

SITE NUMBER AND NAME: <b>S047 Coleman Bin Wall</b>		HIGHWAY & KM: 3:02, 13.283	PREVIOUS INSPECTION DATE: June 2016	INSPECTION DATE: <b>June 1, 2017</b>
LEGAL DESCRIPTION: 09-07-008-04 W5M 12-08-008-04 W5M	NAD 83 COORDINATES: UTM Northing Easting 11 5500995 679014		RISK ASSESMENT: PF: 8 CF: 8 TOTAL: 64	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): On Hwy 3. 7,830 (west), 8,810 (east), (Ref No. 70060)			CONTRACTOR MAINTENANCE AREA (CMA): 26	

SUMMARY OF SITE INSTRUMENTATION:  None	INSPECTED BY: Chris Gräpel (KCB) Peter Roy (KCB) Ross Dickson (AT) Roger Skirrow (AT) Ammar Zaidi (AT)
LAST READING DATE: n/a	
PRIMARY SITE ISSUE: Sections of a galvanized bin-wall retaining wall supporting the south embankment of Hwy 3 is deteriorating. Several sections are severely corroded and are experiencing backfill material loss from behind the wall.	
APPROXIMATE DIMENSIONS: Bin wall is approximately 70 m long, with 22 sections. The wall is approximately 1.5 to 2 m high.	
DATE OF ANY REMEDIAL ACTION: No recent remedial measures have been undertaken.	

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress		x	Not impacting pavement surface		x
Slope Movement		x	Granular fill material spilling out of wall from behind wall through rusted out voids		x
Erosion		x			
Seepage		x			
Culvert Distress		x			

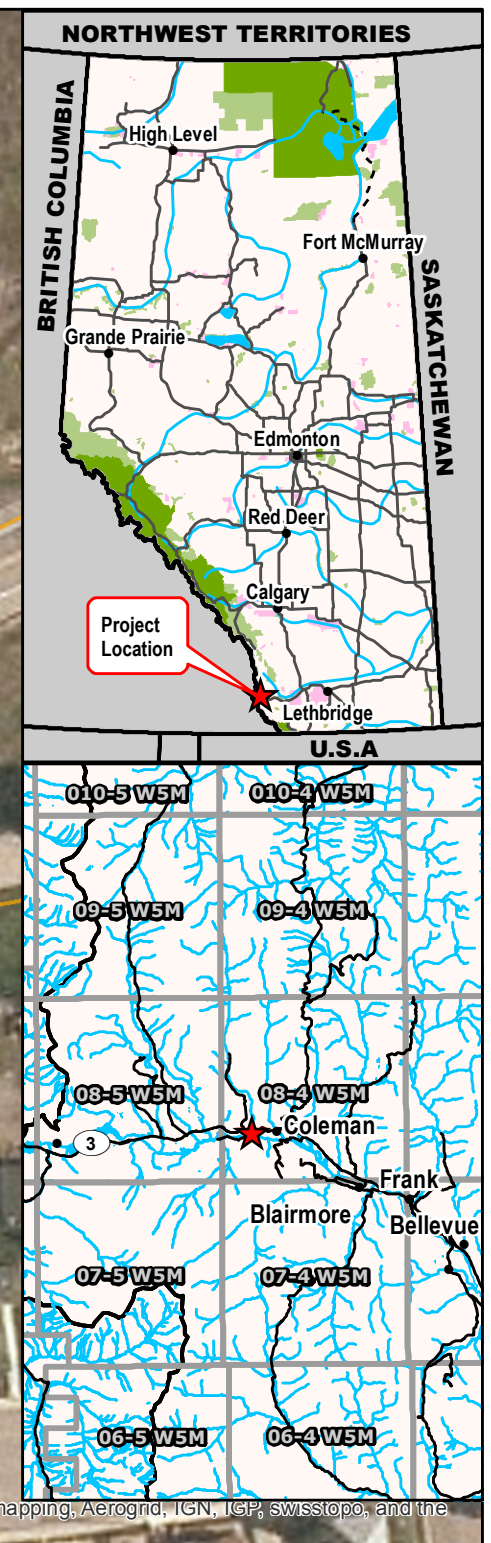
<b>COMMENTS</b>
11 sections of the bin wall have experienced visible corrosion with 8 of those sections having ruptured and backfill material loss from behind the wall through the voids.
A sinkhole is present on the slope just above the top of the bin wall. The sinkhole appears to be due to material loss through the corrosion holes face of the bin wall.
There is a small valley on the opposite (north) side of the highway, generally north of the corroded bin walls.
The corrosion is located only on the bin wall sections located adjacent to a valley, suggesting that groundwater seepage may be corrosive through this area. The reason for the corrosion is not clear, however it could include; drainage from abandoned mine working or piles of slack coal upslope of the bin walls could be acidic, and the soil backfill placed behind the bin walls could have variable geochemical properties which would result in a varying degree of corrosion potential. A sample of the backfill material was taken for testing.
In the short term, jersey barrier should be installed in front of the failing sections of the wall with signage installed indicating a speed reduction, narrow lane and hazard indication. The rate of backfill loss through the voids and short term failure of the bin walls could be reduced by placement of temporary steel plating over the face of the

walls braced with concrete jersey barricades and/or granular fill placed at the toe of the bin walls.

The extent of repair required cannot be assessed now. Based on the degree of deterioration visible from 19 Avenue, it appears that the corroded sections of the bin wall need to be replaced. AT the following options: partial or complete bin wall removal, depending on conditions of exposure of buried structural elements, with replacement with a reinforced earth retaining wall system; and rehabilitate the wall in-situ without removal of the bin walls with corrosion protected tied back pre-cast or cast-in-place concrete panels placed over the front of the bin walls; and a tied-back driven-steel h-pile and timber lagging retaining wall.

Replacement of the bin walls with another reinforced-earth wall could result in the crest of the excavation extending into the east bound land or the use of temporary excavation stabilization such as soil nails to limit the impact on Hwy 3 traffic. Additionally, due to the potential for continued corrosion due to upslope sources of aggressive groundwater, replacement reinforced earth walls will need to incorporate structural elements that do not corrode (such as plastic strips or grids).

A geotechnical investigation should be completed to assess wall backfill materials, foundation materials and groundwater level and chemical composition. The results of the drilling investigation should be reviewed before a design concept is selected for final design.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

**Legend**

— GPS Track (June 1, 2017)



Time: 15:30:59 PM  
Date: June 21, 2017  
File: Z:\A\EDM\A05115A03\ABT Southern Region GRMP\A00 Drawings\2017\Section BIMXD\S047\_170621.mxd

**NOTES:**  
 1. HORIZONTAL DATUM: NAD83  
 2. GRID ZONE: UTM Zone 11N  
 3. IMAGE SOURCE: World Imagery from ESRI  
 ArcGIS Online. Image dated July 15, 2012

CLIENT

*Alberta*  
Transportation

Klohn Crippen Berger

PROJECT SOUTHERN REGION GEOHAZARD RISK MANAGEMENT PROGRAM		
TITLE Site Plan S047 - Coleman Bin Wall Hwy 3:02, km 13.283		
SCALE 1:1,000	PROJECT No. A05115A03	FIG No. 2

**Photo 1** West extent of bin wall. Severe corrosion with backfill spilling from voids. The photo was taken facing north on June 1, 2017.



**Photo 2** East extent of bin wall. Moving from west to east, the corrosion severity decreases. The photo was taken facing northeast on June 1, 2017.



**Photo 4** Voids behind the wall have developed due to loss of material. The photo was taken on June 1, 2017.



**Photo 5** Slope on the south side of the road. Stream outlet at the base of the slope. The photo was taken on June 1, 2017.

