



September 29, 2008

CG25277.B

Alberta Transportation
2nd Floor, 803 Manning Road NE
Calgary, AB T2E 7M8

Attn: Mr. Ross Dickson

**Re: Southern Region Geohazard Assessment Program
Site S4 – Willow Creek, Highway 2:08
2008 Annual Inspection Report**

This letter documents the 2008 annual site inspection of Site S4 – Willow Creek on Highway 2:08, south of Claresholm, AB and approximately 4.7 km north of the Highway 2 bridge over the Oldman River. This site is located on a segment of the west slope of the Willow Creek valley where ongoing landsliding driven by creek erosion along the toe of the slope is causing the slope crest to retrogress westwards towards the northbound lanes of Highway 2.

AMEC Earth & Environmental (AMEC), a division of AMEC Americas Limited, performed this inspection in partial fulfillment of the scope of work for the supply of geotechnical services for Alberta Transportation's (AT's) Southern Region (AT contract CE061/08).

The site inspection was performed on June 26, 2008 by Mr. Andrew Bidwell, P.Eng., and Mr. Bryan Bale, EIT of AMEC in the company of Mr. Ross Dickson and Mr. Roger Skirrow of AT.

BACKGROUND

A general description of the geohazard conditions at this site along with the site geological setting and chronology of previous events, investigations, monitoring and repair work were provided in the Geotechnical File Review (Section A of binder) and summarized in previous annual inspection reports¹.

The landsliding at this site has been monitored by AT and their consultants since 1993. AMEC understands that no repairs have been performed to date. This site has been under greater scrutiny since the summer of 2005 when a relatively large increment of slope crest retrogression occurred. AMEC and Salix Applied Earthcare completed a design during 2007 for a repair consisting of bioengineering measures and erosion protection for the toe of the valley slope in

¹ AMEC report "Southern Region Geohazard Assessment, Annual Assessment Report, 2007", project number CG25263, submitted to AT on November 6, 2007.

the landslide area along with regrading and soil nail reinforcement of the landslide headscarp. At the time of writing, AT has issued the tender for the repair work with the site work planned for the fall of 2008.

SITE OBSERVATIONS

Key observations regarding changes in the site conditions since the 2007 inspection are summarized as follows:

- Approximately 60 m of temporary fenceline has been installed around the segment of the landslide headscarp that is west of the original fenceline, i.e. where the landslide headscarp has retrogressed westwards through the fenceline from the summer of 2005 onwards. Photos S4-1 and S4-2 show the headscarp area. The approximate headscarp location at the time of the June 2008 inspection is shown on Figure S4-1, attached.
- Otherwise, no significant changes in the visual appearance of the site since the 2007 inspection.

ASSESSMENT

The overall assessment of the landslide conditions and risk to the highway at this site is unchanged

The slope crest in the landslide area will continue to retrogress westwards towards the highway in response to the ongoing, naturally occurring slope movement in the middle and lower portions of the west valley slope. It would likely take some time, possibly years, before the slope crest retrogression would directly undermine the northbound lanes of the highway. However, if the landslide movement is left unchecked, a guardrail along the east shoulder of the highway would be required in the near-future due to the proximity of the slope crest to the road.

RISK LEVEL

The current recommended Risk Level for this site, based on AT's general geohazard risk matrix, is as follows:

- Probability Factor of 9 because the landslide is active and westward crest retrogression towards the highway will continue.
- Consequence Factor of 2 for the present location of the landslide relative to the northbound lanes of the highway.

Therefore, the current recommended Risk Level for this site is 18, which is unchanged since the 2005 assessment. It should be noted that until repair measures are implemented to reduce the rate and magnitude of landslide movement, the Consequence Factor will increase over time and the Risk Level will increase correspondingly.

RECOMMENDATIONS

Maintenance and Short Term Measures

- Implement the repair measures (erosion protection and bioengineering measures along the toe of the slope and regrading/soil nail stabilization along the slope crest) in the fall of 2008.

Long Term Measures

- Follow-up visual monitoring of effectiveness of the repair measures, along with annual site inspections for the foreseeable future. This monitoring should include measurements of the minimum offset between the slope crest and the northbound lanes of the highway.

Investigation

No further investigation work for this site is recommended at this time.



CLOSURE

This report has been prepared for the exclusive use of Alberta Transportation for the specific project described herein. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it are the responsibility of such third parties. AMEC Earth & Environmental, a division of AMEC Americas Limited, cannot accept responsibility for such damages, if any, suffered by any third party as a result of decisions made or actions based on this report. This report has been prepared in accordance with accepted geotechnical engineering practices. No other warranty, expressed or implied, is made.

We trust that this meets your needs at this time. Please contact the undersigned if you have any questions or require any further information.

Respectfully Submitted,

**AMEC Earth & Environmental,
a division of AMEC Americas Limited**

Andrew Bidwell, M.Eng., P.Eng.
Associate Geological Engineer

APEGGA Permit to Practice No. P-04546

Reviewed by:

Pete Barlow, M.Sc., P.Eng.
Principal Geotechnical Engineer

Attachments: Site Plan
Photos