

**ALBERTA TRANSPORTATION AND
ECONOMIC CORRIDORS GRMP
NORTH CENTRAL (ATHABASCA AND FORT
McMURRAY DISTRICTS)
INSTRUMENTATION MONITORING- FALL 2024**



Site Number	Location	Name	Hwy	km
NC008	HWY 63:02 L1 15.635	North of La Biche River	63:02	km 15.6
Legal Description: 7-3-69-17 W4		UTM Co-ordinates		
		12U E 403478	N	6089488

Current Monitoring:	16-Sep-2024	Previous Monitoring	8-Jun-2024
Instruments Read By:	Mr. Niraj Regmi, G.I.T and Mr. Nixson Mationg, of Thurber		

Instruments Read During This Site Visit			
Slope Inclinometers (SIs): SI1B and SI20-2	Pneumatic Piezometers (PN): N/A	Vibration Wire Piezometers (VW): VW20-2A and VW20-2B	Standpipe Piezometers (SP): SP20-1
Load Cell (LC): N/A	Strain Gauges: N/A	SAA's: N/A	Others:

Readout Equipment Used			
Slope Inclinometers: RST Digital Inclinator probe with a 2 ft. wheelbase and a RST Pocket PC readout.	Pneumatic Piezometers:	Vibration Wire Piezometers: Geokon GK404 digital readout	Standpipe Piezometers: DGS1 dipmeter
Load Cell:	Strain Gauges:	SAA's:	Others:
Notes: - An attempt was made to read SI20-2, VW20-2A, and VW20-2B, but they were damaged since the Spring of 2024 readings.			

Discussion	
Zones of New Movement:	None
Interpretation of Monitoring Results:	SI1B showed a rate of movement of 1.0 mm/yr over 4.8 m to 8.4 m since the spring of 2024 readings. This corresponds to a decrease in the rate of movement by 0.4 mm/yr. Standpipe piezometer SP20-1 showed an increase in groundwater level of 0.24 m compared to the spring of 2024 readings.
Future Work:	The instruments should be read again in the spring of 2025.
Instrumentation Repairs:	SI20-2, VW20-2A and VW20-2B are critical instruments and consideration should be given to repairing these instruments in the spring of 2025.
Additional Comments:	

<p>Attachments:</p>	<ul style="list-style-type: none"> ▪ Table NC008-1 Fall 2024 – HWY 63:02 North of La Biche River, Slope Inclinator Instrumentation Reading Summary ▪ Table NC008-2 Fall 2024 – HWY 63:02 North of La Biche River, Pneumatic Piezometer Instrumentation Reading Summary ▪ Table NC008-3 Fall 2024 – HWY 63:02 North of La Biche River, Standpipe Piezometer Instrumentation Reading Summary ▪ Table NC008-4 Fall 2024 – HWY 63:02 North of La Biche River, Vibrating Wire Piezometer Instrumentation Reading Summary ▪ Statement of Limitations and Conditions ▪ APPENDIX A – NC008-1 FALL 2024 <ul style="list-style-type: none"> □ Field Inspector's report □ Site Plan Showing Approximate Instrument Locations (Drawing No. 32122-NC008) □ SI Reading Plots □ Figure NC008-1 (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.
Tarek Abdelaziz, Ph.D., P. Eng.
Partner | Senior Geotechnical Engineer

Lucas Green, P.Eng.
Geotechnical Engineer

Table NC008-1: Fall 2024 – Hwy 63:02 North of La Biche River Slope Inclinator Instrumentation Reading Summary

Date Monitored: September 16, 2024

INSTRUMENT #	DATE INITIALIZED	TOTAL CUMULATIVE RESULTANT MOVEMENT AND DEPTH OF MOVEMENT TO DATE (mm)	MAXIMUM RATE OF MOVEMENT (mm/yr)	CURRENT STATUS OF SI	DATE OF PREVIOUS READING	INCREMENTAL MOVEMENT SINCE PREVIOUS READING (mm)	CURRENT RATE OF MOVEMENT (mm/yr)	CHANGE IN RATE OF MOVEMENT SINCE PREVIOUS READING (mm/yr)
SI1A	December 6, 1996	25.9 over 3.5 m to 5.4 m in 302° direction	13.1 in October 1997	Sheared or blocked at 3.2 m depth	May 22, 2003	N/A	N/A	N/A
		16.1 over 6.0 m to 8.4 m in 302° direction	6.3 in May 1997			N/A	N/A	N/A
SI1B	December 6, 1996	90.2 over 4.8 m to 8.4 m depth in 246° direction	16.3 in October 1997	Operational	June 8, 2024	0.3	1.0	-0.4
SI4A	October 21, 1997	54.3 over 0.5 m to 2.4 m depth in 271° direction	17.7 in May 2003	Not read*	Sep. 28, 2020	N/A	N/A	N/A
SI4B	October 21, 1997	27.8 over 1.1 m to 2.9 m depth in 308° direction	20.8 in June 1998	Presumed destroyed	May 22, 2003	N/A	N/A	N/A
		16.5 over 5.9 m to 7.8 m depth in 308° direction	10.3 in June 1998			N/A	N/A	N/A
SI20-2	December 21, 2021	12.8 over 3.8 m to 7.4 m depth in 297° direction	15.8 in March 2021	Damaged	June 8, 2024	N/A	N/A	N/A

Drawing 32122-NC008 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.

* SI4A was deleted from the current GRMP.

Table NC008-2: Fall 2024 – Hwy 63:02 North of La Biche River Pneumatic Piezometer Instrumentation Reading Summary

Date Monitored: Not monitored.

INSTRUMENT #	DATE INITIALIZED	TIP DEPTH** (m)	GROUND ELEV. (m)	CURRENT STATUS	HIGHEST MEASURED GROUNDWATER LEVEL BGS (m)	MEASURED PORE PRESSURE (kPa)	CURRENT GROUNDWATER LEVEL BGS (m)	PREVIOUS GROUNDWATER LEVEL BGS (m)	CHANGE IN WATER LEVEL SINCE PREVIOUS READING (m)
<i>PN1 (34455)</i>	<i>November 20, 1996</i>	<i>17.06</i>	<i>-</i>	<i>Active</i>	<i>-0.77 m on September 28, 2020</i>	<i>N/A</i>	<i>N/A</i>	<i>-0.77*</i>	<i>N/A</i>
<i>PN2 (18199)</i>	<i>November 20, 1996</i>	<i>7.60</i>	<i>-</i>	<i>Active</i>	<i>-1.03 on September 28, 2020</i>	<i>N/A</i>	<i>N/A</i>	<i>-1.03*</i>	<i>N/A</i>

* Installed within the limits of the repaired site in 1997; negative values correspond to an above-ground (artesian) groundwater level.

** Reported tip depths, based on previous reports, may not account for fill placed during berm construction in 1997.

Note: pneumatic piezometers are not included in the current GRMP, and readings were therefore not included.

Table NC008-3: Fall 2024 – Hwy 63:02 North of La Biche River Standpipe Piezometer Instrumentation Reading Summary

Date Monitored: September 16, 2024

INSTRUMENT #	DATE INITIALIZED	TIP DEPTH (m)	GROUND ELEV. (m)	CURRENT STATUS	HIGHEST MEASURED GROUNDWATER LEVEL BGS (m)	CURRENT GROUNDWATER DEPTH BGS (m)	PREVIOUS GROUNDWATER DEPTH BGS (m)	CHANGE IN WATER LEVEL SINCE PREVIOUS READING (m)
SP20-1	Nov. 28, 2020	20.70	-	Operational	1.42 on October 1, 2023	1.43	1.67	0.24
SP20-3	Nov. 26, 2020	20.80	-	Damaged	2.45 on December 21, 2020	N/A	2.88	N/A

Drawing 32122-NC008 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.

Table NC008-4: Fall 2024 – Hwy 63:02 North of La Biche River Vibrating Wire Piezometer Instrumentation Reading Summary

Date Monitored: September 16, 2024

INSTRUMENT #	DATE INITIALIZED	TIP DEPTH (m)	GROUND ELEV. (m)	CURRENT STATUS	HIGHEST MEASURED GROUNDWATER LEVEL BGS (m)	CURRENT GROUNDWATER DEPTH BGS (m)	PREVIOUS GROUNDWATER DEPTH BGS (m)	CHANGE IN WATER LEVEL SINCE PREVIOUS READING (m)
VW20-2A (70909)	December 21, 2020	7.32	-	Damaged	2.32 on June 8, 2024	N/A	2.32 (June 8, 2024)	N/A
VW20-2B (70910)	December 21, 2020	15.09	-	Damaged	2.43 on October 1, 2023	N/A	2.49 (June 8, 2024)	N/A

Drawing 32122-NC008 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.



STATEMENT OF LIMITATIONS AND CONDITIONS

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This Report has been prepared in accordance with generally accepted engineering or environmental consulting practices in the applicable jurisdiction. No other warranty, expressed or implied, is intended or made.

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All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment 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.

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- 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 should 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 detailed in the contract documents should be reported to Thurber immediately so that Thurber can address potential conflicts.
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**ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS GRMP (CON0022163)
NORTH CENTRAL (ATHABASCA AND FORT McMURRAY DISTRICTS)
INSTRUMENTATION MONITORING RESULTS**

FALL 2024

**APPENDIX A
DATA PRESENTATION**

SITE NC008: HWY 63:02 NORTH OF LA BICHE RIVER

**ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS
NORTH CENTRAL REGION - ATHABASCA AND FORT McMURRAY DISTRICTS
INSTRUMENTATION MONITORING FIELD SUMMARY (NC008)
FALL 2024**

Location: North of La Biche River (HWY 63:02 L1 15.635)	Readout: GK404/SN 364/ DGSI Dipmeter
File Number: 32122	Casing Diameter: 3.34"/2.75"
Probe: RST SET 8R	Temp: 20
Cable: RST SET 8R	Read by: NRM

SLOPE INCLINOMETER (SI) READINGS

SI#	GPS Location (UTM 12)		Date	Stickup m	Depth from top of casing (ft)	Azimuth of A+ Groove	Current Bottom Depth Readings				Probe/ Reel #	Remarks
	Easting (m)	Northing (m)					A+	A-	B+	B-		
SI1B	403478	6089488	16-Sep-24	1.02	66 to 4	225	1084	-1118	943	-937	8R/8R	
SI20-2	403494	6089482	16-Sep-24	0.82	70 to 2	293	-280	245	-925	921	8R/8R	

STANDPIPE PIEZOMETER (SP) READINGS

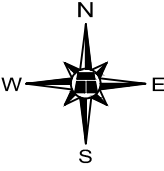
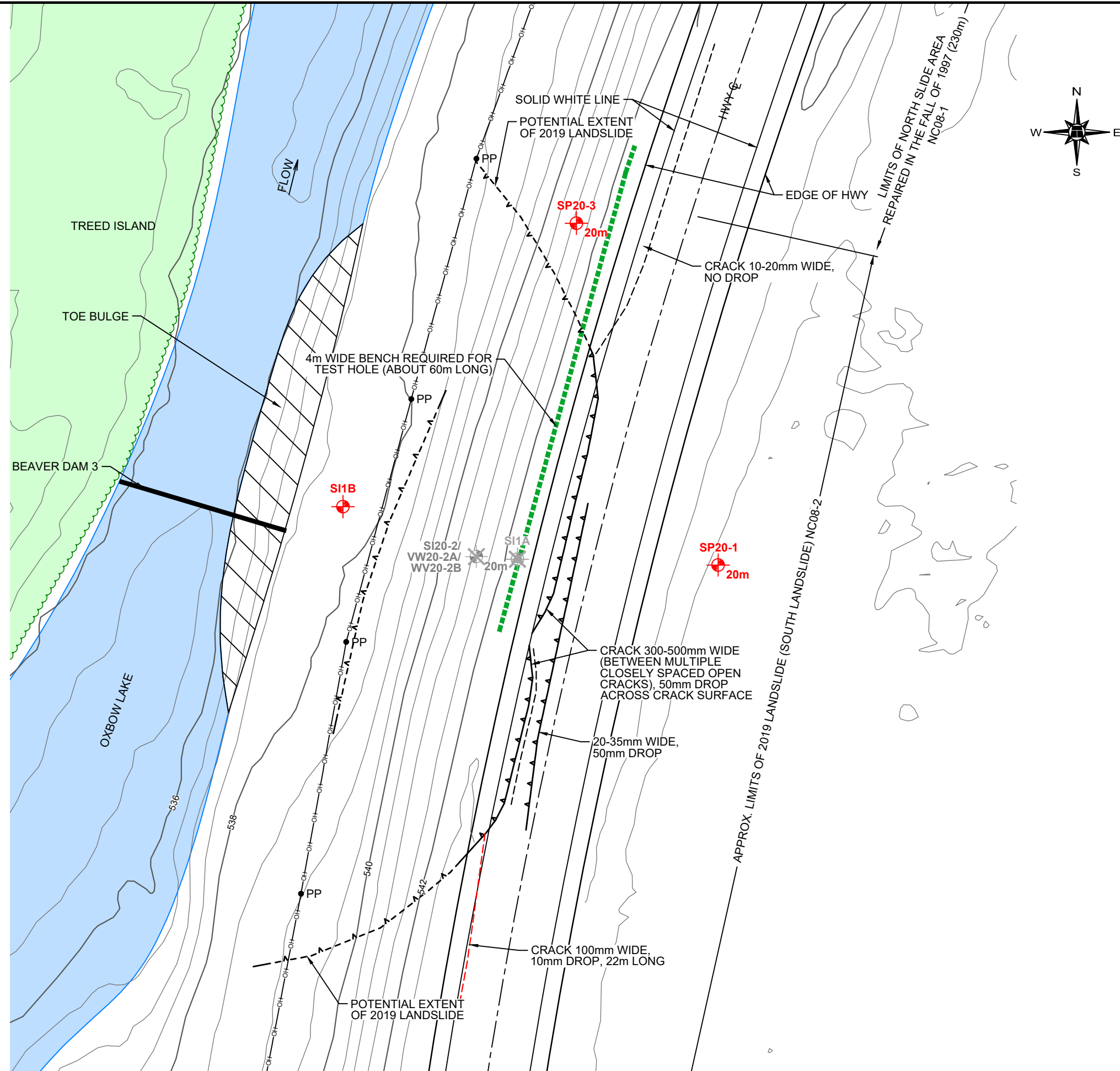
SP#	GPS Location (UTM 12)		Date	Stick-up (m)	Reading below top of casing (m)	Bottom Pipe Depth (below top of casing (m)
	Easting (m)	Northing (m)				
SP20-1	403523	6089481	16-Sep-24	0.84	2.27	20.24

VIBRATING WIRE READINGS

VW	Serial	GPS Location		Date	Reading B(units)	Temp degree C
		Latitude	Longitude			
VW20-2A	70909	6089482	403494	08-Jun-24	8666.4	5.4
VW20-2B	70910	6089482	403494	08-Jun-24	8357.6	5

INSPECTOR REPORT

Damaged by Lawnmower, see photos
SI20-2 stickup protector bent and damaged. Repair needed will have to dig down atleast 3-4 ft to find cut off wire and splice. SI is bent and broken along grooves, need splice

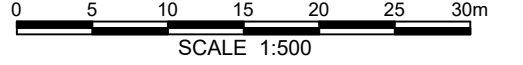



LEGEND

- APPROXIMATE TEST HOLE LOCATION (DEPTH (m))
- SI SLOPE INCLINOMETER
- VW VIBRATING WIRE PIEZOMETER
- SP STANDPIPE PIEZOMETER
- DESTROYED INSTRUMENT
- ACTIVE LANDSLIDE SCARP CRACK
- LANDSLIDE TENSION CRACKS
- CRACK
- GROUND SURFACE CONTOUR
- OVERHEAD POWERLINE
- POWER POLE

NOTES:

1. SITE FEATURES ARE APPROXIMATE
2. TOPOGRAPHY IS BASED ON 2008 LIDAR DATA
3. JULY 3, 2019 OBSERVATIONS SHOWN IN RED
4. POTHOLES AND 10-20mm WIDE REFLECTIVE CRACKS ARE VISIBLE ON SOUTHBOUND LANES WITHIN THE LIMITS OF PREVIOUSLY REPAIRED AREA (NC08-1)
5. OVERHEAD POWERLINES WERE RELOCATED TO THE WEST SIDE OF THE OLD HIGHWAY 63 DURING HIGHWAY TWINNING PROJECT






**NORTH CENTRAL
(ATHABASCA AND FORT McMURRAY DISTRICTS)**

**NC008 HWY 63:02 LA BICHE RIVER
SITE PLAN SHOWING APPROXIMATE
INSTRUMENT LOCATIONS**

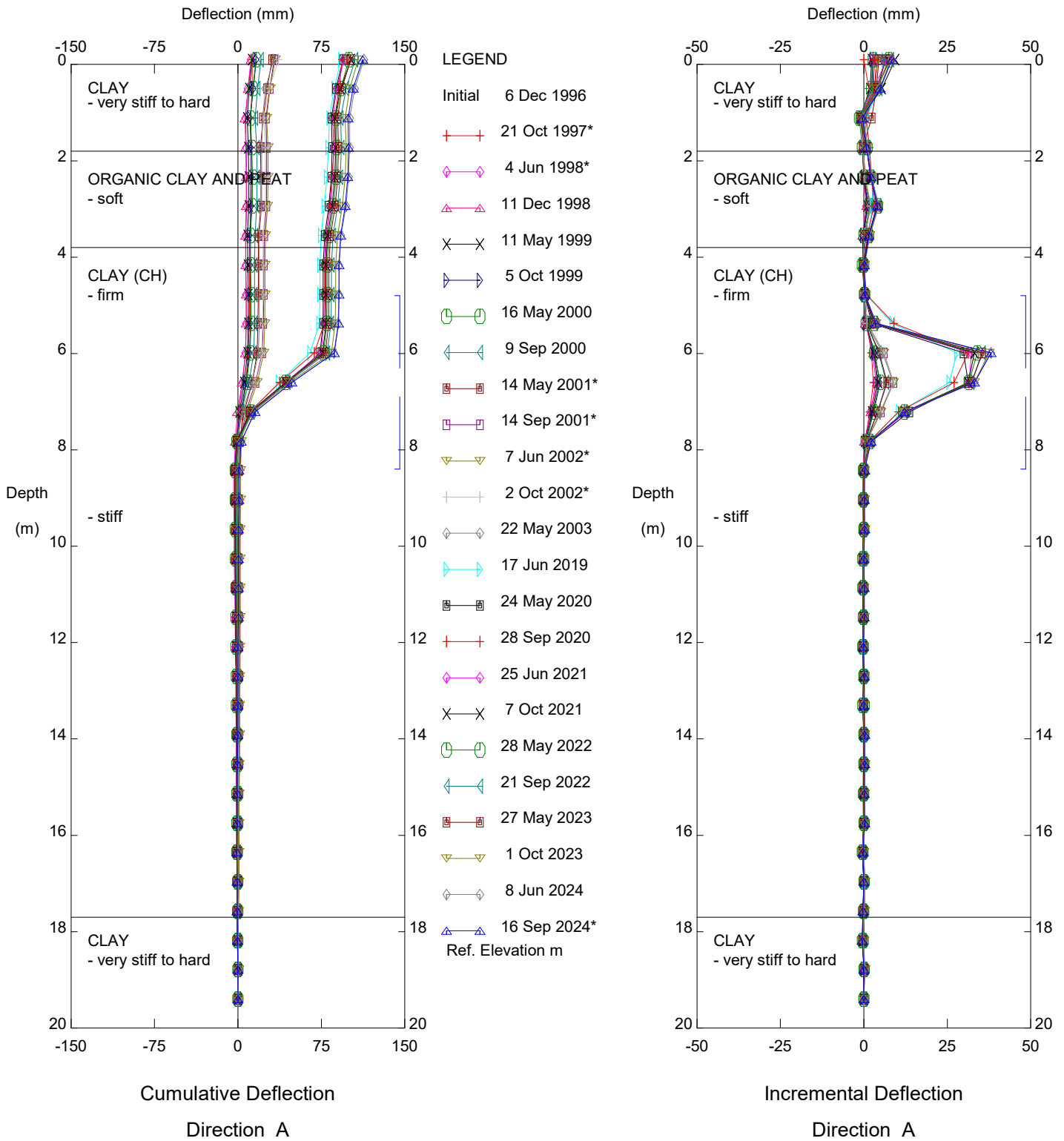
DWG No. 32122-NC008

DRAWN BY	ML
DESIGNED BY	LRG
APPROVED BY	TSA
SCALE	1:500
DATE	SEPTEMBER 2024
FILE No.	32122



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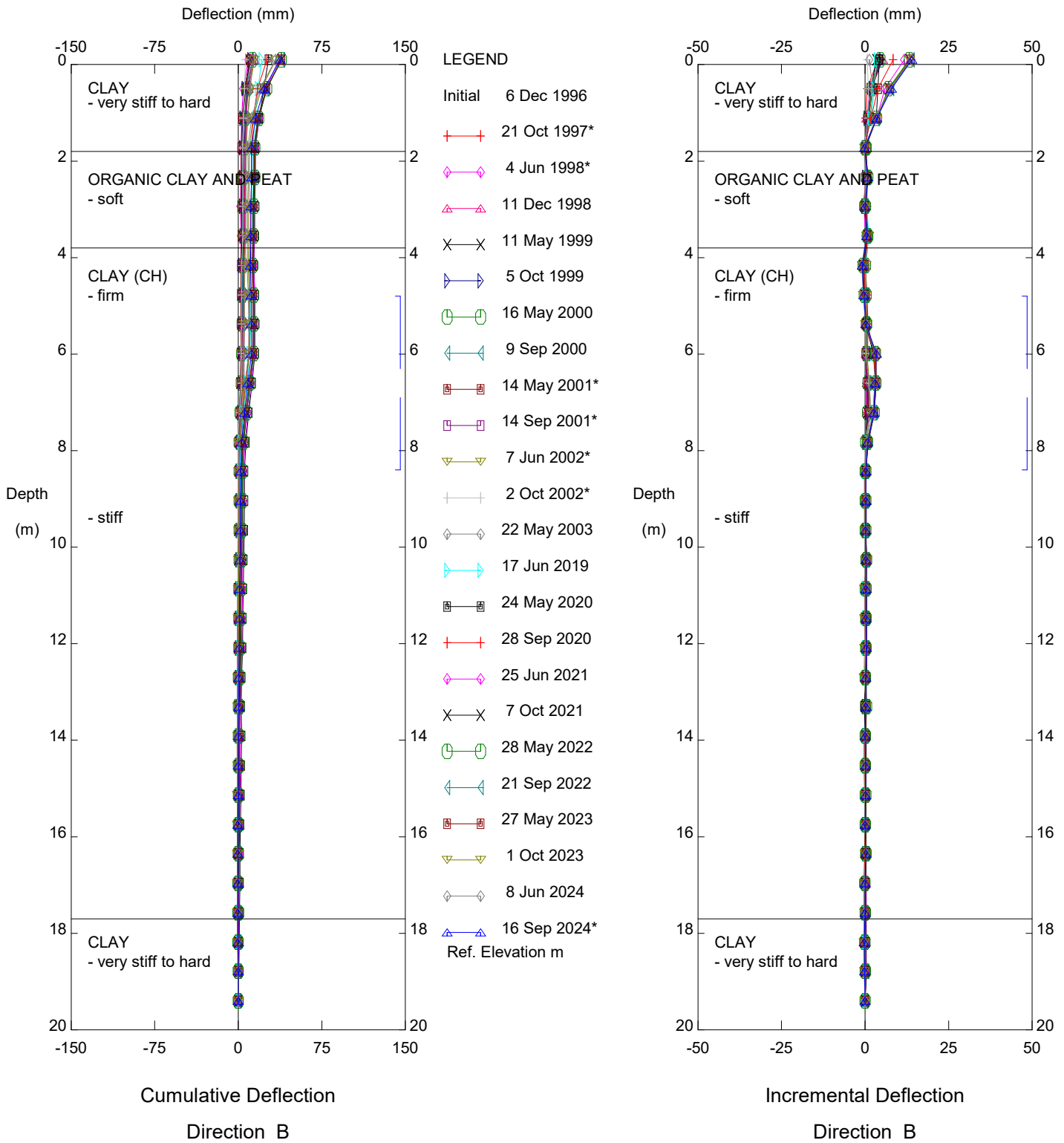


Labiche River, Inclinometer SI#1B

Alberta Transportation

Sets marked * include zero shift and/or rotation corrections.

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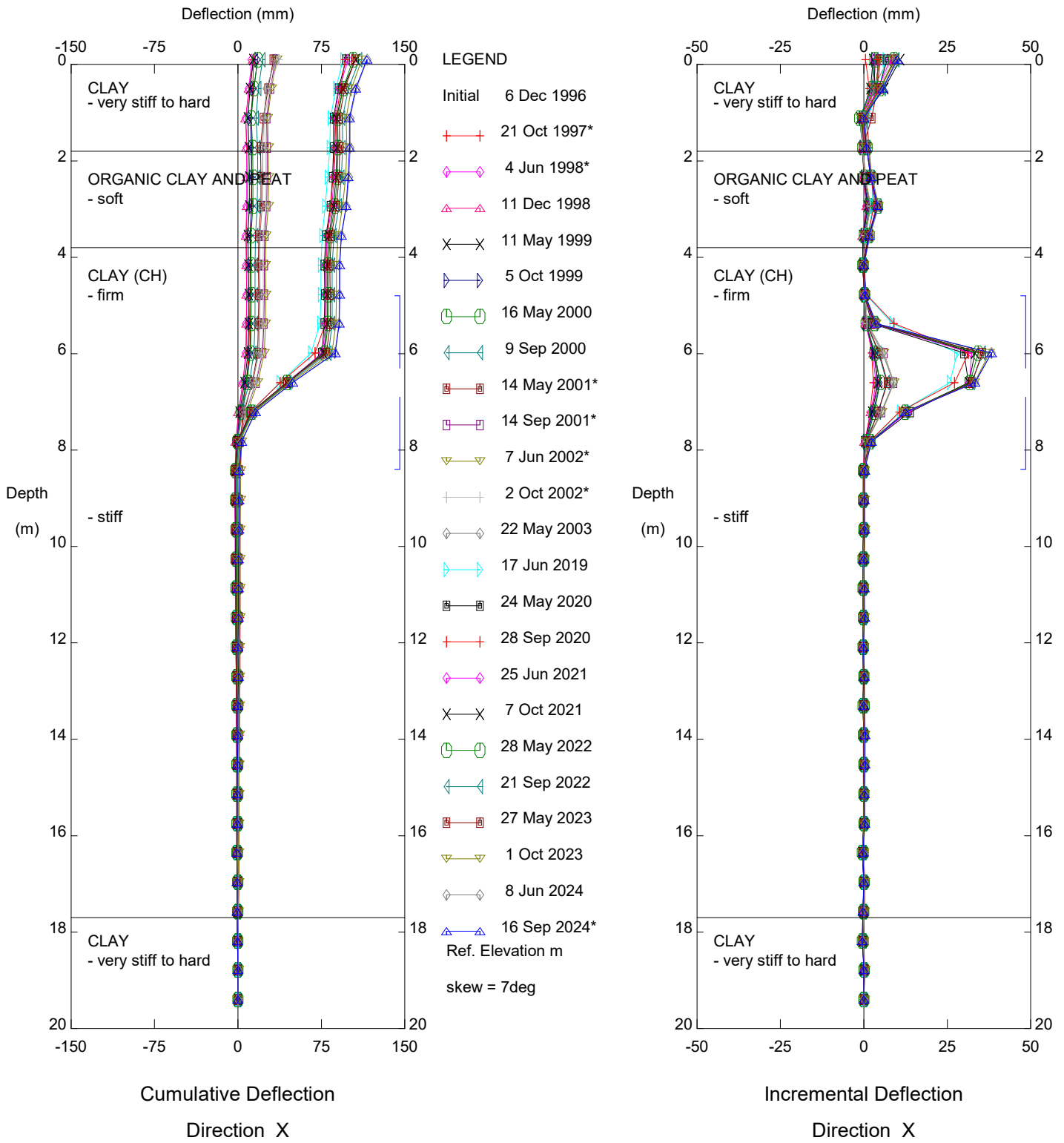


Labiche River, Inclinometer SI#1B

Alberta Transportation

Sets marked * include zero shift and/or rotation corrections.

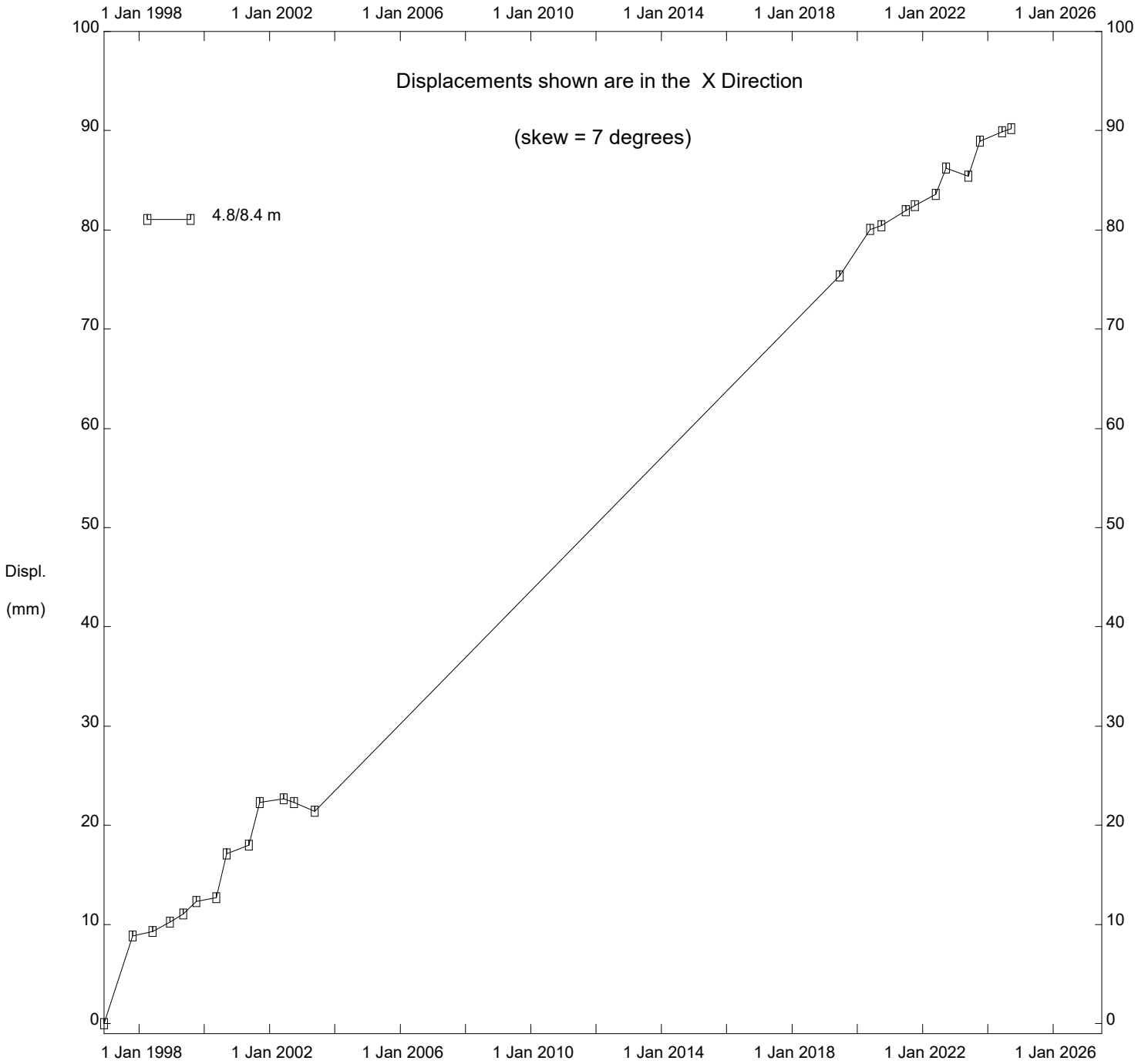
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Labiche River, Inclinometer SI#1B

Alberta Transportation

Sets marked * include zero shift and/or rotation corrections.



Labiche River, Inclinator SI#1B

Alberta Transportation

FIGURE NC008-1
HWY 63:02 NORTH OF LA BICHE RIVER BRIDGE (KM 15.6)
VIBRATING WIRE AND STANDPIPE PIEZOMETER DATA

