



BOLTON & MENK, INC.[®]

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MEMORANDUM

Date: January, 2015
To: Kristina Handt
City of Scandia
From: Chris Chromy, P.E., P.T.O.E.
Jeremy Melquist, EIT
Subject: Zavoral Mine Traffic Summary for 2015 AOP
Scandia, MN

A traffic summary for the reports and analysis that Bolton & Menk has completed in 2014 is needed for the 2015 AOP (Annual Operating Permit).

Video counts were taken at the TH 97 and CR 91 (Lofton Ave) intersection in February 2014 to determine if any safety improvements were needed. Analysis indicated that right turning trucks onto Lofton Ave tended to turn into the opposing lane if there is no opposing traffic, but had no problem staying in their lane when there was opposing traffic. Trucks turning left onto TH 97 from Lofton Ave occasionally caused some vehicles heading eastbound on TH 97 to slow down for the trucks, but did not cause any significant problems. The recommendations from that report, *Truck Highway 97 & County Road 91 Traffic Monitoring Memo*, included to inform truck drivers to stay in their lanes during turning movements. If they continue to have difficulty staying in their lanes, the recommendation was to either revise the intersection to accommodate large trucks or to modify the permit to restrict the haul to the shorter wheel based single unit trucks. In 2014, a reclamation project was completed on CR 91 from north of the TH 97 & CR 91 intersection to the county limits. Two Cobra lights were also installed at the TH 97 & CR 91 intersection in 2014. Proposed improvements for 2015 include designated left turn lanes at this intersection. These intersection improvements may help increase levels of safety.

As a requirement of the Annual Operating Permit, crashes on the Trunk Highway (TH) 97 corridor are being monitored every 6 months. Crashes are being reviewed along TH 97, between CSAH 15 (Manning Trail) and TH 95, and along CR 91 (Lofton Ave), between TH 97 and 228th St.

The tool used to review crashes, The Minnesota Crash Mapping Analysis Tool, currently has crash information updated to October 31, 2014. The tool has a lag time between crash occurrence and data entry into the database of approximately 2 to 3 months, therefore we don't have crash information past October 31, 2014. Since the mine opened (November 25th, 2013), there have been a total of eight crashes on the TH 97 corridor and no crashes on the CR 1 (Lofton Ave) corridor. The attached figure outlines the crashes on this corridor since the mine has opened. The individual crash reports are also included. Of the eight reported crashes, six crashes happened when the hauling was in operation (Monday to Thursday 7:00 AM – 7:00 PM, Friday 7:00 AM – 2:00 PM). Three of these crashes were single vehicle accidents (collision with deer/sign pole/rollover). The other three crashes each involved two vehicles (right angle,



rear end, head on). The severity of the six crashes included one possible injury and five property damage crashes. The TH 97 segment crash rate since the mine opened is 0.58. This crash rate is lower than the TH 97 5-year base crash rate of 0.72, identified in the *Truck Highway 97 & Truck Highway 95 (Zavoral Mine) Traffic Monitoring Memo*. Therefore, safety on the corridor does not appear to be comprised due to the trucking operations at Zavoral Mine.

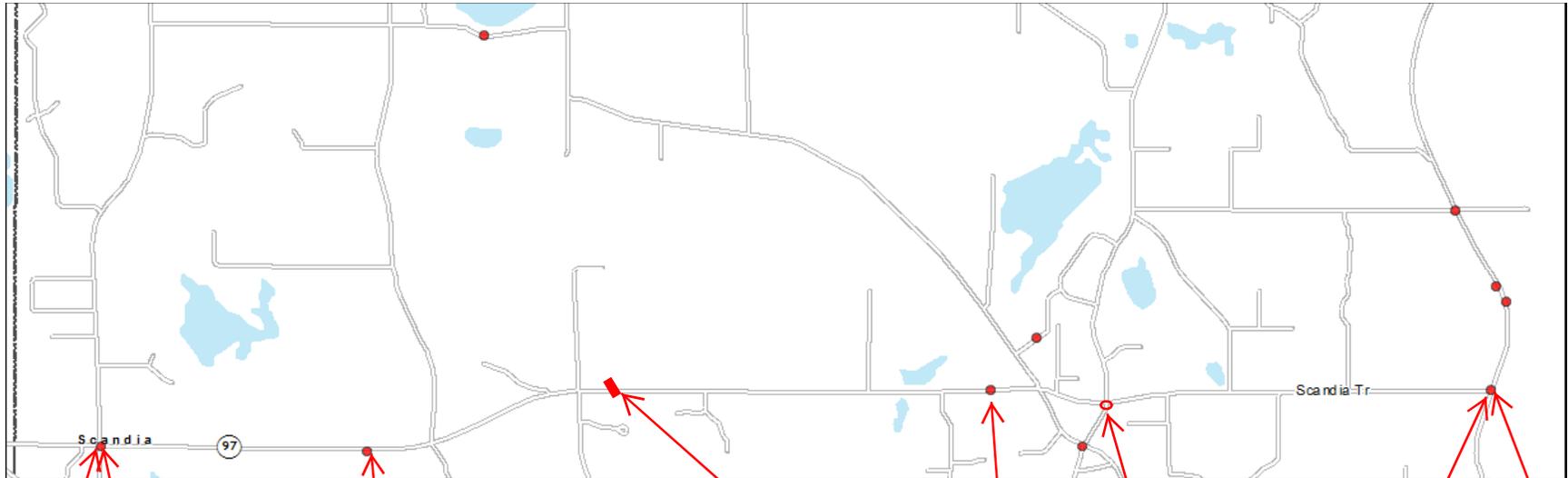
On January 8, 2014, a haul truck from the Zavoral Mine was involved in a collision. The haul truck was rear ended by a passenger car at the TH 95 & TH 97 intersection and was not considered responsible for this crash. The haul truck was at a complete stop on eastbound TH 97 at the intersection with TH 95, preparing to enter the Zavoral Site when the passenger vehicle approaching the intersection from the west allegedly slid into the rear-end of the hauling truck. The collision was deemed a result of the slippery conditions because of the active snowfall on that day. This crash is not listed in the individual crash reports because no accident report was filed due to no injuries and minor damage to the vehicles, however, it was included in the crash totals.

For review in the AOP, truck warning signs may be beneficial at intersections where haul trucks are turning/crossing to warn motorists of potential trucks. The intersection of TH 97 at TH 95 and TH 97 at Lofton Ave would benefit the most from truck warning signs due to the haul truck movements at these intersections. An application to install truck warning signs at the requested locations was submitted to MnDOT, but Tiller had not received a decision from MnDOT when the 2014 AOP was approved.

In conclusion, safety on the corridor does not appear to be compromised due to trucking operations at Zavoral Mine, however, if any traffic issues are identified in 2015, video analysis may be required to verify the problem and improvements necessary. Proposed improvements to the TH 97 & CR 91 intersection may increase safety and help mitigate trucks turning into opposing lanes. Further safety measures include installing truck warning signs at the above intersections. Crashes will continue to be monitored every 6 months.

11/25/2013 - 10/31/2014

TH 97 Corridor - Crash Update



9/25/14 12:00 PM
- Head On
- 2 Pickup Trucks
- (EB/WB)
- Property Damage

1/14/14 12:10 PM
- Collision with Sign pole
- Passenger Car (WB)
- Illegal Speed
- Property Damage

12/19/13 12:10 PM
- Collision with deer
- Passenger Car
- Possible Injury

4/16/14 4:40 PM
- Rollover
- Pickup Truck (NB)
- Illegal Speed
- Property Damage

3/20/14 11:40 AM
- Right Angle
- 2 Passenger Cars (SB & EB)
- Property Damage

4/27/14 11:58 PM
- Collision with deer
- Passenger Car
- Property Damage

9/21/14 7:18 PM
- Right Angle
- SUV (EB)
- Passenger Car (SB)
- Property Damage

1/8/15 12:00 PM
- Rear-End
- Passenger Car (EB)
- Hauling Truck (EB)
- Slippery Conditions

Crash ID: 140050152 **Date:** 12/19/2013 **Time:** 1722
County: WASHINGTON **City:** SCANDIA

Sys: 03-MN
Route: 00000097 009+00.519

Severity: POSSIBLE INJURY	First Event: ON ROADWAY
Road Type: 2 LANES UNDIV 2_WAY	To Junction: NON-JUNCTION
Road Char: STRAIGHT AND GRADE	Traffic Device: NOT APPLICABLE
Crash Type: COLL W/DEER	Speed Limit: 55
Surf Cond: SNOW	Diagram: OTHER
Light Cond: DARK - NO STREET LIGHTS	Officer:
Weather 1: CLOUDY	Reliability: LESS CONFIDENT
Weather 2: NOT SPECIFIED	# of Vehicles: 1.00

Unit 1	Unit 2	Unit 3
Trav Dir: EAST		
Veh Act: STRAIGHT AHEAD		
Veh Type: SPORT UNTILITY VEHICLE		
Age: 50		
Gender: F		
Cond: NORMAL		
Cont Fact NO IMPROPER DRIVING		
Cont Fact NOT SPECIFIED		

Crash ID: 140150291 **Date:** 01/14/2014 **Time:** 1211
County: WASHINGTON **City:** SCANDIA

Sys: 03-MN
Route: 00000097 008+00.488

Severity: PROPERTY DAMAGE	First Event: OFF ROADWAY ON ROADSIDE
Road Type: 3 LANES UNDIVIDED	To Junction: NON-JUNCTION
Road Char: CURVE AND GRADE	Traffic Device: NOT APPLICABLE
Crash Type: COLL W/SIGN POLE	Speed Limit: 55
Surf Cond: SNOW	Diagram: OTHER
Light Cond: DAYLIGHT	Officer:
Weather 1: CLOUDY	Reliability: LESS CONFIDENT
Weather 2: NOT SPECIFIED	# of Vehicles: 1.00

Unit 1	Unit 2	Unit 3
Trav Dir: W		
Veh Act: STRAIGHT AHEAD		
Veh Type: VAN OR MINIVAN		
Age: 19		
Gender: F		
Cond: NORMAL		
Cont Fact ILLEGAL SPEED		
Cont Fact WEATHER		

Crash ID: 140790167 **Date:** 03/20/2014 **Time:** 1143
County: WASHINGTON **City:** SCANDIA

Sys: 03-MN
Route: 00000097 007+00.363

Severity: PROPERTY DAMAGE	First Event: ON ROADWAY
Road Type: 2 LANES UNDIV 2_WAY	To Junction: 4-LEGGED INTERSECTION
Road Char: STRAIGHT AND LEVEL	Traffic Device: STOP SIGN 4-WAY
Crash Type: COLL W/MV IN TRANSPORT	Speed Limit: 55
Surf Cond: DRY	Diagram: RIGHT ANGLE
Light Cond: DAYLIGHT	Officer:
Weather 1: CLOUDY	Reliability: CONFIDENT
Weather 2: NOT SPECIFIED	# of Vehicles: 2.00

	Unit 1	Unit 2	Unit 3
Trav Dir:	S	E	
Veh Act:	STRAIGHT AHEAD	STRAIGHT AHEAD	
Veh Type:	PASSENGER CAR	PASSENGER CAR	
Age:	72	58	
Gender:	F	M	
Cond:	NORMAL	NORMAL	
Cont Fact	NO IMPROPER DRIVING	FAIL TO YIELD ROW	
Cont Fact	NOT SPECIFIED	NOT SPECIFIED	

Crash ID: 141070232 **Date:** 04/16/2014 **Time:** 1641
County: WASHINGTON **City:** SCANDIA

Sys: 03-MN
Route: 00000095 088+00.563

Severity: PROPERTY DAMAGE	First Event: ON ROADWAY
Road Type: 2 LANES UNDIV 2_WAY	To Junction: T-INTERSECTION
Road Char: STRAIGHT AND GRADE	Traffic Device: STOP SIGN OTHER
Crash Type: OVERTURN / ROLLOVER	Speed Limit: 55
Surf Cond: WET	Diagram: NOT APPLICABLE
Light Cond: DAYLIGHT	Officer:
Weather 1: CLOUDY	Reliability: CONFIDENT
Weather 2: SNOW	# of Vehicles: 1.00

	Unit 1	Unit 2	Unit 3
Trav Dir:	N		
Veh Act:	STRAIGHT AHEAD		
Veh Type:	PICKUP TRUCK		
Age:	24		
Gender:	M		
Cond:	NORMAL		
Cont Fact	DISTRACTION		
Cont Fact	ILLEGAL SPEED		

Crash ID: 141270098 **Date:** 04/27/2014 **Time:** 2358
County: WASHINGTON **City:** SCANDIA

Sys: 03-MN
Route: 00000097 011+00.119

Severity: PROPERTY DAMAGE	First Event: ON ROADWAY
Road Type: 2 LANES UNDIV 2_WAY	To Junction: NON-JUNCTION
Road Char: STRAIGHT AND LEVEL	Traffic Device: NOT APPLICABLE
Crash Type: COLL W/DEER	Speed Limit: 55
Surf Cond: WET	Diagram: HEAD ON
Light Cond: DARK - STREET LIGHTS ON	Officer:
Weather 1: CLEAR	Reliability: CONFIDENT
Weather 2: RAIN	# of Vehicles: 1.00

Unit 1	Unit 2	Unit 3
Trav Dir: W		
Veh Act: STRAIGHT AHEAD		
Veh Type: PASSENGER CAR		
Age: 33		
Gender: F		
Cond: NORMAL		
Cont Fact NO IMPROPER DRIVING		
Cont Fact NOT SPECIFIED		

Crash ID: 142640191 **Date:** 09/21/2014 **Time:** 1918
County: WASHINGTON **City:** SCANDIA

Sys: 03-MN
Route: 00000097 011+00.619

Severity: PROPERTY DAMAGE	First Event: ON ROADWAY
Road Type: 2 LANES UNDIV 2_WAY	To Junction: 4-LEGGED INTERSECTION
Road Char: STRAIGHT AND LEVEL	Traffic Device: OVERHEAD FLASHERS
Crash Type: COLL W/MV IN TRANSPORT	Speed Limit: 50
Surf Cond: DRY	Diagram: RIGHT ANGLE
Light Cond: SUNSET	Officer:
Weather 1: CLEAR	Reliability: CONFIDENT
Weather 2: NOT SPECIFIED	# of Vehicles: 2.00

Unit 1	Unit 2	Unit 3
Trav Dir: S	E	
Veh Act: STRAIGHT AHEAD	STRAIGHT AHEAD	
Veh Type: PASSENGER CAR	SPORT UTILITY VEHICLE	
Age: 49	76	
Gender: F	F	
Cond: NORMAL	NORMAL	
Cont Fact NO IMPROPER DRIVING	FAIL TO YIELD ROW	
Cont Fact NOT SPECIFIED	NOT SPECIFIED	

Crash ID: 142680180
County: WASHINGTON

Date: 09/25/2014
City: SCANDIA

Time: 1204

Sys: 03-MN
Route: 00000097

007+00.363

Severity: PROPERTY DAMAGE
Road Type: OTHER DIVIDED HIGHWAY
Road Char: STRAIGHT AND LEVEL
Crash Type: OVERTURN / ROLLOVER
Surf Cond: DRY
Light Cond: DAYLIGHT
Weather 1: CLEAR
Weather 2: NOT SPECIFIED

First Event: ON ROADWAY
To Junction: NON-JUNCTION
Traffic Device: STOP SIGN 4-WAY
Speed Limit: 55
Diagram: OTHER
Officer:
Reliability: CONFIDENT
of Vehicles: 2.00

	Unit 1	Unit 2	Unit 3
Trav Dir:	W	E	
Veh Act:	STRAIGHT AHEAD	STRAIGHT AHEAD	
Veh Type:	PICKUP TRUCK	PICKUP TRUCK	
Age:	19	48	
Gender:	M	M	
Cond:	NORMAL	NORMAL	
Cont Fact	OTHER	NO IMPROPER DRIVING	
Cont Fact	NOT SPECIFIED	NOT SPECIFIED	

Selection Filter:

WORK AREA: COUNTY_CODE('82') - FILTER: CRASH_YEAR('2013','2014') - SPATIAL FILTER APPLIED

Analyst:

Jeremy Melquist

Notes: