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Government of Yukon

Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring-2008

Prepared by:

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Project Number:

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Date:

June, 2009

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June 22, 2009

AECOM Project No. 2940 044 00 (4.6.1)

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Whitehorse, Yukon
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Dear Ms. Pugh:

Re: Former Clinton Creek Asbestos Mine – Long Term Performance Monitoring - 2008

AECOM Canada Ltd. (AECOM) is pleased to submit our report on the above referenced project. If we can be of further assistance, please contact Gil Robinson, P.Eng. directly.

Sincerely,

AECOM Canada Ltd.

Ron Typliski, P.Eng.
Vice-President, Manitoba District
Canada West Region
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1. Introduction

This report provides the results of the 2008 performance monitoring and hydraulic modelling on Wolverine Creek at the former Clinton Creek Asbestos Mine. The purpose of the monitoring program is to obtain information on the performance of physical mine site features including the waste rock dump, Clinton Creek channel including the stabilization works, Wolverine Creek channel and the tailings pile. The monitoring program provides data which is compared with trigger levels and an action plan for maintenance or remedial stabilization work developed to maintain the long term stability of these features. The hydraulic modeling work was carried out to assess the potential for flow in Wolverine Creek to overtop the stabilized portion of the channel located directly downstream of the South Lobe of the tailings pile. The terms of reference for this work are outlined in our letter proposal to Mr. Hugh Copland, P.Eng. P.Geo. of the Government of Yukon (GY), Energy, Mines and Resources dated August 15, 2008. The proposed stability analysis work for a localized portion of the waste rock dump above gabion Drop Structures #3 and #4 was not undertaken because the GY is presently considering options for stabilizing the entire waste rock dump.

1.1 Background

Hazards associated with continued degradation of the Clinton Creek channel through the waste rock dump and the Wolverine Creek channel through the tailings piles have been previously identified (UMA 2000). Of particular concern are potential risks to human life and property downstream of the mine associated with a sudden breach of the channel blockages. In areas with significant relief, such as the Clinton Creek valley, flooding from failures of channel blockages can be especially dangerous and unrelated to precipitation events that would normally be expected to produce flooding conditions.

With respect to the potential for a breach of channel blockages, the most immediate concern was considered to be at the outlet from Hudgeon Lake. Profiles of the creek channel through the waste rock from 1986, 1999 and 2001, showed progressive channel degradation (i.e. erosion / down-cutting) was occurring along the first 500 m of channel downstream of the outlet. As degradation continued, the toe of the waste rock pile was being undercut and localized slope instabilities were developing. By 2001, conditions had developed to a point where it was feared that normal flow and/or an overtopping event could trigger a breach of the waste rock at the Hudgeon Lake outlet. The consequences of a breach and rapid draining of Hudgeon Lake are discussed in UMA's Risk Assessment Report (UMA 2000). To address this concern, channel stabilization works were constructed at the Hudgeon Lake outlet between 2001 and 2004.

Measures to stabilize the Wolverine Creek tailings pile have also been investigated (UMA 2003). The requirement for these remedial measures was based on the premise that the tailings were moving at rates comparable to those observed at mine closure. Recent surveys however, indicate that the movements are significantly less than previously assumed and some mounding of the tailings in the valley bottom is occurring. A better understanding of the overall behaviour of the tailings piles is necessary to determine the most appropriate strategy to deal with previously identified hazards. In this regard, the implementation of stabilization measures have been deferred until this information becomes available and the need for remedial work is confirmed. Of particular concern with respect to tailings pile stability is the potential for channel degradation where Wolverine Creek passes over the toe of the tailings. In this regard, maintaining

the integrity of the rock-lined channel downstream of the tailings is considered essential to reduce the likelihood of mass tailings movements.

2. Performance Monitoring

A site plan of the mine site is provided on Drawing 01. The 2008 monitoring work consisted of surveying the movement monitors on the Clinton Creek Waste Rock Dump and Drop Structures and the Wolverine Creek Tailings Pile, surveying channel profiles of Clinton Creek and Wolverine Creek and surveying cross-sections at two locations on each drop structure. Additional survey work completed in 2008 for the hydraulic modeling of Wolverine Creek (Section 3.0) included channel cross-section surveys and surveying the water edge around the two small ponds upstream of the tailings pile. Horizontal measurements across each drop structure at the locations illustrated on Drawing C-1 in Appendix C were completed by the Government of Yukon in September 2008. The first long term performance monitoring event was completed in 2006 (UMA 2007) with some follow-up work in 2007, including a site inspection (UMA 2008). The 2008 long term performance monitoring event is the second bi-annual event since the long term performance monitoring program was initiated (UMA 2006b).

Underhill Geomatics Ltd. (UGL) from Whitehorse, YK completed the survey work for the performance monitoring program under Contract with the Government of Yukon. The survey was completed between July 8 to 10, 2008 by Jean-Louis Salesse of UGL using Global Positioning Survey (GPS) referenced to the UTM NAD 83 (Zone 7) co-ordinate system. The horizontal accuracy of the GPS survey is within 2 to 3 cm, which is acceptable given the magnitude of movements expected and given the potential error in positioning the survey rod at the exact same location for each monitoring event. The monitoring instructions and protocol provided to UGL by AECOM are provided in Appendix A along with the resulting survey information provided by UGL.

2.1 Clinton Creek Waste Rock Dump

2.1.1 Movement Monitors

Monitoring of the waste rock dump was re-instated in 1999 with subsequent monitoring events in 2001, 2003 and 2004. In 2003, the monitoring network was expanded from seven to forty-two monitoring points (UMA 2004).

The locations of the waste rock movement monitors are shown on Drawing 02 and have been categorized according to location on the waste rock dump that is, the lower slope monitors are located below elevation 420 m, the mid-slope monitors are located between elevation 420 m and 450 m and the upper slope monitors are located above elevation 450 m. The Porcupine Pit slope monitor points are not included in these categories since they provide data on pit wall movements and not waste rock movements (with the exception of monitors #'s 1493 and 1839). A detailed summary of the 2008 waste rock movement monitoring for the upper, mid and lower slope areas and the open pit area are provided on Tables B-1 to B-4 in Appendix B and are summarized in Table 2.1. Horizontal rates of movement range from nil up to 0.06 m/yr, values which are similar or slightly less than the rates determined from the 2006 survey. The total measured movement since the baseline reading is also provided on Tables B-1 to B-4. The direction and magnitude of movement for each monitor since the baseline reading is graphically illustrated on Drawing 02.

Table 2.1: Summary of Annual Horizontal Movement Rates

CLINTON CREEK WASTE ROCK DUMP				
Dump Area	Annual Horizontal Movement Rates (m/yr)			Rate Change
		Monitoring Period 2004-2006	Monitoring Period 2006-2008	
Upper	Average	0.02	0.02	0.00
(5 monitors)	Maximum	0.03	0.03	0.00
	Minimum	0.01	0.01	0.00
Mid	Average	0.03	0.03	0.00
(13 monitors)	Maximum	0.07	0.05	-0.02
	Minimum	0.01	0.01	0.00
Lower	Average	0.02	0.02	0.00
(18 monitors)	Maximum	0.07	0.06	-0.01
	Minimum	0.01	0.00	-0.01

Upper Slope Monitors

There are five monitors located in the upper slope area. The movement vectors and magnitudes shown on Drawing 02 suggest that this area of the waste rock dump is moving in a northerly direction (i.e. down the underlying valley slope). The rates of movement range from 0.01 to 0.03 m/yr with an average of 0.02 m/yr (Table B-1, Appendix B).

Mid Slope Monitors

There are 13 monitors located in the mid slope area of the waste rock pile, which covers the underlying south valley slope toe and the original valley bottom. Monitor #19 was missed during the 2006 survey but is included in the 2008 survey results. The rates of movement for these monitors range from 0.01 to 0.05 m/yr with an average of 0.03 m/yr (Table B-2, Appendix B). The movement vectors and magnitudes shown on Drawing 02 suggest that the waste rock dump in this area is generally moving in a northerly direction across the former valley. However, the three monitors closest to Hudgeon Lake (#0229, #1831 and #22A) are moving in a north westerly direction towards the lake at rates of 0.03 to 0.04 m/yr. This radial spreading has been previously reported and is not unexpected. However, there are three monitors in the center of the mid-slope area (Monitors #4, #68 and #0227) that do not follow this pattern. The direction of movement of these three monitors is thought to be influenced by local topography and not representative of the global movement of the mid slope area of the waste rock dump.

Lower Slope Monitors

There are 19 active monitors located in the lower slope area of the waste rock pile, which is likely located along the toe and/or side slope of the original north valley slope. Monitor XS-G was destroyed during the creek stabilization work in 2003. The rates of movement for these monitors range from nil up to 0.06 m/yr

with an average of 0.02 m/yr (Table B-3, Appendix B). It appears that waste rock in the area south of the stabilized creek channel (Monitors #1833 and P2) are moving in a northerly direction across the stabilized portion of the creek at rates of about 0.03 to 0.06 m/yr. The exception are Monitors #0228 and #0226 which are moving north westerly and north easterly, respectively. Monitor #0228 is moving towards the lake similar to Monitors #0229, 1831 and 22A. Monitor #0226 is located at the top of a slope on the waste rock pile and is generally moving in a direction perpendicular to the slope. The remaining monitors east of the stabilized channel section are moving in a variety of directions at rates of about 0.01 m/yr. The variety of movement directions is unexpected and may be a result of passive resistance developing at the leading edge of the waste rock. In any case, the magnitudes are small and not considered to be of any consequence to the stabilized section of the channel.

Open Pit Area Monitors

There are six monitors in the area of the Porcupine Pit. Four monitors (#'s 1830, 1832, 1837 and 1838) are located on the east wall of the open pit, one on the north side of the pit (#1839) and one near the former crusher building (#1493). The movement data for the four monitors on the east wall of the pit do not indicate any signs of significant horizontal movements. The south west and south east corners of the Porcupine Pit are relatively unstable based upon previous visual inspections. The movement data for Monitor #1839 suggest that this monitor is not undergoing significant horizontal movements however, the survey shows that this monitor settled at a rate of 0.11 m/yr over the 2 year monitoring period, considerably more than the previous rates of 0.01 and 0.05 m/yr. The movement data for Monitor #1493, located north of the open pit near the former crusher building, show that this monitor is moving in a northerly direction at a rate of about 0.10 m /yr. This area of the waste rock is not impacting Clinton Creek. The monitoring data for the open pit monitors is included in Table B-4, Appendix B.

2.1.2 Summary

The waste rock dump continues to undergo creep movements ranging from nil up to 0.06 m per year. In general, the movements measured in the most recent monitoring period (2006 to 2008) are the same or slightly less than the previous monitoring period (2004 to 2006).

The monitoring data suggests the western area of the waste rock dump nearest to Hudgeon Lake is moving in a westerly direction towards the lake and the main mass of the waste rock dump is moving in a northerly direction across Clinton Creek. East of the stabilized creek channel, the monitors at the top of the south bank of the creek channel are moving in a variety of directions, the magnitudes are small and not considered to be of any consequence at this time.

With the exception of Monitor U1493, the monitors around the open pit do not appear to be developing any movement trends. Monitor U1493 is moving in a northerly direction however, this area of the waste rock pile is not impacting the creek channel at this time.

The waste rock is currently closing in on the stabilized section of the creek channel at a rate of about 0.05 m/yr. While movement rates are less than previously reported, it is expected that integrity of the gabion drop structures will eventually be compromised unless stabilization measures for the waste rock dump are implemented. Alternatively, the gabion structures can be replaced or repaired as required in the future to

restore their functionality. While movements of the mid and lower slope downstream of the stabilized channel section are erratic, they are of no consequence to the stabilized section of the channel.

2.2 Gabion Drop Structures

Starting in 2004, the monitoring program for the drop structures was limited to taking horizontal measurements across each gabion drop structure at two locations (Drawing C-1, Appendix C) to determine if the gabions are deforming laterally. To provide a better understanding of the deformations of the gabion drop structures in relation to the waste rock movements, and the impact on functionality of the structures, additional survey requirements were recommended for long term performance monitoring (UMA 2006b). These include four movement monitors located near the four corners of each drop structure and surveying two cross sections of each drop structure between each pair of movement monitors.

2.2.1 Horizontal Measurements

The horizontal measurements to date for Drop Structures 1, 2, 3 and 4 are summarized in Tables C-1 to C-5 (Appendix C). The measurement locations were tagged with permanent markers in September 2006 to improve the repeatability of the measurement locations. To date, from 0.03 to 0.36 m of lateral movement has been measured, with the largest movements measured at Drop Structure #3. The average annual rates of movement calculated from the September 2007 and September 2008 measurements range from 0.02 and 0.09 m/yr, respectively. These rates are in the same order of magnitude as the waste rock monitors suggesting that the drop structures are being impacted by the on-going waste rock movement.

2.2.2 Movement Monitors

Sixteen movement monitors (#1450 to 1465) were installed near the corners of the four drop structures in July 2006 by Underhill Geomatics Ltd. (UGL) to provide additional data on horizontal deformations (closure). The locations of these monitors are illustrated on Drawings 03 to 07 and a summary of the distance between each pair of monitors is provided on Table C-6 (Appendix C).

Between July 2007 and July 2008, the horizontal distance between the pairs of movement monitors decreased from 0.01 m to 0.06 m with an average of 0.04 m. The only exception is the pair of movement monitors located across the lower tier of DS#1, which increased in distance by 0.03 m. The increase in distance could be a result of an error in the measurement or possibly settlement of the gabions. The results indicate that the total decrease in horizontal distance measured to date range from 0.04 to 0.18 m with the largest total movements measured at DS#3.

2.2.3 Surveyed Cross-Sections

Two cross-sections were surveyed across each drop structure between each pair of movement monitors in July 2006 by UGL as part of the long term performance monitoring program (UMA 2006b). The locations of these sections are illustrated on Drawings 04 to 07. The plan view and end view sections provided on the left hand side of these Drawings represent the drop structure geometry based on the nominal dimensions of the baskets and 3H:1V side slopes. The sections on the right hand side of the drawings represent the

surveyed geometry which differ slightly from the plan view and end view sections. The results of the baseline survey in June 2006 suggest that at that time (2006) some deformation had already occurred.

Drop Structure 1: The gabion baskets added to DS#1 in 2007 to address a deficiency in the amount of freeboard have been included on Drawing 04. Cross Sections 1 and 2 show that the design flow depth (2.01 m) at the top of the drop structure (Section 1) is contained within the upper level of the gabion drop structure now that the additional gabion baskets have been added. On Cross Section 2, the dip in the side slope on the right hand side occurred during the first spring freshet after the structure was completed. Based on the surveyed cross-sections, the drop structure does not appear to have undergone additional settlement since the baseline survey in 2006.

A top of bank survey was completed in 2007 to confirm that at least 0.2 m of freeboard is available above the maximum expected lake level of 411.21 m (UMA 2007). There is at least 0.2 m of freeboard along both sides of the channel with the exception of one location on the south side of the outlet channel where the top of bank elevation is 0.07 m below the minimum freeboard elevation of 411.41 m. It is expected that this is a localized area near the top of the channel which is surrounded by higher ground a short distance away.

Drop Structures 2, 3 and 4: As noted in the previous performance monitoring report (UMA 2007), the cross-section surveys of Drop Structures #2, 3 and 4 taken in 2006 (Drawings 05, 06 and 07) showed bulging in the toe of slope area. Visual inspections showed that the gabion baskets had not deformed, which was confirmed with the new cross-sections taken in 2007. The bulging observed on the baseline survey was a consequence of small piles of gabion fill on top of the baskets mistakenly included in the baseline cross-section survey.

Based on the surveyed cross-sections from 2008, the left hand (south) side slope at Drop Structures #3 and #4 appear to have undergone some settlement, ranging from 50 to 150 mm. The changes to the channel cross-section are minor and will not affect the performance of the drop structure.

2.2.4 Summary

The observed deformations of the gabion drop structures are at least partially a result of continued waste rock movements. The side slope angle has not been impacted by the settlements and is still well below the trigger level of 2H:1V sideslopes and the 2.01 m flow depth is still within the channel cross section. The No remedial action is required at this time.

2.3 Clinton Creek Channel

Since 1983, The Clinton Creek Channel profile has been surveyed on seven different occasions. For purposes of comparing conditions before and after channel stabilization works, the profile from 2001 is shown as a dashed line on Drawing 08 with the 2004, 2006, 2007 and 2008 surveys. The 2004 survey has been selected as the baseline to evaluate channel degradation (down-cutting) and determine when remedial measures are required. The creek profile shown on Drawing 08 has been sub-divided on to three larger scale drawings (Drawings 09, 10 and 11) to aid in evaluating changes in the channel profile. Offset lines are shown on these drawings to indicate the depth of channel degradation that would trigger the action items

identified in the Long Term Performance Monitoring Report (UMA 2006b). That is, between the downstream end of Drop Structure #4 and Station 0+225 m a 0.5 m offset line is shown and downstream of Station 0+225 m a 1.5 m offset line is shown.

No channel down-cutting is evident for the first 20 m downstream of Station 0+175m, the end sill on Drop Structure #4. In this section of the channel, the gabion drop structure was constructed just upstream of an area where the channel is relatively well covered with boulders from the former rock weir (Station 0+140m on Drawing 09). Immediately downstream of the end sill of Drop Structure 4, some additional gabion baskets were installed to form a transition between the stabilized creek and the existing creek channel. The transition is 9 m long and consists of two full rows of gabion baskets (6 m long) covering the channel sides and bottom followed by a single row of baskets (3 m long) along the channel bottom (UMA 2005). Beyond this point (Station 0+184m), the channel side slopes are relatively well protected with boulders to about Station 0+195 m near the area where bedrock is exposed in the channel bottom. From about Station 0+195 m (i.e. just downstream of the boulders) to 0+225, about 0.2 to 0.3 m of localized down-cutting was evident in the 2006 and 2007 surveys. Remedial work undertaken in 2007 by GY (UMA 2008) to address the down cutting was effective as illustrated by the 2008 creek profile survey.

Downstream of Station 0+225, there is some evidence of minor and localized down-cutting with some stretches showing as much as 1 m of aggradation (deposition). These results are not unexpected as localized slumps routinely cause small blockages until the material is washed out and deposited farther downstream. From Station 0+225 to 0+425m the 2008 creek profile is similar to the baseline survey. From Station 0+425 m to 0+475 m the 2008 survey is about 0.5 m below the baseline and 2006 surveys but still 1 m above the trigger level creek profile shown on the creek profile drawings. From Station 0+475 to 0+550m the 2008 creek profile is similar to the baseline survey. Downstream of Station 0+550m, the creek profile is similar to the 2006 survey or at least 0.5m above the baseline survey.

2.3.1 Summary

The 2006 and 2007 surveys showed that about 0.2 to 0.3 m of channel degradation had occurred around Station 0+200 m. The subsequent work undertaken by GY restored the creek profile in this area to near the baseline level. The 2008 survey results show that the changes in the creek profile since 2006 are minor and the creek profile is well above the trigger levels shown on the drawings.

2.4 Wolverine Creek Tailings Pile

Fifty-three movement monitors were surveyed in July 2008 by UGL, including the eleven new monitor points (2005-01 to 2005-11) established on the South Lobe in 2005. The previous monitoring event was in July 2006 (UMA 2007). The monitoring results are provided in Appendix D. The locations of the movement monitors are shown on Drawing 12. The monitors on the South and North lobes of the tailings pile have been grouped according to their location on the upper, mid and lower slope areas. The monitors on the upper slope are located above elevation 530 m, the mid slope monitors are located between elevation 425 and 530 m and the lower slope monitors are located below elevation 425 m. The vectors for each monitoring point on Drawing 12 indicate the total horizontal movement and direction since the baseline survey (typically 2003). The measured horizontal movement for the current monitoring period from July 2006 to July 2008 is

printed beside each monitor point label. The measured movement between July 2006 and July 2008 has been converted to annual movement rates and are summarized in Tables 3-2 and 3-3 for the South and North lobes, respectively. A summary of the movements and movement rates for each monitor is provided in Appendix D (Tables D1 to D3).

2.4.1 South Lobe

The average horizontal movement rates for the upper, mid and lower slope areas of the South Lobe for the current monitoring period (July 2006 to July 2008) are 0.07, 0.33 and 0.38 m/yr, respectively, as shown in Table 2.2. The average annual movement rates for the last three monitoring periods show that the movement rates are decreasing with time and are less than those for the previous monitoring period (2005 to 2006) by 0.03, 0.10 and 0.10 m/yr, respectively. Drawing 13 illustrates the movement vectors and magnitudes on the South Lobe. The monitoring results for each monitor are presented in Appendix D on Tables D-1 to D-3. The upper slope is the least active area, consistent with previous monitoring data, with annual movement rates of 0.05 and 0.09 m/yr for the two monitors on the upper slope. The mid slope and lower slope areas are active and have similar annual movement rates ranging from 0.02 to 0.62 m/yr and an average of 0.33 to 0.38 m/yr, respectively.

Table 2.2: Range of Annual Horizontal Movement Rates – South Lobe

WOLVERINE CREEK TAILINGS PILE – SOUTH LOBE						
Slope Area		Annual Horizontal Movement Rates (m/yr)				Rate Change Last 2 Surveys
		Monitoring Period 1984	Monitoring Period 2004- 2005	Monitoring Period 2005-2006	Monitoring Period 2006-2008	
Upper	Average	0.50	0.13	0.10	0.07	-0.03
(2 monitors)	Maximum	-	0.18	0.18	0.09	-0.09
	Minimum	-	0.09	0.02	0.05	0.03
Mid	Average	7.00	0.76	0.43	0.33	-0.10
(12 monitors)	Maximum	-	0.93	0.75	0.58	-0.17
	Minimum	-	0.35	0.04	0.03	-0.01
Lower	Average	-	0.45	0.48	0.38	-0.10
(14 monitors)	Maximum	2.80	0.66	0.81	0.62	-0.19
	Minimum	0.50	0.05	0.03	0.02	-0.01

As shown by the direction of movement vectors on Drawing 13, the upper and mid slope areas are generally moving down slope in an easterly direction and the lower slope area is undergoing some lateral spreading. The majority of monitors in the mid slope area near the boundary with the lower slope are moving in a north easterly direction towards the pond between the two lobes. On the lower slope area, the movement monitors on the north end are moving in a north easterly direction towards the pond and the monitors on the south end are generally moving east, perpendicular to the leading edge of the South lobe.

The movements of the mid and lower slope areas discussed above are a result of the mounding of the tailings in the middle portion of the lower slope area (i.e. Monitors 80-9, 25B, SL-1, Sl-2, Sl-3 and 1484) which is providing passive resistance to the movement of the tailings. As the passive resistance has increased over the years the movement of the tailings has been redirected towards areas of less resistance. The most pronounced movement is towards the pond between the two lobes. As the tailings move in this north easterly direction they impart some thrust on the tailings mounded up in the middle area of the lower slope, essentially pushing them aside as the tailings move towards the pond. The mounding in the middle area and the main direction of movement is illustrated on Figure 2-1.

The tailings on the south end of the lower slope area are generally moving in an easterly direction at lower rates than the north end of the tailings which are moving towards the pond. Some of the monitors (i.e. 2005-05, 2005-06 and 80-9) at the south limit of the lobe are most likely being influenced by local topography.

The small movement rates on the upper slope area are not unexpected because the original landslide did not encompass much of this area, which may be due to a decrease in the inclination of the underlying valley slope above elevation 530 m. The flatter valley slope feature is visible on aerial photographs taken before mine site development (UMA 2003). The mid and lower slopes are most active since these areas are coincident with the main area of the original landslide which occurred in 1974 (UMA 2003). As the tailings mound up in the valley bottom (i.e. lower slope area), the movement rates in the mid-slope area may continue to decrease as toe support due to mounding increases.

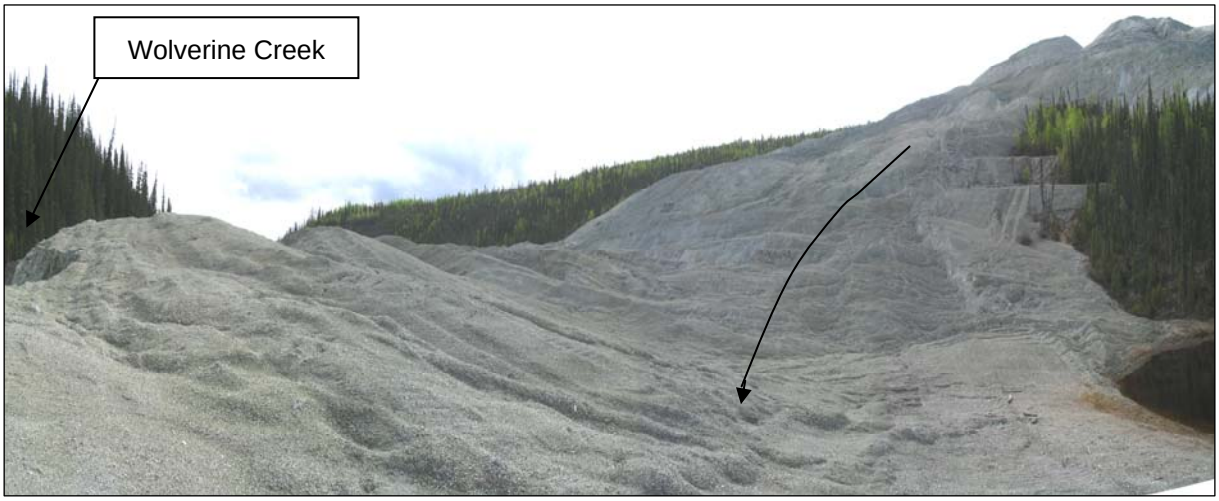

Figure 2-1) Mounding at Toe of South Lobe Near Monitor 2005-01 (view facing south)

2.4.2 North Lobe

The movement rates for the North lobe summarized in Table 2.3 are less than those measured for the South lobe. The average horizontal movement rates for the upper, mid and lower slope areas of the North Lobe for the current monitoring period (July 2006 to July 2008) are 0.03, 0.10 and 0.07 m/yr, respectively. The rates are less than those for the previous monitoring period (2005 to 2006) by about 0.03, 0.03 and 0.02 m/yr, respectively. The monitoring results for each monitor are presented in Appendix D on Tables D-1 to D-3.

Drawing 12 illustrates the movement vectors and magnitudes on the North lobe. The upper slope is the least active area, consistent with previous monitoring data, with movements rates ranging from 0.02 to 0.05 m/yr. Monitors 80-4 and 80-5 in the mid slope area are relatively active compared to all the other monitors on the North Lobe. Monitors 1086, 500-1 and 650-1 in the northwest area of the mid slope area have relatively small movement rates compared to the other movement monitors on both the mid and lower slope areas. The group of movement monitors on the east limit of the North lobe and on the lower slope area all have similar movement rates of about 0.07 m/year.

The small movements of the upper slope are not unexpected since the original landslide did not encompass much of this area (UMA 2003). As shown on Drawing 12, the upper slope monitors in the center of the North lobe are generally moving in an easterly direction but may be influenced by local topography. The two monitors at the north edge are moving in a North easterly direction perpendicular to the slope of the tailings pile in this area.

Table 2.3: Range of Annual Movement Rates – North Lobe

WOLVERINE CREEK TAILINGS PILE – NORTH LOBE						
Slope Area		Annual Movement Rates (m/yr)				Rate Change Last 2 Surveys
		Monitoring Period 1984	Monitoring Period 2004-2005	Monitoring Period 2005-2006	Monitoring Period 2006-2008	
Upper	Average	-	0.07	0.06	0.03	-0.03
(7 monitors)	Maximum	0.90	0.12	0.18	0.05	-0.13
	Minimum	0.40	0.03	0.03	0.02	-0.01
Mid	Average	-	0.18	0.13	0.10	-0.03
(10 monitors)	Maximum	24.5	0.53	0.43	0.31	-0.12
	Minimum	1.6	0.02	0.02	0.01	-0.01
Lower	Average	20.0	0.13	0.09	0.07	-0.02
(8 monitors)	Maximum	-	0.18	0.13	0.10	-0.03
	Minimum	-	0.08	0.05	0.04	-0.01

The largest movements on the North lobe were measured along the south and east edges of the mid slope area (i.e. all mid-slope monitors except 1085, 500-1 and 650-1) and the lower slope area. The direction of movement is eastward (downslope) is consistent with the previous monitoring period. The mid-slope monitors just upslope from the 425 m contour moved 0.06 to 0.10 m. On the south edge, Monitors 80-4 and 80-5 moved 0.60 and 0.45 m, respectively over a two year monitoring period. These two monitors moved the most, possibly due to the lack of toe support in the treed area between the two lobes just above the pond. The monitors clustered at the east limit of the mid slope area and the lower slope area are moving a similar rates in an easterly direction. Monitors NL-4, NL-5 and 1489 on the south side of the lower slope area are moving in a south easterly direction towards the pond where there is less resistance to movement.

2.4.3 Summary

The downslope movement rates of the tailings have reduced during each of the last monitoring periods, likely as a result of mounding of tailings at the toe of the slide mass. Since none of the trigger levels have been reached (UMA 2006b) no action is required at this time.

2.5 Wolverine Creek Channel

The channel profile between Stations 0+700 m and 1+500 m (Drawing 14) was surveyed by UGL in 2006 with the intent to utilize the original survey from 2003 as the baseline to compare subsequent surveys and evaluate channel degradation. Once the two plan and profiles were created it was noted that there was a discrepancy between the two surveys, in plan and profile, mainly between Station 0+800 and 1+100 m. In discussion with Jean-Louis Salesse of UGL, these two surveys could not be reconciled without checking some of the control points used for the 2003 survey. No conclusions were made in the 2006 monitoring report except a recommendation that the survey be re-done in 2007. In 2007, the creek channel survey was only partially completed (i.e. Station 1+025 to 1+450 m) and no conclusions could be made. During the 2008 survey, the creek profile survey was completed from Station 0+700 to 1+450 m.

The 2008 survey results compare well in plan view with the 2003 baseline survey and the profile compares well with the 2003 baseline survey from Station 0+700 to 0+950 and from Station 1+050 to 1+475m. Between Station 0+950 and 1+050 the 2008 survey suggest that the channel has filled in by about 0.5 to 1 m.

3. Wolverine Creek – Hydraulic Modeling

3.1 Overview

Wolverine Creek is a tributary of Clinton Creek located approximately 1.5 km downstream of Hudgeon Lake as shown on Drawing 01. Between 1968 and 1974, 10 million tonnes of tailings were deposited on the upper portion of the west slope of the Wolverine Creek valley (now referred to as the South lobe). In 1974, a failure of the South lobe blocked natural flow in Wolverine Creek backing up approximately 9 m of water behind the landslide material (Figure 3-1). A subsequent breach of the tailings occurred resulting in flash flooding of the Wolverine creek valley to the confluence with Clinton Creek where the flooding is believed to have quickly attenuated. The eroded tailings were deposited several metres deep in the creek valley directly downstream of the South lobe (Figure 3-2 & Drawing 14).

Following the failure of the South lobe, a 9 m deep channel was excavated at the toe of the tailings to facilitate creek flow and a new tailings pile was established north of the failed mass, now referred to as the North lobe (Figure 3-1). By 1977, the North lobe was showing signs of instability and during the last months of mine operation, the tailings were placed in the northwest corner of the North lobe. Partial re-grading of the North and South lobes was undertaken in 1978 and 1979 in an unsuccessful attempt at stabilizing the tailings. Since 1978 when the mine was shut down, the tailings have continued to move downhill and eventually two small ponds were created, one between the two lobes and one upstream of the North lobe (UMA 2003). Wolverine Creek now flows across the North and South lobes as illustrated on Drawing 14.

In 1978, channel stabilization measures were constructed in Wolverine Creek across the tailings immediately downstream of the South lobe. These measures consisted of a rock-lined channel with a series of rock weirs (Figure 3-2). The rock weirs have become flattened over time and brush has established along the channel banks and in the channel, which make the rock weirs barely recognizable in the field. To date, these measures have performed well although some deterioration was noted during recent site visits. In 2007, recommendations were provided to remove the trees and brush growing within the channel (UMA 2008), this work was completed by GY.

Following the inspection of Wolverine Creek in 2007, it was recommended that the flow in the creek be assessed in more detail downstream of the South Lobe. Due to the convex cross-section of the valley floor at several locations along the rock-lined channel, the top of bank of the creek channel is located higher than the point where tailings the surface intersects the creek valley sides. As a result, in the event the creek flow overtops the top of bank of the creek channel, it is more likely that the creek flow would cut a new channel along the valley side and not return to the existing channel at the end of the flood event.

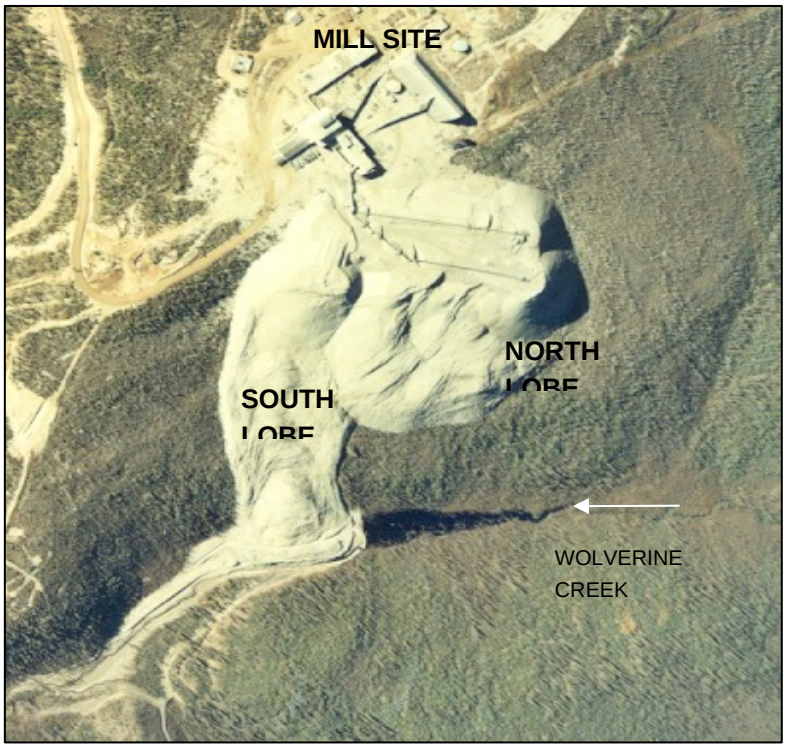

Figure 3-1)
Failed South Lobe (1976)

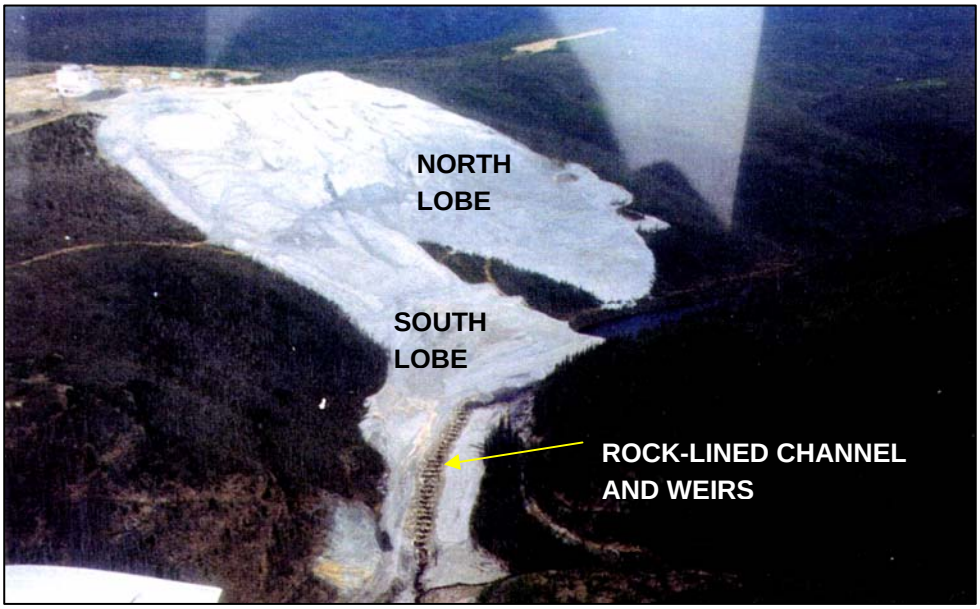

Figure 3-2) Rock-Lined Channel and Weirs (1982)

3.2 Topographic Data

Topographic data was required to delineate the Wolverine Creek drainage basin, estimate pond water surface areas and assess creek channel flow. The available topographic data consisted of:

- 5 m elevation contours from the 1999 mine site aerial photography and digital terrain model (DTM) covering the area between the North lobe and Clinton Creek (Drawing 15),
- 30.5 m (100 ft.) elevation contours from the digital 1:50,000 scale NTS maps, covering the entire drainage basin (Drawing 16),
- Spot elevations from the July 2008 survey around the perimeters of the two small ponds located upstream of the North and South lobes,
- 23 surveyed cross-sections at approximately 50 m spacing along Wolverine Creek, four cross-sections are located upstream of the South lobe (Drawings 15 and 17).

3.3 Hydrologic Assessment

3.3.1 Drainage Basin

3.3.1.1 Basin Characteristics

The Wolverine Creek drainage basin was delineated in ArcGIS using both the 5 m elevation contours from the 1999 mine site DTM and the 30.5 m elevation contours from the 1:50,000 scale digital NTS maps. The 30.5 m contours were used to delineate most of the drainage basin and the 5 m contours were used to delineate the basin boundaries in the vicinity of the North and South lobes. The extracted data are listed in Table 3.1.

Table 3.1 Drainage Basin Topographic Data

Sub-Basin	Incremental Area (km^2)	Cumulative Area (km^2)	Highest Elevation (m)	Lowest Elevation (m)	Flow Length (m)	Straight Length (m)
Upstream of north lobe	21.14	21.1	884	409	8,130	7,090
Between north and south lobes	0.25	21.4	610	408	168	140
Downstream end of study reach	6.44	27.8	793	380	4,750	4,500

3.3.1.2 Pond Data

Two small ponds have formed along Wolverine Creek as a result of the development of the North and South lobes. The water surface perimeters of the two ponds were surveyed in July 2008 and the water surface area and elevation are listed in Table 3.2.

Table 3.2 Pond Characteristics

Pond	Pond Surface Area (m^2)	Water Surface Elevation at Time of Survey (m)
Upstream of north lobe	11,770	409.1
Upstream of south lobe	5,560	407.8

3.3.2 Precipitation Data

The closest precipitation station is Dawson Airport near Dawson City, located 76 km southeast of Wolverine Creek. The monthly precipitation data for Dawson Airport were extracted from the 1971-2000 Climate Normals published by Environment Canada are summarised in Table 3.3.

Table 3.3 Precipitation Normals for Dawson Airport

Precipitation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall (mm)	0	0	0.3	2.2	26.1	40.4	48.4	42.1	31.3	8.7	0.0	0.4
Snowfall (cm)	24.2	17.0	12.8	7.8	2.4	0.0	0.0	0.4	4.1	27.0	35.8	28.5
Total Precipitation (mm)	19.2	12.7	11.1	8.0	28.4	40.4	48.4	42.5	35.0	31.6	25.8	21.3
Average Snow Depth (cm)	49	54	51	24	0	0	0	0	0	5	23	37

As can be seen in Table 3.3, the months of June, July and August have the largest precipitation and then primarily in the form of rainfall.

The mathematical rainfall IDF (Intensity-Duration-Frequency) relationship used by Environment Canada is

$$I = A\ D^{B}$$

Where I is the rainfall intensity (mm/hr), D is the rainfall duration (hrs) and A and B are frequency dependent constants. The values for constants A and B are listed in Table 3.4.

Table 3.4 IDF Constants A and B For Dawson Airport

Constant	Constant A and B by Frequency					
	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
Constant A	8.3	11.6	13.8	16.5	18.5	20.5
Constant B	-0.741	-0.800	-0.824	-0.845	-0.857	-0.867

3.3.3 Discharge Data

3.3.3.1 Review of Discharge Data

The historic discharge flow data for 24 Canadian and US hydrometric stations in the region were reviewed to determine the seasonal variations in stream flow. From this review it was determined that the highest stream flows in the region occurs during the month of June and July. That indicates that the high rainfall depths in

June and July coupled with the increased base flow from snow melt in early June generally generate the highest discharge events.

The Wolverine Creek flood discharges have been estimated through a regional analysis in a previous study of Clinton Creek (UMA 2000) and were adopted for this study. In the Risk Assessment Report (UMA 2000) the estimated flood discharges from Wolverine Creek applied to the confluence with Clinton Creek were based upon an estimated drainage area of 29 km². The flood discharges at the North and South Lobes were estimated by linear distribution based on drainage basin areas and are listed in Table 3.5.

Table 3.5 Frequency Floods Discharges By Sub-Basin

Sub-Basin	Basin Area (km^2)	25-Year Flood (m^3/s)	50-Year Flood (m^3/s)	100-Year Flood (m^3/s)	200-Year Flood (m^3/s)
Upstream of north lobe	21.1	7.28	8.88	10.8	12.6
Upstream of south lobe	21.4	7.38	9.00	11.0	12.8
End of study reach	27.8	9.58	11.7	14.3	16.6
Upstream of Clinton Creek	29.0	10.0	12.2	14.9	17.3

3.3.4 Peak Flow Attenuation

3.3.4.1 General

The two ponds created by the North and South lobes have surface areas that are large enough when combined with the narrow outlets to provide storage and thereby reduce the peak flow in Wolverine Creek similar to stormwater retention ponds in municipal stormwater systems. To assess the magnitude of the peak flow attenuation, the flow through the two ponds was analysed as a stormwater retention system.

The computer program XP-SWMM (version 10.5) was used to model the upper part of Wolverine Creek and the two ponds, to estimate the peak outflow discharge at the South lobe. XP-SWMM is a rainfall runoff simulation model that routes a rainfall runoff hydrograph through the drainage system and computes the water levels, discharges and flow velocities at selected points in the system.

3.3.4.2 Storm Selection

The rain event used for the modeling scenario was a 100-year, 24-hour rainfall. The size of the event, 33.6 mm total rainfall, was based on data from Dawson Airport, which is the nearest meteorological station. A rainfall hyetograph was generated for two distributions; AES and Huff. The Huff distribution simulated higher peak intensity (4.7 mm/h versus 2.2 mm/h for the AES distribution), and was therefore selected as the more conservative assumption for modelling.

3.3.4.3 Runoff Modelling

The XP-SWMM model was calibrated to generate a run-off hydrograph with a peak discharge of 10.8 m^3/s during the 100-year storm at the inflow point to the north pond. The selected peak discharge was estimated based on the basin area (see Table 3.5).

For modelling of the pond outlets, typical channel cross-sections were extracted based on surveyed cross-section data. For simplicity, the channel cross-section was assumed to be uniform but with the similar characteristics as the irregular natural cross-section. As a check on this assumption, surveyed cross-sections at several stations were tried in the model and it was determined that varying the cross-section did not have any significant impact on the results. The selected outlet channel characteristics are presented in Table 3.6.

Table 3.6 Pond Outlet Channels

Parameter	North Pond Outlet	South Pond Outlet
Reach length	86 m	200 m
Reach average slope	0.010 m/m	0.019 m/m
Manning's roughness, channel	0.035	0.035
Manning's roughness, over bank areas	0.1	0.1

The characteristics of the sub-basins upstream of the study reach were extracted from the 1999 aerial photo mosaic for the mine site, contour data, field observations and general references. The extracted and estimated characteristics that were used in the modelling are listed in Tables 3.7 and 3.8.

Table 3.7 Drainage Basin Characteristics Upstream of North Lobe

Parameter	Estimated Value
Surface topography (average slope)	0.18 m/m
Average surface overland flow length	1,700 m
Surface cover, type	80% forest, 20% bare
Surface cover, impervious	15%
Soil type	Clay/loam
Soil initial infiltration	13.5 mm/h
Soil saturated infiltration	1.75 mm/h
Infiltration rate of decay	0.00115 s^{-1}

Table 3.8 Drainage Basin Characteristics Between North and South Lobes

Parameter	Estimated Value
Surface topography (average slope)	0.40 m/m
Average surface overland flow length	500 m
Surface cover, type	25% forest, 75% bare
Surface cover, impervious	20%
Soil type	Clay/loam
Soil initial infiltration	8 mm/h
Soil saturated infiltration	1.2 mm/h
Infiltration rate of decay	0.00115 s^{-1}

The primary parameters that were adjusted for calibration were the infiltration rates of the soil. The soils at the site consist of shallow overburden with granular material and permafrost in the substrata. For modelling purposes, it was assumed that this soil profile would respond similarly to a clay soil. Typical infiltration values for clay soils appear in various publications and some typical values are listed in Table 3.9.

Table 3.9 Typical Infiltration Rate Values For Clay

Source	Maximum (Dry) Infiltration Rate (mm/h)	Saturated Infiltration Rates (mm/h)
Lindsay and Franzini (1979)[1]	--	1.5
Rawls et al (1983)[2]		2.3
ASCE[3]	75	2.5
XP-SWMM User's Manual	25 - 50	4 - 8

The initial soil infiltration rates used in the model were somewhat lower than typical rates for dry soils and may be more reflective of a partially dry soil.

3.3.4.4 Modelling Results

The modelling generated three hydrographs:

- The inflow hydrograph to the north pond (Hydrograph A)
- The resulting north pond outflow hydrograph was also used as the south pond inflow hydrograph (Hydrograph B)
- The resulting south pond outflow hydrograph (Hydrograph C) that will enter the Wolverine Creek downstream of the South lobe.

From the modelling, it was found that there is very little attenuation of the flood peak (0.2 m^3/s) gained by the two ponds. From that it was concluded that the outflow channel cross-sections are large enough to convey the flow through the ponds with approximately 1 m increases in pond water levels. It was therefore concluded that the peak discharges estimated from the regional analysis (Table 3.9) could be used for the channel flow assessment of Wolverine Creek.

3.4 Hydraulic Assessment

3.4.1 HEC-RAS Model Setup

The computer program HEC-RAS (Version 4.0) was used to model the flow in Wolverine Creek downstream of the South lobe. HEC-RAS is a computer program that was developed by the US Army Corps of Engineers to model stream flow in irregular channels. It is a one-dimensional model that can analyse both steady state and dynamic flow.

The 17 surveyed cross-sections between 1+100 and 0+700 (see Drawings 15, 17 and 18) were used for the modelling. The portions outside the surveyed extents were supplemented with data from the 5 m contour data set. The combined data cross-sections used in the HEC-RAS modelling are shown in Drawings 17 and 18.

[1] *Lindsey, R.K. and Franzini, J.B., "Water Resources Engineering," McGraw-Hill Book Company, 1979*
[2] *Rawls, W.J., Brakensiek, D.L., and Miller, N., "Green-Ampt Infiltration Parameters From Soils Data," Journal of Hydraulic Engineering, ASCE, January 1983*
[3] *American Society of Civil Engineers, "Hydrology Handbook," ASCE Publications, 1996*

For the modelling, the contraction and expansion coefficients for gradual cross-section changes were left at the HEC-RAS default values 0.1 and 0.3 respectively. The main channel is lined with riprap and willows are growing in the channel. The overbank areas consist of tailings with a relatively smooth gravel-like surface without any grass cover or other type of vegetation. Based on that, the Manning's roughness values for the channel during high discharges and the overbank areas were taken to be 0.06 and 0.03, respectively.

The 200-year peak flood discharge was used to check the flow conditions in Wolverine Creek. The 200-year peak flood discharge at Cross-Section 0+700 was estimated to be 16.6 m³/s (Table 3.5) and the same discharge was applied to the entire reach between Cross-Section 1+100 and 0+700.

3.4.2 HEC-RAS Modelling Results

For a discharge of 16.6 m³/s, the flow did not overtop the man-made channel bank located between the Wolverine channel and the creek valley sides. That is, the potential for a break-out from the channel is relatively low as long as the creek channel is stable and not eroding.

The flow velocity in the channel varied between 1.1 and 3.8 m/s and the flow was super-critical (steep channel slope) along most of the reach. Sub-critical flow (mild channel slope) occurred upstream of Cross-Section 1+025, between Cross-Sections 1+000 and 0+975 and downstream of Cross-Section 0+775. The computed flow velocities and flow conditions are summarised in Table 3.10.

Table 3.10 HEC-RAS Modelling Results

Reach	Flow Velocity (m/s)	Flow Type
1+100 to 1+075	1.1 – 2.1	Sub-critical
1+075 to 1+050	1.9 – 2.5	Sub-critical
1+050 to 1+025	1.8 – 3.8	Sub-critical and super-critical
1+025 to 1+000	2.5 – 3.8	Super-critical
1+000 to 0+975	1.5 – 1.6	Sub-critical
0+975 to 0+950	2.1 – 3.4	Super-critical
0+950 to 0+925	3.1 – 3.4	Super-critical
0+925 to 0+900	3.1 – 3.2	Super-critical
0+900 to 0+875	2.3 – 3.2	Super-critical
0+875 to 0+850	2.3 – 2.5	Super-critical
0+850 to 0+825	2.3 – 3.0	Super-critical
0+825 to 0+800	3.0 – 3.7	Super-critical
0+800 to 0+775	3.0 – 3.7	Super-critical
0+775 to 0+750	2.6 – 3.0	Sub-critical
0+750 to 0+725	1.7 – 2.9	Sub-critical
0+725 to 0+700	1.7 – 1.8	Sub-critical

The highest flow velocities occurred at Cross-Section 1+025 (3.8 m/s), Cross-Section 0+950 (3.4 m/s), Cross-Section 0+900 (3.2 m/s) and Cross-Section 0+800 (3.8 m/s). As the channel has to be protected from erosion, to reduce the risk of the creek flow breaching the dykes on each side of the creek, the riprap used to armour the channels has to be sufficiently large. To provide a guide as to the general size of the riprap required to protect the channel, a typical riprap size range is shown in Table 3.11.

Table 3.11 Alberta Transportation Recommended Riprap Sizes

Riprap Class	Nominal Size (mm)	Thickness (mm)	Allowable Flow Velocity (m/s)
1M	175	300	2.0
1	300	450	3.0
2	500	800	4.0
3	800	1100	4.6

3.5 Summary

From a flood routing through the ponds formed by the North and South lobes, it was found that the two ponds provide only a nominal attenuation of the flood peaks during the current outflow channel conditions. It is therefore recommended that the detention storage provided by the two ponds is ignored when estimating the peak discharge in Wolverine Creek downstream of the South lobe.

From a hydraulic analysis of the Wolverine Creek flow using the computer program HEC-RAS, it was found that the flow was contained within the stream channel during the estimated 200-year flood (16.6 m^3/s). At that discharge the flow was super-critical along most of the reach due to the steep channel profile slope. The flow velocities in the channel varied between 1.1 and 3.8 m/s along the reach with the lowest flow velocities occurring along the upstream and downstream ends of the creek reach reviewed in this hydraulic analysis. The flow velocities at the upstream and downstream ends of the creek reach are sub-critical.

Since 1978 when the channel stabilization work (i.e. installation of the rock weirs) was completed on Wolverine Creek, the rock weirs have flattened and vegetation has established itself in the channel but all together the riprap armouring, the flattened rock weirs and the vegetation serve as revetment for the channel that reduces the risk of a new channel forming. However, there is a chance that the channel revetment may erode and fail locally. It is therefore recommended that the channel revetment be inspected on an annual basis, to assess if any localised erosion is starting to develop.

If localised erosion is identified and the placement of additional riprap is contemplated, it is important that the available channel depth from top of bank is not reduced. For example, if an 800 mm layer of Class 2 riprap is placed on the creek bed the water level in the creek may increase a corresponding amount and could cause an overtopping of the creek banks. Therefore it is important that any creek channel revetment be designed rather than simply placed without any assessment of how it may affect the creek flow at that location.

4. Recommendations

Based on previous recommendations and the results of the 2008 performance monitoring the following work is recommended for 2009:

- Bi-annual site inspection as recommended in the Long Term Performance Monitoring Program (UMA 2006b)
  - Visually inspect the gabion drop structures and Clinton Creek channel
  - Measure the horizontal distances across the drop structures
  - Visually inspect the rock lined channel and weirs on Wolverine Creek
  - Visually inspect Wolverine Creek upstream of the rock lined channel

The next complete round of performance monitoring is scheduled for 2010 as described in the Long Term Performance Monitoring Plan (UMA 2006b). If we can be of further assistance or should you wish to proceed with the recommended engineering work in 2009, please contact either Gil Robinson or Ken Skaftfeld.

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Drawings

510,500 511,000 511,500 512,000 513,000 513,500 514,000 514,500 515,000 515,500 516,000

7,149,500
7,149,000
7,148,500
7,148,000
7,147,500
7,147,000

U1190
AIRSTRIP
WOLVERINE CREEK TAILINGS PILE
NORTH LOBE
FORMER MILL SITE
U2834 (RTK BASE)
SOUTH LOBE
U1561 (MINE)
U1086
WOLVERENE CREEK
HILL (MINE)
U5700
U1192
U5699
U5698
U1183
U1191
G-TRAV (MINE)
HUDGEON LAKE
CLINTON CREEK
2835
U1200
U1189
MINE ACCESS ROAD
CLINTON CREEK WASTE ROCK DUMP
U2836 (RTK BASE)
BEAR CREEK
U228 (MINE)
U1836
U1182
PORCUPINE PIT
U1193
SHACK (MINE)
U280 (MINE)
PORCUPINE CREEK

0 150 300 m
SCALE 1:1500(
UTM ZONE 7 NAD83
IMAGE DATE 1999

U5700 BENCHMARK
U228 (MINE) LOCAL MINE BENCHMARKS

AECOM

Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring - 2008

Site Plan and Bench Mark Locations

Drawing - 01

B SIZE 11" x 17" (279.4mm x 431.8mm)

PLOT: 09/05/04 10:04:18 AM

Saved By: vibergj

ISS/REV: A

AECOM FILE NAME: 2940-044-00_01-B-F002_RX.dwg

CREEK STABILIZATION AREA INCLUDING:
HUDGEON LAKE OUTLET AND
FOUR GABION DROP
STRUCTURES

HUDGEON LAKE

±420 CONTOUR

CLINTON CREEK WASTE ROCK DUMP

±450 CONTOUR

PORCUPINE PIT SLOPE MONITORS

PORCUPINE PIT

FORMER CRUSHER BUILDING (DEMOLISHED)

SNOWSHOE PIT

CREEK PIT

CLINTON CREEK

WOLVERINE CREEK

7,147,500

7,147,000

7,146,500

513,000

513,500

514,000

0228 4cm
P2 6cm
XS-G
0217 1cm
69 2cm
XS-A 4cm
0226 3cm
1833 3cm
P3 2cm
XS-B 1cm
0219 2cm
80-13 1cm
80-14 4cm
0222 2cm
0220 1cm
XS-E 1cm
0224 3cm
68 5cm
U1196 2cm
2cm 81-2
20A 3cm
4 6cm
P4 1cm
0218 1cm
84-1 2cm
P5 1cm
1831 3cm
22A 4cm
21A 5cm
0229 4cm
U1195 3cm
0227 3cm
19 13cm
81-1 3cm
1834 3cm
0223 5cm
0225 4cm
U1194 7cm
1839 6cm
U1493 15cm
1830 1cm
1cm 1837
1832 3cm
1838 1cm

0 50 100 m

SCALE 1:5000

UTM ZONE 7 NAD83
IMAGE DATE 1999

0226 MONITOR LOCATION (ACTIVE)

XS-G MONITOR LOCATION (DESTROYED)

P2 PIEZOMETER LOCATION

22cm INCREMENTAL MOVEMENT (JULY 2007 - 2008)

10cm TOTAL MOVEMENT VECTOR (BASELINE TO 2008)

UPPER SLOPE AREA
- ELEVATION >450±

MID SLOPE AREA
- ELEVATION >420± <450±

LOWER SLOPE AREA
- ELEVATION <420±

AECOM

Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring - 2008

Clinton Creek Waste Rock Dump Movement Monitoring Drawing - 02

7 147 500
7 147 250
7 147 000
513 000
513 250
513 500

SECTION 1
SECTION 2
SECTION 3
SECTION 4
SECTION 5
SECTION 6
SECTION 7
SECTION 8

1450 1451 1452 1453 1454 1455 1456 1457 1458 1459 1460 1461 1462 1463 1464 1465

DROP STRUCTURE #1
(SEE DRAWING 04)

DROP STRUCTURE #2
(SEE DRAWING 05)

DROP STRUCTURE #3
(SEE DRAWING 06)

DROP STRUCTURE #4
(SEE DRAWING 07)

ALIGNMENT OF CREEK
CHANNEL (TYP.)

1999
2001
JULY, 2006
JULY, 2004 (BASE LINE)
JULY, 2008

0+000 0+050 0+100 0+150 0+200 0+250 0+300 0+350 0+400 0+450 0+500 0+550 0+600 0+650 0+700 0+750 0+800 0+850 0+900 0+950

CHANNEL STATION
(m) TYP.

N

PLAN

0 25 50 m
SCALE 1:2500

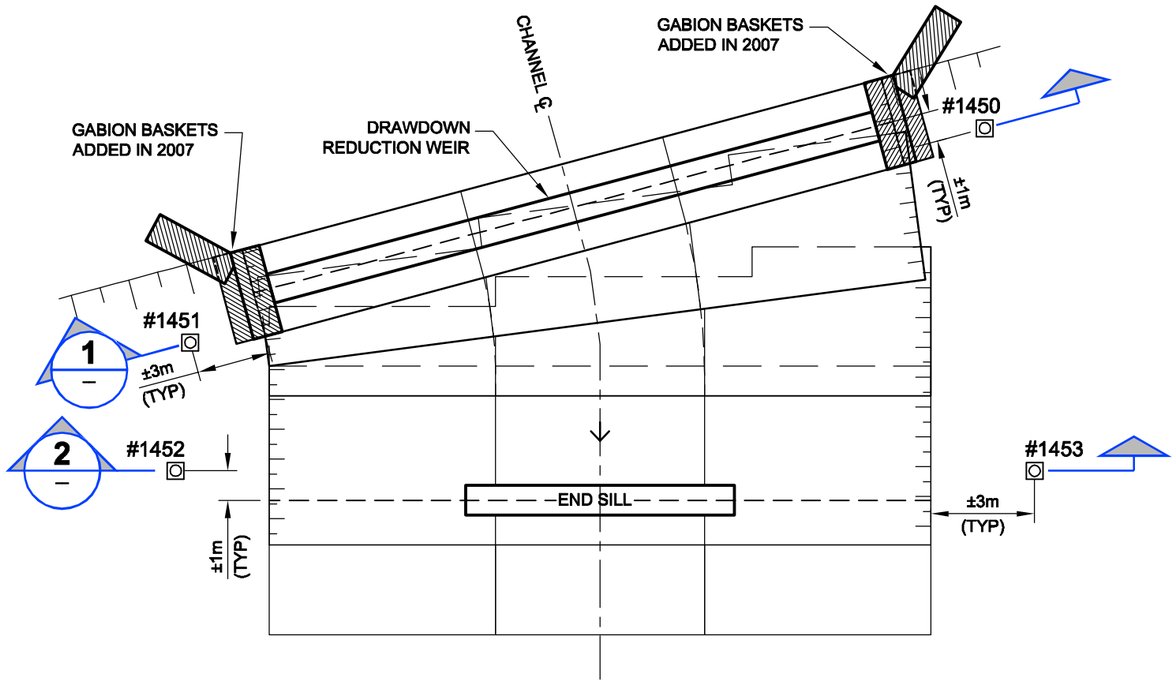
LEGEND

- 1450 — CHANNEL CLOSURE MOVEMENT MONITOR (TYP)
- CREEK CENTRELINE 1999
- CREEK CENTRELINE 2001
- CREEK CENTRELINE 2004 (BASELINE FOR LONG TERM MONITORING)
- CREEK CENTRELINE 2006
- CREEK CENTRELINE 2008

AECOM

Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring - 2008

Clinton Creek
Channel Plan
Drawing - 03

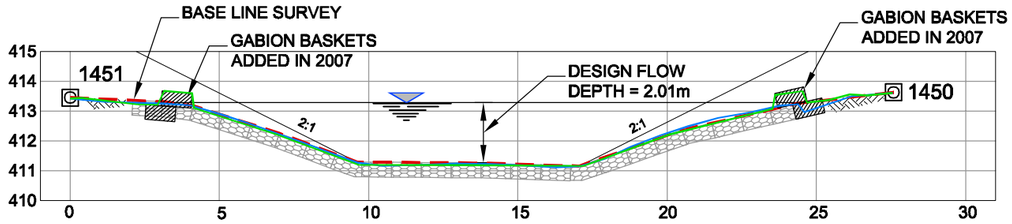


DROP STRUCTURE PLAN VIEW

0 2 4 m SCALE 1:200

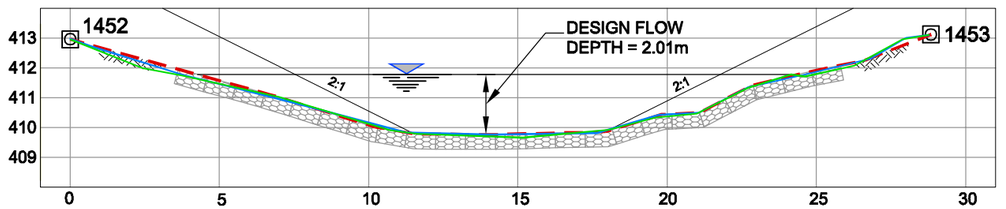
DROP STRUCTURE END VIEW

0 2 4 m SCALE 1:200



SECTION 1 –

0 2 4 m SCALE 1:200



SECTION 2 –

0 2 4 m SCALE 1:200

℄ CHANNEL CLOSURE MOVEMENT MONITOR (19mm Ø STEEL PIN) INSTALLED DURING 2006 SURVEY.

NOTE 1: GABION FILL REMOVED FROM THIS CELL OF THE DRAWDOWN WEIR IN 2007 TO AID IN DRAWING DOWN THE LEVEL IN HUDGEON LAKE DURING LOW FLOW PERIODS.

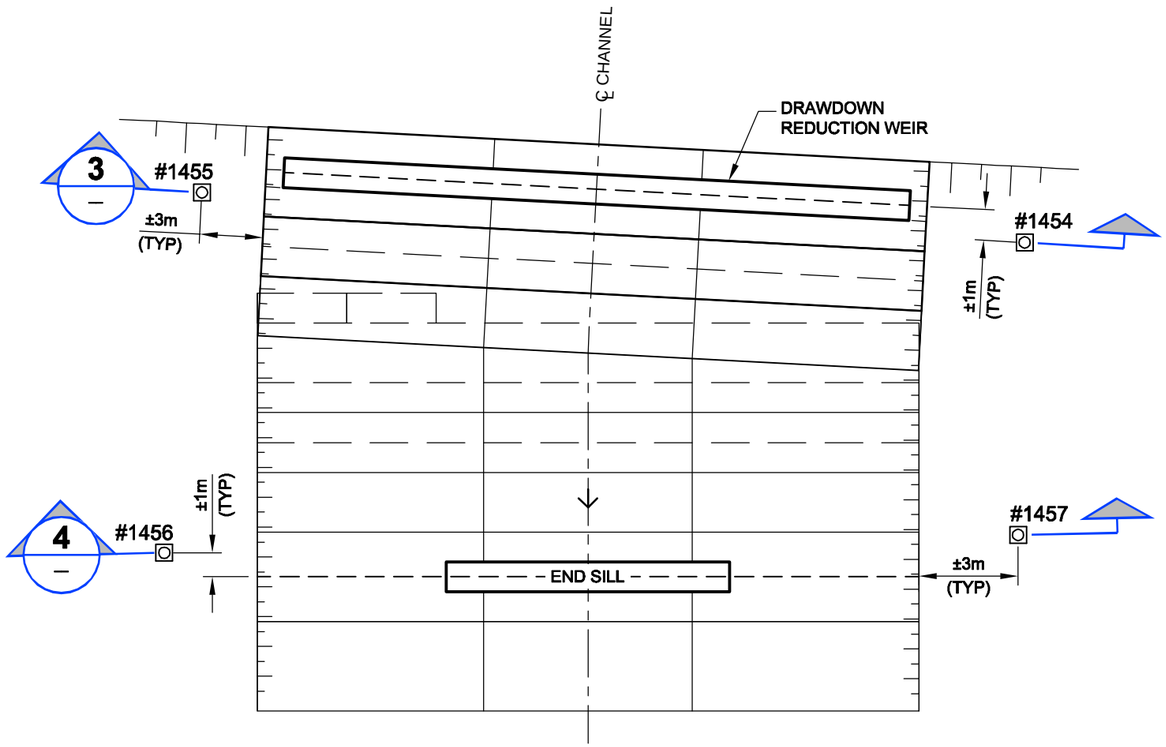
– – – BASE LINE SURVEY (2006)
——— SURVEY (2007)
——— SURVEY (2008)

AECOM

Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring – 2008

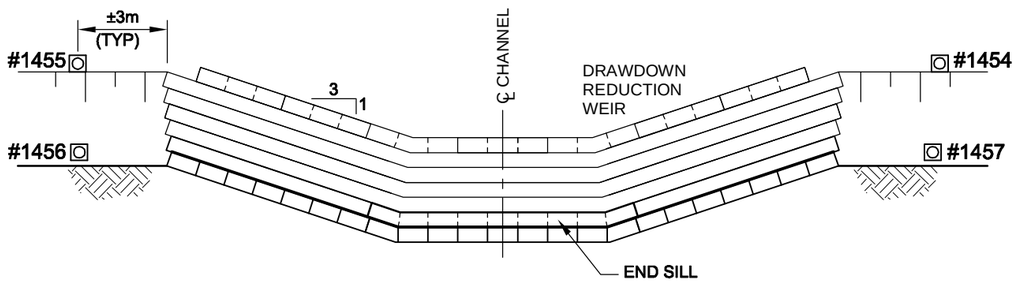
Drop Structure #1

Drawing - 04



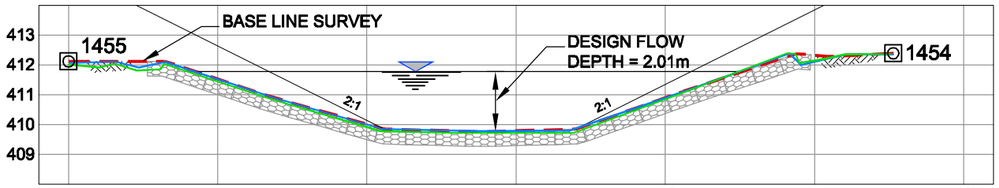
DROP STRUCTURE PLAN VIEW

0 2 4 m SCALE 1:200



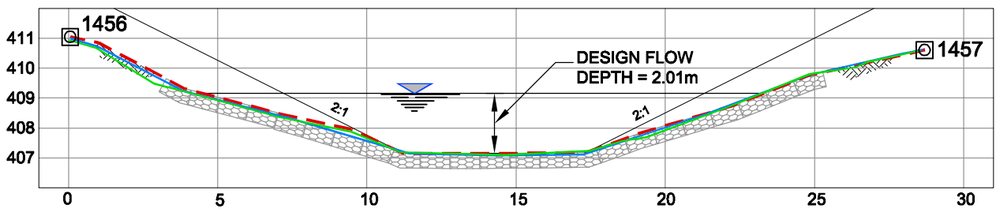
DROP STRUCTURE END VIEW

0 2 4 m SCALE 1:200



SECTION 3

0 2 4 m SCALE 1:200



SECTION 4

0 2 4 m SCALE 1:200

▣ CHANNEL CLOSURE MOVEMENT MONITOR (19mm Ø STEEL PIN) INSTALLED DURING 2006 SURVEY.

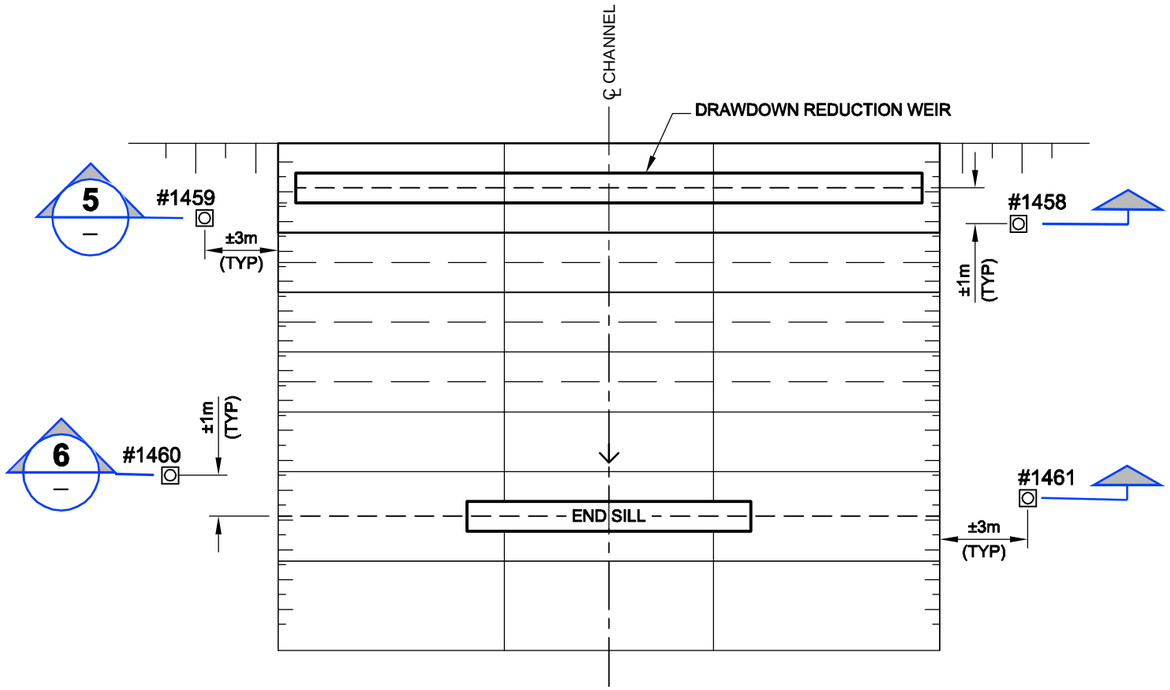
- - - BASE LINE SURVEY (2006)
——— SURVEY (2007)
——— SURVEY (2008)

Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring – 2008

Drop Structure #2

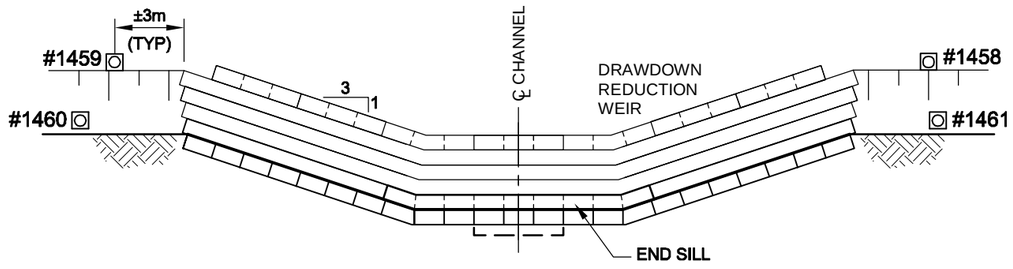
Drawing - 05

AECOM



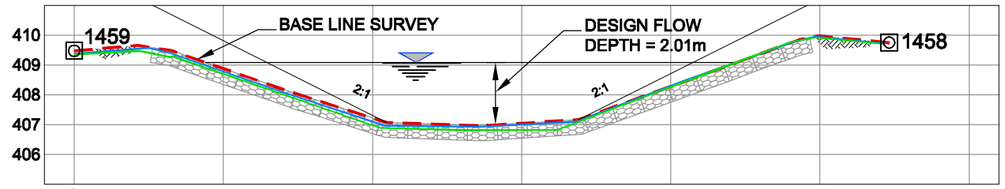
DROP STRUCTURE PLAN VIEW

0 2 4 m SCALE 1:200



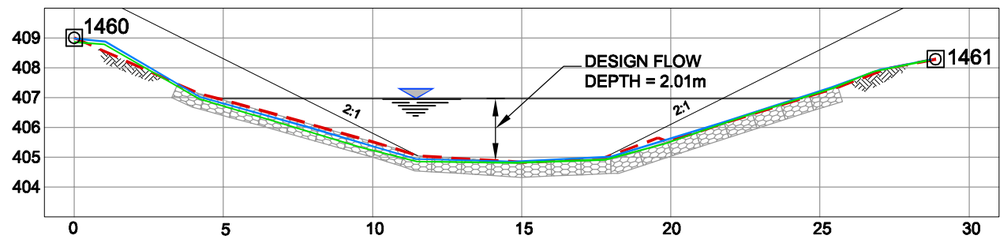
DROP STRUCTURE END VIEW

0 2 4 m SCALE 1:200



SECTION 5

0 2 4 m SCALE 1:200



SECTION 6

0 2 4 m SCALE 1:200

▣ CHANNEL CLOSURE MOVEMENT MONITOR (19mm Ø STEEL PIN) INSTALLED DURING 2006 SURVEY.

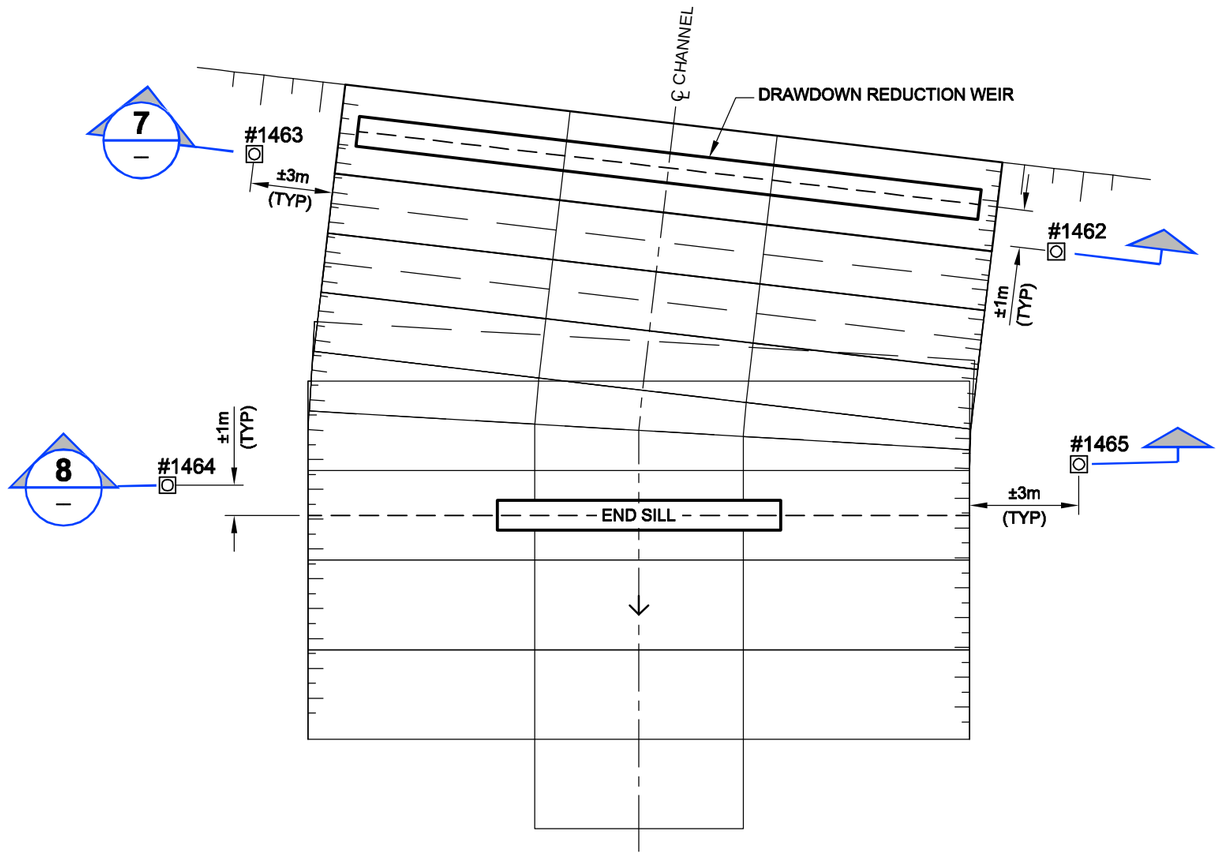
- - - BASE LINE SURVEY (2006)
——— SURVEY (2007)
——— SURVEY (2008)

Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring – 2008

Drop Structure #3

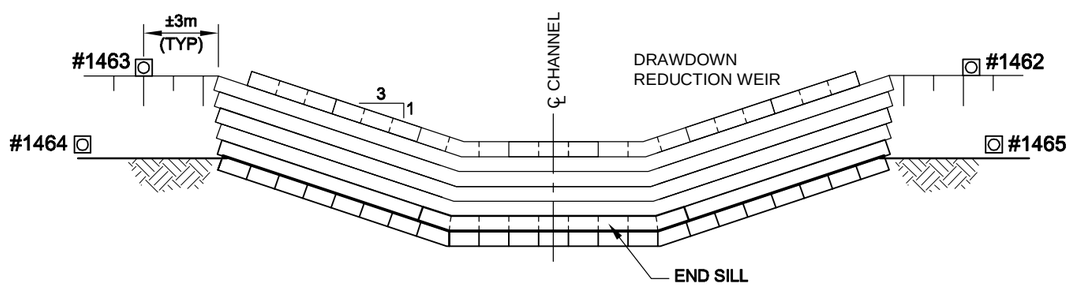
AECOM

Drawing - 06



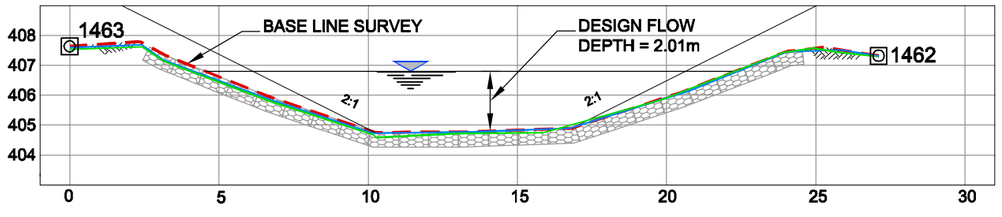
DROP STRUCTURE PLAN VIEW

0 2 4 m SCALE 1:200



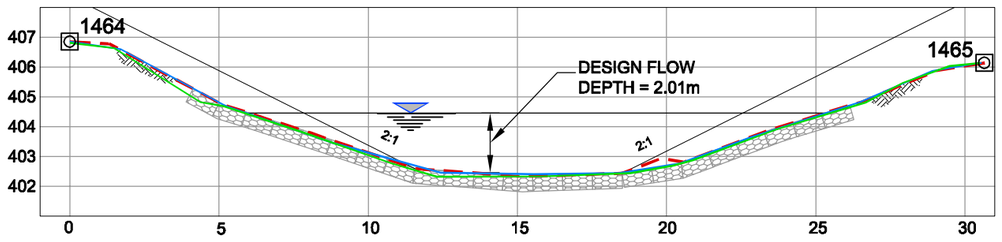
DROP STRUCTURE END VIEW

0 2 4 m SCALE 1:200



SECTION 7

0 2 4 m SCALE 1:200



SECTION 8

0 2 4 m SCALE 1:200

▣ CHANNEL CLOSURE MOVEMENT MONITOR (19mm Ø STEEL PIN) INSTALLED DURING 2006 SURVEY.

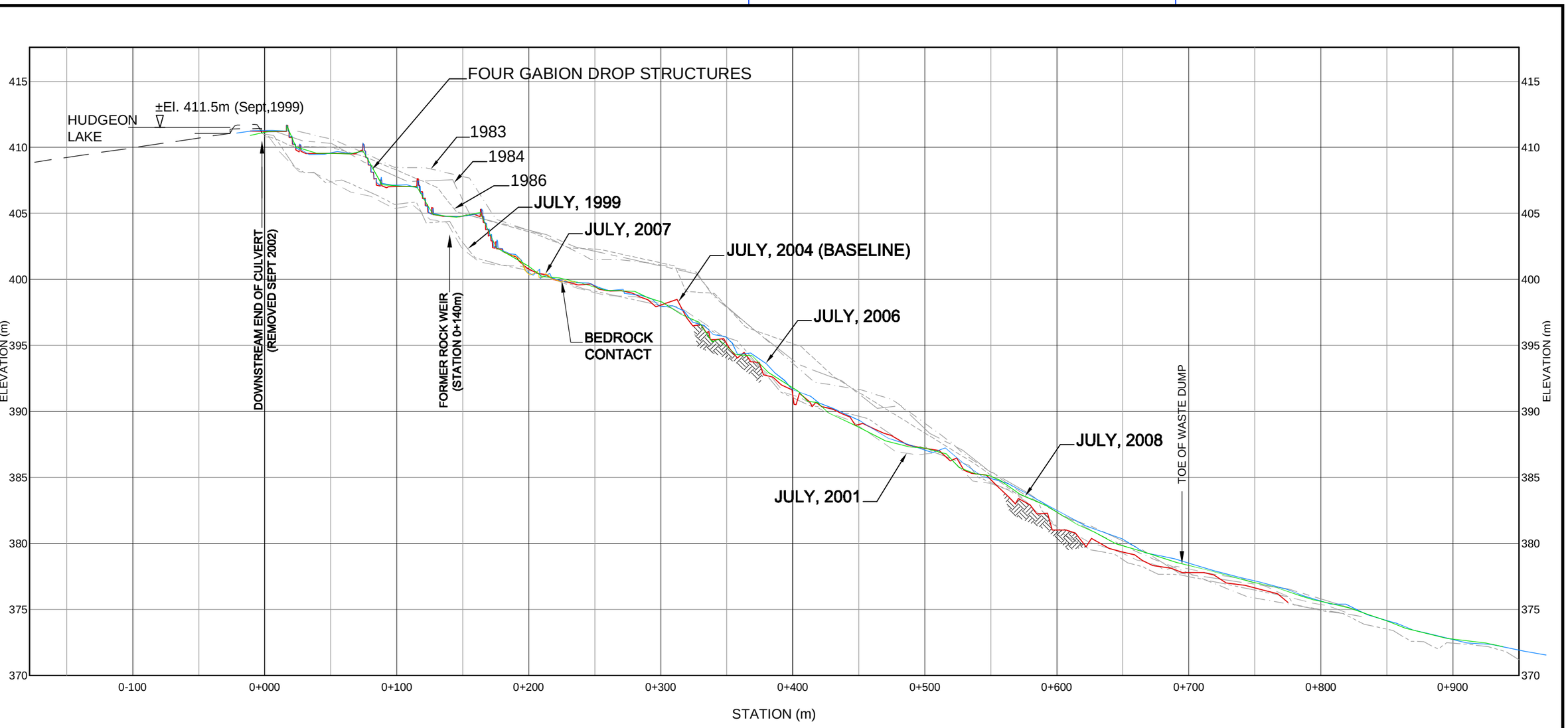
– – – BASE LINE SURVEY (2006)
——— SURVEY (2007)
——— SURVEY (2008)

Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring – 2008

Drop Structure #4

Drawing - 07

AECOM



PROFILE

0 30 60 H=1:3000 m
0 3 6 V=1:300

STATION	NORTHING	EASTING
0+000	7,147,427	512,863
0+250	7,147,366	513,113
0+500	7,147,272	513,363
0+750	7,147,204	513,613

COORD: UTM ZONE 7W NAD83

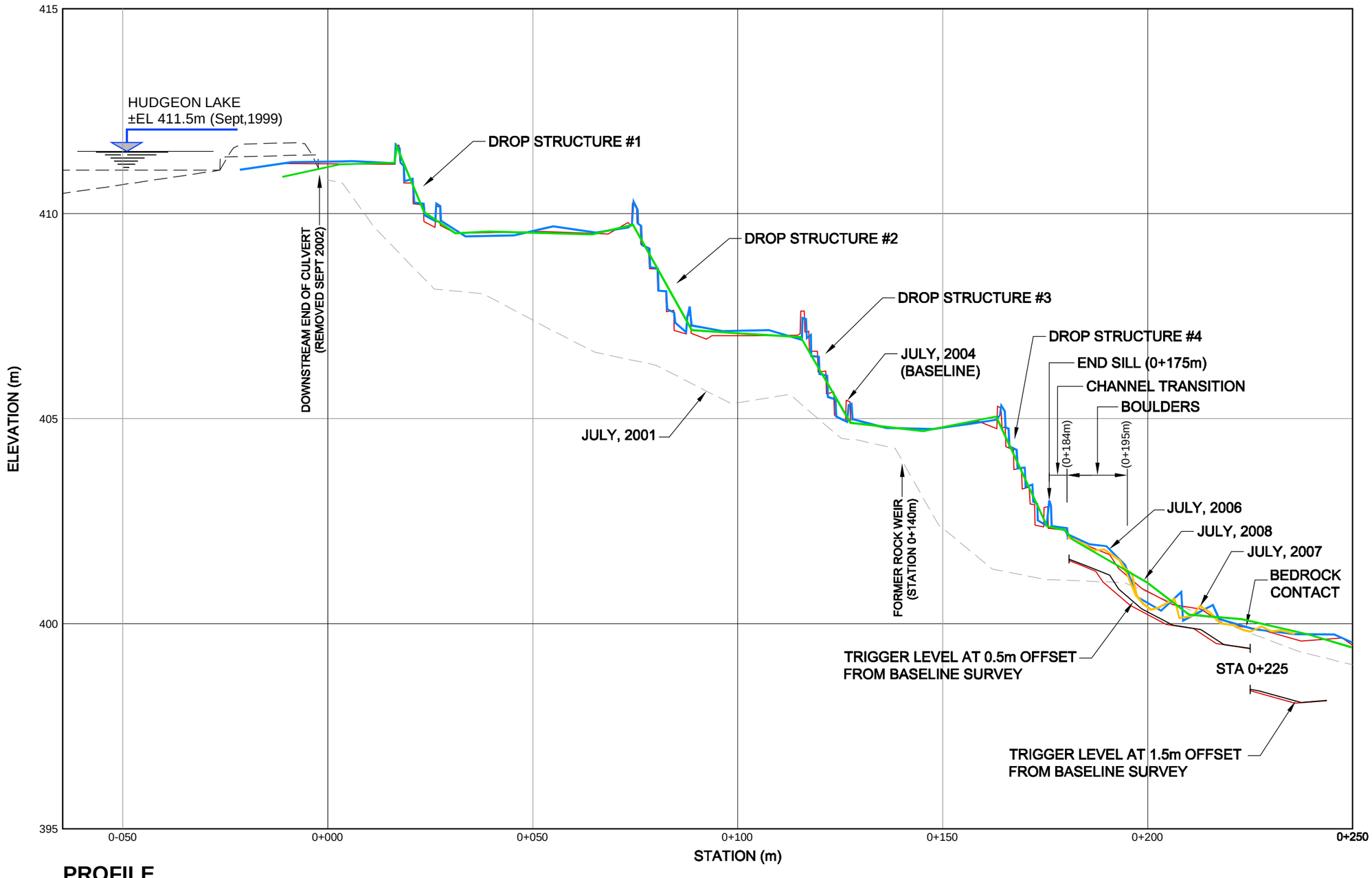
LEGEND

- PROFILE 1983
- PROFILE 1984
- PROFILE 1986
- PROFILE 1999
- PROFILE 2001
- PROFILE 2004 (BASELINE FOR LONG TERM MONITORING)
- PROFILE 2006
- PROFILE 2007
- PROFILE 2008

AECOM

Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring – 2008

Clinton Creek
Channel Profile
Drawing - 08



PROFILE

0 10 20 m H=1:1000
0 1 2 V=1:100

0-50 to 0+250

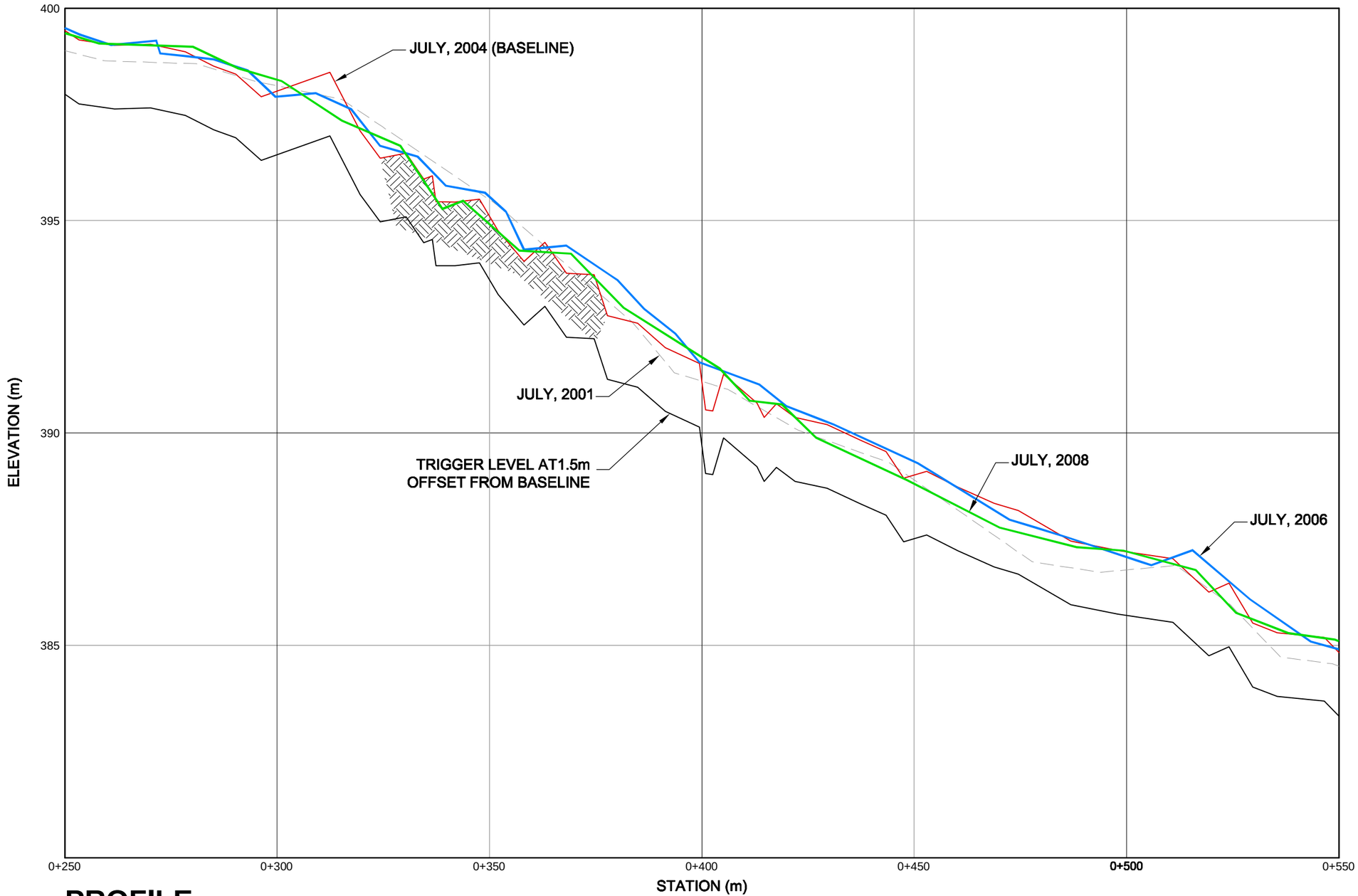
LEGEND

- PROFILE 2001
- PROFILE 2004 (BASELINE FOR LONG TERM MONITORING)
- PROFILE 2006
- PROFILE 2007
- PROFILE 2008

AECOM

Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring – 2008

Clinton Creek Channel Profile
Station 0-050 to 0+250
Drawing - 09



PROFILE

0 10 20 30 m H=1:1000

0 1 2 3 V=1:100

0+250 to 0+550

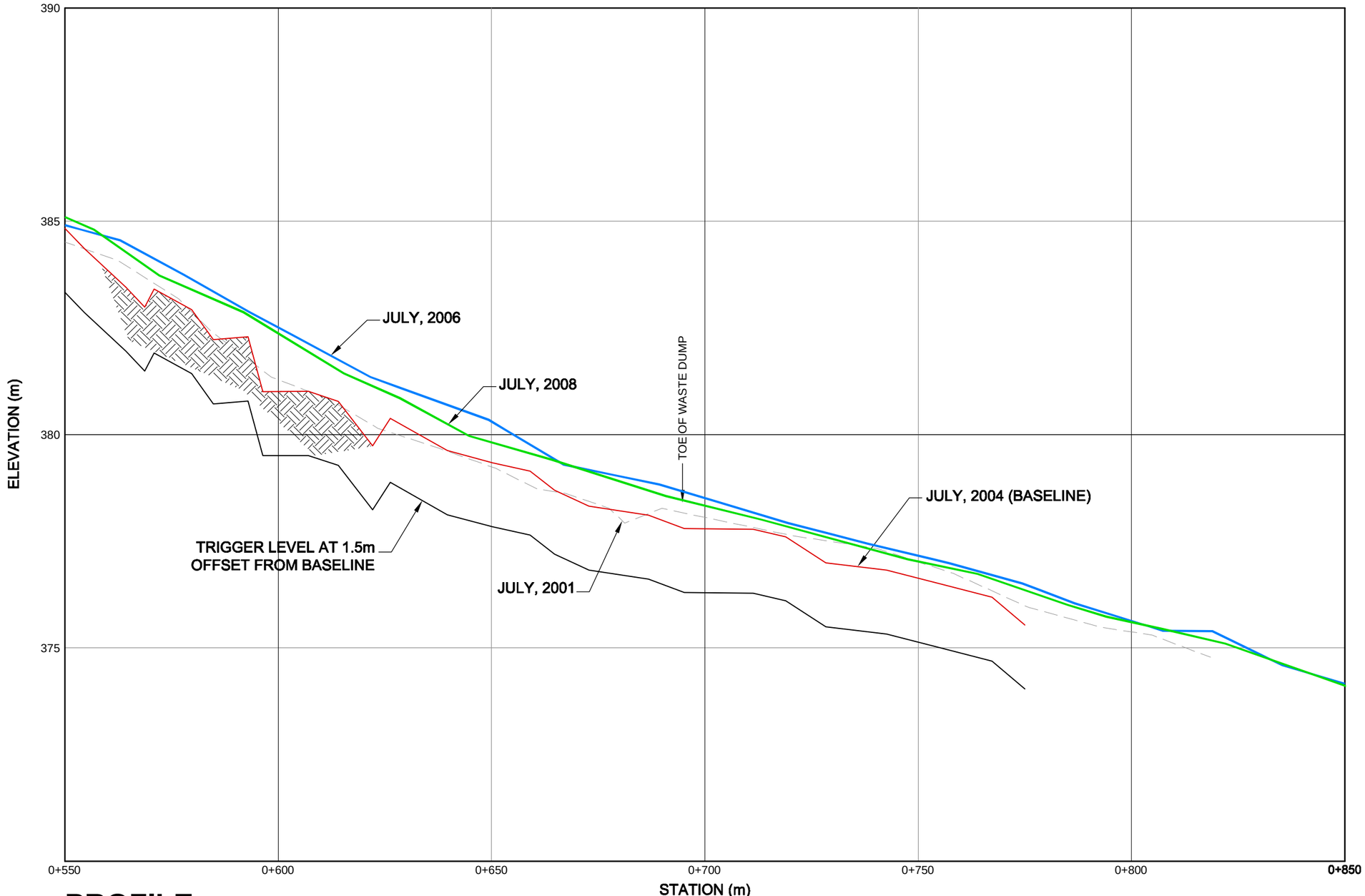
LEGEND

- PROFILE 2001
- PROFILE 2004 (BASELINE FOR LONG TERM MONITORING)
- PROFILE 2006
- PROFILE 2008

AECOM

Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring – 2008

Clinton Creek Channel Profile
Station 0+250 to 0+550
Drawing - 10



PROFILE

0 10 20 30 m H=1:1000

0 1 2 3 V=1:100

0+550 to 0+850

LEGEND

- PROFILE 2001
- PROFILE 2004 (BASELINE FOR LONG TERM MONITORING)
- PROFILE 2006
- PROFILE 2008

AECOM

Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring – 2008

Clinton Creek Channel Profile
Station 0+550 to 0+850
Drawing - 11

513,000 513,500 514,000

7,148,500 7,148,000

530 425

WOLVERINE CREEK

1495 6cm
BH-14(T7) 7cm
80-1 7cm
650-1 5cm
650-2 12cm
1491 17cm
80-7 20cm
NORTH LOBE
NL-1 16cm
1083 (NL-2) 15cm
NL-3 12cm
350-3A 15cm
1085 5cm
500-1 1cm
500-2 18cm
1489 7cm
NL-4 13cm
NL-5 9cm
350-1A 17cm
350-2A 15cm
26 4cm
26A 5cm
80-2 9cm
1483 5cm
80-5 45cm
80-4 60cm
FORMER MILL SITE
2834 (RTK BASE)
NL-BASE 5cm
2005-01 93cm
SL-4 77cm
2005-02 84cm
1484 86cm
2005-03 91cm
SL-3 79cm
SL-2 60cm
SL-1 46cm
2005-10 73cm
SL-5 85cm
2005-11 68cm
2005-09 54cm
WOLVERINE CREEK TAILINGS PILES
SOUTH LOBE
BH-16(T8) 110cm
24B 109cm
24D 77cm
25B 35cm
24A 113cm
2005-04 102cm
1492 10cm
24 17cm
1084 30cm
2005-07 8cm
2005-06 81cm
2005-08 16cm
1485 114cm
2005-05 122cm
80-9 3cm
U1086

UPPER SLOPE AREA | MID SLOPE AREA | LOWER SLOPE AREA

ROCK LINED CHANNEL AND ROCK WEIRS
530m ELEVATION CONTOUR
425m ELEVATION CONTOUR

0 40 80 120 m SCALE 1:4000

UTM ZONE 7 NAD83
IMAGE DATE 1999

24 MONITOR LOCATION (ACTIVE)
2005-01 MONITOR LOCATION (ADDED IN 2005)
SL/NL-01 VISUAL ALIGNMENT PIN
BH-14 (T7) 1978 TEST HOLE LOCATION

17cm INCREMENTAL MOVEMENT (JULY 2006 - 2008)
100cm TOTAL MOVEMENT VECTOR (BASELINE TO 2008)

COMPASS BEARING FROM NL-BASE ALONG PINS NL-1 TO NL-5
DECLINATION: 30°
BEARING: 208°

COMPASS BEARING FROM NL-BASE ALONG PINS SL-1 TO SL-5
DECLINATION: 30°
BEARING: 121°

AECOM

Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring - 2008

Wolverine Creek Tailings Pile Movement Monitoring Drawing - 12

513,500
514,000
7,148,000

80-2 9cm
1483 5cm
80-5 45cm
80-4 60cm
2834 (RTK BASE)
1492 10cm
24 17cm
1084 30cm
1485 114cm
BH-16(T8) 110cm
24A 113cm
24B 109cm
350-1A 17cm
350-2A 15cm
1489 7cm
NL-4 13cm
NL-5 9cm
NL-BASE 5cm
2005-01 93cm
2005-02 84cm
1484 86cm
SL-5 85cm
2005-10 73cm
2005-03 91cm
2005-11 68cm
2005-09 54cm
SL-4 77cm
SL-3 79cm
SL-2 60cm
SL-1 46cm
24D 77cm
25B 35cm
2005-04 102cm
2005-08 16cm
2005-07 8cm
2005-06 81cm
2005-05 122cm
80-9 3cm

530
425

WOLVERINE CREEK TAILINGS PILES
SOUTH LOBE
APPARENT DIRECTION OF MOVEMENT (TYPICAL)
530m ELEVATION CONTOUR
425m ELEVATION CONTOUR
UPPER SLOPE AREA
MID SLOPE AREA
LOWER SLOPE AREA
ROCK LINED CHANNEL AND ROCK WEIRS

0 20 40 m
SCALE 1:2000
UTM ZONE 7 NAD83
IMAGE DATE 1999

24 MONITOR LOCATION (ACTIVE)
2005-01 MONITOR LOCATION (ADDED IN 2005)
SL/NL-01 VISUAL ALIGNMENT PIN
BH-14 (T7) 1978 TEST HOLE LOCATION

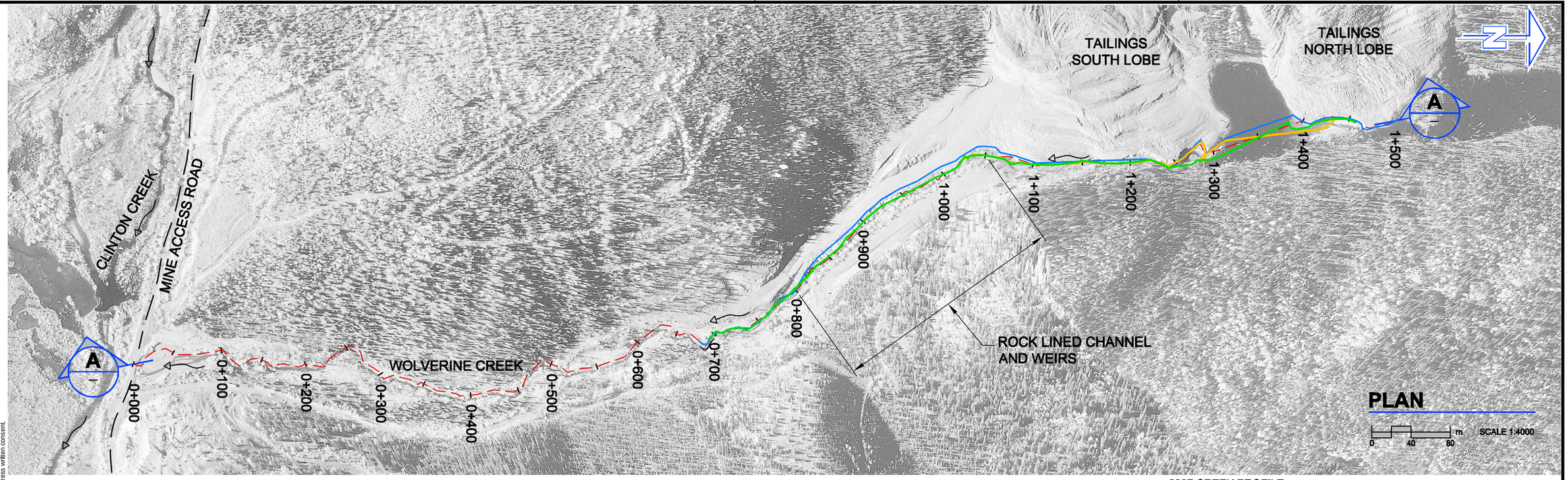
17cm INCREMENTAL MOVEMENT (JULY 2006 - 2008)
100cm TOTAL MOVEMENT VECTOR (BASELINE TO 2008)
APPARENT DIRECTION OF MOVEMENT

COMPASS BEARING FROM NL-BASE ALONG PINS NL-1 TO NL-5
DECLINATION: 30°
BEARING: 208°

COMPASS BEARING FROM NL-BASE ALONG PINS SL-1 TO SL-5
DECLINATION: 30°
BEARING: 121°

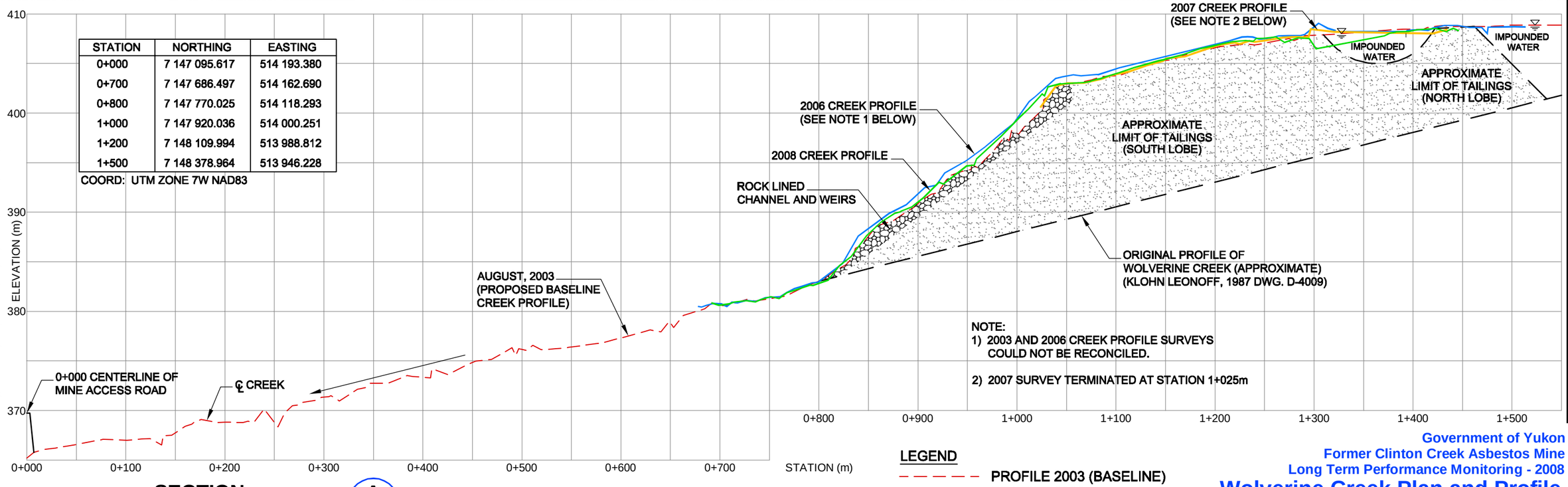
AECOM

Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring - 2008
Wolverine Creek Tailings Pile
South Lobe Movement
Drawing - 13



STATION	NORTHING	EASTING
0+000	7 147 095.617	514 193.380
0+700	7 147 686.497	514 162.690
0+800	7 147 770.025	514 118.293
1+000	7 147 920.036	514 000.251
1+200	7 148 109.994	513 988.812
1+500	7 148 378.964	513 946.228

COORD: UTM ZONE 7W NAD83



NOTE:
1) 2003 AND 2006 CREEK PROFILE SURVEYS COULD NOT BE RECONCILED.

2) 2007 SURVEY TERMINATED AT STATION 1+025m

LEGEND
- PROFILE 2003 (BASELINE)
- PROFILE 2006
- PROFILE 2007
- PROFILE 2008

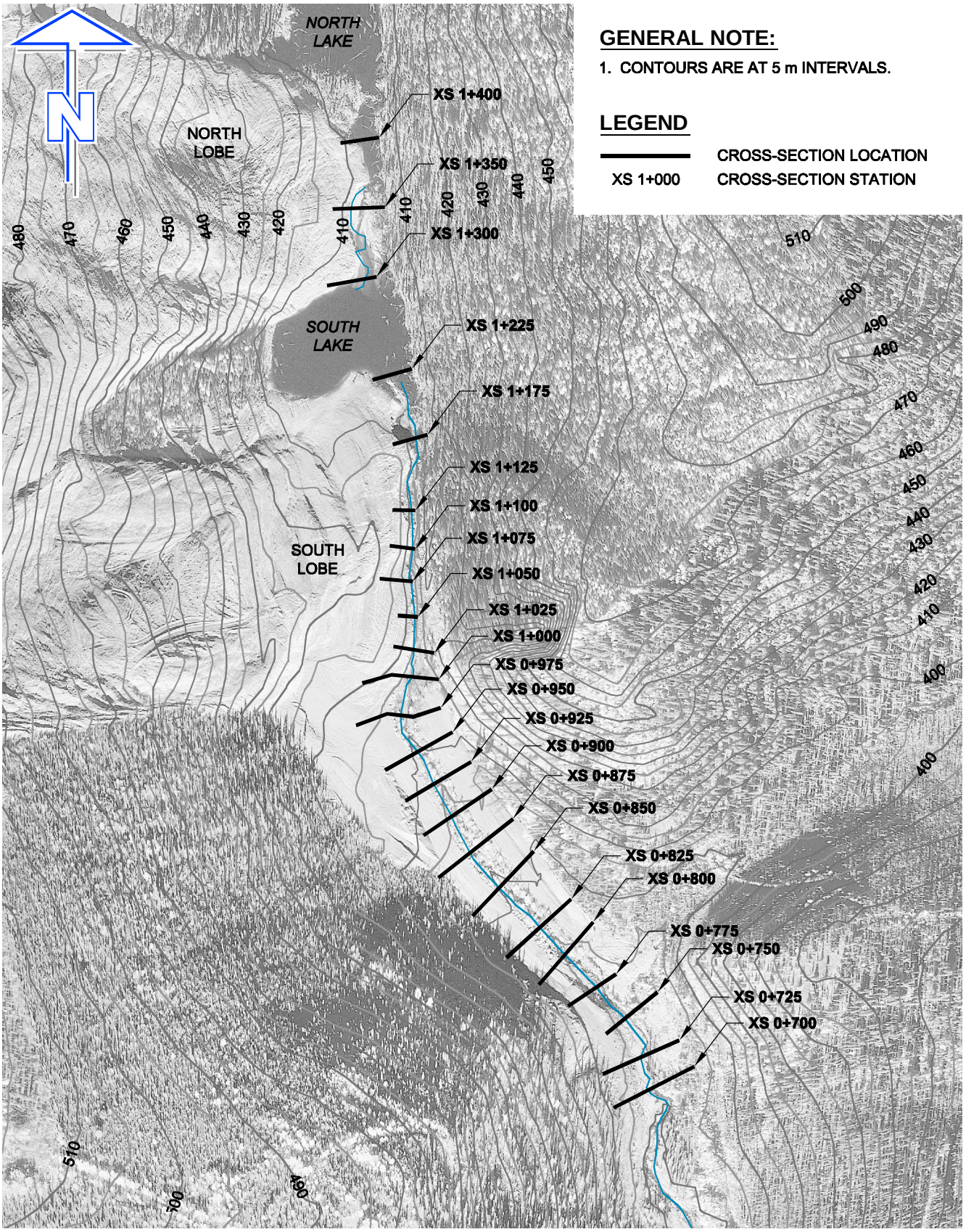
SECTION A
0 40 80 m H=1:4000
0 4 8 V=1:400

AECOM

Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring - 2008

Wolverine Creek Plan and Profile

Drawing - 14



GENERAL NOTE:

1. CONTOURS ARE AT 5 m INTERVALS.

LEGEND

CROSS-SECTION LOCATION

XS 1+000 CROSS-SECTION STATION

0 40 80 m

SCALE 1:4000

A SIZE 8.5" x 11" (215.9mm x 279.4mm)

PLOT: 09/05/08 11:03:23 AM

Saved By: vibergj

AECOM FILE NAME: 2940-044-00_01-B-F015_RX.dwg

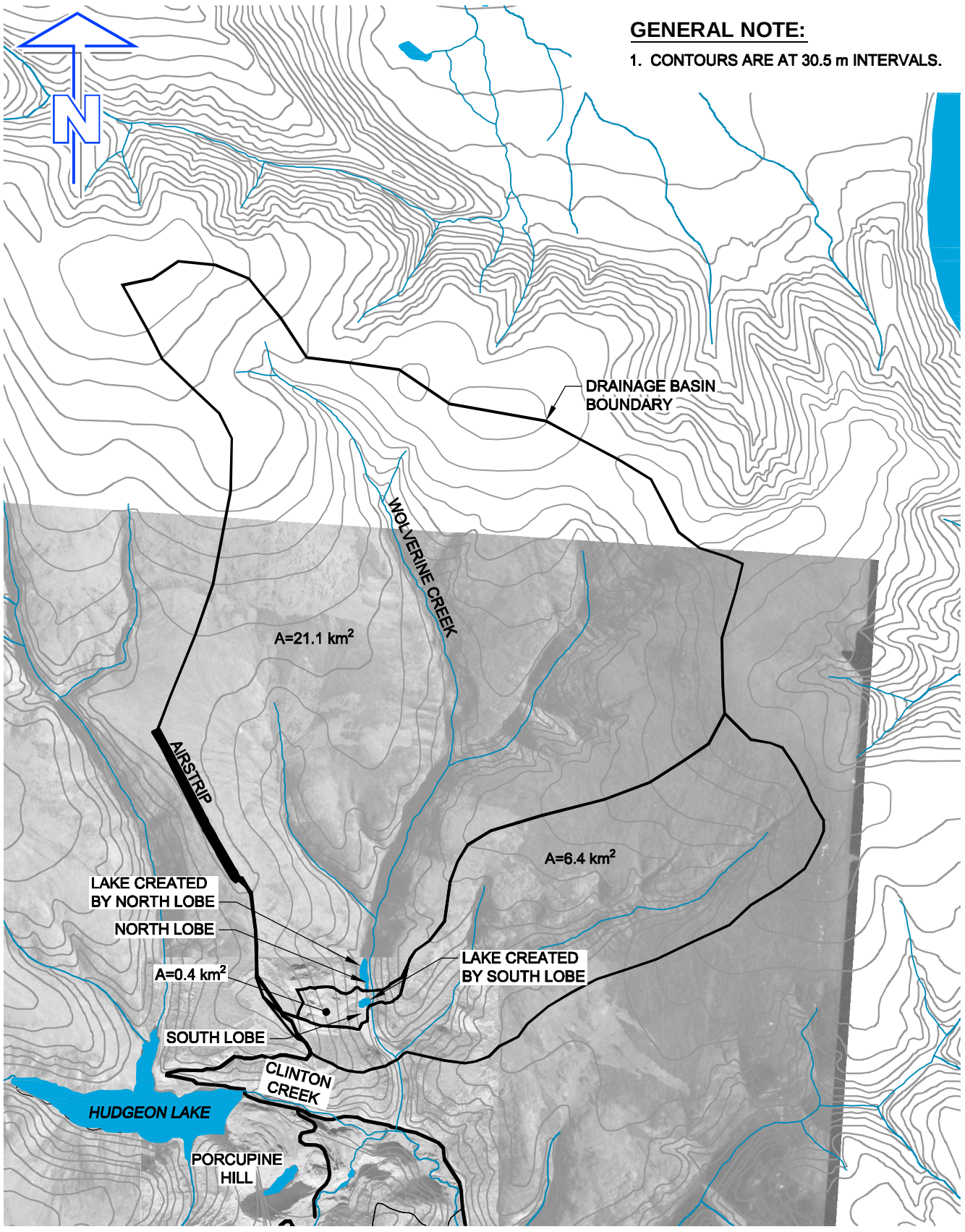
ISS/REV: A

Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring - 2008

Wolverine Creek
Surveyed Cross-Sections

AECOM

Drawing - 15



A SIZE 8.5" x 11" (215.9mm x 279.4mm)

PLOT: 09/05/05 3:41:48 PM

Saved By: vibergj

ISS/REV: A

AECOM FILE NAME: 2940-044-00_01-B-F016_RX.dwg

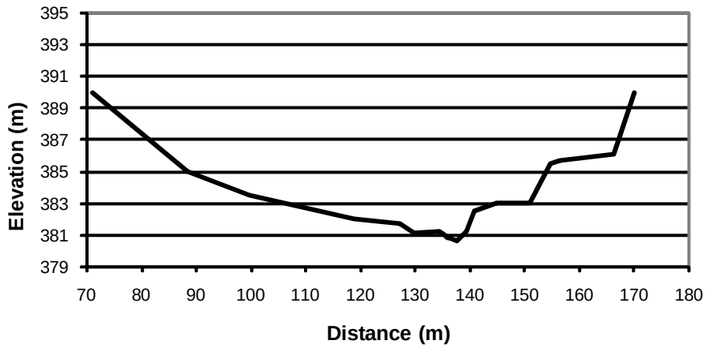
Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring - 2008

Wolverine Creek Drainage Basin

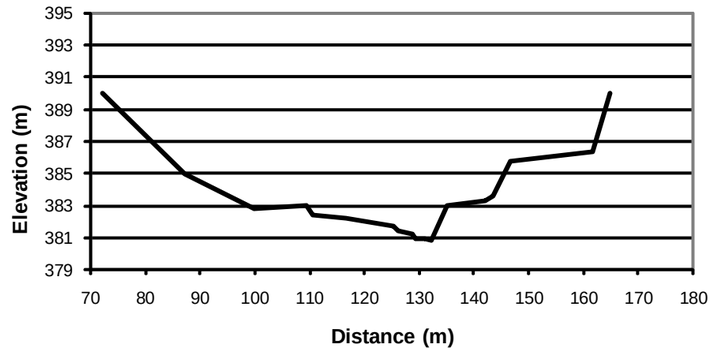
Drawing - 16

AECOM

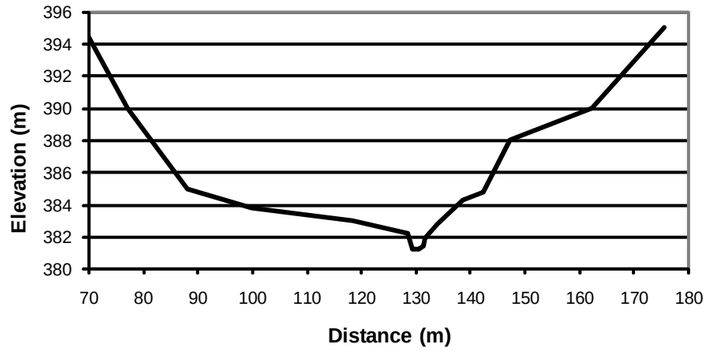
Cross-Section 0+700



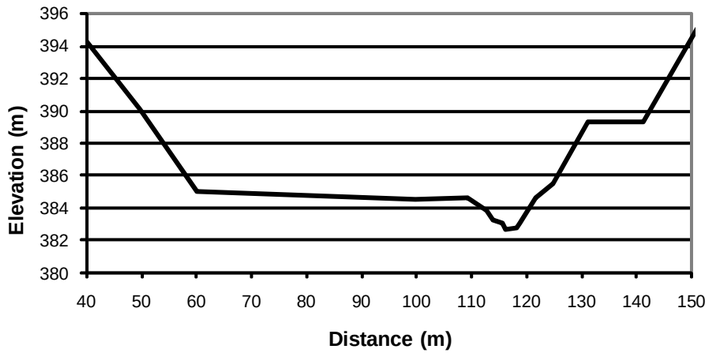
Cross-Section 0+725



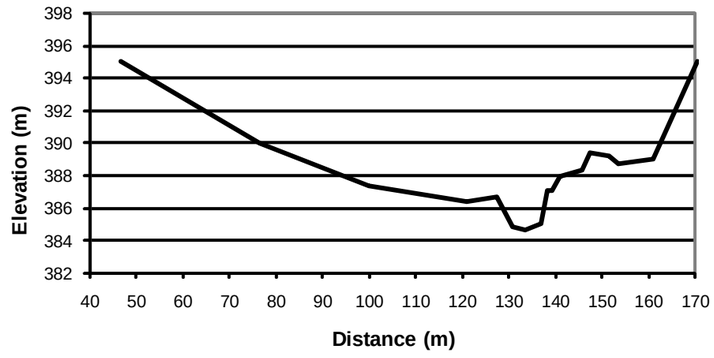
Cross-Section 0+750



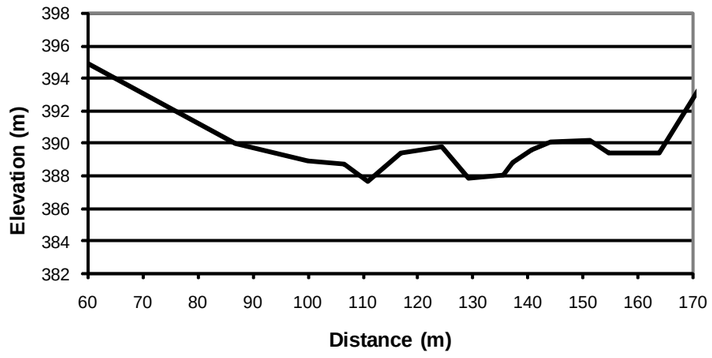
Cross-Section 0+775



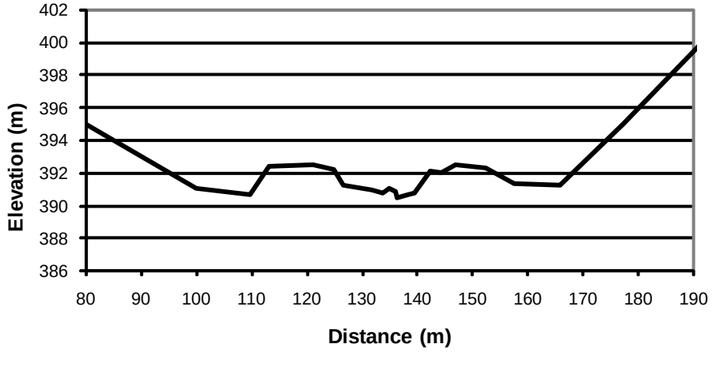
Cross-Section 0+800



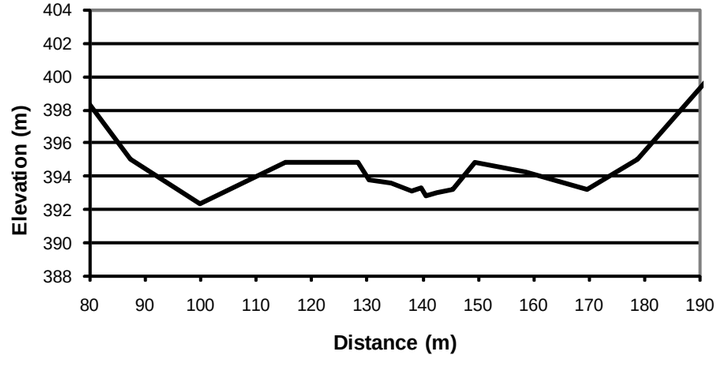
Cross-Section 0+825



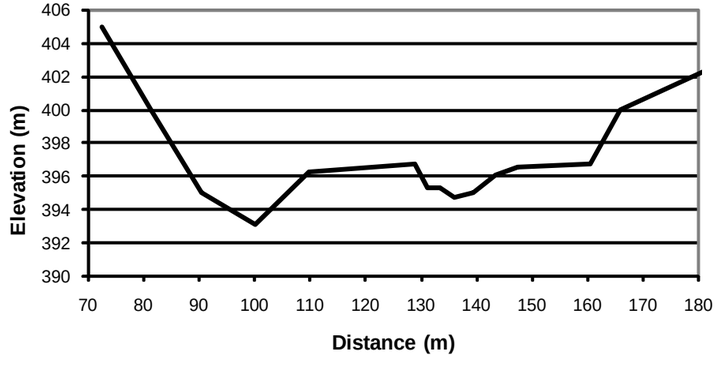
Cross-Section 0+850



Cross-Section 0+875



Cross-Section 0+900

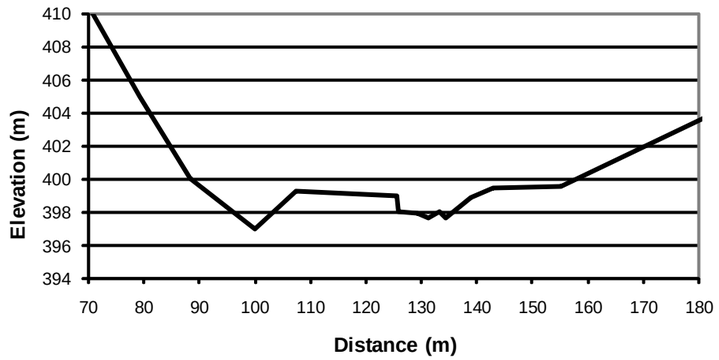


Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring - 2008

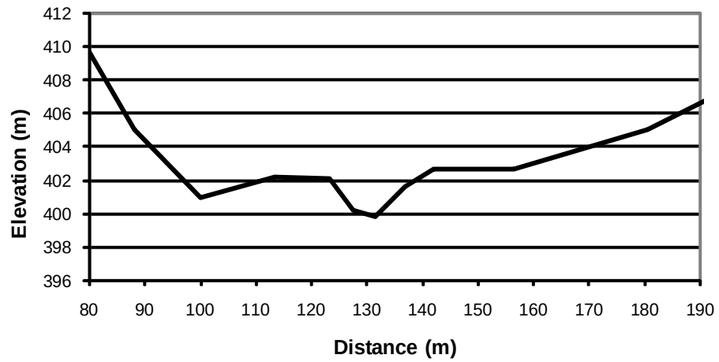
Wolverine Creek
Cross-Sections
Drawing - 17

AECOM

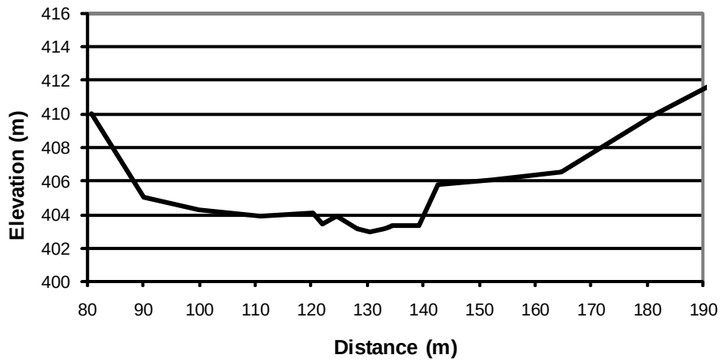
Cross-Section 0+925



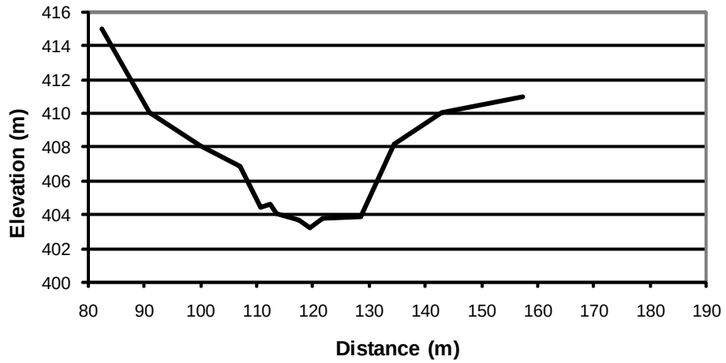
Cross-Section 0+950



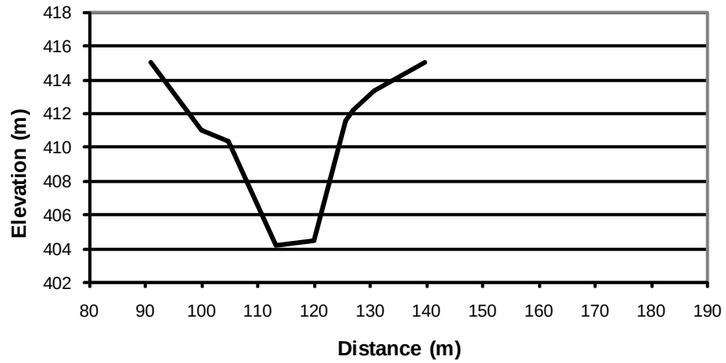
Cross-Section 0+975



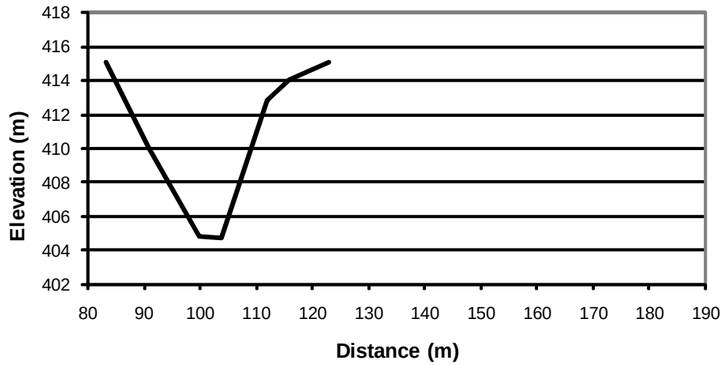
Cross-Section 1+000



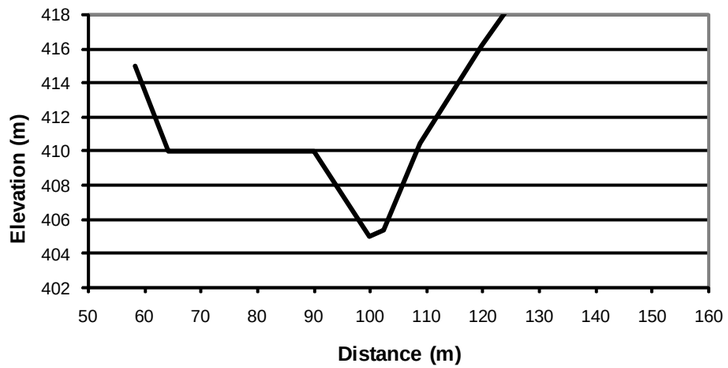
Cross-Section 1+025



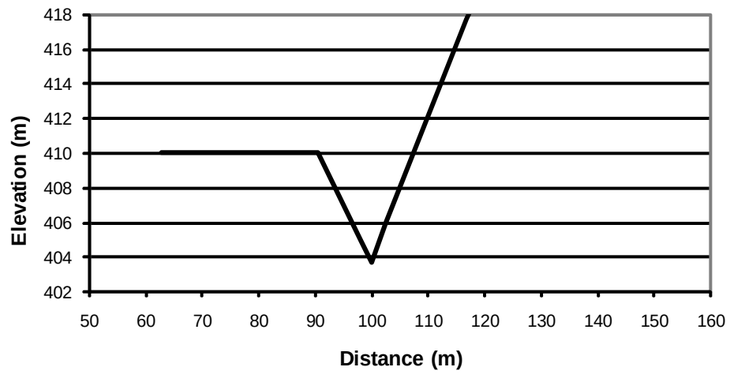
Cross-Section 1+050



Cross-Section 1+075



Cross-Section 1+100



Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring - 2008

Wolverine Creek
Cross-Sections
Drawing - 18

AECOM

Appendix A

Monitoring Instructions and Protocol and Survey Results from Underhill Geomatics

Former Clinton Creek Asbestos Mine
2008 Performance Monitoring Program

1. Set-up GPS base station near Mill Site at BM-U1086.
   (Ref. Drawing 1, Table 1)

2. Check control points to confirm BM-U1086 is stable
   (Ref. Drawing 1, Table 1).

3. Once control has been verified start survey of movement monitoring points.

4. Waste Rock Pile Movement Monitors (ref: Drawing 2, Table 2):
   - Setup RTK base station on Waste Rock pile at U2836,
   - Face Clinton Creek (CC) when surveying points,
   - Survey ground level at the base of the pin on the side of the pin furthest from the creek.

5. Porcupine Pit Slope Monitors (ref: Drawing 2, Table 2):
   - Face the open pit when surveying,
   - Survey ground level at the base of the pin on the side of the pin furthest from the pit.

6. Clinton Creek Channel Stabilization – Drop Structure Monitoring (ref: Drawing 2, Table 2):
   - Monitor Pins # 1450 to 1465 located at the four corners of each drop structure
   - Face creek when surveying,
   - survey ground level at the base of the pin on the side of the pin furthest from the creek.
   - Survey cross-sections #1 to #8 of drop structures along the line between the two sets of movement monitoring pins at each structure. As a minimum, take survey shots on top of the gabions at top of slope, mid-slope, toe of slope and centerline.

7. Clinton Creek Centreline Profile Survey (ref. Drawing 3):
   - Establish TBM's (check 2004/2006 survey files for locations),
   - Start at Station 0+00m (see Table below for co-ordinates),
   - Survey from Station 0+000 to 0+800 m

Clinton Creek Profile Survey: Station Co-ordinates

STATION (m)	NORTHING	EASTING
0+000	7,147,427	512,863
0+250	7,147,366	513,113
0+500	7,147,272	513,363
0+750	7,147,204	513,613
	UTM NAD 83 Zone 7W	

8. Waste Rock Pile Cross-sections (ref: Drawing 2)
    - Survey 3 cross-sections at the locations shown on Drawing 2. The south end of the sections should start about ¼ up the waste rock slope and finish +/- 3 m up the valley slope on the north side of the creek channel.

9. Tailings Movement Monitors(ref: Drawing 4, Table 3):
    - Setup RTK base station near crest of tailings pile (U 2834),
    - Face Wolverine Creek when surveying,
    - Survey ground level at the base of the pin on the side furthest from the creek.

10. Wolverine Creek Centreline Profile Survey (ref: Drawing 5):
    - Establish TBM's if required (check 2003 survey for locations),
    - Start at Station 0+700 m (see Table below for co-ordinates),
    - Survey from Station 0+700 to 1+500 m ***(PLEASE NOTE THAT THE STATION NUMBERS INCREASE IN THE UPSTREAM DIRECTION AS SHOWN ON THE ATTACHED DRAWING)***

Wolverine Creek Profile Survey: Station Co-ordinates

STATION (m)	**NORTHING**	**EASTING**
0+000	7,147,095.6	514,193.4
0+700	7,147,686.5	514,162.7
0+800	7,147,770.0	514,118.3
1+000	7,147,920.0	514,000.3
1+200	7,148,110.0	513,988.8
1+500	7,148,379.0	513,946.2
	UTM NAD 83 Zone 7W	

11. Wolverine Creek (ref: Drawing 4 & 5):
    - Survey the water edge around the ponded area between the north and south lobes and the ponded area upstream of the North Lobe.
    - Survey 3 typical cross-sections of the channel constrictions between each tailings lobe and the creek valley sides. These cross-sections can be terminated 3 m above the stream bed.
        i. **South Lobe** – survey sections at Stations 1+200, 1+250 and 1+300 m.
        ii. **North Lobe** – survey sections at Stations 1+400, 1+450 and 1+500 m.
    - Survey cross-sections at a 25 m spacing from Station 0+700 m to 1+200 m. Each channel cross-section should extend 10 m past the left and right top of banks plus one spot elevation at the toe of the left and right valley sides.

B SIZE 11" x 17" (279.4mm x 431.8mm)

PLOT: 08/05/28 3:43:54 PM

Saved By: jviberg

UMA FILE NAME: 6029-009-00_02-H-F001_RX.dwg

510,500 511,000 511,500 512,000 513,000 513,500 514,000 514,500 515,000 515,500 516,000

7,149,500

7,149,000

7,148,500

7,148,000

7,147,500

7,147,000

U1190

AIRSTRIP

WOLVERINE CREEK TAILINGS PILE

NORTH LOBE

FORMER MILL SITE

U2834 (RTK BASE)

SOUTH LOBE

U1561 (MINE)

U1086

WOLVERENE CREEK

HILL (MINE)

U5700

U1192

U1183

U1191

G-TRAV (MINE)

U5699

U5698

HUDGEON LAKE

U1200

U1189

CLINTON CREEK WASTE ROCK DUMP

U2836 (RTK BASE)

BEAR CREEK

CLINTON CREEK

U228 (MINE)

U1836

U1182

PORCUPINE PIT

U1193

SHACK (MINE)

U280 (MINE)

PORCUPINE CREEK

0 150 300 m SCALE 1:15000

UTM ZONE 7 NAD83
IMAGE DATE 1999

U5700 BENCHMARK

U228 (MINE) LOCAL MINE BENCHMARKS

UMA | AECOM

Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring

Site Plan
Bench Mark Locations

Drawing - 1

B SIZE 11" x 17" (279.4mm x 431.8mm)

PLOT: 08/05/28 3:56:12 PM

Saved By: jviberg

UMA FILE NAME: 6029-009-00_02-H-F002_RX.dwg

7,147,500

CREEK STABILIZATION AREA INCLUDING:
HUDGEON LAKE OUTLET AND FOUR GABION DROP STRUCTURES (MOVEMENT MONITORS #1450 TO #1465)

513,000

513,500

HUDGEON LAKE

CLINTON CREEK

CREEK

±420 CONTOUR

±450 CONTOUR

CLINTON CREEK WASTE ROCK DUMP

0228 0226 0217 0219 0220 0222 0224 0229 1833 1831 22A 21A U1196 20A 81-2 4 84-1 U1195 0227 81-1 U1194 1834 0223 0225 1839 U1493 19

XS-A XS-B XS-E XS-G 80-13 80-14

P2 P3 P4 P5

69 68

ENLARGEMENT

0 20 40 60 m

0228 4cm
P2 13cm
XS-G
CLINTON CREEK
1833 7cm
0226 7cm
A B C
0224 4cm
21A
U1196

FORMER CRUSHER BUILDING (DEMOLISHED)

SNOWSHOE PIT

PORCUPINE PIT

PORCUPINE PIT SLOPE MONITORS

CREEK PIT

1832 1830 1837 1838

7,146,500

13,000 13,500 14,000

0 50 100 m

SCALE 1:5000

UTM ZONE 7 NAD83
IMAGE DATE 1999

0226 MONITOR LOCATION (ACTIVE)

XS-G MONITOR LOCATION (DESTROYED)

P2 PIEZOMETER LOCATION

ELEVATION >450± - UPPER SLOPE

ELEVATION >420± <450± - MID SLOPE

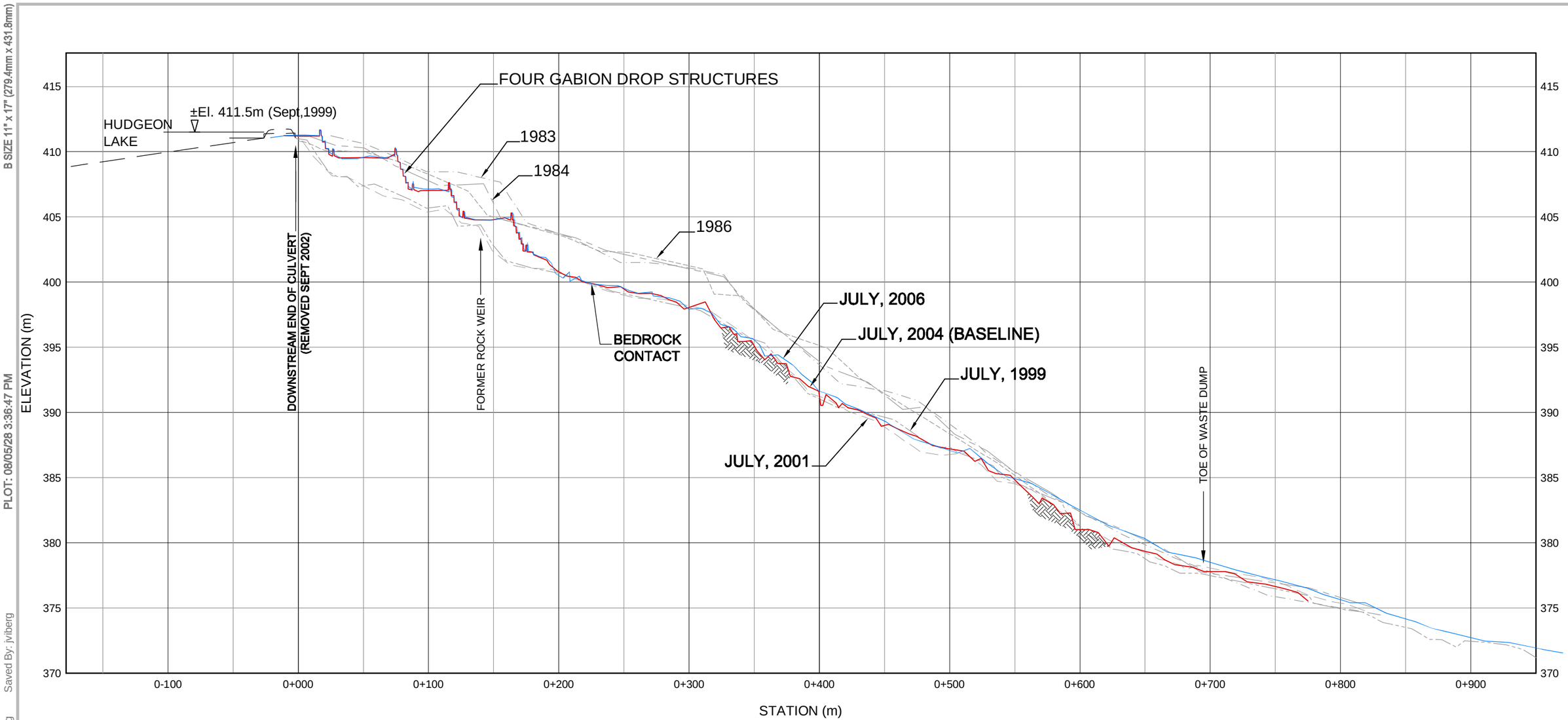
ELEVATION <420± LOWER SLOPE

Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring

Clinton Creek Waste Rock Dump Movement Monitors

Drawing - 2

UMA | AECOM



PROFILE

0 30 60 H=1:3000
m
0 3 6 V=1:300

STATION	NORTHING	EASTING
0+000	7,147,427	512,863
0+250	7,147,366	513,113
0+500	7,147,272	513,363
0+750	7,147,204	513,613

COORD: UTM ZONE 7W NAD83

LEGEND

- PROFILE 1983
- PROFILE 1984
- PROFILE 1986
- PROFILE 1999
- PROFILE 2001
- PROFILE 2004 (BASELINE FOR LONG TERM MONITORING)
- PROFILE 2006

Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring

Clinton Creek Channel Profile

Drawing - 3

UMA | AECOM

B SIZE 11" x 17" (279.4mm x 431.8mm)

PLOT: 08/05/28 4:12:09 PM

Saved By: jviberg

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513,000

513,500

514,000

7,148,500

7,148,000

530

425

1495

BH-14(T7)

WOLVERINE CREEK

80-1

650-1

650-2

1491

NL-1 13cm

1083 (NL-2) 13cm

NL-3 10cm

350-3A 12cm

1489 9cm

NL-4 11cm

NL-5 6cm

NORTH LOBE

SURVEY WATER EDGE

26

26A

1085

500-1

500-2

80-7

80-2

350-1A

350-2A

80-5

80-4

1483

FORMER MILL SITE

2834 (RTK BASE)

2005-01

NL-BASE

2005-02

1484

SL-5

2005-03

SL-3 58cm

SL-2 35cm

SL-1 20cm

WOLVERINE CREEK TAILINGS PILES

2005-10

SL-4

2005-11

2005-09

SOUTH LOBE

24D

BH-16(T8)

1492

24B

25B

2005-04

24

24A

1084

1485

2005-08

2005-07

2005-06

2005-05

80-9

U1086

UPPER SLOPE AREA

MID SLOPE AREA

LOWER SLOPE AREA

ROCK LINED CHANNEL AND ROCK WEIRS

530m ELEVATION CONTOUR

425m ELEVATION CONTOUR

0 40 80 120 m

SCALE 1:4000

UTM ZONE 7 NAD83

IMAGE DATE 1999

24	MONITOR LOCATION (ACTIVE)
2005-01	MONITOR LOCATION (ADDDED IN 2005)
SL/NL-01	VISUAL ALIGNMENT PIN
BH-14 (T7)	1978 TEST HOLE LOCATION

COMPASS BEARING FROM NL-BASE ALONG PINS NL-1 TO NL-5
DECLINATION: 30°
BEARING: 208°

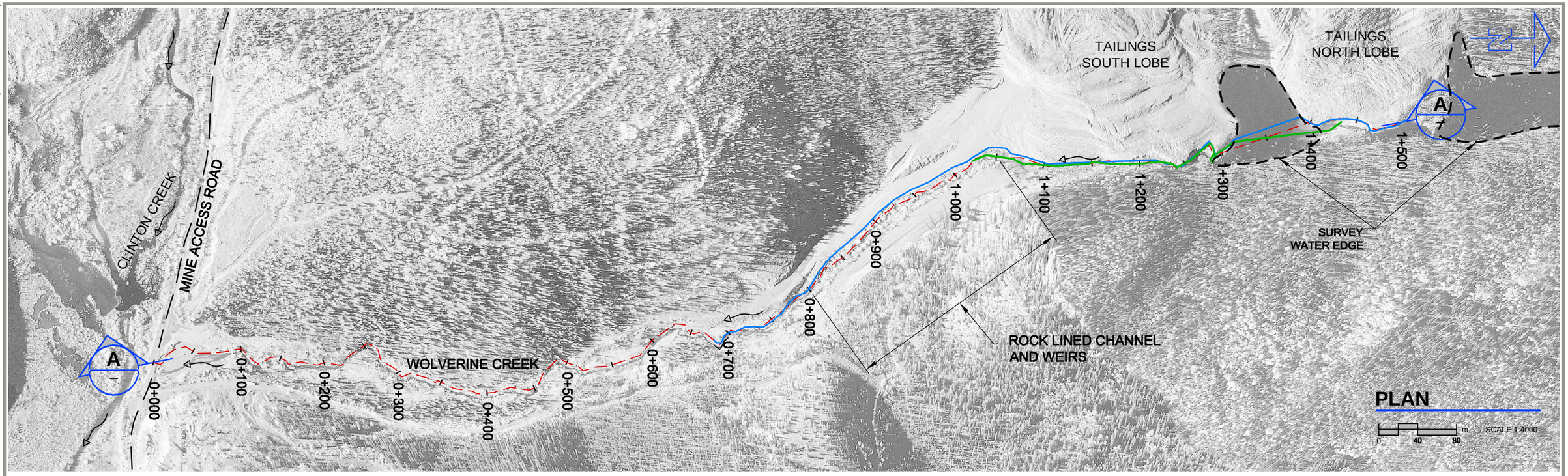
COMPASS BEARING FROM NL-BASE ALONG PINS SL-1 TO SL-5
DECLINATION: 30°
BEARING: 121°

Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring

Wolverine Creek Tailings Pile Movement Monitors

Drawing - 4

UMA | AECOM

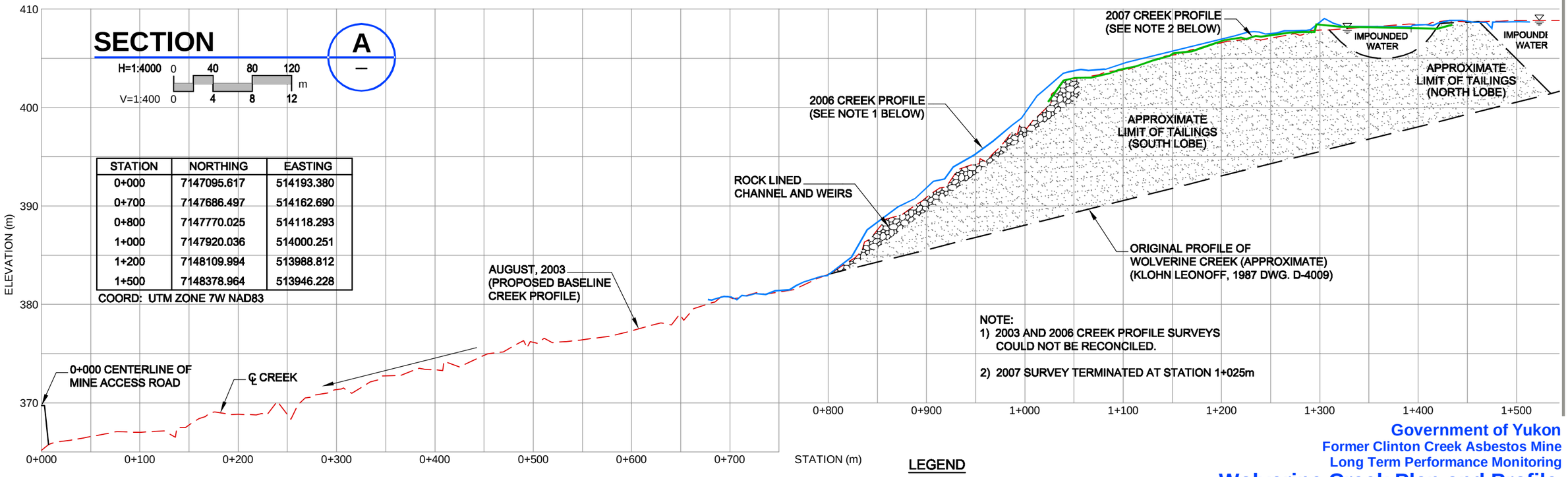


SECTION A

H=1:4000 V=1:400

STATION	NORTHING	EASTING
0+000	7147095.617	514193.380
0+700	7147686.497	514162.690
0+800	7147770.025	514118.293
1+000	7147920.036	514000.251
1+200	7148109.994	513988.812
1+500	7148378.964	513946.228

COORD: UTM ZONE 7W NAD83



NOTE:
1) 2003 AND 2006 CREEK PROFILE SURVEYS COULD NOT BE RECONCILED.
2) 2007 SURVEY TERMINATED AT STATION 1+025m

LEGEND
- PROFILE 2003 (BASELINE)
- PROFILE 2006
- PROFILE 2007

Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring

Wolverine Creek Plan and Profile

UMA | AECOM

Drawing - 5

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
UMA Job No.: 6029-009-00 **Date:** May 2008

Table 1) Benchmarks at Former Clinton Creek Mine

UTM NAD83 ZONE 7N

Based on 1999 Air Photo Control (U1189 Destroyed)
Set new Control Points U1086 and U1836. Tied 2001 Control Points in stable areas

	Northing (m)	Easting (m)	Elevation (m)	ID
1086	7,147,972.205	513,176.707	590.950	U1086
1182	7,146,634.155	513,637.686	465.460	U1182
1190	7,149,824.696	512,500.926	609.520	U1190
1191	7,147,605.454	513,589.857	528.930	U1191
1192	7,147,564.047	512,278.761	441.290	U1192
1193	7,146,545.113	513,572.457	456.430	U1193
1200	7,147,166.861	513,662.996	375.480	U1200
1836	7,146,656.183	513,597.724	476.540	U1836
2834	7,148,172.722	513,447.467	607.224	U2834
2836	7,146,814.577	513,092.158	478.422	U2836
5698	7,147,458.764	512,825.164	415.050	U5698
5699	7,147,485.368	512,618.332	425.550	U5699
5700	7,147,657.353	512,155.907	481.380	U5700

Local Mine Ground Control Transformed to UTM by Underhill Geomatics

Transformation based on U5698,U5699,U5700,U1182 common 2001 and 2003 ties.(U1184 not found)
Used U5698 as base. LDD handles scale to ground and rotation -0°17'15" to grid. Manually scale to metric.
Elevation differences based on U1561 (UTM = 423.803m., LOCAL = 1389.87ft.)

	Northing (m)	Easting (m)	Elevation (m)	ID
228	7,146,650.833	513,454.406	500.740	U228
280	7,146,404.795	513,292.824	501.030	U280
300	7,147,747.252	512,674.428	509.290	HILL
400	7,146,435.213	513,325.619	495.390	SHACK
900	7,147,649.576	513,899.213	489.860	GTRAV
1561	7,148,082.327	514,012.370	423.800	U1561

LOCAL MINE GROUND SYSTEM (feet)

2003 GPS Control transformed to ground

	Northing (ft)	Easting (ft)	Elevation (ft)	ID
1086	113,283.833	107,216.924	1,938.260	U1086
1182	108,884.267	108,707.955	1,526.550	U1182
1190	119,375.619	105,029.244	1,999.190	U1190
1191	112,073.197	108,566.986	1,734.780	U1191
1192	111,958.873	104,262.818	1,447.250	U1192
1193	108,593.080	108,492.379	1,496.920	U1193
1200	110,632.388	108,799.766	1,231.340	U1200
1836	108,957.224	108,577.153	1,562.900	U1836
5698	111,604.300	106,054.560	1,361.160	U5698
5699	111,695.030	105,376.109	1,395.610	U5699
5700	112,267.162	103,861.093	1,578.780	U5700

Local Mine Control From Historical Files

	Northing (ft)	Easting (ft)	Elevation (ft)	ID
228	108,941.540	108,107.020	1,642.290	U228
280	108,136.470	107,572.500	1,643.240	U280
300	112,553.880	105,564.450	1,670.330	HILL
400	108,235.800	107,680.660	1,624.750	SHACK
900	112,213.030	109,583.730	1,606.590	GTRAV
1561	113,631.480	109,961.620	1,389.870	U1561

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
UMA Job No.: 6029-009-00
Date: May 2008

Upper Slope) Elevation > 450m
Mid-Slope) Elevation 420 to 450m
Lower Slope) Elevation < 420m

Table 2) Clinton Creek Waste Rock Dump Instrumentation

Description	ID	Location	Type	Marker Cone	Monitor Tag	Underhill Geomatics Tag	Underhill Survey (Aug 21/03) UTM NAD 83			Comments
							Northing	Easting	Elevation	
Movement Monitor	0225	Upper Slope			0225	0225	7,146,918.716	512,905.221	475.17	
Movement Monitor	0223	Upper Slope			0223	0223	7,146,978.053	512,942.739	467.22	
Movement Monitor	1834	Upper Slope			1834	1834	7,146,973.618	512,893.433	461.12	
Movement Monitor	UU1195	Upper Slope	Bench Mark		UU1195		7,147,111.936	512,899.532	456.59	
Movement Monitor	81-1	Upper Slope			81-1		7,147,034.819	512,978.933	455.27	Old Pin
Movement Monitor	21-A	Mid-Slope	Prism		21-A		7,147,228.197	512,915.152	446.54	Old Pin with prism
Movement Monitor	20-A	Mid-Slope	Prism		20-A		7,147,207.859	513,057.137	445.83	Old Pin with prism
Movement Monitor	22-A	Mid-Slope		YES	22-A		7,147,224.290	512,841.309	444.99	
Movement Monitor	0224	Mid-Slope			0224	0224	7,147,241.091	512,963.327	444.85	Old pin found
Movement Monitor	UU1196	Mid-Slope	Bench Mark		UU1196		7,147,231.232	513,066.175	444.08	
Movement Monitor	81-2	Mid-Slope		YES	81-2		7,147,205.285	513,011.562	443.75	Old Pin
Movement Monitor	0227	Mid-Slope			0227	0227	7,147,076.844	513,124.776	439.48	
Movement Monitor	0229	Mid-Slope			0229	0229	7,147,113.528	512,719.142	437.43	Old Pin found
Movement Monitor	4	Mid-Slope			4		7,147,211.284	513,193.636	435.18	Old Pin
Movement Monitor	68	Mid-Slope		YES	68		7,147,262.029	513,142.415	434.42	
Movement Monitor	UU1194	Mid-Slope	Bench Mark		UU1194		7,147,017.321	513,472.438	433.19	
Local Mine Ground Co	1831	Mid-Slope			1831	1831	7,147,227.179	512,766.646	432.85	
Movement Monitor	19	Mid-Slope	3/4" diam. Bar	YES	19		7,147,124.347	513,365.638	429.24	located 3m east of #19-B
Movement Monitor	19-B	Mid-Slope	1/2" diam. Bar		19-B		7,147,126.637	513,363.485	429.13	was 19. Should be 19-B
Movement Monitor	1839	Mid-Slope	Marker		1839	1839	7,146,861.354	513,285.180	428.66	Marker Pin for T2
Movement Monitor	0226	Lower Slope			0226	0226	7,147,311.525	513,066.355	426.46	Was Underhill tag CP1635-1.
Movement Monitor	1833	Lower Slope	3/8" Steel Pin		1833	1833	7,147,302.699	512,921.250	418.34	
~~Movement Monitor~~	XS-G	Lower Slope	3/4" Steel Pin		n/a		7,147,356.110	513,038.841	416.54	**Destroyed**
Piezometer	P2	Lower Slope	1" white pipe		P2		7,147,354.357	512,999.352	416.10	P1 destroyed
Piezometer	P3	Lower Slope	1" white pipe		P3		7,147,309.317	513,135.578	415.35	
Movement Monitor	69	Lower Slope	Marker?		69		7,147,335.532	513,140.577	414.90	Mon 69 in previous UMA survey
Movement Monitor	0217	Lower Slope	Marker		0217	0217	7,147,314.731	513,183.178	414.87	XS-A in previous UMA survey
Movement Monitor	0228	Lower Slope			0228	0228	7,147,346.995	512,836.840	413.95	
Movement Monitor	80-13	Lower Slope	3/8" Steel Pin		80-13		7,147,299.401	513,183.839	413.08	Found on South Side of Road
Movement Monitor	XS-A	Lower Slope	3/4" Steel Pin		XS-A		7,147,320.214	513,190.989	411.33	Nearly in Creek
Movement Monitor	0219	Lower Slope	Marker		0219	0219	7,147,292.121	513,274.646	404.60	Monitor 83 in previous UMA Survey
Movement Monitor	XS-B	Lower Slope	3/4" Steel Pin		XS-B		7,147,293.649	513,274.196	404.28	Nearly in Creek
Movement Monitor	80-14	Lower Slope	3/4" Steel Pin		80-14	No	7,147,267.767	513,283.109	403.77	Found on South Side of Road
Movement Monitor	0222	Lower Slope	Marker		0222	0222	7,147,269.485	513,334.964	398.01	XS-C in previous UMA Survey
Piezometer	P4	Lower Slope	1" white pipe		P4		7,147,239.500	513,347.557	397.28	
Movement Monitor	0220	Lower Slope	Marker		0220	0220	7,147,223.417	513,430.902	388.65	XS-E in previous UMA Survey
Movement Monitor	0218	Lower Slope	Marker		0218	0218	7,147,222.214	513,433.185	388.04	Mon-X in previous UMA Survey
Movement Monitor	XS-E	Lower Slope	3/4" Steel Pin		XS-E	No	7,147,224.703	513,432.222	387.53	
Piezometer	P5	Lower Slope	1" white pipe		P5		7,147,182.931	513,461.461	387.21	
Movement Monitor	84-1	Lower Slope	Marker		84-1		7,147,201.069	513,504.647	381.77	
PORCUPINE PIT AREA										
Movement Monitor	1839	north of pit	Marker		1839	1839	7,146,861.354	513,285.180	428.66	located at entrance to open pit
Movement Monitor	U1493	NE of pit	Marker		U1493	U1493	7,146,801.561	513,576.663	453.00	Located NW od former crusher building
Movement Monitor	1832	West pit slope	Marker		1832	1832	7,146,537.063	513,483.131	473.62	Pit Slope Monitor
Movement Monitor	1830	West pit slope	Marker		1830	1830	7,146,523.769	513,455.681	471.67	Pit Slope Monitor
Movement Monitor	1837	West pit slope	Marker		1837	1837	7,146,502.874	513,411.468	470.22	Pit Slope Monitor
Movement Monitor	1838	West pit slope	Marker		1838	1838	7,146,491.909	513,380.524	468.34	Pit Slope Monitor, original markings show '320'
1978 TEST HOLE LOCATIONS (WITH THERMISTORS)										
BH - 1 (T1)	T1	Mid-Slope	cable		BH - 1 (T1)		7,146,863.402	513,381.017	422.96	Borehole / Thermistor
BH - 2 (T2)	T2	Mid-Slope	cable		BH - 2 (T2)		7,146,882.784	513,274.725	424.28	Borehole / Thermistor
~~BH-4 (T3)~~	T3	Upper Slope	cable							Borehole / Thermistor - cable cut
~~BH-6 (T4)~~	T4	Lower Slope								**Destroyed**
GABION DROP STRUCTURE MOVEMENT MONITORS							**UGL Survey July 2007**			
Movement Monitor	1450	DS#1	steel pin		1450	1450	7,147,441.29	512,890.12	413.61	
Movement Monitor	1451	DS#1	steel pin		1451	1451	7,147,413.80	512,888.17	413.42	
Movement Monitor	1452	DS#1	steel pin		1452	1452	7,147,411.91	512,892.02	412.99	
Movement Monitor	1453	DS#1	steel pin		1453	1453	7,147,439.06	512,901.52	413.10	
Movement Monitor	1454	DS#2	steel pin		1454	1454	7,147,423.23	512,948.58	412.35	
Movement Monitor	1455	DS#2	steel pin		1455	1455	7,147,397.03	512,939.88	412.06	
Movement Monitor	1456	DS#2	steel pin		1456	1456	7,147,392.75	512,951.22	410.99	
Movement Monitor	1457	DS#2	steel pin		1457	1457	7,147,420.52	512,958.00	410.60	
Movement Monitor	1458	DS#3	steel pin		1458	1458	7,147,412.17	512,986.90	409.72	
Movement Monitor	1459	DS#3	steel pin		1459	1459	7,147,385.84	512,980.01	409.38	
Movement Monitor	1460	DS#3	steel pin		1460	1460	7,147,382.58	512,988.07	408.97	
Movement Monitor	1461	DS#3	steel pin		1461	1461	7,147,410.18	512,995.89	408.28	
Movement Monitor	1462	DS#4	steel pin		1462	1462	7,147,399.84	513,033.18	407.31	
Movement Monitor	1463	DS#4	steel pin		1463	1463	7,147,373.73	513,025.89	407.60	
Movement Monitor	1464	DS#4	steel pin		1464	1464	7,147,369.18	513,036.45	406.83	
Movement Monitor	1465	DS#4	steel pin		1465	1465	7,147,399.46	513,040.34	406.12	

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
UMA Job No.: 6029-009-00 **Date:** May 2008

Table 3) Wolverine Creek Tailings Pile - Movement Monitor Summary
Datum: NAD83, UTM Zone 7 Coordinates

Station	Northing	Easting	Elevation	Comment
24	7,148,033.895	513,525.561	549.553	
26	7,148,341.494	513,483.546	575.081	
1083 / NL-2	7,148,354.012	513,936.519	414.078	
1084	7,148,017.993	513,618.378	516.095	
1085	7,148,346.060	513,666.411	488.824	
1484	7,148,149.184	513,961.975	417.949	
1485	7,148,018.022	513,703.459	480.101	
1489	7,148,305.198	513,928.504	413.635	
1491	7,148,376.821	513,868.989	432.316	
1492	7,148,053.727	513,409.949	609.982	
1495	7,148,526.645	513,528.950	529.066	
2834	7,148,172.721	513,447.481	607.227	RTK base for tailings survey
1483	7,148,233.020	513,412.679	608.997	
24-A	7,148,035.439	513,775.702	464.888	
24-B	7,148,045.334	513,833.263	445.888	
24-D	7,148,071.928	513,920.650	422.279	
25-B	7,148,065.753	513,948.634	422.031	
26-A	7,148,339.318	513,540.493	557.740	
350-1A	7,148,298.609	513,822.642	448.002	
350-2A	7,148,300.538	513,873.845	428.576	
350-3A	7,148,312.197	513,899.138	417.275	
500-1	7,148,343.237	513,725.526	474.010	
500-2	7,148,344.367	513,842.258	438.050	
650-1	7,148,408.753	513,701.306	483.907	
650-2	7,148,400.253	513,816.079	439.717	
80-1	7,148,408.034	513,543.064	555.613	
80-2	7,148,290.083	513,549.484	552.632	
80-4	7,148,201.727	513,689.474	501.415	
80-5	7,148,249.423	513,718.768	481.074	
80-7	7,148,344.005	513,890.893	422.399	
80-9	7,147,996.383	513,970.725	411.035	
BH-14 T7	7,148,488.334	513,562.988	530.299	
BH-16 T8 CORD	7,148,048.627	513,761.307	464.593	
BH-16 T8 POST	7,148,048.841	513,761.873	464.910	
NL-1	7,148,365.727	513,942.447	413.164	
NL-2	see 1083			NL-2 and 1083 are the same point
NL-3	7,148,334.731	513,926.880	417.046	
NL-4	7,148,307.194	513,912.986	416.159	
NL-5	7,148,275.174	513,896.964	415.416	
SL-1	7,148,079.086	513,970.461	419.764	
SL-2	7,148,087.009	513,956.878	422.458	
SL-3	7,148,100.541	513,933.163	420.779	
New Monitors Points Established in 2005				
NL-Base	7,148,154.79	513,836.26	431.47	
SL-4	7,148,115.67	513,907.57	416.88	
SL-5	7,148,133.63	513,876.08	422.91	
2005-01	7,148,100.15	513,757.89	463.73	
2005-02	7,148,118.21	513,816.95	447.89	
2005-03	7,148,108.16	513,870.12	428.18	
2005-04	7,148,047.07	513,876.04	428.36	
2005-05	7,148,000.57	513,781.55	464.67	
2005-06	7,147,999.72	513,865.78	433.29	
2005-07	7,148,000.11	513,945.37	416.35	
2005-08	7,148,038.85	513,970.98	415.77	
2005-09	7,148,124.38	513,969.23	420.18	
2005-10	7,148,146.69	513,925.39	411.78	
2005-11	7,148,176.10	513,942.17	411.91	

Appendix B
Waste Rock Dump Movement Monitoring Results

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 2940-044-00
Date: 9-Jul-08

Table B-1) Waste Rock Dump Stability - Upper Slope Summary After July 2008 Survey

Monitor	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	**Easting** (metres)	**Elevation** (metres)	total (metres)	increment (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
81-1	19-Jun-01	7,147,034.71	512,978.88	455.25	0.00	0.12	0.06	-2.02	0.14	0.07
	20-Aug-03	7,147,034.82	512,978.93	455.27	0.12	0.12	0.06	-2.01	0.02	0.01
	28-Jul-04	7,147,034.76	512,978.92	455.23	0.06	0.06	0.07	-2.05	-0.04	-0.05
	28-Jul-06	7,147,034.80	512,978.92	455.18	0.10	0.05	0.02	-2.09	-0.04	-0.02
	9-Jul-08	7,147,034.83	512,978.93	455.22	0.13	0.03	0.01	-2.06	0.04	0.02
223	19-Jun-01	n/a								
	20-Aug-03	7,146,978.05	512,942.74	467.22	0.00			0.00		
	28-Jul-04	7,146,978.08	512,942.73	467.20	0.03	0.03	0.03	-0.02	-0.02	-0.02
	28-Jul-06	7,146,978.12	512,942.73	467.21	0.07	0.04	0.02	-0.01	0.00	0.00
	9-Jul-08	7,146,978.16	512,942.75	467.15	0.11	0.05	0.02	-0.07	-0.05	-0.03
225	19-Jun-01	n/a								
	20-Aug-03	7,146,918.72	512,905.22	475.17	0.00			0.00		
	28-Jul-04	7,146,918.73	512,905.18	475.14	0.04	0.04	0.04	-0.03	-0.03	-0.03
	28-Jul-06	7,146,918.77	512,905.18	475.15	0.07	0.04	0.02	-0.03	0.00	0.00
	9-Jul-08	7,146,918.81	512,905.20	475.10	0.09	0.04	0.02	-0.07	-0.05	-0.03
1195	19-Jun-01	7,147,111.83	512,899.53	456.62	0.00	0.10	0.05	0.16	0.16	0.08
	20-Aug-03	7,147,111.94	512,899.53	456.59	0.10	0.11	0.05	0.13	-0.03	-0.01
	28-Jul-04	7,147,111.95	512,899.52	456.60	0.12	0.02	0.02	0.14	0.01	0.01
	28-Jul-06	7,147,111.95	512,899.50	456.56	0.12	0.03	0.01	0.10	-0.04	-0.02
	4-Jul-07	7,147,112.01	512,899.50	456.54	0.17	0.06	0.06	0.08	-0.02	-0.03
	9-Jul-08	7,147,112.03	512,899.52	456.51	0.19	0.03	0.03	0.05	-0.03	-0.03
1834	19-Jun-01	n/a								
	20-Aug-03	7,146,973.62	512,893.43	461.12	0.00			0.00		
	28-Jul-04	7,146,973.64	512,893.38	461.09	0.06	0.06	0.06	-0.03	-0.03	-0.03
	28-Jul-06	7,146,973.69	512,893.36	461.09	0.11	0.06	0.03	-0.03	0.00	0.00
	4-Jul-07	7,146,973.72	512,893.36	461.08	0.13	0.03	0.03	-0.04	-0.01	-0.01
	9-Jul-08	7,146,973.74	512,893.38	461.06	0.13	0.03	0.03	-0.06	-0.01	-0.01

Average	1999 to 2001	0.11	0.06		0.15	0.08
	2001 to 2003	0.12	0.05		0.00	0.00
	2003 to 2004	0.04	0.04		-0.02	-0.02
	2004 to 2006	0.04	0.02		-0.02	-0.01
	2006 to 2008	**0.03**	**0.02**		**-0.02**	**-0.02**
Maximum	1999 to 2001	0.12	0.06		0.16	0.08
	2001 to 2003	0.12	0.06		0.02	0.01
	2003 to 2004	0.06	0.07		0.01	0.01
	2004 to 2006	0.06	0.03		0.00	0.00
	2006 to 2008	**0.05**	**0.03**		**0.04**	**0.02**
Minimum	1999 to 2001	0.10	0.05		0.14	0.07
	2001 to 2003	0.11	0.05		-0.03	-0.01
	2003 to 2004	0.02	0.02		-0.04	-0.05
	2004 to 2006	0.03	0.01		-0.04	-0.02
	2006 to 2008	**0.03**	**0.01**		**-0.05**	**-0.03**

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 2940-044-00
Date: 9-Jul-08

Table B-2) Waste Rock Dump Stability - Mid - Slope Summary After July 2008 Survey

Monitor	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	total (metres)	increment (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
4	19-Jun-01	7,147,211.31	513,193.67	435.30	0.00	0.06	0.03	0.00	-0.17	-0.09
	20-Aug-03	7,147,211.28	513,193.64	435.18	0.04	0.05	0.02	-0.12	-0.12	-0.06
	28-Jul-04	7,147,211.22	513,193.64	435.08	0.08	0.06	0.07	-0.22	-0.10	-0.11
	28-Jul-06	7,147,211.16	513,193.61	435.06	0.15	0.07	0.03	-0.24	-0.02	-0.01
	9-Jul-08	7,147,211.10	513,193.62	434.97	0.20	0.06	0.03	-0.33	-0.09	-0.05
19	19-Jun-01	7,147,124.18	513,365.54	430.10	0.00	0.22	0.11	0.00	-0.32	-0.16
	20-Aug-03	7,147,124.35	513,365.64	429.24	0.19	0.19	0.09	-0.87	-0.86	-0.40
	28-Jul-04	7,147,124.36	513,365.70	429.13	0.24	0.06	0.06	-0.98	-0.11	-0.11
	28-Jul-06	not surveyed in 2006								
	9-Jul-08	7,147,124.48	513,365.75	428.78	0.36	0.13	0.03	-1.33	-0.35	-0.09
20A	19-Jun-01	7,147,207.71	513,057.05	445.86	0.00	0.22	0.11	0.00	0.05	0.03
	20-Aug-03	7,147,207.86	513,057.14	445.83	0.17	0.17	0.08	-0.03	-0.03	-0.01
	28-Jul-04	7,147,207.85	513,057.12	445.74	0.15	0.02	0.03	-0.12	-0.09	-0.09
	28-Jul-06	7,147,207.88	513,057.14	445.69	0.19	0.05	0.02	-0.17	-0.05	-0.03
	4-Jul-07	7,147,207.91	513,057.16	445.66	0.22	0.03	0.03	-0.20	-0.03	-0.03
	9-Jul-08	7,147,207.92	513,057.18	445.63	0.25	0.03	0.03	-0.23	-0.03	-0.03
21A	19-Jun-01	7,147,228.14	512,915.05	446.57	0.00	0.20	0.10	0.00	0.05	0.02
	20-Aug-03	7,147,228.20	512,915.15	446.54	0.05	0.11	0.05	-0.03	-0.03	-0.02
	28-Jul-04	7,147,228.18	512,915.11	446.43	0.03	0.04	0.05	-0.14	-0.11	-0.11
	28-Jul-06	7,147,228.26	512,915.11	446.38	0.11	0.08	0.04	-0.19	-0.05	-0.02
	4-Jul-07	7,147,228.30	512,915.11	446.37	0.15	0.12	0.13	-0.21	-0.06	-0.02
	9-Jul-08	7,147,228.31	512,915.12	446.32	0.17	0.05	0.05	-0.25	-0.06	-0.06
22A	19-Jun-01	7,147,224.10	512,841.41	445.02	0.00	0.19	0.10	0.00	-0.03	-0.02
	20-Aug-03	7,147,224.29	512,841.31	444.99	0.21	0.22	0.10	-0.03	-0.03	-0.01
	28-Jul-04	7,147,224.27	512,841.30	444.88	0.20	0.02	0.02	-0.14	-0.11	-0.12
	28-Jul-06	7,147,224.40	512,841.26	444.81	0.33	0.13	0.07	-0.21	-0.07	-0.03
	4-Jul-07	7,147,224.45	512,841.23	444.77	0.38	0.05	0.06	-0.25	-0.04	-0.05
	9-Jul-08	7,147,224.48	512,841.23	444.72	0.42	0.04	0.04	-0.30	-0.05	-0.05
68	19-Jun-01	7,147,261.98	513,142.46	434.49	0.00	0.02	0.01	0.00	-0.15	-0.08
	20-Aug-03	7,147,262.03	513,142.42	434.42	0.00	0.07	0.03	-0.07	-0.07	-0.03
	28-Jul-04	7,147,262.00	513,142.42	434.33	-0.02	0.03	0.04	-0.16	-0.09	-0.09
	28-Jul-06	7,147,262.02	513,142.36	434.31	-0.05	0.06	0.03	-0.18	-0.02	-0.01
	4-Jul-07	7,147,262.06	513,142.33	434.27	-0.04	0.10	0.04	-0.22	-0.06	-0.02
	9-Jul-08	7,147,262.05	513,142.32	434.22	-0.06	0.05	0.03	-0.27	-0.09	-0.05
81-2	19-Jun-01	7,147,205.22	513,011.60	443.70	0.00	0.15	0.08	0.00	0.04	0.02
	20-Aug-03	7,147,205.29	513,011.56	443.75	0.03	0.07	0.03	0.05	0.05	0.02
	28-Jul-04	7,147,205.26	513,011.60	443.71	0.03	0.05	0.05	0.01	-0.04	-0.05
	28-Jul-06	7,147,205.28	513,011.59	443.71	0.04	0.02	0.01	0.01	0.00	0.00
	4-Jul-07	7,147,205.31	513,011.58	443.69	0.06	0.03	0.04	-0.01	-0.02	-0.02
	9-Jul-08	7,147,205.32	513,011.59	443.68	0.08	0.02	0.02	-0.02	-0.01	-0.01
224	19-Jun-01	n/a								
	20-Aug-03	7,147,241.09	512,963.33	444.85	0.00			0.00		
	28-Jul-04	7,147,241.12	512,963.29	444.82	0.04	0.04	0.05	-0.03	-0.03	-0.03
	28-Jul-06	7,147,241.17	512,963.29	444.79	0.09	0.05	0.03	-0.06	-0.03	-0.02
	4-Jul-07	7,147,241.19	512,963.25	444.74	0.12	0.04	0.04	-0.11	-0.05	-0.05
	9-Jul-08	7,147,241.21	512,963.27	444.72	0.13	0.03	0.03	-0.13	-0.02	-0.02
227	19-Jun-01	n/a								
	20-Aug-03	7,147,076.84	513,124.78	439.48	0.00			0.00		
	28-Jul-04	7,147,076.78	513,124.77	439.44	0.07	0.07	0.07	-0.04	-0.04	-0.04
	28-Jul-06	7,147,076.82	513,124.77	439.45	0.03	0.04	0.02	-0.03	0.01	0.01
	9-Jul-08	7,147,076.83	513,124.80	439.42	0.02	0.03	0.01	-0.06	-0.03	-0.02
229	19-Jun-01	n/a								
	20-Aug-03	7,147,113.53	512,719.14	437.43	0.00			0.00		
	28-Jul-04	7,147,113.49	512,719.14	437.37	0.04	0.04	0.05	-0.06	-0.06	-0.06
	28-Jul-06	7,147,113.55	512,719.11	437.39	0.04	0.07	0.04	-0.05	0.02	0.01
	4-Jul-07	7,147,113.52	512,719.04	437.37	0.11	0.08	0.08	-0.06	-0.02	-0.02
	9-Jul-08	7,147,113.56	512,719.06	437.33	0.09	0.04	0.04	-0.10	-0.04	-0.04
1194	19-Jun-01	7,147,017.22	513,472.45	433.19	0.00	0.09	0.05	0.00	-0.18	-0.09
	20-Aug-03	7,147,017.32	513,472.44	433.19	0.09	0.10	0.05	0.00	0.00	0.00
	28-Jul-04	7,147,017.35	513,472.44	433.12	0.12	0.03	0.03	-0.07	-0.07	-0.07
	28-Jul-06	7,147,017.43	513,472.44	433.08	0.19	0.08	0.04	-0.10	-0.04	-0.02
	9-Jul-08	7,147,017.49	513,472.46	433.04	0.26	0.07	0.03	-0.14	-0.04	-0.02
1196	19-Jun-01	7,147,231.16	513,066.14	444.13	0.00	0.17	0.09	0.00	0.03	0.01
	20-Aug-03	7,147,231.23	513,066.18	444.08	0.08	0.08	0.04	-0.05	-0.05	-0.02
	28-Jul-04	7,147,231.26	513,066.20	444.05	0.12	0.04	0.04	-0.09	-0.03	-0.03
	28-Jul-06	7,147,231.28	513,066.23	443.97	0.15	0.04	0.02	-0.17	-0.08	-0.04
	4-Jul-07	7,147,231.35	513,066.26	443.93	0.22	0.07	0.08	-0.21	-0.04	-0.04
	9-Jul-08	7,147,231.36	513,066.28	443.87	0.24	0.02	0.02	-0.27	-0.06	-0.06
1831	19-Jun-01	n/a								
	20-Aug-03	7,147,227.18	512,766.65	432.85	0.00			0.00		
	28-Jul-04	7,147,227.23	512,766.60	432.79	0.07	0.07	0.08	-0.06	-0.06	-0.07
	28-Jul-06	7,147,227.36	512,766.55	432.71	0.20	0.13	0.07	-0.14	-0.07	-0.04
	4-Jul-07	7,147,227.41	512,766.51	432.67	0.27	0.06	0.07	-0.18	-0.04	-0.04
	9-Jul-08	7,147,227.44	512,766.52	432.61	0.29	0.03	0.03	-0.24	-0.06	-0.06

Average	1999 to 2001	0.15	0.08		-0.08	-0.04
	2001 to 2003	0.12	0.05		-0.13	-0.06
	2003 to 2004	0.04	0.05		-0.07	-0.08
	2004 to 2006	0.07	0.03		-0.03	-0.02
	2006 to 2008	**0.05**	**0.03**		**-0.07**	**-0.04**
Maximum	1999 to 2001	0.22	0.11		0.05	0.03
	2001 to 2003	0.22	0.10		0.05	0.02
	2003 to 2004	0.07	0.08		-0.03	-0.03
	2004 to 2006	0.13	0.07		0.02	0.01
	2006 to 2008	**0.13**	**0.05**		**-0.01**	**-0.01**
Minimum	1999 to 2001	0.02	0.01		-0.32	-0.16
	2001 to 2003	0.05	0.02		-0.86	-0.40
	2003 to 2004	0.02	0.02		-0.11	-0.12
	2004 to 2006	0.02	0.01		-0.08	-0.04
	2006 to 2008	**0.02**	**0.01**		**-0.35**	**-0.09**

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 2940-044-00
Date: 9-Jul-08

Table B-3) Waste Rock Dump Stability - Lower - Slope Summary After July 2008 Survey

Monitor	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	**Easting** (metres)	**Elevation** (metres)	total (metres)	increment (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
69	19-Jun-01	7,147,335.52	513,140.55	414.88	0.00	0.19	0.10	0.00	-0.05	-0.03
	20-Aug-03	7,147,335.53	513,140.58	414.90	0.03	0.03	0.01	0.02	0.02	0.01
	28-Jul-04	7,147,335.53	513,140.56	414.87	0.01	0.02	0.02	-0.01	-0.03	-0.04
	28-Jul-06	7,147,335.49	513,140.52	414.91	-0.04	0.05	0.03	0.03	0.05	0.02
	9-Jul-08	7,147,335.48	513,140.50	414.89	-0.06	0.02	0.01	0.01	-0.02	-0.01
80-13	19-Jun-01	n/a								
	20-Aug-03	7,147,299.40	513,183.84	413.08	0.00			0.00		
	28-Jul-04	7,147,299.39	513,183.83	413.06	0.02	0.02	0.02	-0.02	-0.02	-0.03
	28-Jul-06	7,147,299.35	513,183.82	413.10	0.06	0.04	0.02	0.02	0.05	0.02
	9-Jul-08	7,147,299.35	513,183.81	413.07	0.06	0.01	0.01	-0.01	-0.03	-0.02
80-14	19-Jun-01	n/a								
	20-Aug-03	7,147,267.77	513,283.11	403.77	0.00			0.00		
	28-Jul-04	7,147,267.79	513,283.08	403.74	0.03	0.03	0.03	-0.03	-0.03	-0.03
	28-Jul-06	7,147,267.65	513,283.10	403.80	0.12	0.14	0.07	0.03	0.05	0.03
	9-Jul-08	7,147,267.63	513,283.14	403.83	0.14	0.04	0.02	0.06	0.04	0.02
84-1	19-Jun-01	7,147,201.04	513,504.62	381.71	0.00	0.13	0.07	0.00	-0.01	-0.01
	20-Aug-03	7,147,201.07	513,504.65	381.77	-0.03	0.04	0.02	0.06	0.06	0.03
	28-Jul-04	7,147,201.08	513,504.64	381.72	-0.04	0.01	0.02	0.00	-0.06	-0.06
	28-Jul-06	7,147,201.09	513,504.63	381.83	-0.05	0.01	0.01	0.11	0.11	0.06
	9-Jul-08	7,147,201.07	513,504.62	381.78	-0.03	0.02	0.01	0.07	-0.04	-0.02
217	19-Jun-01	7,147,314.81	513,183.13	414.83	0.00	0.05	0.02	0.00	-0.05	-0.03
	20-Aug-03	7,147,314.73	513,183.18	414.87	0.03	0.09	0.04	0.04	0.04	0.02
	28-Jul-04	7,147,314.77	513,183.18	414.84	0.02	0.03	0.04	0.01	-0.03	-0.03
	28-Jul-06	7,147,314.72	513,183.16	414.86	0.02	0.05	0.03	0.03	0.02	0.01
	9-Jul-08	7,147,314.72	513,183.17	414.86	0.02	0.01	0.01	0.03	0.01	0.00
218	19-Jun-01	7,147,222.17	513,433.25	387.99	0.00	0.07	0.04	0.00	0.05	0.02
	20-Aug-03	7,147,222.21	513,433.19	388.04	0.08	0.07	0.03	0.04	0.05	0.02
	28-Jul-04	7,147,222.22	513,433.18	388.03	0.08	0.00	0.00	0.03	-0.01	-0.01
	28-Jul-06	7,147,222.20	513,433.18	388.09	0.08	0.02	0.01	0.09	0.06	0.03
	9-Jul-08	7,147,222.21	513,433.18	388.09	0.08	0.01	0.01	0.09	0.00	0.00
219	19-Jun-01	7,147,292.13	513,274.61	404.48	0.00	0.17	0.09	0.00	-0.05	-0.03
	20-Aug-03	7,147,292.12	513,274.65	404.60	-0.02	0.03	0.02	0.17	0.12	0.06
	28-Jul-04	7,147,292.13	513,274.65	404.55	-0.03	0.01	0.01	0.00	-0.05	-0.05
	28-Jul-06	7,147,292.12	513,274.62	404.62	0.00	0.03	0.02	0.12	0.07	0.04
	9-Jul-08	7,147,292.14	513,274.63	404.62	-0.02	0.02	0.01	0.05	0.00	0.00
220	19-Jun-01	7,147,223.43	513,431.01	388.55	0.00	0.25	0.13	0.00	0.06	0.03
	20-Aug-03	7,147,223.42	513,430.90	388.65	0.09	0.11	0.05	0.11	0.10	0.05
	28-Jul-04	7,147,223.43	513,430.90	388.60	0.08	0.01	0.01	0.06	-0.05	-0.05
	28-Jul-06	7,147,223.42	513,430.88	388.68	0.10	0.02	0.01	0.14	0.08	0.04
	9-Jul-08	7,147,223.43	513,430.88	388.67	0.10	0.01	0.01	0.12	-0.01	-0.01
222	19-Jun-01	7,147,269.46	513,334.94	397.91	0.00	0.06	0.03	0.00	-0.05	-0.02
	20-Aug-03	7,147,269.49	513,334.96	398.01	0.00	0.04	0.02	0.10	0.10	0.04
	28-Jul-04	7,147,269.52	513,334.97	397.96	-0.01	0.03	0.03	0.05	-0.05	-0.05
	28-Jul-06	7,147,269.51	513,334.93	397.99	-0.04	0.03	0.02	0.08	0.03	0.02
	9-Jul-08	7,147,269.53	513,334.95	397.99	-0.03	0.02	0.01	0.08	0.00	0.00
226	19-Jun-01	n/a								
	20-Aug-03	7,147,311.53	513,066.36	426.46	0.00			0.00		
	28-Jul-04	7,147,311.54	513,066.40	426.43	0.04	0.04	0.05	-0.03	-0.03	-0.03
	28-Jul-06	7,147,311.56	513,066.42	426.36	0.07	0.03	0.01	-0.10	-0.07	-0.04
	4-Jul-07	7,147,311.62	513,066.44	426.32	0.13	0.07	0.07	-0.14	-0.04	-0.04
	9-Jul-08	7,147,311.61	513,066.47	426.27	0.15	0.03	0.03	-0.19	-0.05	-0.05
228	19-Jun-01	n/a								
	20-Aug-03	7,147,347.00	512,836.84	413.95	0			0		
	28-Jul-04	7,147,347.03	512,836.79	413.88	0.06	0.06	0.07	-0.07	-0.07	-0.08
	28-Jul-06	7,147,347.13	512,836.73	413.92	0.18	0.12	0.06	-0.03	0.04	0.02
	4-Jul-07	7,147,347.15	512,836.70	413.86	0.21	0.04	0.04	-0.09	-0.06	-0.07
	9-Jul-08	7,147,347.20	512,836.68	413.83	0.26	0.04	0.04	-0.12	-0.02	-0.02
1833	19-Jun-01	n/a								
	20-Aug-03	7,147,302.70	512,921.25	418.34	0			0		
	28-Jul-04	7,147,302.69	512,921.27	418.30	0.02	0.02	0.02	-0.04	-0.04	-0.04
	28-Jul-06	7,147,302.78	512,921.24	418.35	0.08	0.10	0.05	0.01	0.04	0.02
	4-Jul-07	7,147,302.84	512,921.20	418.34	0.15	0.07	0.07	0.00	-0.01	-0.01
	9-Jul-08	7,147,302.86	512,921.23	418.44	0.16	0.03	0.03	0.10	0.10	0.10
P2	19-Jun-01	7,147,354.12	512,999.27	416.14	0.00	0.17	0.09	0.00	-0.09	-0.05
	20-Aug-03	7,147,354.36	512,999.35	416.10	0.25	0.25	0.11	-0.04	-0.04	-0.02
	28-Jul-04	7,147,354.41	512,999.36	415.98	0.30	0.05	0.05	-0.16	-0.12	-0.13
	28-Jul-06	7,147,354.50	512,999.34	415.99	0.39	0.10	0.05	-0.16	0.00	0.00
	4-Jul-07	7,147,354.63	512,999.38	416.05	0.52	0.13	0.14	-0.09	0.06	0.07
	9-Jul-08	7,147,354.57	512,999.39	415.98	0.47	0.06	0.06	-0.16	-0.07	-0.07
P3	19-Jun-01	7,147,309.29	513,135.55	415.34	0.00	0.11	0.06	0.00	-0.11	-0.06
	20-Aug-03	7,147,309.32	513,135.58	415.35	0.00	0.04	0.02	0.01	0.01	0.00
	28-Jul-04	7,147,309.30	513,135.56	415.24	0.00	0.03	0.03	-0.10	-0.11	-0.11
	28-Jul-06	7,147,309.30	513,135.53	415.19	0.02	0.02	0.01	-0.15	-0.05	-0.03
	9-Jul-08	7,147,309.31	513,135.55	415.17	0.01	0.02	0.01	-0.18	-0.02	-0.01
P4	19-Jun-01	7,147,239.53	513,347.49	397.05	0			0		
	20-Aug-03	7,147,239.50	513,347.56	397.28	0.07	0.07	0.02	0.23	0.23	0.06
	28-Jul-04	7,147,239.49	513,347.51	397.31	0.05	0.05	0.05	0.26	0.03	0.03
	28-Jul-06	7,147,239.44	513,347.50	397.34	0.09	0.05	0.02	0.29	0.03	0.01
	9-Jul-08	7,147,239.44	513,347.49	397.31	0.09	0.01	0.00	0.26	-0.03	-0.01
P5	19-Jun-01	7,147,182.91	513,461.26	386.86	0			0		
	20-Aug-03	7,147,182.93	513,461.46	387.21	0.20	0.20	0.05	0.35	0.35	0.09
	28-Jul-04	7,147,182.95	513,461.42	387.20	0.17	0.04	0.05	0.34	-0.01	-0.01
	28-Jul-06	7,147,182.92	513,461.40	387.24	0.14	0.04	0.02	0.38	0.04	0.02
	9-Jul-08	7,147,182.92	513,461.40	387.23	0.14	0.01	0.00	0.37	-0.01	0.00
XS-A	19-Jun-01	n/a								
	20-Aug-03	7,147,320.21	513,190.99	411.33	0			0		
	28-Jul-04	7,147,320.32	513,191.01	411.24	0.10	0.10	0.11	-0.09	-0.09	-0.09
	28-Jul-06	7,147,315.67	513,189.82	413.35						
	9-Jul-08	7,147,315.71	513,189.83	413.35		0.04	0.02	2.02	0.01	0.00
XS-B	19-Jun-01	n/a								
	20-Aug-03	7,147,293.65	513,274.20	404.28	0.00			0.00		
	28-Jul-04	7,147,293.70	513,274.20	404.29	0.06	0.06	0.06	0.01	0.01	0.01
	28-Jul-06	7,147,293.67	513,274.18	404.31	0.03	0.04	0.02	0.03	0.02	0.01
	9-Jul-08	7,147,293.68	513,274.18	404.31	0.04	0.01	0.01	0.03	0.00	0.00
XS-E	19-Jun-01	n/a								
	20-Aug-03	7,147,224.70	513,432.22	387.53	0.00			0.00		
	28-Jul-04	7,147,224.67	513,432.18	387.52	0.06	0.06	0.06	-0.01	-0.01	-0.01
	28-Jul-06	7,147,224.66	513,432.16	387.59	0.07	0.01	0.01	0.06	0.07	0.04
	9-Jul-08	7,147,224.67	513,432.16	387.53	0.07	0.01	0.00	0.00	-0.06	-0.03
XS-G	19-Jun-01	7,147,355.94	513,038.74	416.55	0.00	0.19	0.10	0.00	-0.12	-0.06
	20-Aug-03	7,147,356.11	513,038.84	416.54	0.20	0.20	0.09	-0.01	-0.01	0.00
	28-Jul-06	destroyed								

Average	1999 to 2001	0.14	0.07		-0.04	-0.02
	2001 to 2003	0.10	0.04		0.09	0.03
	2003 to 2004	0.04	0.04		-0.04	-0.04
	2004 to 2006	0.05	0.02		0.04	0.02
	2006 to 2008	**0.02**	**0.02**		**-0.01**	**-0.01**
Maximum	1999 to 2001	0.25	0.13		0.06	0.03
	2001 to 2003	0.25	0.11		0.35	0.09
	2003 to 2004	0.10	0.11		0.03	0.03
	2004 to 2006	0.14	0.07		0.11	0.06
	2006 to 2008	**0.06**	**0.06**		**0.10**	**0.10**
Minimum	1999 to 2001	0.05	0.02		-0.12	-0.06
	2001 to 2003	0.03	0.01		-0.04	-0.02
	2003 to 2004	0.00	0.00		-0.12	-0.13
	2004 to 2006	0.01	0.01		-0.07	-0.04
	2006 to 2008	**0.01**	**0.00**		**-0.07**	**-0.07**

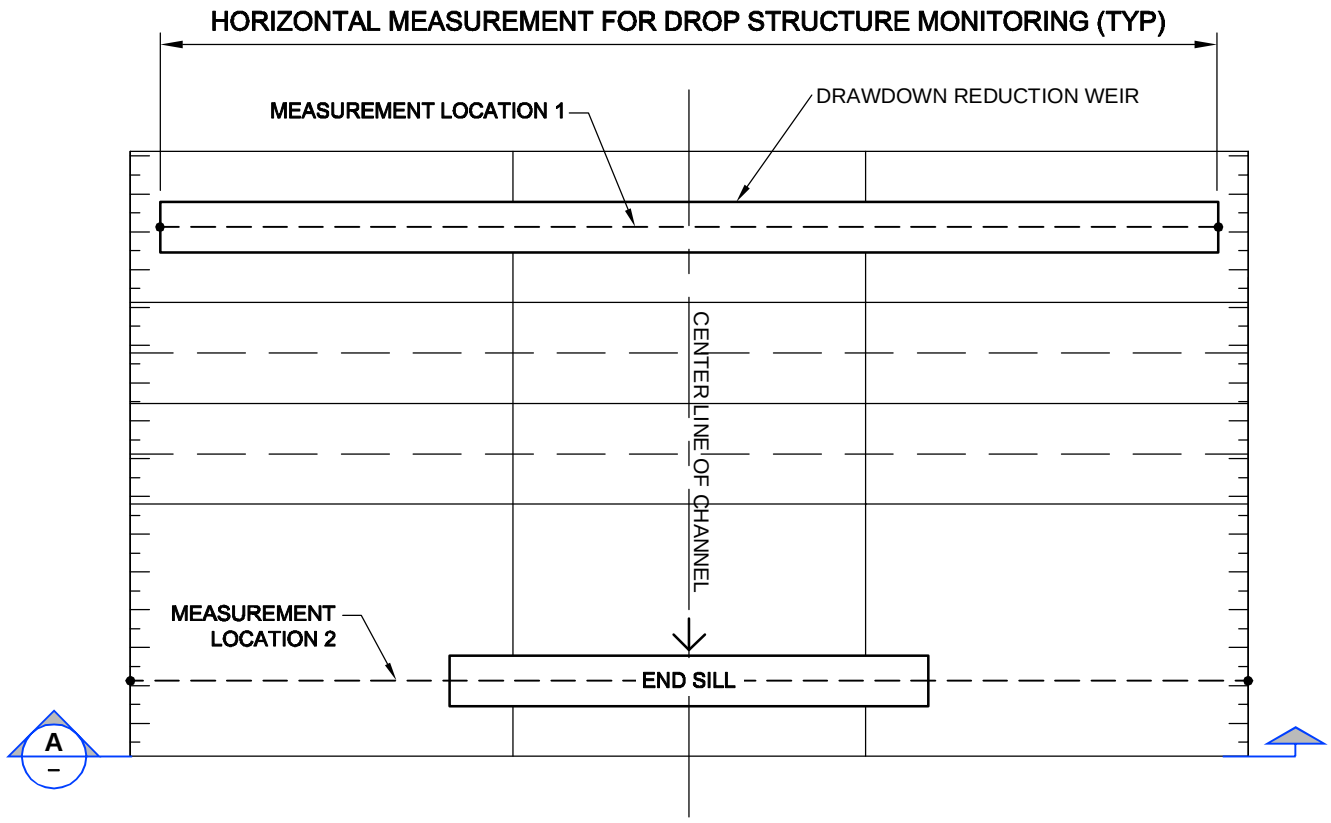
Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 2940-044-00
Date: 9-Jul-08

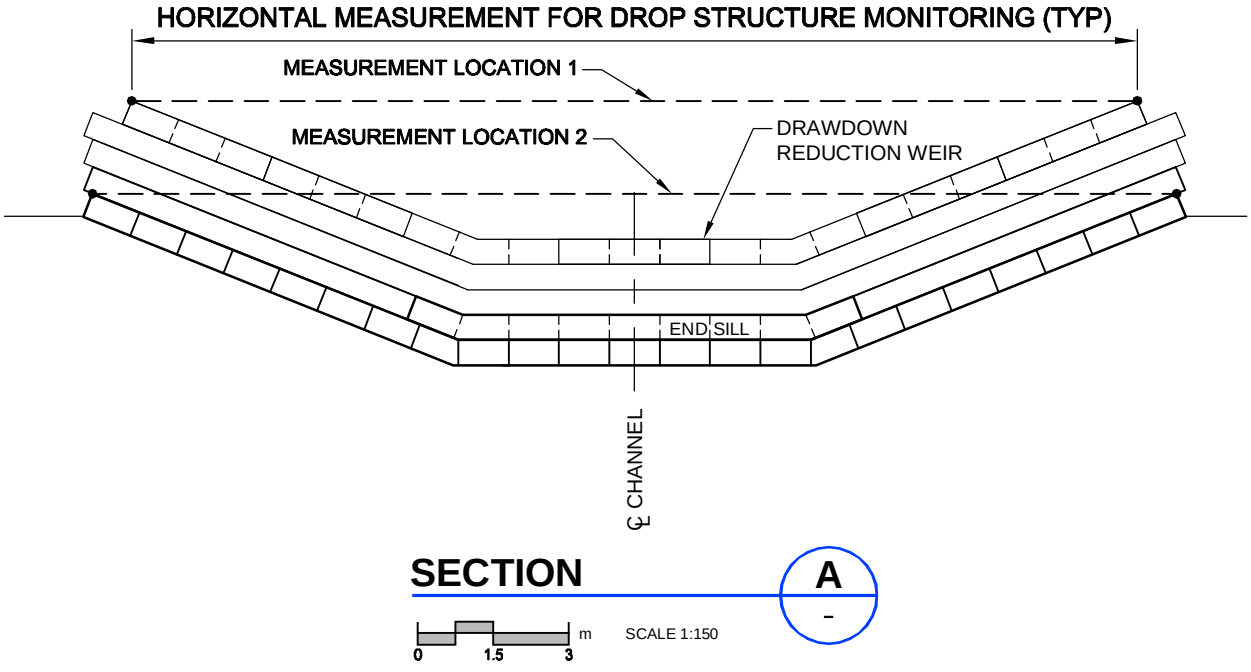
Table B-4) Open Pit Area - Summary After July 2008 Survey

Monitor	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	**Easting** (metres)	**Elevation** (metres)	total (metres)	increment (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
1493	19-Jun-01	n/a								
	20-Aug-03	7,146,801.56	513,576.66	453.00	0.00			0.00		
	28-Jul-04	7,146,801.65	513,576.65	452.96	0.08	0.08	0.09	-0.04	-0.04	-0.04
	28-Jul-06	7,146,801.85	513,576.60	452.89	0.29	0.21	0.10	-0.11	-0.07	-0.03
	9-Jul-08	7,146,802.00	513,576.60	452.79	0.44	0.15	0.08	-0.21	-0.10	-0.05
1830	19-Jun-01	n/a								
	20-Aug-03	7,146,523.77	513,455.68	471.67	0.00			0.00		
	28-Jul-04	7,146,523.79	513,455.68	471.68	0.02	0.02	0.02	0.01	0.01	0.01
	28-Jul-06	7,146,523.79	513,455.68	471.73	0.02	0.01	0.00	0.06	0.05	0.03
	9-Jul-08	7,146,523.78	513,455.68	471.70	0.02	0.01	0.00	0.03	-0.03	-0.02
1832	19-Jun-01	n/a								
	20-Aug-03	7,146,537.06	513,483.13	473.62	0.00			0.00		
	28-Jul-04	7,146,537.06	513,483.16	473.58	0.03	0.03	0.03	-0.04	-0.04	-0.05
	28-Jul-06	7,146,537.04	513,483.16	473.68	0.04	0.02	0.01	0.06	0.10	0.05
	9-Jul-08	7,146,537.07	513,483.17	473.65	0.03	0.03	0.02	0.02	-0.04	-0.02
1837	19-Jun-01	n/a								
	20-Aug-03	7,146,502.87	513,411.47	470.22	0.00			0.00		
	28-Jul-04	7,146,502.89	513,411.46	470.20	0.02	0.02	0.02	-0.02	-0.02	-0.02
	28-Jul-06	7,146,502.88	513,411.44	470.24	0.02	0.02	0.01	0.02	0.03	0.02
	9-Jul-08	7,146,502.89	513,411.44	470.25	0.03	0.01	0.01	0.03	0.01	0.01
1838	19-Jun-01	n/a								
	20-Aug-03	7,146,491.91	513,380.52	468.34	0.00			0.00		
	28-Jul-04	7,146,491.89	513,380.52	468.33	0.02	0.02	0.02	-0.01	-0.01	-0.01
	28-Jul-06	7,146,491.87	513,380.53	468.38	0.04	0.02	0.01	0.04	0.05	0.03
	9-Jul-08	7,146,491.89	513,380.52	468.38	0.02	0.01	0.01	0.04	0.00	0.00
1839	19-Jun-01	n/a								
	20-Aug-03	7,146,861.35	513,285.18	428.66	0.00			0.00		
	28-Jul-04	7,146,861.34	513,285.17	428.61	0.02	0.02	0.02	-0.05	-0.05	-0.05
	28-Jul-06	7,146,861.40	513,285.20	428.60	0.05	0.07	0.03	-0.06	-0.01	-0.01
	9-Jul-08	7,146,861.36	513,285.15	428.39	0.03	0.06	0.03	-0.28	-0.21	-0.11

Average	1999 to 2001	n/a	n/a		n/a	n/a
	2001 to 2003	n/a	n/a		n/a	n/a
	2003 to 2004	0.03	0.03		-0.03	-0.03
	2004 to 2006	0.06	0.03		0.03	0.01
	2006 to 2008	**0.05**	**0.02**		**-0.06**	**-0.03**
Maximum	1999 to 2001	n/a	n/a		n/a	n/a
	2001 to 2003	n/a	n/a		n/a	n/a
	2003 to 2004	0.08	0.09		0.01	0.01
	2004 to 2006	0.21	0.10		0.10	0.05
	2006 to 2008	**0.15**	**0.08**		**0.01**	**0.01**
Minimum	1999 to 2001	n/a	n/a		n/a	n/a
	2001 to 2003	n/a	n/a		n/a	n/a
	2003 to 2004	0.02	0.02		-0.05	-0.05
	2004 to 2006	0.01	0.00		-0.07	-0.03
	2006 to 2008	**0.01**	**0.00**		**-0.21**	**-0.11**

Appendix C
Gabion Drop Structure Movements





SECTION A–

SCALE 1:150

Government of Yukon
Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring - 2008

Drop Structure Measurements

AECOM

Drawing - C-1

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine - Channel Stabilization
Job No.: 2940-044-00
Date: 8-Sep-08

Table C-1) Former Clinton Creek Asbestos Mine - Clinton Creek Drop Structure Monitoring
Horizontal Measurements - Summary

Measurement Location #1 - Across Drawdown Weir

Drop Structure	Horizontal Distance Across Drop Structure (metres)							Incremental Change (m)	Average Annual Rate Of Movement (m/yr)	Total Change (m)	Comment
	Date 29-Jul-04	Date 22-May-05	Date 21-Jun-06	Date 3-Oct-06	Date 4-Jul-07	Date 21-Sep-07	Date 8-Sep-08	Sept 2007 to Sept 2008	Sept 2007 to Sept 2008		
1	19.62	19.57	19.57	19.58	19.51	19.55	19.48	-0.07	-0.07	-0.14	survey tags 1 & 2
2	19.49	19.48	19.48	19.48	19.43	19.48	19.46	-0.02	-0.02	-0.03	survey tags 5 & 6
3	19.44	19.32	19.25	19.21	19.14	19.17	19.08	-0.09	-0.09	-0.36	survey tags 9 & 10
4	n/a	19.61	19.55	19.51	19.43	19.46	19.40	-0.06	-0.06	-0.21	survey tags 13 & 14

Measurement Location #2 - Across Lower Tier In-Line With End Sill

Drop Structure	Horizontal Distance Across Drop Structure (metres)							Incremental Change (m)	Average Annual Rate Of Movement (m/yr)	Total Change (m)	Comment
	Date 29-Jul-04	Date 22-May-05	Date 21-Jun-06	Date 3-Oct-06	Date 4-Jul-07	Date 21-Sep-07	Date 8-Sep-08	Sept 2007 to Sept 2008	Sept 2007 to Sept 2008		
1	n/a	21.00	20.99	20.90	20.83	20.85	20.77	-0.08	-0.08	-0.23	survey tags 3 & 4
2	n/a	21.15	21.06	21.05	21.01	21.01	20.95	-0.06	-0.06	-0.20	survey tags 7 & 8
3	n/a	21.50	21.31	21.31	21.25	21.24	21.17	-0.07	-0.07	-0.33	survey tags 11 & 12
4	n/a	21.48	21.46	21.36	21.34	21.35	21.30	-0.05	-0.05	-0.18	survey tags 15 & 16

Year	Monitored By	
2004	UMA	
2005	UMA	
2006	Gov of Yukon	Survey tags installed in September 2006
2007	UMA (July) / GY (Sept)	
2008	Gov of Yukon	

Average	**-0.06**	**-0.06**	**-0.21**
Minimum	**-0.02**	**-0.02**	**-0.03**
Maximum	**-0.09**	**-0.09**	**-0.36**

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 2940-044-00
Date: 8-Sep-08

Table C-2) Clinton Creek Drop Structure #1 Monitoring Results

Monitoring Date	Time		Horizontal Movement - Location 1 (Weir)				Horizontal Movement - Location 2 (End Sill)				Comments
	total (days)	incremental (days)	measurement (metres)	total (metres)	incremental (metres)	rate (metres/year)	measurement (metres)	total (metres)	incremental (metres)	rate (metres/year)	
29-Jul-04	0	0	19.62								
22-May-05	297	297	19.57	-0.05	-0.05	**-0.06**	21.00				
21-Jun-06	692	395	19.57	-0.05	0.00	**0.00**	20.99	-0.01	-0.01	**-0.01**	
3-Oct-06	796	104	19.58	-0.04	0.01	**0.04**	20.90	-0.10	-0.09	**-0.32**	
4-Jul-07	1,070	274	19.51	-0.11	-0.07	**-0.09**	20.83	-0.17	-0.07	**-0.09**	
21-Sep-07	1,149	79	19.55	-0.07	0.04	**0.18**	20.85	-0.15	0.02	**0.09**	
8-Sep-08	1,502	353	19.48	-0.14	-0.07	**-0.07**	20.77	-0.23	-0.08	**-0.08**	

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 2940-044-00
Date: 8-Sep-08

Table C-3) Clinton Creek Drop Structure #2 Monitoring Results

Monitoring Date	Time		Horizontal Movement - Location 1 (Weir)				Horizontal Movement - Location 2 (End Sill)				Comments
	total (days)	incremental (days)	measurement (metres)	total (metres)	incremental (metres)	rate (metres/year)	measurement (metres)	total (metres)	incremental (metres)	rate (metres/year)	
29-Jul-04	0	0	19.49								
22-May-05	297	297	19.48	-0.01	-0.01	**-0.01**	21.15				
21-Jun-06	692	395	19.48	-0.01	0.00	**0.00**	21.06	-0.09	-0.09	**-0.08**	
3-Oct-06	796	104	19.48	-0.01	0.00	**0.00**	21.05	-0.10	-0.01	**-0.04**	
4-Jul-07	1,070	274	19.43	-0.06	-0.05	**-0.07**	21.01	-0.14	-0.04	**-0.05**	
21-Sep-07	1,149	79	19.48	-0.01	0.05	**0.23**	21.01	-0.14	0.00	**0.00**	
8-Sep-08	1,502	353	19.46	-0.03	-0.02	**-0.02**	20.95	-0.20	-0.06	**-0.06**	

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 2940-044-00
Date: 8-Sep-08

Table C-4) Clinton Creek Drop Structure #3 Monitoring Results

Monitoring Date	Time		Horizontal Movement - Location 1				Horizontal Movement - Location 2				Comments
	total (days)	incremental (days)	measurement (metres)	total (metres)	incremental (metres)	rate (metres/year)	measurement (metres)	total (metres)	incremental (metres)	rate (metres/year)	
29-Jul-04	0	0	19.44								
22-May-05	297	297	19.32	-0.12	-0.12	**-0.15**	21.50				
21-Jun-06	692	395	19.25	-0.19	-0.07	**-0.06**	21.31	-0.19	-0.19	**-0.18**	
3-Oct-06	796	104	19.21	-0.23	-0.04	**-0.14**	21.31	-0.19	0.00	**0.00**	
4-Jul-07	1,070	274	19.14	-0.30	-0.07	**-0.09**	21.25	-0.25	-0.06	**-0.08**	
21-Sep-07	1,149	79	19.17	-0.27	0.03	**0.14**	21.24	-0.26	-0.01	**-0.05**	
8-Sep-08	1,502	353	19.08	-0.36	-0.09	**-0.09**	21.17	-0.33	-0.07	**-0.07**	

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 2940-044-00
Date: 8-Sep-08

Table C-5) Clinton Creek Drop Structure #4 Monitoring Results

Monitoring Date	Time		Horizontal Movement - Location 1				Horizontal Movement - Location 2				Comments
	total (days)	incremental (days)	measurement (metres)	total (metres)	incremental (metres)	rate (metres/year)	measurement (metres)	total (metres)	incremental (metres)	rate (metres/year)	
29-Jul-04	n/a										
22-May-05	0	0	19.61				21.48				
21-Jun-06	395	395	19.55	-0.06	-0.06	**-0.06**	21.46	-0.02	-0.02	**-0.02**	
3-Oct-06	499	104	19.51	-0.10	-0.04	**-0.14**	21.36	-0.12	-0.10	**-0.35**	
4-Jul-07	773	274	19.43	-0.18	-0.08	**-0.11**	21.34	-0.14	-0.02	**-0.03**	
21-Sep-07	852	79	19.46	-0.15	0.03	**0.14**	21.35	-0.13	0.01	**0.05**	
8-Sep-08	1205	353	19.40	-0.21	-0.06	**-0.06**	21.30	-0.18	-0.05	**-0.05**	

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 2940-044-00
Date: 9-Jul-08

Table C-6) Former Clinton Creek Asbestos Mine - Clinton Creek Drop Structure Monitoring
Channel Closure Monitor Pins #1450 to #1465

Location #1 - Across The Drawdown Weir

Drop Structure	Horizontal Distance Across Drop Structure (metres)						Incremental Change (m)	Average Annual Rate Of Movement (m/yr)	Total Change (m)	Comment
	Date	Date	Date	Date	Date	Date	Jul 07 to Jul 08	Jul 07 to Jul 08		
	28-Jul-06	4-Jul-07	9-Jul-08							
1	27.59	27.56	27.55				-0.01	-0.01	-0.04	survey tags 1450 & 1451
2	27.62	27.60	27.58				-0.02	-0.02	-0.04	survey tags 1454 & 1455
3	27.28	27.21	27.16				-0.05	-0.05	-0.12	survey tags 1458 & 1459
4	27.09	27.11	27.05				-0.06	-0.06	-0.04	survey tags 1462 & 1463

Location #2 - Across Lower Tier

Drop Structure	Horizontal Distance Across Drop Structure (metres)						Incremental Change (m)	Average Annual Rate Of Movement (m/yr)	Total Change (m)	Comment
	Date	Date	Date	Date	Date	Date	Jul 07 to Jul 08	Jul 07 to Jul 08		
	28-Jul-06	4-Jul-07	9-Jul-08							
1	28.83	28.76	28.79				0.03	0.03	-0.04	survey tags 1452 & 1453
2	28.62	28.58	28.54				-0.04	-0.04	-0.08	survey tags 1456 & 1457
3	28.82	28.69	28.64				-0.05	-0.05	-0.18	survey tags 1460 & 1461
4	30.57	30.53	30.51				-0.02	-0.02	-0.06	survey tags 1464 & 1465

Year	Monitored By
2006	Installed by Underhill Geomatics Limited
2007	Underhill Geomatics Limited
2008	Underhill Geomatics Limited

Average (m)	**-0.03**	**-0.03**	**-0.08**
Maximum (m)	**0.03**	**0.03**	**-0.04**
Minimum (m)	**-0.06**	**-0.06**	**-0.18**

Channel Closure Monitor Pins #1450 to #1465

Location #1 - Across The Drawdown Weir

Drop Structure	Incremental Change Summary					
	Jul 06 to Jul 07	Jul 07 to Jul 08				
1	-0.03	-0.01				
2	-0.02	-0.02				
3	-0.07	-0.05				
4	0.02	-0.06				

Location #2 - Across Lower Tier

Drop Structure	Incremental Change Summary					
	Jul 06 to Jul 07	Jul 07 to Jul 08				
1	-0.07	0.03				
2	-0.04	-0.04				
3	-0.13	-0.05				
4	-0.04	-0.02				

Appendix D
Tailings Pile Movement Monitoring Results

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine - Tailings Movement Monitoring
Job No.: 2940-044-00
Date: 9-Jul-08

Table D1) Tailings Stability - Upper Slopes (Elevation > 530 m)

North Lobe

Monitor	Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	increment (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
1483	21-Aug-03	7,148,233.01	513,412.67	609.08	0	0	0.00			0.00		
	28-Jul-04	7,148,233.01	513,412.69	609.02	342	342	0.03	0.03	0.03	-0.06	-0.06	-0.06
	23-Sep-04	7,148,233.02	513,412.68	609.00	399	57	0.02	0.02	0.10	-0.08	-0.03	-0.16
	17-Sep-05	7,148,233.03	513,412.71	608.96	758	359	0.05	0.03	0.03	-0.12	-0.04	-0.04
	28-Jul-06	7,148,233.06	513,412.70	609.00	1,072	314	0.06	0.03	0.04	-0.08	0.04	0.05
	9-Jul-08	7,148,233.04	513,412.75	608.94	1,784	712	0.08	0.05	0.02	-0.14	-0.06	-0.03
26	21-Aug-03	7,148,341.45	513,483.53	575.11	9,275	7,007	0.00	0.77	0.04	-0.95	-0.43	-0.02
	28-Jul-04	7,148,341.48	513,483.55	575.10	9,617	342	0.03	0.04	0.04	-0.96	-0.01	-0.01
	23-Sep-04	7,148,341.49	513,483.55	575.08	9,674	57	0.03	0.02	0.10	-0.97	-0.01	-0.10
	17-Sep-05	7,148,341.47	513,483.57	575.01	10,033	359	0.04	0.04	0.04	-1.05	-0.07	-0.07
	28-Jul-06	7,148,341.50	513,483.58	575.07	10,347	314	0.06	0.04	0.04	-0.99	0.06	0.07
	9-Jul-08	7,148,341.50	513,483.61	575.02	11,059	712	0.09	0.04	0.02	-1.04	-0.05	-0.03
80-2	21-Aug-03	7,148,290.05	513,549.41	552.78	7,294	7,007	0.00	0.86	0.05	-0.57	-0.57	-0.03
	28-Jul-04	7,148,290.09	513,549.50	552.65	7,636	342	0.09	0.09	0.10	-0.70	-0.13	-0.14
	23-Sep-04	7,148,290.08	513,549.48	552.63	7,693	57	0.08	0.01	0.09	-0.72	-0.02	-0.12
	17-Sep-05	7,148,290.08	513,549.57	552.50	8,052	359	0.16	0.09	0.09	-0.86	-0.14	-0.14
	28-Jul-06	7,148,290.09	513,549.60	552.54	8,366	314	0.19	0.03	0.04	-0.81	0.05	0.05
	9-Jul-08	7,148,290.08	513,549.69	552.45	9,078	712	0.28	0.09	0.05	-0.91	-0.10	-0.05
26-A	21-Aug-03	7,148,339.30	513,540.50	557.82	9,275	7,007	0.00	0.74	0.04	-0.83	-0.83	-0.04
	28-Jul-04	7,148,339.32	513,540.52	557.75	9,617	342	0.01	0.03	0.03	-0.90	-0.07	-0.08
	23-Sep-04	7,148,339.32	513,540.49	557.74	9,674	57	-0.01	0.02	0.15	-0.91	-0.01	-0.06
	17-Sep-05	7,148,339.34	513,540.56	557.65	10,033	359	0.05	0.07	0.07	-1.01	-0.10	-0.10
	28-Jul-06	7,148,339.33	513,540.54	557.71	10,347	314	0.04	0.02	0.03	-0.94	0.06	0.07
	9-Jul-08	7,148,339.35	513,540.59	557.67	11,059	712	0.09	0.05	0.03	-0.98	-0.04	-0.02
80-1	21-Aug-03	7,148,407.98	513,543.04	555.71	7,294	7,007	0.00	1.79	0.09	-1.97	-1.97	-0.10
	28-Jul-04	7,148,408.01	513,543.07	555.61	7,636	342	0.02	0.04	0.05	-2.06	-0.10	-0.10
	23-Sep-04	7,148,408.03	513,543.06	555.61	7,693	57	0.01	0.03	0.16	-2.06	0.00	0.00
	17-Sep-05	7,148,408.01	513,543.12	555.49	8,052	359	0.07	0.06	0.06	-2.19	-0.12	-0.13
	28-Jul-06	7,148,408.02	513,543.14	555.55	8,366	314	0.09	0.03	0.03	-2.12	0.06	0.07
	9-Jul-08	7,148,408.04	513,543.21	555.48	9,078	712	0.15	0.07	0.04	-2.20	-0.08	-0.04
BH-14 (T7)	21-Aug-03	7,148,488.36	513,563.01	530.33	0	0	0.00			0.00		
	28-Jul-04	7,148,488.36	513,563.01	530.29	342	342	0.01	0.01	0.01	-0.04	-0.04	-0.05
	23-Sep-04	7,148,488.33	513,562.99	530.30	399	57	0.03	0.03	0.22	-0.03	0.01	0.08
	17-Sep-05	7,148,488.34	513,562.87	530.24	758	359	0.14	0.12	0.12	-0.09	-0.06	-0.06
	28-Jul-06	7,148,488.37	513,563.02	530.34	1,072	314	0.02	0.16	0.18	0.01	0.10	0.11
	9-Jul-08	7,148,488.43	513,563.07	530.36	1,784	712	0.10	0.07	0.04	0.03	0.02	0.01
1495	21-Aug-03	7,148,526.59	513,528.92	529.06	0	0	0.00			0.00		
	28-Jul-04	7,148,526.62	513,528.97	529.05	342	342	0.06	0.06	0.06	-0.01	-0.01	-0.01
	23-Sep-04	7,148,526.65	513,528.95	529.07	399	57	0.06	0.03	0.20	0.01	0.01	0.08
	17-Sep-05	7,148,526.65	513,529.00	528.97	758	359	0.10	0.05	0.05	-0.09	-0.10	-0.10
	28-Jul-06	7,148,526.67	513,529.02	529.06	1,072	314	0.13	0.03	0.03	0.00	0.09	0.11
	9-Jul-08	7,148,526.69	513,529.07	529.04	1,784	712	0.18	0.06	0.03	-0.02	-0.01	-0.01

Average	Aug 03 to Jul 04	0.04	0.04		-0.06	-0.06
	Jul 04 to Sep 04	0.02	0.15		-0.01	-0.04
	Sep 04 to Sep 05	0.06	0.07		-0.09	-0.09
	Sep 05 to Jul 06	0.05	0.06		0.07	0.08
	Jul 06 to Jul 08	**0.06**	**0.03**		**-0.04**	**-0.02**
Maximum	Aug 03 to Jul 04	0.09	0.10		-0.01	-0.01
	Jul 04 to Sep 04	0.03	0.22		0.01	0.08
	Sep 04 to Sep 05	0.12	0.12		-0.04	-0.04
	Sep 05 to Jul 06	0.16	0.18		0.10	0.11
	Jul 06 to Jul 08	**0.09**	**0.05**		**0.02**	**0.01**
Minimum	Aug 03 to Jul 04	0.01	0.01		-0.13	-0.14
	Jul 04 to Sep 04	0.01	0.09		-0.03	-0.16
	Sep 04 to Sep 05	0.03	0.03		-0.14	-0.14
	Sep 05 to Jul 06	0.02	0.03		0.04	0.05
	Jul 06 to Jul 08	**0.04**	**0.02**		**-0.10**	**-0.05**

South Lobe

Monitor	Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	increment (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
1492	21-Aug-03	7,148,053.74	513,409.91	610.07	1,496	1,496	0.00	0.30	0.07	-0.42	-0.42	-0.10
	28-Jul-04	7,148,053.72	513,409.97	609.98	1,838	342	0.06	0.06	0.07	-0.50	-0.09	-0.09
	23-Sep-04	7,148,053.73	513,409.95	609.98	1,895	57	0.04	0.02	0.14	-0.50	0.00	-0.01
	17-Sep-05	7,148,053.69	513,410.03	609.80	2,254	359	0.12	0.08	0.09	-0.69	-0.18	-0.19
	28-Jul-06	7,148,053.68	513,410.04	609.79	2,568	314	0.14	0.02	0.02	-0.70	-0.01	-0.01
	9-Jul-08	7,148,053.66	513,410.14	609.70	3,280	712	0.24	0.10	0.05	-0.79	-0.09	-0.05
24	21-Aug-03	7,148,033.83	513,525.34	549.69	9,275	7,007	0.00	9.06	0.47	-5.54	-5.54	-0.29
	28-Jul-04	7,148,033.87	513,525.57	549.55	9,617	342	0.22	0.23	0.24	-5.68	-0.14	-0.15
	23-Sep-04	7,148,033.90	513,525.56	549.55	9,674	57	0.21	0.03	0.19	-5.67	0.01	0.04
	17-Sep-05	7,148,033.91	513,525.74	549.37	10,033	359	0.39	0.18	0.18	-5.86	-0.19	-0.19
	28-Jul-06	7,148,033.92	513,525.89	549.37	10,347	313	0.54	0.15	0.18	-5.86	0.00	0.00
	9-Jul-08	7,148,033.94	513,526.07	549.28	11,059	712	0.71	0.17	0.09	-5.95	-0.09	-0.05

Average	Aug 03 to Jul 04	0.14	0.15		-0.11	-0.12
	Jul 04 to Sep 04	0.03	0.17		0.00	0.01
	Sep 04 to Sep 05	0.13	0.13		-0.19	-0.19
	Sep 05 to Jul 06	0.09	0.10		0.00	0.00
	Jul 06 to Jul 08	**0.14**	**0.07**		**-0.09**	**-0.05**
Maximum	Aug 03 to Jul 04	0.23	0.24		-0.09	-0.09
	Jul 04 to Sep 04	0.03	0.19		0.01	0.04
	Sep 04 to Sep 05	0.18	0.18		-0.18	-0.19
	Sep 05 to Jul 06	0.15	0.18		0.00	0.00
	Jul 06 to Jul 08	**0.17**	**0.09**		**-0.09**	**-0.05**
Minimum	Aug 03 to Jul 04	0.06	0.07		-0.14	-0.15
	Jul 04 to Sep 04	0.02	0.14		0.00	-0.01
	Sep 04 to Sep 05	0.08	0.09		-0.19	-0.19
	Sep 05 to Jul 06	0.02	0.02		-0.01	-0.01
	Jul 06 to Jul 08	**0.10**	**0.05**		**-0.09**	**-0.05**

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine - Tailings Movement Monitoring
Job No.: 2940-044-00
Date: 9-Jul-08

Table D2) Tailings Stability - Mid Slopes (Elevation 425 to 530 m)

North Lobe

Monitor	Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	increment (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
80-4	21-Aug-03	7,148,201.56	513,688.82	501.73	7,294	7,007	0.00	14.32	0.75	-5.41	-5.41	-0.28
	28-Jul-04	7,148,201.69	513,689.40	501.49	7,636	342	0.59	0.59	0.63	-5.65	-0.24	-0.26
	23-Sep-04	7,148,201.73	513,689.47	501.42	7,693	57	0.67	0.09	0.56	-5.73	-0.07	-0.47
	17-Sep-05	7,148,201.81	513,689.99	501.18	8,052	359	1.19	0.52	0.53	-5.96	-0.24	-0.24
	28-Jul-06	7,148,201.90	513,690.35	501.14	8,366	314	1.56	0.37	0.43	-6.00	-0.04	-0.05
	9-Jul-08	7,148,202.02	513,690.93	500.95	9,078	712	2.16	0.60	0.31	-6.19	-0.19	-0.10
80-5	21-Aug-03	7,148,249.32	513,718.34	481.19	7,294	7,007	0.00	17.49	0.91	-8.31	-8.31	-0.43
	28-Jul-04	7,148,249.41	513,718.73	481.10	7,636	342	0.40	0.40	0.43	-8.40	-0.09	-0.10
	23-Sep-04	7,148,249.42	513,718.77	481.07	7,693	57	0.44	0.04	0.28	-8.43	-0.02	-0.16
	17-Sep-05	7,148,249.49	513,719.16	480.92	8,052	359	0.83	0.39	0.40	-8.59	-0.16	-0.16
	28-Jul-06	7,148,249.55	513,719.41	480.96	8,366	314	1.09	0.26	0.30	-8.54	0.04	0.05
	9-Jul-08	7,148,249.63	513,719.85	480.86	9,078	712	1.54	0.45	0.23	-8.64	-0.10	-0.05
1085	21-Aug-03	7,148,346.05	513,666.41	488.88	0	0	0			0		
	28-Jul-04	7,148,346.06	513,666.43	488.84	342	342	0.02	0.02	0.02	-0.04	-0.04	-0.04
	23-Sep-04	7,148,346.06	513,666.41	488.82	399	57	0.01	0.02	0.14	-0.06	-0.01	-0.09
	17-Sep-05	7,148,346.06	513,666.46	488.72	758	359	0.05	0.05	0.05	-0.16	-0.10	-0.10
	28-Jul-06	7,148,346.08	513,666.47	488.82	1,072	314	0.06	0.02	0.02	-0.06	0.09	0.11
	9-Jul-08	7,148,346.05	513,666.51	488.82	1,784	712	0.10	0.05	0.03	-0.06	0.00	0.00
500-1	21-Aug-03	7,148,343.22	513,725.53	474.09	9,088	7,007	0.00	44.05	2.29	-46.56	-15.13	-0.79
	28-Jul-04	7,148,343.24	513,725.54	474.02	9,430	342	0.01	0.02	0.02	-46.63	-0.07	-0.07
	23-Sep-04	7,148,343.24	513,725.53	474.01	9,487	57	0.00	0.01	0.09	-46.64	-0.01	-0.06
	17-Sep-05	7,148,343.24	513,725.55	473.95	9,846	359	0.02	0.02	0.02	-46.70	-0.06	-0.06
	28-Jul-06	7,148,343.24	513,725.56	474.10	10,160	314	0.03	0.02	0.02	-46.56	0.14	0.16
	9-Jul-08	7,148,343.25	513,725.57	474.08	10,872	712	0.04	0.01	0.01	-46.57	-0.01	-0.01
650-1	21-Aug-03	7,148,408.73	513,701.26	483.95	9,088	7,007	0.00	25.21	1.31	-31.32	-11.57	-0.60
	28-Jul-04	7,148,408.75	513,701.33	483.92	9,430	342	0.07	0.06	0.07	-31.35	-0.03	-0.03
	23-Sep-04	7,148,408.75	513,701.31	483.91	9,487	57	0.05	0.02	0.13	-31.36	-0.01	-0.07
	17-Sep-05	7,148,408.75	513,701.34	483.87	9,846	359	0.09	0.04	0.04	-31.39	-0.03	-0.03
	28-Jul-06	7,148,408.77	513,701.35	483.89	10,160	314	0.09	0.02	0.03	-31.37	0.02	0.02
	9-Jul-08	7,148,408.75	513,701.39	483.87	10,872	712	0.13	0.05	0.02	-31.63	-0.02	-0.01
350-1A	21-Aug-03	7,148,298.59	513,822.46	448.09	9,078	7,007	0.00	72.05	3.75	-52.52	-25.55	-1.33
	28-Jul-04	7,148,298.61	513,822.64	448.01	9,420	342	0.19	0.19	0.20	-52.61	-0.08	-0.09
	23-Sep-04	7,148,298.61	513,822.64	448.00	9,477	57	0.19	0.00	0.03	-52.61	0.00	-0.03
	17-Sep-05	7,148,298.64	513,822.81	447.93	9,836	359	0.35	0.17	0.17	-52.69	-0.07	-0.08
	28-Jul-06	7,148,298.65	513,822.90	447.93	10,150	314	0.44	0.10	0.11	-52.68	0.00	0.00
	9-Jul-08	7,148,298.68	513,823.08	447.87	10,862	712	0.62	0.17	0.09	-52.74	-0.06	-0.03
500-2	21-Aug-03	7,148,344.36	513,842.07	438.14	9,078	7,007	0.00	66.97	3.49	-61.43	-26.78	-1.40
	28-Jul-04	7,148,344.36	513,842.27	438.06	9,420	342	0.20	0.20	0.21	-61.51	-0.08	-0.08
	23-Sep-04	7,148,344.37	513,842.26	438.05	9,477	57	0.19	0.02	0.10	-61.52	-0.01	-0.08
	17-Sep-05	7,148,344.37	513,842.43	438.00	9,836	359	0.37	0.17	0.18	-61.57	-0.05	-0.05
	28-Jul-06	7,148,344.39	513,842.53	438.02	10,150	314	0.46	0.10	0.11	-61.55	0.03	0.03
	9-Jul-08	7,148,344.41	513,842.70	437.96	10,862	712	0.64	0.18	0.09	-61.61	-0.07	-0.03
650-2	21-Aug-03	7,148,400.26	513,815.95	439.87	9,078	7,007	0.00	38.47	2.00	-44.69	-11.93	-0.62
	28-Jul-04	7,148,400.25	513,816.10	439.75	9,420	342	0.14	0.15	0.16	-44.81	-0.12	-0.12
	23-Sep-04	7,148,400.25	513,816.08	439.72	9,477	57	0.12	0.02	0.12	-44.84	-0.04	-0.24
	17-Sep-05	7,148,400.24	513,816.21	439.67	9,836	359	0.25	0.13	0.13	-44.89	-0.04	-0.05
	28-Jul-06	7,148,400.25	513,816.27	439.70	10,150	314	0.31	0.06	0.07	-44.86	0.02	0.03
	9-Jul-08	7,148,400.20	513,816.38	439.64	10,862	712	0.42	0.12	0.06	-46.07	-0.06	-0.03
350-2A	21-Aug-03	7,148,300.52	513,873.67	428.71	9,070	7,007	0.00	73.00	3.80	-61.41	-29.09	-1.52
	28-Jul-04	7,148,300.53	513,873.83	428.58	9,412	342	0.16	0.16	0.17	-61.54	-0.13	-0.14
	23-Sep-04	7,148,300.54	513,873.85	428.58	9,469	57	0.18	0.01	0.09	-61.55	-0.01	-0.04
	17-Sep-05	7,148,300.52	513,873.98	428.51	9,828	359	0.31	0.14	0.14	-61.61	-0.06	-0.07
	28-Jul-06	7,148,300.52	513,874.08	428.52	10,142	314	0.41	0.10	0.12	-61.60	0.01	0.01
	9-Jul-08	7,148,300.50	513,874.23	428.47	10,854	712	0.56	0.15	0.08	-61.66	-0.06	-0.03
1491	21-Aug-03	7,148,376.83	513,868.79	432.49	0	0	0			0		
	28-Jul-04	7,148,376.82	513,869.00	432.34	342	342	0.21	0.21	0.22	-0.15	-0.15	-0.16
	23-Sep-04	7,148,376.82	513,868.99	432.32	399	57	0.20	0.01	0.05	-0.17	-0.02	-0.13
	17-Sep-05	7,148,376.85	513,869.15	432.27	758	359	0.36	0.17	0.17	-0.22	-0.05	-0.05
	28-Jul-06	7,148,376.90	513,869.24	432.34	1,072	314	0.45	0.09	0.11	-0.15	0.07	0.08
	9-Jul-08	7,148,376.96	513,869.39	432.28	1,784	712	0.62	0.17	0.09	-0.21	-0.06	-0.03

Average	Aug 03 to Jul 04	0.20	0.21		-0.10	-0.11
	Jul 04 to Sep 04	0.02	0.16		-0.02	-0.14
	Sep 04 to Sep 05	0.18	0.18		-0.09	-0.09
	Sep 05 to Jul 06	0.11	0.13		0.04	0.04
	Jul 06 to Jul 08	**0.19**	**0.10**		**-0.06**	**-0.03**
Maximum	Aug 03 to Jul 04	0.59	0.63		-0.03	-0.03
	Jul 04 to Sep 04	0.09	0.56		0.00	-0.03
	Sep 04 to Sep 05	0.52	0.53		-0.03	-0.03
	Sep 05 to Jul 06	0.37	0.43		0.14	0.16
	Jul 06 to Jul 08	**0.60**	**0.31**		**0.00**	**0.00**
Minimum	Aug 03 to Jul 04	0.02	0.02		-0.24	-0.26
	Jul 04 to Sep 04	0.00	0.03		-0.07	-0.47
	Sep 04 to Sep 05	0.02	0.02		-0.24	-0.24
	Sep 05 to Jul 06	0.02	0.02		-0.04	-0.05
	Jul 06 to Jul 08	**0.01**	**0.01**		**-0.19**	**-0.10**

South Lobe

Monitor	Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	increment (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
1084	21-Aug-03	7,148,017.97	513,617.95	516.26	0	0	0			0		
	28-Jul-04	7,148,017.98	513,618.35	516.10	342	342	0.40	0.40	0.43	-0.16	-0.16	-0.17
	23-Sep-04	7,148,017.99	513,618.38	516.10	399	57	0.43	0.03	0.18	-0.16	-0.01	-0.06
	17-Sep-05	7,148,018.02	513,618.72	516.02	758	359	0.77	0.34	0.35	-0.24	-0.08	-0.08
	28-Jul-06	7,148,018.00	513,618.94	515.98	1,072	314	0.99	0.22	0.26	-0.28	-0.04	-0.04
	9-Jul-08	7,148,018.01	513,619.24	515.89	1,784	712	1.29	0.30	0.15	-0.37	-0.10	-0.05
1485	21-Aug-03	7,148,017.91	513,702.37	480.46	0	0	0.00			0.00		
	28-Jul-04	7,148,018.00	513,703.32	480.19	342	342	0.95	0.95	1.02	-0.27	-0.27	-0.29
	23-Sep-04	7,148,018.02	513,703.46	480.10	399	57	1.09	0.14	0.89	-0.36	-0.09	-0.56
	17-Sep-05	7,148,018.12	513,704.37	479.82	758	359	2.00	0.91	0.93	-0.64	-0.29	-0.29
	28-Jul-06	7,148,018.16	513,705.01	479.62	1,072	314	2.65	0.65	0.75	-0.84	-0.19	-0.22
	9-Jul-08	7,148,018.25	513,706.15	479.22	1,784	712	3.79	1.14	0.58	-1.24	-0.40	-0.20
BH-16 (T8)	21-Aug-03	7,148,048.49	513,760.30	464.94	0	0	0			0		
	28-Jul-04	7,148,048.61	513,761.19	464.65	342	342	0.90	0.90	0.96	-0.29	-0.29	-0.31
	23-Sep-04	7,148,048.63	513,761.31	464.59	399	57	1.02	0.12	0.77	-0.35	-0.05	-0.35
	17-Sep-05	7,148,048.72	513,762.13	464.34	758	359	1.84	0.82	0.84	-0.60	-0.25	-0.26
	28-Jul-06	7,148,048.79	513,762.77	464.20	1,072	314	2.49	0.64	0.75	-0.75	-0.14	-0.17
	9-Jul-08	7,148,048.93	513,763.85	463.84	1,784	712	3.58	1.10	0.56	-1.10	-0.36	-0.18
24A	21-Aug-03	7,148,035.28	513,774.68	465.27	9,275	7,007	0.00	61.43	3.20	-21.10	-21.10	-1.10
	28-Jul-04	7,148,035.42	513,775.58	464.94	9,617	342	0.91	0.91	0.97	-21.43	-0.33	-0.35
	23-Sep-04	7,148,035.44	513,775.70	464.89	9,674	57	1.04	0.13	0.82	-21.49	-0.05	-0.34
	17-Sep-05	7,148,035.58	513,776.55	464.66	10,033	359	1.90	0.86	0.87	-21.71	-0.23	-0.23
	28-Jul-06	7,148,035.66	513,777.19	464.47	10,347	673	2.54	0.64	0.75	-21.90	-0.42	-0.23
	9-Jul-08	7,148,035.85	513,778.31	464.12	11,059	712	3.68	1.13	0.58	-22.25	-0.54	-0.28
24B	21-Aug-03	7,148,045.09	513,832.26	446.30	9,275	7,007	0.00	61.12	3.18	-20.06	-20.06	-1.04
	28-Jul-04	7,148,045.31	513,833.13	446.00	9,617	342	0.90	0.90	0.96	-20.36	-0.30	-0.32
	23-Sep-04	7,148,045.33	513,833.26	445.89	9,674	57	1.03	0.13	0.85	-20.47	-0.11	-0.69
	17-Sep-05	7,148,045.55	513,834.05	445.62	10,033	359	1.84	0.82	0.83	-20.74	-0.27	-0.27
	28-Jul-06	7,148,045.69	513,834.66	445.46	10,347	314	2.47	0.62	0.73	-20.90	-0.16	-0.19
	9-Jul-08	7,148,045.97	513,835.72	445.06	11,059	712	3.56	1.09	0.56	-21.30	-0.39	-0.20
NL-Base	17-Sep-05	7,148,154.79	513,836.26	431.47	0	0	0.00			0.00		
	28-Jul-06	7,148,154.78	513,836.23	431.38	314	314	0.03	0.03	0.04	-0.09	-0.09	-0.10
	9-Jul-08	7,148,154.80	513,836.28	431.40	1,026	712	0.02	0.05	0.03	-0.07	0.02	0.01
2005-06	17-Sep-05	7,147,999.72	513,865.78	433.29	0	0	0.00			0.00		
	28-Jul-06	7,147,999.74	513,866.22	433.22	314	314	0.44	0.44	0.51	-0.07	-0.07	-0.08
	9-Jul-08	7,147,999.88	513,867.02	432.94	1,026	712	1.25	0.81	0.41	-0.35	-0.28	-0.14
2005-07	17-Sep-05	7,148,000.11	513,945.37	416.35	0	0	0.00			0.00		
	28-Jul-06	7,148,000.07	513,945.39	416.36	314	314	0.04	0.04	0.05	0.01	0.01	0.01
	9-Jul-08	7,147,999.99	513,945.41	416.36	1,026	712	0.12	0.08	0.04	0.01	0.00	0.00
2005-08	17-Sep-05	7,148,038.85	513,970.98	415.77	0	0	0.00			0.00		
	28-Jul-06	7,148,038.81	513,971.06	415.79	314	314	0.09	0.09	0.10	0.02	0.02	0.02
	9-Jul-08	7,148,038.79	513,971.22	415.84	1,026	712	0.25	0.16	0.08	0.07	0.05	0.03
2005-09	17-Sep-05	7,148,124.38	513,969.23	420.18	0	0	0.00			0.00		
	28-Jul-06	7,148,124.55	513,969.46	420.28	314	314	0.29	0.29	0.34	0.10	0.10	0.12
	9-Jul-08	7,148,124.87	513,969.90	420.40	1,026	712	0.83	0.54	0.28	0.22	0.12	0.06
2005-10	17-Sep-05	7,148,146.69	513,925.39	411.78	0	0	0.00			0.00		
	28-Jul-06	7,148,146.97	513,925.66	411.80	314	314	0.39	0.39	0.45	0.02	0.02	0.02
	9-Jul-08	7,148,147.50	513,926.16	411.83	1,026	712	1.12	0.73	0.37	0.05	0.03	0.02
2005-11	17-Sep-05	7,148,176.10	513,942.17	411.91	0	0	0.00			0.00		
	28-Jul-06	7,148,176.45	513,942.33	411.80	314	314	0.39	0.39	0.45	-0.11	-0.11	-0.13
	9-Jul-08	7,148,177.04	513,942.67	411.99	1,026	712	1.07	0.68	0.35	0.08	0.19	0.10

Average	Aug 03 to Jul 04	0.81	0.87		-0.27	-0.29
	Jul 04 to Sep 04	0.11	0.70		-0.06	-0.40
	Sep 04 to Sep 05	0.75	0.76		-0.22	-0.23
	Sep 05 to Jul 06	0.37	0.43		-0.09	-0.08
	Jul 06 to Jul 08	**0.65**	**0.33**		**-0.14**	**-0.07**
Maximum	Aug 03 to Jul 04	0.95	1.02		-0.16	-0.17
	Jul 04 to Sep 04	0.14	0.89		-0.01	-0.06
	Sep 04 to Sep 05	0.91	0.93		-0.08	-0.08
	Sep 05 to Jul 06	0.65	0.75		0.10	0.12
	Jul 06 to Jul 08	**1.14**	**0.58**		**0.19**	**0.10**
Minimum	Aug 03 to Jul 04	0.40	0.43		-0.33	-0.35
	Jul 04 to Sep 04	0.03	0.18		-0.11	-0.69
	Sep 04 to Sep 05	0.34	0.35		-0.29	-0.29
	Sep 05 to Jul 06	0.03	0.04		-0.42	-0.23
	Jul 06 to Jul 08	**0.05**	**0.03**		**-0.54**	**-0.28**

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine - Tailings Movement Monitoring
Job No.: 2940-044-00
Date: 9-Jul-08

Table D3) Tailings Stability - Lower Slopes (Elevation <425 m)

North Lobe

Monitor	Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	increment (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
80-7	21-Aug-03	7,148,344.01	513,890.73	422.54	7,294	7,007	0.00	64.92	3.38	-23.45	-23.45	-1.22
	28-Jul-04	7,148,344.00	513,890.89	422.43	7,636	342	0.16	0.16	0.17	-23.56	-0.11	-0.12
	23-Sep-04	7,148,344.01	513,890.89	422.40	7,693	57	0.16	0.01	0.04	-23.59	-0.03	-0.21
	17-Sep-05	7,148,344.00	513,891.07	422.38	8,052	359	0.34	0.17	0.18	-23.61	-0.02	-0.02
	28-Jul-06	7,148,343.99	513,891.16	422.37	8,366	314	0.43	0.09	0.11	-23.62	-0.01	-0.01
	9-Jul-08	7,148,344.00	513,891.36	422.35	9,078	712	0.63	0.20	0.10	-23.65	-0.03	-0.01
350-3A	21-Aug-03	7,148,312.23	513,899.00	417.39	9,064	7,007	0.00	67.44	3.51	-67.47	-27.66	-1.44
	28-Jul-04	7,148,312.20	513,899.14	417.31	9,406	342	0.14	0.14	0.15	-67.55	-0.08	-0.08
	23-Sep-04	7,148,312.20	513,899.14	417.28	9,463	57	0.13	0.01	0.03	-67.59	-0.04	-0.25
	17-Sep-05	7,148,312.19	513,899.26	417.28	9,822	359	0.26	0.12	0.12	-67.58	0.00	0.00
	28-Jul-06	7,148,312.16	513,899.34	417.29	10,136	314	0.34	0.09	0.10	-67.57	0.01	0.01
	9-Jul-08	7,148,312.15	513,899.49	417.25	10,848	712	0.49	0.15	0.08	-67.61	-0.04	-0.02
1489	21-Aug-03	7,148,305.23	513,928.45	413.70	0	0	0			0		
	28-Jul-04	7,148,305.19	513,928.51	413.66	342	342	0.08	0.08	0.08	-0.04	-0.04	-0.04
	23-Sep-04	7,148,305.20	513,928.50	413.64	399	57	0.06	0.01	0.09	-0.06	-0.03	-0.16
	17-Sep-05	7,148,305.15	513,928.58	413.62	758	359	0.15	0.09	0.09	-0.08	-0.02	-0.02
	28-Jul-06	7,148,305.12	513,928.62	413.62	1,072	314	0.20	0.04	0.05	-0.08	0.00	0.00
	9-Jul-08	7,148,305.09	513,928.68	413.60	1,784	712	0.27	0.07	0.04	-0.10	-0.02	-0.01
NL-1	28-Jul-04	7,148,365.73	513,942.45	413.19	0	0	0.00			0.00		
	23-Sep-04	7,148,365.73	513,942.45	413.16	57	57	0.01	0.01	0.03	-0.02	-0.02	-0.15
	17-Sep-05	7,148,365.72	513,942.59	413.16	416	359	0.14	0.14	0.14	-0.03	0.00	-0.01
	28-Jul-06	7,148,365.70	513,942.70	413.15	730	314	0.24	0.11	0.13	-0.03	-0.01	-0.01
	9-Jul-08	7,148,365.72	513,942.85	413.10	1,442	712	0.40	0.16	0.08	-0.09	-0.05	-0.03
1083	21-Aug-03	7,148,354.01	513,936.37	414.10	0	0	0			0		
(NL-2)	28-Jul-04	7,148,354.00	513,936.52	414.10	342	342	0.15	0.15	0.16	0.00	0.00	-0.01
	23-Sep-04	7,148,354.01	513,936.52	414.08	33	-309	0.15	0.01	0.09	-0.02	-0.02	0.02
	17-Sep-05	7,148,354.02	513,936.65	414.05	758	359	0.28	0.13	0.14	-0.05	-0.03	-0.03
	28-Jul-06	7,148,354.03	513,936.74	414.06	1,072	314	0.37	0.09	0.11	-0.04	0.01	0.02
	9-Jul-08	7,148,354.05	513,936.89	414.04	1,784	712	0.52	0.15	0.07	-0.06	-0.02	-0.01
NL-3	28-Jul-04	7,148,334.73	513,926.88	417.07	0	0	0.00			0.00		
	23-Sep-04	7,148,334.73	513,926.88	417.05	57	57	0.00	0.00	0.03	-0.02	-0.02	-0.13
	17-Sep-05	7,148,334.75	513,926.99	417.08	416	359	0.10	0.11	0.11	0.01	0.03	0.03
	28-Jul-06	7,148,334.75	513,927.08	417.08	730	314	0.20	0.09	0.11	0.02	0.01	0.01
	9-Jul-08	7,148,334.74	513,927.20	417.08	1,442	712	0.32	0.12	0.06	0.01	0.00	0.00
NL-4	28-Jul-04	7,148,307.20	513,913.00	416.19	0	0	0.00			0.00		
	23-Sep-04	7,148,307.19	513,912.99	416.16	57	57	0.02	0.02	0.13	-0.03	-0.03	-0.20
	17-Sep-05	7,148,307.14	513,913.12	416.11	416	359	0.13	0.14	0.14	-0.08	-0.05	-0.05
	28-Jul-06	7,148,307.12	513,913.19	416.11	730	314	0.21	0.08	0.09	-0.08	0.01	0.01
	9-Jul-08	7,148,307.10	513,913.33	416.07	1,442	712	0.34	0.13	0.07	-0.13	-0.05	-0.02
NL-5	28-Jul-04	7,148,275.21	513,896.96	415.46	0	0	0.00			0.00		
	23-Sep-04	7,148,275.17	513,896.96	415.42	57	57	0.04	0.04	0.26	-0.04	-0.04	-0.26
	17-Sep-05	7,148,275.16	513,897.05	415.39	416	359	0.10	0.08	0.08	-0.07	-0.03	-0.03
	28-Jul-06	7,148,275.14	513,897.10	415.41	730	314	0.16	0.06	0.07	-0.04	0.03	0.03
	9-Jul-08	7,148,275.11	513,897.19	415.40	1,442	712	0.26	0.09	0.05	-0.06	-0.02	-0.01

Average	Aug 03 to Jul 04	0.11	0.11		-0.05	-0.05
	Jul 04 to Sep 04	0.01	0.09		-0.03	-0.17
	Sep 04 to Sep 05	0.12	0.13		-0.02	-0.02
	Sep 05 to Jul 06	0.08	0.09		0.01	0.01
	Jul 06 to Jul 08	**0.14**	**0.07**		**-0.03**	**-0.01**
Maximum	Aug 03 to Jul 04	0.16	0.17		0.00	-0.01
	Jul 04 to Sep 04	0.04	0.26		-0.02	0.02
	Sep 04 to Sep 05	0.17	0.18		0.03	0.03
	Sep 05 to Jul 06	0.11	0.13		0.03	0.03
	Jul 06 to Jul 08	**0.20**	**0.10**		**0.00**	**0.00**
Minimum	Aug 03 to Jul 04	0.08	0.08		-0.11	-0.12
	Jul 04 to Sep 04	0.00	0.03		-0.04	-0.26
	Sep 04 to Sep 05	0.08	0.08		-0.05	-0.05
	Sep 05 to Jul 06	0.04	0.05		-0.01	-0.01
	Jul 06 to Jul 08	**0.07**	**0.04**		**-0.05**	**-0.03**

South Lobe

Monitor	Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	increment (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
24D	21-Aug-03	7,148,071.59	513,920.05	422.39	9,103	7,007	0.00	50.43	2.63			
	28-Jul-04	7,148,071.88	513,920.59	422.29	9,445	342	0.61	0.61	0.65	-0.10	-0.10	-0.11
	23-Sep-04	7,148,071.93	513,920.65	422.28	9,502	57	0.68	0.08	0.51	-0.11	-0.01	-0.06
	17-Sep-05	7,148,072.22	513,921.17	422.27	9,861	359	1.26	0.59	0.60	-0.12	-0.01	-0.01
	28-Jul-06	7,148,072.45	513,921.53	422.29	10,175	314	1.68	0.43	0.50	-0.10	0.03	0.03
	9-Jul-08	7,148,072.86	513,922.19	422.25	10,887	712	2.42	0.77	0.40	-0.14	-0.04	-0.02
25B	21-Aug-03	7,148,065.68	513,948.29	422.02	9,096	7,007	0.00	35.04	1.83	1.18	1.18	0.06
	28-Jul-04	7,148,065.72	513,948.61	422.03	9,438	342	0.32	0.32	0.34	1.19	0.01	0.01
	23-Sep-04	7,148,065.75	513,948.63	422.03	9,495	57	0.35	0.04	0.26	1.19	0.00	-0.01
	17-Sep-05	7,148,065.78	513,948.89	422.10	9,854	359	0.60	0.25	0.26	1.26	0.07	0.07
	28-Jul-06	7,148,065.81	513,949.05	422.15	10,168	314	0.77	0.16	0.19	1.31	0.05	0.06
	9-Jul-08	7,148,065.90	513,949.39	422.20	10,880	712	1.12	0.35	0.18	1.36	0.05	0.02
80-9	21-Aug-03	7,147,996.44	513,970.69	411.11	7,294	7,007	0.00	12.02	0.63	3.07	3.07	0.16
	28-Jul-04	7,147,996.41	513,970.75	411.09	7,636	342	0.06	0.06	0.07	3.05	-0.02	-0.03
	23-Sep-04	7,147,996.38	513,970.73	411.04	7,693	57	0.05	0.03	0.20	2.99	-0.05	-0.33
	17-Sep-05	7,147,996.37	513,970.77	411.06	8,052	359	0.10	0.05	0.05	3.02	0.03	0.03
	28-Jul-06	7,147,996.36	513,970.80	411.12	8,366	314	0.13	0.03	0.03	3.08	0.06	0.07
	9-Jul-08	7,147,996.33	513,970.82	411.14	9,078	712	0.16	0.03	0.02	3.10	0.02	0.01
1484	21-Aug-03	7,148,148.49	513,961.52	417.94	0	0	0			0		
	28-Jul-04	7,148,149.07	513,961.93	417.98	342	342	0.71	0.71	0.76	0.04	0.04	0.04
	23-Sep-04	7,148,149.18	513,961.98	417.95	399	57	0.83	0.12	0.78	0.01	-0.03	-0.19
	17-Sep-05	7,148,149.71	513,962.36	417.93	758	359	1.49	0.65	0.66	-0.01	-0.01	-0.02
	28-Jul-06	7,148,150.10	513,962.63	417.98	1,072	314	1.96	0.47	0.55	0.04	0.05	0.05
	9-Jul-08	7,148,150.81	513,963.12	417.96	1,784	712	2.82	0.86	0.44	0.02	-0.02	-0.01
SL-1	28-Jul-04	7,148,078.88	513,970.45	419.86	0	0	0.00			0.00		
	23-Sep-04	7,148,079.09	513,970.46	419.76	57	57	0.20	0.20	1.30	-0.09	-0.09	-0.60
	17-Sep-05	7,148,078.87	513,970.86	419.83	416	359	0.40	0.45	0.46	-0.03	0.06	0.06
	28-Jul-06	7,148,078.84	513,971.10	419.84	730	314	0.64	0.24	0.28	-0.02	0.01	0.01
	9-Jul-08	7,148,078.82	513,971.55	419.81	1,442	712	1.10	0.46	0.23	-0.04	-0.02	-0.01
SL-2	28-Jul-04	7,148,086.80	513,956.84	422.53	0	0	0.00			0.00		
	23-Sep-04	7,148,087.01	513,956.88	422.46	57	57	0.21	0.21	1.38	-0.07	-0.07	-0.45
	17-Sep-05	7,148,086.98	513,957.37	422.60	416	359	0.56	0.49	0.50	0.08	0.15	0.15
	28-Jul-06	7,148,087.08	513,957.68	422.65	730	314	0.89	0.33	0.38	0.13	0.05	0.06
	9-Jul-08	7,148,087.23	513,958.26	422.76	1,442	712	1.49	0.60	0.31	0.23	0.10	0.05
SL-3	28-Jul-04	7,148,100.47	513,933.11	420.80	0	0	0.00			0.00		
	23-Sep-04	7,148,100.54	513,933.16	420.78	57	57	0.09	0.09	0.59	-0.02	-0.02	-0.13
	17-Sep-05	7,148,100.89	513,933.63	420.83	416	359	0.67	0.58	0.59	0.03	0.05	0.05
	28-Jul-06	7,148,101.13	513,933.98	420.86	730	314	1.10	0.43	0.49	0.06	0.03	0.04
	9-Jul-08	7,148,101.63	513,934.59	420.87	1,442	712	1.88	0.79	0.40	0.07	0.01	0.00
SL-4	17-Sep-05	7,148,115.67	513,907.57	416.88	0	0	0.00			0.00		
	28-Jul-06	7,148,115.91	513,907.91	416.82	314	314	0.42	0.42	0.49	-0.06	-0.06	-0.07
	9-Jul-08	7,148,116.34	513,908.56	416.70	1,026	712	1.19	0.77	0.40	-0.18	-0.12	-0.06
SL-5	17-Sep-05	7,148,133.63	513,876.08	422.91	0	0	0.00			0.00		
	28-Jul-06	7,148,133.86	513,876.52	422.79	314	314	0.49	0.49	0.57	-0.12	-0.12	-0.14
	9-Jul-08	7,148,134.25	513,877.26	422.53	1,026	712	1.34	0.85	0.43	-0.38	-0.26	-0.13
2005-01	17-Sep-05	7,148,100.15	513,757.89	463.73	0	0	0.00			0.00		
	28-Jul-06	7,148,100.13	513,758.45	463.64	314	314	0.56	0.56	0.65	-0.09	-0.09	-0.10
	9-Jul-08	7,148,100.09	513,759.38	463.46	1,026	712	1.49	0.93	0.48	-0.27	-0.18	-0.09
2005-02	17-Sep-05	7,148,118.21	513,816.95	447.89	0	0	0.00			0.00		
	28-Jul-06	7,148,118.32	513,817.41	447.77	314	314	0.48	0.48	0.56	-0.12	-0.12	-0.14
	9-Jul-08	7,148,118.56	513,818.22	447.45	1,026	712	1.31	0.84	0.43	-0.44	-0.32	-0.17
2005-03	17-Sep-05	7,148,108.16	513,870.12	428.18	0	0	0.00			0.00		
	28-Jul-06	7,148,108.35	513,870.58	428.04	314	314	0.50	0.50	0.58	-0.14	-0.14	-0.16
	9-Jul-08	7,148,108.74	513,871.41	427.72	1,026	712	1.41	0.91	0.47	-0.46	-0.32	-0.16
2005-04	17-Sep-05	7,148,047.07	513,876.04	428.36	0	0	0.00			0.00		
	28-Jul-06	7,148,047.27	513,876.56	428.26	314	314	0.55	0.55	0.64	-0.10	-0.10	-0.12
	9-Jul-08	7,148,047.65	513,877.50	428.02	1,026	712	1.57	1.02	0.52	-0.34	-0.24	-0.13
2005-05	17-Sep-05	7,148,000.57	513,781.55	464.67	0	0	0.00			0.00		
	28-Jul-06	7,148,000.65	513,782.24	464.51	314	314	0.70	0.70	0.81	-0.16	-0.16	-0.19
	9-Jul-08	7,148,000.83	513,783.44	464.19	1,026	712	1.91	1.22	0.62	-0.48	-0.32	-0.16

Average	Aug 03 to Jul 04	0.43	0.46		-0.02	-0.02
	Jul 04 to Sep 04	0.11	0.72		-0.04	-0.25
	Sep 04 to Sep 05	0.44	0.45		0.05	0.05
	Sep 05 to Jul 06	0.41	0.48		-0.04	-0.04
	Jul 06 to Jul 08	**0.74**	**0.38**		**-0.12**	**-0.06**
Maximum	Aug 03 to Jul 04	0.71	0.76		0.04	0.04
	Jul 04 to Sep 04	0.21	1.38		0.00	-0.01
	Sep 04 to Sep 05	0.65	0.66		0.15	0.15
	Sep 05 to Jul 06	0.70	0.81		0.06	0.07
	Jul 06 to Jul 08	**1.22**	**0.62**		**0.10**	**0.05**
Minimum	Aug 03 to Jul 04	0.06	0.07		-0.10	-0.11
	Jul 04 to Sep 04	0.03	0.20		-0.09	-0.60
	Sep 04 to Sep 05	0.05	0.05		-0.01	-0.02
	Sep 05 to Jul 06	0.03	0.03		-0.16	-0.19
	Jul 06 to Jul 08	**0.03**	**0.02**		**-0.32**	**-0.17**