ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS GRMP
PEACE REGION – (PEACE RIVER DISTRICT)
INSTRUMENTATION MONITORING - SPRING 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:	5-June-2025	**Previous Monitoring**	18-Sep-2024
Instruments Read By:	Mr. Niraj Regmi, G.I.T., and Mr. Godfred Etiendem, of Thurber		

Instruments Read During This Site Visit			
Slope Inclinometers (SIs): SI23-1	**Pneumatic Piezometers (PN):**	**Vibrating Wire Piezometers (VW):** VW23-1 VW23-2	**Standpipe Piezometers (SP):**
Load Cell (LC):	**Strain Gauges:**	**SAAs:**	**Others:**

Readout Equipment Used			
Slope Inclinometers: RST Digital Inclinometer 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:**	**SAAs:**	**Others:**
Notes:			

Discussion	
Zones of New Movement:	None
Interpretation of Monitoring Results:	SI23-1 showed a cumulative movement of 86.4 mm over a well defined movement zone between 6.1 m to 8.6 m depth with a rate of movement of 26.4 mm/yr since the previous readings on September 18, 2024. The movement rate has been elevated over the last four readings compared to the previous trend. Vibrating wire piezometer VW23-1 is located near the shear zone in SI23-1. It continues to show artesian groundwater conditions of about 3.3 m above ground surface. VW23-2 also shows artesian groundwater conditions of about 2.3 m above ground surface. VW23-1 and VW23-2 showed decreases in groundwater levels of 0.06 m and 0.02 m, respectively, compared to the September 18, 2024, readings. VW23-3 also showed artesian conditions about 2.5 m above ground surface prior to being damaged.
Future Work:	The instruments should be read again in the fall of 2025. The movement rate in SI23-1 should be monitored to confirm if it is still elevated. Long term monitoring post-construction is recommended.
Instrumentation Repairs:	No instrument repairs are required at this time.
Additional Comments:	Additional readings should be taken just prior to, and during, construction of the mitigation project. Special care will be required to

	avoid damage to the remaining instruments during construction, as instructed in the tender document.

Attachments:	• Table SH036-1 Spring 2025 – HWY 679:06 Prairie Echo, Slope Inclinometer Reading Instrumentation Summary • Table SH036-2 Spring 2025 – HWY 679:06 Prairie Echo, Vibrating Wire Piezometer Instrumentation Reading Summary • Statement for Use and Interpretation of Report • APPENDIX A – SH036 SPRING 2025 o Field Inspector's report o Site Plan Showing Approximate Instrument Locations (Drawing No.32121 SH036-1) o SI Reading Plots o Figure SH036-1 (Piezometric Elevations) o Figure SH036-2 (Piezometric Depths)

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.
Don Proudfoot, M.Eng., P. Eng.
Senior Geotechnical Engineer

PROFESSIONAL ENGINEER ALBERTA
LUCAS R.M. GREEN
ID 206714
July 11, 2025

PERMIT TO PRACTICE
THURBER ENGINEERING LTD.
RM SIGNATURE: Don Proudfoot
RM APEGA ID #: 51674
DATE: July 11, 2025
PERMIT NUMBER: P005186
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Lucas Green, P.Eng.
Geotechnical Engineer

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

Date Monitored: June 5, 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	Operational	September 18, 2024	18.8	26.4	-43.6

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

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

Date Monitored: June 5, 2025

INSTRUMENT #	DATE INITIALIZED	TIP ELEV. (m)	GROUND ELEV. (m)	CURRENT STATUS	HIGHEST MEASURED WATER ELEVATION (m)	CURRENT WATER ELEVATION (m)	PREVIOUS WATER ELEVATION (SEPTEMBER 18, 2024) (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	619.02	619.08	-0.06
VW23-2 (158210)	January 6, 2023	607.44	613.54	Operational	615.93 on June 11, 2023	615.83	615.85	-0.02
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.

Notes:
VW – vibrating wire piezometer.
BGS - below ground surface.

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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 TOTHE 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

SPRING 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)
SPRING 2025

Location:	Prairie Echo (HWY 679:06 C1 8.18)	**Readout:**	GK 404 SN 364
File Number:	32121	**Casing Diameter:**	2.75"
Probe:	RST SET 5R	**Temp:**	25
Cable:	RST SET 5R	**Read by:**	NKR/GE

SLOPE INCLINOMETER (SI) READINGS

SI#	GPS Location (UTM 11)		Date	Stickup (m)	Depth from top of casing (ft)	Magn. North A+ Groove	Current Bottom Depth Readings				Probe/ Reel		Remarks
	Easting	Northing				degree	A+	A-	B+	B-	#	Size (")	
SI23-1	539207	6162495	05-Jun-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				
SI23-1	539207	6162495	05-Jun-25	7775.8	6.6	158202
TH23-2	539207	6162484	05-Jun-25	8237	5.6	158210
TH23-3	539318	6162492				157856

DAILY INSPECTOR REPORT

TH23-3 damaged, large hole where VW is supposed to be, filled with water
SI 23-1 about to shear use dummy probe for fall reading
Road maintence contractor place a road sign at the SI protector as support see photo.

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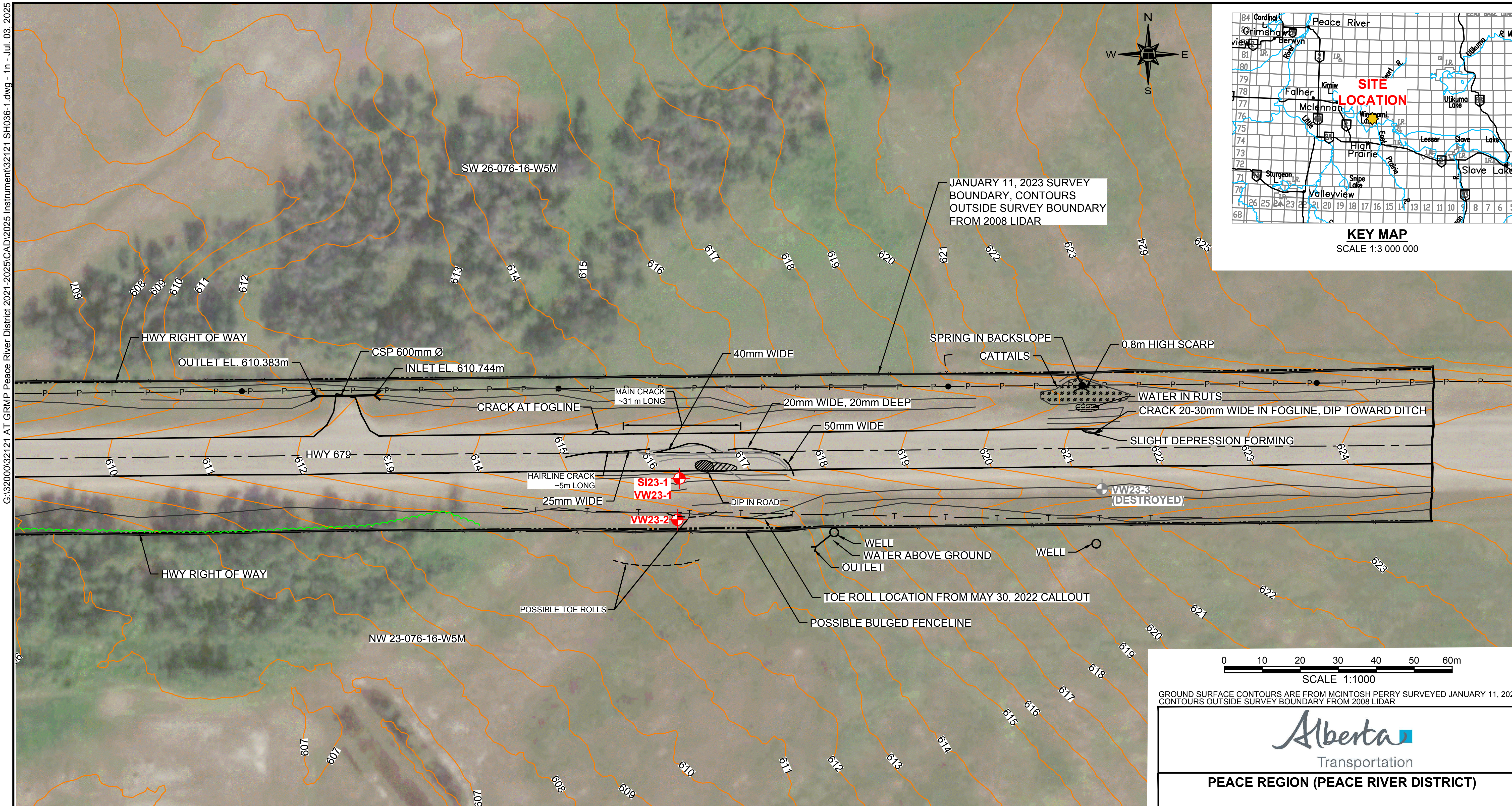

GROUND SURFACE CONTOURS ARE FROM MCINTOSH PERRY SURVEYED JANUARY 11, 2023
CONTOURS OUTSIDE SURVEY BOUNDARY FROM 2008 LIDAR

LEGEND

Symbol	Description
(red line)	CRACK (APPROXIMATE)
(red target)	APPROXIMATE TEST HOLE LOCATION
(SI)	SLOPE INCLINOMETER
(VW)	VIBRATING WIRE PIEZOMETER
—T—	TELUS LINE
—x—	FENCE LINE
—P—	OVERHEAD POWER LINE
—GL—	GAS LINE
(orange line)	GROUND SURFACE CONTOUR (CONTOUR INTERVAL = 1m)
(green line)	TREE LINE
•	POWER POLE

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

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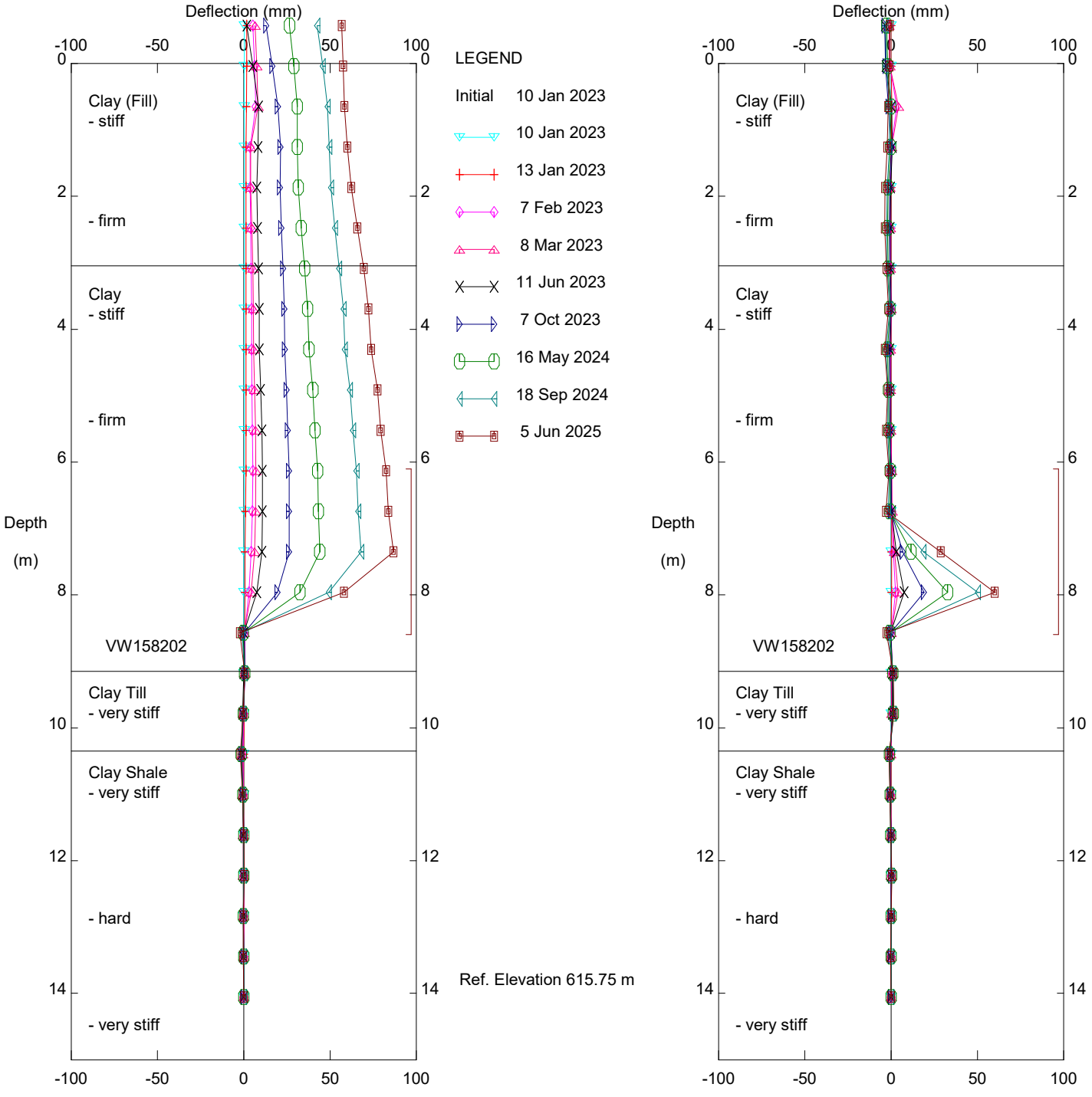

Hwy 679:06 km 8.18 Prairie Echo, Inclinometer SI23-1

TEC

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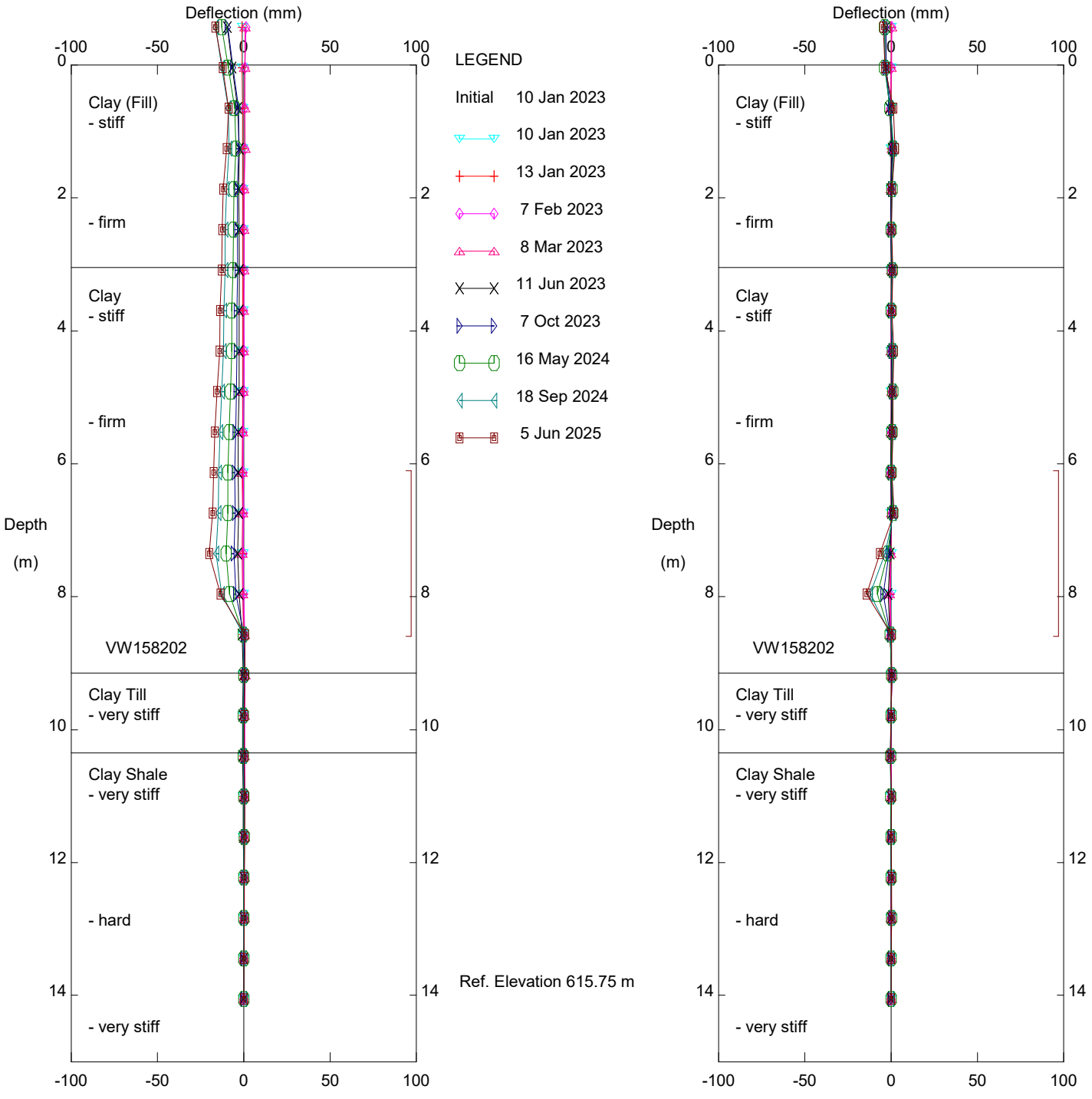

Hwy 679:06 km 8.18 Prairie Echo, Inclinometer SI23-1

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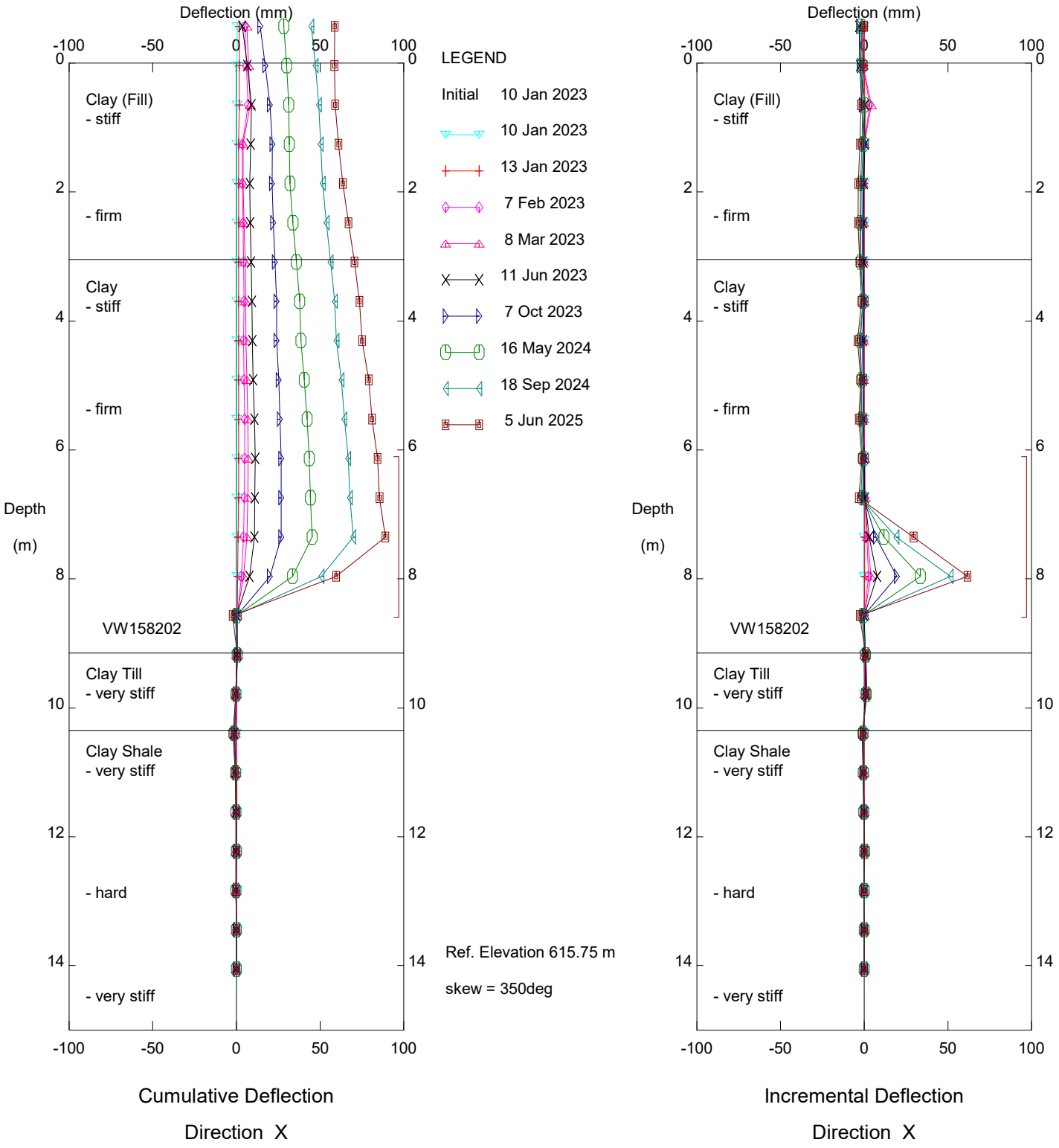

Cumulative Deflection

Direction X

Incremental Deflection

Direction X

Hwy 679:06 km 8.18 Prairie Echo, Inclinometer SI23-1

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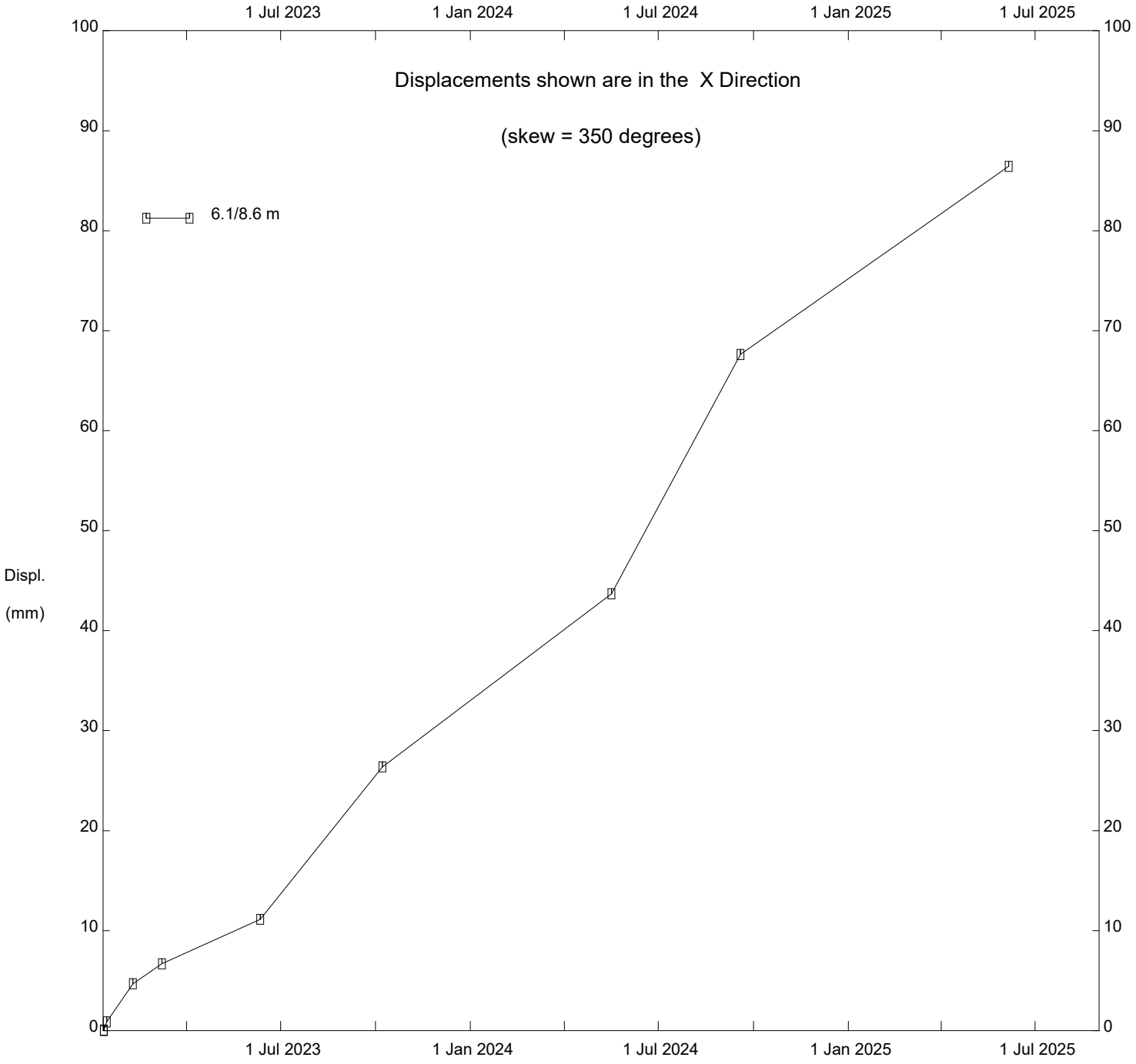

Hwy 679:06 km 8.18 Prairie Echo, Inclinometer SI23-1

TEC

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

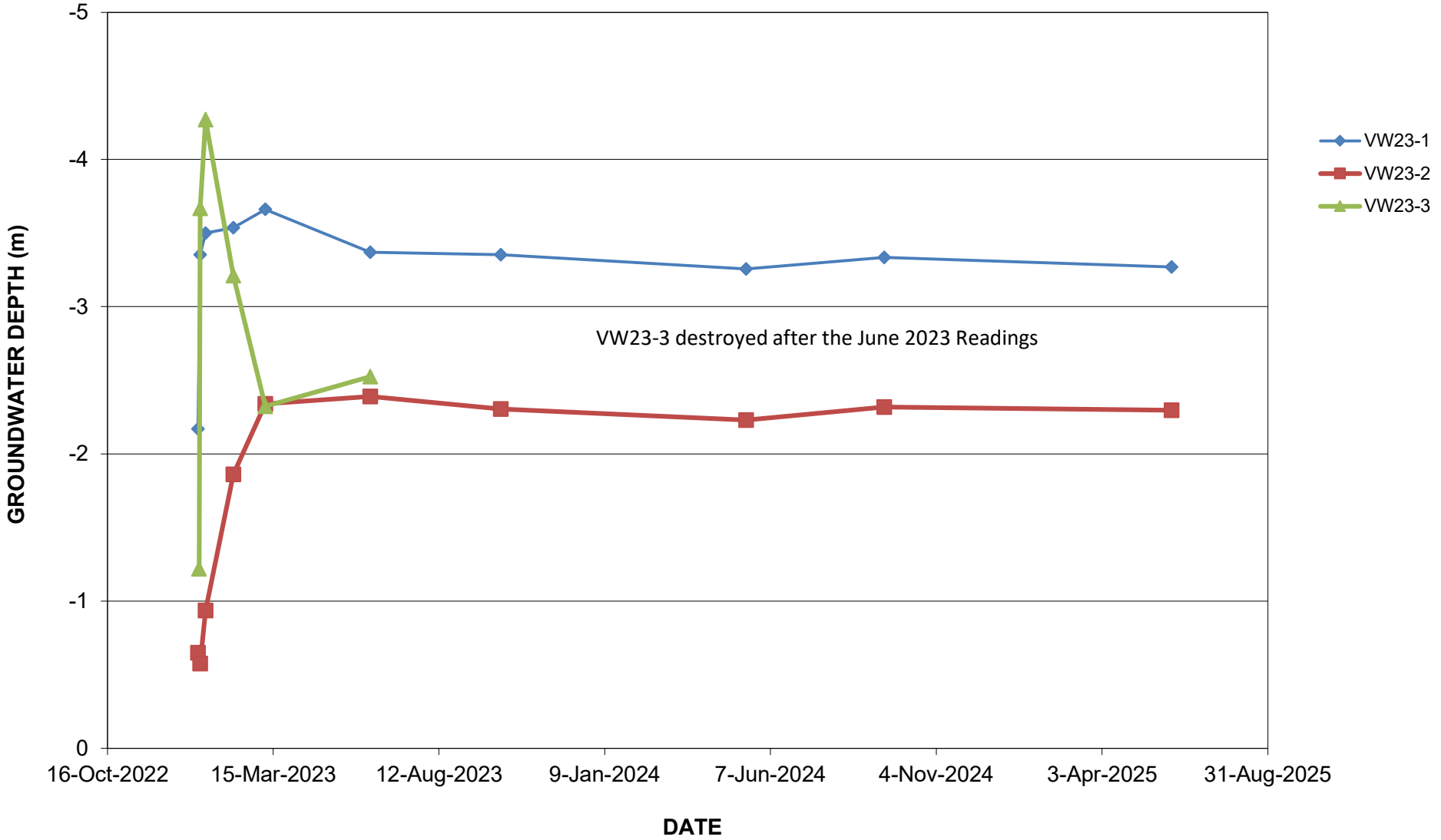

FIGURE SH036-2
PIEZOMETRIC ELEVATIONS FOR HWY 679:06 PRAIRIE ECHO