulated Materials	No impact	**Impact:** Unidentified contaminants, taconite tailings or other materials may be encountered **Mitigation**: Handling of regulated materials/wastes per management plan, response action plan, demolition plan, and MnDOT Guidance documents			
	Excess Materials	**Impact:** Asphalt/concrete disposal **Mitigation**: Disposal of excess material per approved disposal plan	**Impact:** Import of construction fill and removal of unusable soils **Mitigation**: Disposal of excess material per approved disposal plan			
	Geotechnical and Earthborne Vibrations	No impact	**Impact:** Blasting, pile driving, compacting, and/or pavement breaking or operation of construction equipment may result in temporary earthborn vibrations that could affect homes **Mitigation**: Vibration monitoring would be used. Blasting may be required for each Build Alternative, which could result in some additional temporary road closures similar to those experienced for mine blasting. However, much of the construction for the Build Alternatives is on new alignments and can be constructed with minimal disruption to current US 53 travelers. Blasting, when needed, will be scheduled for minimal disruption.			
	Stormwater	**Impact:** Potential for erosion during existing US 53 roadway removal **Mitigation**: NPDES Stormwater permit for construction activity, including BMPs, temporary construction measures, and erosion control plan, would be acquired and complied with throughout construction. After construction, all disturbed areas would be sodded or seeded.	**Impact:** Potential for erosion during construction **Mitigation**: NPDES Stormwater permit for construction activity, including BMPs, temporary construction measures, and erosion control plan, would be acquired and complied with throughout construction. After construction, all disturbed areas would be sodded or seeded.			
	Water Supply/ Water Body Modification	No impact	**Impact:** Potential for construction dewatering/appropriation for Rouchleau Pit activities for Alternatives E-1A and E-2 **Mitigation**: NPDES Stormwater permit for construction activity, including BMPs, temporary construction measures, and erosion control plan, would be acquired and complied with throughout construction. DNR water appropriation permit may identify mitigation measures. Dewatering discharge options would be considered water transfers to waters of the state and would not be subject to MPCA water quality permitting, provided that there is no intervening use of the water and no pollutants are introduced.			
Short-Term Use and Long-Term Productivity		Substantial long-term transportation inefficiencies	The long-term transportation service and efficiency benefits of the Build and Existing US 53 Alternatives would outweigh short-term adverse impacts to the physical/natural environment. Short-term impacts to the natural environment would be mitigated to alleviate long-term consequences. Would result in the short-term use of resources, but short-term use of these resources is consistent with long-term productivity of the area			
Irreversible and Irretrievable		Increased energy consumption and financial resources for travelers and communities due to increased travel time	One-time expenditure of irretrievable state and federal funds, considered long-term investment; land used for the project is considered an irreversible commitment during the time period that the land is used for a highway facility			
Total Capital Costs for Construction		$1-2 million	$315-450 million	*Intersection Option:* $195-300 million *Interchange Option:* Additional cost of $4 million	*Intersection Option:* $175-270 million *Interchange Option:* Additional cost of $4 million	*Intersection Option (with Straight Option and Curved Setback Option):* $180-240 million *Interchange Option (with Straight Option and Curved Setback Option):* Additional cost of $4 million

ES.6 Studies in Process/Unresolved Issues

Many studies have been conducted to support the analysis needed for this Draft EIS. A list of those studies is provided in Table ES-2. There are a few studies that remain in progress, which will be used to inform final design of the preferred alternative and the project cost estimates. These include:

- Long-eared bat survey report
- Estimate of In-Situ Non-Ferrous Resources: Preliminary Results for E-1A and E-2 Options
- Estimate of In-Situ Ferrous Resources: Preliminary Results for E-1A and E-2 Options

Table ES-2. Reports Prepared for the US 53 Relocation Project Virginia to Eveleth

Author	Title	Date	Status	Location[A]
Social, Economic, and Environmental Impact Studies				
Braun Intertec	Subsurface Taconite Assessment and Drilling Report	2012	Final	Appendix I
CH2M Hill, Inc.	Highway 53 M-1 Alignment Air Quality Mitigation Assessment	2013	Final	Appendix E
CH2M Hill, Inc.	Traffic Analysis Technical Report	2013	Final	Project website
HDR Engineering, Inc.	TH 53 Relocation Alternative E-1A Reinforced Soil Slope (RSS) Construction Option Water Management Study	2014	Final	Appendix G
Kimley-Horn and Associates, Inc.	Alternatives Development Report	2014	Final	Appendix K
Kimley-Horn and Associates, Inc.	Water Resources Technical Report	2013	Final	Appendix J
Kimley-Horn and Associates, Inc.	US 53 Virginia to Eveleth: Summary of Existing Water Appropriation Permits and Intake Locations within the Study Area	2013	Final	Appendix G
Landscape Research, LLC	Phase I and II Architectural History Evaluation for the TH 53 Relocation, Virginia, St. Louis County, Minnesota	2012	Final	Project website
Landscape Research, LLC	Phase I and II Historic Resources Evaluation for the TH 53 Relocation Alternatives E-1A and E-2A, Virginia, St. Louis County, Minnesota	2013	Final	Project website
McComb Group, Ltd. and SEH, Inc.	Highway 53 Relocation Economic Impact Study	2014	Final	Project website
Peer Engineering, Inc.	Phase I Environmental Site Assessment, S.P. 6918-80, Trunk Highway 53, Virginia to Eveleth, Minnesota	2013	Final	Project website
Peer Engineering, Inc.	Phase II Investigation Results, Trunk Highway 53, Virginia, Minnesota	2013	Final	Project website
SBP Associates, Inc.	Noise Impacts Technical Report	2014	Final	Project website
SEH, Inc.	Highway 53 Relocation Project – Benefit Cost Analysis	2014	Final	Available upon request
Two Pines Resource Group, LLC	Phase I and II Archaeological Investigations for the Trunk Highway 53 Relocation Project, Virginia to Eveleth, St. Louis County, Minnesota	2012	Final	Project website

Author	Title	Date	Status	Location[A]
Two Pines Resource Group, LLC	Phase I and II Archaeological Investigations for the Trunk Highway 53 Relocation Project (Alternatives E-1, E-1A, and E-2A), Virginia to Eveleth, St. Louis County, Minnesota	2013	Final	Project website
Engineering Studies				
Gale-Tec Engineering, Inc.	Preliminary Geotechnical Engineering Report for TH 53 Relocation: E-1A Alignment – Embankment	2014	Final	Project website
Gale-Tec Engineering, Inc.	Preliminary Geotechnical Engineering Report for TH 53 Relocation: M-1 Foundation	2013	Final	Project website
HDR Engineering, Inc.	Proposed TH 53 M-1 (and E-2) Alignment, Virginia, MN: Report of Seismic Study of Mine Blast Induced Vibrations	2013	Final	Project website
Kimley-Horn and Associates, Inc.	Structural Cost Estimate for Elevated Tunnel for US 53 Alternative M-1 Air Quality Mitigation	2013	Final	Appendix E
Scoping Documents				
Minnesota Department of Transportation	US Highway 53 Virginia to Eveleth Amended Scoping Decision Document (State Project SP 6918-80)	2013	Final	Project website
Minnesota Department of Transportation	US Highway 53 Virginia to Eveleth Scoping Decision Document (State Project SP 6918-80)	2012	Final	Project website
Minnesota Department of Transportation	US Highway 53 Virginia to Eveleth Scoping Document/Draft Scoping Decision Document (State Project SP 6918-80)	2012	Final	Project website

[A] The project website is http://www.dot.state.mn.us/d1/projects/hwy53relocation/index.html.

ES.7 Costs/Funding

ES.7.1 Estimated Costs

There are a number of factors that were included in developing a preliminary estimate of costs for the alternatives evaluated in this Draft EIS. These include estimates for:

- Construction: includes preliminary estimates for mobilization, removals, excavation, materials (i.e., pavement, aggregate), traffic control/signing and striping, storm sewer and drainage, turf establishment and erosion control, bridges, culverts, retaining walls, noise walls, lighting, and traffic signals, and other miscellaneous construction costs. Also includes 12 percent for professional services necessary to complete construction. Construction costs were inflated to 2015 dollars to reflect anticipated year of construction.
- Right-of-Way/Land/Mitigation: includes estimated right-of-way acquisition (permanent; greater than 99 years), relocation costs, air quality mitigation, mine operating expenses, mineral rights, and other compensation

Estimates for unit costs were reviewed and evaluated based on identified risks for cost variation, and a Monte Carlo simulation[9] was used to develop estimated cost ranges for each alternative based on these

[9] Monte Carlo simulation is a computerized mathematical technique that allows for risk in quantitative analysis and decision making to be taken into account. It furnishes the decision-maker with a range of possible outcomes and the probabilities they will occur for any choice of action.

risks. Specific unit costs for ferrous and non-ferrous resources were not available at the time of this estimate and therefore were not specifically included; however, the cost ranges were set to cover a range of risks associated with these and other unknown costs and/or variability in cost factors. Preliminary cost ranges for each of the alternatives, separated into the construction and right-of-way/land/mitigation cost categories described above, are provided in Table ES-3. The ranges shown are for the purpose of comparing alternatives at an order-of-magnitude level and are based on concept-level footprints and information available at the time of Draft EIS preparation. Additional cost factors, such as operation and maintenance costs, have not been included in these estimates at this time.

Refined cost information for the preferred alternative will be report in the Final EIS, as available. The ferrous and non-ferrous resource valuations are underway and will be used in right-of-way negotiations. This analysis will estimate value based on the amount and quality (level of oxidation) of ferrous resources present, as well as its accessibility/location. Samples are being evaluated for indicators of ferrous and non-ferrous resources and potential for these resources within the areas of evaluation for each alternative.

Table ES-3. Range of Total Capital Costs for Construction[A]

Alternative	Construction Cost	Right-of-Way/Land/ Mitigation Cost	Total Capital Costs for Construction
No Build Alternative	$1-2 million	$0	$1-2 million
Existing US 53 Alternative	$0	$400-600 million	$400-600 million
Alternative M-1	$235-350 million	$80-100 million	$315-450 million
Alternative E-1A RSS Option[B]	$185-280 million	$10-20 million	$195-300 million
Alternative E-1A Bridge Option	$165-250	$10-20 million	$175-270 million
Alternative E-2 Straight Option	$165-215 million	$15-25 million	$180-240 million
Alternative E-2 Curved Setback Option	$165-215 million	$15-25 million	$180-240 million

[A] Based on 2014 dollars; construction costs inflated to 2015 dollars. Does not include costs for maintenance/operation.
[B] Future mine access bridge anticipated to add approximately $12 million to the cost of the Alternative E-1A RSS Option (2015 dollars).

ES.7.2 Available Funding

ES.7.2.1 Estimate of Cost

The estimated total project cost of the preferred alternative (in 2015 dollars) is $180 to $240 million.

ES.7.2.2 Anticipated Funding

The funds allocated for the proposed project (SP 6918-80 and associated projects) are a combination of federal and state funds.

- Federal: $30 million (National Highway Performance Program – NHPP)
- State Trunk Highway Bonds: $34 million (Chapter 152)

MnDOT currently has $30 million in federal funds and $34 million in state bonds shown for preliminary engineering and initial construction in the approved Fiscal Year 2015-2018 State Transportation Improvement Program (STIP). These funds will be used both for preliminary engineering and for actual construction.

At present there is a gap between the identified funding and the range for the total project cost ($240 million for the preferred alternative). Since maintaining this connection is critical to the state of Minnesota it is likely that the funding gap may be addressed through legislation in the upcoming 2015 legislative session beginning January 6, 2015. Without legislative action the funding gap would be addressed through major changes to the existing program, resulting in MnDOT's failure to meet

performance outcomes identified in the Minnesota State Highway Investment Plan (MnSHIP),[10] or accepting the No Build Alternative for this project.

The gap between the funding dedicated to the project as programmed in the current STIP and what it would take to build the preferred alternative would have to be programmed in an approved STIP before the lead federal agency (FHWA) could issue a Record of Decision for this project.

ES.8 Selection of a Preferred Alternative

Based on the analysis conducted for and presented in this Draft EIS, MnDOT has identified a preferred alternative: Alternative E-2. Each alternative evaluated had unique and challenging issues and a combination of impacts. A summary of the rationale used to reach this conclusion is outlined below for each alternative, starting with the preferred alternative. See Section 10.3 for more details.

ES.8.1 Preferred Alternative

Alternative E-2 includes a 1,300-foot long bridge with 180-foot or taller bridge piers within the Rouchleau Pit. It is recommended as the preferred alternative based on its ability to meet the project Purpose and Need and minimize impacts to social, economic, and environmental resources, and on the basis of a number of technical and cost considerations, as described below. Both the Straight Option and Curved Setback Option are being carried forward with the preferred alternative for further refinement; however, one will be identified as the selected option in the Final EIS based on public and agency comment, refinement of the design, and overall environmental impacts.

MN 135 and US 53 are currently connected via an interchange. The Highway Safety Manual (HSM) was used to compare crash rates for the Intersection and Interchange Options. The results were essentially the same for the two options at the level of the HSM analysis for the years 2009, 2017, and 2037. Both options have similar levels of service with the exception of the southbound movement in the PM peak hour for the Intersection Option.

While the results were essentially the same between the Intersection Option and Interchange Option at the level of the HSM analysis for the years 2009, 2017, and 2037, this analysis does not account for the grade difference for the east approach between these options. With the Interchange Option, the grade of MN 135 from the east can be reduced from six percent to two percent as compared to the Intersection Option. The Intersection Option would require a much steeper grade (six percent) at the east approach, which would be expected to result in increased difficulty for loaded semi-trucks turning left onto US 53 in the winter (November to April). This difficulty would increase the potential for semi-truck/vehicle conflict at the intersection, which could increase crash risk and result in the intersection being the less desirable option based on safety. This reduction in grade would also reduce the earthwork and rock cut quantities required for construction. Maintenance of existing access and minimizing delays at US 53 and MN 135 has been strongly supported by the public during public meetings. Therefore, the Interchange Option was selected for the preferred alternative over the Intersection Option.

Benefits of the preferred alternative include:

- Mineral Rights: Avoids the permit to mine/environmental setting boundary
- Business Risks: Has no risk for air quality compliance to impact mine operations
- Water Supply: Avoids the major dewatering that would be required for the Alternative E-1 RSS Option
- Wetlands: Both the Straight and Curved Setback Options have fewer wetland impacts than Alternative E-1A (RSS or Bridge Option). The Straight Option has fewer wetland impacts than Alternative M-1, and the Curved Setback Option has wetland impacts similar to Alternative M-1.

[10] Available at http://www.dot.state.mn.us/planning/mnship/pdf/mnship-full-doc.pdf

- Noise: A noise wall is preliminarily cost effective at affected residential locations
- Right-of-Way: Impacts the fewest number of parcels of any Build Alternative
- Engineering and Constructability Considerations:
    - Shorter bridge than the Alternative E-1A Bridge Option
    - Only two pier foundations required, compared to up to eight for the Alternative E-1A Bridge Option
    - Less work required to construct in the water/ice of the Rouchleau Pit
    - Avoids 40 mph curve needed for Alternative E-1A
    - Has a better sight distance northbound from the bridge to the 2nd Avenue traffic signal than Alternative E-1A
    - Piers to be constructed in less than 30 feet of mine waste fill as compared to Alternative E-1A that would have up to 100 feet of mine waste fill
- Schedule: Has the least schedule risk due to engineering constructability considerations noted above as well as considerations related to owner and operator property interests
- Cost: Costs significantly less than the Existing US 53 Alternative and Alternative M-1, and the upper range of the cost estimate is less than that for either the Alternative E-1A RSS Option or Bridge Option

The negative effects of this alternative include:

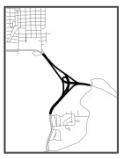
- Mineral Rights: More mineral encumbrance than Alternative E-1A; requires greater impact to School Trust land and, therefore, has potential for greater impact to Vermillion Gold, Inc.'s lease than Alternative E-1A
- Section 4(f): Impacts the Off-Highway Vehicle Recreation Area (OHVRA); however, the impact is negligible and meets the definition of de minimis
- Vegetation/Cover Types: Impacts more acres of forest than other alternatives; however, impacts to wildlife are negligible
- Unknowns: Requires additional geotechnical characterization at pier locations

ES.8.2 Other Alternatives Considered

ES.8.2.1 No Build Alternative (Easement Agreement Area Closed)

The No Build Alternative was carried forward for analysis as the "do nothing alternative" because it was required for comparison to other alternatives. It is not identified as the preferred alternative since other Build Alternatives (i.e., M-1, E-1A, and E-2) would meet all of the identified project needs with less severe social, economic, and environmental impacts.

ES.8.2.2 Existing US 53 Alternative (Easement Agreement Area Remains Open)



The Existing US 53 Alternative would have substantially greater uncertainty and cost than any of the Build Alternatives; therefore, it was not selected as the preferred alternative.

ES.8.2.3 Alternative M-1

Alternative M-1 has feasibility issues and would result in severe negative impacts that are not offset by the benefits in minimization; therefore, it was not identified as the preferred alternative.

ES.8.2.4 Alternative E-1A

RSS Option

The Alternative E-1A RSS Option has feasibility issues and would result in severe schedule and constructability impacts (i.e., it is unlikely to meet the timeline due to dewatering, with substantial risks for additional delays due to weather, mine waste fill, and design requirements to mitigate constructability concerns) that are not offset by the benefits in minimization of environmental impacts; therefore, it was not identified as the preferred alternative.

Bridge Option

The Alternative E-1A Bridge Option has feasibility issues and would result in severe negative schedule impacts (i.e., it would require the greatest construction effort to meet the timeline, with substantial risks for delays due to weather, mine waste fill, and design requirements to mitigate constructability concerns) that are not offset by the benefits in minimization of environmental impacts; therefore, it was not identified as the preferred alternative.

ES.9 Permits and Approvals

Permits and approvals that may be required for the proposed project are listed in Table ES-3.

Table ES-3. Agency Permits and Approvals

Agency	Permit/Approval
Federal	
Federal Highway Administration	EIS Approval EIS Record of Decision Section 4(f) Determinations Section 106 Tribal Coordination Section 106 Cultural Resources Determinations Section 7 Threatened and Endangered Species Act Determination
U.S. Army Corps of Engineers	Section 404 Permit (fill in U.S. Waters)
State	
Minnesota Department of Transportation	Scoping Decision Document EIS Approval EIS Adequacy Determination Wetland Conservation Act (WCA) Approvals
Minnesota Department of Natural Resources	Water Appropriation Permit, if needed
Minnesota Pollution Control Agency	National Pollution Discharge Elimination System (NPDES) Construction Stormwater Permit Section 401 Water Quality Certification
State Historic Preservation Office	Section 106 Consultation
Local	
City of Virginia	Municipal Approval of roadway plans

ES.10 Schedule

As required by the federal and state environmental review process, copies of the Draft EIS have been distributed to appropriate local, regional, state, and federal agencies as well as the public for their review and comment. Public comment on the content of the Draft EIS and the identified preferred alternative will be taken into account in the preparation of the Final Environmental Impact Statement (Final EIS) and Record of Decision (ROD).

The anticipated schedule for this process is as follows (subject to revision):

- Draft EIS published with a 45-day comment period – December 2014
- Final EIS and Record of Decision – fall 2015

ES.11 Opportunities for Public Comment

The Draft EIS serves as the primary document to facilitate review by federal, state, and local agencies and the general public of the proposed project. This Draft EIS will be circulated for review to interested parties, including private citizens, community groups, the business community, elected officials, and public agencies in accordance with federal and state requirements. Public hearings will be held to provide a forum for agency and citizen participation and comment. Responses to comments received during circulation of the Draft EIS will be responded to and both the comments and responses will be documented in the Final EIS.

Comments on the Draft EIS will be accepted from December 22, 2014 through February 5, 2015 and may be submitted through email, mail, or in person at the public open house that will be held for the US 53 project.

The address to which written comment should be sent is:

Pat Huston, Project Manager
MnDOT District 1
1123 Mesaba Avenue
Duluth, MN 55811
Patrick.Huston@state.mn.us

The public open house is scheduled as follows:

Thursday, January 22, 2015
6:00-9:00 p.m.
Mountain Iron Community Center
8586 Enterprise Drive South, Mountain Iron, MN 55768

The Draft EIS and supporting documents are available on the project website at http://www.dot.state.mn.us/d1/projects/hwy53relocation/index.html. Hard copies can be reviewed at the following locations:

- Virginia Public Library, 215 5th Avenue South, Virginia, MN 55792
- Eveleth Public Library, 614 Pierce Street, Eveleth, MN 55734
- Gilbert Public Library, 17 North Broadway, Gilbert, MN 55741
- Mountain Iron Public Library, 5742 Mountain Avenue, Mountain Iron, MN 55768
- Duluth Public Library, 520 West Superior Street, Duluth, MN 55802
- Hennepin County Library – Minneapolis Central, 300 Nicollet Mall, Minneapolis, MN 55401
- Legislative Reference Library, 645 State Office Building, Saint Paul, MN 55155