

ALBERTA TRANSPORTATION AND
ECONOMIC CORRIDORS GRMP
PEACE REGION – (PEACE RIVER DISTRICT)
INSTRUMENTATION MONITORING - FALL 2025



Site Number	Location	Name	Hwy	km
SH036	HWY 679:06	Prairie Echo	679:06	8.2
Legal Description:		UTM Co-ordinates		
4-26-76-16 W5		11U E 539207	N	6162495

Current Monitoring:	22-Sep-2025 to 25-Oct-2025	Previous Monitoring	5-June-2025
Instruments Read By:	Mr. Niraj Regmi, G.I.T., and Mr. Angelo Castillo, of Thurber		

Instruments Read During This Site Visit			
Slope Inclinometers (SIs):	Pneumatic Piezometers (PN):	Vibrating Wire Piezometers (VW): VW23-1 VW23-2	Standpipe Piezometers (SP):
Load Cell (LC):	Strain Gauges:	SAA's:	Others:

Readout Equipment Used			
Slope Inclinometers: RST Digital Inclinator probe with 2 ft. wheelbase and RST Pocket PC readout	Pneumatic Piezometers:	Vibrating Wire Piezometers: GEOKON GK-404 vibrating wire readout	Standpipe Piezometers:
Load Cell:	Strain Gauges:	SAA's:	Others:
Notes: SI23-1 was destroyed during construction.			

Discussion	
Zones of New Movement:	None
Interpretation of Monitoring Results:	<p>SI23-1 was damaged during construction</p> <p>Vibrating wire piezometer VW23-1 is located near the shear zone in SI23-1 and shows a groundwater condition of about 2.2 m below the ground surface. VW23-2 shows artesian groundwater conditions of about 2.4 m above ground surface. A number of additional piezometer readings were taken during construction remediation of this landslide project in the summer/fall of 2025, and are also included on the graphs in Appendix A.</p> <p>VW23-1 showed a sustained decrease in groundwater level of about 5.50 m for the readings taken after the wick drains were installed during remediation, compared to all the readings prior to wick drain installation. Over the same period, VW23-2 showed a slight initial decrease of about 0.3 m in groundwater level compared to the prior readings, but then a rebound back to or slightly higher than all the pre-construction readings.</p> <p>It is concluded that the reason the piezometer readings dropped about 5.5 m further in VW23 -1 compared to VW23-2, is because VW23-1 is located about 5 m horizontally inside the south edge of the wick/sand drain zone, while VW23-2 is located about 7 m outside the south edge of this wick/sand drain zone.</p>

	VW23-3 also showed artesian conditions about 2.5 m above ground surface prior to being damaged in 2024.
Future Work:	The instruments should be read again in the spring of 2026.
Instrumentation Repairs:	SI23-1 was damaged during construction. due to all of the surplus grout and bentonite around the hole during initial installation. This SI was considered to be near the end of it's life (a total deflection of 87 mm had already been recorded last spring). Repairs can be attempted but may provide limited data given the SI was nearly pinched off already. A replacement SI may be a better option to meet long-term monitoring objectives. The replacement SI would provide the best indication of repair success as it would be a direct measurement of the slide plane movements.
Additional Comments:	Repairs to the site were undertaken in 2025. The remediation consisted of excavating the highway embankment to 3 m depth, installing a granular filter blanket that collects seepage and drains into a subdrain buried below the north ditch. A system of wick drains, and sand drains were also installed, to about 12 m below the highway across the landslide to dissipate the artesian groundwater pressures and move seepage water to the sand blanket drain and subdrain. The road embankment was reconstructed over the granular filter blanket using light weight cellular concrete capped with clay and the new pavement structure. Inspection of the subdrain outfall, and measurement of the seepage flow rate should be taken during the next instrumentation reading cycle.

Attachments:	<ul style="list-style-type: none"> ▪ Table SH036-1 Fall 2025 – HWY 679:06 Prairie Echo, Slope Inclinator Reading Instrumentation Summary ▪ Table SH036-2 Fall 2025 – HWY 679:06 Prairie Echo, Vibrating Wire Piezometer Instrumentation Reading Summary ▪ Statement for Use and Interpretation of Report ▪ APPENDIX A – SH036 FALL 2025 <ul style="list-style-type: none"> □ Field Inspector's report □ Site Plan Showing Approximate Instrument Locations (Drawing No.32121 SH036-1) □ SI Reading Plots □ Figure SH036-1 (Piezometric Elevations) □ Figure SH036-2 (Piezometric Depths)
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We trust this report meets your requirements at present. If you have any questions, please contact the undersigned at your convenience.

Yours very truly,
Thurber Engineering Ltd.
Roger Skirrow, M.Sc., P. Eng.
Senior Geotechnical Engineer

Yasir Khan, E.I.T.
Geotechnical Engineer-In-Training

Table SH036-1: Fall 2025 – Hwy 679:06 Prairie Echo Slope Inclinometer Instrumentation Reading Summary

Date Monitored: November 23, 2025

INSTRUMENT #	DATE INITIALIZED	TOTAL CUMULATIVE RESULTANT MOVEMENT AT NOTED DEPTH SINCE INITIAL READING (mm)	MAXIMUM RATE OF MOVEMENT (mm/yr)	CURRENT STATUS	DATE OF PREVIOUS READING	INCREMENTAL MOVEMENT SINCE PREVIOUS READING (mm)	RATE OF MOVEMENT (mm/yr)	CHANGE IN RATE OF MOVEMENT SINCE PREVIOUS READING (mm/yr)
SI23-1	January 10, 2023	86.4 mm over 6.1 m to 8.6 m depth in 172° direction	101.7 mm/yr in January 2023	Damaged	June 5, 2025	N/A	N/A	N/A

Drawing 32121-SH036-1 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.

Table SH036-2: Fall 2025 – Hwy 679:06 Prairie Echo Vibrating Wire Piezometer Instrumentation Reading Summary

Date Monitored: October 25, 2025

INSTRUMENT #	DATE INITIALIZED	TIP ELEV. (m)	GROUND ELEV. (m)	CURRENT STATUS	HIGHEST MEASURED WATER ELEVATION (m)	CURRENT WATER ELEVATION (m)	PREVIOUS WATER ELEVATION (JUNE 5, 2025) (m)	CHANGE IN WATER LEVEL SINCE PREVIOUS READING (m)
VW23-1 (158202)	January 6, 2023	606.75	615.75	Operational	619.41 on March 8, 2023	613.52	619.02	-5.50
VW23-2 (158210)	January 6, 2023	607.44	613.54	Operational	615.93 on June 11, 2023	615.91	615.83	0.08
VW23-3 (157856)	January 7, 2023	610.68	619.98	Destroyed	624.24 on January 13, 2023	N/A	622.51*	N/A

Drawing 32121-SH036-1 in Appendix A provides a sketch of the approximate locations of the monitoring instrumentation for this site.

*VW23-3 was last read on June 11, 2023

Notes:

VW – vibrating wire piezometer.

BGS - below ground surface.



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.



**ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS GRMP (CON0022164)
PEACE REGION (PEACE RIVER DISTRICT)
INSTRUMENTATION MONITORING RESULTS**

FALL 2025

**APPENDIX A
DATA PRESENTATION**

SITE SH036: HWY 679:06, PRAIRIE ECHO

**ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS
PEACE REGION (PEACE RIVER DISTRICT)
INSTRUMENTATION MONITORING FIELD SUMMARY (SH036)
FALL 2025**

Location: Prairie Echo (HWY 679:06 C1 8.18) File Number: 32121 Probe: RST SET 5R Cable: RST SET 5R	Readout: GK 404 SN 364 Casing Diameter: 2.75" Temp: 10 Read by: NKR/AFC
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SLOPE INCLINOMETER (SI) READINGS

SI#	GPS Location (UTM 11)		Date	Stickup (m)	Depth from top of casing (ft)	Magn. North A+ Groove degree	Current Bottom Depth Readings				Probe/ Reel #	Size (")	Remarks
	Easting	Northing					A+	A-	B+	B-			
SI23-1	539207	6162495	23-Sep-25	0.88	48 to 2	182	650	-641	95	-105	5R	2.75	

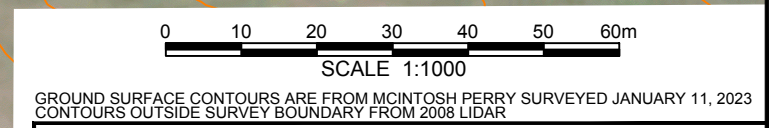
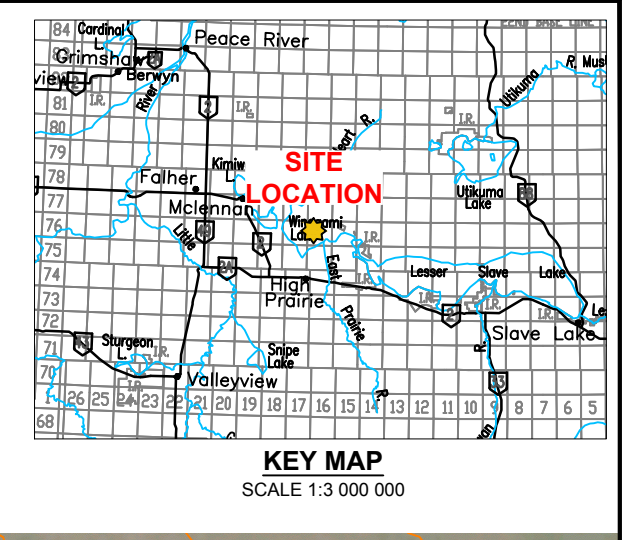
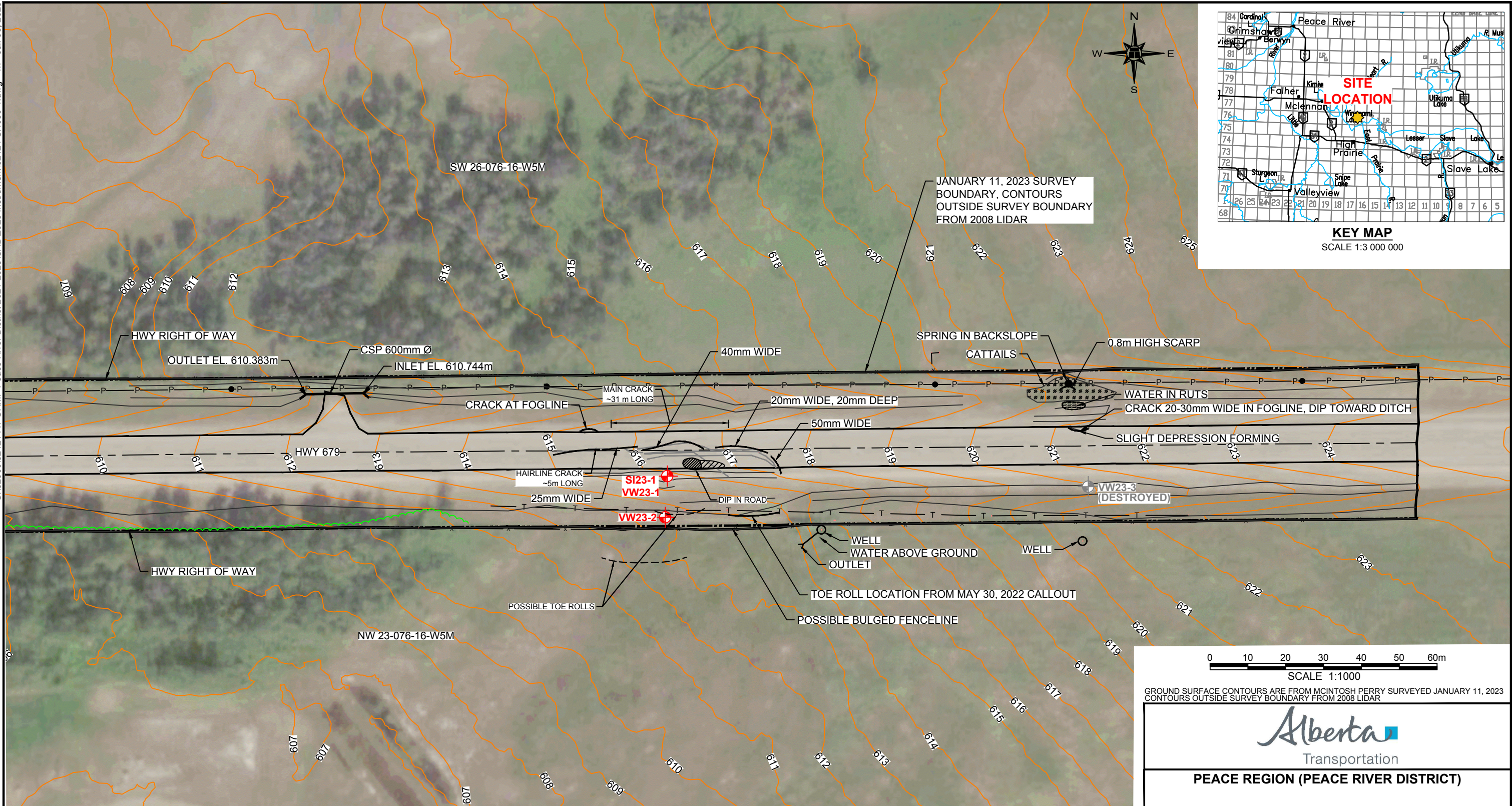
VIBRATING WIRE PIEZOMETER (VW) READINGS

VW#	GPS Location (UTM 12)		Date	Reading (B)	Temp (°C)	Identification Number
	Easting	Northing				
TH23-1	539207	6162495	23-Sep-25	8309.9	6.3	158202
TH23-2	539207	6162484	23-Sep-25	8258.4	5.8	158210
TH23-3	539318	6162492	23-Sep-25			157856

DAILY INSPECTOR REPORT

TH23-3 damaged, large hole where VW is supposed to be, filled with water
SI23-1 Wiped out during construction
Road maintenance contractor place a road sign at the SI protector as support see photo.

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Alberta
Transportation

PEACE REGION (PEACE RIVER DISTRICT)

SH036: HWY 679:06 km 8.18 TO km 8.24 PRAIRIE ECHO
SITE PLAN SHOWING APPROXIMATE
INSTRUMENT LOCATIONS

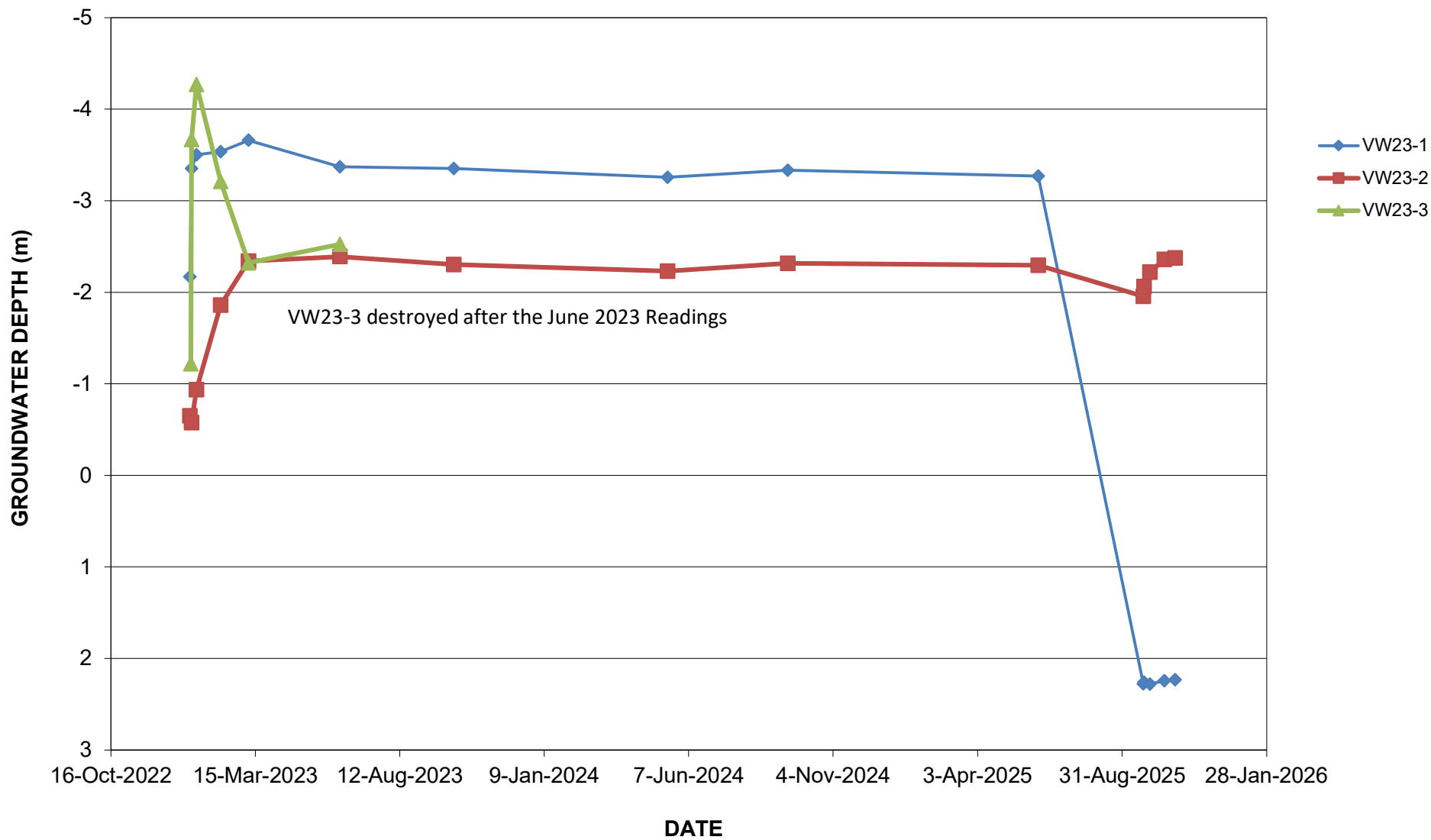
DWG NO. 32121-SH036-1

DRAWN BY	ML
DESIGNED BY	NFR
APPROVED BY	DWP
SCALE	1:1000
DATE	JULY 2025
FILE No.	32121

LEGEND

	CRACK (APPROXIMATE)		OVERHEAD POWER LINE
	APPROXIMATE TEST HOLE LOCATION		GAS LINE
(SI)	SLOPE INCLINOMETER		GROUND SURFACE CONTOUR (CONTOUR INTERVAL = 1m)
(VW)	VIBRATING WIRE PIEZOMETER		TREE LINE
	TELUS LINE		POWER POLE
	FENCE LINE		

**FIGURE SH036-1
PIEZOMETRIC DEPTHS FOR HWY 679:06 PRAIRIE ECHO**



**FIGURE SH036-2
PIEZOMETRIC ELEVATIONS FOR HWY 679:06 PRAIRIE ECHO**

