

**ALBERTA TRANSPORTATION AND
ECONOMIC CORRIDORS
GEOHAZARD RISK MANAGEMENT PROGRAM
PEACE REGION (PEACE RIVER DISTRICT)
2025 INSPECTION**



Site Number	Location	Name	Hwy	km
SH008-1	2 km E of Watino Bridge	Watino East Hill	49:08	18.80-19.05
Legal Description		UTM Co-ordinates		
NE26-77-24-W5M		11U E 462,307	N	6,173,153

	Date	PF	CF	Total
Previous Inspection:	06-Jun-2023	10	2	20
Current Inspection:	27-May-2025	9	2	18
Road AADT:	840		Year:	2024
Inspected By:	Kristen Tappenden, TEC		Roger Skirrow, Thurber Mark Gallego, Thurber	
Report Attachments:	<input checked="" type="checkbox"/> Photographs		<input checked="" type="checkbox"/> Plans	<input type="checkbox"/> Maintenance Items

Primary Site Issue:	Multiple rotational, retrogressive failures in a 10 m high backslope that partially block the highway ditch and approach a pipeline ROW.	
Dimensions:	250 m length of backslope slumping on south side of highway.	
Date of Remediation:	1993: Highway re-routed to this current alignment. 1994: Assessment of subdrains in north slope found them to be working well. 1999: Design undertaken for French drains in south backslope slump area but not constructed. 2001: Gravel placed to buttress upper portion of Slump A and lower portion of Slump C and placed 3 m wide riprap lining in ditch. 2003: Rip-rap-lined channel constructed on lower half of Slump B. 2020: Pavement overlay placed on valley hill section of highway through this site.	
Maintenance:	2004: Additional stone added to south ditch east of Slump C. 2006: Riprap placed in north ditch. 2015: Slumped material in the south ditch removed. 2019: Site regraded to open up south ditch; north sideslope also regraded	
Observations:	Description	Worsened?
<input checked="" type="checkbox"/> Pavement Distress		<input type="checkbox"/>
<input checked="" type="checkbox"/> Slope Movement	Five separate slump blocks in the south backslope. Continued creep movement causing toe rolls to obstruct the ditch. Scarp upslope of Slump B extending into treeline.	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Erosion	Slumped material removed from the ditch, leaving bare soil exposed. Some erosion scarps approaching asphalt.	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Seepage	Seepage noted in the backslope and accumulating in grabens.	<input type="checkbox"/>
<input checked="" type="checkbox"/> Bridge/Culvert Distress	Outlet of drainage pipe partially obstructed.	<input type="checkbox"/>
<input checked="" type="checkbox"/> Other	Two pipelines are located immediately south of the backslope.	<input type="checkbox"/>
Instrumentation: None.		

Assessment:

This site is located at the crest of the Smoky River valley. The backslope slumping appears to be the result of seepage from sandy/silty layers in the backslope rather than deep-seated instability due to valley movements. At the present time, there is no impact to the highway surface as the depth of failure is contained within the height of the backslope. South slopes to the west and east of this localized area are not as high and appear to be stable; the north slope is of a similar height and also appears to be stable. This may indicate that the direction of groundwater flow is a contributing factor. The shaded north facing slope likely retains moisture more than the opposing south facing slope.

In the spring of 2019, the maintenance contractor excavated the toe rolls to improve ditch drainage. The material was wasted higher up on the slopes. Two swales were constructed on the slope to assist with drainage from the sag ponds further up the slope. The grading work obscured some of the slide features and may also have contributed to local instability at the toe due to the overall steepening of the lower portion of the backslope. The grading work re-established flow in the south ditch. In 2020, there was deterioration of the toe of this regrading with some sloughing and erosion observed. Not many changes were observed at the site in 2021; it was noted that the upper portions of the fill revegetated. By 2023 the toe of Slump B has pushed out further into the ditch and some minor slumping of the Slump A toe roll was noted. Some of the previously wet sag ponds were dry in 2023. During the 2025 inspection, the headscarp of Slump B was observed to be extending into the treeline and the headscarp of Slump A had extended to the southeast. Some erosion scarps were observed to be approaching the asphalt in 2025.

A set of head scarp monitoring markers were installed in 2013, and periodically replaced over the years. The measurements have generally shown a slow retrogression of the slide areas with little change between the 2023 and 2025 measurements,

An underground utility locate was undertaken in 2018 to identify the locations of the pipelines at the top of the slope. The TransCanada pipeline (TCPL) was closest at an offset 4.9 m south of Pin A1 and 0.1 m south of Pin B3. The East Peace Gas Co-op natural gas line is located further south of the TCPL line.

Overall, there does not appear to be significant changes since the 2023 inspection.

Recommendations:**Short-Term:**

- Remove material from the ditch when required to maintain flow, but do not place the excavated material back onto the slide mass. Augment the ditch bottom riprap to minimize downcutting and erosion of the trimmed slide toe rolls.
- Undertake a discussion with the pipeline owners to determine their risk tolerance and minimum setback distance.
- The head scarp monitoring markers should be made more visible and cleared of vegetation to make locating and accessing them easier.

Long-Term:

- Develop remediation options such as flattening of the backslope with a buried culvert along the ditch or a low height gabion basket wall; reconstruct the slope with gravel material or select clay with a drainage blanket and subdrains, and install a groundwater cut-off trench at the top of the slope and regrade the slope to promote surface drainage.

Ongoing Investigation:

- It is recommended that the Geohazard inspection should continue as scheduled every second year.
- A geotechnical drilling program is recommended if the long-term remediation option(s) are considered.

Closure

It is a condition of this letter report that Thurber's performance of its professional services will be subject to the attached Statement for Use and Interpretation of Report.

Roger Skirrow, P.Eng.
Senior Geotechnical Engineer

Mark Gallego, P.Eng.
Geotechnical Engineer

STATEMENT FOR USE AND INTERPRETATION OF REPORT

1. STANDARD OF CARE

This Report has been prepared in a manner consistent with that degree of care and skill ordinarily exercised by members of the same profession currently practicing under similar circumstances at the same time and in the same or similar locality and in compliance with all applicable laws.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment, including this Statement For Use and Interpretation of Report, are a part of the Report, which is of a summary nature and is not intended to stand alone without reference to the instructions given to Thurber by the Client, communications between Thurber and the Client, and any other reports, proposals or documents prepared by Thurber for the Client relative to the specific site described herein, all of which together constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT, AS DESCRIBED ABOVE. THURBER IS NOT RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE OF THE REPORT.

3. BASIS OF REPORT

The Report has been prepared for the specific site, development, design objectives, and purposes that were described to Thurber by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the Report, subject to the limitations provided herein, are only valid to the extent that the Report expressly addresses proposed development, design objectives and purposes, and then only to the extent that there has been no material alteration to or variation from any of the said descriptions provided to Thurber, unless Thurber is specifically requested by the Client to review and revise the Report in light of such alteration or variation.

4. USE OF THE REPORT

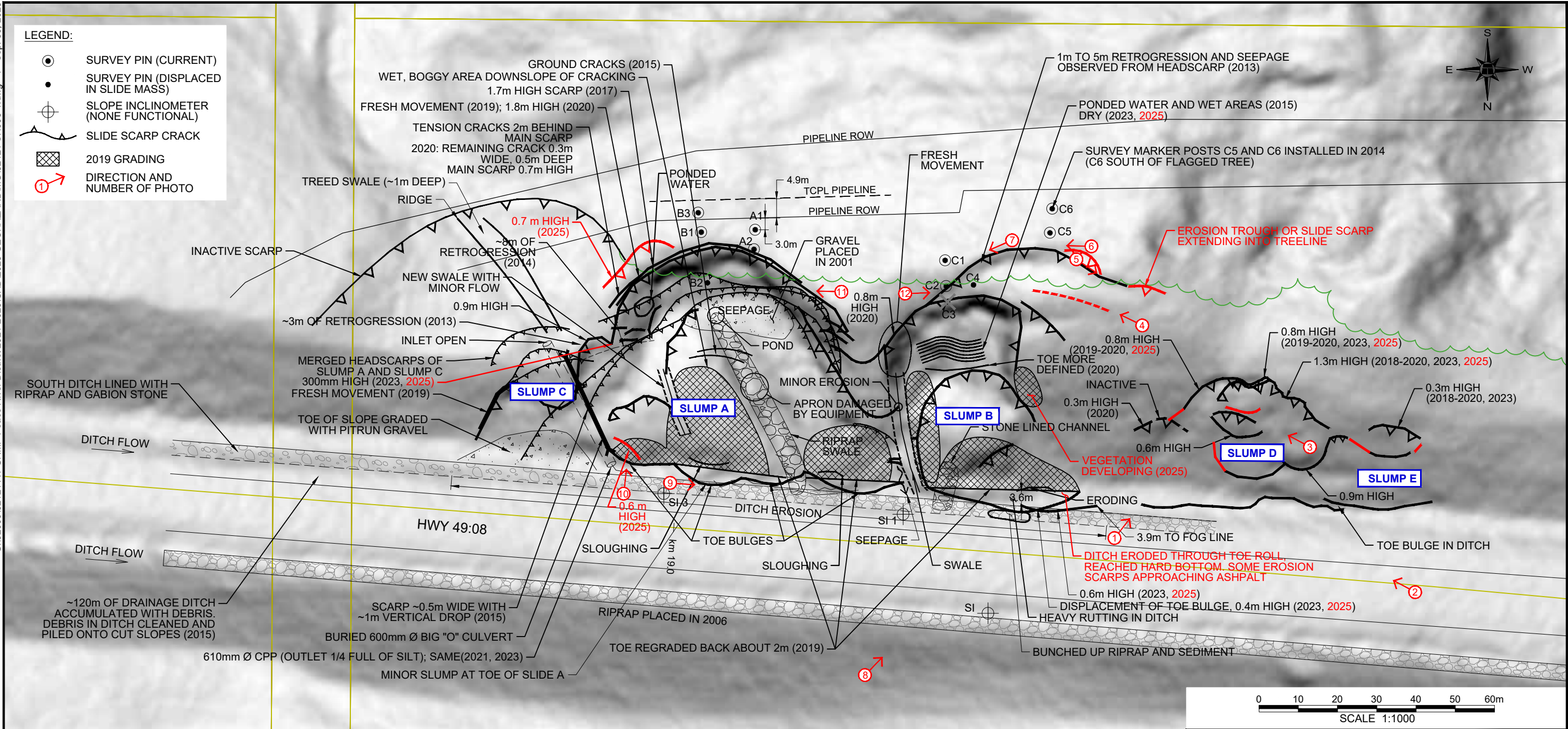
The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client for the development, design objectives, and/or purposes described to Thurber by the Client. **NO OTHER PARTY MAY USE OR RELY ON THE REPORT OR ANY PORTION THEREOF FOR OTHER THAN THE CLIENT'S BENEFIT IN CONNECTION WITH THE PURPOSES DESCRIBED IN THE REPORT.** Any use which a third party makes of the Report is the sole responsibility of such third party and is always subject to this Statement for Use and Interpretation of Report. Thurber accepts no liability or responsibility for damages suffered by any third party resulting from use of the Report for purposes outside the reasonable contemplation of Thurber at the time it was prepared or in any manner unintended by Thurber.

5. INTERPRETATION OF THE REPORT

- a) **Nature and Exactness of Soil and Contaminant Description:** Classification and identification of soils, rocks, geological units, contaminant materials and quantities have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors is inherently judgement-based. Comprehensive sampling and testing programs implemented with the appropriate equipment by experienced personnel may fail to locate some conditions. All investigations utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and the Client and all other parties making use of such documents or records with or without our express written consent need to be aware of this risk and the Report is delivered subject to the express condition that such risk is accepted by the Client and such other parties. Some conditions are subject to change over time and those making use of the Report need to be aware of this possibility and understand that the Report only presents the interpreted conditions at the sampled points at the time of sampling. If special concerns exist, or the Client has special considerations or requirements, the Client must disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.
- b) **Reliance on Provided Information:** The evaluation and conclusions contained in the Report have been prepared based on conditions in evidence at the time of site inspections and based on information provided to Thurber. Thurber has relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, Thurber does not accept responsibility for any deficiency, misstatement or inaccuracy contained in the Report resulting from misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other parties providing information relied on by Thurber. Thurber is entitled to rely on such representations, information and instructions and is not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.
- c) **Design Services:** The Report may form part of design and construction documents for information purposes even though it may have been issued prior to final design being completed. Thurber is recommended to be retained to review final design, project plans and related documents prior to construction to confirm that they are consistent with the intent of the Report. Any differences that may exist between the Report's recommendations and the final design need to be reported to Thurber immediately so that Thurber can address potential conflicts.
- d) **Construction Services:** During construction Thurber should be retained to provide field reviews. Field reviews consist of performing sufficient and timely observations of encountered conditions to confirm and document that the site conditions do not materially differ from those conditions considered in the preparation of the report. Adequate field reviews are necessary for Thurber to provide letters of assurance, in accordance with the requirements of many regulatory authorities.

6. INDEPENDENT JUDGEMENTS OF CLIENT

The information, interpretations and conclusions in the Report are based on Thurber's interpretation of conditions revealed through limited investigation conducted within a defined scope of services. Thurber does not accept responsibility for independent conclusions, interpretations, interpolations and/or decisions of the Client, or other parties who may come into possession of the Report, or any part thereof, which may be based on information contained in the Report. This restriction of liability includes, but is not limited to, decisions made to develop, purchase, or sell land, unless such decisions expressly form part of the stated purpose of the Report as described in Paragraph 3.



- NOTES :
1. FEATURE LOCATIONS ARE APPROXIMATE.
 2. PREVIOUS OBSERVATIONS SHOWN IN BLACK.(2013-2015 FROM AMEC FIGURE 1, PROJECT EG10030 PROVIDED BY ALBERTA TRANSPORTATION.)
 3. LIDAR PROVIDED BY ALBERTA TRANSPORTATION DATED 2007-2008 AND SHADED FROM WHITE AT 0° TO BLACK AT 30°
 4. MAY 2025 OBSERVATION SHOWN IN RED.
 5. DRAWING RESET IN 2017, MANY PREVIOUS OBSERVATIONS REMOVED. SEE 2016 DRAWING FOR THOSE HISTORIC DETAILS.
 6. SCARP CRACKS VERIFIED FROM UAV IMAGERY IN 2018.

		MARKER DISTANCES (m)											SCARP HEIGHT (m)						
MARKER	TYPE	2025	2023	2021	2020	2019	2018	2017	2016	2015	2014	2013	2025	2023	2021	2020	2019	2018	2017
B1 - B2							4.9	-	-	-	-	5.7							
B2 - SCARP							-	-	-	-	-	5.2							
B1 - SCARP	REBAR	2.8	3.2	3.2	3.2	3.2	3.3	3.3	3.3	3.4	3.4	-	0.9m VERTICAL 1.6m OVERALL	0.7m VERTICAL 1.6m OVERALL	1.6****	1.6****	1.7	1.9	1.9
B1 - B3* **	REBAR							5.0	-	-	-	-							
A1 - A2***		5.5	5.5				5.0	5.4	5.4	6.6	6.6	5.4							
A2 - SCARP		0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.9	1.2	1.2	2.1	0.8m VERTICAL 1.3m OVERALL	0.6m VERTICAL 1.3m OVERALL	1.3	1.3	1.3	1.3	1.3
C1 - C2	REBAR	8.1	8.1				7.8	7.8	7.8	7.8	7.8	7.9							
C2 - C3	REBAR						-	-	-	-	-	5.1							
C2 - SCARP		0.5	0.5	0.5	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.3				0.6****	1.1	1.0	0.7
C5 - C6	SURVEY MARKER	2.0	2.0				2.0	2.0	2.0	2.0	2.0	-							
C5 - SCARP	SURVEY MARKER	5.7	5.7		5.7	5.7	5.9	5.9	5.9	5.9	6.0	-		0.8		1.0	0.7	0.4	0.3

*B2 REBAR PIN SALVAGED AND INSTALLED 5m BEHIND B1 AND RENAMED B3
**B3 LOCATED 0.1m NORTH OF TCPL PIPELINE
***A1 LOCATED 3.9m NORTH OF TCPL PIPELINE
**** SCARP HAS RAVELLED SO LESS VERTICAL

LEGEND
X MARKER NOT LOCATED

PEACE REGION (PEACE RIVER DISTRICT)

SH008-1: HWY 49:08 WATINO EAST HILL SMOKY RIVER
2025 SITE INSPECTION PLAN

DWG No. 32121-SH008-1

DRAWN BY
DESIGNED BY
APPROVED BY
SCALE
DATE
FILE No.

ML
MG
RKS
1:1000
SEPTEMBER 2025
32121



Photo 1 – Looking southwest at Slump D where extensions of scarps were observed due to continued creep movement.



Photo 2 – Looking southeast toe bulges of Slumps D and E. No significant changes since 2023 inspection.



Photo 3 – Looking east at intermediate scarp within Slump D that has vegetation present.



Photo 4 – Looking east at possible intermediate scarp within Slump B and downslope of treeline.



Photo 5: Looking west at headscarp of Slump B extending into treeline.



Photo 6: Looking east at headscarp retrogressing upslope.



Photo 7: Looking east at headscarp of Slump B.



Photo 8 – Looking southwest at Slumps B, D and E from backslope across the highway.



Photo 9 – Looking west at the toe of Slump A.



Photo 10: Lower south at culvert outlet with observed slumps upslope.



Photo 11: Looking east at top of Slump A.



Photo 12: Looking west at the top of Slump B.