

1.0 Site Visit

The Annual Inspection site visit was conducted on May 30, 2001. At the time of the visit, the weather was partially cloudy and blustery.

2.0 Significant Observations

The following observations, considered to be relevant to the stability of the slope were made:

- The large landslide complex in the valley wall continues to be active as described in last year's assessment, although retrogression of the crest appears to be very minor or unchanged. Creek erosion continues to be the primary trigger for the slide activity.
- The current closest point of the overall slide crest to the highway is still approximately 1 m from the fence line located approximately 25 m east of the edge of the highway.
- No evidence of tension cracks or extension of the slide between the fence line and the highway were observed.
- The island/bar near the center of the toe is still providing erosion protection to the central portion of the slide by directing the stream flow to the eastern portion of the channel.
- Northern portion of the slide complex still appears more active than central and southern.
- The relatively deep drainage gully located near the southern end of the slide area does not appear to have changed significantly since last year's inspection.

3.0 Changes from Previous Visits

There does not appear to be significant crest retrogression in the zones nearest the highway since the last visit in June, 2000. However, there is evidence of ongoing movement in the lower slide blocks.

4.0 Discussion

Although changes from the previous site visit appear to be relatively minor, the mode of this slide is such that crest loss will occur in successive steps, with slide blocks dropping rapidly, followed by periods with little or no crest retrogression. As noted in 2000, it is speculated that the currently stationary extent of the central portion of the slide is due to the reduction in direct toe erosion with the small island being present in this area of the stream. Changes in the flow pattern of the stream could have large and rapid effects on the crest in this area.

AMEC considers retrogression of this slide to the west to be inevitable. It is likely that the portions of the ROW and fence line will be lost in the next few years. However retrogression to the near vicinity of the highway will likely be measured in decades. An historical airphoto study could be undertaken to better assess the overall rates of crest retrogression. Although it may

be some time before the highway is affected, there may be safety concerns for vehicles with the relatively sharp drop being located in the ROW near the highway.

Mitigation of this landslide complex would be a fairly major undertaking. As a minimum, significant river training works would be required. Significant earthwork volumes would also be required to flatten the slopes, which will continue to retrogress; even after toe erosion is mitigated. Mitigative measures would require significant investigation and design studies prior to implementation.

It may be most practical to allow the landslide to run its course and realign the highway to the west as the slide crest retrogresses. There do not appear to be any topographical constraint to relocation of the highway and such works may be less costly and have fewer environmental impacts than attempting to mitigate this slide.

The monitoring methods currently being used, primarily based on slope indicator readings, are not considered to be wholly adequate at this site. As mentioned above the mode of failure is considered to be where large block slide rapidly with periods where little or no movement can take place. As such, slope indicators behind the crest could show no signs of movement, and then be sheared off, possibly not providing any warning. As a result, AMEC recommends that additional monitoring methods be implemented, as discussed below. The primary purpose of these additional measures would be to monitor crest retrogression and assess changes in the slope conditions.

5.0 Assessment

This is a very large, active landslide complex. The lower portions of the south and central areas and all of the northern areas are considered to be currently active. Although there has been little crest retrogression within the past year in the south and central areas, continued crest retrogression in these areas is considered to be inevitable within the next few years. On this basis the Probability Factor with respect to this slide is taken as 11 since the slide is active and crest retrogression near the highway will continue.

It is likely that in the short term continuing retrogression of the current slide will not impact the highway, but over the medium to long term the highway is at risk. On this basis a Consequence Factor of 2 is assigned for the **present location** of this slide. This value will increase with time as the slide retrogresses toward the highway.

Based on the above, the **present** Risk Level at this site is calculated as 22. This value will increase with time as the slide retrogresses toward the highway.

6.0 Recommendations

The monitoring programs currently in place should be continued. Additional slope indicators should be considered as the crest of the slope progresses to the west and the existing instrumentation is lost.

In addition to the above monitoring it is recommended that regular surveying be undertaken. This surveying should consist of three profiles of the slide taken along the same section lines annually. As discussed during the site visit, these section lines should be located at the center of the slide (closest point to the fence) to the closest point in the stream and 50 m on either side of this line. These section surveys should be done annually. In addition, the crest of the slide should be surveyed semi-annually. This could be done using GPS methods or by measurements from reference pins installed back from the crest. The intent of these surveys is to monitor the changed in the slide geometry.

An historic airphoto review should be conducted. This work would be to assess the historic rate of crest retrogression to the highway.

The owner of buried telephone line adjacent to the fence should be notified of the proximity of the crest of the slide to the slide.

As part of the Annual Assessment program by AMEC, a regular record of land-based stereographic photographs from established locations will be implemented to record visual changes from year to year.