November 30, 2022

Alberta Transportation
Main Floor, Provincial Building
9621 – 96th Avenue
Peace River, Alberta
T8S 1T4

Ed Szmata
Construction Technologist

Dear Mr. Szmata:

CON0022166 Peace Region (Grande Prairie District – South) GRMP Instrumentation Monitoring Site GP006; H40:36, km 21.779 Sheep Creek Embankment (Three Teardrops Slide)
Section C – 2022 Fall Readings

1 GENERAL

Four slope inclinometers (SIs) (SI-2, SI19-1 through SI19-3), one pneumatic piezometer (PN) (PN-4), ten vibrating wire piezometers (VWPs) (VW19-1A/1B through 5A/5B), and four standpipe piezometers (SPs) (SP19-6, SP19-7, SP19-8, and SP19-10) were read at the GP006 site in the Peace Region (Grande Prairie District – South) (GP South Region) on September 28, 2022 by Messrs. Gabriel Bonot, E.I.T. and Guerin White, E.I.T. of Klohn Crippen Berger Ltd. (KCB). These instruments were read as part of the GP South Geohazard Risk Management Program (GRMP). The site is located on Hwy 40:36, km 21.779, on the Sheep Creek Embankment approximately 7 km north of the former McIntyre Mine. The approximate site coordinates are 5990716 N, 366584 E (UTM Zone 11, NAD 83). A site plan is presented in Figure 1.

The geohazard at the GP006 site consists of a landslide in the embankment fill of Hwy 40:36 which was repaired in 2020 with a binwall. The binwall consists of 60 bins with two subdrains, an asphalt ditch constructed between the guardrail and binwall that conveys surface water runoff to a riprap-lined channel at the north end of the binwall, a midslope bench constructed below the highway and binwall, horizontal subdrains drilled from the toe of the slope below the highway and binwall, and a drainage gallery in the upslope/west highway ditch. Prior to binwall construction, regular crack sealing and pavement patching was performed. The original Three Teardrop slide was also excavated (date unknown).

In 1998 and 2019, geotechnical site investigations, which included installing instruments, were conducted at the GP006 site by the previous consultants. The encountered stratigraphy has not been provided to KCB.

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1.1 Instrumentation

KCB has been reading the instruments at this site since the spring of 2021. Instrumentation installation details are tabulated in Table 1.1. Instrument locations are shown in Figure 1. Any instruments not included in Table 1.1 or shown in Figure 1 are assumed to be inoperable and are not presented or discussed herein.

In 1998 and 2019, four SIs and fifteen piezometers were installed at the site by the previous consultants to monitor movement and groundwater conditions, respectively. Some of these instruments are now inoperable (e.g., destroyed, sheared, or lost) as detailed in Table 1.1 (see table notes).

During the fall 2022 readings, KCB installed above-ground casing protectors on the Instruments installed in fall 2019. All instruments are now protected by above-ground casing protectors.

The operable SIs were read using the same metric RST Digital MEMS Inclinometer System that has been used to read the SIs since KCB took over the readings in June 2021. SI-2 and SI19-1 through -3 were re-initialized to the June2021 readings to remove large post-construction deflections which were impacting data interpretation.

The operable VWPs, PNs, and SPs were read using an RST VW2106 vibrating wire readout, RST C109 pneumatic piezometer readout, and RST Water Level Meter, respectively.

Table 1.1 Instrumentation Installation Details

Instrument ID	Instrument Type	Date Installed[1]	UTM Coordinates[1] (m)		Ground Surface Elevation[1,2] (m)	Stick Up[1] (m)	Depth (mbgs[3])	Condition
			Northing	Easting				
~~SI-1~~	~~SI~~	~~Mar. 1998~~	~~Unknown~~	~~Unknown~~	~~Unknown~~	~~Unknown~~	~~Unknown~~	~~Inoperable[4]~~
SI-2	SI	Mar. 1998	5990696	366588	920.2	0.89	15.0	Operable
~~SI-3~~	~~SI~~	~~Mar. 1998~~	~~5990784~~	~~366650~~	~~914.9~~	~~Unknown~~	~~Unknown~~	~~Inoperable[5]~~
~~SI-4~~	~~SI~~	~~Mar. 1998~~	~~5990803~~	~~366640~~	~~914.1~~	~~0.61~~	~~9.7~~	~~Inoperable[6]~~
SI19-1	SI	Oct. 30, 2019	5990610	366529	924.8	0.78	25.5	Operable
SI19-2	SI	Oct. 30, 2019	5990726	366610	918.7	0.95	26.0	Operable
SI19-3	SI	Oct. 30, 2019	5990814	366670	913.3	0.67	23.5	Operable
~~PN-1~~	~~PN~~	~~Mar. 1998~~	~~Unknown~~	~~Unknown~~	~~Unknown~~	~~N/A~~	~~Unknown~~	~~Inoperable~~
~~PN-2~~	~~PN~~	~~Mar. 1998~~	~~5990696~~	~~366588~~	~~920.2~~	~~N/A~~	~~9.1~~	~~Inoperable~~
~~PN-3~~	~~PN~~	~~Mar. 1998~~	~~5990784~~	~~366650~~	~~914.9~~	~~N/A~~	~~14.9~~	~~Inoperable~~
PN-4	PN	Mar. 1998	5990803	366640	914.1	N/A	10.0	Operable
VW19-1A	VWP	Oct. 30, 2019	5990610	366529	924.8	N/A	5.3	Operable, but dry
VW19-1B	VWP	Oct. 30, 2019	5990610	366529	924.8	N/A	14.9	Operable
VW19-2A	VWP	Oct. 30, 2019	5990726	366610	918.7	N/A	3.2	Operable, but dry
VW19-2B	VWP	Oct. 30, 2019	5990726	366610	918.7	N/A	21.3	Operable
VW19-3A	VWP	Oct. 30, 2019	5990814	366670	913.3	N/A	8.4	Operable
VW19-3B	VWP	Oct. 30, 2019	5990814	366670	913.3	N/A	18.3	Operable
VW19-4A	VWP	Nov. 03, 2019	5990690	366562	920.9	N/A	7.0	Operable
VW19-4B	VWP	Nov. 03, 2019	5990690	366562	920.9	N/A	12.3	Operable
VW19-5A	VWP	Nov. 03, 2019	5990759	366609	917.8	N/A	7.0	Operable
VW19-5B	VWP	Nov. 03, 2019	5990759	366609	917.8	N/A	13.1	Operable
SP19-6	SP	Oct. 31, 2019	5990687	366510	936.4	0.79	19.2	Operable
SP19-7	SP	Nov. 02, 2019	5990844	366644	919.5	0.73	14.4	Operable
SP19-8	SP	Oct. 20, 2019	5990945	366762	905.3	0.73	10.1	Operable
SP19-10	SP	Oct. 20, 2019	5990465	366412	929.6	0.75	13.1	Operable

Notes:
[1] Installation details taken from reports and data files prepared or provided by the previous consultant(s) or AT. Coordinates and elevations were confirmed using a handheld GPS (accuracy of ± 5 m) in spring 2022 by KCB. Ground surface elevations were measured prior to construction and should be surveyed.
[3] Meters below ground surface (mbgs). Bottom casing depth for SIs, and tip or screen depth for piezometers.
[4] SI-1 has sheared at an approximate depth of 10.0 m below ground surface.
[5] SI-3 is blocked at an approximate depth of 1.0 m below ground surface.
[6] SI-4 has not been read successfully since June 2021 because the SI probe wheels come out of the instrument casing grooves.

2 INTERPRETATION

2.1 General

For the operable SIs, the cumulative displacement, incremental displacement, and displacement-time data was plotted in the A-direction (i.e., the direction of the A0-groove) and, where applicable, the X-direction (i.e., the direction of maximum movement obtained at a skew angle from the A0-grooves). SI-2 and SI19-3 have skew angles of 338° and 35°, respectively, measured clockwise from the direction of the A0-grooves.

For the operable PNs and VWPs, the recorded porewater pressures were converted to an equivalent water/piezometric elevation and plotted relative to ground surface elevation and each instruments tip elevation.

For the operable SPs, the water level data was plotted relative to ground surface elevation and each instruments screen elevation.

The SI and piezometer data plots are included in Appendix I, and a summary of the SI and piezometer data is provided in Table 2.1 through Table 2.4, respectively.

Table 2.1 Slope Inclinometer Reading Summary

Instrument ID	Date				Ground Surface Elevation[1] (m)	Depth of Movement (mbgs[1])	Direction of Movement, Skew Angle[2]	Movement (mm)				Rate of Movement (mm/year)		
	Initialized (Re-initialized)	Previous Maximum Cumulative Movement Recorded	Previous Reading	Most Recent Reading				Maximum Cumulative			Incremental Since Previous Maximum Cumulative	Previous Maximum	Most Recent Reading	Change from Previous Reading
								Before Re-Initialization	After Re-Initialization	Total				
SI-2	Mar. 30, 1998 (Sep. 11, 2008)[3] (Jun. 28, 2021)[4]	Jun. 22, 2022	Jun. 22, 2022	Sep. 28, 2022	920.2	1.1 – 5.1	X-Direction, 338°	N/A	11.6	11.6	-1.1	46.8	-3.9	-6.7
						6.1 – 6.9		(19.8)[3] (129.4)[4]	1.3	151.2	0.8	409.5	3.2	3.6
~~SI-4[5]~~	~~1998 (Nov. 19, 2019)[3]~~	~~Oct. 06, 2020~~	~~Sep. 09, 2021~~	~~Sep. 09, 2021[3]~~	~~914.1~~	~~5.2 – 6.7~~	~~X-Direction, 340°~~	~~Unknown~~	~~2.4~~	~~2.4~~	~~N/A – cannot be assessed, probe wheels coming out of grooves[5]~~	~~4.5~~	~~N/A – cannot be assessed, probe wheels coming out of grooves[5]~~	
SI19-1	Oct. 31, 2019 (Jun. 28, 2021)[4]	Jun. 22, 2022	Jun. 22, 2022	Sep. 28, 2022	924.8	2.0 – 24.5	A-Direction	-11.4	-10.2	-21.6	4.8	-168.2	17.8	26.6
SI19-2	Nov. 03, 2019 (Jun. 28, 2021)[4]	Jun. 22, 2021	Jun. 22, 2022	Sep. 28, 2022	918.7	0.0 – 6.3	A-Direction	-203.2	10.5	-192.7	1.9	-276.6	7.2	-1.5
SI19-3	Oct. 31, 2019 (Jun. 28, 2021)[4]	Jun. 22, 2022	Jun. 22, 2022	Sep. 28, 2022	913.3	0.0 – 4.1	X-Direction, 35°	497.5	60.7	558.2	6.8	149.0	25.1	-6.2

Notes:
[1] Meters below ground surface (mbgs
[2] Skew angle of X-direction measured clockwise from the A-direction. The azimuth of the A0-grooves for the SIs was measured by a magnetic compass in spring 2022.
[3] SI-2 and SI-4 were re-initialized in 2008 and 2019, respectively, by the previous consultants.
[4] SI-2 and SI19-1 through -3 were re-initialized to the June 2021 readings to remove large post-construction deflections which were affecting data interpretation.
[5] SI-4 has not been read successfully since June 2021 because the SI probe wheels come out of the instrument casing grooves.

Table 2.2 Pneumatic Piezometer Reading Summary

Instrument ID	Serial No.	Date			Ground Surface Elevation (m)	Tip Depth (mbgs[1])	Water Level		
		Installed	Previous Reading	Most Recent Reading			Previous Reading (mbgs[1])	Most Recent Reading (mbgs[1])	Change from Previous Reading (m)
PN-4	7668	Mar. 1998	Jun. 22, 2022	Sep. 28, 2022	914.1	10.0	1.2	1.9	-0.7

Notes:
[1] Meters below ground surface (mbgs).

Table 2.3 Vibrating Wire Piezometer Reading Summary

Instrument ID	Serial No.	Date			Ground Surface Elevation (m)	Tip Depth (mbgs[1])	Water Level		
		Installed	Previous Reading	Most Recent Reading			Previous Reading (mbgs[1])	Most Recent Reading (mbgs[1])	Change from Previous Reading (m)
VW19-1A	61688	Oct. 30, 2019	Jun. 22, 2022	Sep. 28, 2022	924.8	5.3	N/A – instrument is dry		
VW19-1B	61695	Oct. 30, 2019	Jun. 22, 2022	Sep. 28, 2022	924.8	14.9	10.7	10.4	0.3
VW19-2A	61691	Oct. 30, 2019	Jun. 22, 2022	Sep. 28, 2022	918.7	3.2	N/A – instrument is dry		
VW19-2B	61693	Oct. 30, 2019	Jun. 22, 2022	Sep. 28, 2022	918.7	21.3	13.4	13.7	-0.3
VW19-3A	61692	Oct. 30, 2019	Jun. 22, 2022	Sep. 28, 2022	913.3	8.4	8.3	8.4	-0.1
VW19-3B	61694	Oct. 30, 2019	Jun. 22, 2022	Sep. 28, 2022	913.3	18.3	8.8	8.7	0.1
VW19-4A	61687	Nov. 03, 2019	Jun. 22, 2022	Sep. 28, 2022	920.9	7.0	5.4	5.6	-0.2
VW19-4B	61689	Nov. 03, 2019	Jun. 22, 2022	Sep. 28, 2022	920.9	12.3	11.3	12.8	-1.5
VW19-5A	61686	Nov. 03, 2019	Jun. 22, 2022	Sep. 28, 2022	917.8	7.0	3.8	4.0	-0.2
VW19-5B	61690	Nov. 03, 2019	Jun. 22, 2022	Sep. 28, 2022	917.8	13.1	3.9	4.2	-0.3

Notes:
[1] Meters below ground surface (mbgs).

Table 2.4 Standpipe Piezometer Reading Summary

Instrument ID	Date			Ground Surface Elevation (m)	Screen Depth (mbgs[1])	Water Level		
	Installed	Previous Reading	Most Recent Reading			Previous Reading (mbgs[1])	Most Recent Reading (mbgs[1])	Change from Previous Reading (m)
SP19-6	Oct. 31, 2019	Jun. 22, 2022	Sep. 28, 2022	936.4	19.2	10.5	10.4	0.1
SP19-7	Nov. 02, 2019	Jun. 22, 2022	Sep. 28, 2022	919.5	14.4	4.8	4.3	0.5
SP19-8	Oct. 20, 2019	Jun. 22, 2022	Sep. 28, 2022	905.3	10.1	7.5	8.9	-1.4
SP19-10	Oct. 20, 2019	Jun. 22, 2022	Sep. 28, 2022	929.6	13.1	2.0	1.8	0.2

Notes:
[1] Meters below ground surface (mbgs).

In 2021, KCB reviewed the instrumentation data provided by the previous consultant and removed corrections applied to the historical SI data based on our experience. The instrumentation data obtained by KCB is generally consistent with the data obtained by the previous consultant, except for:

- Large deflections that were recorded in the tops of SI-2, SI19-2, and SI19-3 to an approximate depth of 6 m, 3 m, and 4 m below ground surface, respectively. The deflections are likely due to binwall construction in late-2020. It is noted that SI-2 and SI19-2 were shortened to the binwall bench level and then later raised through the binwall fill during construction. It also appears the instruments were raised again after the previous consultant took their last reading in October 2020. The exact length of casing added is unknown but was estimated to be 2.5 m. KCB has subsequently extended the data files for SI-2 and SI19-2 by 2.5 m. The instruments were read to the adjusted depth in June and September 2022 and the data aligns with the new reading depth. Due to the large deflections recorded due to binwall construction, KCB re-initialized the SI data plots to the June 2021 readings.
- A large deflection recorded in SI-4 from top to bottom of the casing. It is unclear if the deflection is the result of the reading equipment being changed or if the casing is damaged. Since the June 2021 reading, the SI probe wheels have been coming out of the casing grooves despite multiple reading attempts, and the data has had high checksums. This instrument was previously damaged between 2013 and 2019 and may have been damaged again during binwall construction in late-2020.

The SI data plots presented herein include only data taken with KCB's SI reading equipment.

2.2 Zones of Movement

Distributed movement was being recorded in SI-2 between an approximate depth of 6.1 m and 9.1 m below ground surface. However, due to a large deflection that was recorded in the top 6 m of the SI casing since late 2020, KCB re-initialized the instrument to the June 2021 reading. Since June 2021, distributed movement has been recorded in SI-2 from an approximate depth of 1.1 m to 5.1 m below ground surface (elevation 921.6 m to 917.6 m).

Discrete movement (i.e., occurring on a defined failure plane) was previously being recorded in SI-4 between an approximate depth of 5.2 m and 6.7 m below ground surface. However, due to the SI probe wheels coming out of the casing grooves since June 2021, KCB cannot currently assess for movements in this instrument.

Distributed movement from top to bottom of casing has been recorded in SI19-1 since installation. This movement could be due to the SI not being installed deep enough or installed on enough of an angle (i.e., tilt) that complicates processing of the SI data. Based on the absolute plot for this instrument, it is tilted approximately 0.7 m and 1.5 m in the A- and B-directions, respectively.

No discernible movement had previously (i.e., before binwall construction) been recorded in SI19-2 or SI19-3. However, since construction, large deflections have been recorded in the tops of these instruments to an approximate depth of 3 m and 2 m below ground surface, respectively. These large

deflections are believed to have been caused by cutting back (lowering) and raising the instrument casing during construction. Due to the large deflections recorded due to binwall construction, KCB re-initialized the SI data plots to the June 2021 readings.

Between October 2021 and September 2022, distributed movement has been recorded in SI19-2 from an approximate depth of 3 m below ground surface to bottom of casing. This movement could be due to the SI not being installed deep enough or installed on enough of an angle (i.e., tilt) that complicates processing of the SI data. Based on the absolute plot for this instrument, it is tilted approximately 0.9 m and 2.5 m in the A- and B-directions, respectively.

2.3 Interpretation of Monitoring Results

The movement recorded in SI-2, SI19-2, and SI19-3 between October 2020 and June 2021 can most likely be attributed to binwall construction in late-2020. Most notably in SI19-3, where a significant amount of shallow movement (approximately 498 mm) was recorded between October 2020 and June 2021. This shallow movement may be attributed to settlement as the binwall takes up load from the highway embankment, as well as deflection of the above-ground casing, since a casing protector was not installed on these instruments until fall 2022. Since the SIs were re-initialized to the June 2021 readings, approximately 12 mm and 61 mm of shallow movement has been recorded in SI-2 and SI19-3, respectively.

Between the October 2021 and September 2022, negative distributed displacement has been recorded in SI19-1 and SI19-2 (from an approximate depth of 2 m and 3 m below ground surface, respectively, to bottom of casing). This movement could be due to the SI not being installed deep enough or installed on enough of an angle (i.e., tilt) that complicates processing of the SI data, which may have attributed to the discrepancy between the June and September 2022 data, or post-installation settlement/flexure of the SI casing. More data is needed to assess these movement in SI19-1 and SI19-2 to assess if these instruments need to be re-initialized.

A large increase in water level (up to approximately 10 m) was recorded in the SPs (SP19-6, SP19-7, SP19-8, and SP19-10) following installation in the winter of 2019. The recorded increases were likely due to post-installation stabilization of these instruments. Between late-2020 and September 2022, SP19-6 and SP19-7 have recorded overall decreases of approximately 3.2 m and 2.3 m, respectively, and have recorded relatively steady water levels (±0.5 m) since spring 2021. The water levels recorded in SP19-8 and SP19-10 have remained relatively steady (±0.7 m).

Between mid to late-2020 and mid-2021, decreases in water level between approximately 2.5 m and 6.0 m was recorded in all the piezometers installed along the repaired section of highway (PN-4, SP19-6, SP19-7, VW19-2/B through -5A/B), excluding VW19-2A which has been dry since installation. The recorded decreases could be attributed to the installation of drains during 2020 binwall construction. During the most recent Section B inspection in June 2022, some of the subdrains at the toe of the highway embankment were observed to be flowing and others to be wet around their outlets. It is KCB's understanding that the rate of flow from the subdrains has decreased since 2020

binwall construction. Since 2021, water levels recorded in these piezometers have been relatively steady (±1 m).

VW19-1A/B are installed outside of the repaired section of highway. VW19-1A has been dry since installation (installed approximately 5 m below ground surface) and the water level recorded in VW19-1B has been relatively steady since installation (fluctuated between approximately 9.5 m to 11.4 m below ground surface).

More data is needed to assess seasonal trends for the instruments installed in 2019. Peak rainfall in the region usually occurs between May and July each year and may have attributed to the small water level increases being recorded in VW19-1AB and SP19-08.

3 RECOMMENDATIONS

3.1 Future Work

All operable instruments should continue to be read twice per year (spring and fall). Spring readings should be completed after late-May or early-June, due to the risk of water inside the instruments casing being frozen earlier in the year.

Ground surface elevation should be re-surveyed for all instruments due to binwall construction in 2020.

The site should continue to be inspected by the Maintenance Contract Inspector (MCI) and as part of the GP South region GRMP Section B inspections.

3.2 Instrument Repairs and Maintenance

Since the SI probe wheels have been coming out of the casing grooves for SI-4 since June 2021, KCB recommends replacing the instrument. Otherwise, no other instrument repairs or maintenance is required.

4 CLOSING

This report is an instrument of service of Klohn Crippen Berger (KCB). The report has been prepared for the exclusive use of Alberta Transportation (Client) for the specific application to GP South Geohazard Risk Management Program (Contract No. CON0022166), and it may not be relied upon by any other party without KCB's written consent.

KCB has prepared this report in a manner consistent with the level of care, skill and diligence ordinarily provided by members of the same profession for projects of a similar nature at the time and place the services were rendered. KCB makes no warranty, express or implied.

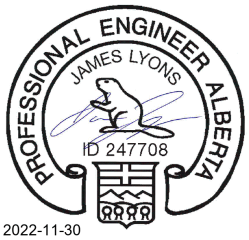
Use of or reliance upon this instrument of service by the Client is subject to the following conditions:

1. The report is to be read in full, with sections or parts of the report relied upon in the context of the whole report.
2. The observations, findings and conclusions in this report are based on observed factual data and conditions that existed at the time of the work and should not be relied upon to precisely represent conditions at any other time.
3. The report is based on information provided to KCB by the Client or by other parties on behalf of the client (Client-supplied information). KCB has not verified the correctness or accuracy of such information and makes no representations regarding its correctness or accuracy. KCB shall not be responsible to the Client for the consequences of any error or omission contained in Client-supplied information.
4. KCB should be consulted regarding the interpretation or application of the findings and recommendations in the report.
5. This report is electronically signed and sealed and its electronic form is considered the original. A printed version of the original can be relied upon as a true copy when supplied by the author or when printed from its original electronic file.

Please contact the undersigned if you have any questions or comments regarding this report.

Yours truly,

KLOHN CRIPPEN BERGER LTD.



James Lyons, P.Eng.
Civil Engineer

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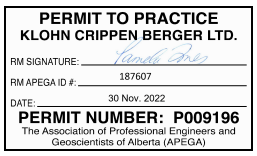
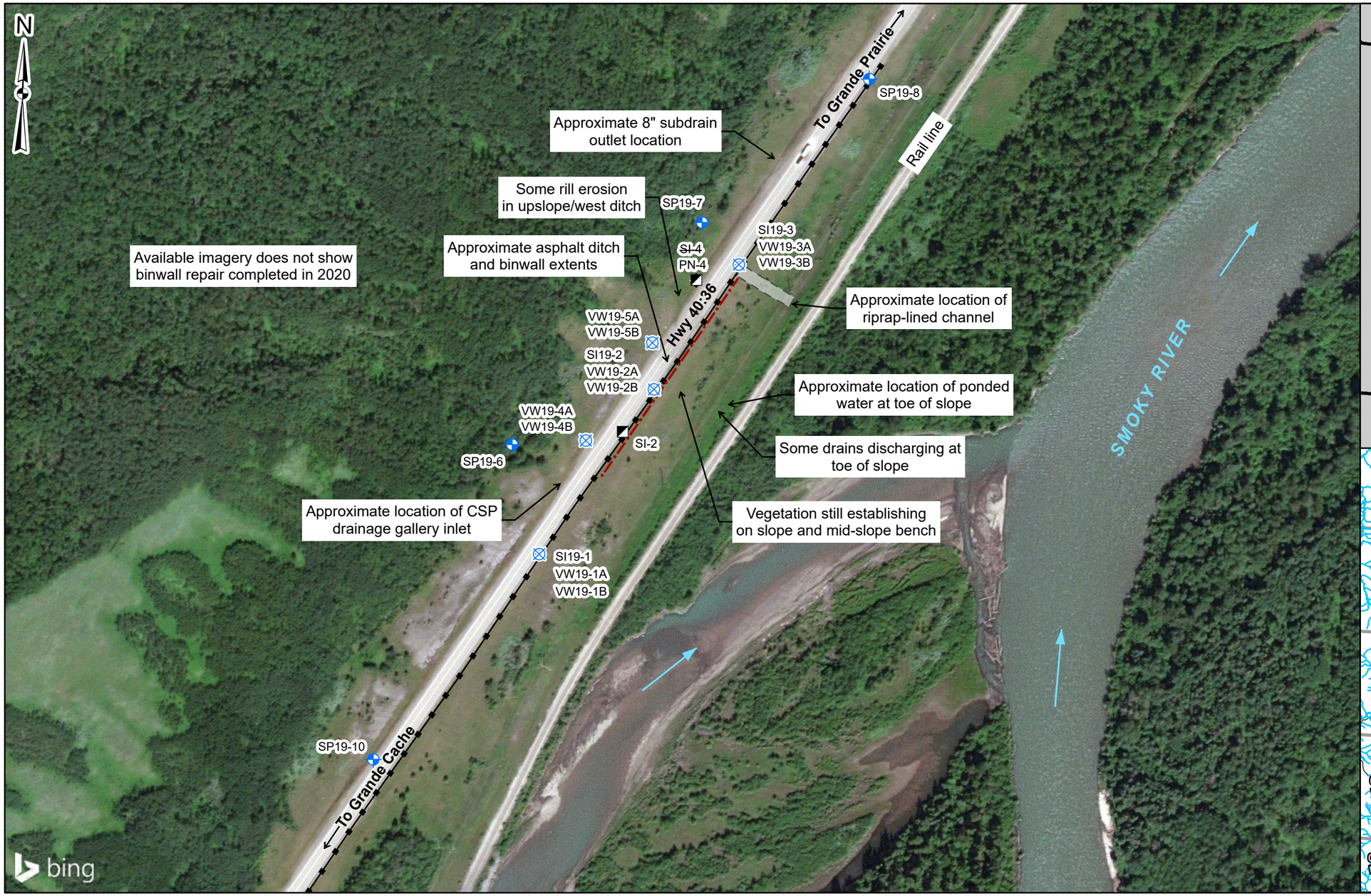
Senior Civil Engineer, Associate

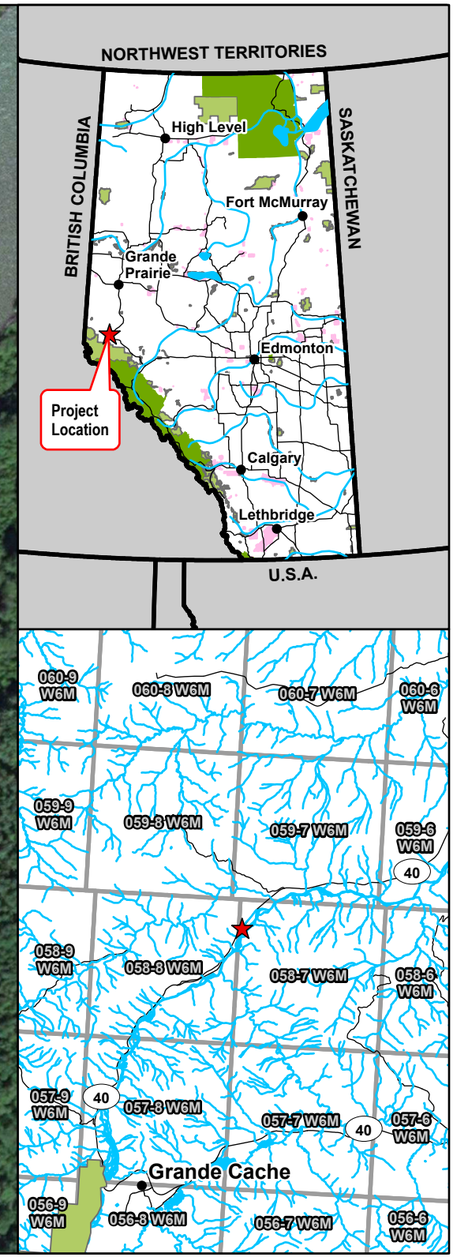
JL:bb



ATTACHMENTS
Figure
Appendix I Instrumentation Plots

FIGURE





Legend

- Approximate Pneumatic Piezometer Location
- Approximate Slope Inclinometer Location
- Approximate Standpipe Piezometer Location
- Approximate Vibrating Wire Piezometer Location
- Flow Direction
- Binwall Extent
- Guardrail
- Riprap-Lined Channel

0 125 Metres

NOTES:
1. HORIZONTAL DATUM: NAD83
2. GRID ZONE: UTM ZONE 11N
3. IMAGE SOURCE: 2022 MICROSOFT CORPORATION, 2022 MAXAR CNES, DISTRIBUTION AIRBUS DS
4. STRIKETHROUGH INDICATES INSTRUMENT IS INACTIVE

CLIENT: Alberta

Klohn Crippen Berger

PROJECT: PEACE REGION (GRANDE PRAIRIE DISTRICT-SOUTH) GEOHAZARD RISK MANAGEMENT PROGRAM

TITLE: Site Plan
GP006 - Sheep Creek Embankment
(Three Teardrops Slide)
Hwy 40:36, km 21.779

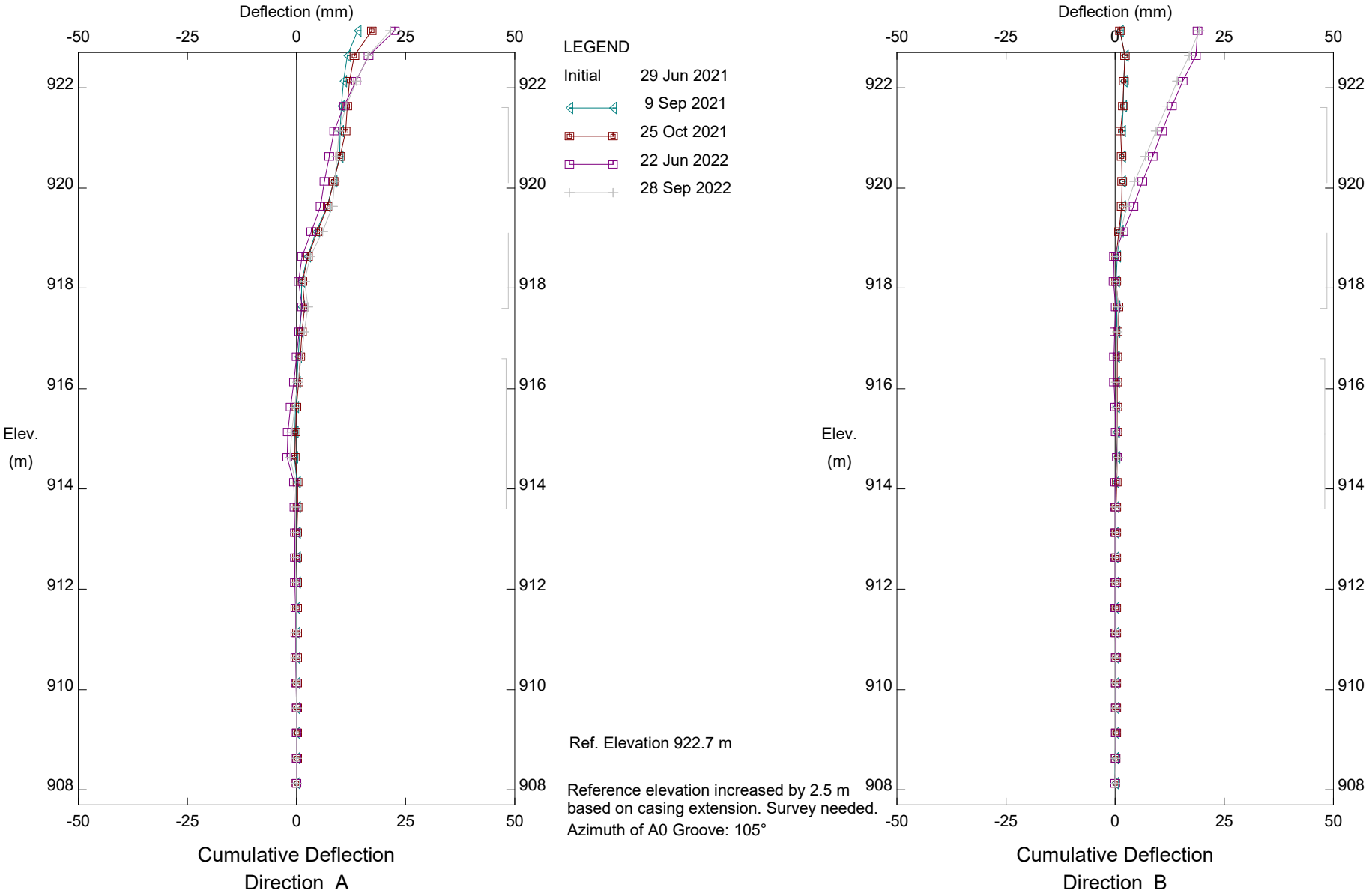
SCALE	PROJECT No.	FIG No.
1:3,000	A05116A01	1

File: Z:\AEDM\A05116A01 ABT Grande Prairie South GRMP\400 Drawings\GIS\MXD\2022\2022 GRMP Figures_220425\2022 GRMP Figures_220425.aprx Date: Time: Creator: : aharrison

APPENDIX I

Instrumentation Plots

Klohn Crippen Berger - Edmonton



GP006; H40:36, Sheep Creek Embankment, Inclinometer SI-2

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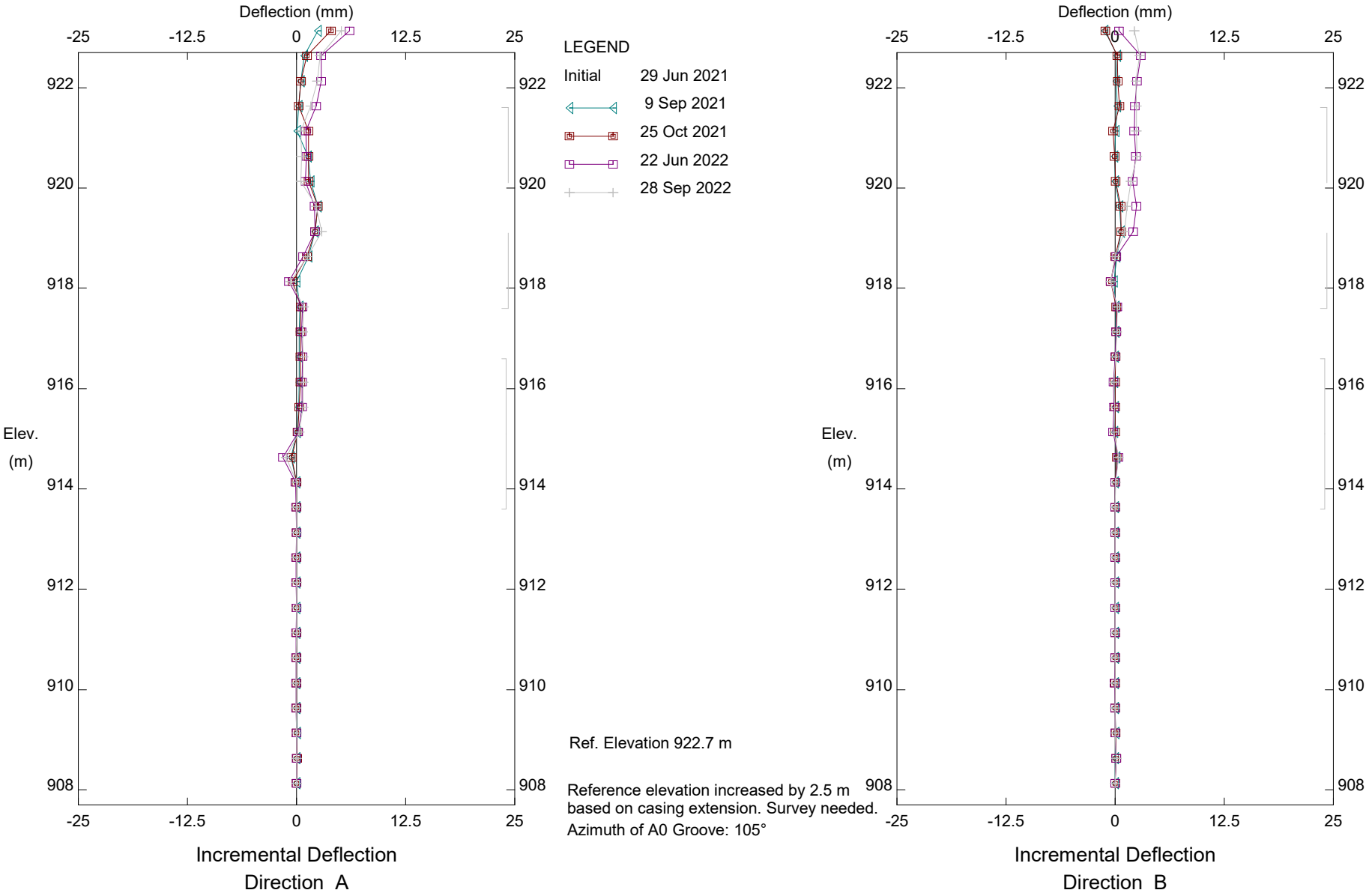

GP006; H40:36, Sheep Creek Embankment, Inclinometer SI-2

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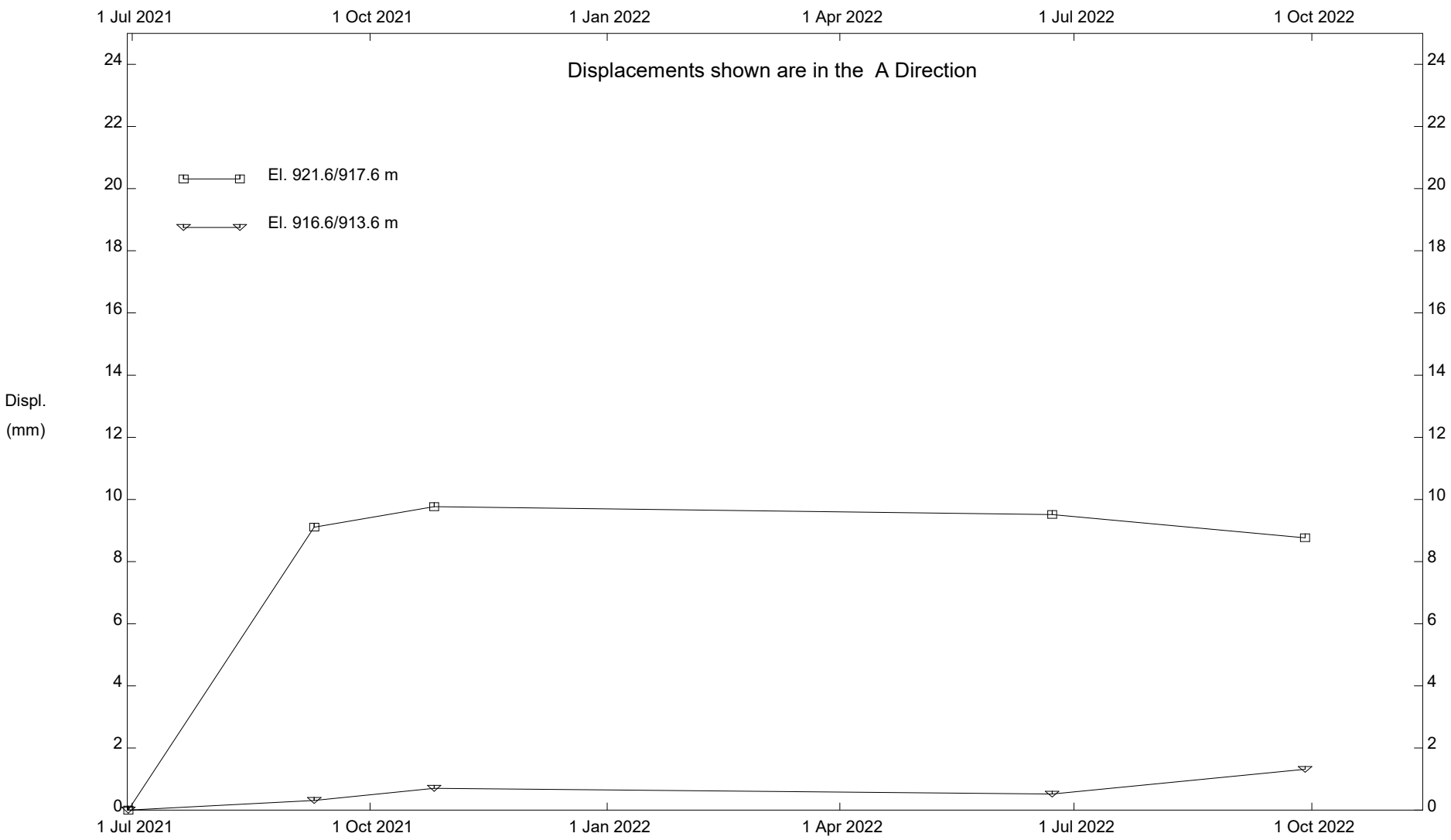
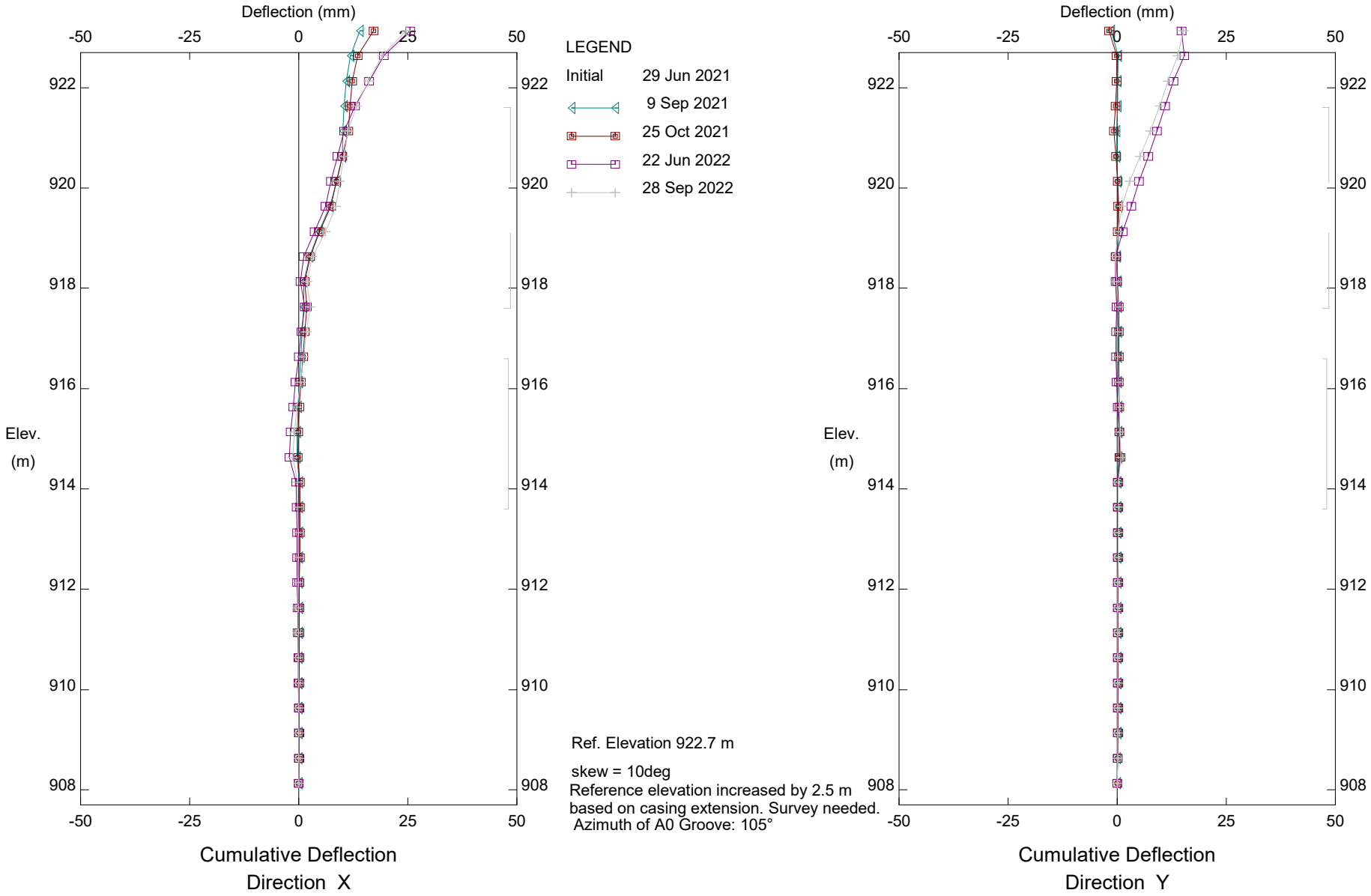


GP006; H40:36, Sheep Creek Embankment, Inclinometer SI-2

Alberta Transportation

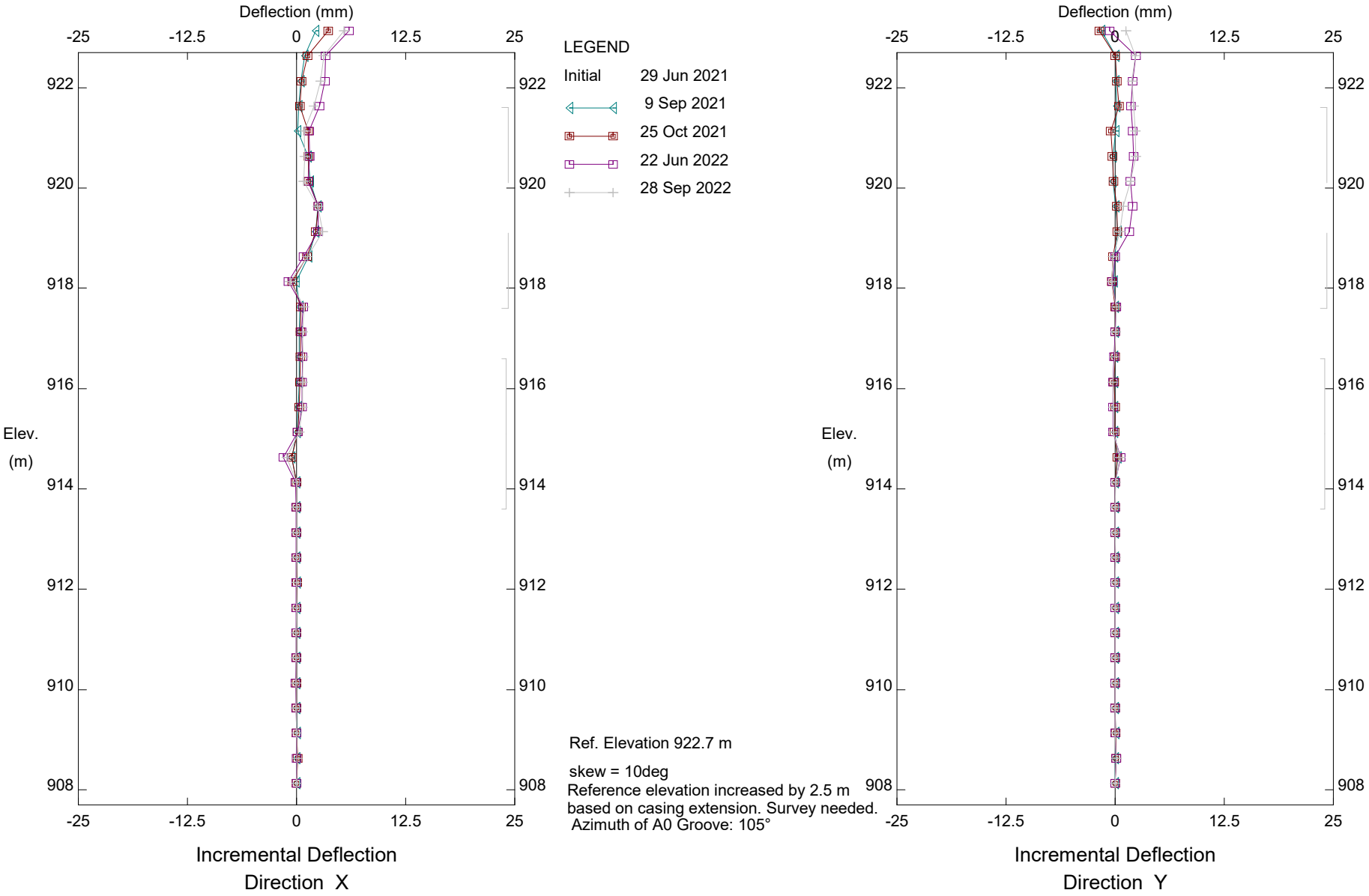
Klohn Crippen Berger - Edmonton



GP006; H40:36, Sheep Creek Embankment, Inclinometer SI-2

Alberta Transportation

Klohn Crippen Berger - Edmonton



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Alberta Transportation

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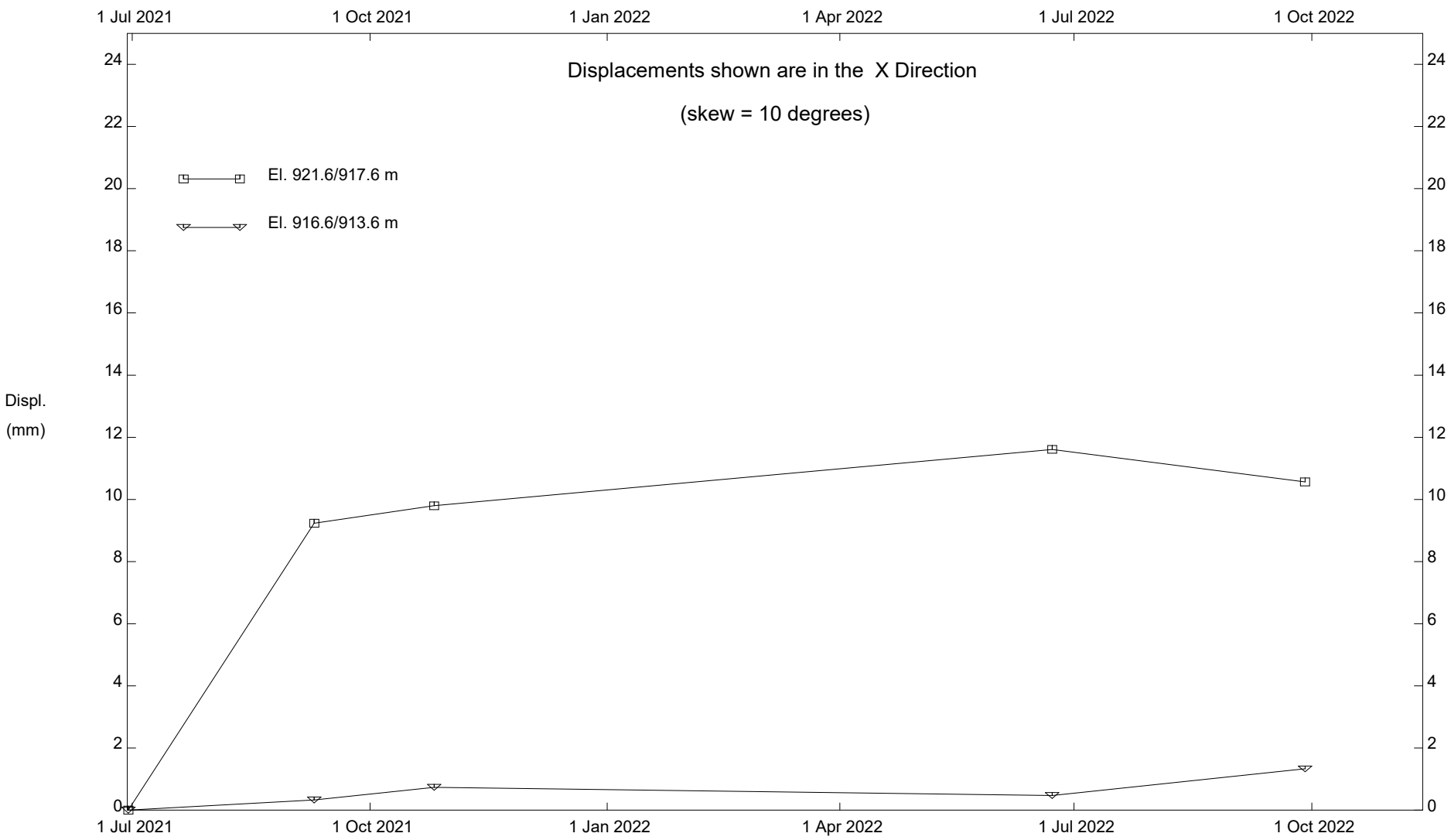
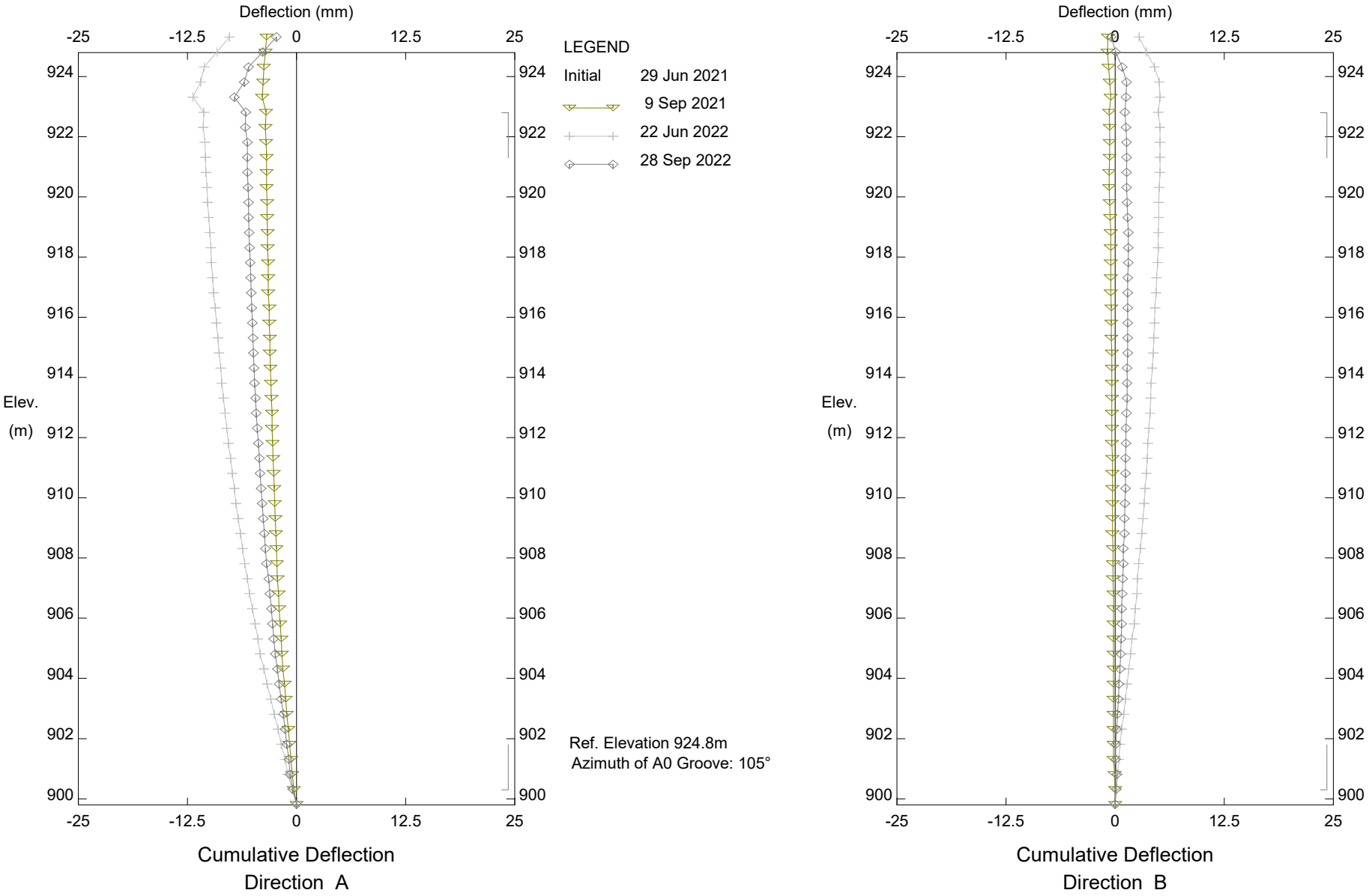


GP006; H40:36, Sheep Creek Embankment, Inclinometer SI-2

Alberta Transportation

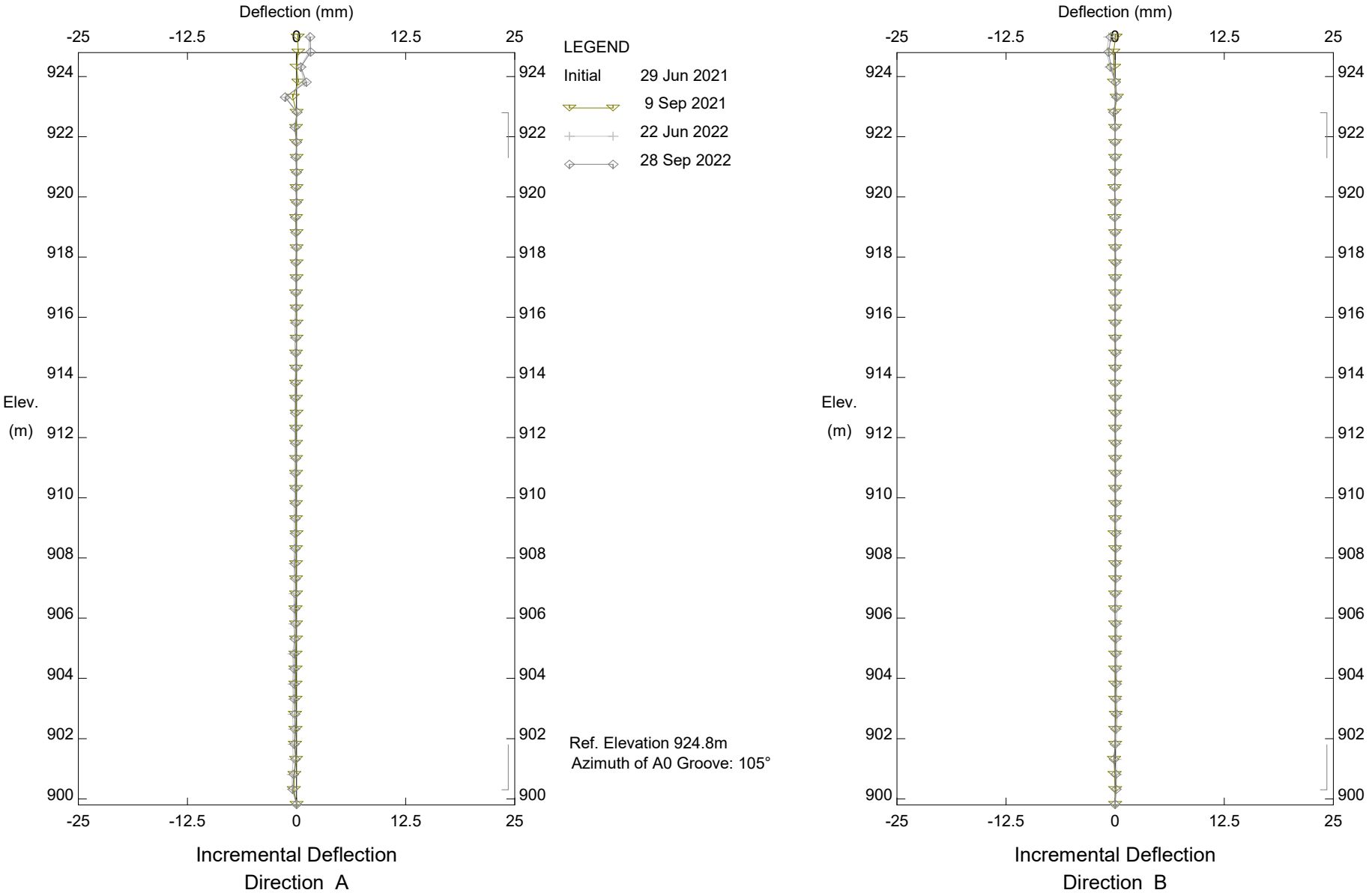
Klohn Crippen Berger - Edmonton



GP006; H40:36, Sheep Creek Embankment, Inclinometer SI19-1

Alberta Transportation

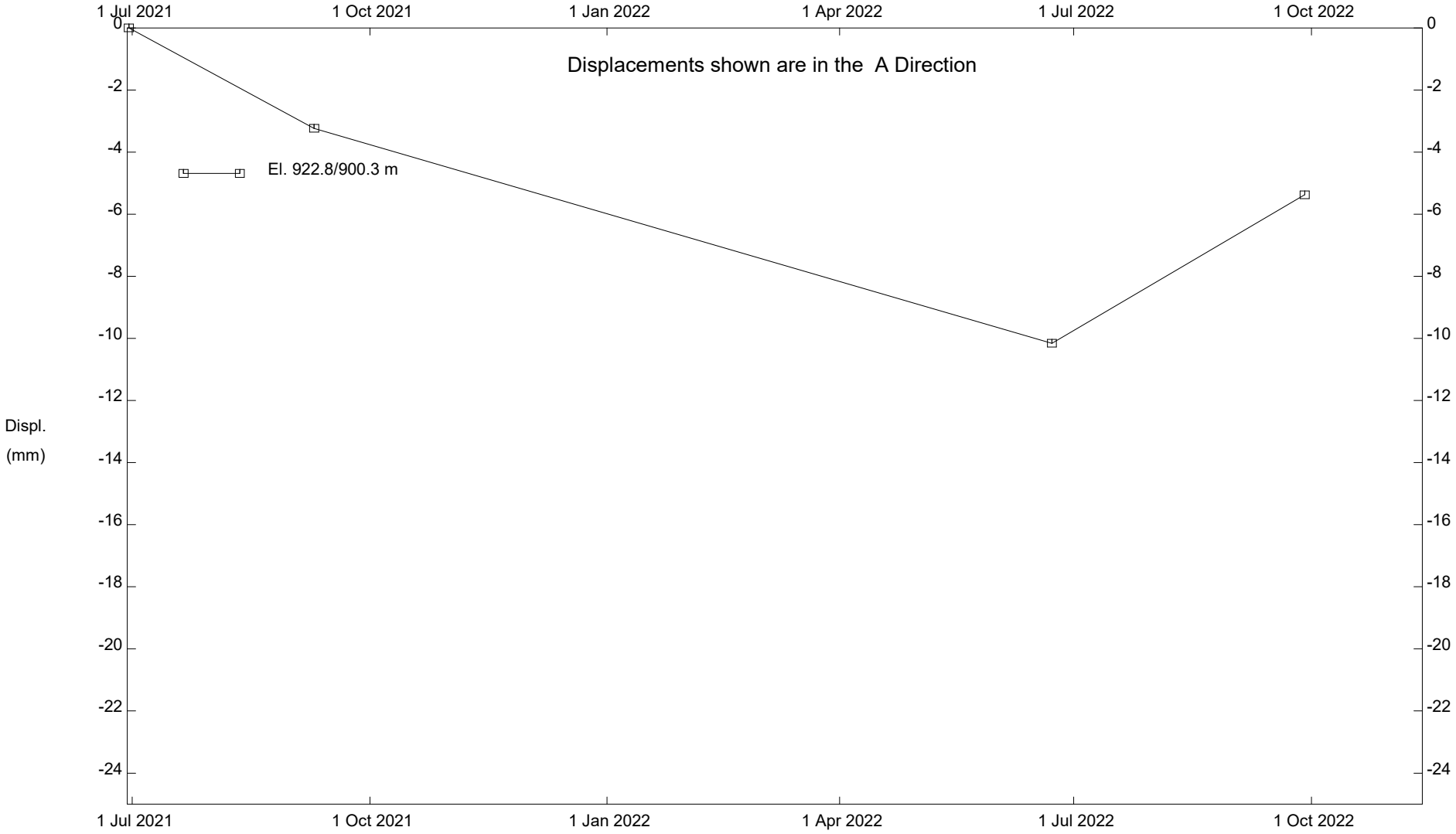
Klohn Crippen Berger - Edmonton



GP006; H40:36, Sheep Creek Embankment, Inclinometer SI19-1

Alberta Transportation

Klohn Crippen Berger - Edmonton



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Alberta Transportation

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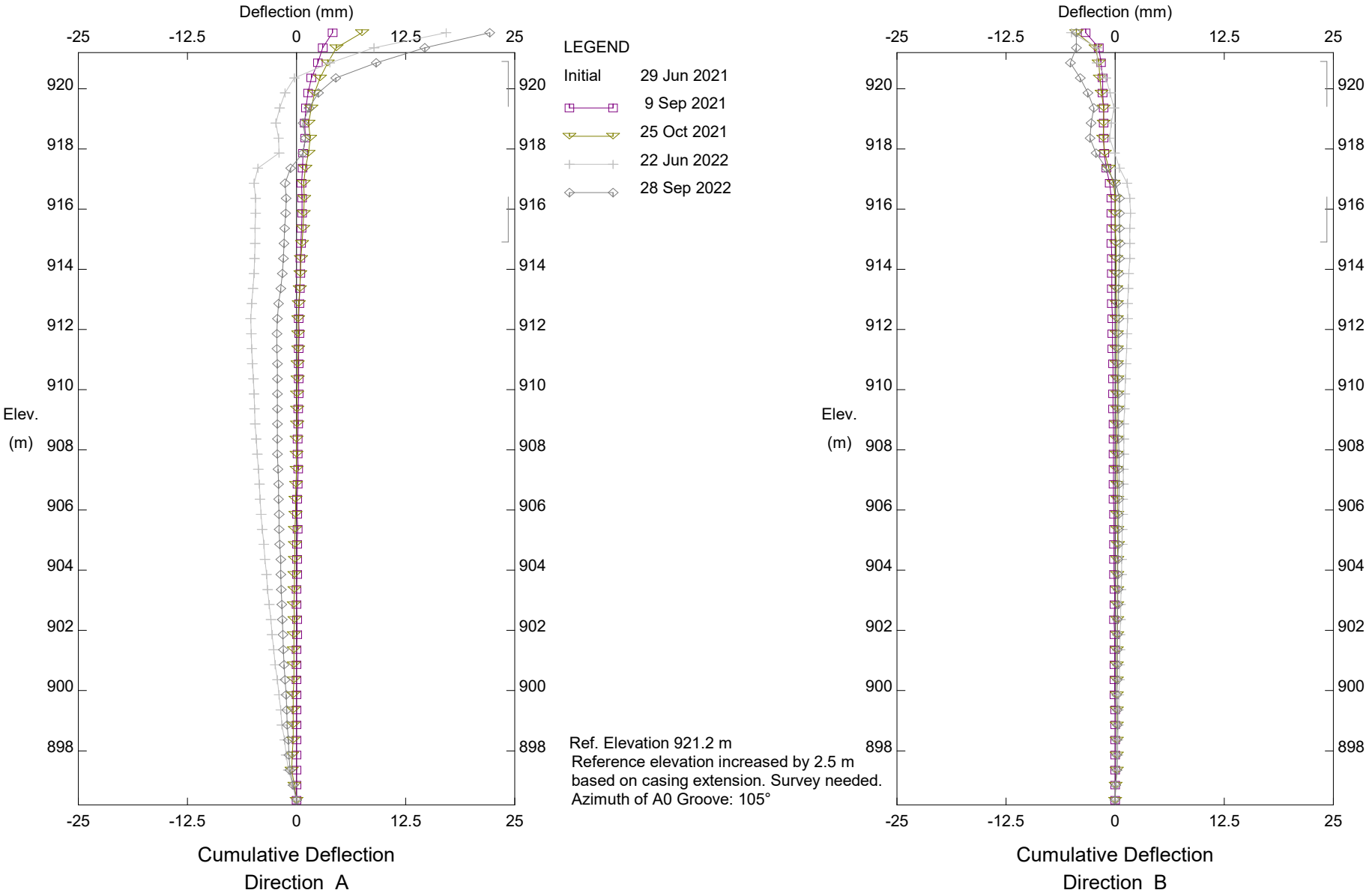

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Alberta Transportation

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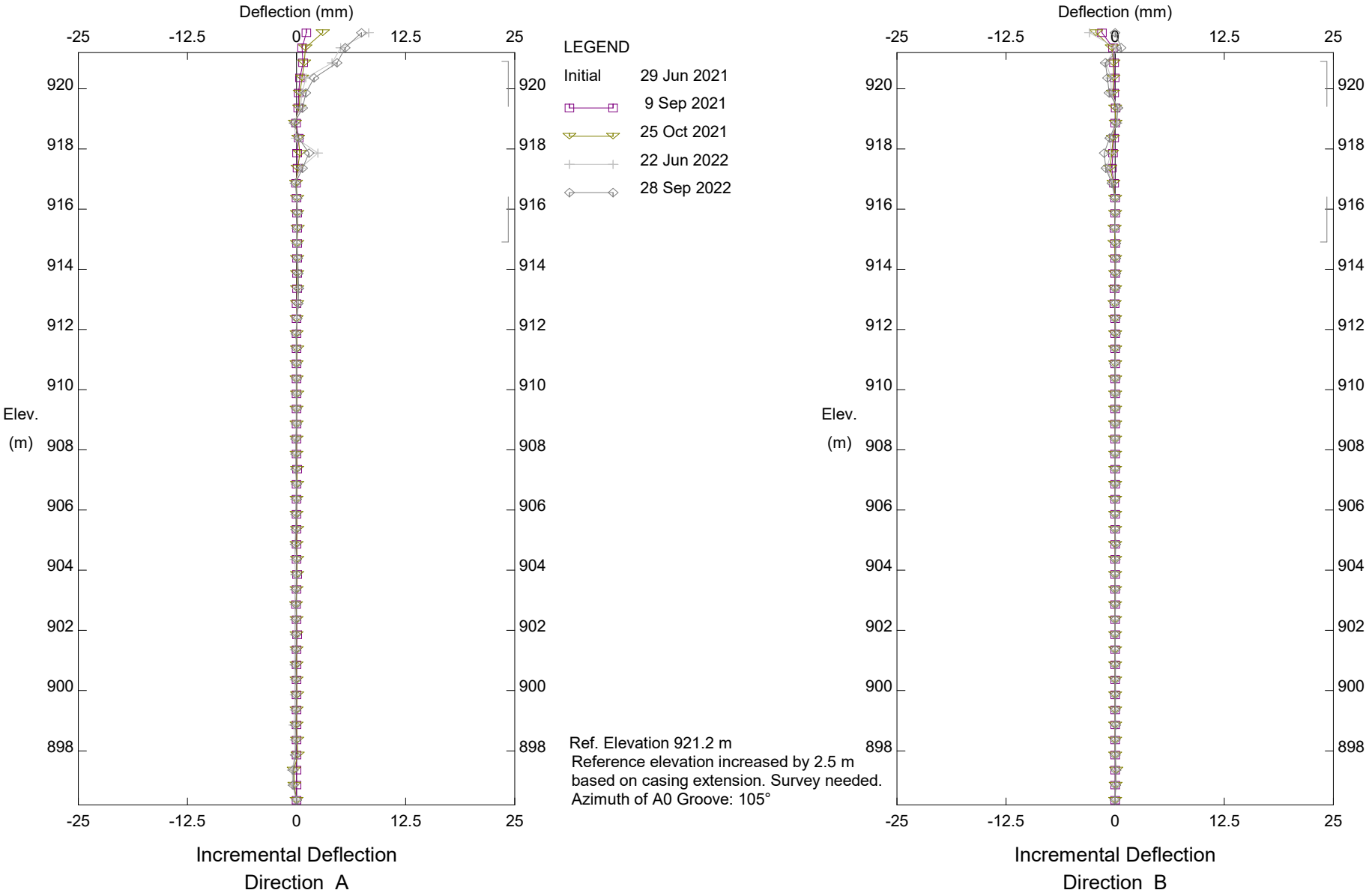

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Alberta Transportation

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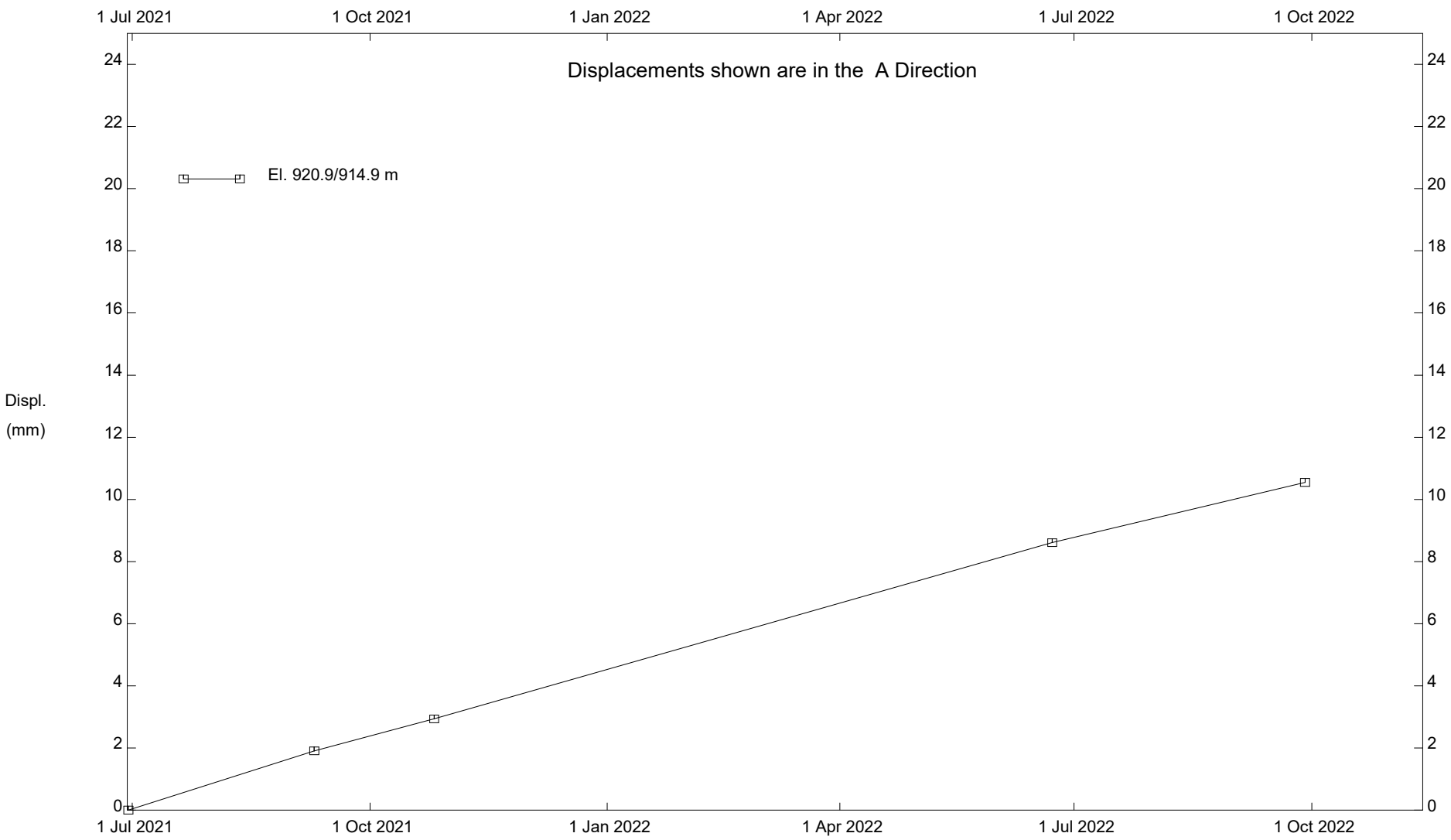
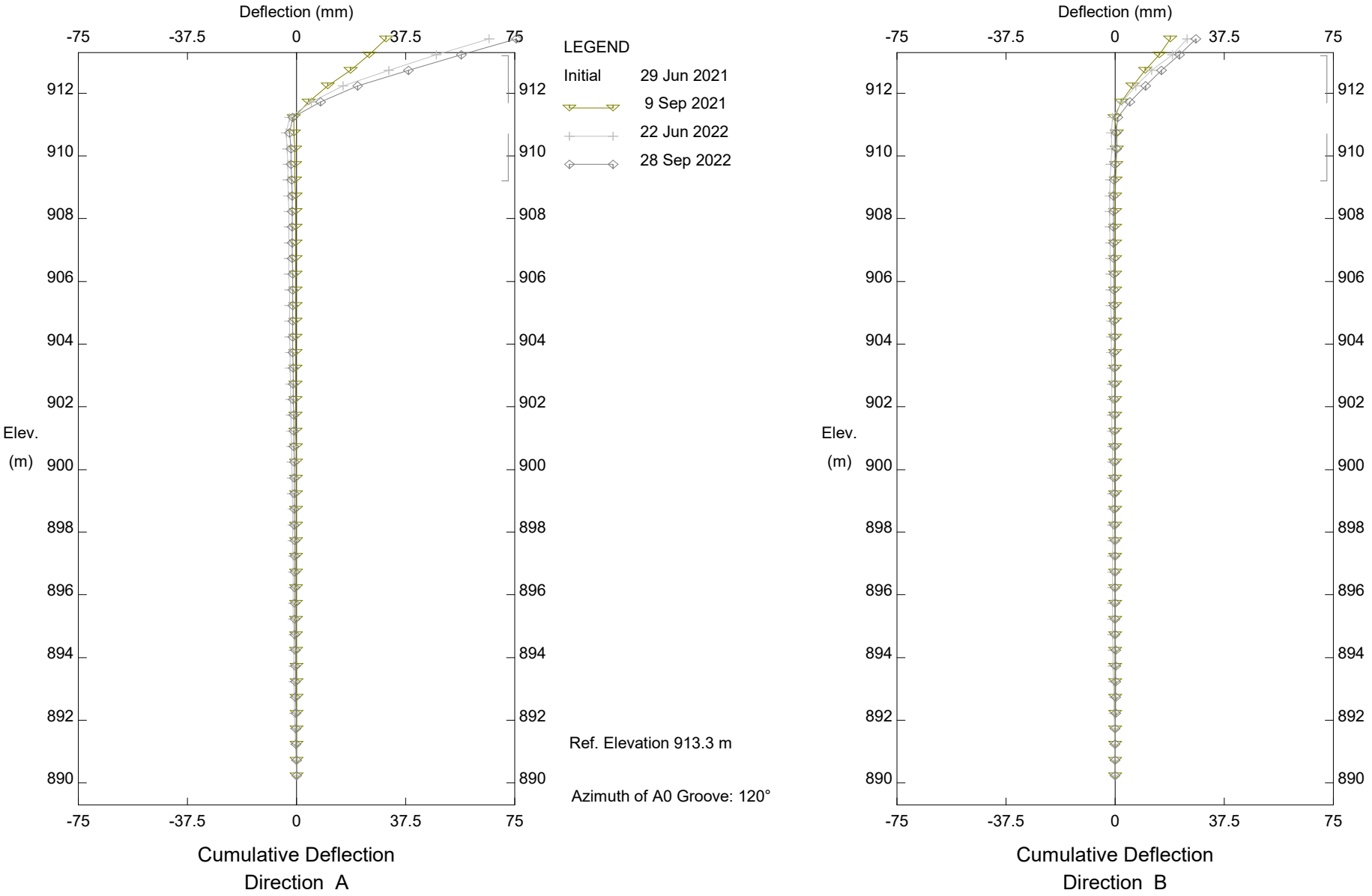


GP006; H40:36, Sheep Creek Embankment, Inclinometer SI19-2

Alberta Transportation

Klohn Crippen Berger - Edmonton



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Alberta Transportation

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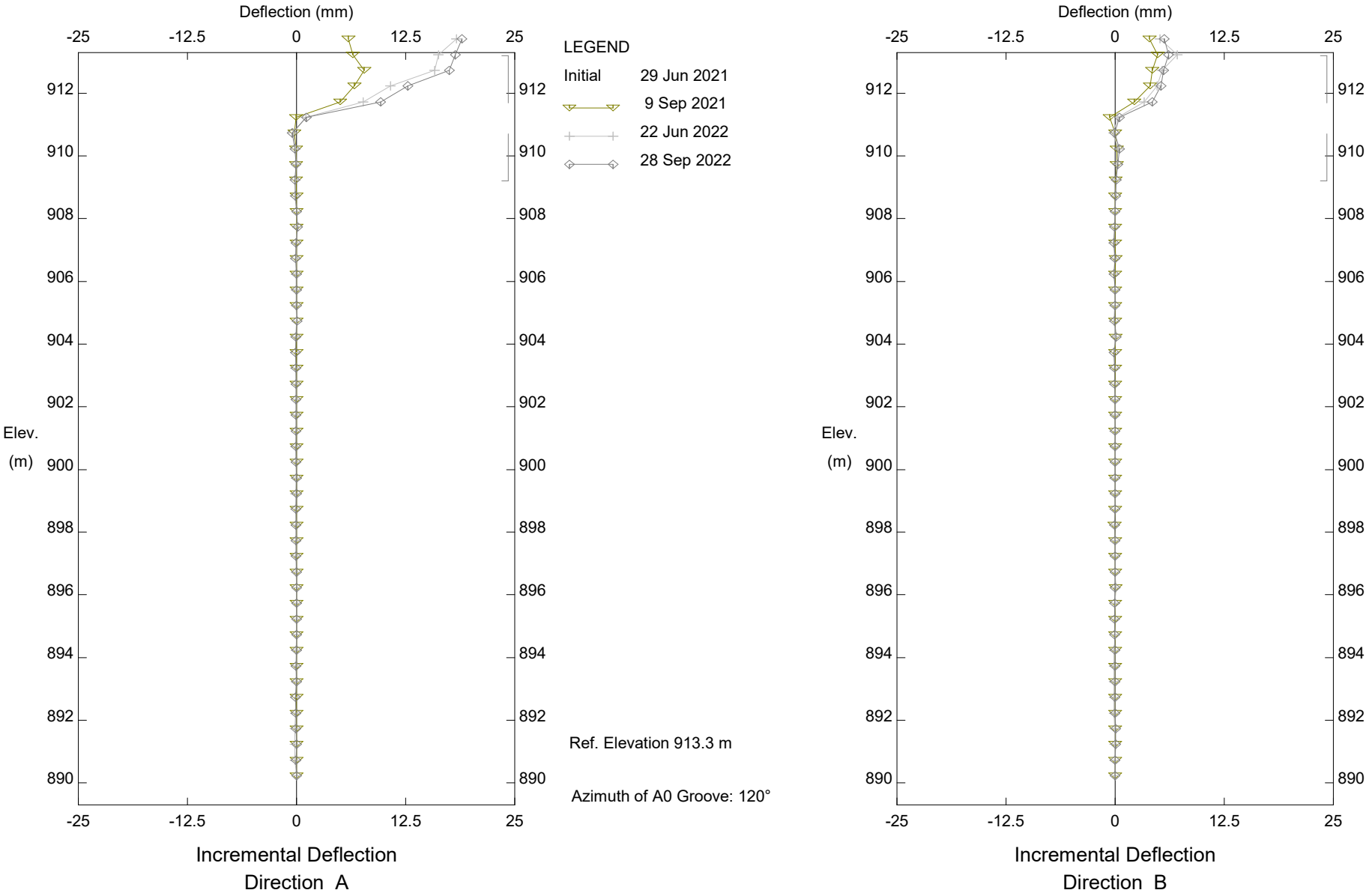

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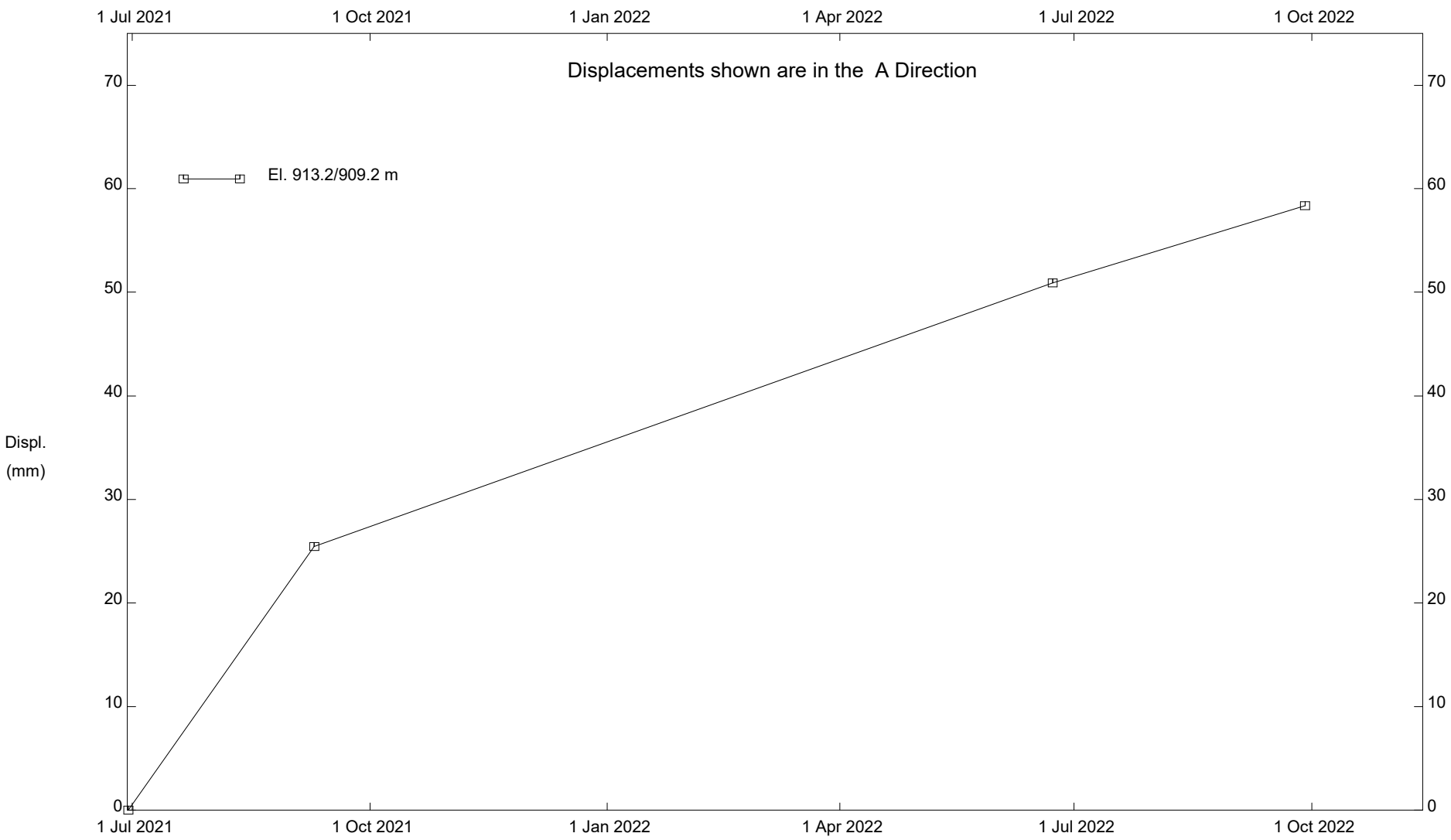
Alberta Transportation

Klohn Crippen Berger - Edmonton



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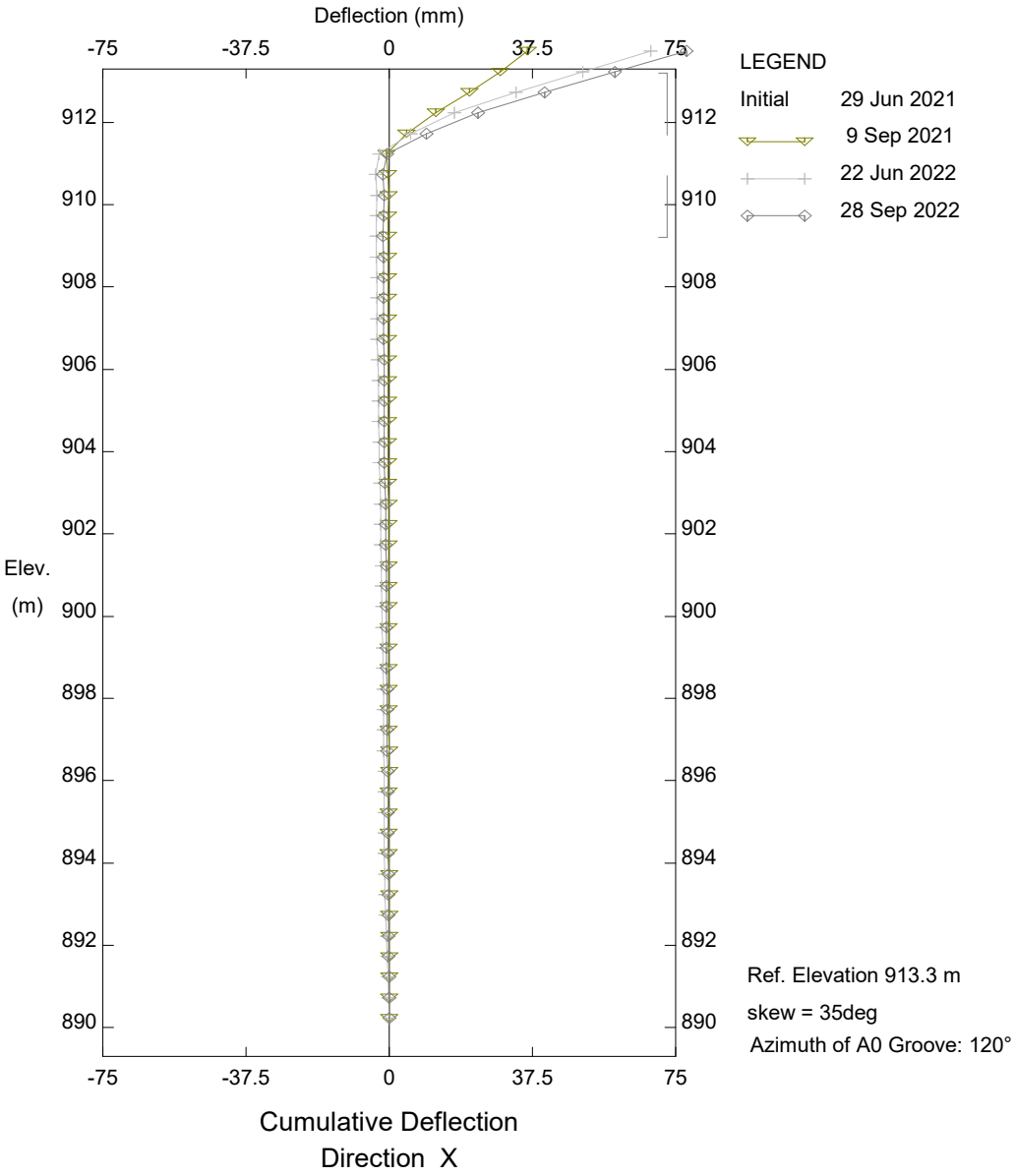

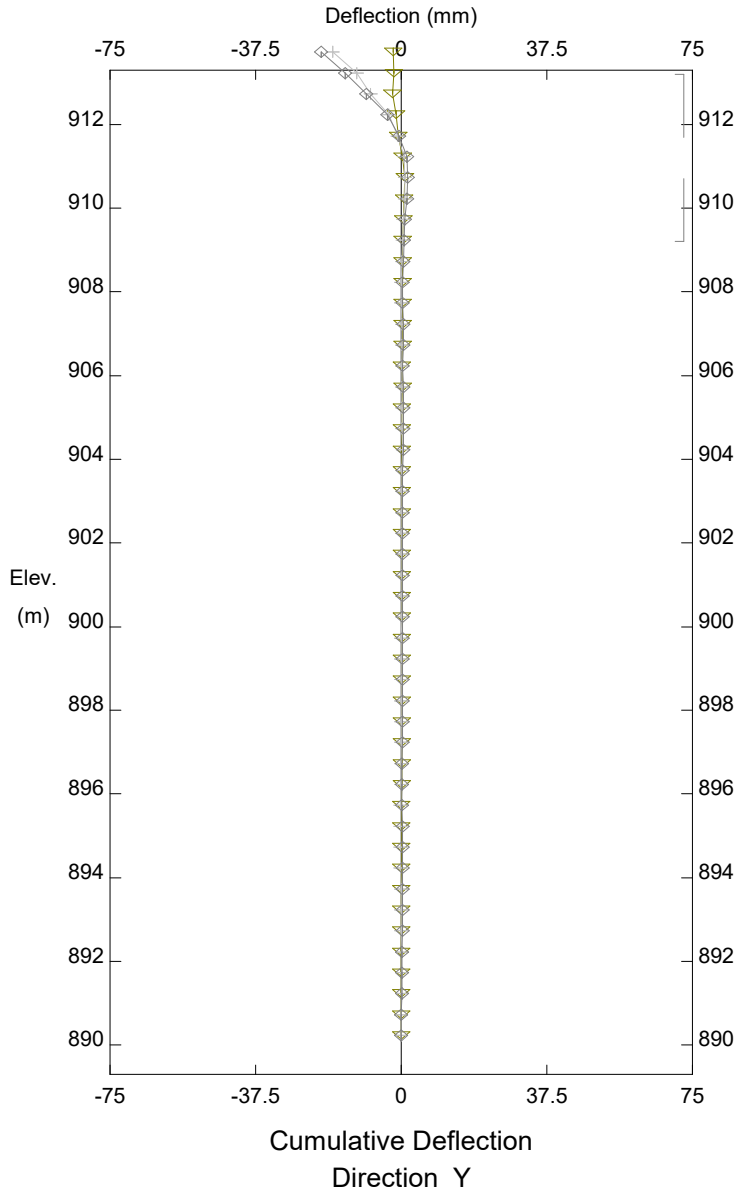

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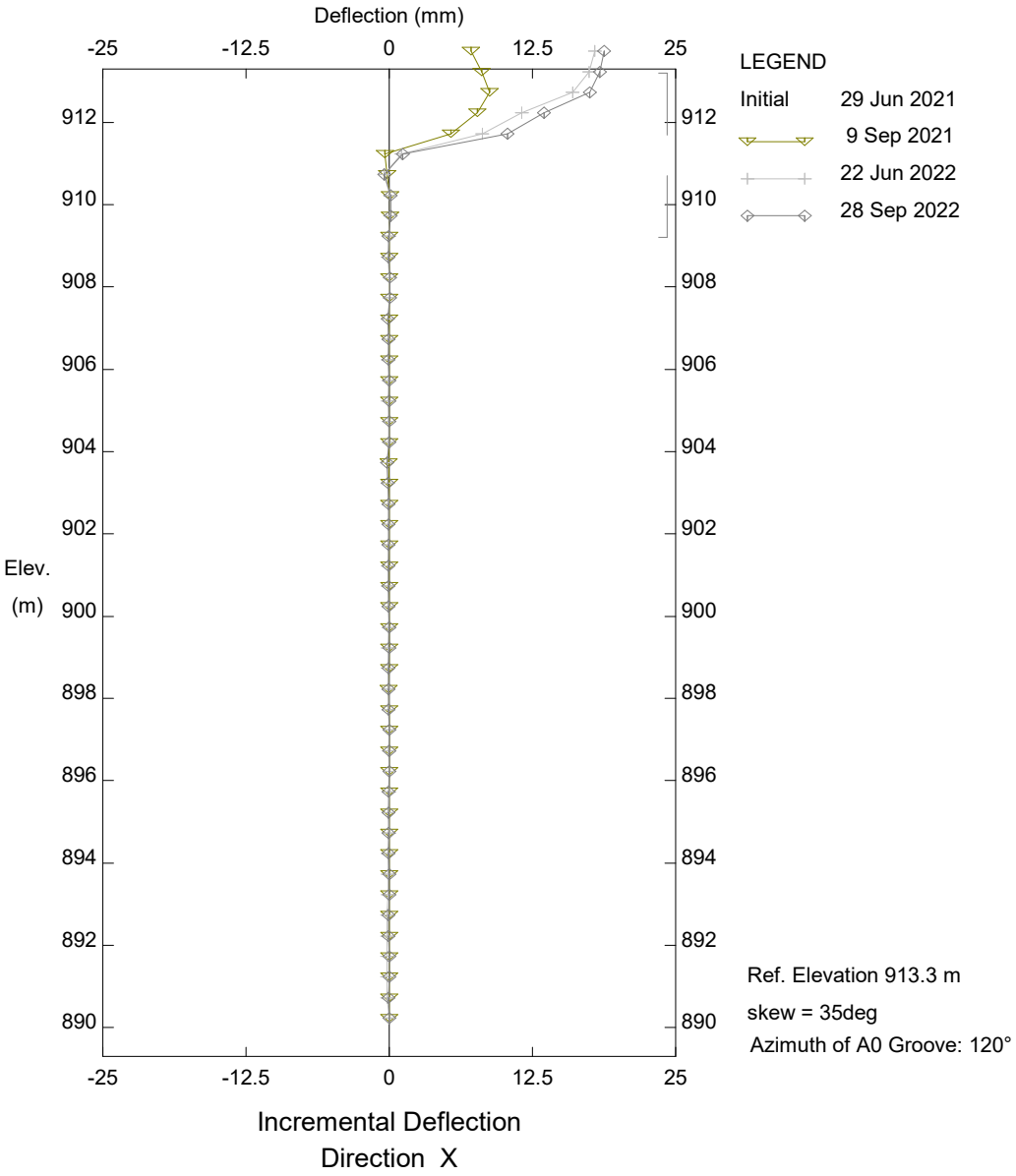

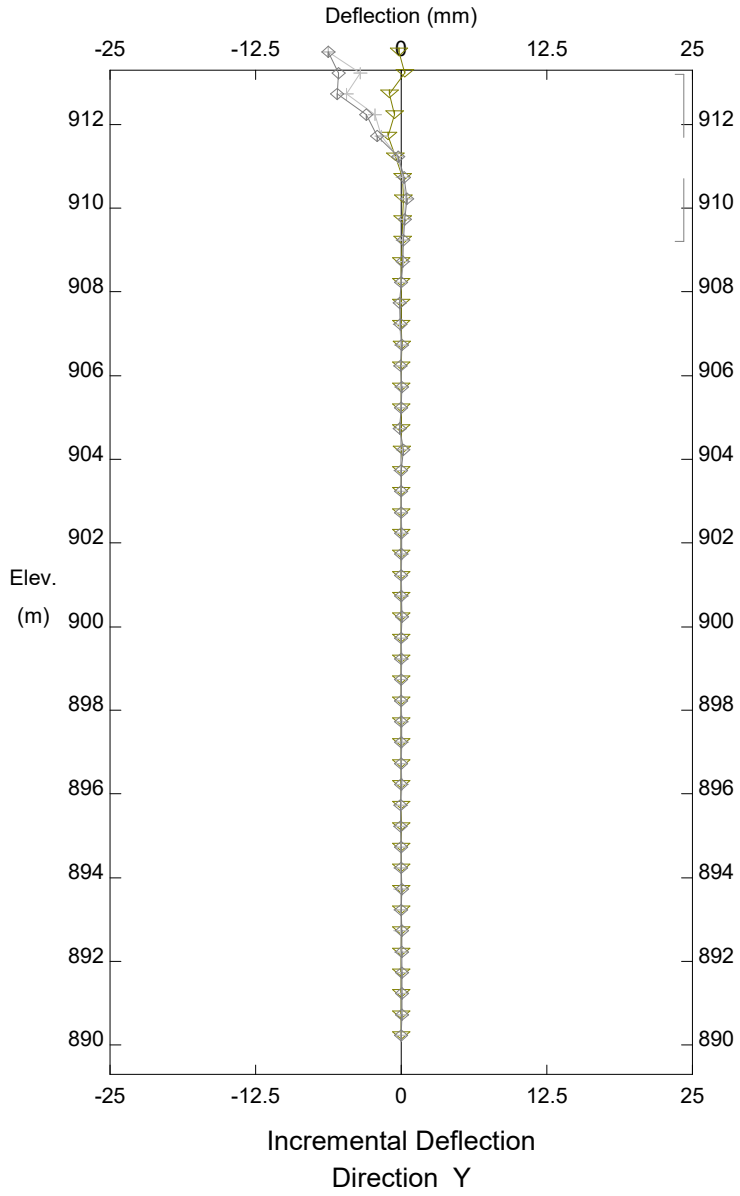

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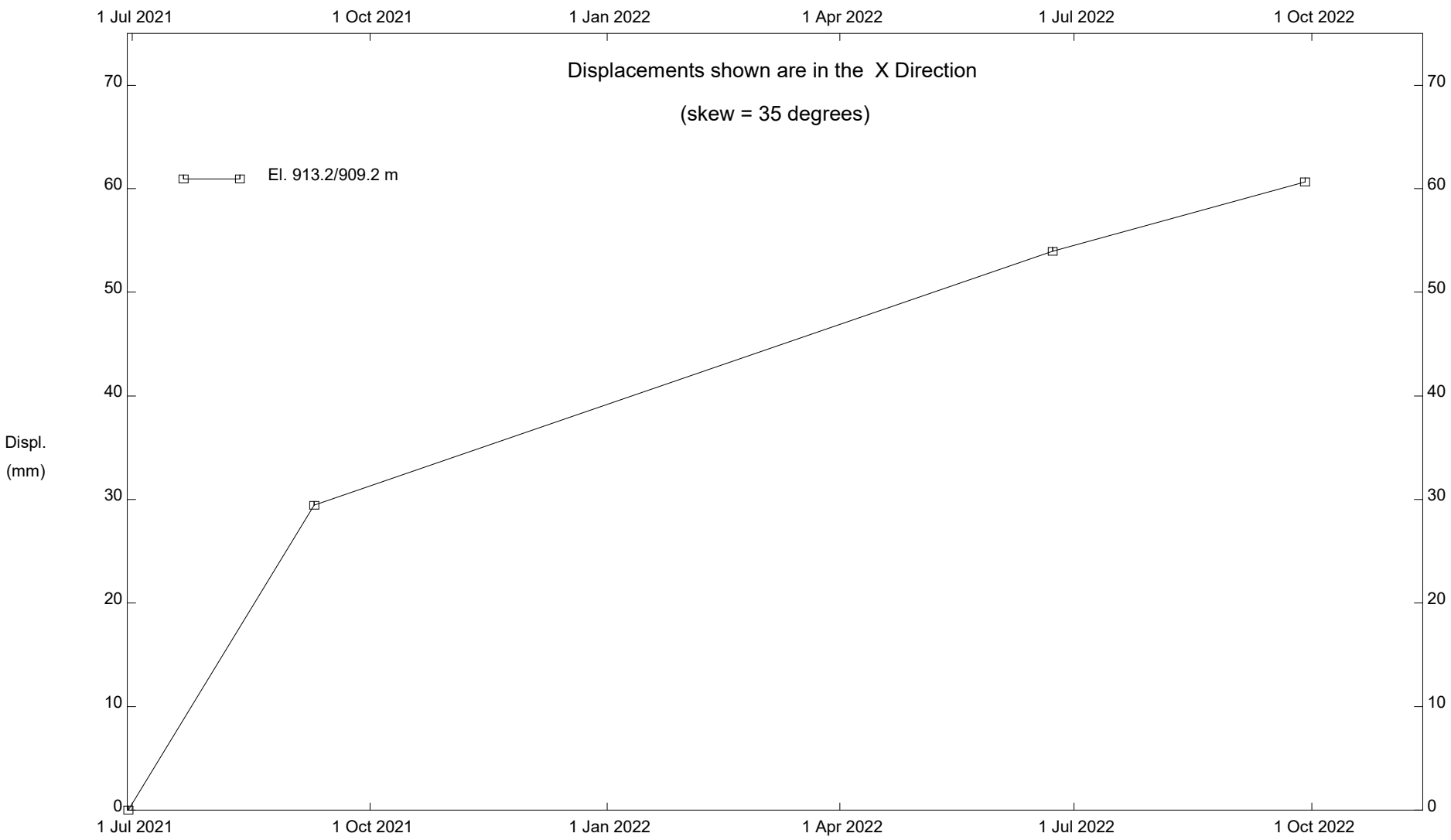

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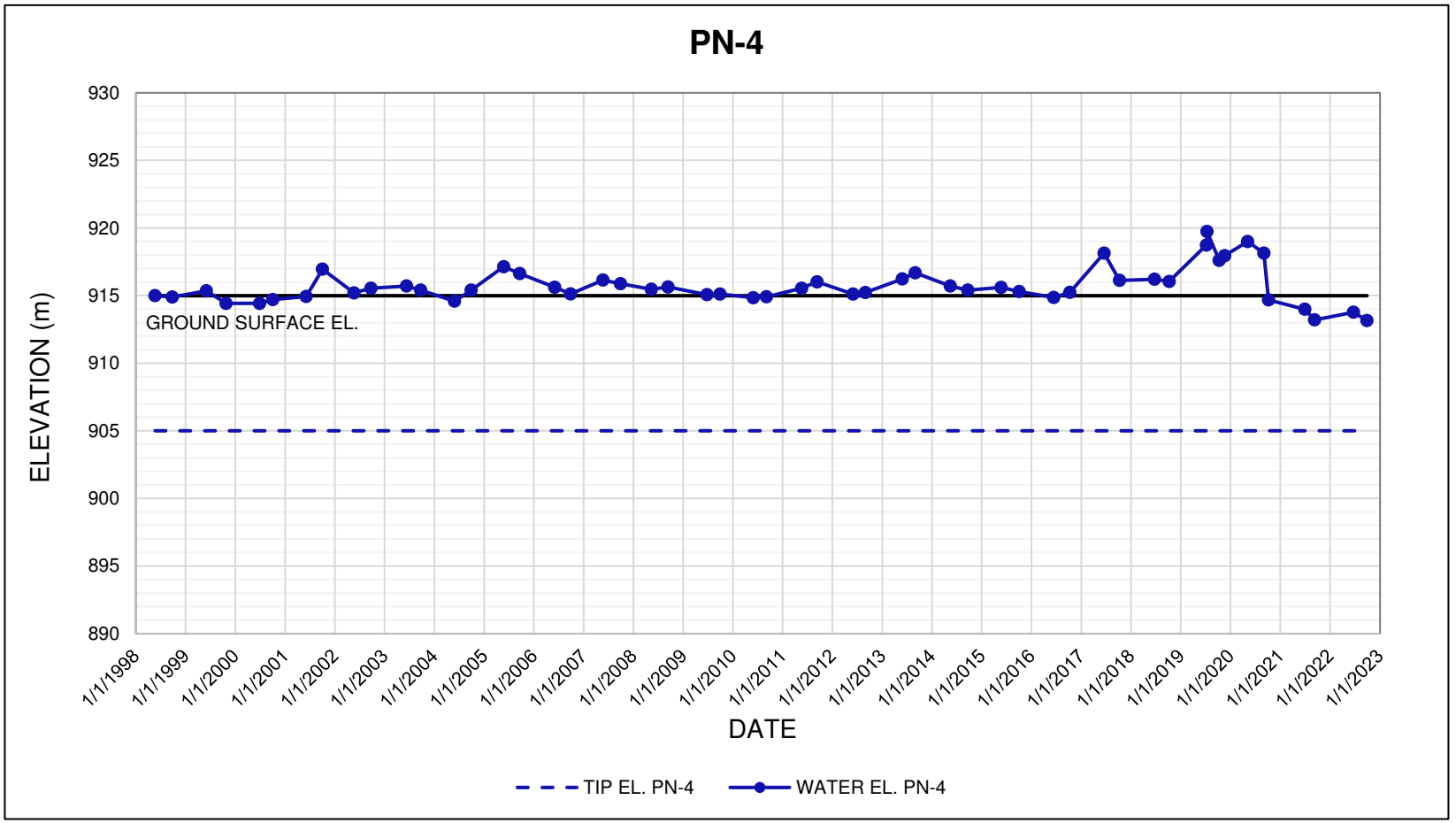
Alberta Transportation



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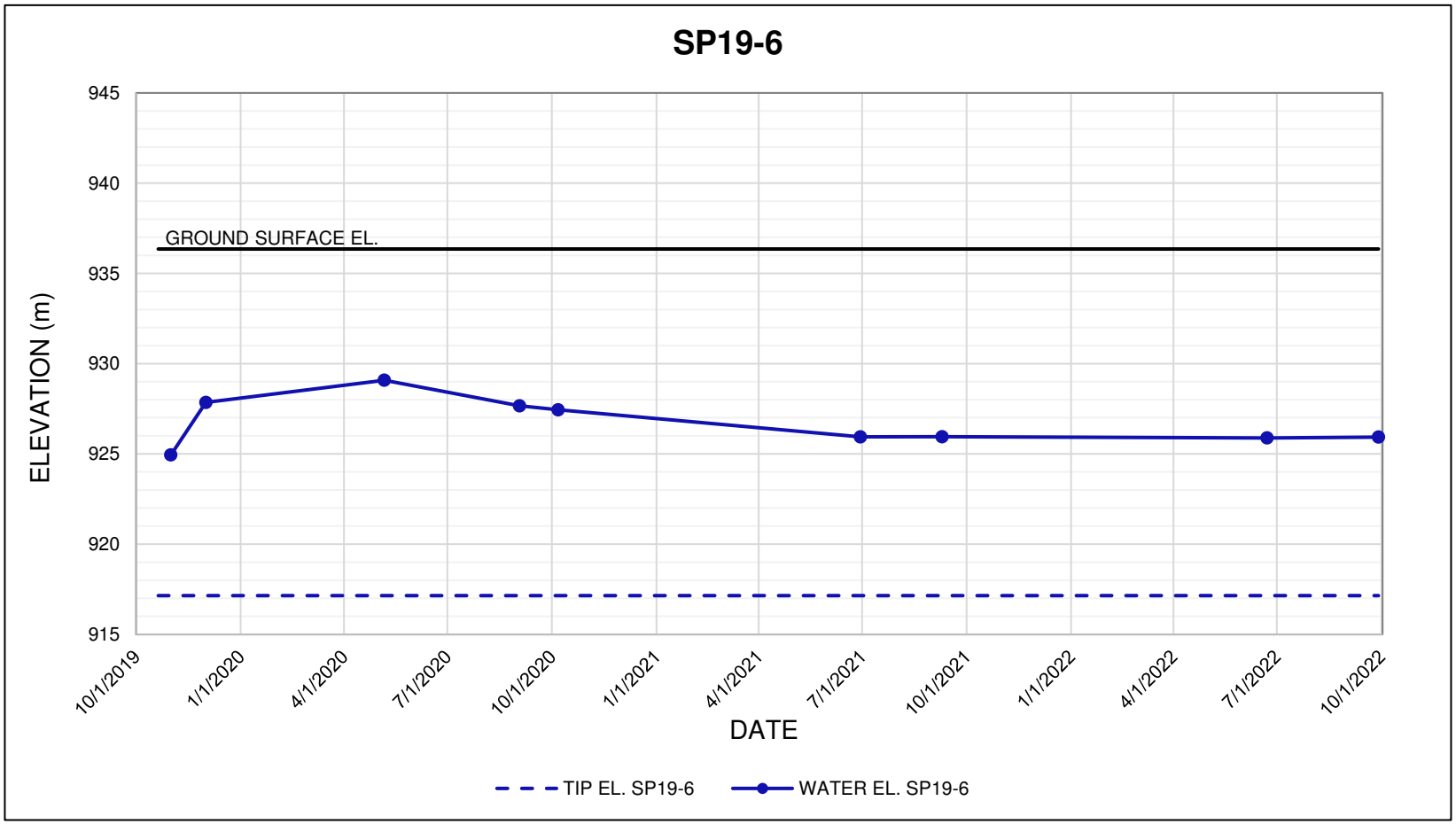
CLIENT: Alberta / Klohn Crippen Berger	PROJECT: PEACE REGION (GRANDE PRAIRIE DISTRICT - SOUTH) GEOHAZARD RISK MANAGEMENT PROGRAM	
	TITLE: Piezometer Data GP006 - Sheep Creek Embankment (Three Teardrops Slide) Hwy 40:36, km 21.779	
	SCALE: AS SHOWN	PROJECT No.: A05116A01
		FIG No.:



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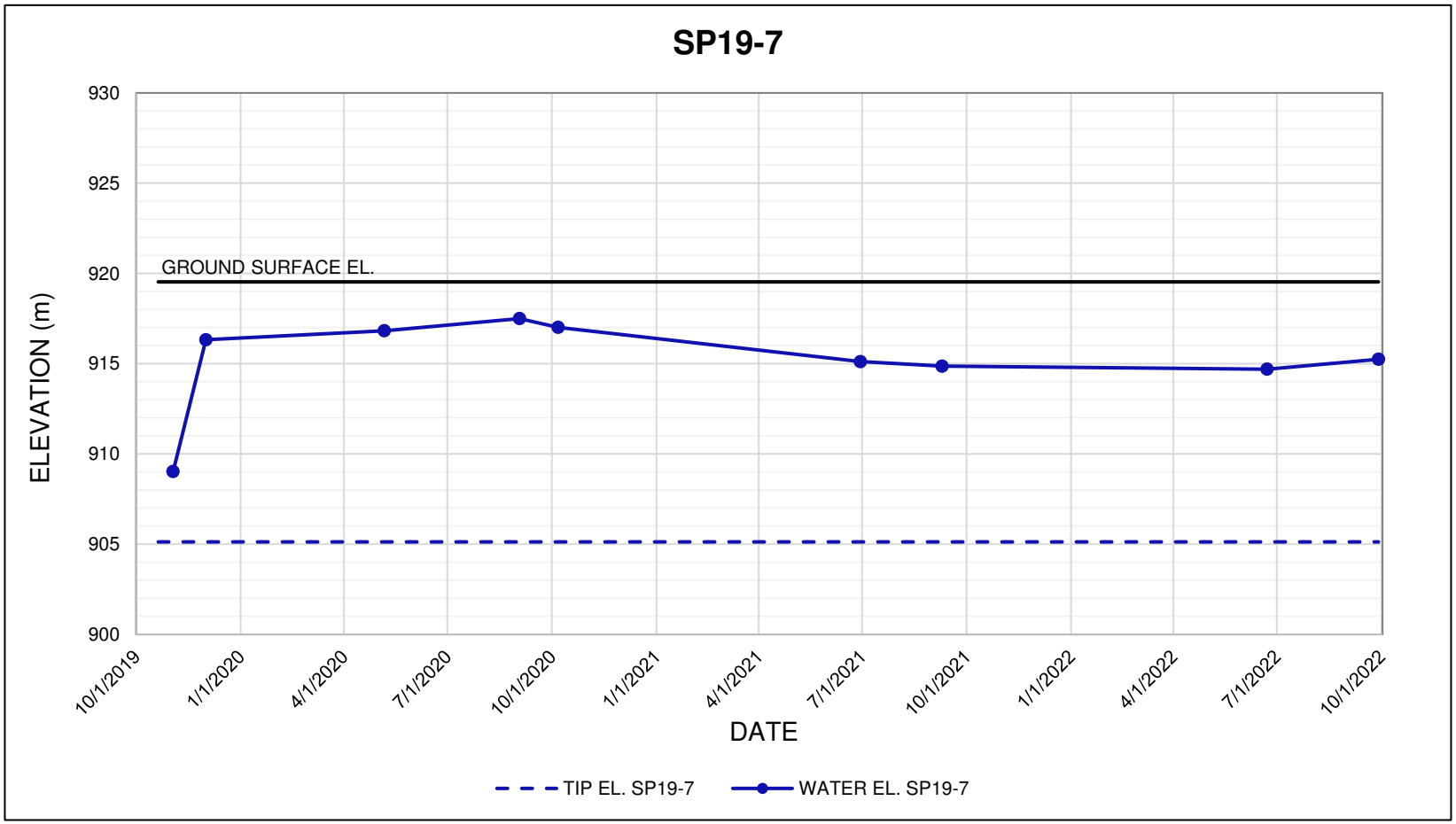
Alberta
Klohn Crippen Berger

PROJECT
PEACE REGION (GRANDE PRAIRIE DISTRICT - SOUTH)
GEOHAZARD RISK MANAGEMENT PROGRAM

TITLE
Piezometer Data
GP006 - Sheep Creek Embankment (Three Teardrops Slide)
Hwy 40:36, km 21.779

SCALE	PROJECT No.	FIG No.
AS SHOWN	A05116A01	



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PEACE REGION (GRANDE PRAIRIE DISTRICT - SOUTH)
GEOHAZARD RISK MANAGEMENT PROGRAM

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Piezometer Data
GP006 - Sheep Creek Embankment (Three Teardrops Slide)
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SCALE	PROJECT No.	FIG No.
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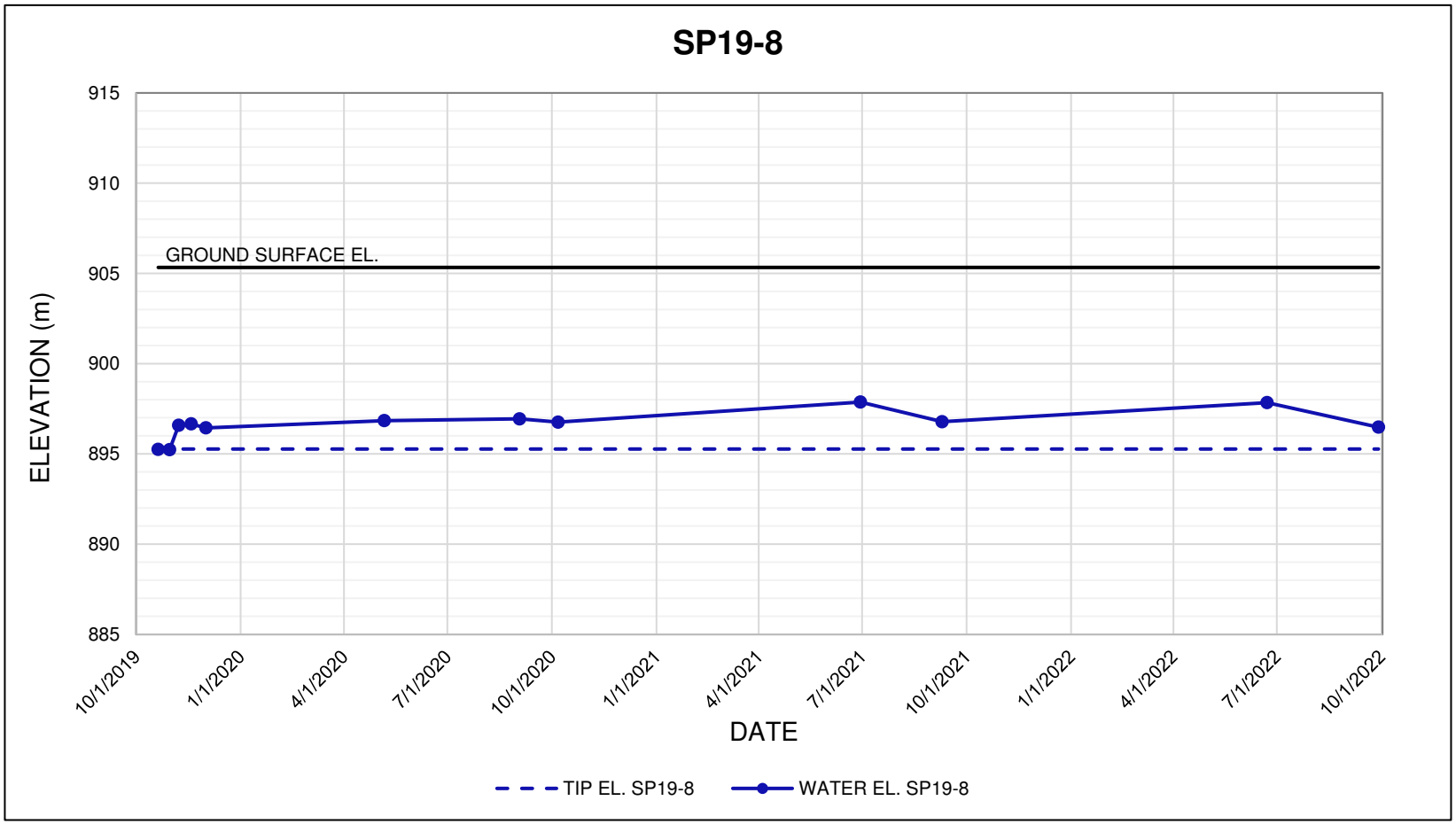

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GEOHAZARD RISK MANAGEMENT PROGRAM

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GP006 - Sheep Creek Embankment (Three Teardrops Slide)
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SCALE	PROJECT No.	FIG No.
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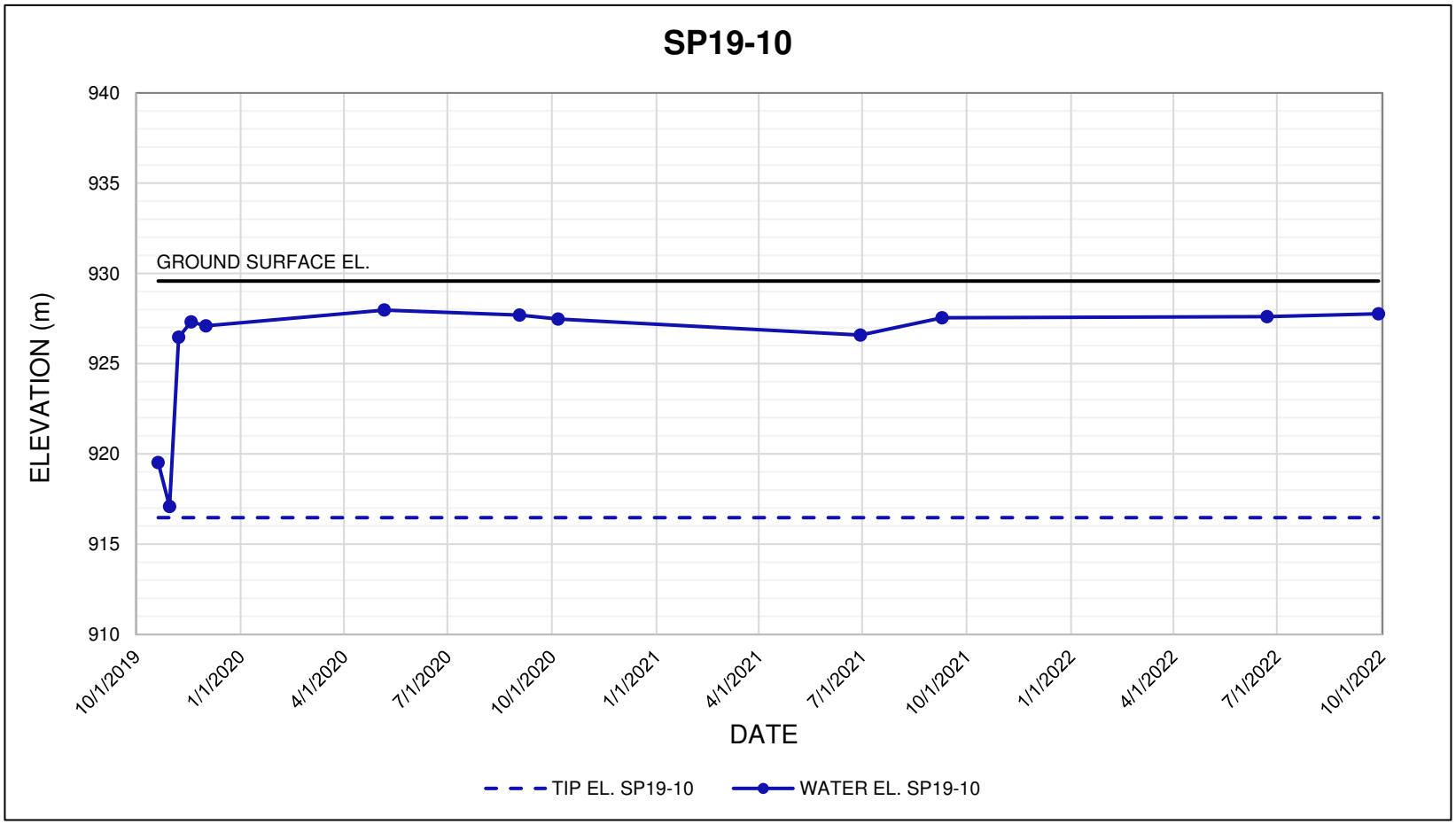

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PEACE REGION (GRANDE PRAIRIE DISTRICT - SOUTH)
GEOHAZARD RISK MANAGEMENT PROGRAM

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Piezometer Data
GP006 - Sheep Creek Embankment (Three Teardrops Slide)
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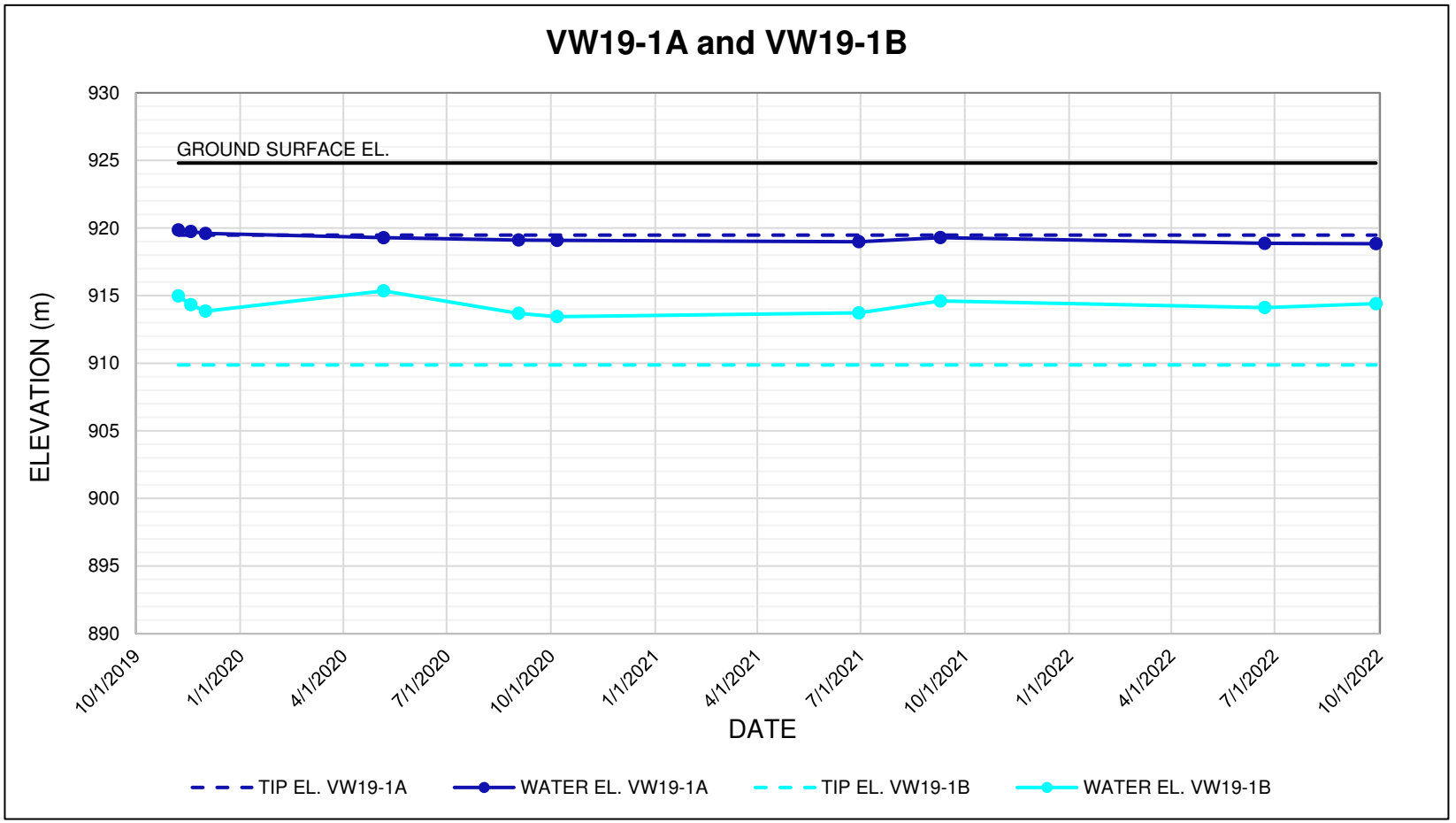

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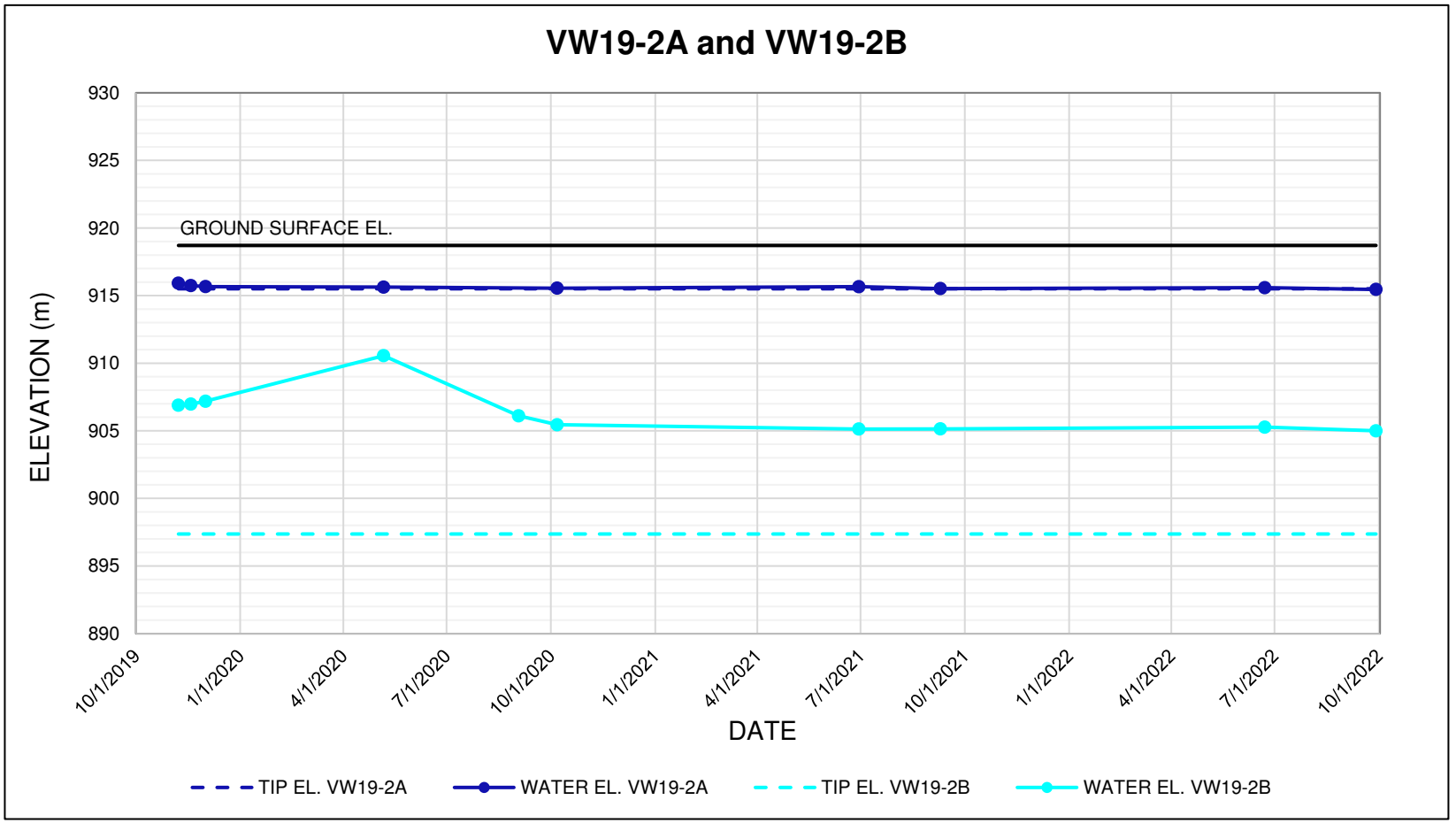

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Klohn Crippen Berger

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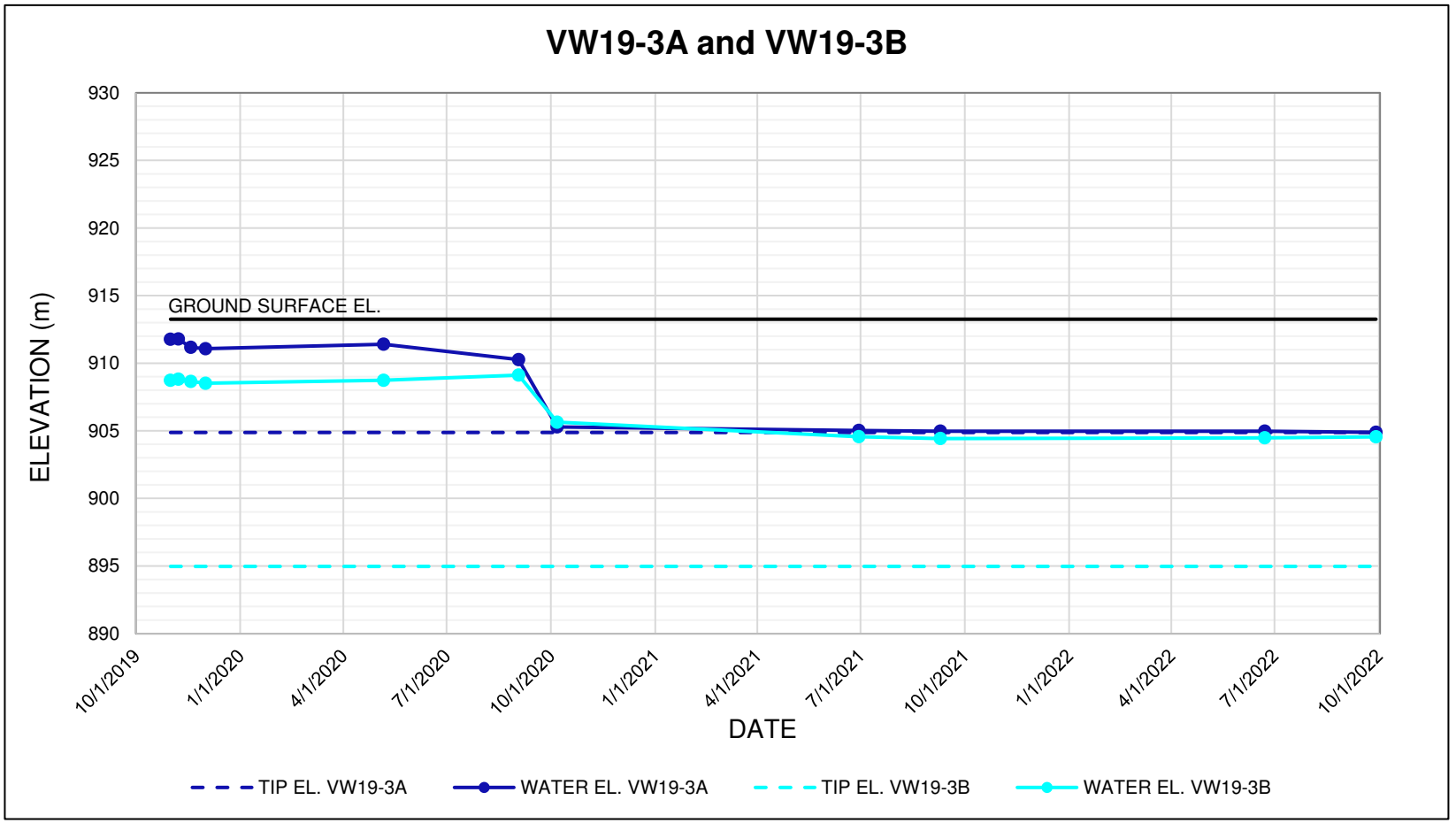

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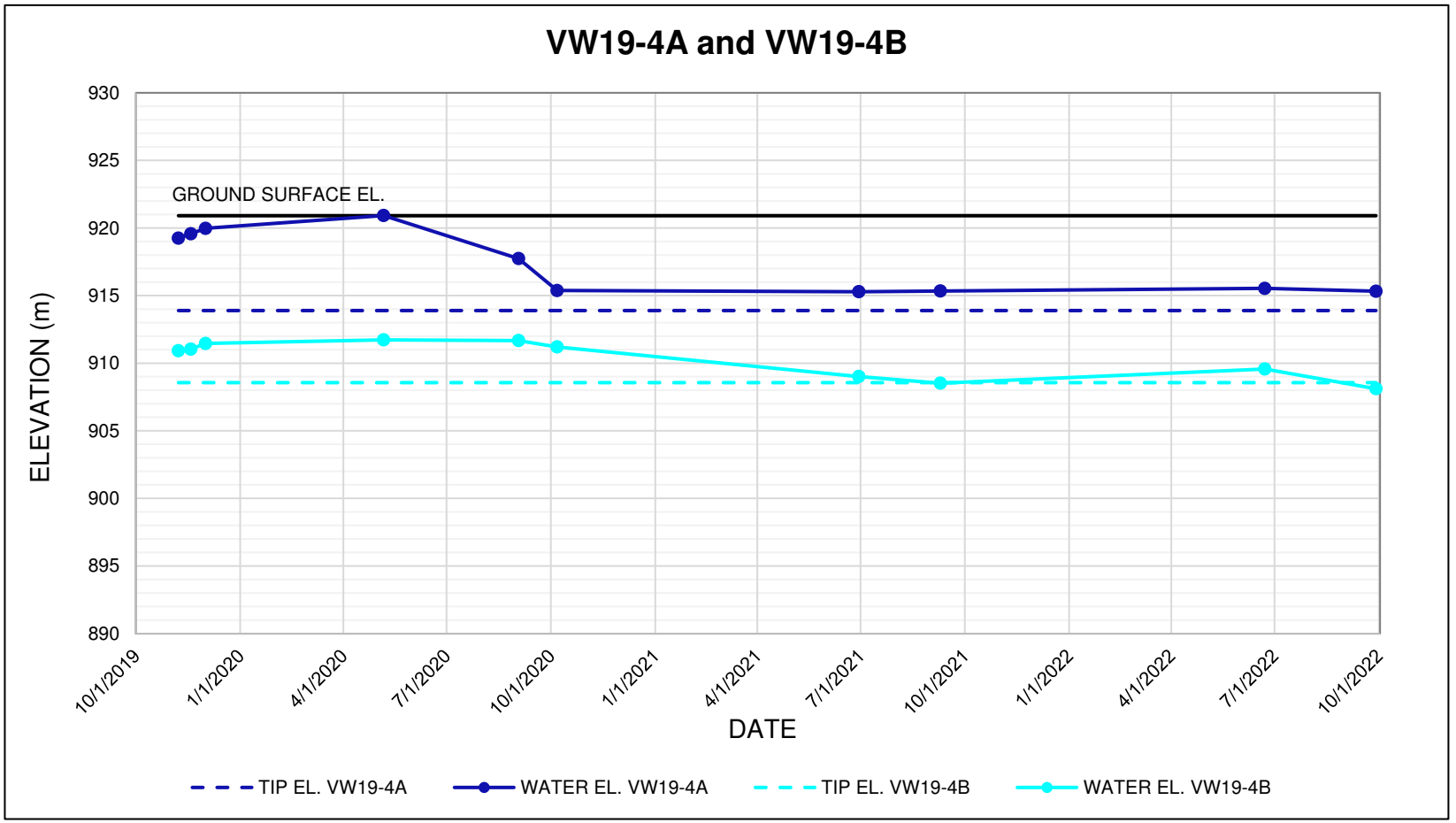

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GP006 - Sheep Creek Embankment (Three Teardrops Slide)
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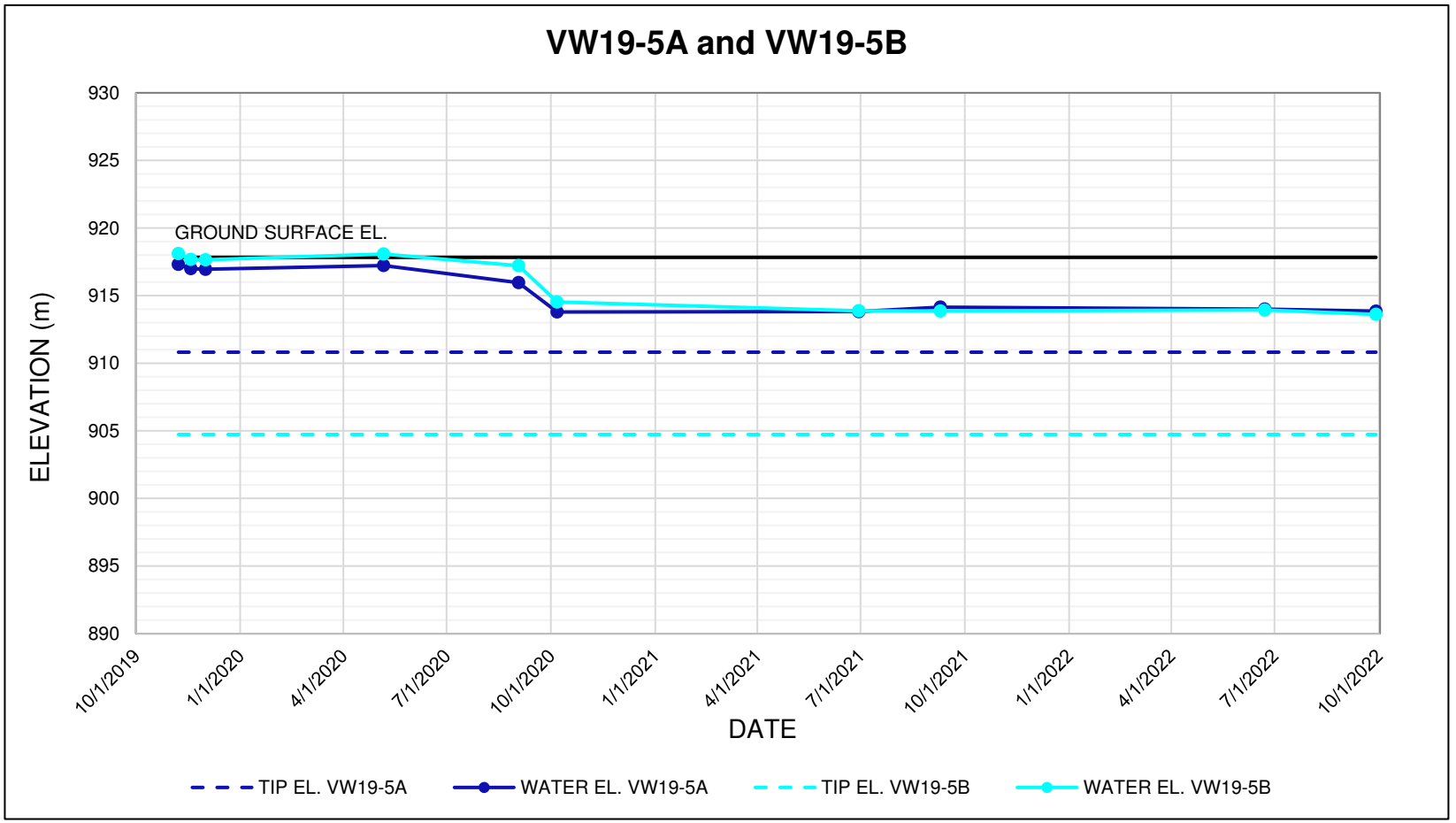

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