

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



Site Number	Location	Name	Hwy
SH016	HWY 49:12	Little Smoky River, West Bank Instability	49:12
Legal Description:		UTM Co-ordinates	
10-33-74-21 W5		11U E 489600	N 6145512

Current Monitoring:	06-Jun-2025	Previous Monitoring	18-Sep-2024
Instruments Read By:	Mr. Niraj Regmi, G.I.T., and Mr. Godfred Etiendem, Thurber		

Instruments Read During This Site Visit			
Slope Inclinometers (SIs): N/A	Pneumatic Piezometers (PN): N/A	Vibrating Wire Piezometers (VW): VW21-7A, VW21-7B, VW21-8A, VW21-8B, VW21-9A, VW21-9B,	Standpipe Piezometers (SP): N/A
Load Cell (LC): N/A	Strain Gauges: N/A	SAA: N/A	Others: N/A

Readout Equipment Used			
Slope Inclinometers:	Pneumatic Piezometers:	Vibrating Wire Piezometers: Three RST DT2055 dataloggers	Standpipe Piezometers:
Load Cell:	Strain Gauges:	SAA:	Others:

Note: Dataloggers were installed in January 2023 to obtain a better understanding of seasonal or cyclical trends tied to longer term climatic triggers.

Discussion	
Zones of New Movement:	N/A
Interpretation of Monitoring Results:	<p>Vibrating wire piezometers VW21-7A and VW21-7B showed decreases in groundwater level of 0.02 m and 0.06 m since the fall of 2024 readings.</p> <p>VW21-8A and VW21-8B showed decreases in groundwater level of 0.06 m and 0.03 m, respectively since the fall of 2024 readings. However, VW21-8B registered a short term all-time high groundwater level of 483.09 m on April 24, 2025 and has generally shown an increasing water level trend since installation in July 2021.</p> <p>VW21-9A showed a decrease in groundwater level of 0.05 m and VW21-9B showed an increase in groundwater level of 0.17 m since the fall of 2024 readings. VW21-9B registered an all-time high groundwater level of 492.67 m on January 19, 2025. VW21-8B and VW21-9B have shown gradually increasing groundwater levels since installation.</p>
Future Work:	The instruments should be read again in the fall of 2025.
Instrumentation Repairs:	No instrument repairs are required at this time.
Additional Comments:	The University of Alberta assessed the fibre optic cables continuity in Fall 2023, and determined the cables were still intact. At this time, TEC is not planning to undertake another reading of the cables. A program involving

	<p>precise surveying of monitoring points installed at various locations on the bridge and bridge foundations was proposed to TEC's bridge group to assist in tracking bridge movements and timing for adjustments to the foundations. If this program is conducted, the tops of the three sheared SI's could also be monitored to gauge ground movements at those locations.</p> <p>TEC implemented installation of a Geocube system at this site to track ground movements in 2024 which is being managed by another consultant.</p>
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Attachments:	<ul style="list-style-type: none"> • Table SH016-1 Spring 2025 – HWY 49:12 Little Smoky River Bridge, Slope Inclinator Instrumentation Reading Summary • Table SH016-2 Spring 2025 – HWY 49:12 Little Smoky River Bridge, Vibrating Wire Piezometer Instrumentation Reading Summary • Statement for Use and Interpretation of Report • APPENDIX A – SH016 SPRING2025 <ul style="list-style-type: none"> ○ Field Inspector's report ○ Site Plan Showing Approximate Instrument Locations (Drawing No. 32121 SH016-1) ○ Figure SH016-1 (Vibrating Wire Piezometer Elevations) ○ Figure SH016-2 (Vibrating Wire Piezometer 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.
Don Proudfoot, M. Eng., P. Eng.
Senior Geotechnical Engineer

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

Table SH016-1 Spring 2025 – Hwy 49:12, Little Smoky River Bridge Slope Inclinator Instrumentation Reading Summary

Date Monitored: Not Monitored

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)	AVERAGE RATE OF MOVEMENT OVER MONITORING PERIOD (mm/yr)	CHANGE IN RATE OF MOVEMENT SINCE PREVIOUS READING (mm/yr)
SI21-7	June 14, 2021	7.2 mm over 11.6 m to 13.5 m in 91° direction	25.7 in July 2021	Sheared at 13.4 m below top of casing	October 12, 2021	N/A	N/A	N/A
SI21-8	June 14, 2021	7.5 mm over 9.3 m to 11.1 m in 86° direction	35.6 in July 2021	Sheared at 11.0 m below top of casing	October 12, 2021	N/A	N/A	N/A
SI21-9	June 14, 2021	9.3 mm over 15.3 m to 16.5 m in 61° direction	32.0 in July 2021	Sheared at 16.5 m below top of casing	October 12, 2021	N/A	N/A	N/A

Drawing 32121-SH016 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.

Table SH016-2 Spring 2025 – Hwy 49:12, Little Smoky River Bridge Vibrating Wire Piezometer Instrumentation Reading Summary

Date Monitored: June 06, 2025

INSTRUMENT	DATE INITIALIZED	GROUND ELEVATION (m)	TIP DEPTH (m)	CURRENT STATUS	MAXIMUM GROUNDWATER ELEVATION (m)	CURRENT GROUNDWATER ELEVATION (m)	PREVIOUS GROUNDWATER ELEVATION* (m)	CHANGE IN WATER LEVEL SINCE PREVIOUS READING (m)
VW21-7A	June 10, 2021	492.42	5.00	Operational	490.23 on April 17, 2024	489.70	489.72	-0.02
VW21-7B	June 20, 2021	492.42	12.00	Operational	489.67 on April 17, 2024	489.12	489.18	-0.06
VW21-8A	June 16, 2021	493.89	5.00	Operational	492.46 on July 11, 2023	491.76	491.82	-0.06
VW21-8B	June 16, 2021	493.89	14.00	Operational	483.09 on April 24, 2025	482.66	482.69	-0.03
VW21-9A	June 16, 2021	500.36	9.80	Operational	494.13 on August 25, 2023	493.51	493.56	-0.05
VW21-9B	June 16, 2021	500.36	19.04	Operational	492.67 m on January 19, 2025	492.36	492.19	0.17

Drawing 32121-SH016 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site

* Previous groundwater elevation on September 18, 2024.

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**

SPRING 2025

**APPENDIX A
DATA PRESENTATION**

SITE SH016: HWY 49:12, LITTLE SMOKY RIVER BRIDGE

**ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS
PEACE REGION (PEACE RIVER DISTRICT)
INSTRUMENTATION MONITORING FIELD SUMMARY (SH016)
SPRING 2025**

Location: HWY 49:12 LITTLE SMOKY RIVER WEST BANK INSTABILITY	Read Out:
File Number: 32121	Temp: 19
	Read by: NKR

VIBRATING WIRE PIEZOMETER (VW) READINGS

Location	Serial	GPS Location (UTM 11)		Location	Date	Reading		Comments
		Easting (m)	Northing (m)			B Units	Temp °C	
VW21-7A	133742	489600	6145512	Stand Alone Location	06-Jun-25	Downloaded	Downloaded	
VW21-7A	133747	489600	6145512	Stand Alone Location	06-Jun-25	Downloaded	Downloaded	
VW21-8A	133715	489593	6145503	Attached to SI21-08	06-Jun-25	Downloaded	Downloaded	
VW21-8B	133476	489593	6145503	Attached to SI21-08	06-Jun-25	Downloaded	Downloaded	
VW21-9A	133478	489570	6145510	Attached to SI21-09	06-Jun-25	Downloaded	Downloaded	
VW21-9B	133492	489570	6145510	Attached to SI21-09	06-Jun-25	Downloaded	Downloaded	

INSPECTOR REPORT

- Dataloggers are connected to RST DT2055 dataloggers at their respective locations - download data at each station

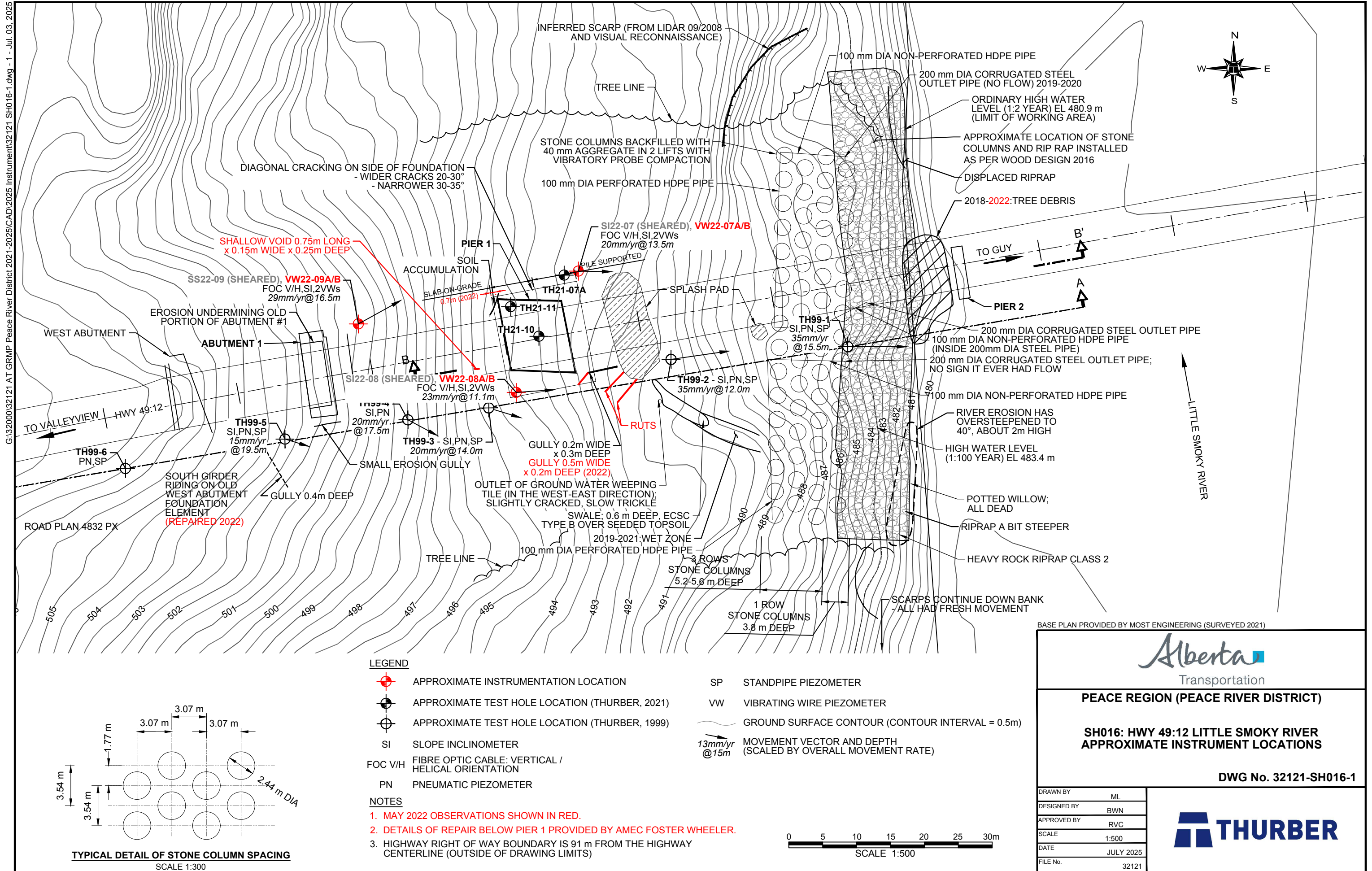


FIGURE SH016-1
HWY 49:12 LITTLE SMOKY RIVER PIEZOMETRIC ELEVATIONS

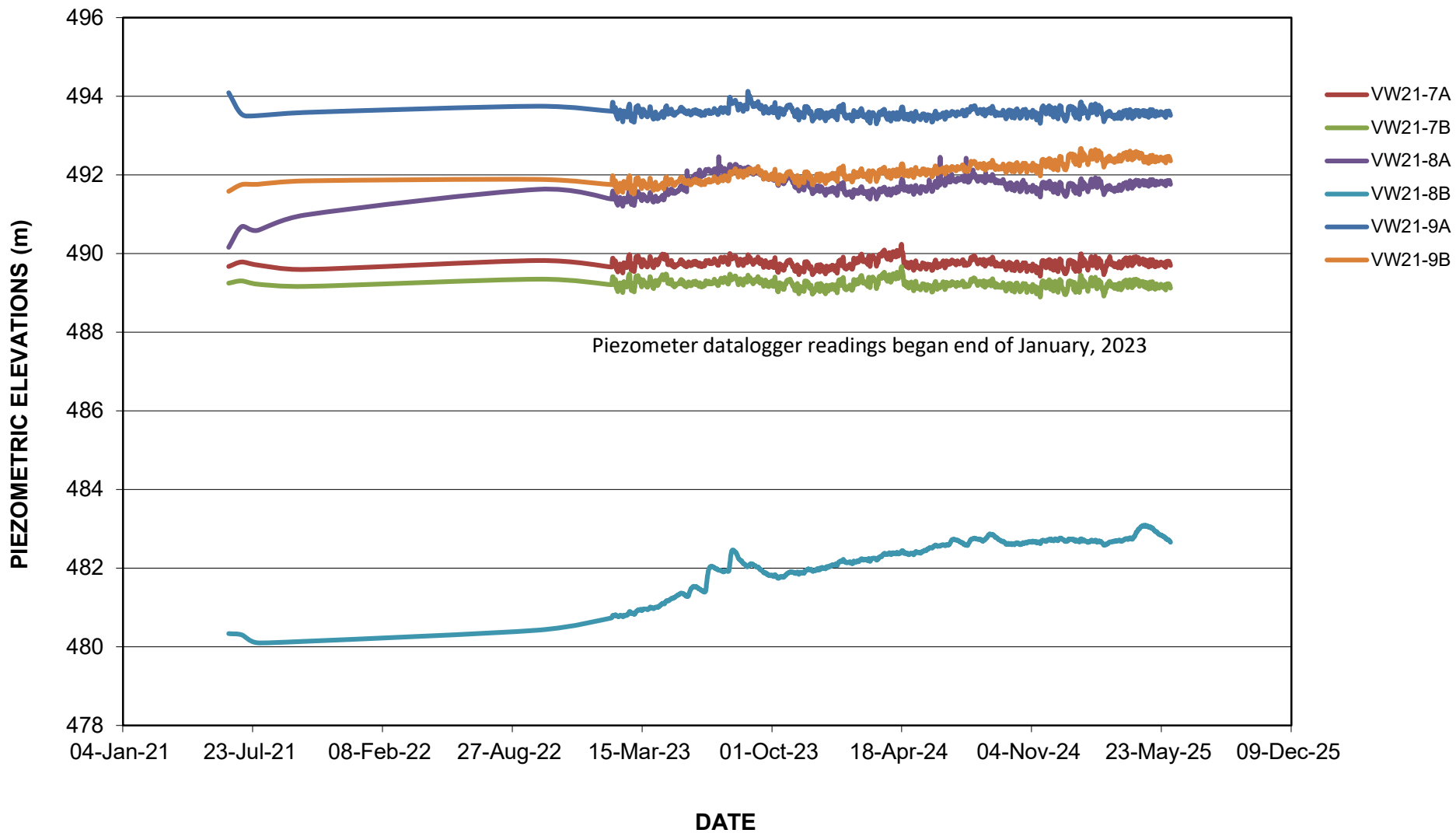


FIGURE SH016-2
HWY 49:12 LITTLE SMOKY RIVER PIEZOMETRIC DEPTHS

