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APPENDIX 11

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Annual Subsidence Monitoring Report for Tahmoor South LW S3A
1 January to 31 December 2025

Summary	
Monitoring period	1 January to 31 December 2025
Mining status	LW 3A commenced extraction on 8 May 2024 LW 3A completed extraction on 17 December 2024 Tahmoor Mine was in care and maintenance during 2025

Summary of observed ground movements

Subsidence Parameter		Maximum observed during LW S3A	Location
Subsidence (mm)	Inc Total	805 1105	Main Southern Railway GNSS S26
Tilt (mm/m)	Inc Total	7.0 7.2	Remembrance Drive Remembrance Drive and Main Southern Railway
Hogging Curvature (km^{-1})	Inc Total	0.37 0.39	Main Southern Railway Main Southern Railway
Sagging Curvature (km^{-1})	Inc Total	-0.23 -0.22	Main Southern Railway Main Southern Railway
Tensile Strain (mm/m)	Inc Total	0.6 0.9	Remembrance Drive, Main Southern Railway & Caloola Rd Main Southern Railway
Compressive Strain (mm/m)	Inc Total	-2.2 -2.9	Remembrance Drive Remembrance Drive
Change in subsidence during 2025 (mm)		48 mm	Main Southern Railway

This monitoring report provides the results of the latest ground surveys for LW S3A during 2025, in accordance with the requirements of subsidence management plans.

Longwall face position

LW S3A commenced on 8 May 2024 and completed extraction on 17 December 2024. The mine layout and the monitoring peg positions are shown in Drawing No. MSEC1430-01.

Monitoring results

Ground monitoring was undertaken within the active subsidence zone of LW S3A. Maximum subsidence parameters for monitoring lines surveyed during 2025 are summarised in Table 1.

Table 1 Summary of maximum observed subsidence parameters

Monitoring Line		Maximum observed subs (mm)	Maximum observed tilt (mm/m)	Maximum observed hogging curvature (km^{-1})	Maximum observed sagging curvature (km^{-1})	Maximum observed tensile strain (mm/m)	Maximum observed comp. strain (mm/m)
Main Southern Railway (last survey 16-Dec-25)	Inc Total	805 1015	6.7 7.2	0.37 0.39	-0.23 -0.22	0.6 0.9	-1.7 -2.6
Remembrance Drive (last survey 12-Jan-25)	Inc Total	773 830	7.0 7.2	0.09 0.19	-0.12 -0.20	0.6 0.5	-2.2 -2.9
V-Line (last survey 30-Jan-25)	Inc Total	399 1004	1.4 7.0	0.03 0.07	-0.03 -0.15	0.2 1.1	-0.3 -2.2
Caloola Road (last survey 14-Jan-25)	Inc Total	510 565	5.1 5.2	0.13 0.13	-0.04 -0.04	0.6 0.7	-0.8 -0.8
Charlies Point Road (last survey 07-Jan-25)	Inc Total	23 69	0.4 0.6	0.04 0.05	-0.03 -0.04	0.2 0.4	-0.4 -0.4
Great Southern Road (last survey 09-Jan-25)	Inc	40	0.8	0.04	-0.08	0.3	-0.4
Yarran Road (last survey 14-Jan-25)	Inc	27	0.2	0.02	-0.01	0.2	-0.3

Ground survey results

Ground monitoring was undertaken within the active subsidence zone of LW S3A. Monitoring results are shown graphically at the back of this report.

The spatial distribution of incremental subsidence is shown in Drawing No. MSEC1430-02. Total subsidence is shown in Drawing No. MSEC1430-03.

Changes in subsidence during 2025 are shown in Drawing No. MSEC1430-04. It can be seen that the maximum observed increase in subsidence was along the Main Southern Railway. It is noted, however, that surveys were conducted along the Railway regularly throughout 2025 while surveys along streets ceased in January 2025, in accordance with management plans and in consultation with infrastructure owners. It is likely that residual subsidence gradually continued to increase above LW S3A along the streets, as was observed along the Main Southern Railway and at the continuously operating GNSS units.

Observed development of subsidence above LW S3A is shown in Figure A. Observed subsidence has developed within predictions. Rates of change in subsidence have reduced to low levels along the Main Southern Railway. It is likely that Remembrance Drive continued to experience gradually developing residual subsidence since the last survey was conducted in January 2025, following trends that were observed along the Main Southern Railway.

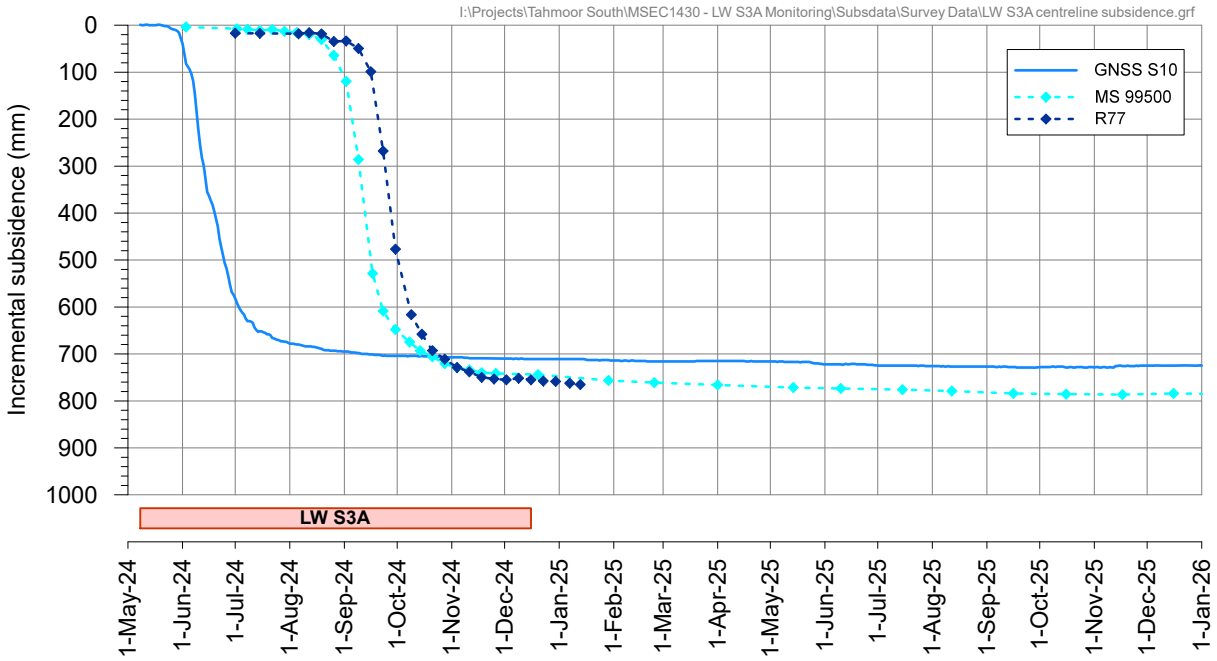

Figure A Development of subsidence along centreline of LW S3A

GNSS monitoring

Global Navigation Satellite System (GNSS) units are fixed survey stations that continuously measure their absolute horizontal and vertical positions in real time. There are 28 units located directly above and adjacent to LW S1A to S6A. These include two units above the commencing end of LW S3A, being Sites S09 and S10.

The measured position of each GNSS unit varies depending on atmospheric conditions and the array of satellites that are present in the sky at each time, and the vegetation cover surrounding each unit. Measured variations in height are typically greater than the variations for eastings and northings.

The results from the GNSS units are shown in Fig. S01 to Fig. S27 and Fig. TM at the back of this report. Mining-induced movements have developed at the GNSS units, with maximum measured incremental subsidence due to the mining of LW S3A of 724 mm at Site S10 above LW S3A. Rates of change at Site S10 have reduced to low levels, with 13 mm of additional subsidence observed between January and December 2025.

Observed changes in subsidence during 2025 are shown in Figure B. It can be seen that residual subsidence has developed gradually during 2025, as expected. Rates of change in subsidence have reduced to low levels. Maximum observed additional subsidence of 28 mm was observed at Site S27, which is located on the Main Southern Railway above previously extracted LW S2A.

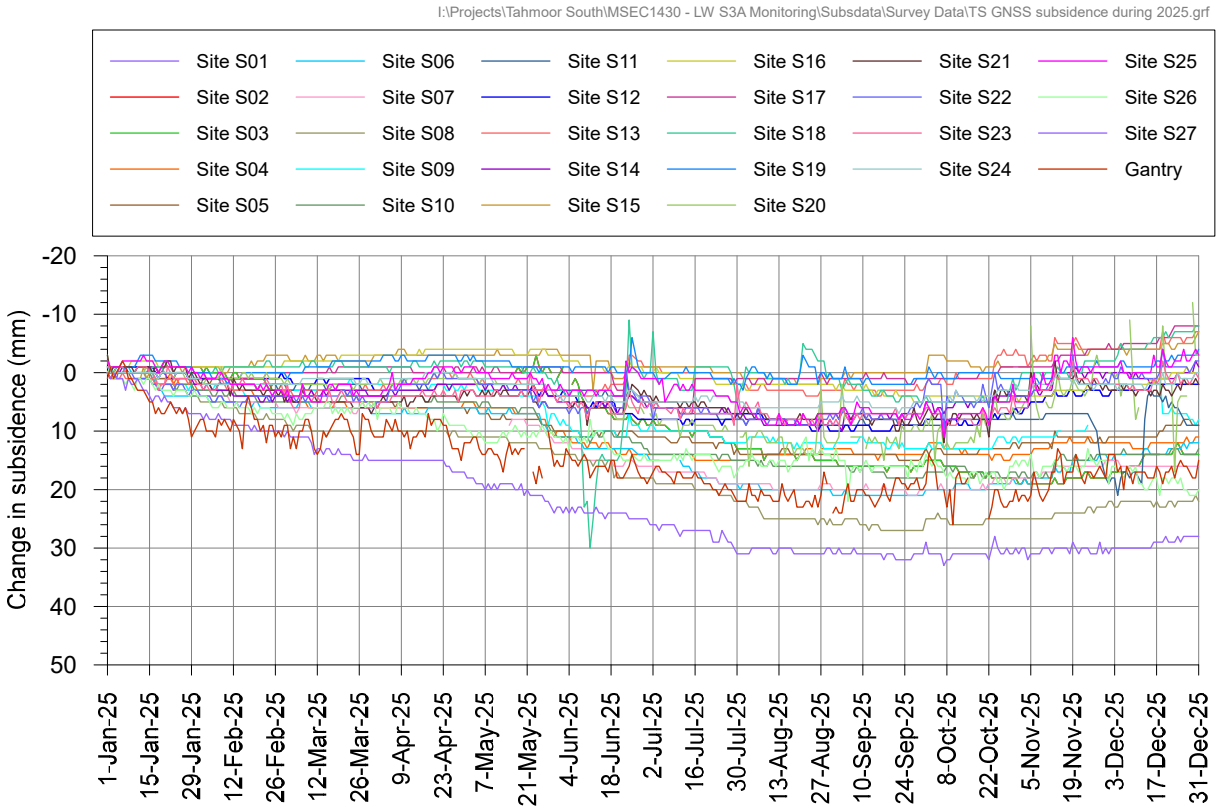

Figure B Observed changes in subsidence at GNSS units during 2025

Changes in horizontal distances can be calculated between GNSS units that are located close together and results are shown in Figure C. Closure has developed across the Tributary to Teatree Hollow (Wirrimbirra Creek). The greatest closure across Wirrimbirra Creek during the mining of LW S3A occurred between Sites S09 and S10, which are located directly above LW S3A. Rates of change have reduced at all sites.

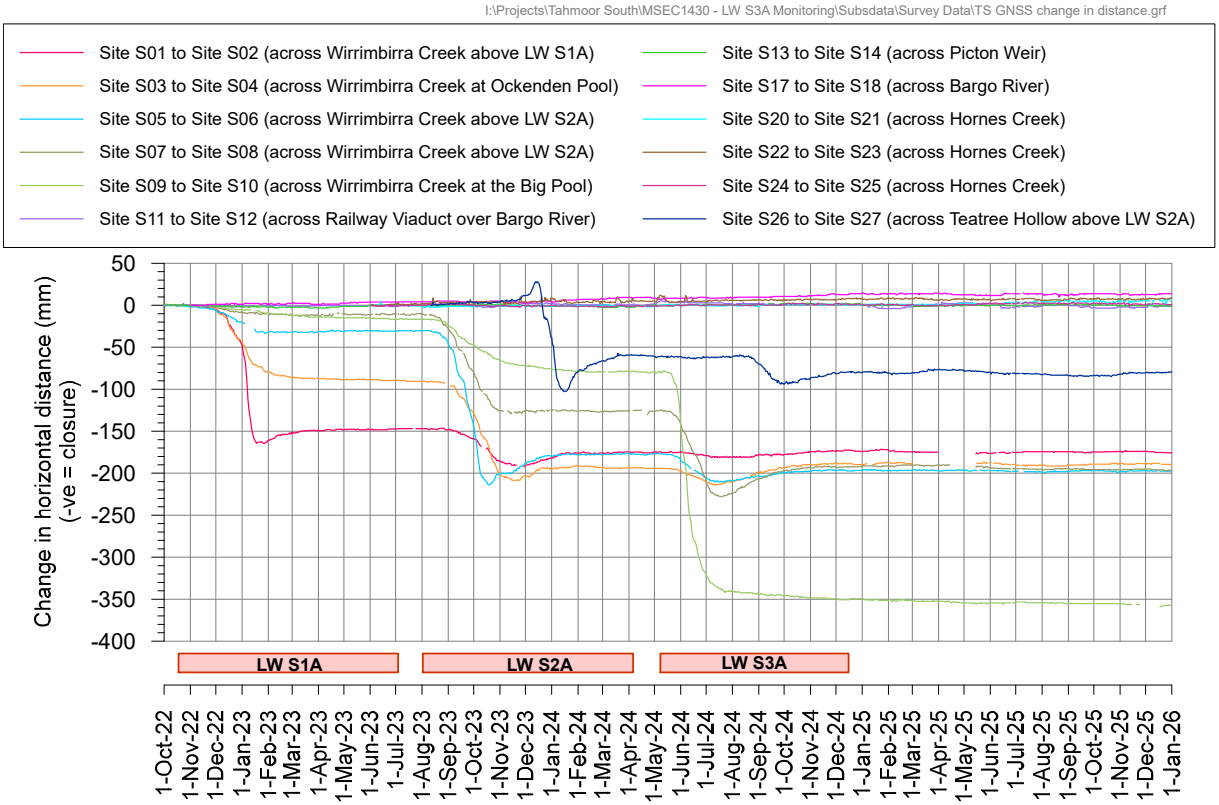

Figure C Observed changes in horizontal distances between GNSS units

Main Southern Railway

The final survey for LW S3A during 2025 was conducted on 16 December 2025. Results are shown in Figs. 3 and 4 at the back of this report. Ongoing minor residual subsidence was measured, with a maximum change in subsidence during 2025 of 48 mm. No impacts were observed to the railway during 2025.

Incremental strain and changes in vertical alignment at sites of interest during and after the mining of LW S3A are shown in Figure D. It can be seen that there have been very minor ongoing changes in bumps in the subsidence profile (vertical mid-ordinate deviation) due to residual subsidence. Rates of change in ground strains at the sites of interest have reduced to very low levels.

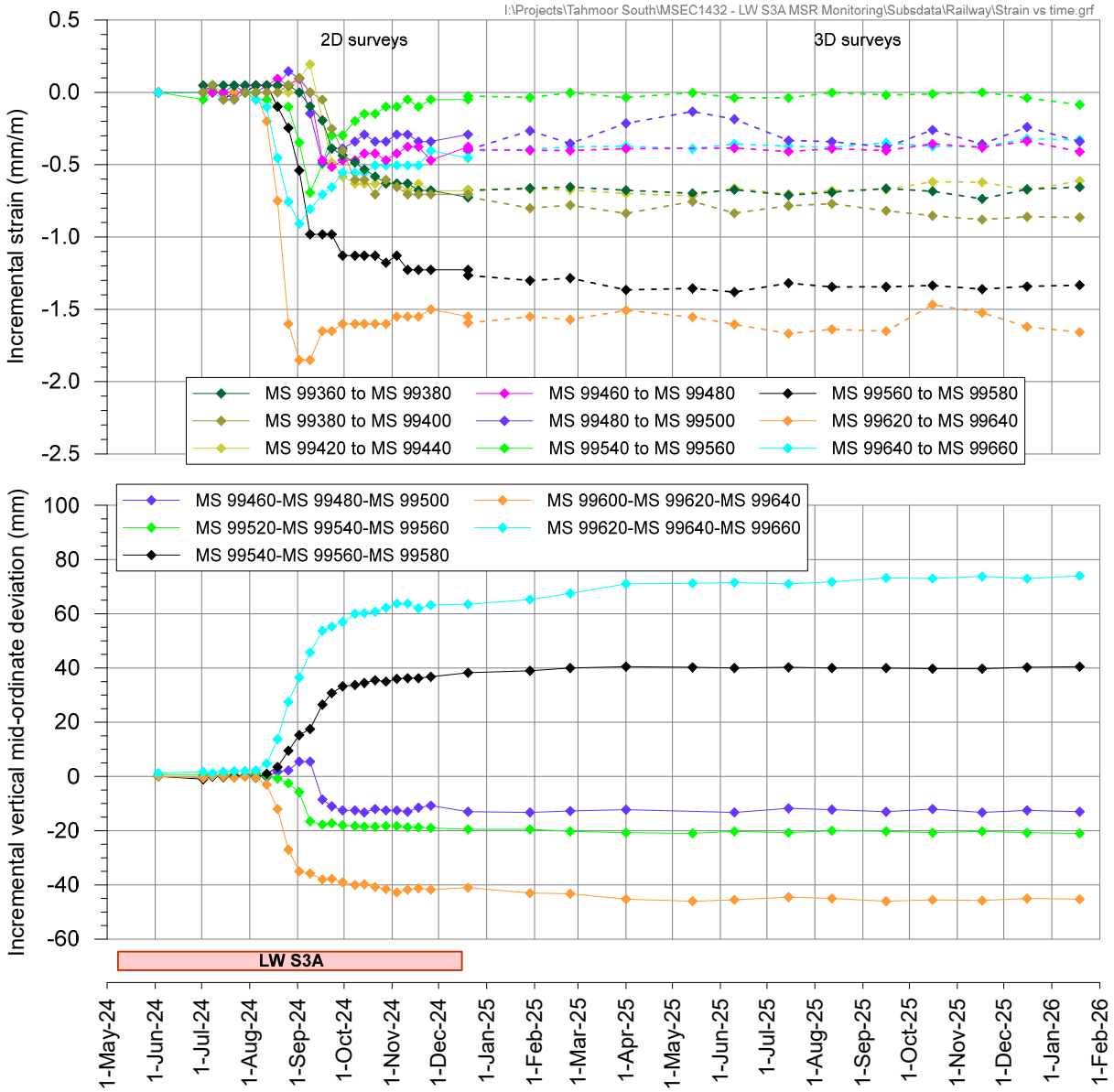

Figure D Development of incremental ground strain and changes in vertical alignment at selected areas of interest during LW S3A

A visual inspection of the Bargo River Railway Viaduct on 20 January 2025 did not identify any issues.

Charlies Point Road

A final survey for LW S3A was conducted on 7 January 2025. Results are shown in Figs. 1 and 2 at the back of this report. Minor residual subsidence was measured, with a maximum change in subsidence during 2025 of 16 mm. No impacts were observed at this time and none have been reported during the remainder of 2025.

Remembrance Drive

A final survey along Remembrance Drive for LW S3A was conducted on 13 January 2025. Results are shown in Figs. 6 and 7 at the back of this report. Minor residual subsidence was measured, with a maximum change in subsidence during 2025 of 12 mm. No new impacts were observed at this time and none have been reported during the remainder of 2025.

Remembrance Drive experienced the most active period of subsidence due to the extraction of LW S3A during 2024 with rates of change reducing to low levels during 2025. The observed subsidence profile is relatively smooth, with compressive strains developing broadly above the central section of LW S3A, as shown in Fig. 6.

The observed development of compressive ground strains along Remembrance Drive above the central section of LW S3A is shown in Figure E.

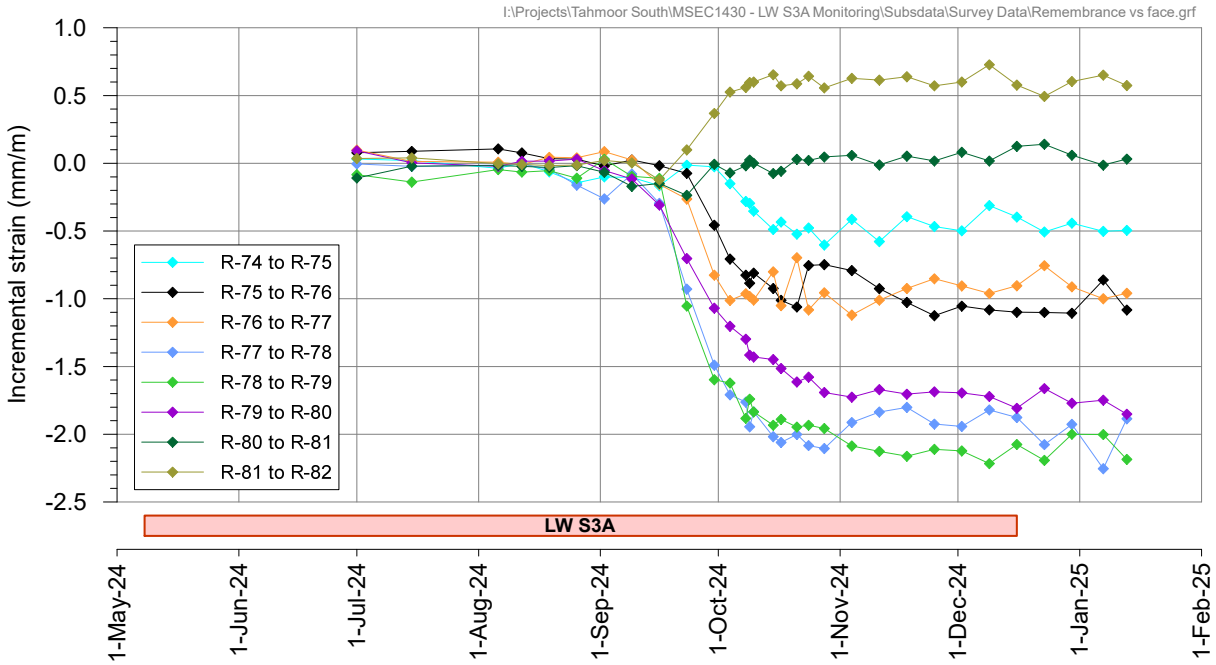

Figure E Observed development of ground strain along Remembrance Drive above central section of LW S3A over time

The observed development of compressive strain at previously observed impact sites during and after the mining of LW S2A is shown in Figure F. Minor changes were measured from the final survey on 13 January.

The last absolute 3D survey for LW S3A along the Embankment at Caloola Road was conducted on 15 January 2025 and the results for absolute and local 3D surveys on 15 January 2025 are shown in Figs. 14 to 19. Compressive strains had developed along all five survey lines along the embankment and their developments over time are shown in Figure G. A final additional local 3D survey was conducted on 21 January 2025 to confirm that rates of change have reduced to low levels. The results from the additional survey on 21 January 2025 are shown only in Figure G. Very small, ongoing increases in compressive strains are expected to occur along the embankment over time. The observed subsidence profiles are relatively smooth along the crest and toe on both sides of the embankment, as shown in Fig. 14 to Fig. 18.

Caloola Road

A final survey for LW S3A was conducted on 14 January 2025. Results are shown in Figs. 22 and 23 at the back of this report. Very minor residual subsidence was measured, with a maximum change in subsidence during 2025 of 2 mm. No impacts were observed at this time and none have been reported during the remainder of 2025.

Caloola Road has experienced the most active period of subsidence due to the extraction of LW S3A, with rates of change reducing. The observed subsidence profile is relatively smooth, with minor ground strains currently observed, as shown in Fig. 22. No issues were observed from visual inspections.

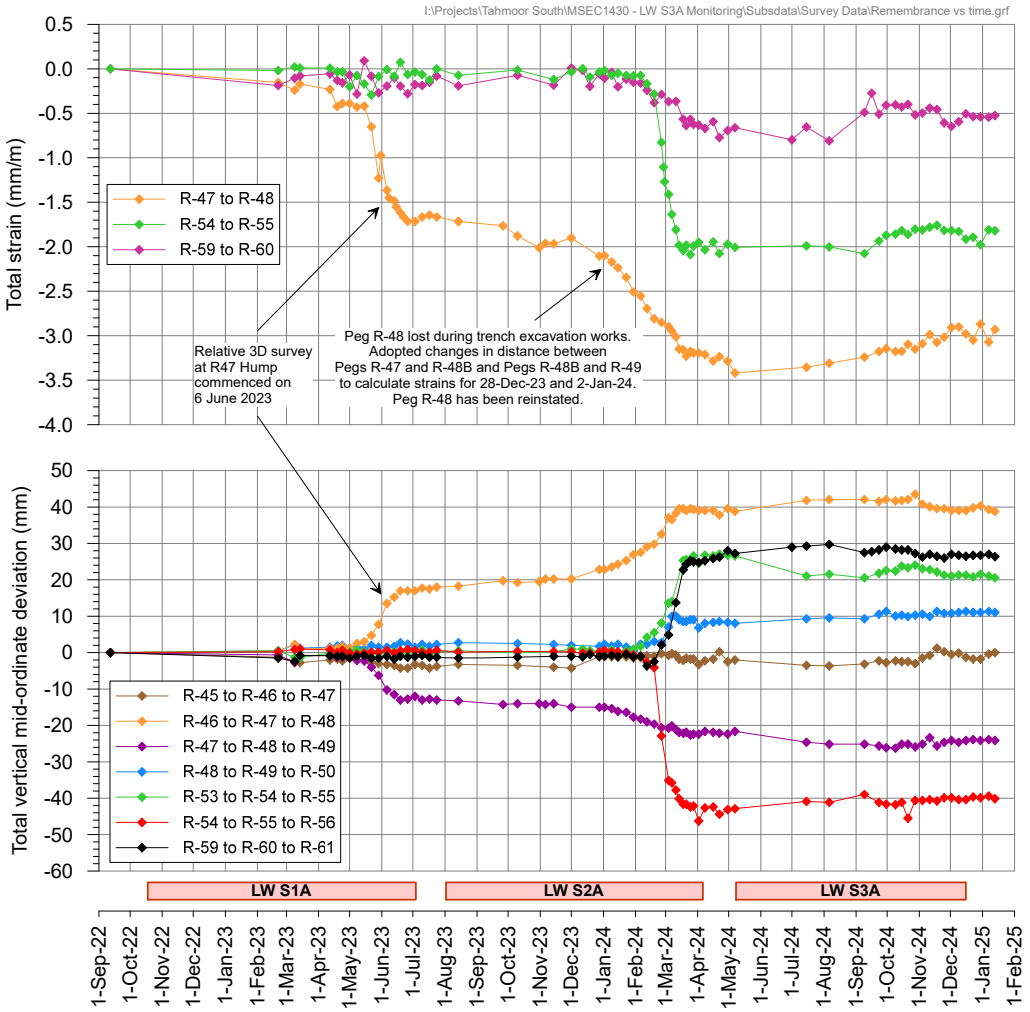

Figure F Observed development of ground strain and changes in vertical alignment at previously observed impact sites along Remembrance Drive

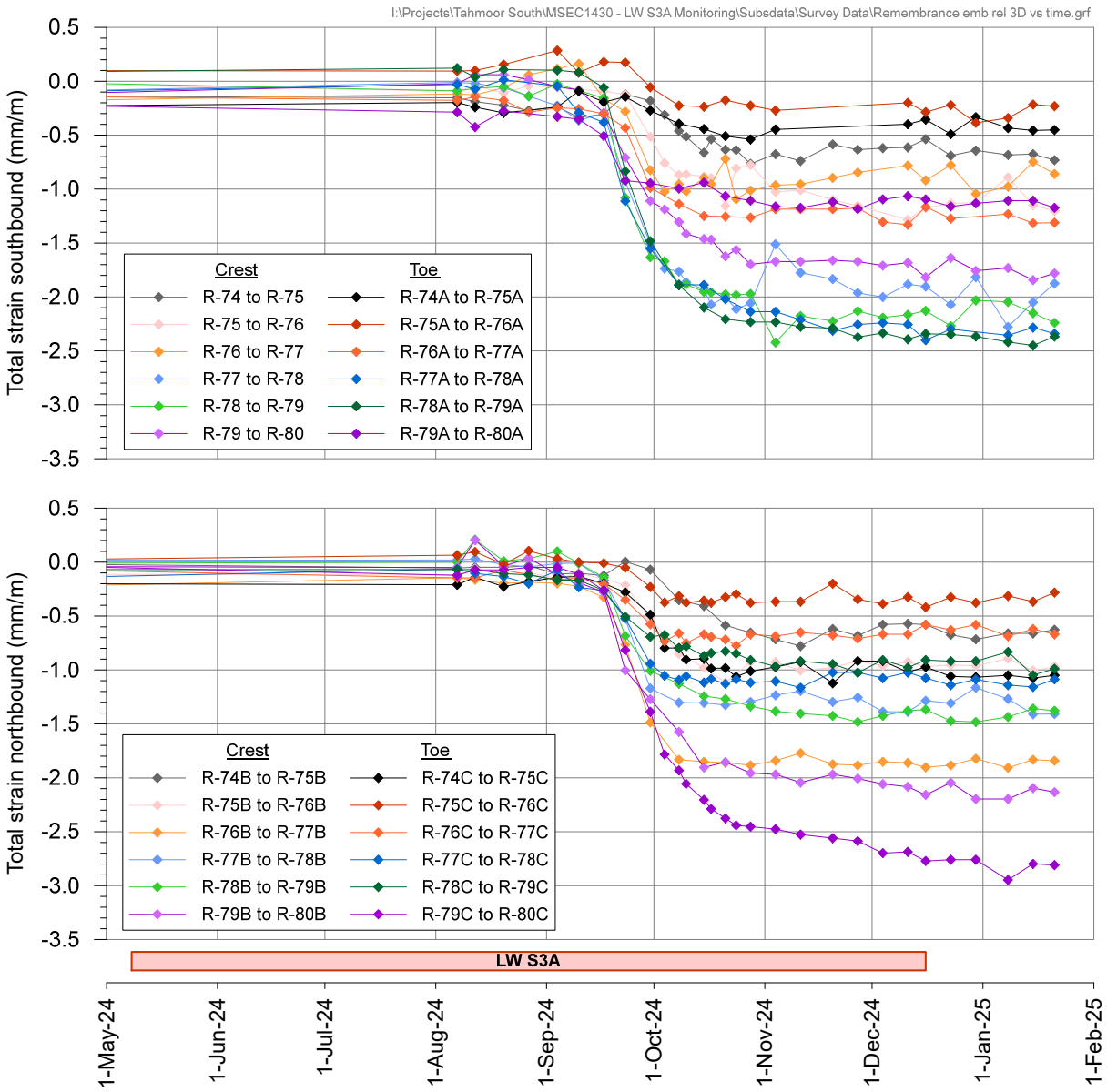

Figure G Observed development of ground strain along Remembrance Drive Embankment at Caloola Road

Great Southern Road

A final survey for LW S3A was conducted on 9 January 2025. Results are shown in Fig. 5 at the back of this report. Minor residual subsidence was measured, with a maximum change in subsidence during 2025 of 26 mm. This result is from a survey mark that was potentially disturbed prior to the final survey. No impacts were observed during 2025.

Yarran Road

A final survey for LW S3A was conducted on 14 January 2025. Results are shown in Fig. 13 at the back of this report. Very minor residual subsidence was measured, with a maximum change in subsidence during 2025 of 5 mm. No impacts were observed during 2025.

V-Line

A final survey for LW S3A was conducted on 30 January 2025. Results are shown in Figs. 20 and 21 at the back of this report. Minor residual subsidence was measured, with a maximum change in subsidence during 2025 of 16 mm. No impacts were observed during 2025.

Natural Features

In addition to the GNSS units, survey marks were installed at four locations across the Tributary to Teatree Hollow (Wirrimbirra Creek), and at four locations across Teatree Hollow, as shown in Drawing No. MSEC1430-01.

Tributary to Teatree Hollow (Wirrimbirra Creek) surveys

An end of LW S3A survey across the Tributary to Teatree Hollow (Wirrimbirra Creek) was conducted on 28 January 2025. The maximum measured incremental closure during the mining of LW S3A was 178 mm, which was measured across Wirrimbirra Creek at TT2 (the Big Pool), located directly above the commencing end of LW S3A. The measured substantial increases in the end of panel survey for LW S3A were expected as large increases in closure had been observed by the GNSS units.

It is observed that the ground surveys have measured less closure compared to closure that has been measured by the GNSS units. This is because the ground survey lines are shorter, concentrating across the bases of the valleys due to lines of sight.

Incremental closure of 66 mm was measured across Wirrimbirra Creek at TT4, located between LW S2A and LW S3A during the mining of LW S3A.

Teatree Hollow surveys

An End of LW S3A survey was conducted across Teatree Hollow on 28 January 2025. Very little closure was observed at TT6 (4 mm) and TT12 (4 mm). Observed closure across TT9 was 34 mm after the mining of LW S2A, with no measurable change observed after the mining of LW S3A.

GNSS units S26 and S27 were installed across Teatree Hollow directly above LW S2A to measure valley closure. As shown in Figure C, approximately 100 mm maximum closure was measured by the GNSS units during the mining of LW S2A though closure reduced after the travelling subsidence passed through the valley. Total closure then briefly increased to approximately 100 mm during the mining of LW S3A before reducing again after the travelling subsidence passed through the valley.

Visual inspections

Both the Tributary to Teatree Hollow and Teatree Hollow were inspected during 2025. There have been minor changes to previously observed fractures and surface flow diversions.

- One additional fracture was observed at Site TT2 in April 2025. Minor changes were observed to the other 7 fractures at this location.
- An additional fracture was also observed at Site TT10 in April 2025 with minor changes observed the first fracture observed at this location.
- Changes in water levels were observed, reflecting periods of rainfall and dry weather.

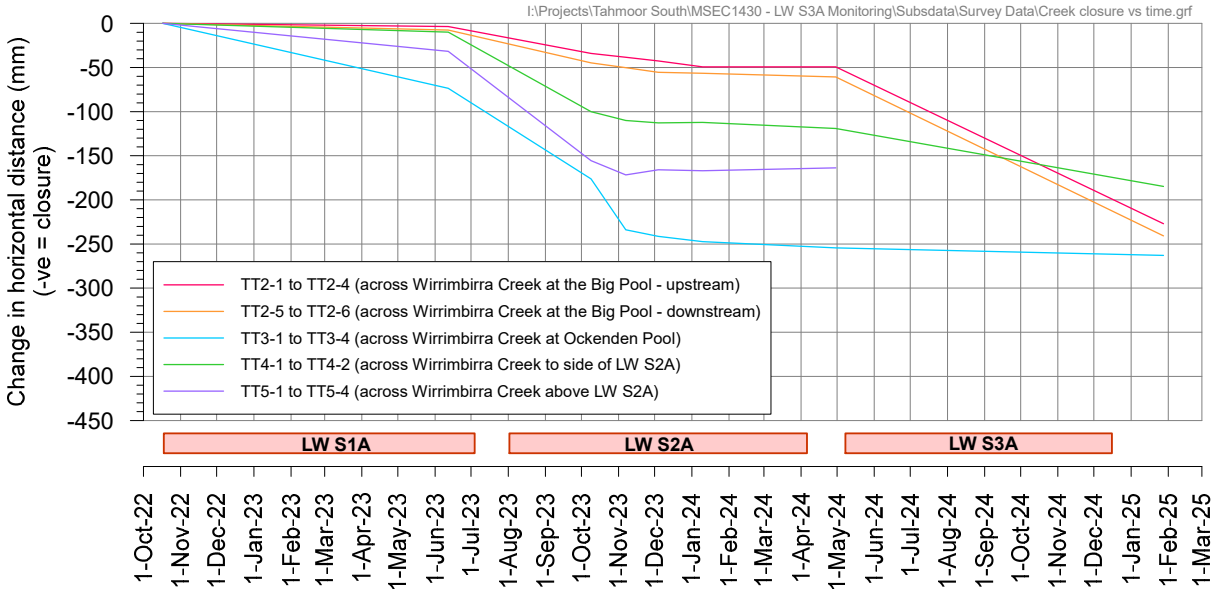

Figure H Observed development of closure across Tributary to Teatree Hollow from ground surveys

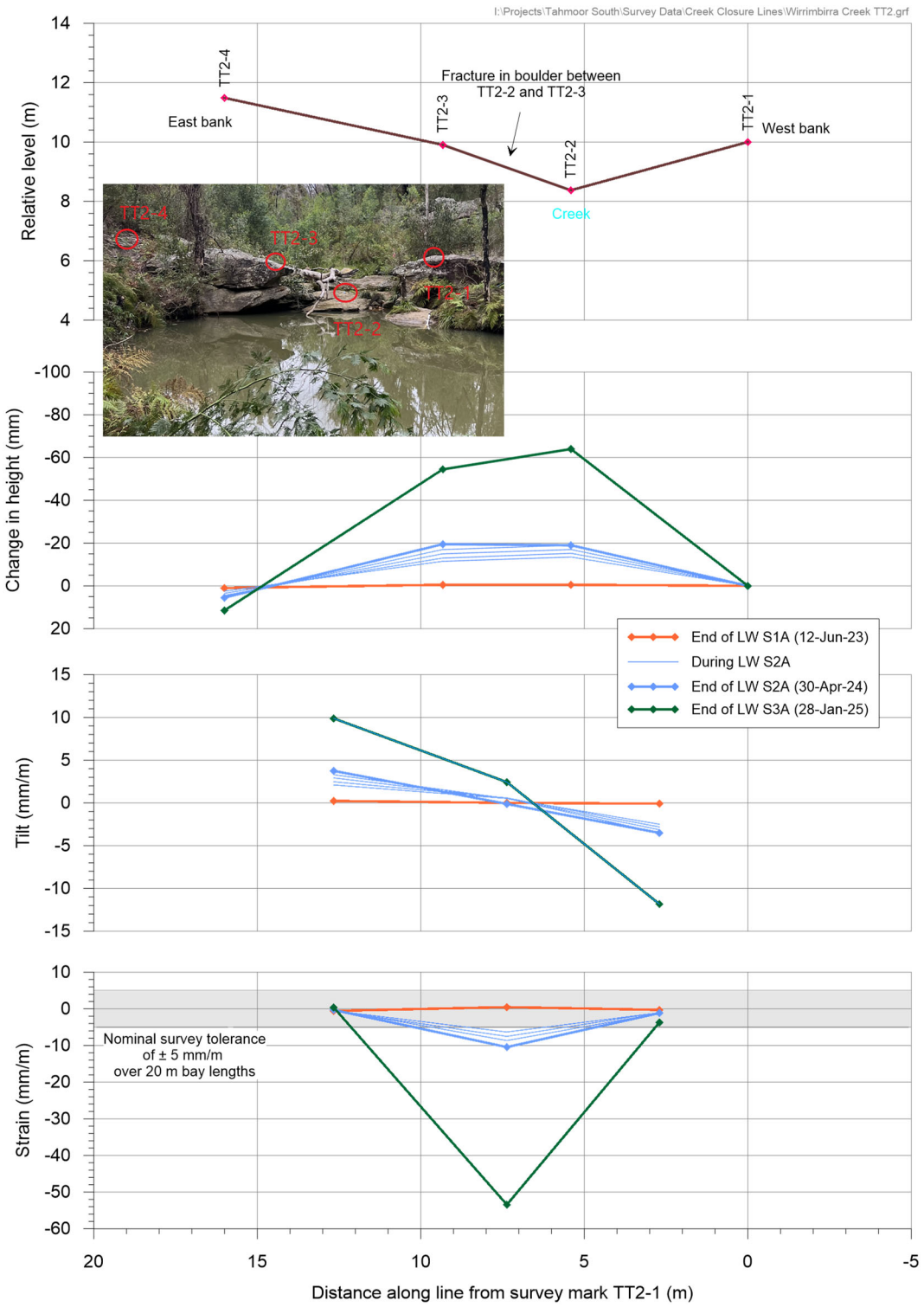

Figure I Observed subsidence, tilt and strain along TT2 line, upstream of Pool TT2

Structures

No surveys and inspections were conducted during 2025 at MKD Machinery, Australian Wildlife Sanctuary or the Tahmoor Garden Centre in accordance with the Management Plans for these properties.

Weekly surveys and inspections were conducted at Bargo Petroleum with no mining-related impacts observed during the mining of LW S3A, with the last three surveys and inspections conducted in January 2025. A crack in the west wall of the shop was noted during a visual inspection on 8 January. The crack is at the wall / floor interface and is likely pre-existing. A fuel balance test was conducted on 17 January 2025, with no trends apparent.

Local Roads

Visual inspections along local roads during January 2025 did not identify any issues.

Visual inspections of Remembrance Drive Bridge and Bargo River Road Overbridge on 20 January 2025 did not identify any issues.

Gas Infrastructure

Weekly surveys were conducted along Remembrance Drive during the mining of LW S3A. The last surveys and inspections on the embankment were conducted on 21 January 2025. Observed changes in horizontal distance between Pegs R76 and R78, which are located at either end of the trench, are shown in Figure J. It can be seen that rates of change had reduced to low levels for a period of two months before monitoring ceased.

Prior to the influence of LW S3A, the gas pipeline was exposed along the section of Remembrance Drive embankment where it crosses Teatree Hollow, as planned. The exposed pipeline was observed to be bowing outwards in response to the observed compressive strains. In response, the trench was widened on 9 October under supervision by Jemena inspectors to reduce pipe stresses.

The pipeline's position in the trench was adjusted in late December 2024 and further adjustments of the pipeline were undertaken on 14 and 15 January 2025. Engineering analyses confirmed that pipeline stresses had reduced and are within acceptable levels for managing potential future impacts due to the extraction of LW S4A. Additional engineering analyses will be conducted following feedback provided by Jemena. The analyses will include selection of an appropriate early warning trigger for undertaking additional management actions during the extraction of LW S4A and consideration of an appropriate location for excavating a trench, if required.

Tahmoor Coal met regularly with Jemena to discuss the observations and assessments, with a final meeting for LW S3A held on 21 January 2025. The pipeline was backfilled between 3 and 5 February 2025.

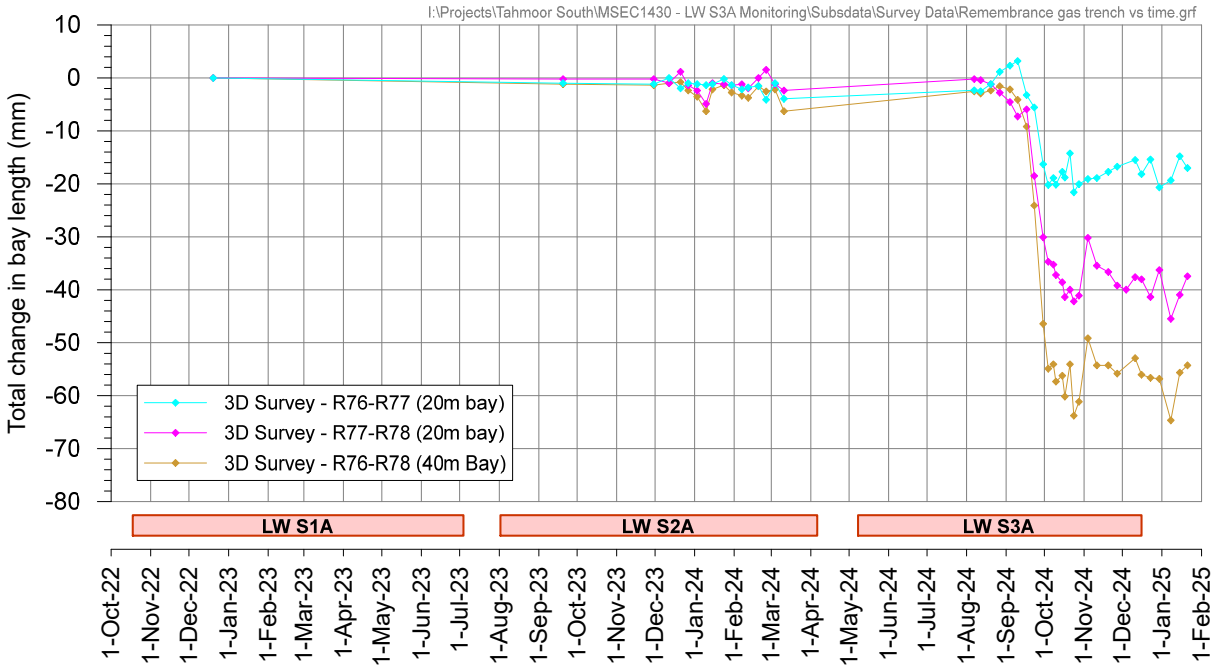

Figure J Observed changes in distance along Remembrance Drive at location of exposed Jemena gas main

Electrical Infrastructure

Weekly surveys and inspections were conducted at power poles during the mining of LW S3A. The final ground surveys of critical power poles for LW S3A were conducted on 20 January 2025. No concerns for electrical infrastructure were observed.

Telecommunications Infrastructure

Weekly surveys were conducted along the optical fibre cable within the Main Southern Railway corridor during the mining of LW S3A.

A bump in the subsidence profile with compressive strain was observed along the section of cable that is directly above LW S3A along the Main Southern Railway near 99.62 km. Telstra advised on 27 August 2024 that a minor indication of loss (0.2 dB) was observed from OTDR monitoring. Cracking and shearing was observed to intersect the buried cable. Tahmoor Coal excavated a narrow trench on 3 September 2024 to relieve stresses and deformations in the cable. After the cable was free to move within the trench, Telstra recorded an improvement in performance of approximately 0.3 dB.

Additional cracks were observed across the Telstra optical fibre cable on 9 September 2024 at 99.56 km. A loss of signal strength was observed by remote monitoring on Telstra's optical fibre cable on 10 September. Tahmoor Coal excavated and exposed Telstra's optical fibre cable on 11 September 2024 at two locations. The first excavation was between 99.440 km and 99.460 km based on information from remote monitoring. Some improvement in signal strength was observed. Signal strength later returned to previously observed levels after the cable was exposed at the second trench at 99.560 km, where surface cracks were observed to intersect it and a noticeable kink was exposed and straightened.

Telstra advised on 14 January 2025 that there is currently no indication of mining-induced loss observed from OTDR monitoring.

Surveys continued along the Main Southern Railway and optical fibre cable during 2025, with the last survey for the year conducted on 16 December 2025. Ongoing minor residual subsidence was measured, with a maximum change in subsidence during 2025 of 48 mm. Observed rates of change in ground strains and changes in vertical alignment had reduced to very low levels at the two sites of interest (99.440 km to 99.460 km, and 99.560 km to 99.580 km), as shown in Figure D.

Potable Water Infrastructure

Weekly surveys were conducted along the 450 mm diameter DICL water main, which runs along Remembrance Drive during the mining of LW S3A. Focussed surveys and inspections were conducted at two locations where increased compressive strains were observed during the mining of LWs S2A and S3A, with the last surveys conducted on 21 January 2025.

Compressive ground strains developed alongside the C-Line at the Remembrance Drive Embankment at Caloola Road, where the pegs cross Teatree Hollow. The last absolute 3D survey for LW S3A along the Embankment at Caloola Road was conducted on 15 January 2025 and the results for absolute and local 3D surveys on 15 January 2025 are shown in Figs. 14 to 19. Compressive strains had developed along all five survey lines along the embankment and their developments over time are shown in Figure G. A final additional local 3D survey was conducted on 21 January 2025 to confirm that rates of change have reduced to low levels. The results from the additional survey on 21 January 2025 are shown only in Figure G. It can be seen that rates of change in compressive strains between Pegs R79C to R80C have reduced to low levels.

Minor changes were observed on the four Gibault joints on the water main at the Caloola Road crossing, as shown in Figure K. The northern displacement sensor across the southern joint was replaced in late February 2024. It can be seen from Figure K that developed at the northern end of the southern joint and both ends of the northern joint. Rates of change had reduced to low levels as at 21 January 2025. Tahmoor Coal regularly met with Sydney Water during the mining of LW S3A to discuss the observations and it was agreed to cease monitoring for LW S3A.

Continuous monitoring of displacement sensors was conducted at Gibault joints that had been installed at the impact site between Pegs R47 and R48 up to 21 January 2025, as shown in Figure L. The northern-most Gibault joint had reached the limit of its capacity on 25 February 2024, and ongoing ground closure was taken up by the next joint. Closure had gradually developed on the southern Gibault joint at the northern connection, with rates of change reduced to low levels. The displacement sensors across the other two joints are currently recording very minor changes. Rates of change had reduced to very low levels by the time monitoring ceased in January 2025.

Weekly surveys were conducted along the Main Southern Railway where the Sydney Water potable water main crosses beneath the Railway up to 16 December 2025. Minor changes were observed, as expected.

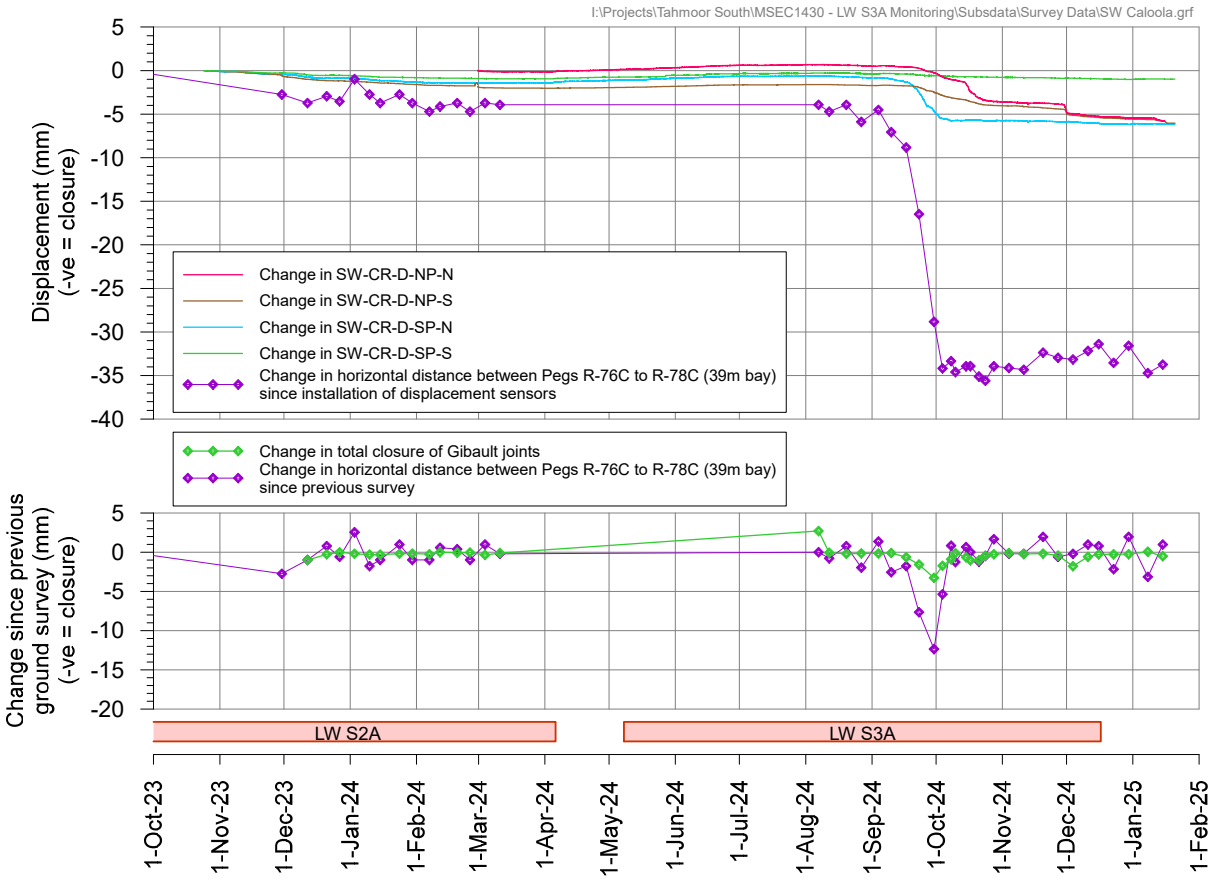

Figure K **Observed change in distance across Gibault joints at Caloola Road on Sydney Water potable water main**

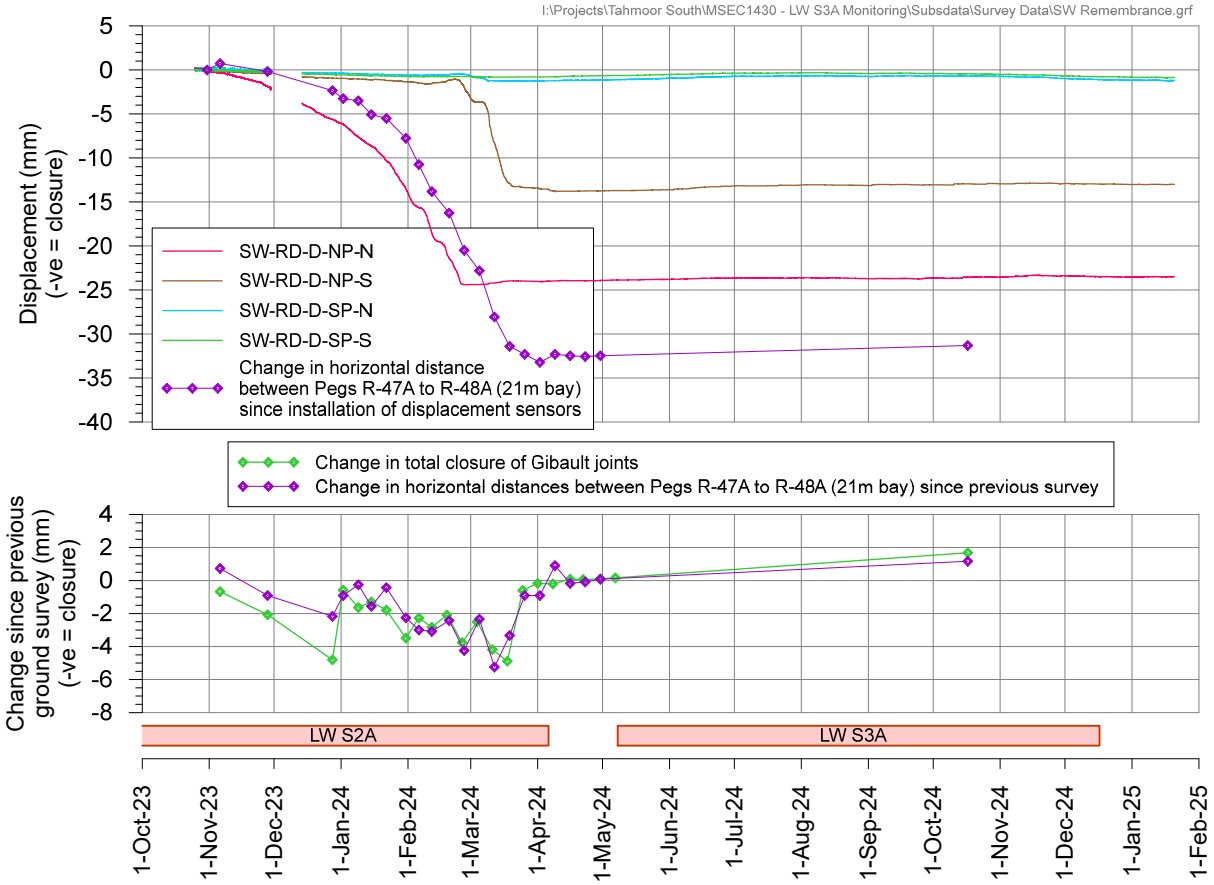

Figure L **Observed change in distance across Gibault joints at Remembrance Drive between Pegs R47A and R48A on Sydney Water potable water main**

Sewer Infrastructure

As described previously in this report, surveys were conducted along Remembrance Drive and the Remembrance Drive Embankment at Caloola Road up to 21 January 2025. Rates of change had reduced to low levels. No concerns for sewer infrastructure were observed.

Dams

Monthly geotechnical inspections were undertaken at farm dams during 2025, in accordance with the Land Management Plan. No issues were observed.

Archaeological Sites

Gradually developing movements have been measured by GNSS units S03 and S04 located on either side of Wirrimbirra Creek, with no impacts observed. No visual inspections were conducted during 2025.

Summary

LW S3A commenced extraction on 8 May 2024 and completed extraction on 17 December 2024. Minor ongoing residual subsidence was measured during 2025 with no additional impacts observed. No additional extraction occurred during 2025.

Summary of surveys and inspections completed during LW S3A

Surveys and inspections were conducted to meet the requirements of the LW S1A-S6A Extraction Plan. A timeline showing when each type of survey and inspection was conducted for LW S3A during 2025 is shown in Figure M.



Figure M Surveys and inspections for LW S3A during 2025

A summary of surveys and inspections is provided in Table 2.

Table 2 Surveys and inspections conducted for LW S3A during 2025

Inspection / Survey	Responsibility	Number of Inspections / Surveys
Ground Monitoring Surveys		
GNSS	Geomatix	365
Local road surveys	SMEC	10
Local road inspections	Tahmoor Coal	3
Local road bridge surveys	SMEC	0
Local road bridge inspections	Tahmoor Coal	1
Sub-Total		**379**
Natural Features		
Teatree Hollow, Wirrimbirra Creek and Bargo River survey lines	SMEC	1
Teatree Hollow and Dogtrap Creek visual inspections	ENRS / Tahmoor Coal	11
Surface water manual monitoring	ATC Williams	(Report pending)
Groundwater manual monitoring	SLR	(Report pending)
Cliffs and steep slopes geotechnical inspections	Douglas Partners & PSM	7
Sub-Total		**19**
Main Southern Railway		
Ground surveys	Southern Rail Surveys	11
Track geometry surveys	BloorRail	1
Track inspections	BloorRail	104
Main Southern Railway structure surveys	Southern Rail Surveys	0
Main Southern Railway structure visual inspections	Tahmoor Coal	1
Embankments and cutting surveys	Southern Rail Surveys	1
Embankments and cuttings geotechnical inspections	Newcastle Geotech	1
Sub-Total		**119**
Utilities		
Endeavour Energy power pole surveys and inspections	SMEC & Tahmoor Coal	3
Telecommunications monitoring and Inspections	Telstra & Tahmoor Coal	2
Water Main surveys and inspections	SMEC & Tahmoor Coal	0
Gas Main surveys and inspections	SMEC & Tahmoor Coal	4
Sub-Total		**9**
Mine Site		
Conveyor, tunnel and structure surveys	SMEC	2
Visual inspections	Tahmoor Coal	0
Sub-Total		**2**
Public Amenities		
Public Amenity ground surveys	SMEC	2
Public Amenity visual inspections	Tahmoor Coal	0
Sub-Total		**2**
Commercial and Business		
Commercial ground surveys	SMEC	2
Commercial visual inspections	Tahmoor Coal	2
Sub-Total		**4**
Residential		
Pre-mining Front of House inspections (LW W S1A-S6A)	JMA Solutions	0
Pre-mining Structural Hazard Identification inspection and PMI (LW W S1A-S6A)	JMA Solutions	0
Private property ground surveys	SMEC	8
Private property visual inspections	Tahmoor Coal	0
Private property pool inspections	Tahmoor Coal	0
Private property dam inspections	Douglas Partners, PSM & Tahmoor Coal	7
Sub-Total		**15**
Total		**549**

A comparison between assessed and observed impacts to surface features is summarised in Table 3. The assessed and observed impacts to surface features compare reasonably well with predictions.

Table 3 Summary of predicted and observed impacts during 2025 after completion of LW S3A

Surface Feature	Predicted Impacts for LW S3A	Observed Impacts
Natural Features		
Teatree Hollow and Wirrimbirra Creek	Likely fracturing in creek bed. Likely surface flow diversion Likely reduction in water quality during times of low flow. Likely gas emissions.	Fracturing, surface flow diversion and reduction in water quality observed in Tributary to Teatree Hollow and Teatree Hollow. No gas emissions observed. Minor changes observed from visual inspections during 2025. (Surface water report for 2025 pending)
Aquifers or known groundwater resources	Temporary lowering of piezometric surface by up to 4m. Groundwater levels should recover with no permanent post mining reduction in water levels in bores. Potential impacts to privately owned groundwater bores. Please refer Water Management Plan.	Groundwater levels fallen in response to mining. (Groundwater report for 2025 pending).
Steep slopes and cliffs	Potential soil slippage and cracking to slopes. Large scale slope failures or cliff instabilities unlikely.	No impacts observed during 2025.
Natural vegetation	No impacts anticipated.	No impacts observed during 2025.
Public Utilities		
Main Southern Railway	Impacts expected at isolated locations. Railway bridges and Viaduct very unlikely to experience adverse impacts. Railway will remain safe and serviceable with a management plan in place.	While impacts were observed to the track during LW S3A, the railway was maintained in a safe and serviceable condition. No impacts observed during 2025.
Tahmoor Mine Rail Loop	Very minor impacts possible at isolated locations. Railway will remain safe and serviceable with a management plan in place.	No impacts observed during 2025.
Roads and Bridges (all types)	Cracking and buckling may occur in isolated locations. Road bridges very unlikely to experience adverse impacts. Local roads will remain safe and serviceable with a management plan in place.	While a minor impact was observed on Remembrance Driveway near Peg R64 during LW S3A, the pavements were maintained in a safe and serviceable condition. No impacts observed to bridges. No impacts observed during 2025.
Potable water pipelines	Impacts and minor leakages possible at isolated locations, particularly at creek crossings. Potable water pipelines will remain safe and serviceable with a management plan in place.	No impacts observed during 2025.
Sewer pipelines	Impacts possible at isolated locations, particularly at creek crossings. Sewer pipelines will remain safe and serviceable with a management plan in place.	No impacts observed during 2025.
Gas pipelines	Impacts possible at isolated locations, particularly at creek crossings. Gas pipelines will remain safe and serviceable with a management plan in place.	While impacts were observed to the gas pipeline during LW S3A, the pipeline was maintained in a safe and serviceable condition. A trench on the Remembrance Drive embankment that was used to manage pipeline stresses was backfilled in February 2025. No impacts observed during 2025.

Surface Feature	Predicted Impacts for LW S3A	Observed Impacts
Electricity infrastructure	Some adjustments of power poles, catenaries or aerial powerline connections may be required. Electricity infrastructure will remain safe and serviceable with a management plan in place.	No impacts observed during 2025.
Telecommunication infrastructure	Impacts possible at isolated locations, particularly at creek crossings. Telecommunications cables will remain safe and serviceable with a management plan in place.	While minor losses were detected in optic fibre cable near locations of compressive strain on Main Southern Railway during LW S3A, the cable was maintained in a safe and serviceable condition. No impacts observed during 2025.
Public Amenities		
Wollondilly Anglican College	Damage may occur in isolated locations but will remain safe and serviceable with a management plan in place.	Monitoring ceased in November 2024. No impacts reported during 2025.
Australian Wildlife Sanctuary	Damage may occur but will remain safe and serviceable with a management plan in place.	Monitoring ceased in October 2024. No impacts reported during 2025.
Dingo Sanctuary	Damage may occur but will remain safe and serviceable with a management plan in place.	Monitoring ceased in October 2024. No impacts reported during 2025.
Bargo Cemetery	Damage may occur but will remain safe and serviceable with a management plan in place.	No impacts reported during 2025.
Commercial and Business Establishments		
MKD	Minor damage may occur but will remain safe and serviceable with a management plan in place.	Monitoring ceased in October 2024. No impacts reported during 2025.
Tahmoor Garden Centre	Damage may occur but will remain safe and serviceable with a management plan in place.	Monitoring ceased in December 2024. No impacts reported during 2025.
Bargo Petroleum	Damage may occur but will remain safe and serviceable with a management plan in place.	Monitoring ceased in January 2025. No impacts reported during 2025.
Tahmoor Mine Site	Damage may occur but will remain safe and serviceable with a management plan in place.	No impacts observed during 2025.
Farmland and Facilities		
Farm buildings, sheds, tanks	Negligible to slight impacts predicted for all farm buildings and sheds with management plan in place.	No impacts reported during 2025.
Fences	Potential for impacts to fences and gates.	No impacts reported during 2025.
Farm dams	Potential adverse effects on dam walls and storage capacity.	No impacts observed during 2025.
Wells or bores	Potential impact to groundwater bores, particularly bores located directly above LWs.	No impacts reported during 2025.
Areas of Archaeological Significance	Rock shelter site may experience adverse impacts. Open Camp site and Isolated Find site unlikely to experience adverse impacts.	No impacts observed during 2025.
Areas of Heritage Significance	Picton Weir extremely unlikely to experience adverse impacts. The Weir will remain safe and serviceable with a management plan in place.	No impacts reported during 2025.
Permanent Survey Control Marks	Ground movement predicted at identified survey marks.	Ground movement occurred.

Surface Feature	Predicted Impacts for LW S3A	Observed Impacts
Residential Establishments		
Houses	Damage may occur to houses but they will remain safe and serviceable with a management plan in place.	While minor impacts were observed during LW S3A, houses were in a safe and serviceable condition. Monitoring ceased in December 2024. No impacts reported during 2025.
Swimming pools	Damage may occur to pools but they will remain safe and serviceable with a management plan in place.	While one pool fence required adjustment during LW S3A, pools were in a safe and serviceable condition. Monitoring ceased in December 2024. No impacts reported during 2025.
Associated structures such as workshops, garages, on-site wastewater systems, water or gas tanks or tennis courts	Potential impact to pipes connected to inground septic tanks. Damage may occur to structures but they will remain safe and serviceable with a management plan in place.	While minor impacts were observed during LW S3A, associated structures were in a safe and serviceable condition. Monitoring ceased in December 2024. No impacts reported during 2025.
External residential pavements and fences	Damage may occur but they will remain safe and serviceable with a management plan in place.	While minor impacts were observed during LW S3A, pavements and fences were in a safe and serviceable condition. Monitoring ceased in December 2024. No impacts reported during 2025.

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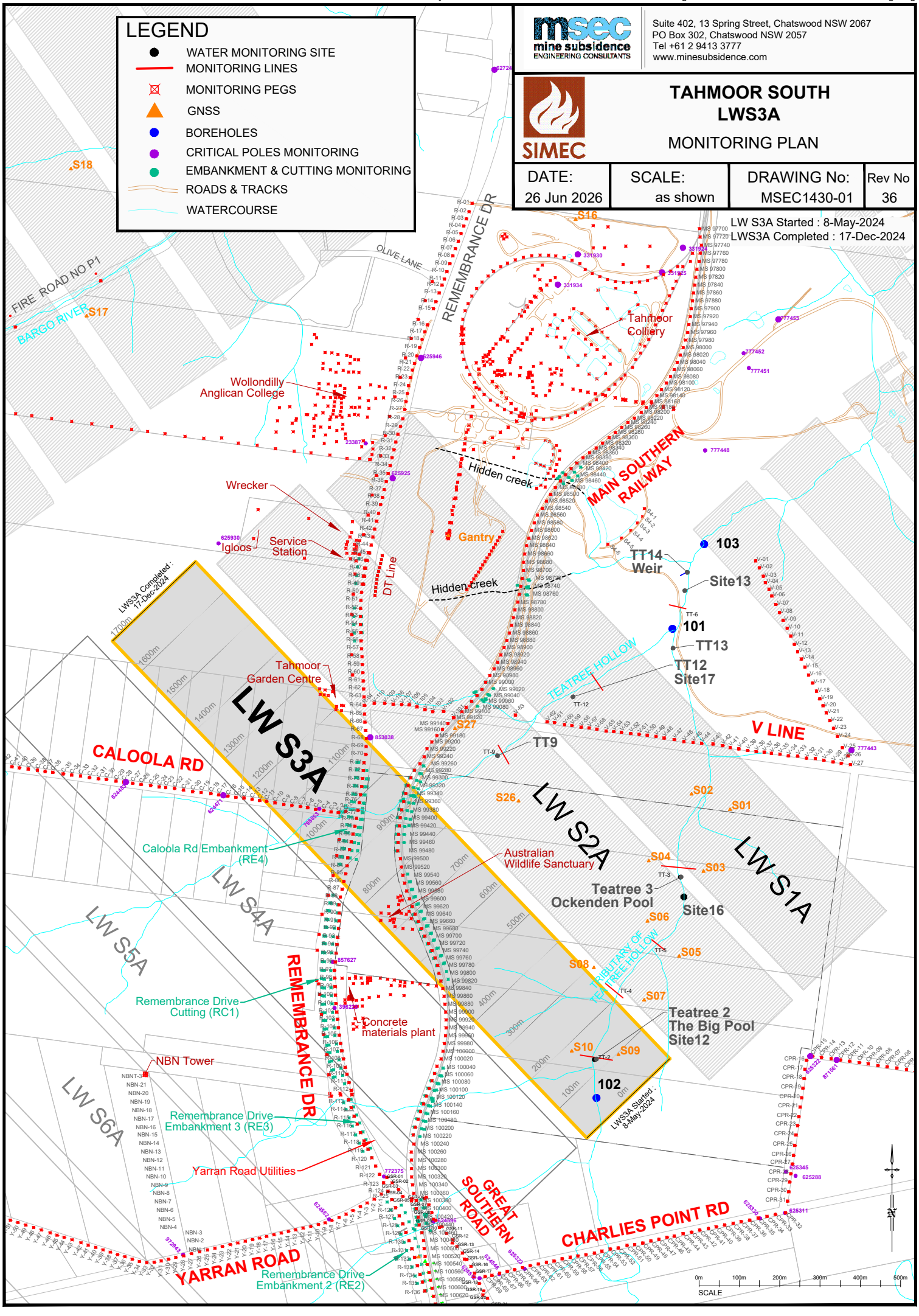
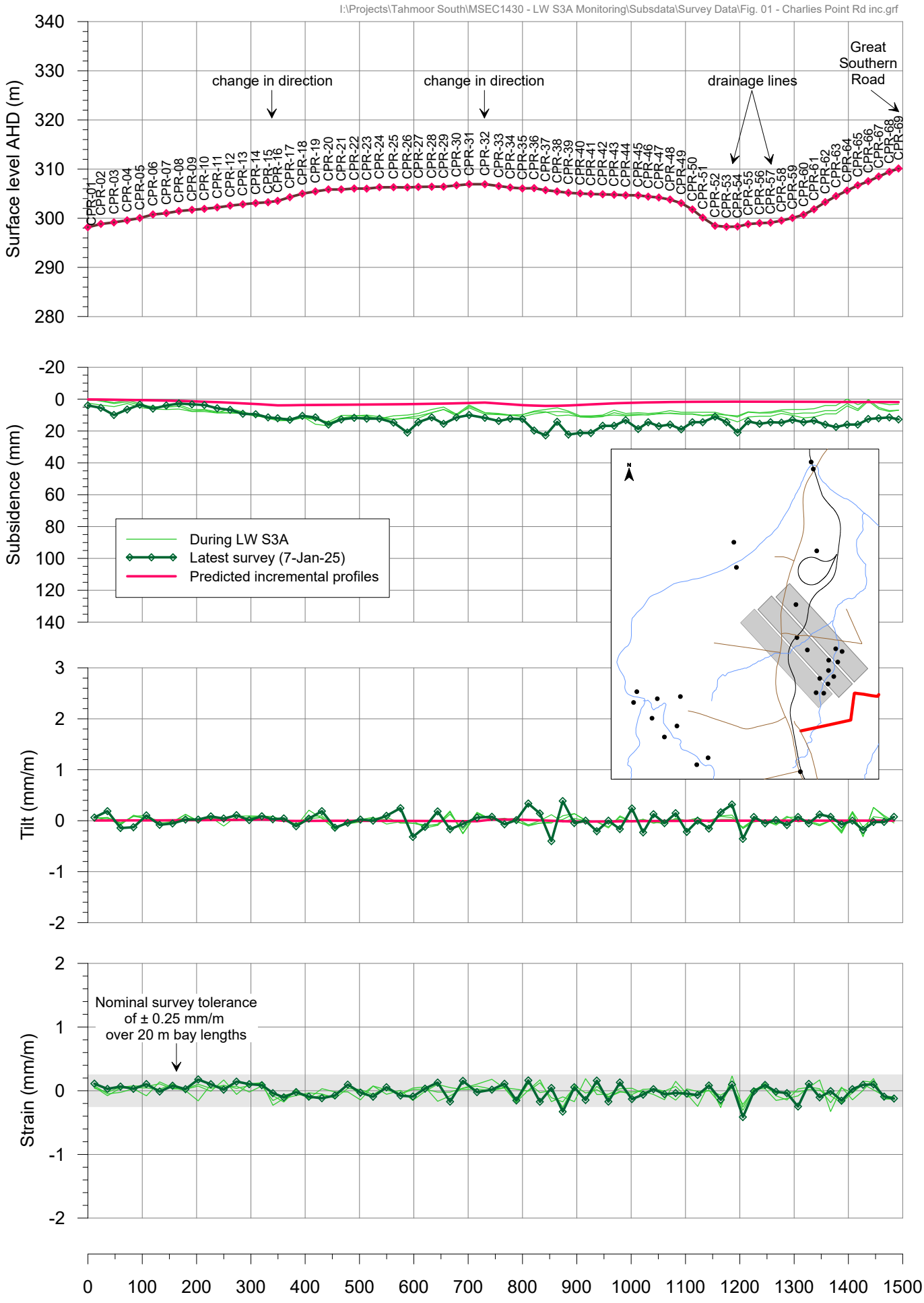


Tahmoor South LW S3A
Incremental subsidence profiles along Charlies Point Road



msec

Fig. 1-R36

Tahmoor South LW S3A
Total subsidence profiles along Charlies Point Road

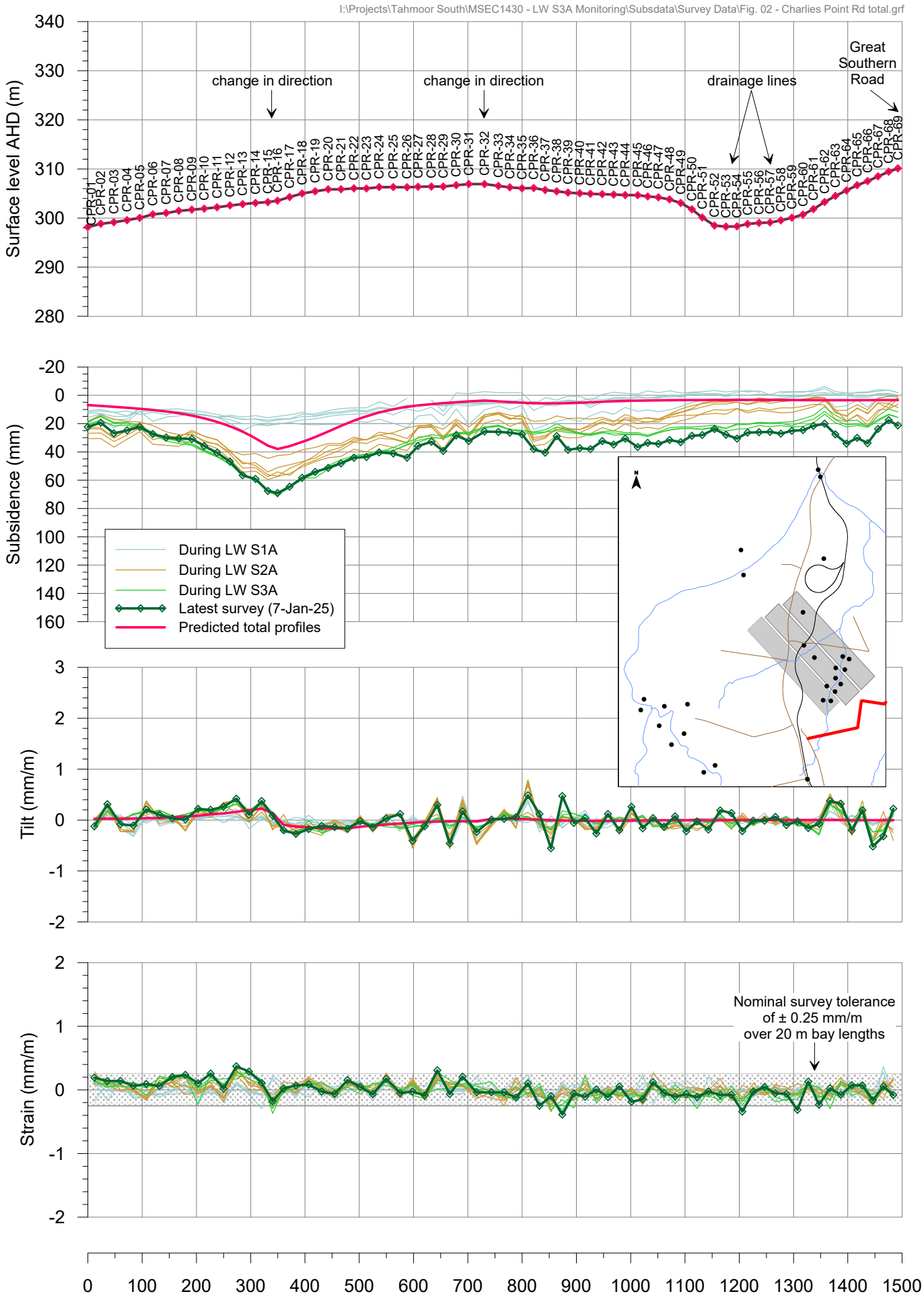


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Fig. 2-R36

Tahmoor South LW S3A - Main Southern Railway
Incremental subsidence profiles
Survey date: 16 December 2025

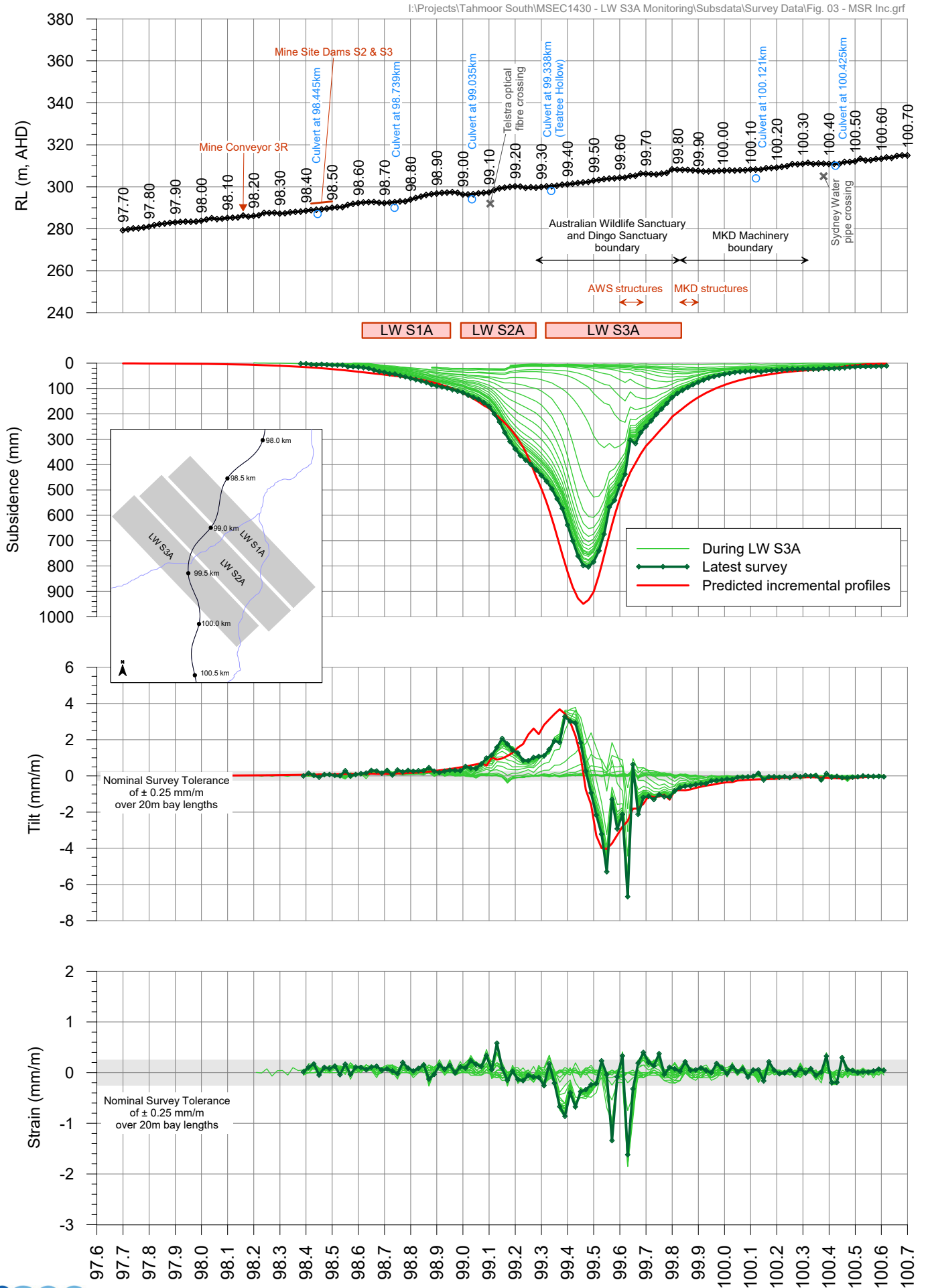

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Fig. 3-R36

Tahmoor South LW S3A - Main Southern Railway
Total subsidence profiles
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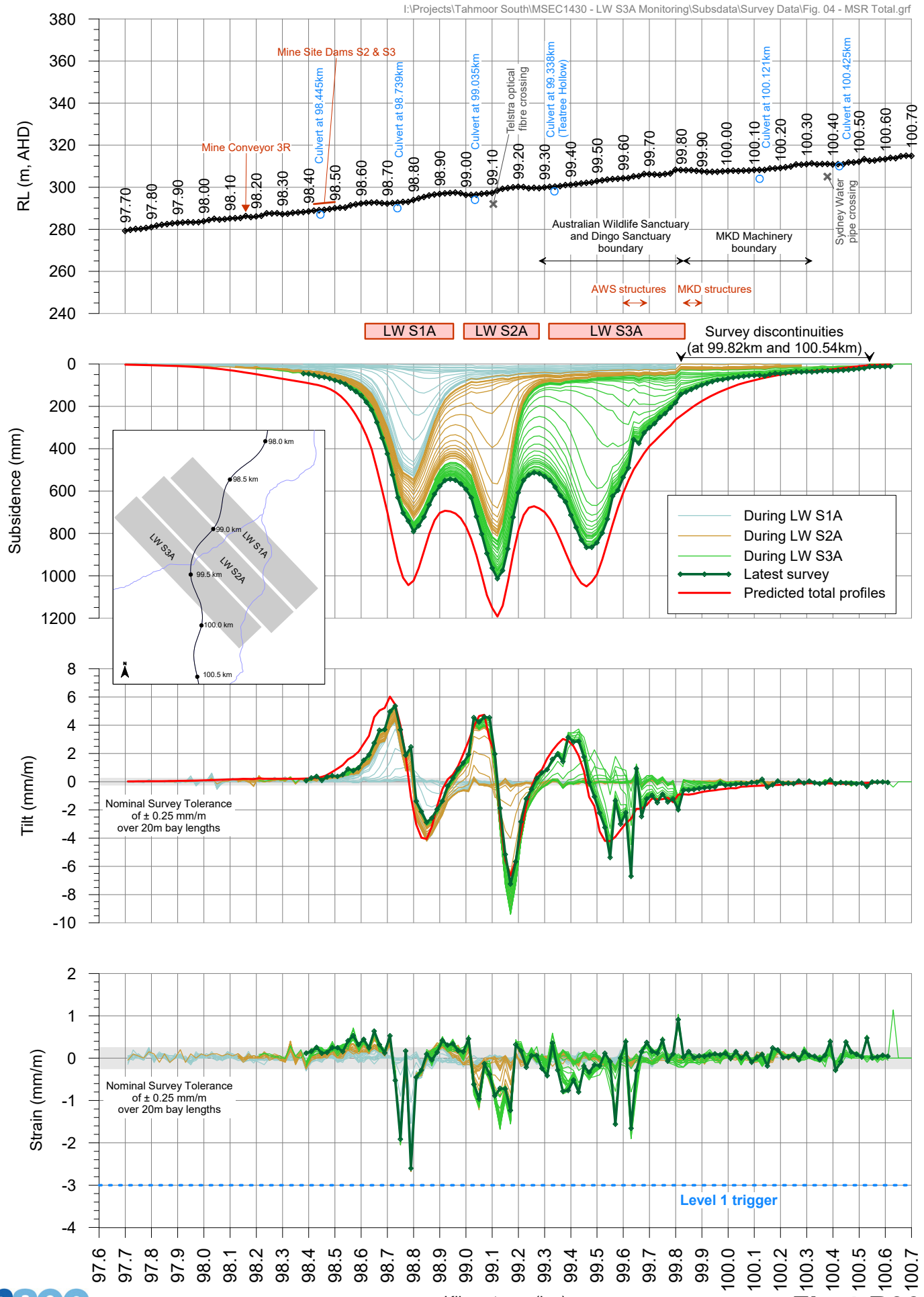

Fig.4-R36

Tahmoor South LW S3A
Incremental subsidence profiles along Great Southern Road

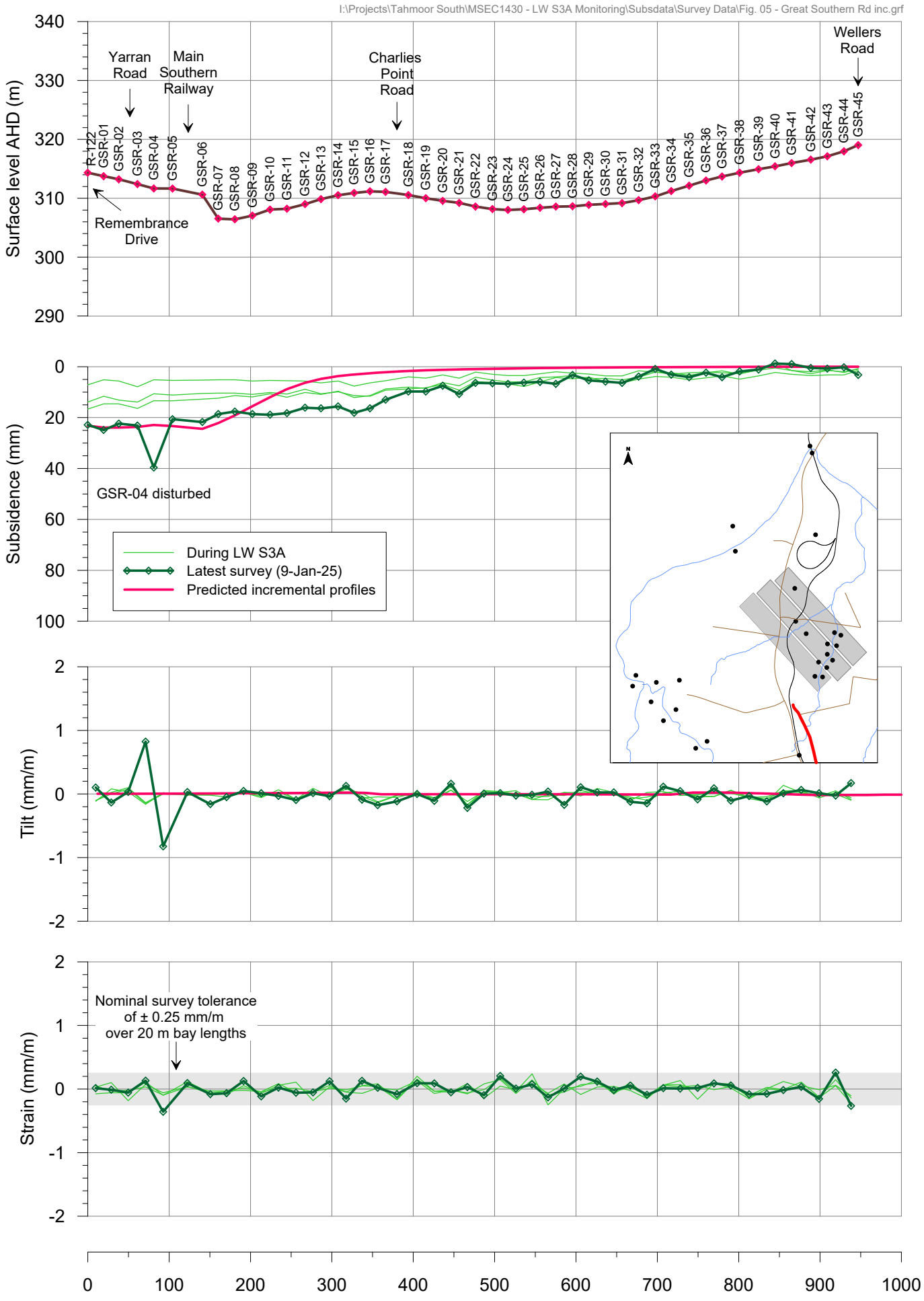

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Fig. 5-R36

Tahmoor South LW S3A
Incremental subsidence profiles along Remembrance Drive

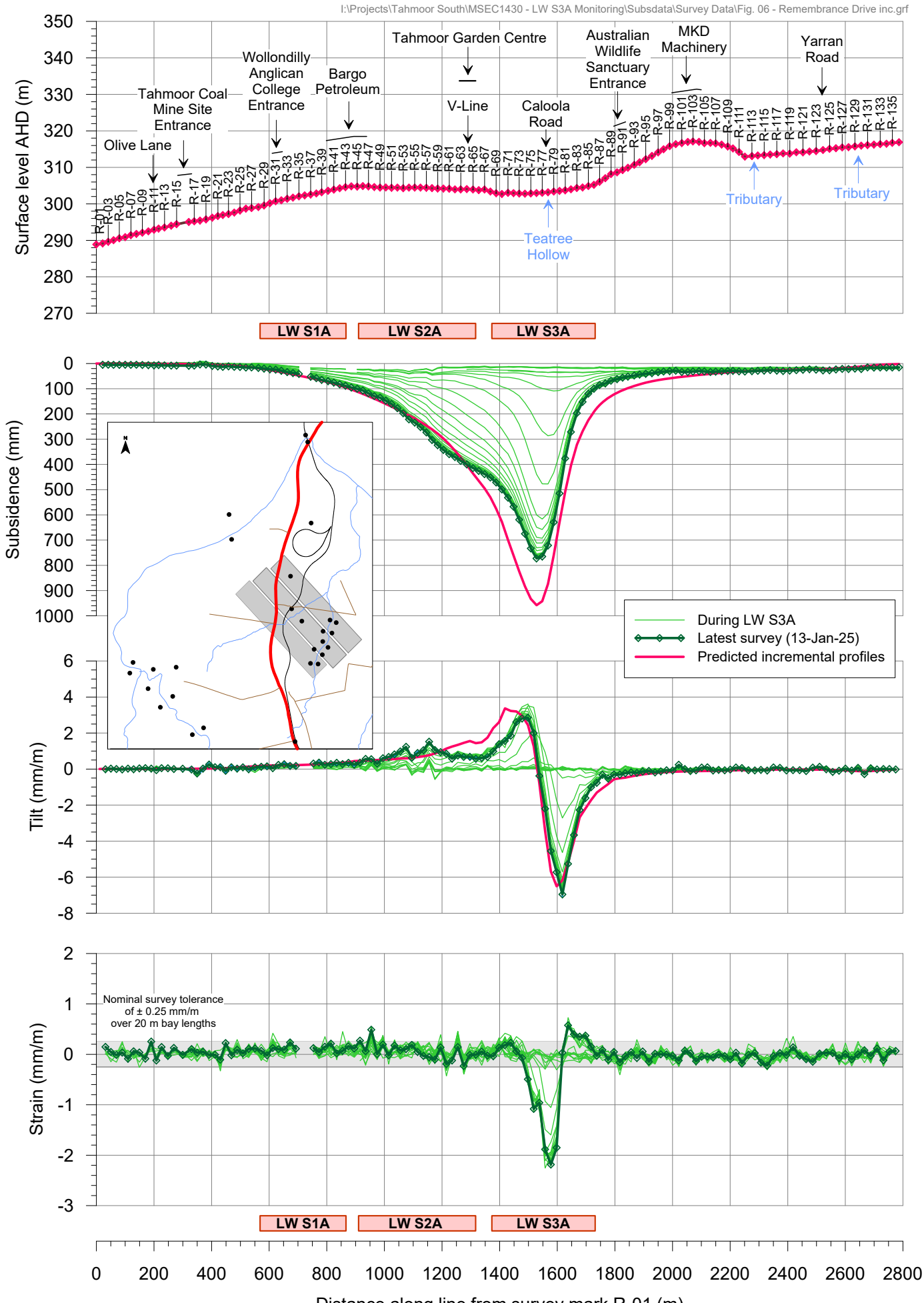

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Fig. 6-R36

Tahmoor South LW S3A
Total subsidence profiles along Remembrance Drive

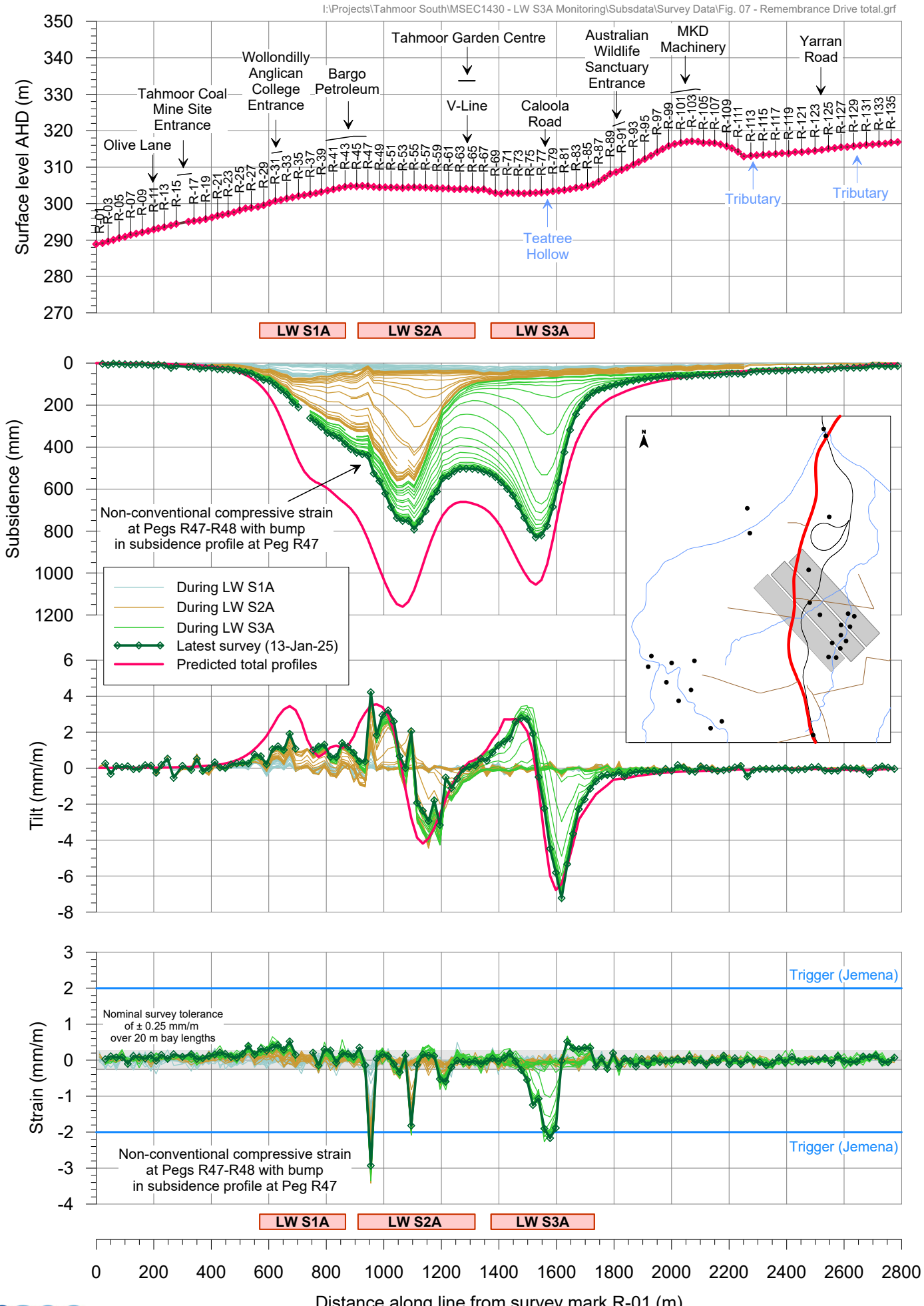

Fig. 7-R36

Tahmoor South LW S3A
Incremental subsidence profiles along Yarran Road

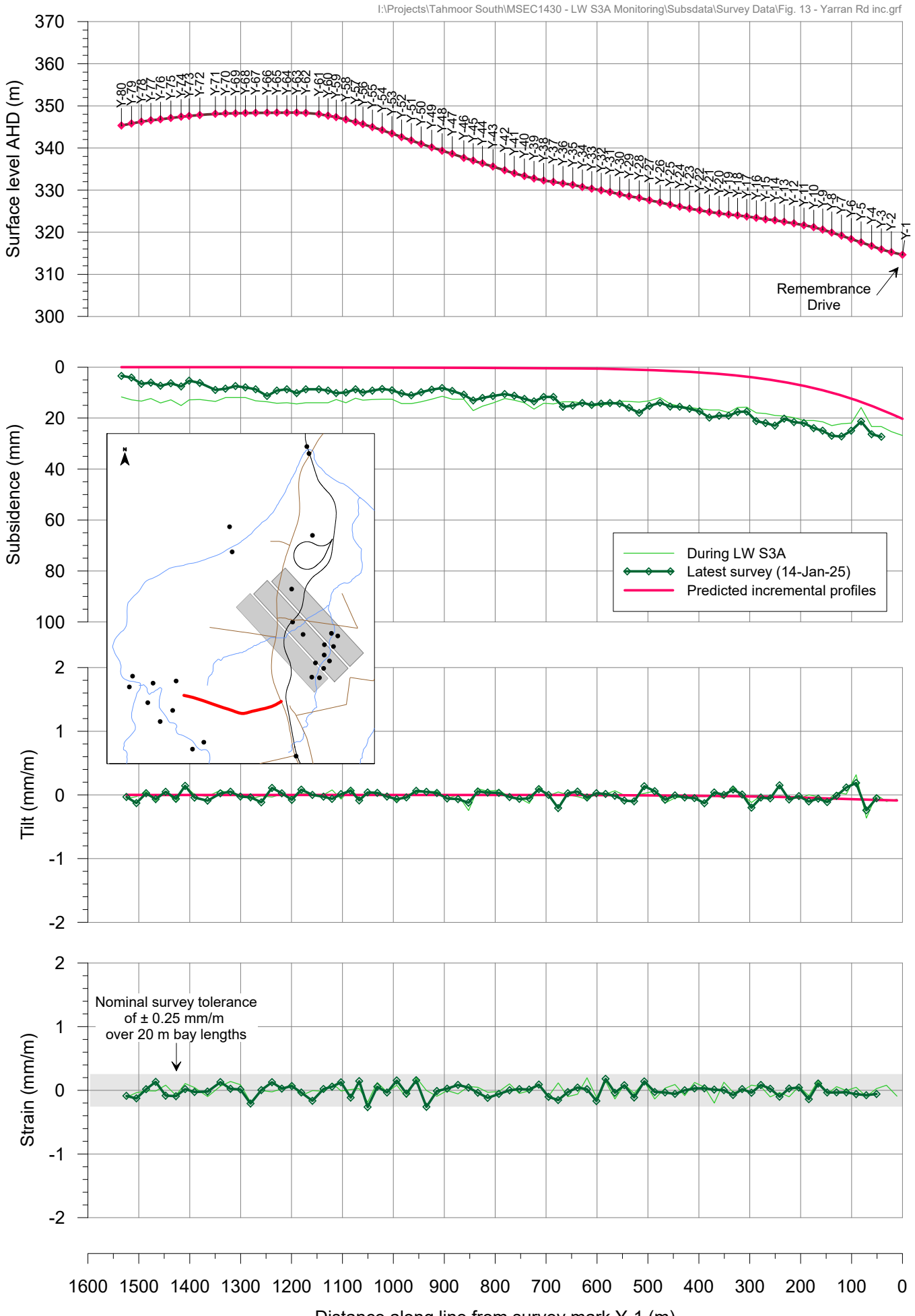

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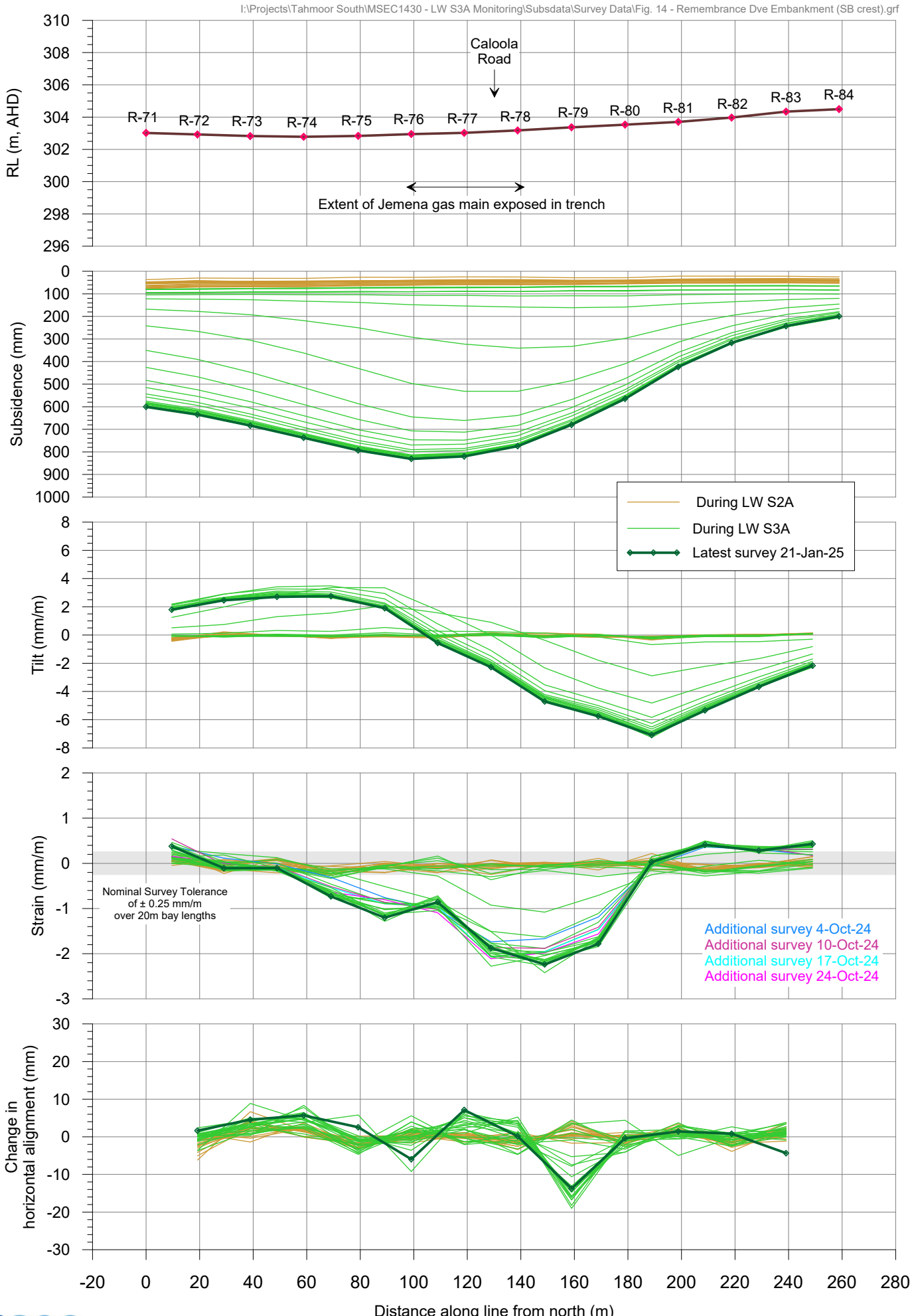
Fig. 13-R36

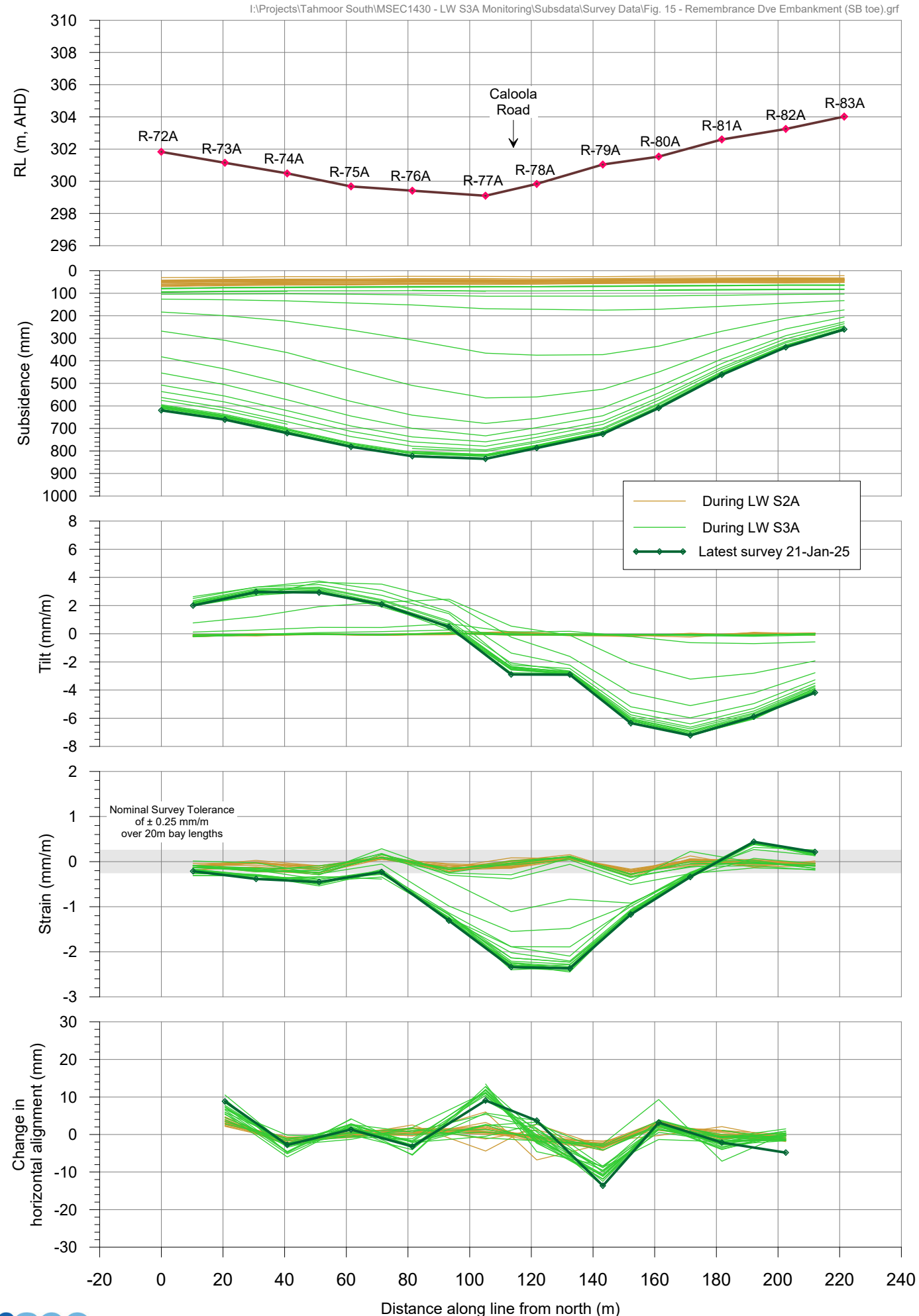
Tahmoor South LW S3A - Remembrance Drive Embankment
Total subsidence profiles along southbound crest



msec

Fig. 14-R36

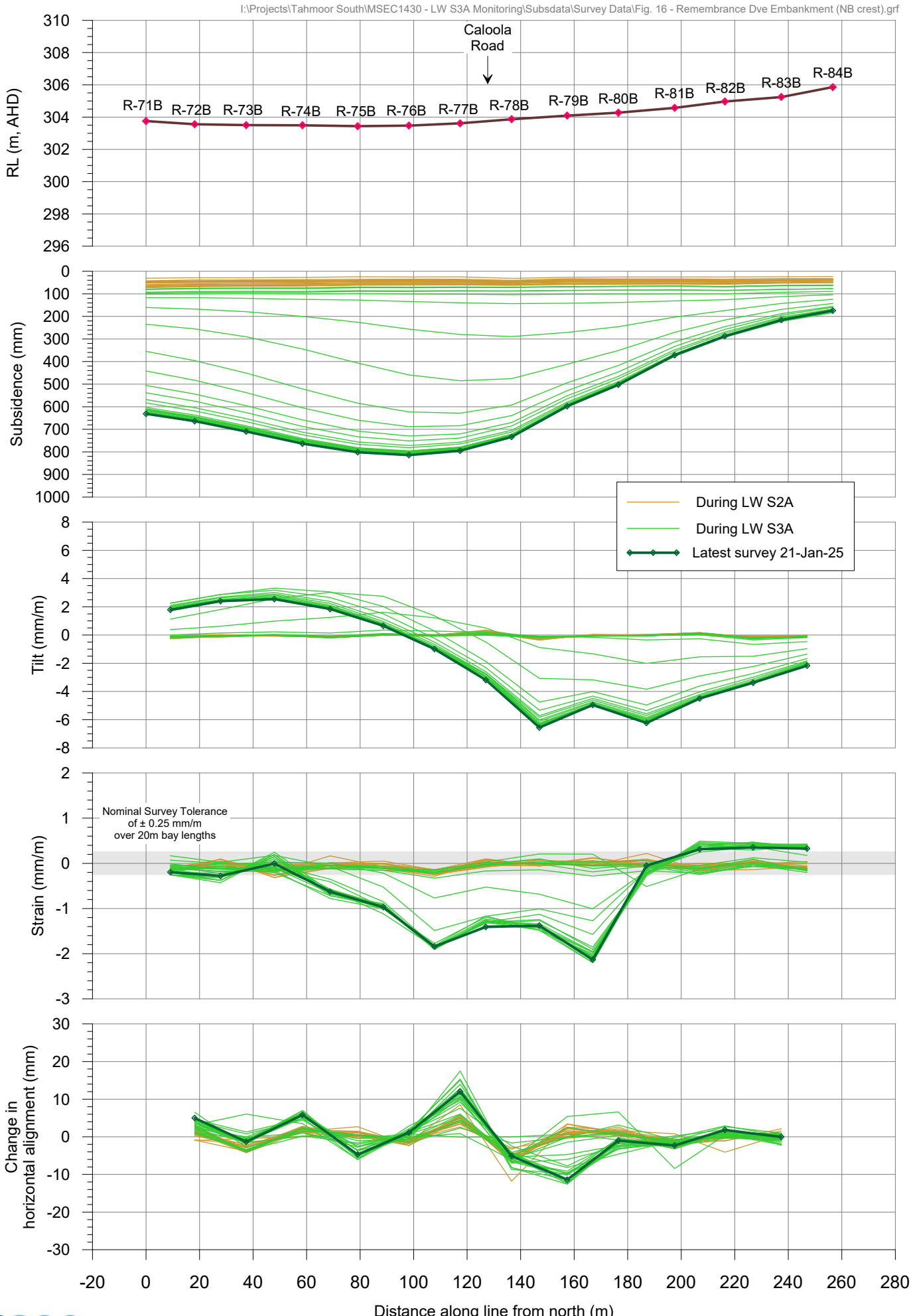
Tahmoor South LW S3A - Remembrance Drive Embankment
Total subsidence profiles along southbound toe



msec

Fig. 15-R36

Tahmoor South LW S3A - Remembrance Drive Embankment
Total subsidence profiles along northbound crest



msec

Fig. 16-R36

Tahmoor South LW S3A - Remembrance Drive Embankment
Total subsidence profiles along northbound toe

I:\Projects\Tahmoor South\MSEC1430 - LW S3A Monitoring\Subsdata\Survey Data\Fig. 17 - Remembrance Dve Embankment (NB toe).grf

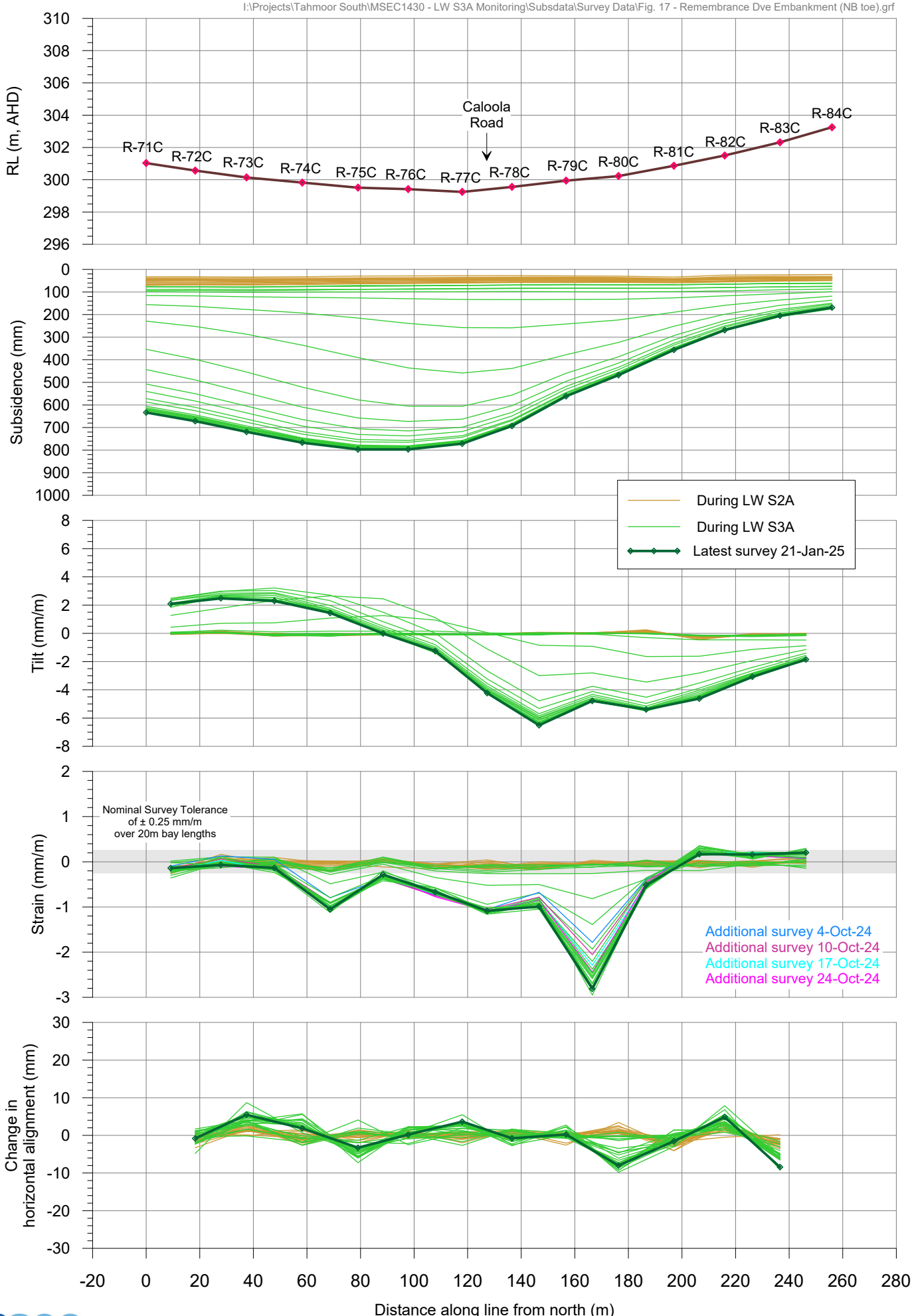


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Fig. 17-R36

Tahmoor South LW S3A - Remembrance Drive Embankment
Total subsidence profiles along southbound fence

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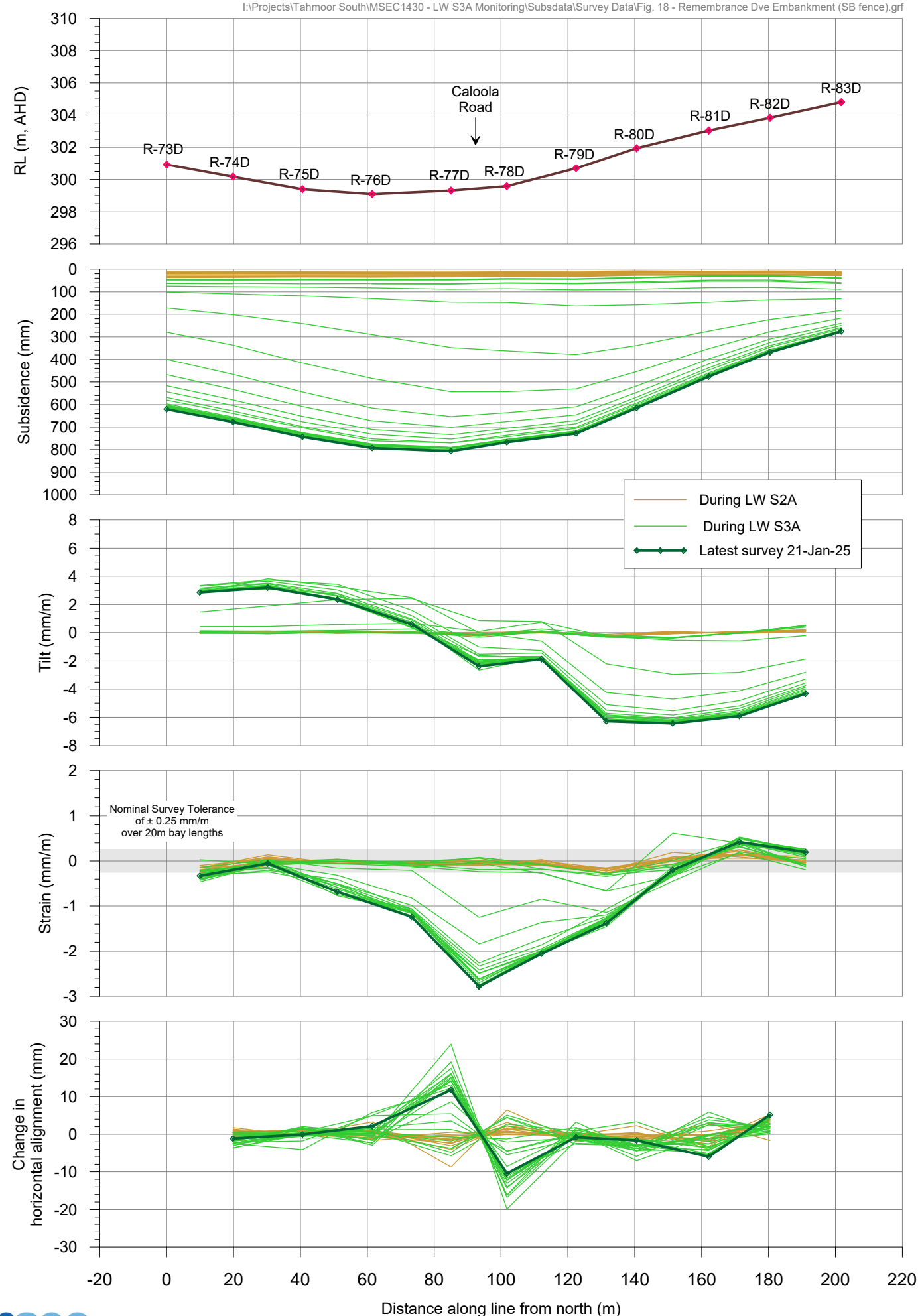

msec

Fig. 18-R36

Tahmoor South LW S3A - Remembrance Drive Embankment
Total closure across the embankment

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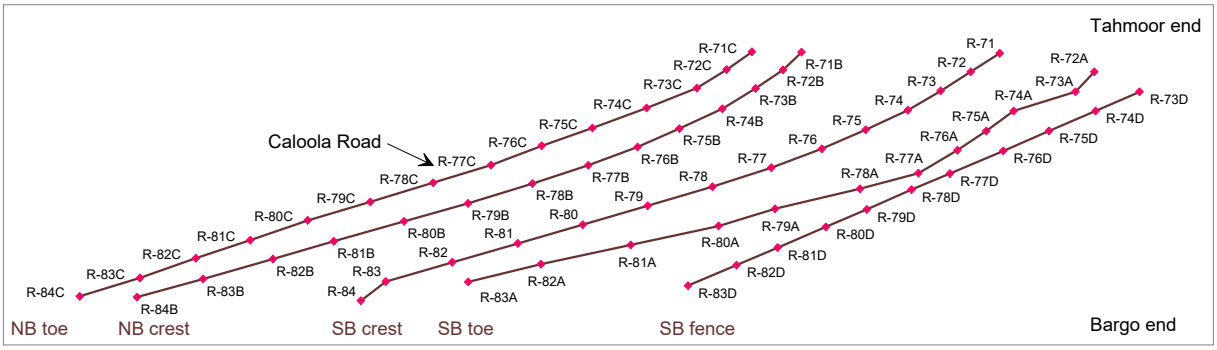

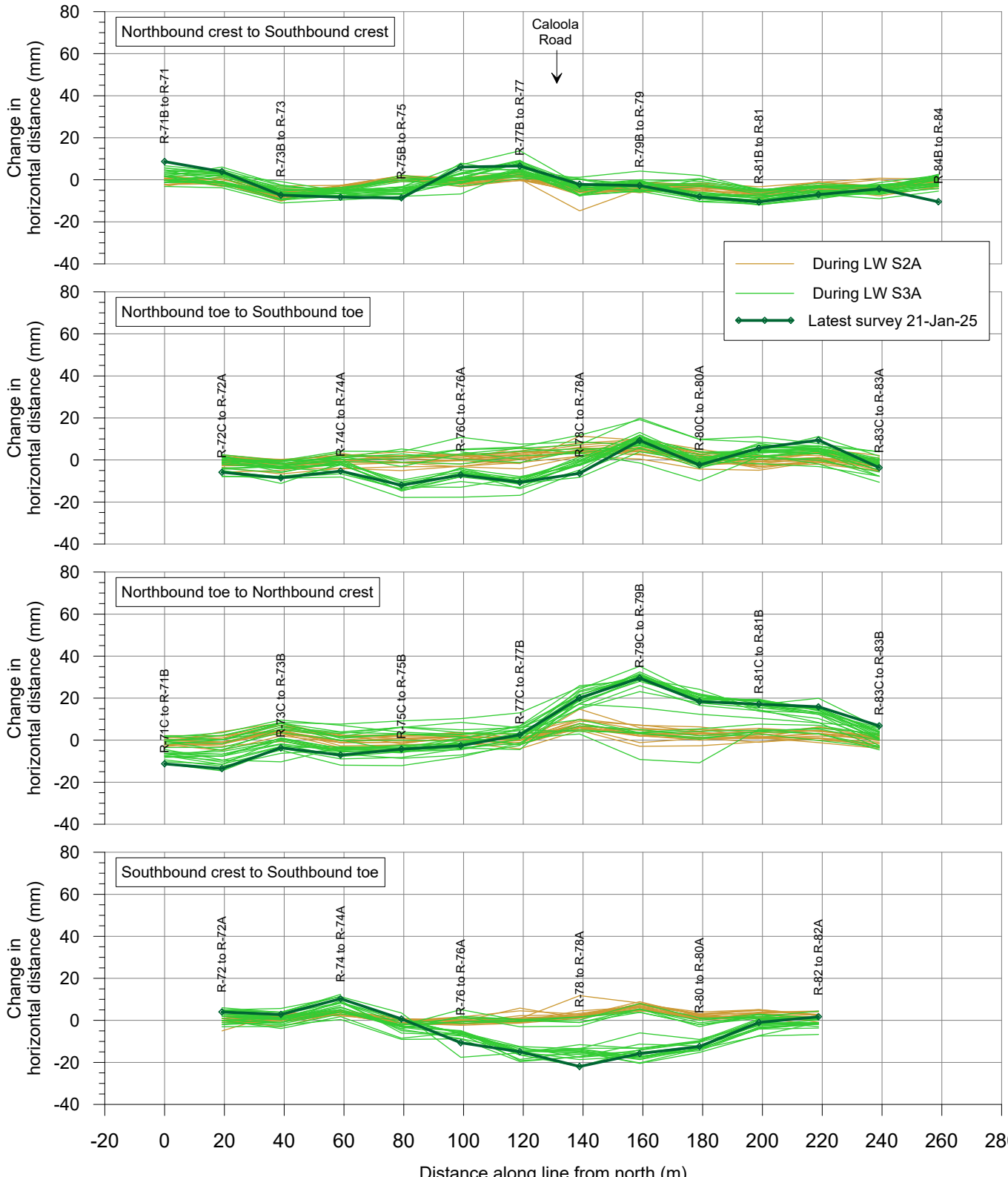

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Fig. 19-R36

Tahmoor South LW S3A
Incremental subsidence profiles along V-Line

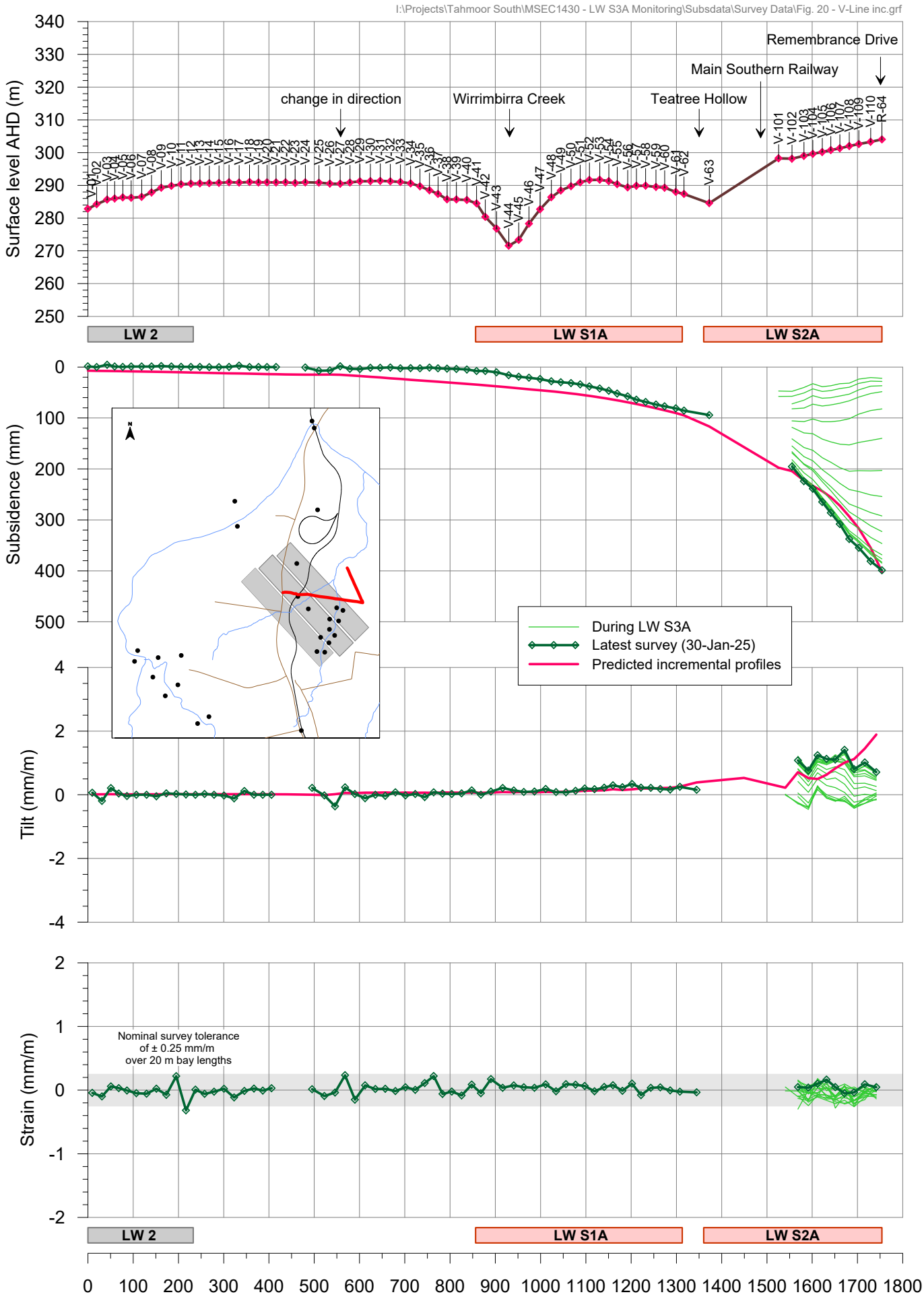
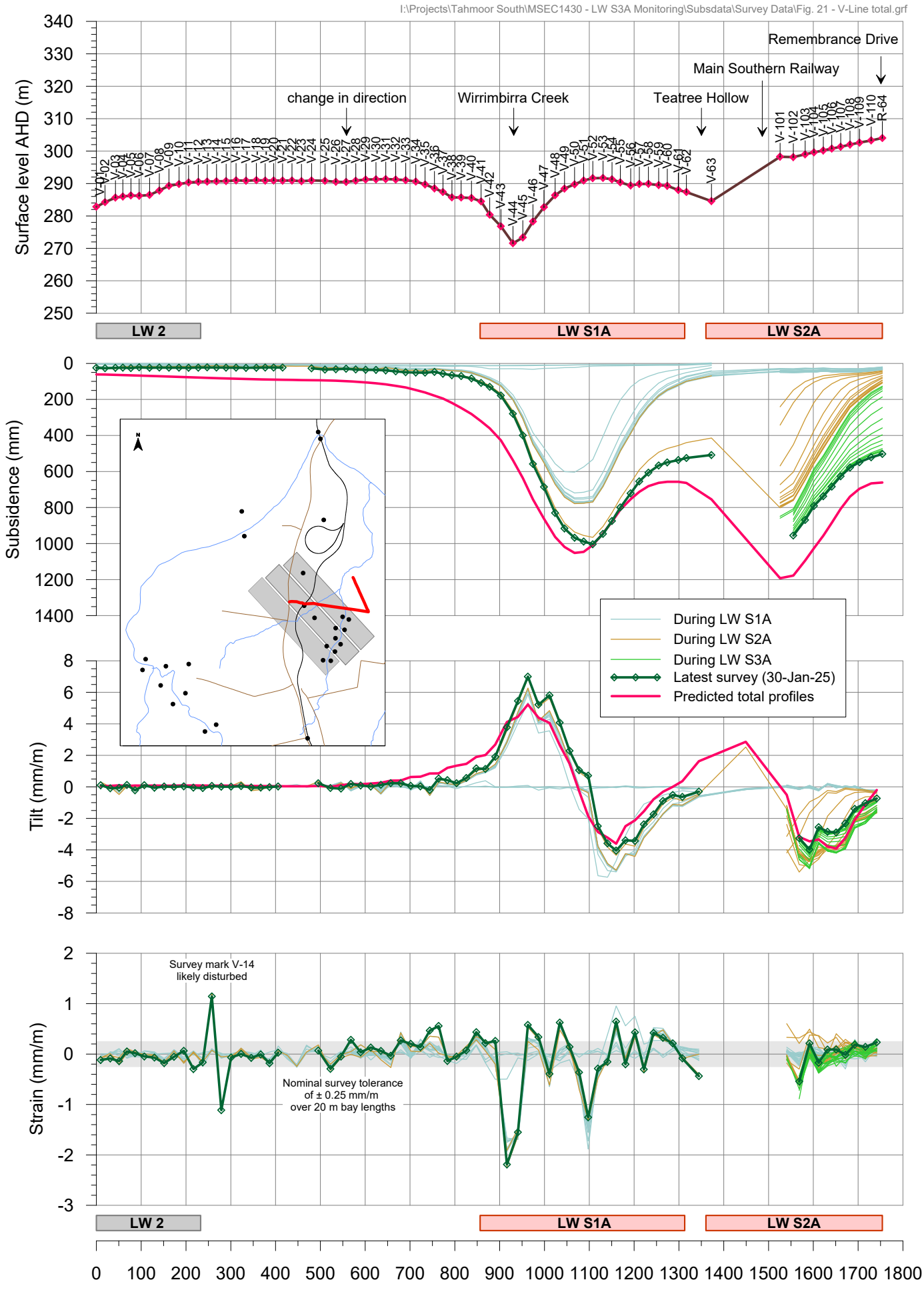


Fig. 20-R36

Tahmoor South LW S3A
Total subsidence profiles along V-Line



Tahmoor South LW S3A
Incremental subsidence profiles along Caloola Road

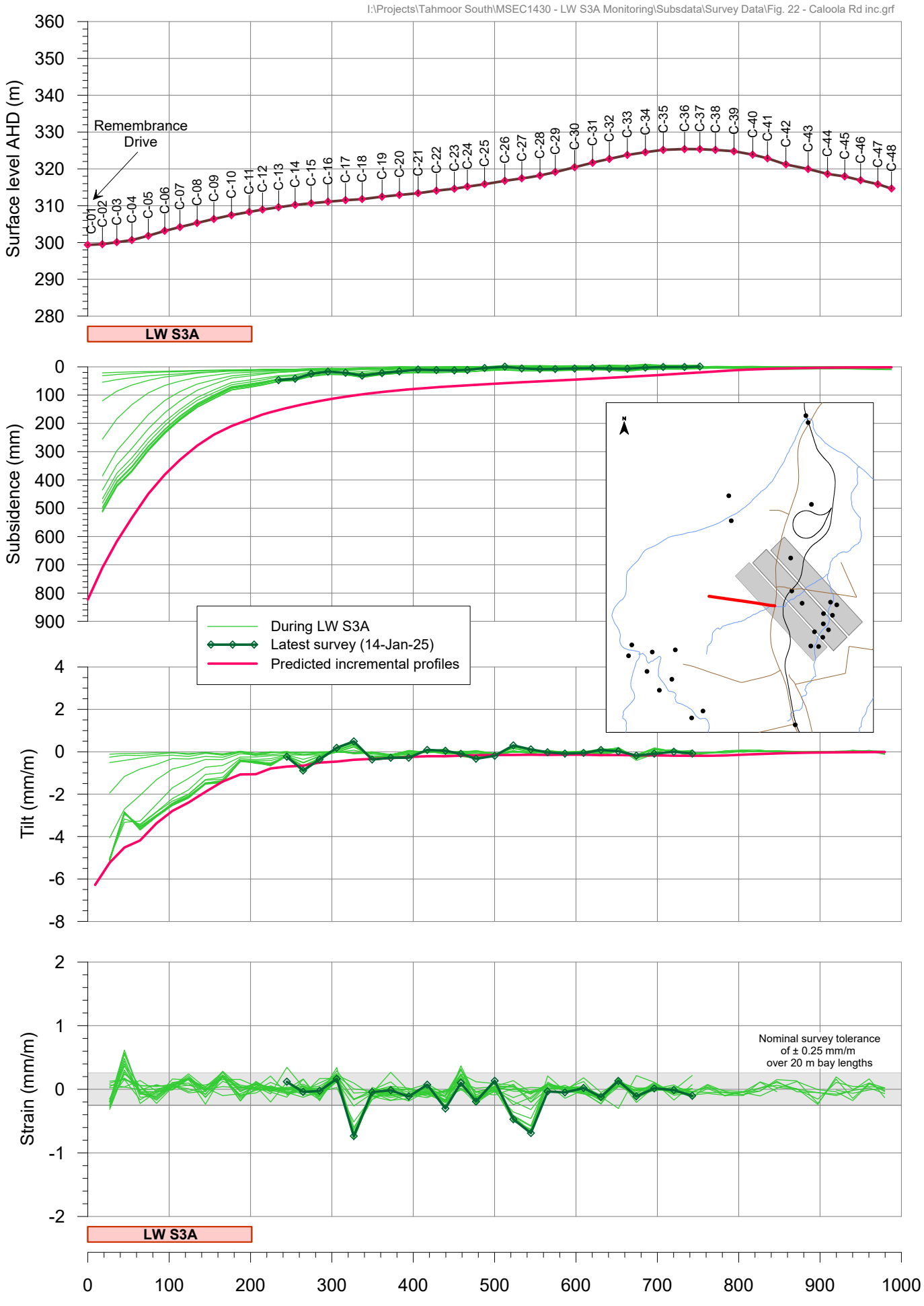


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Fig. 22-R36

Tahmoor South LW S3A
Total subsidence profiles along Caloola Road

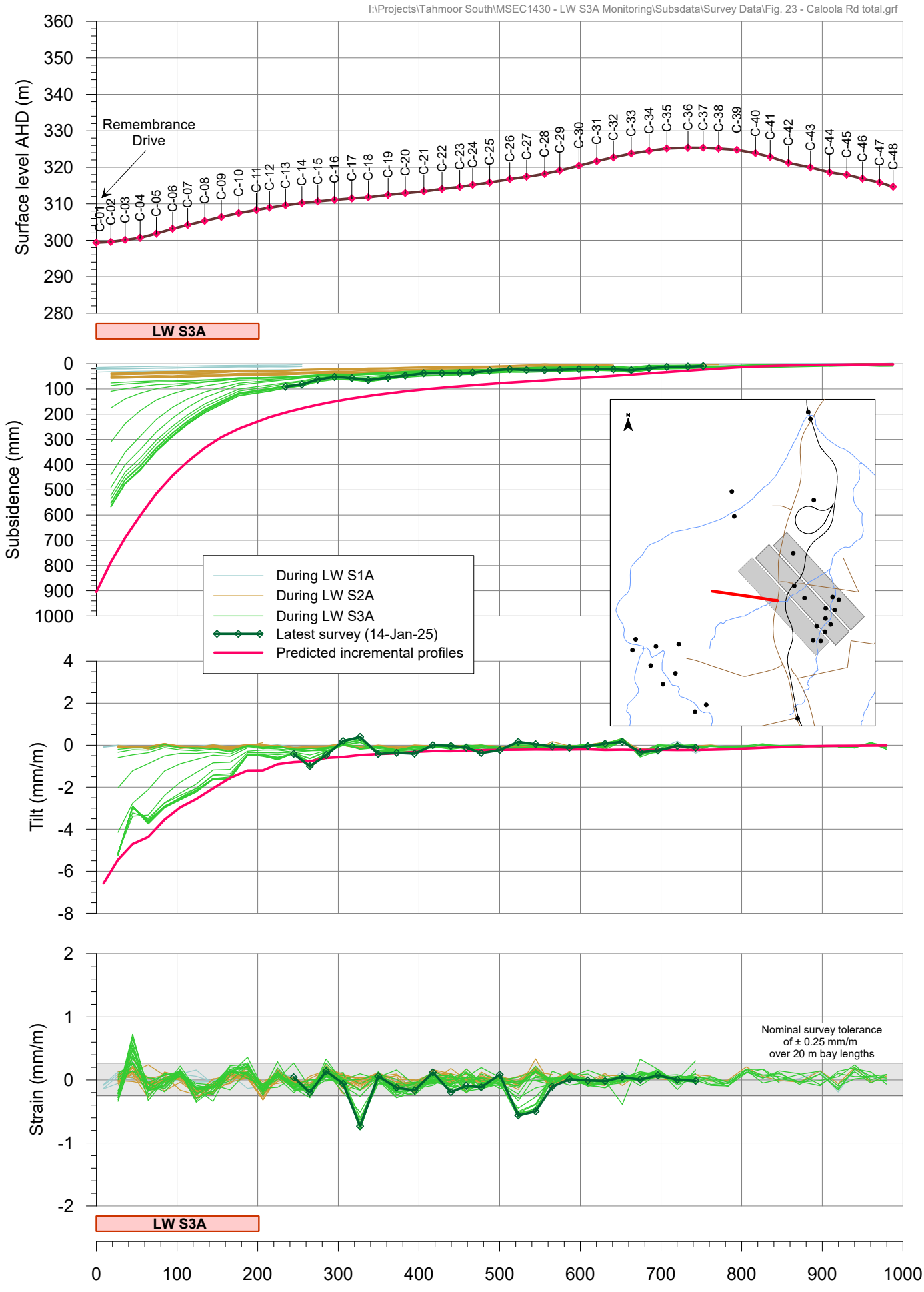

Fig. 23-R36

Tahmoor South LW S3A - GNSS Monitoring

Site S01 above LW S1A

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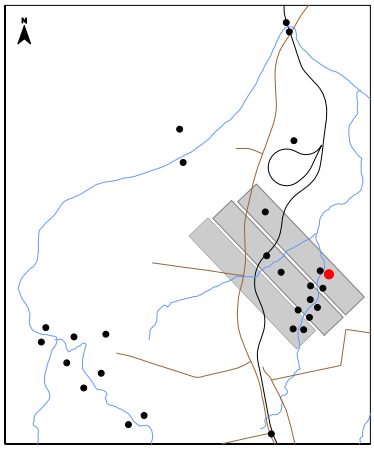



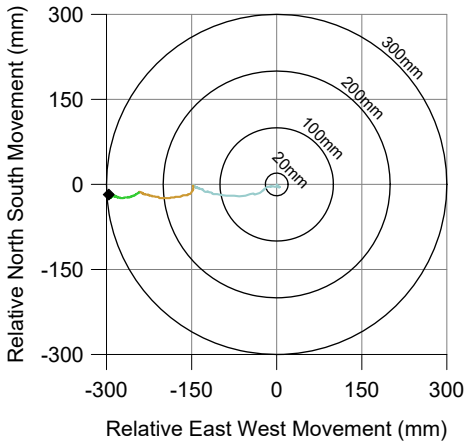

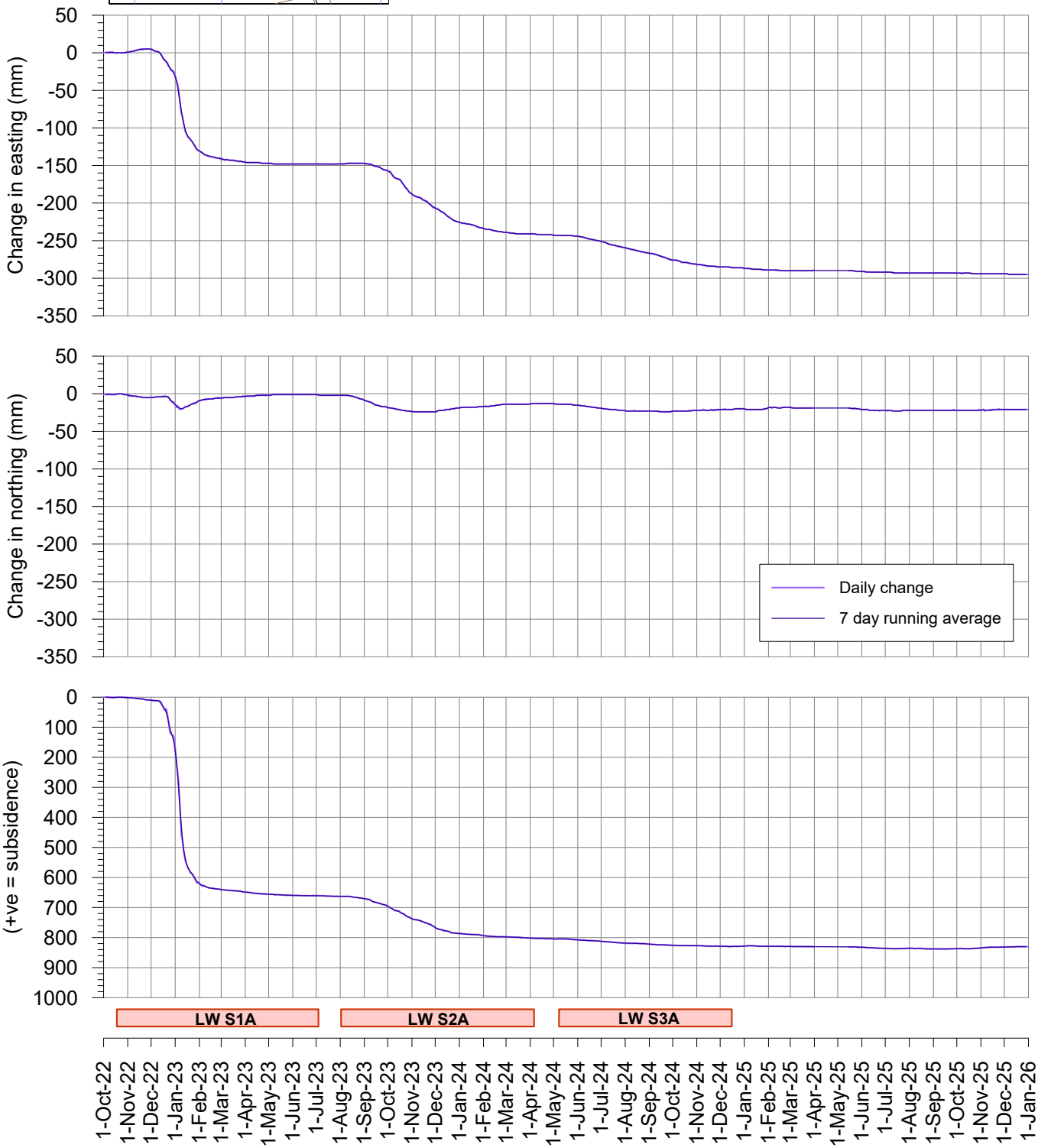

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Fig. S01-R36

Tahmoor South LW S3A - GNSS Monitoring

Site S02 above LW S1A

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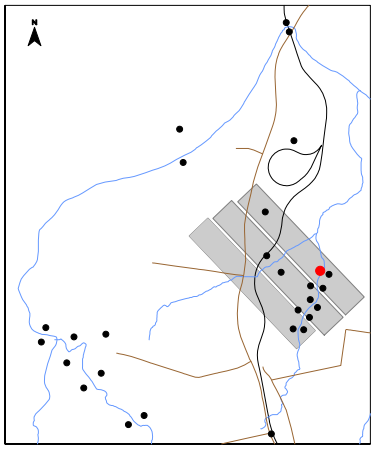



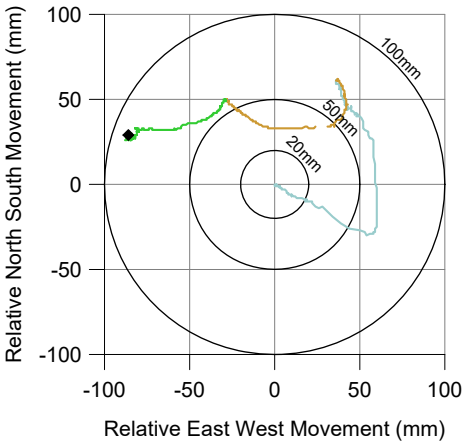

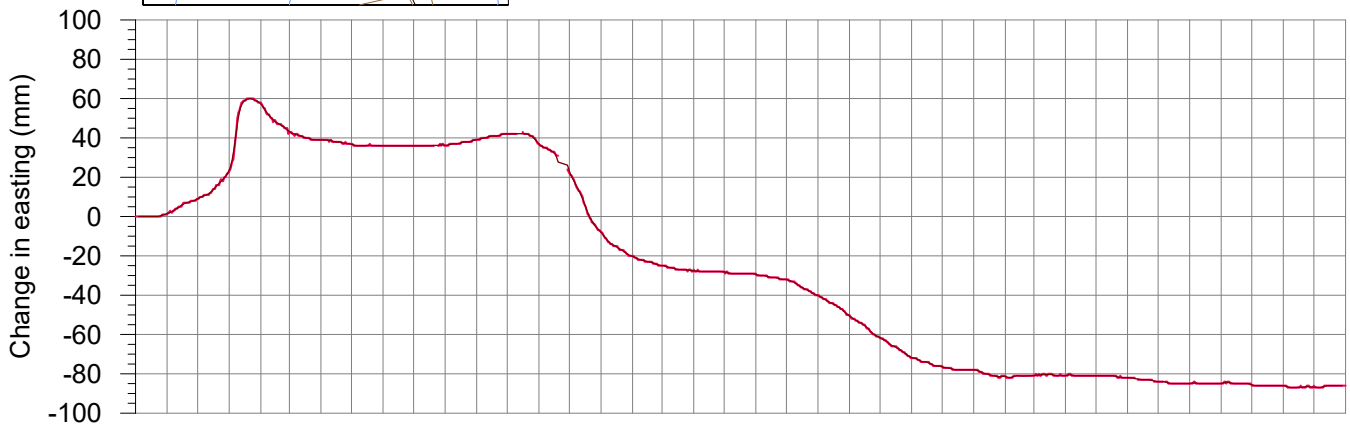

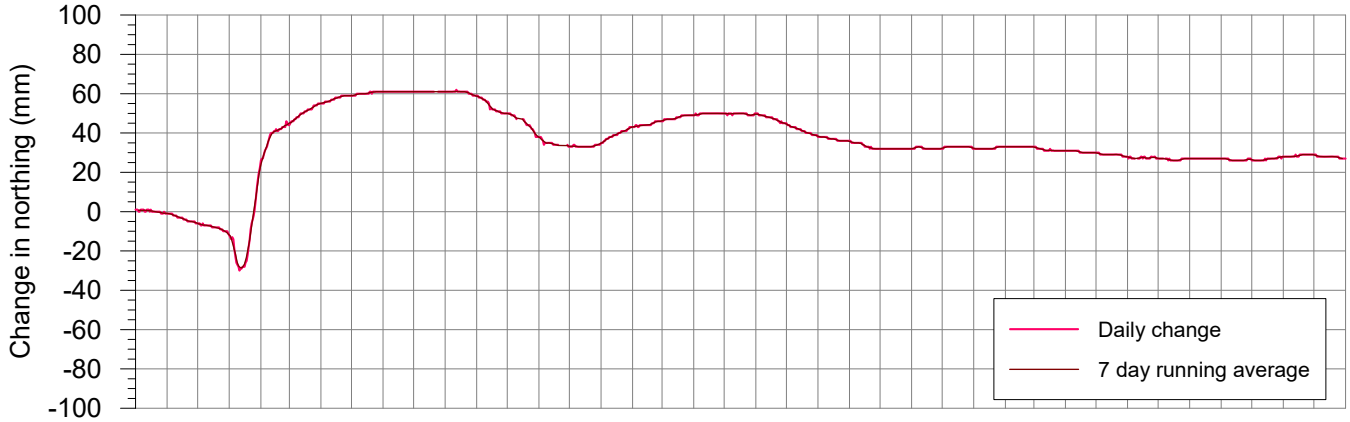

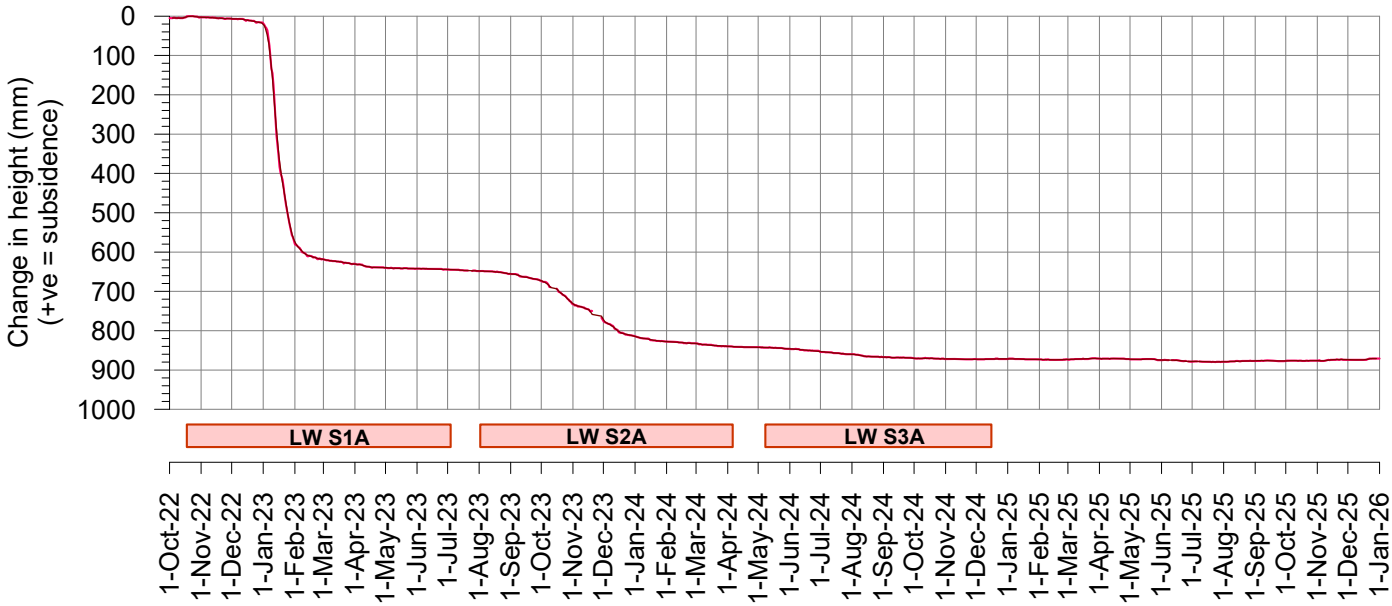

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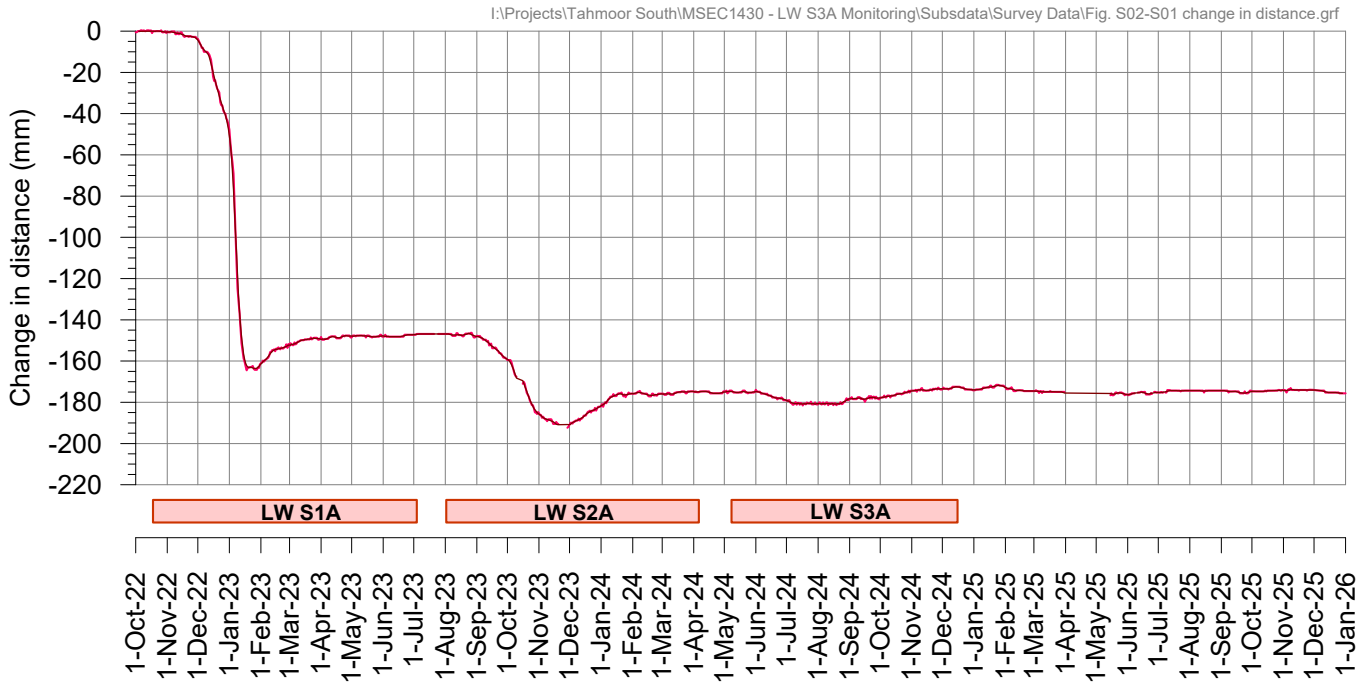
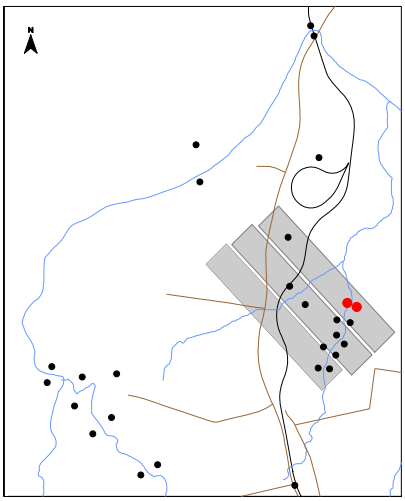
Fig. S02-R36

Tahmoor South LW S3A - GNSS Monitoring

Change in distance across Wirrimbirra Creek
Sites S01 and S02 above LW S1A





Tahmoor South LW S3A - GNSS Monitoring

Site S03 above LW S1A at Teatree 3

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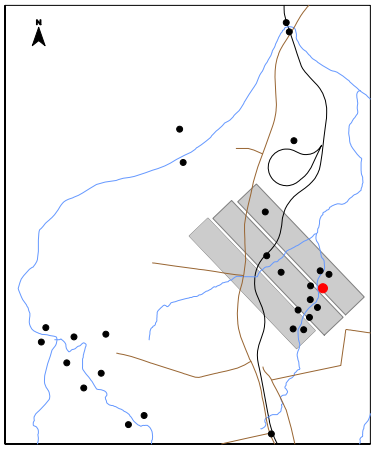

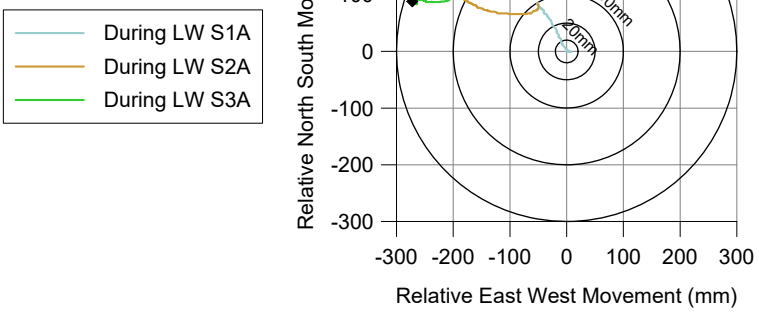

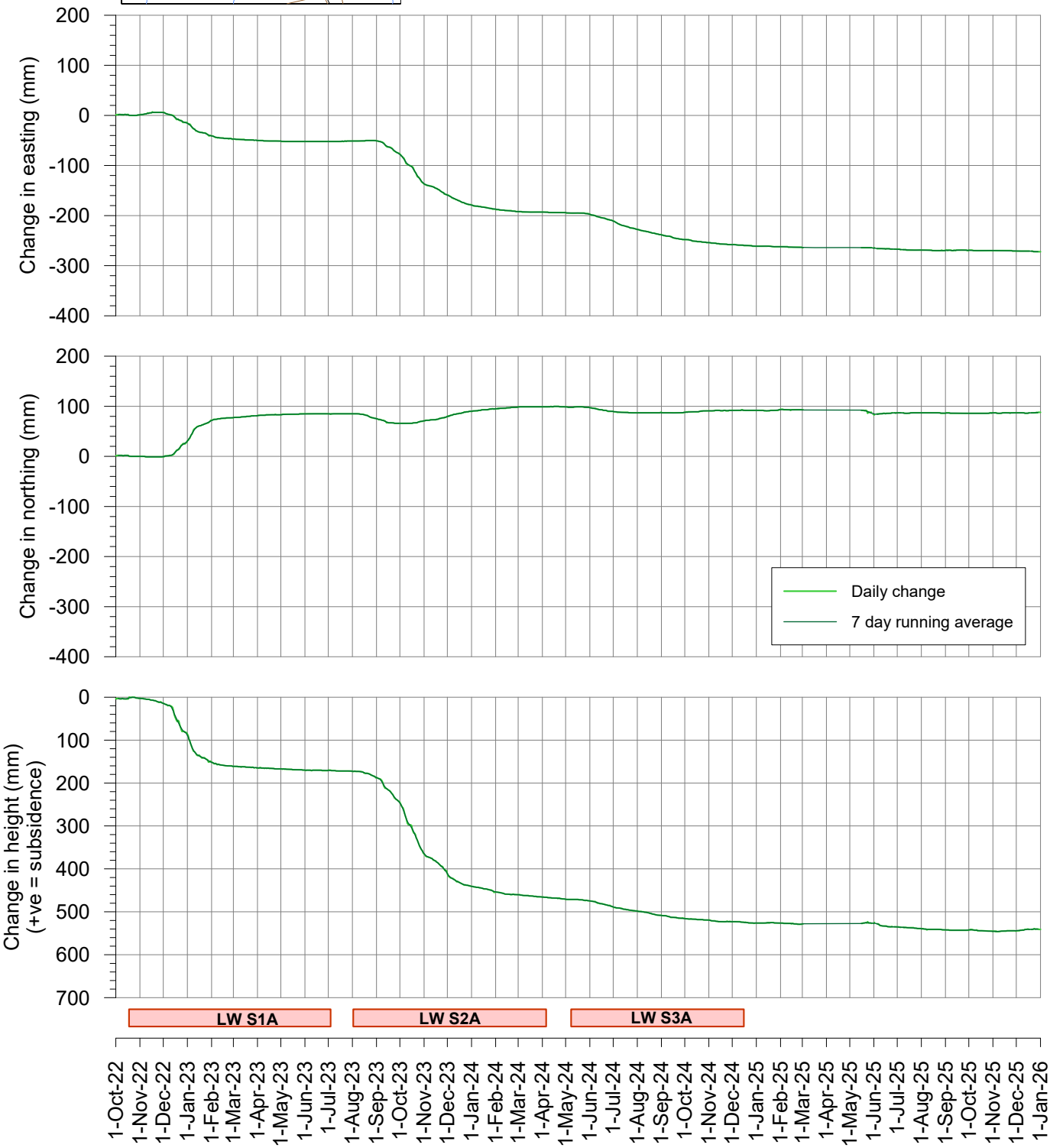

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Fig. S03-R36

Tahmoor South LW S3A - GNSS Monitoring

Site S04 above LW S2A at Teatree 3

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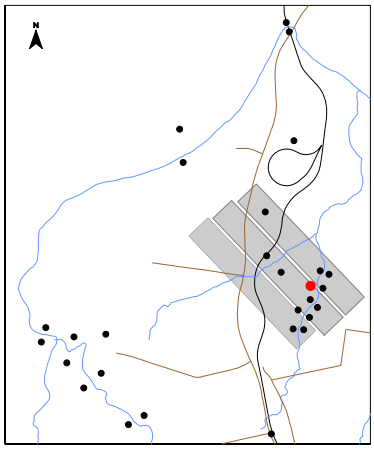
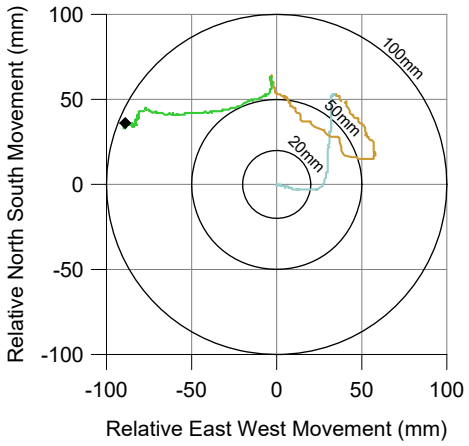
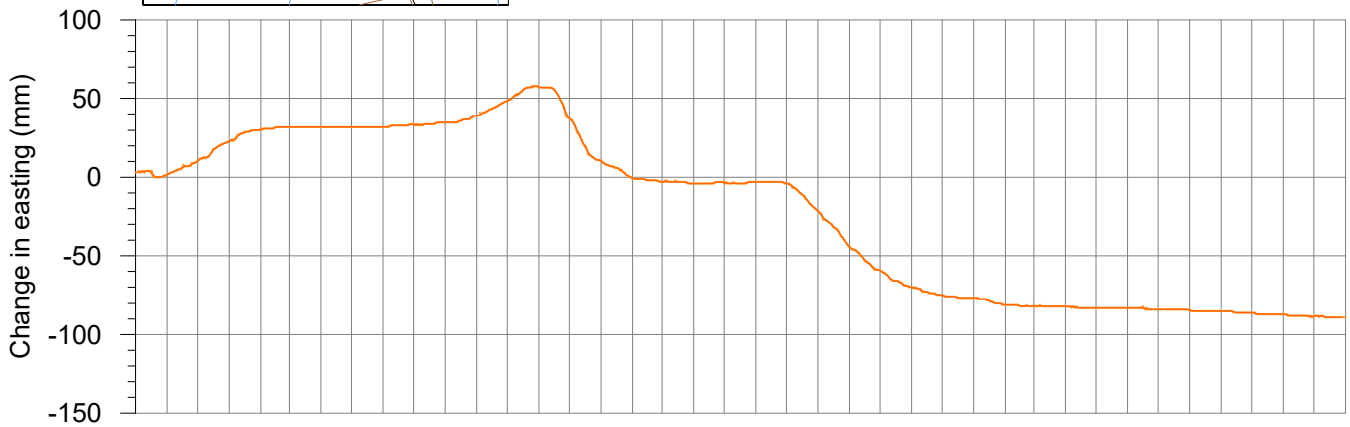
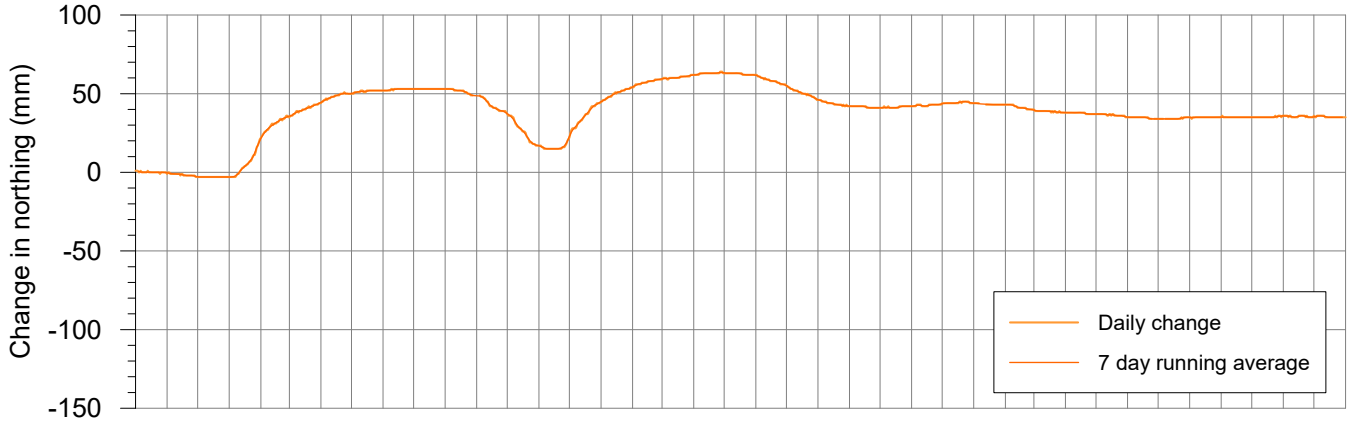
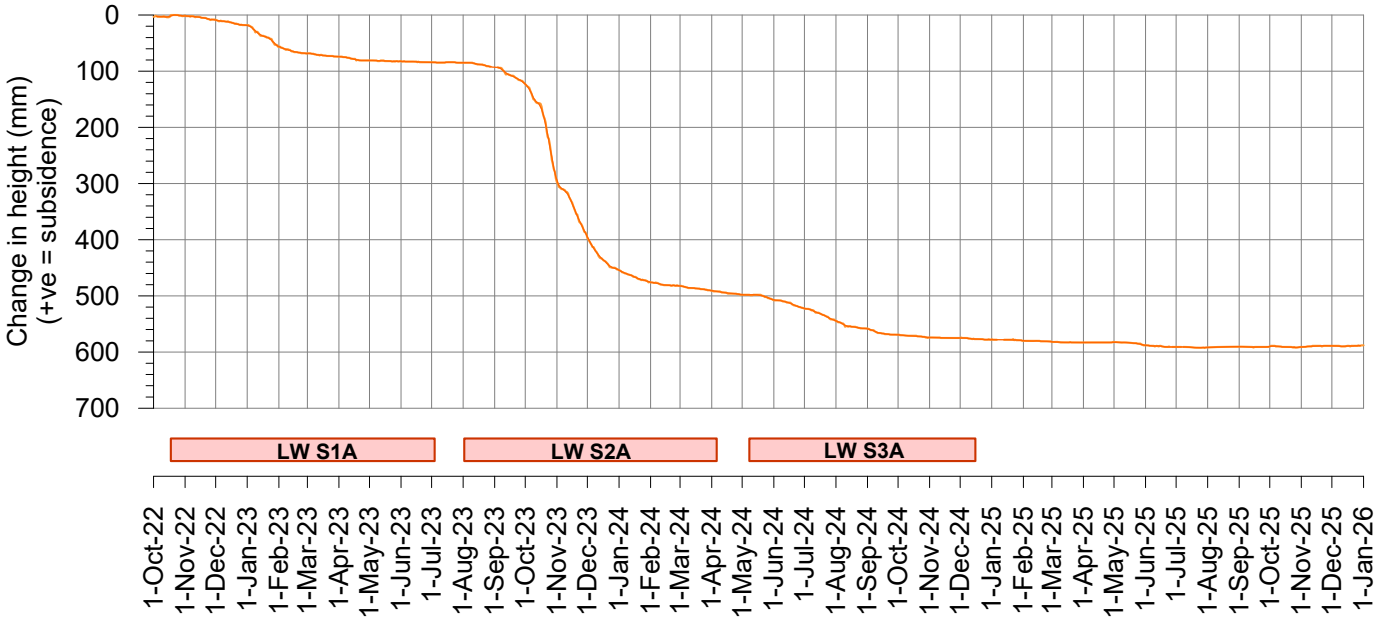










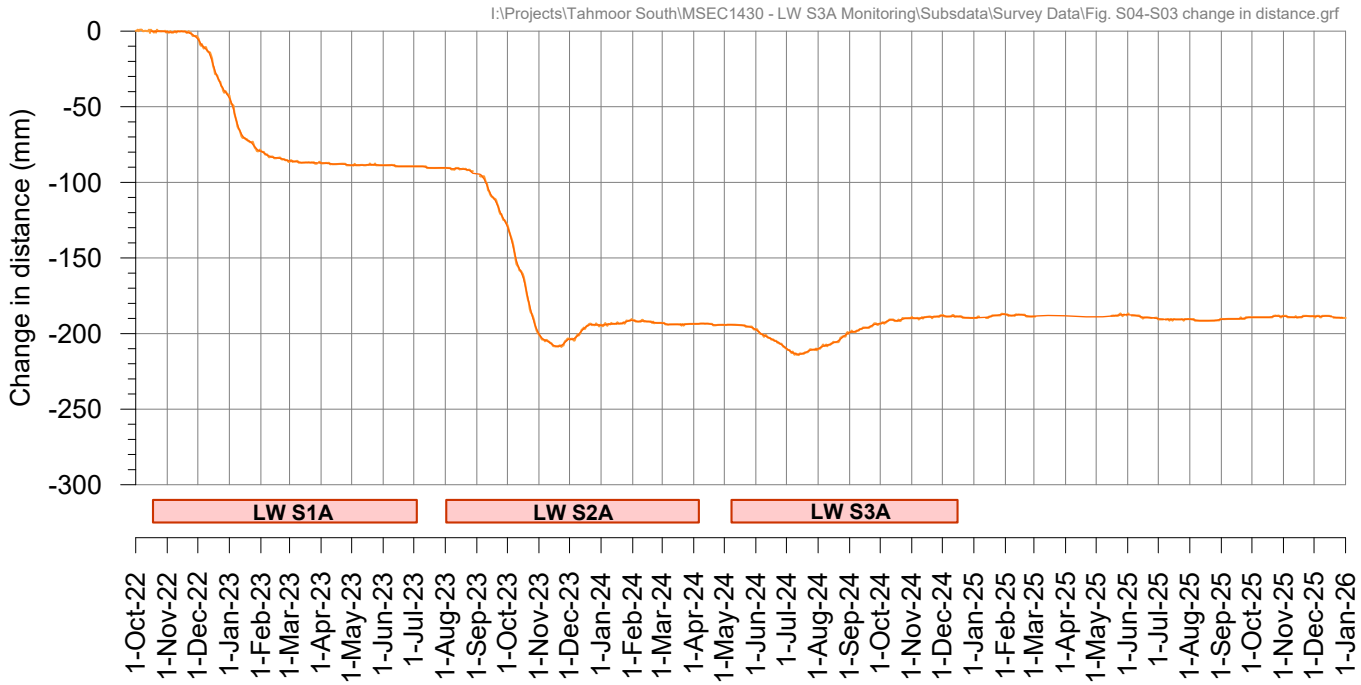


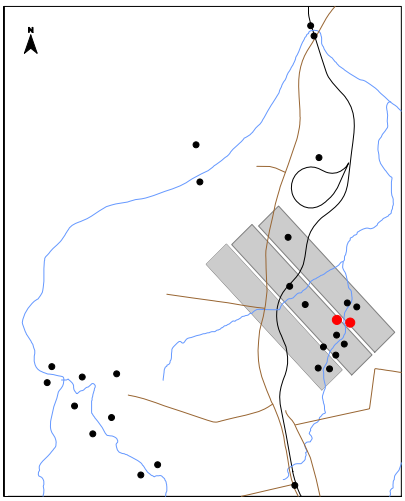
msec

Fig. S04-R36

Tahmoor South LW S3A - GNSS Monitoring

Change in distance across Wirrimbirra Creek at Teatree 3
Site S03 above LW S1A and Site S04 above LW S2A





Tahmoor South LW S3A - GNSS Monitoring

Site S05 above LW S2A

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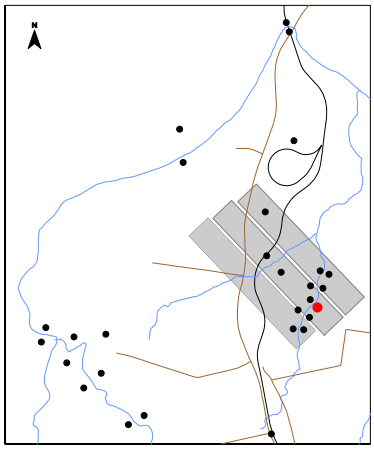
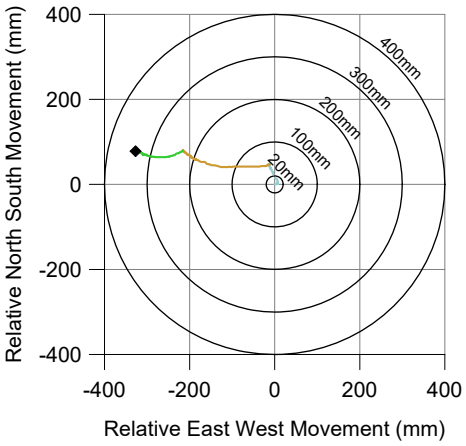
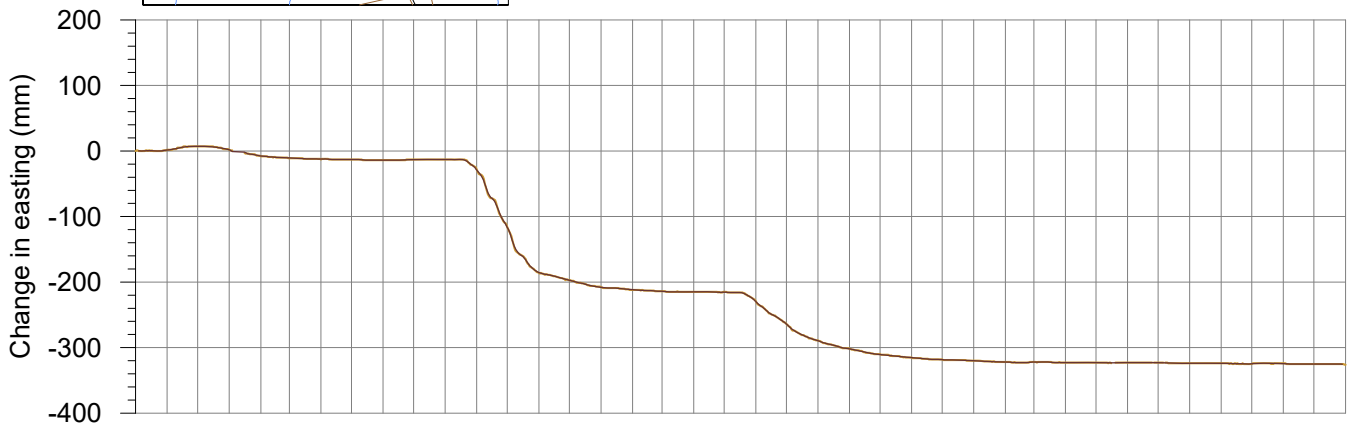
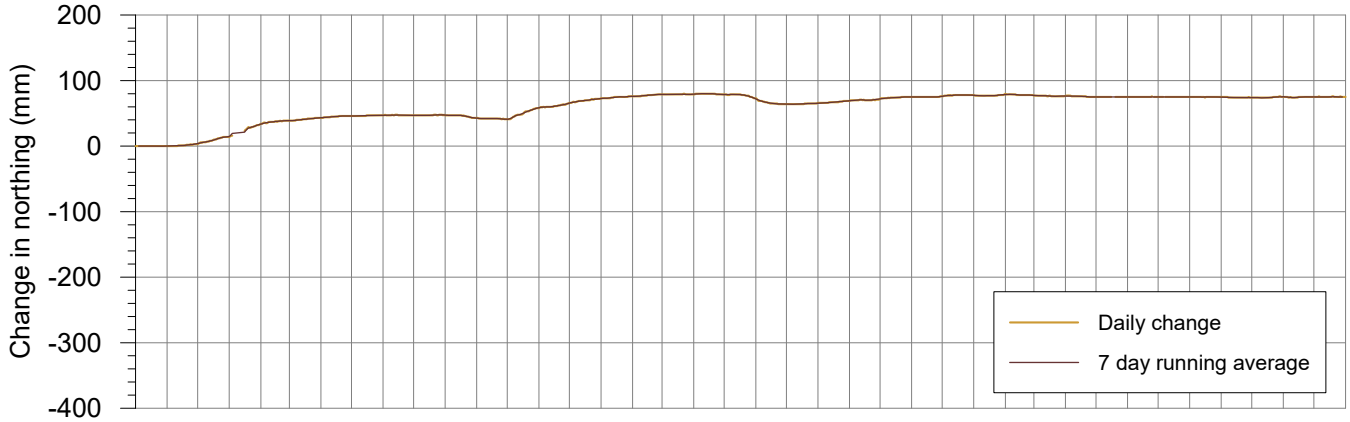
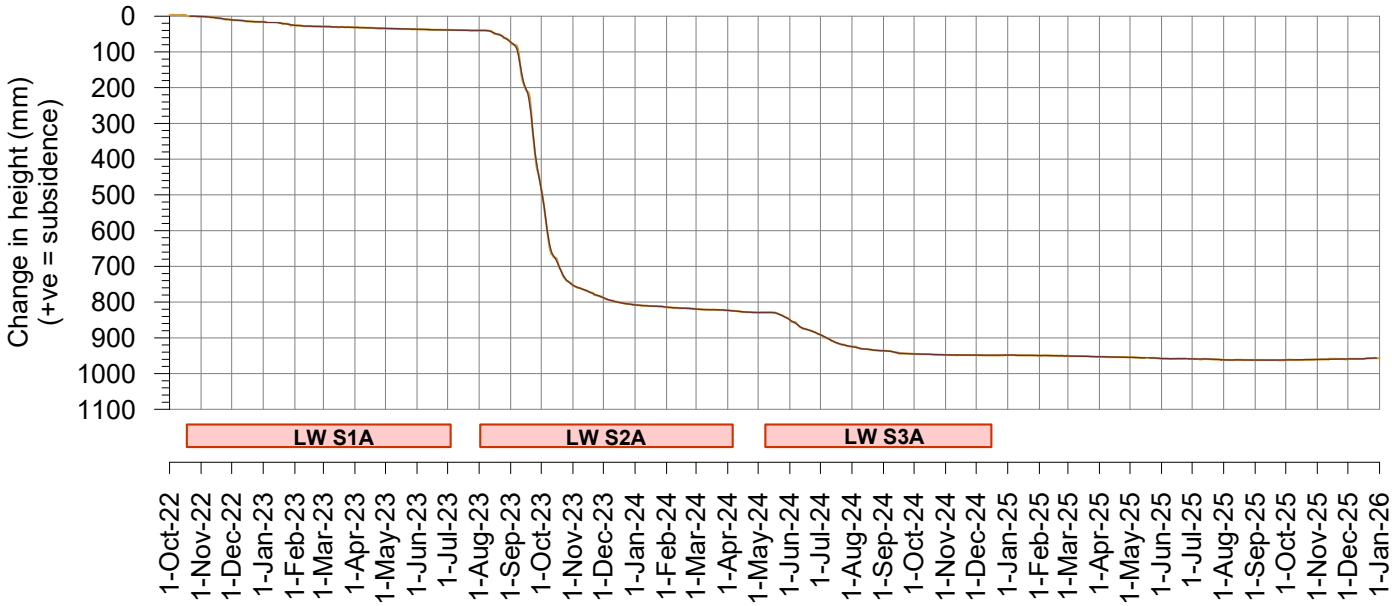


During LW S1A
During LW S2A
During LW S3A









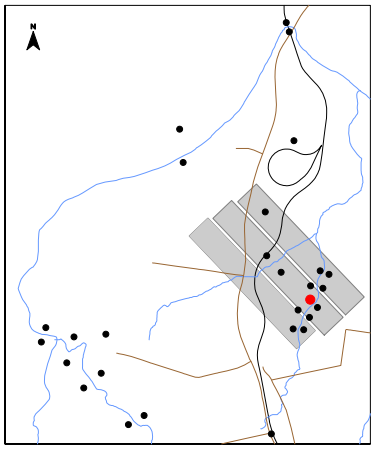
msec

Fig. S05-R36

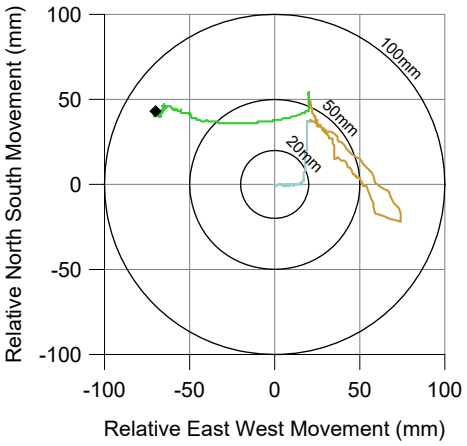
Tahmoor South LW S3A - GNSS Monitoring

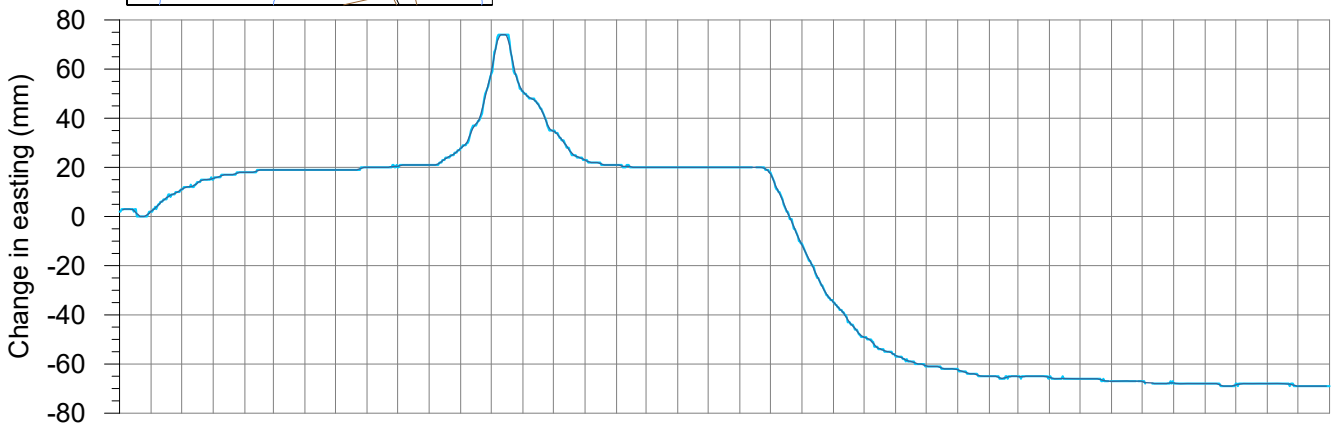
Site S06 above LW S2A

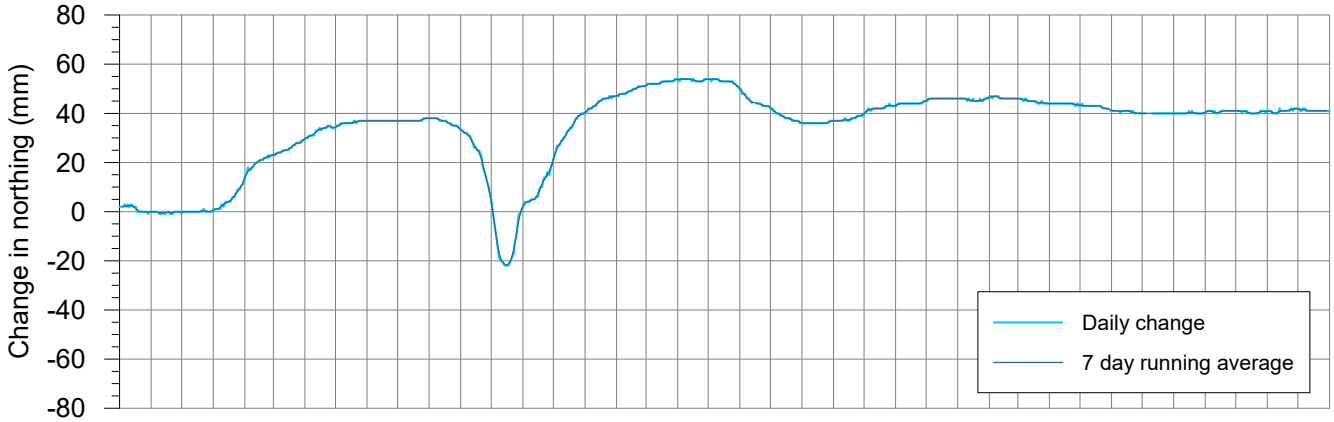
I:\Projects\Tahmoor South\MSEC1430 - LW S3A Monitoring\Subsdata\Survey Data\Fig. S06 GNSS.grf

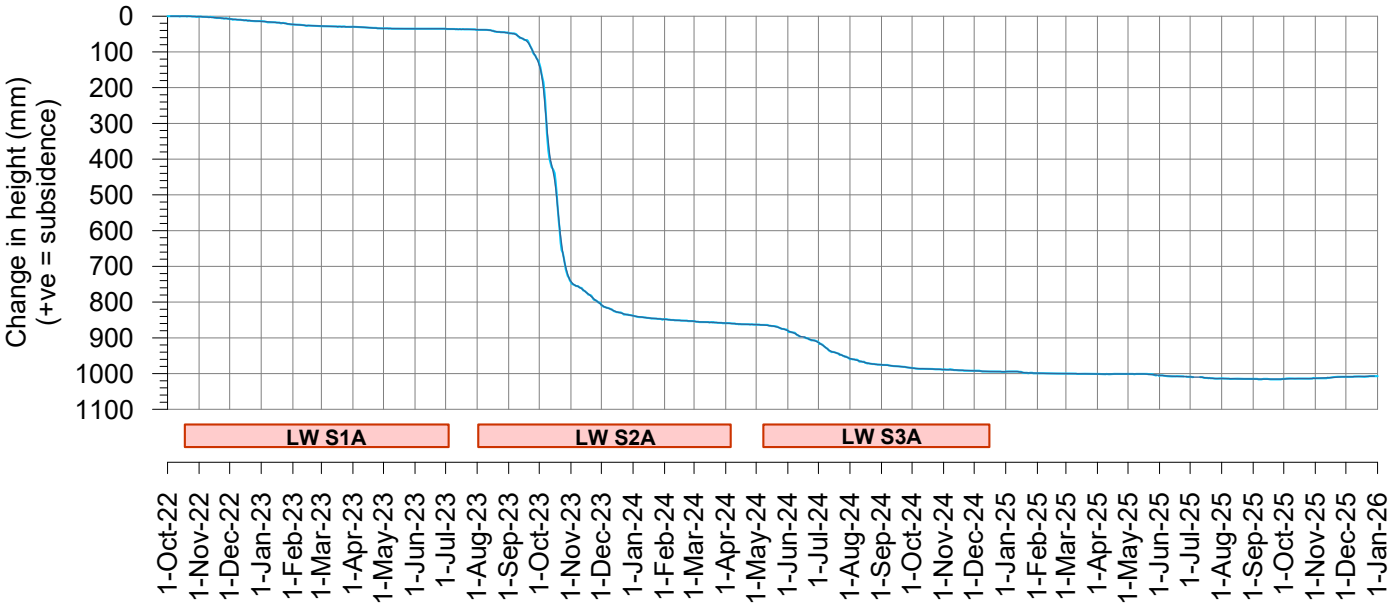


During LW S1A
During LW S2A
During LW S3A







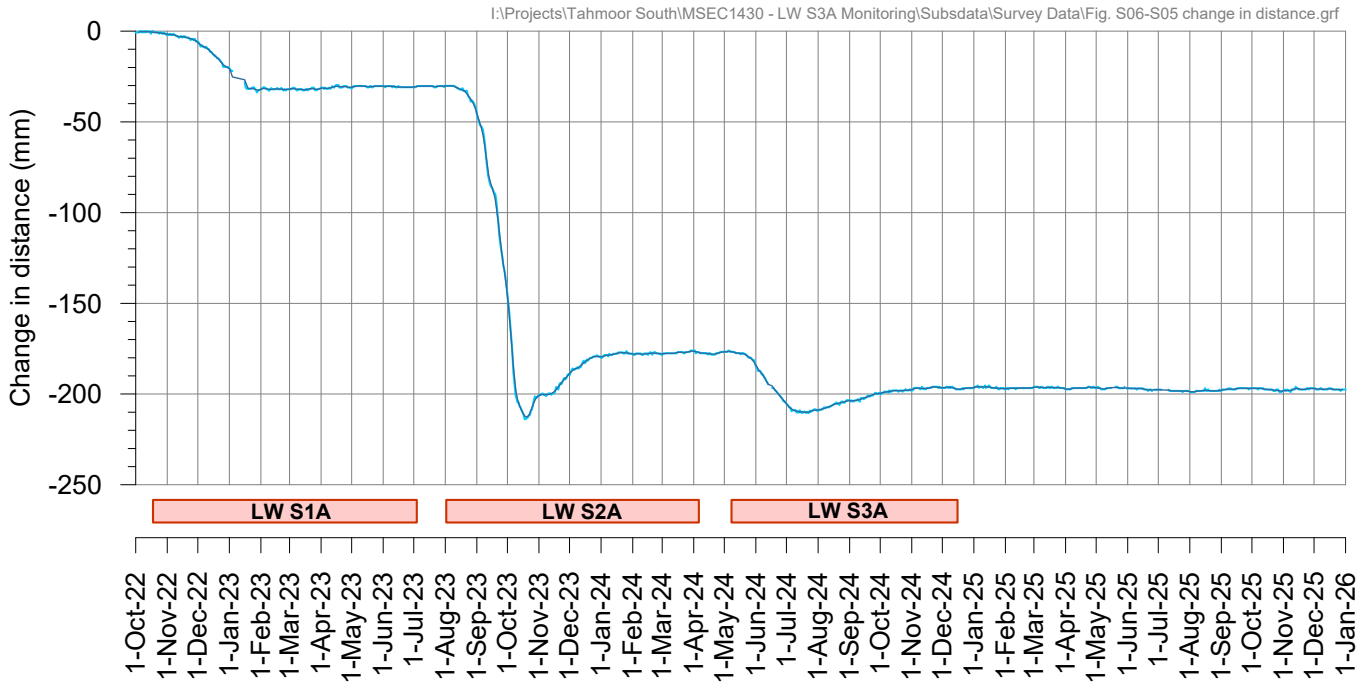


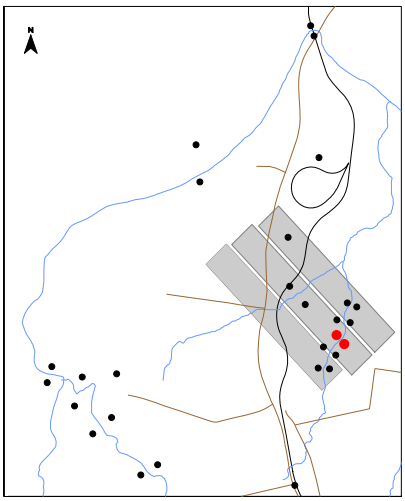
msec

Fig. S06-R36

Tahmoor South LW S3A - GNSS Monitoring

Change in distance across Wirrimbirra Creek
Sites S05 and S06 above LW S2A





Tahmoor South LW S3A - GNSS Monitoring

Site S07 above LW S2A

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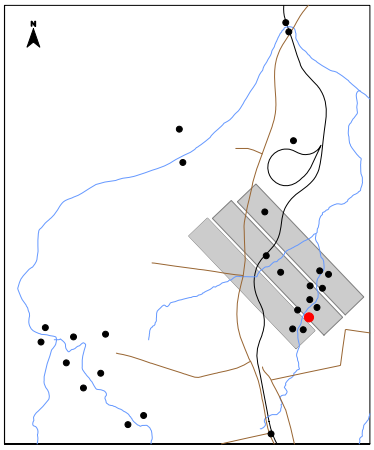
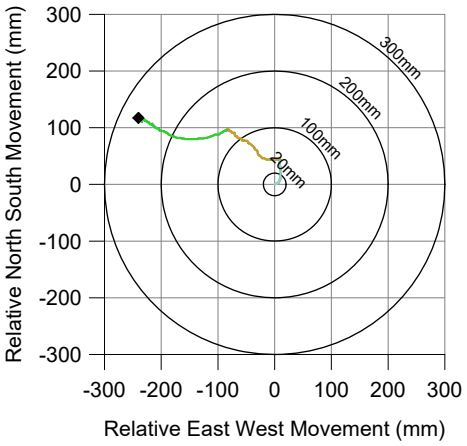
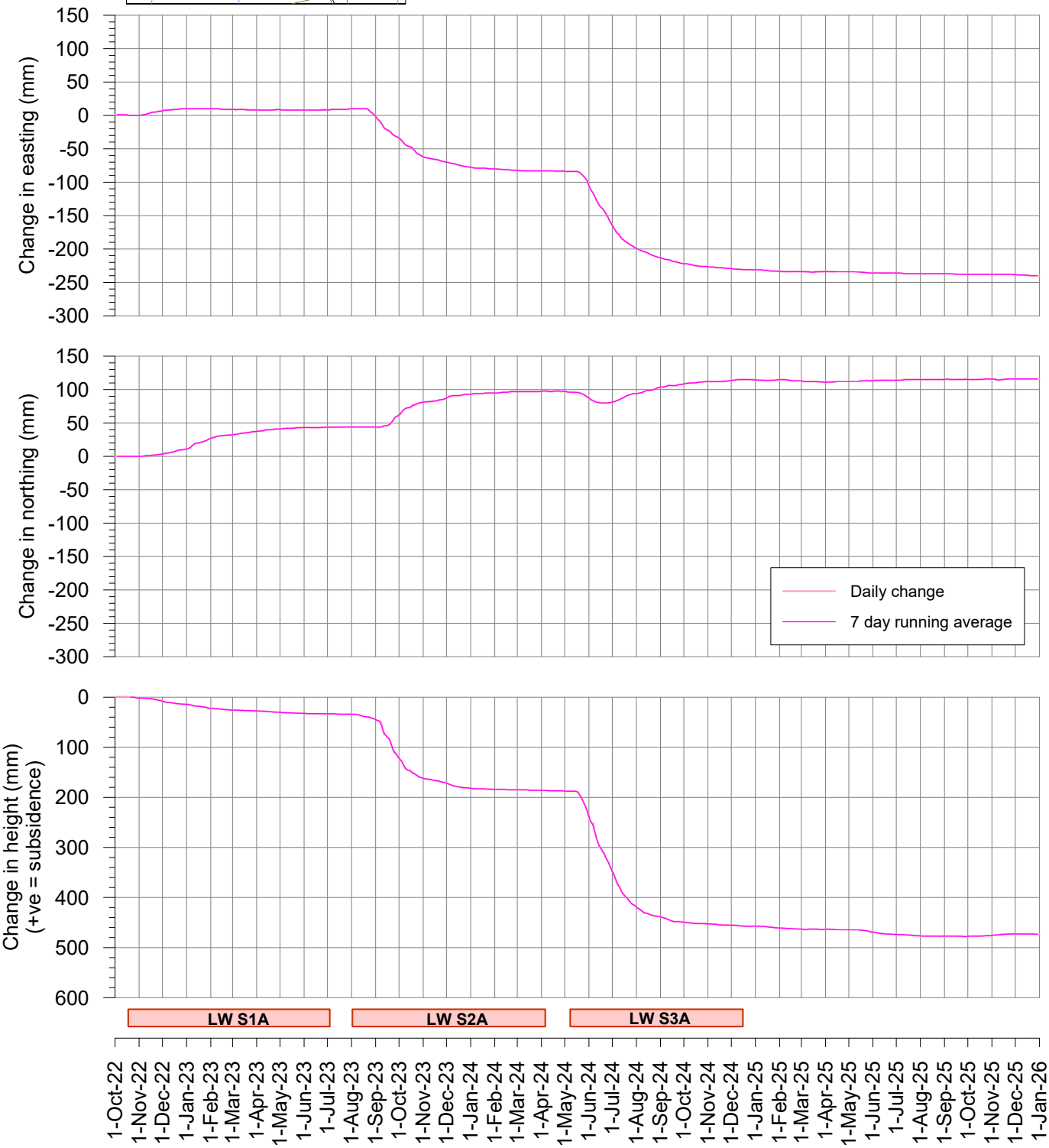


During LW S1A
During LW S2A
During LW S3A





msec

Fig. S07-R36

Tahmoor South LW S3A - GNSS Monitoring

Site S08 between LW S2A and LW S3A

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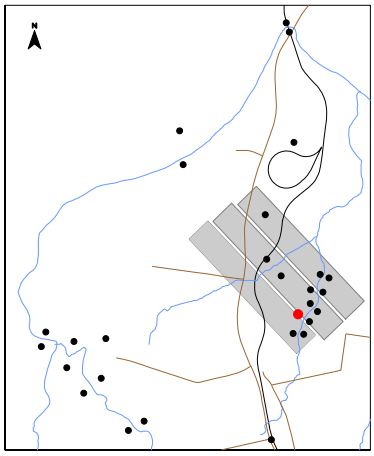
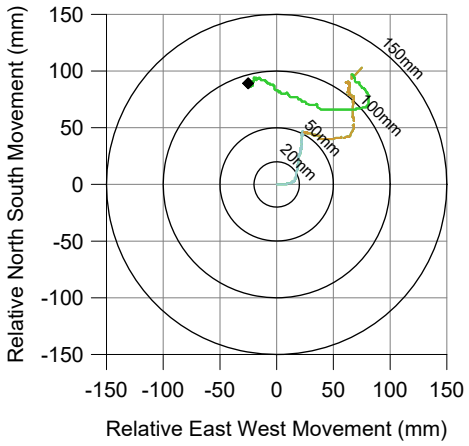
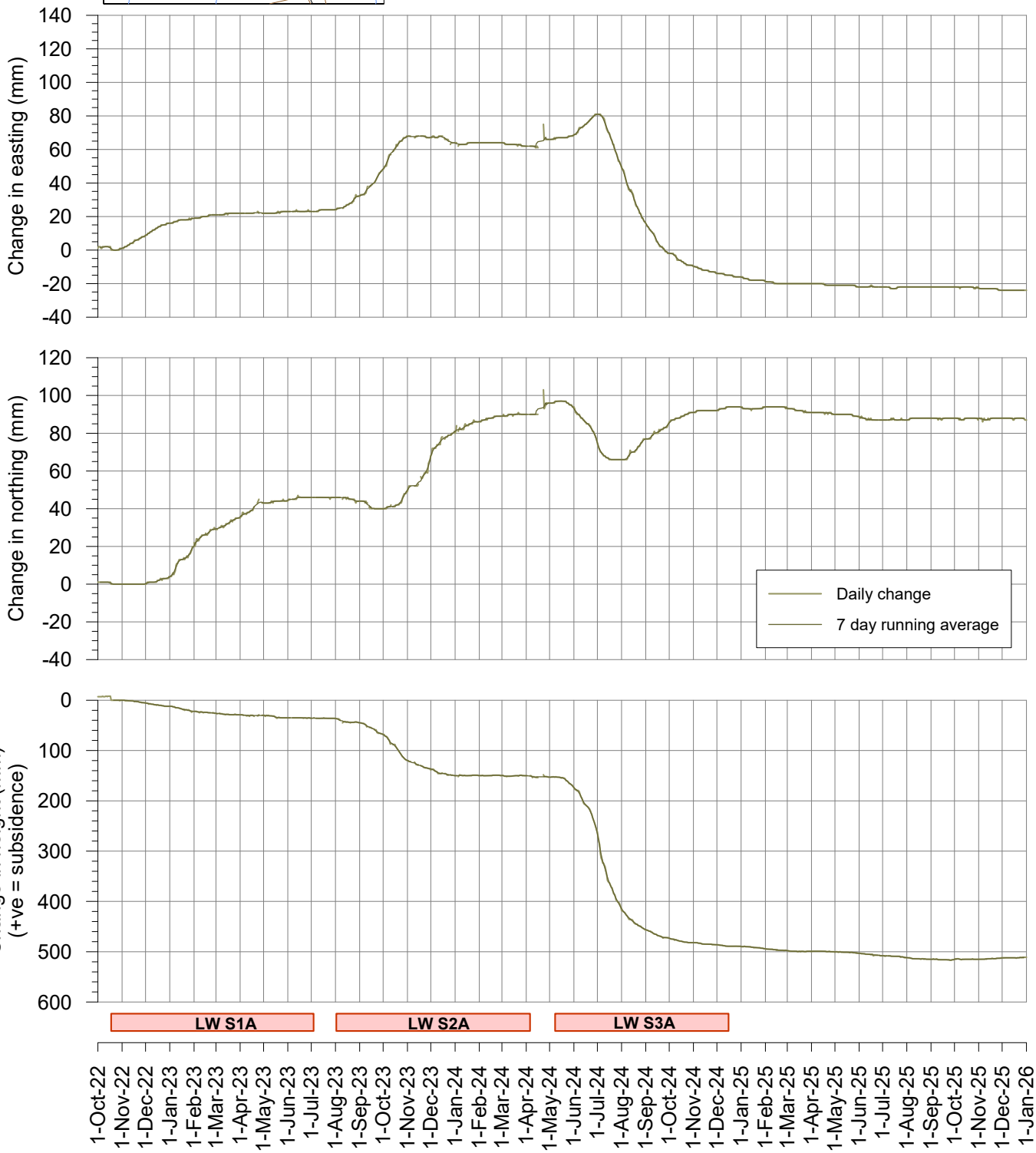






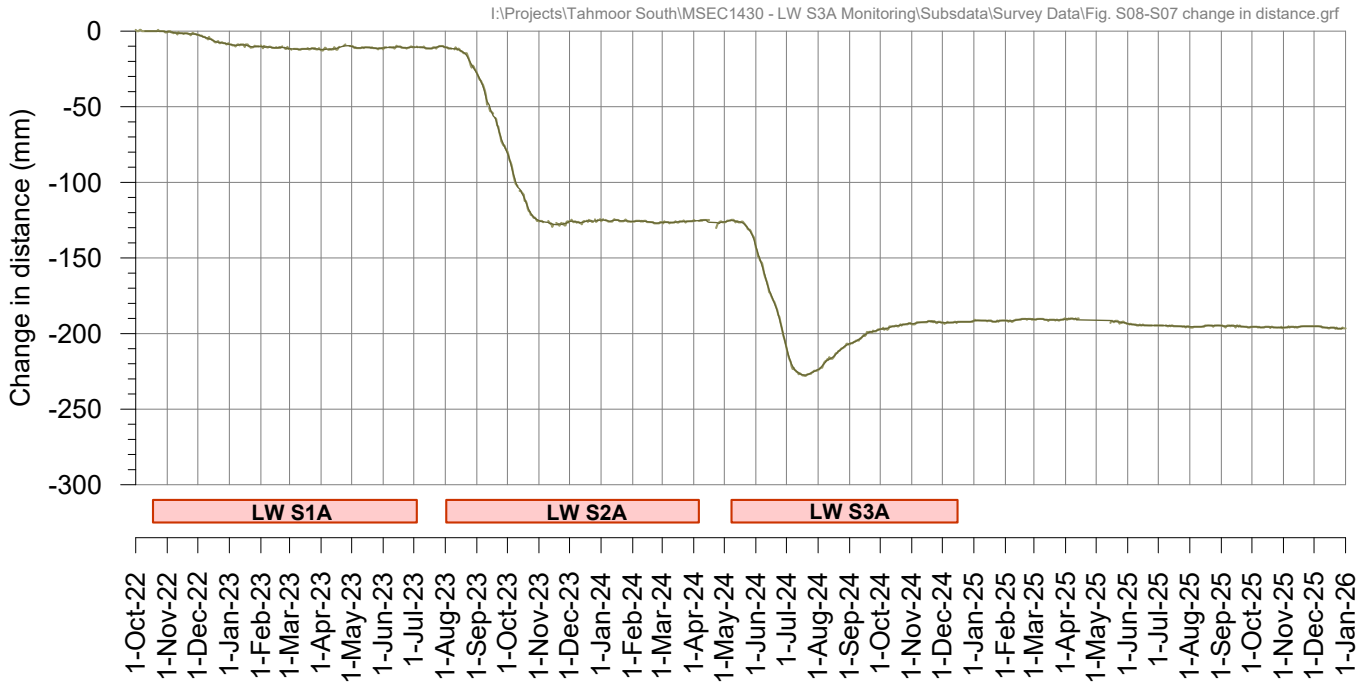


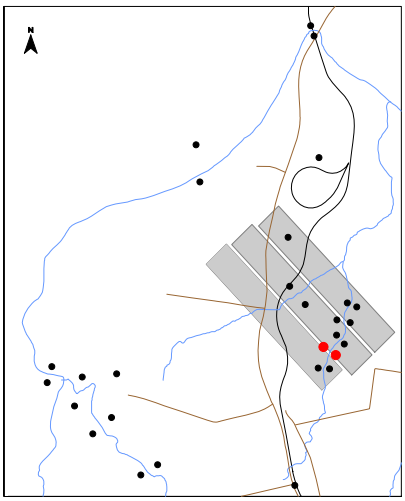
msec

Fig. S08-R36

Tahmoor South LW S3A - GNSS Monitoring

Change in distance across Wirrimbirra Creek
Site S07 above LW S2A and Site S08 between LW S2A and LW S3A





Tahmoor South LW S3A - GNSS Monitoring

Site S09 above LW S3A at Teatree 2

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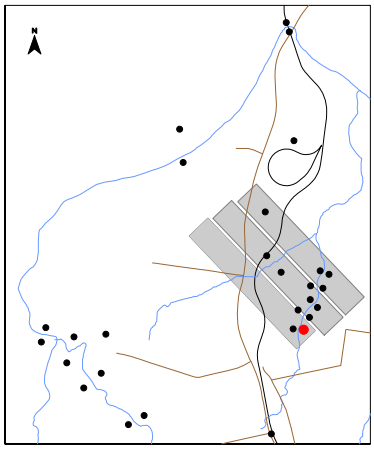
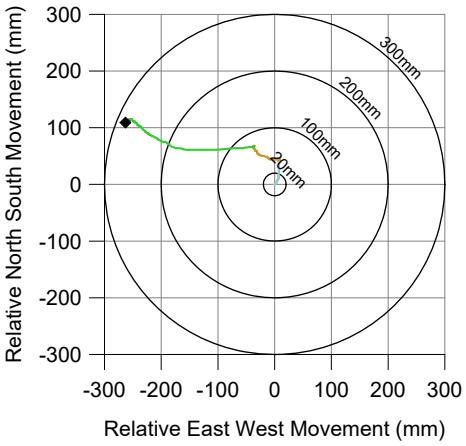
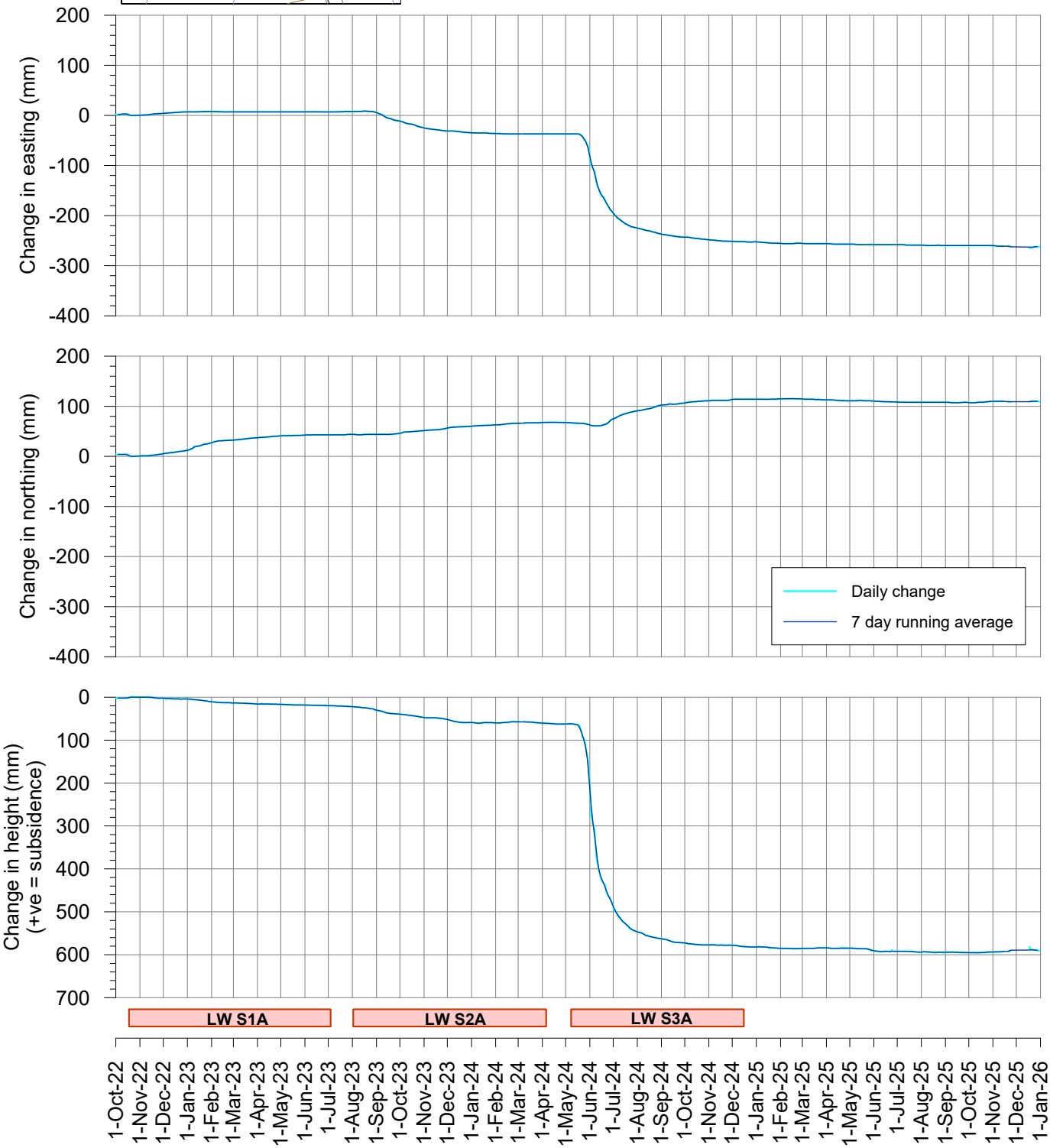


During LW S1A
During LW S2A
During LW S3A





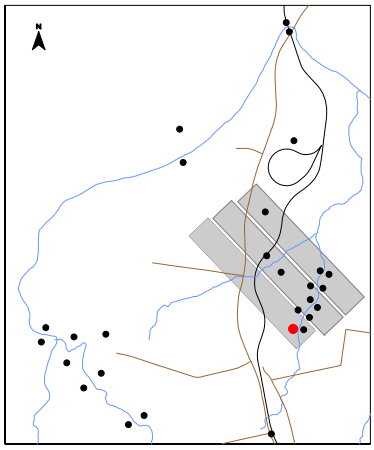
msec

Fig. S09-R36

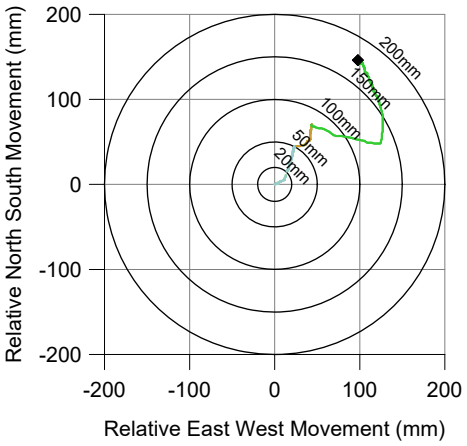
Tahmoor South LW S3A - GNSS Monitoring

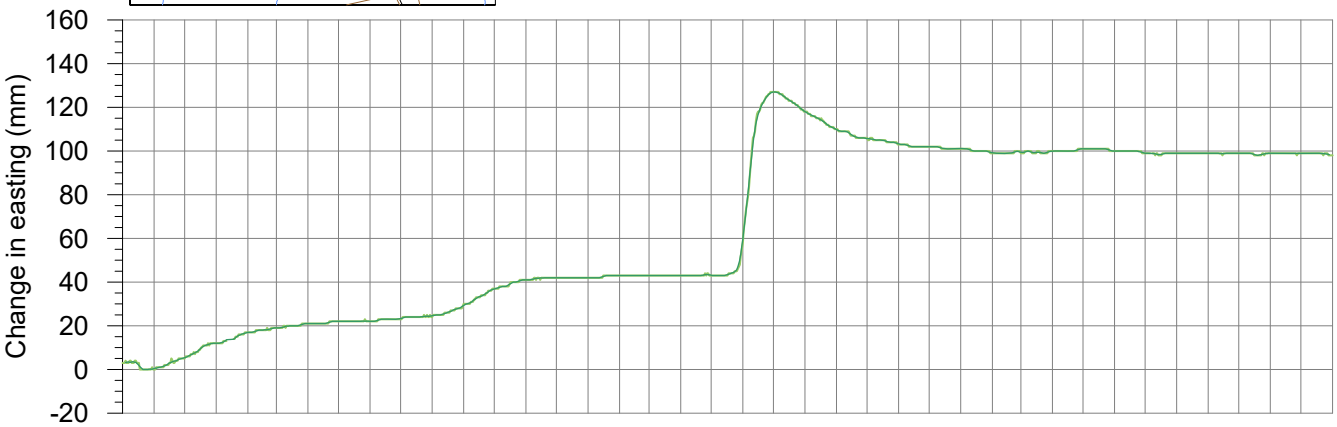
Site S10 above LW S3A at Teatree 2

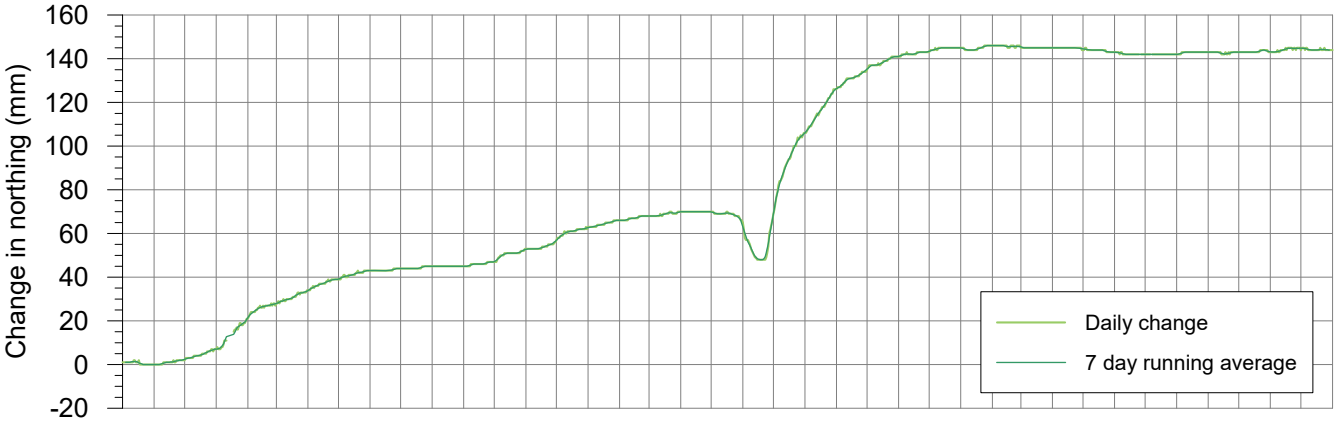
I:\Projects\Tahmoor South\MSEC1430 - LW S3A Monitoring\Subsdata\Survey Data\Fig. S10 GNSS.grf

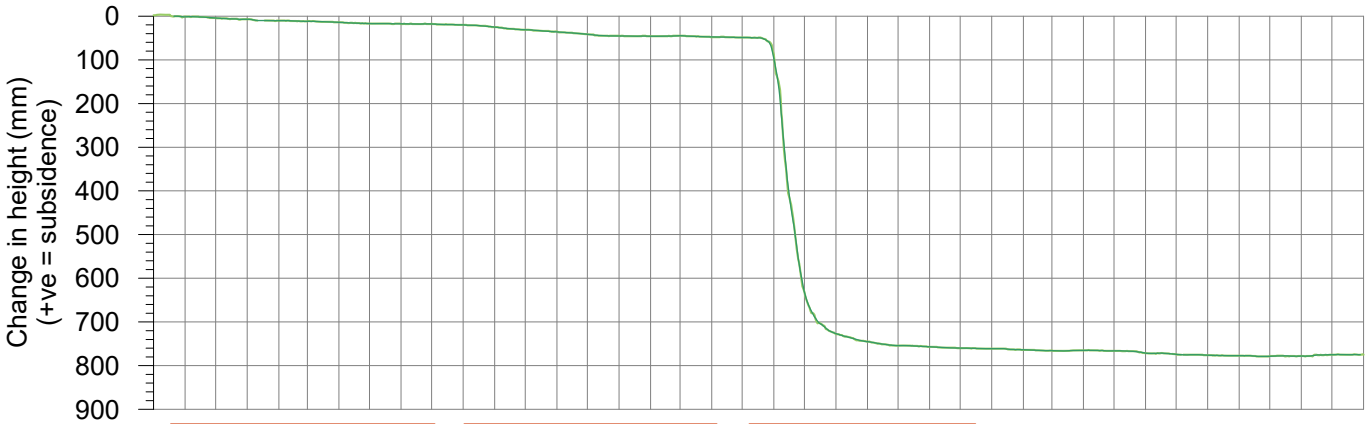


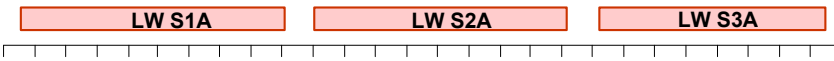
During LW S1A
During LW S2A
During LW S3A

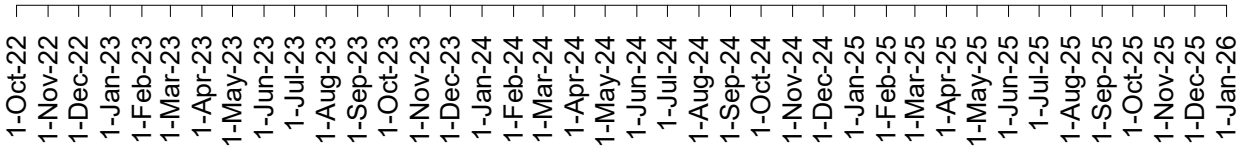










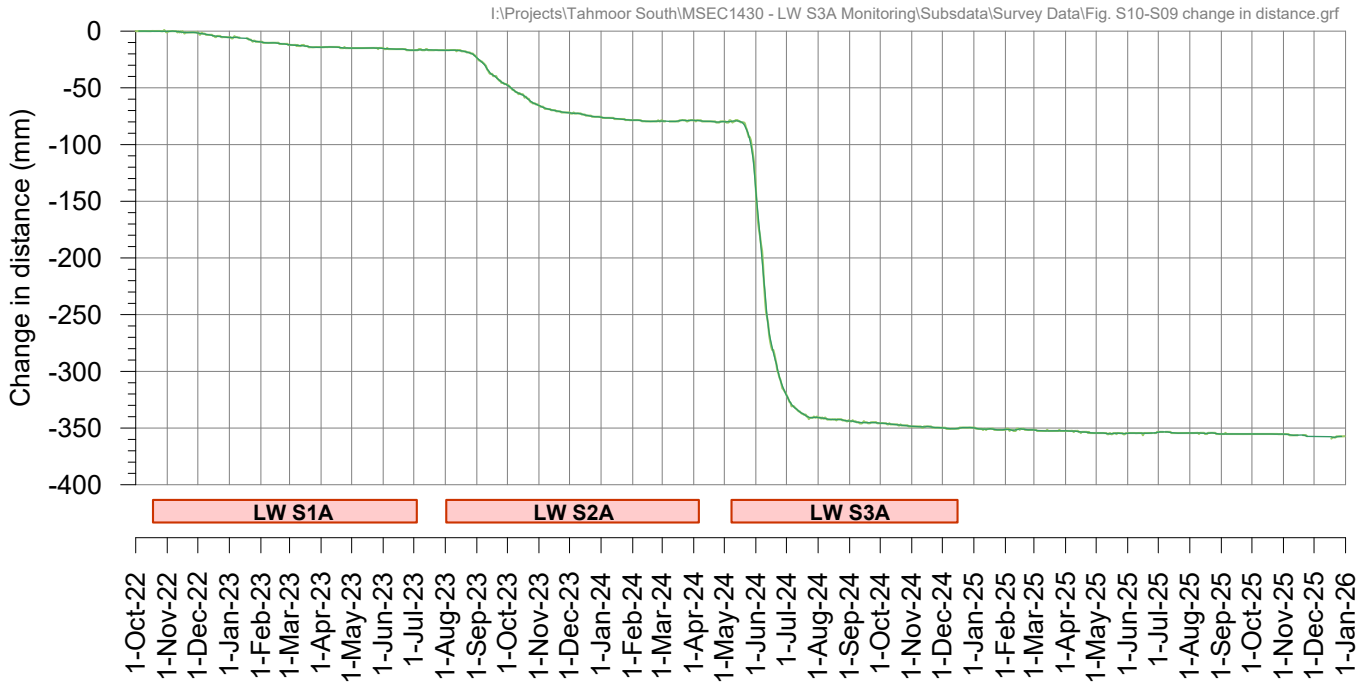


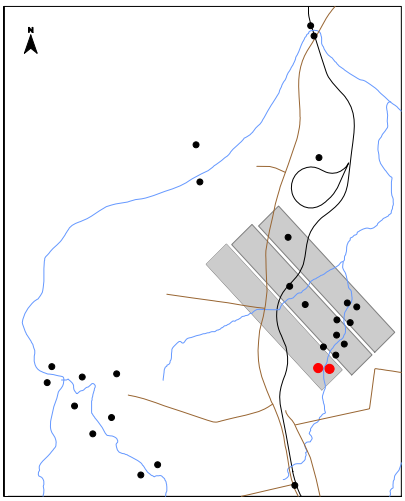
msec

Fig. S10-R36

Tahmoor South LW S3A - GNSS Monitoring

Change in distance across Wirrimbirra Creek at Teatree 2
Sites S09 and S10 above LW S3A

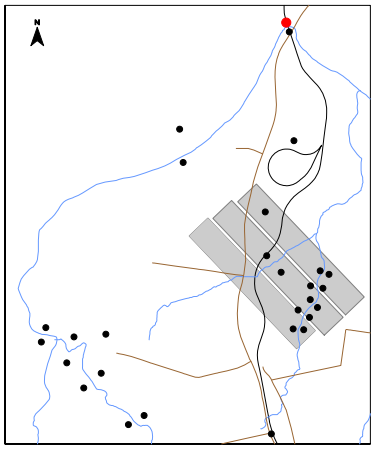




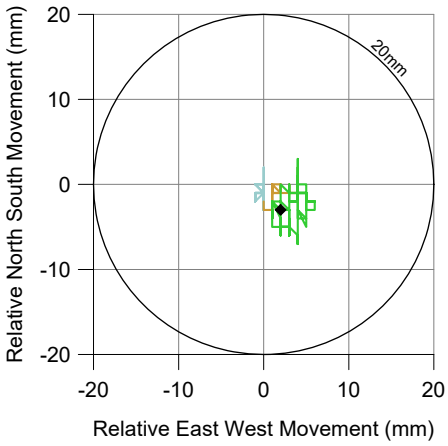
Tahmoor South LW S3A - GNSS Monitoring

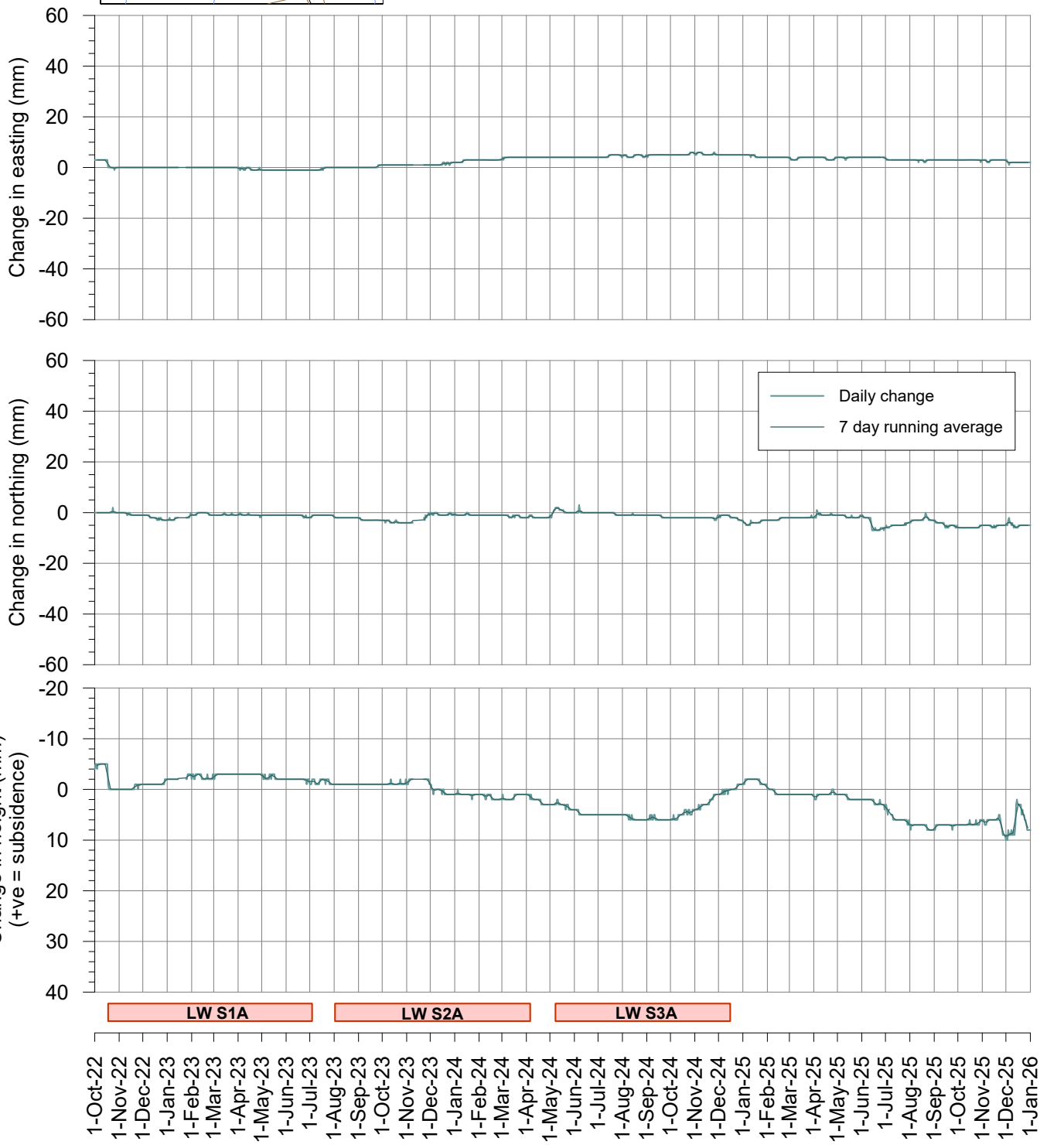
Site S11 at northern end of railway viaduct over Bargo River

I:\Projects\Tahmoor South\MSEC1430 - LW S3A Monitoring\Subsdata\Survey Data\Fig. S11 GNSS.grf









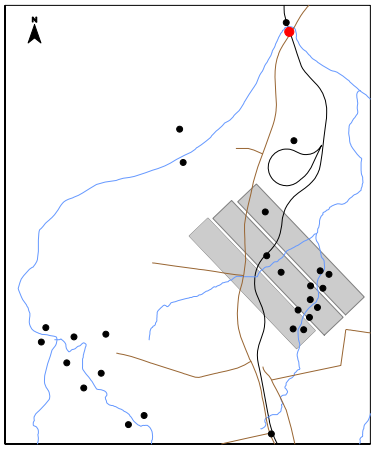
msec

Fig. S11-R36

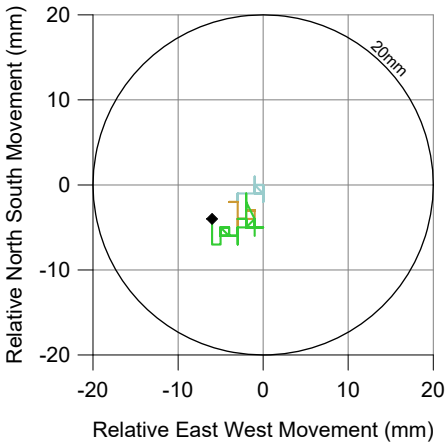
Tahmoor South LW S3A - GNSS Monitoring

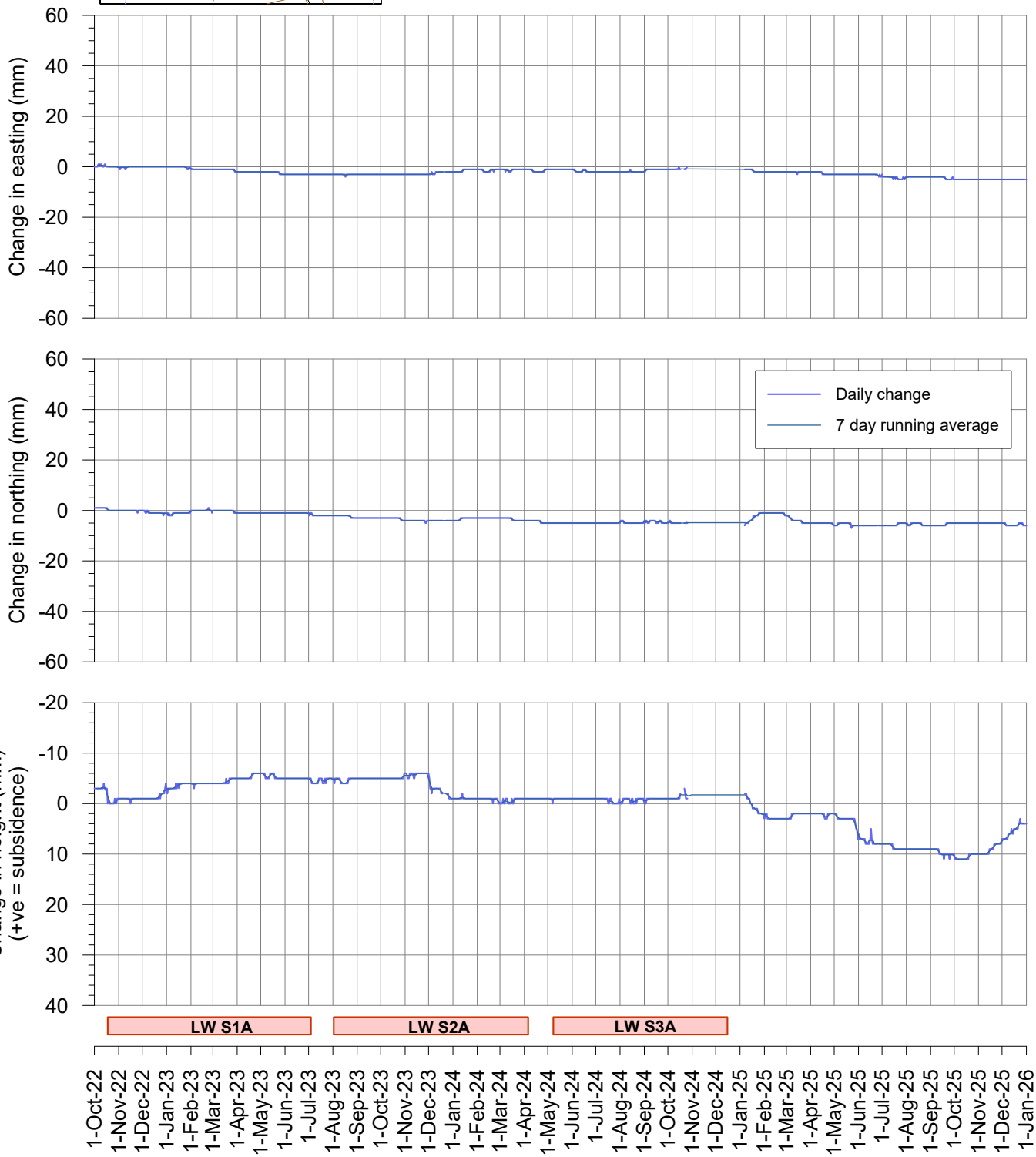
Site S12 at southern end of railway viaduct over Bargo River

I:\Projects\Tahmoor South\MSEC1430 - LW S3A Monitoring\Subsdata\Survey Data\Fig. S12 GNSS.grf







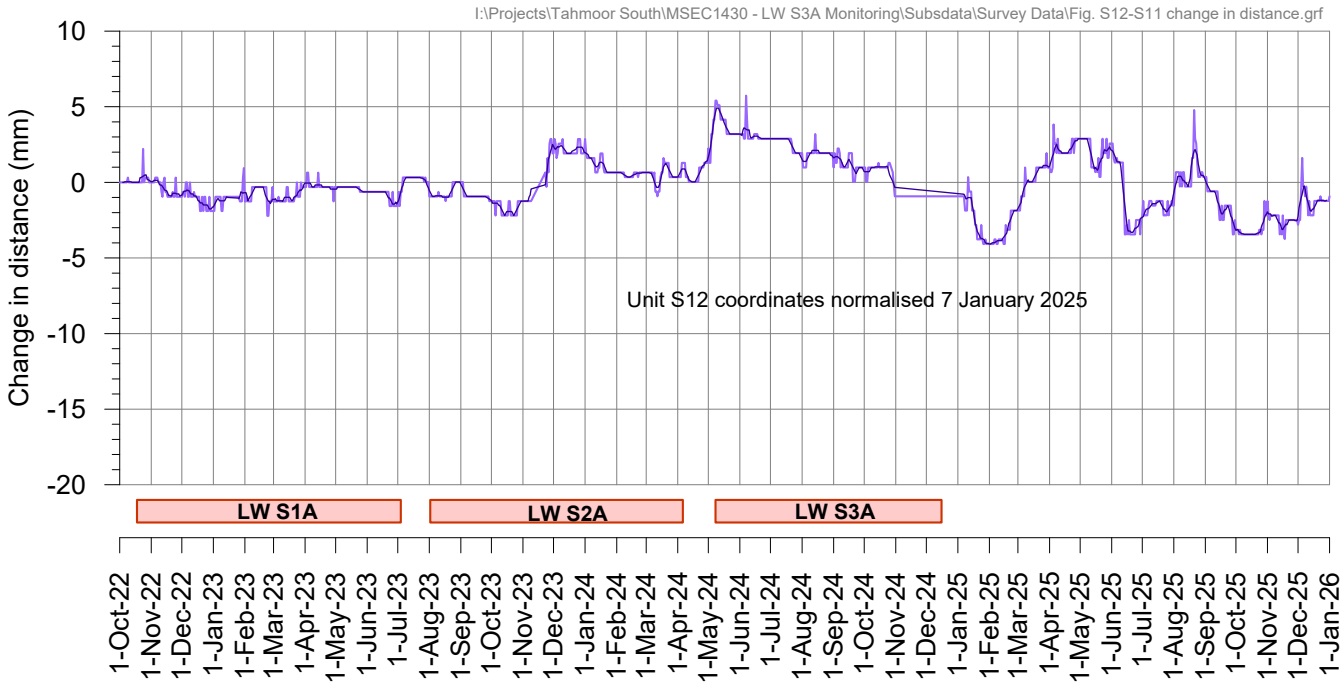


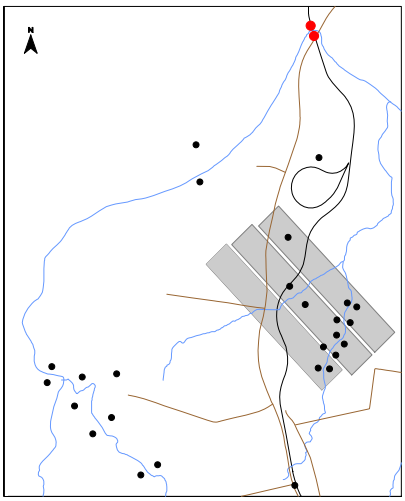
msec

Fig. S12-R36

Tahmoor South LW S3A - GNSS Monitoring

Change in distance across Railway Viaduct over Bargo River
Sites S11 and S12





Tahmoor South LW S3A - GNSS Monitoring

Site S13 on northern side of Picton Weir

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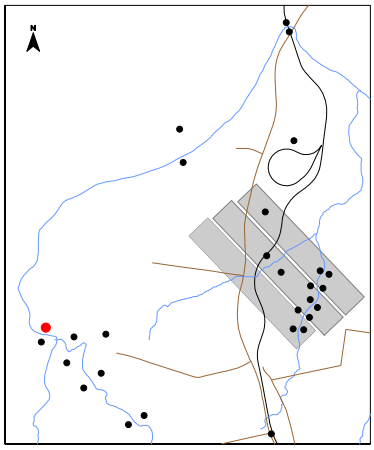
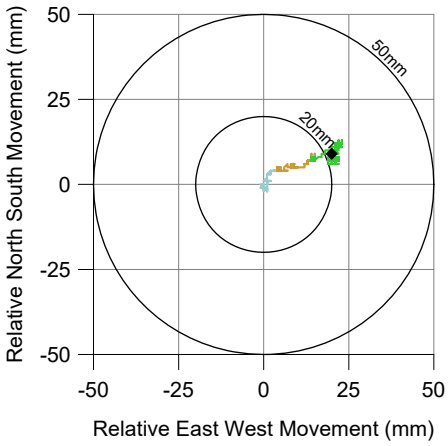


During LW S1A
During LW S2A
During LWS3A





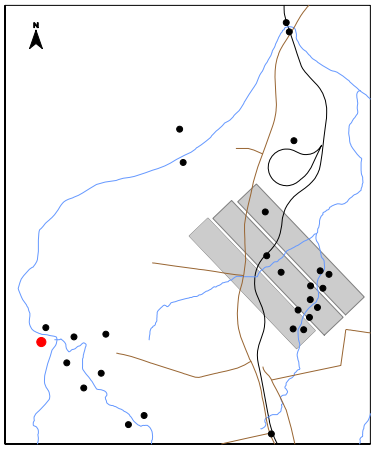
msec

Fig. S13-R36

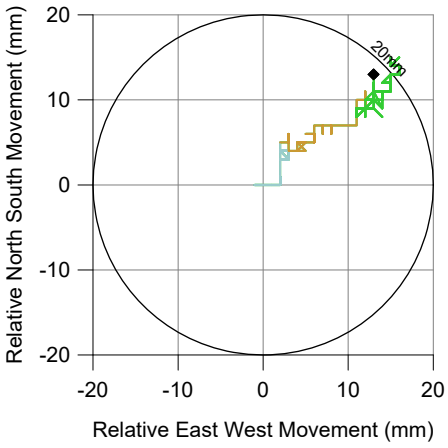
Tahmoor South LW S3A - GNSS Monitoring

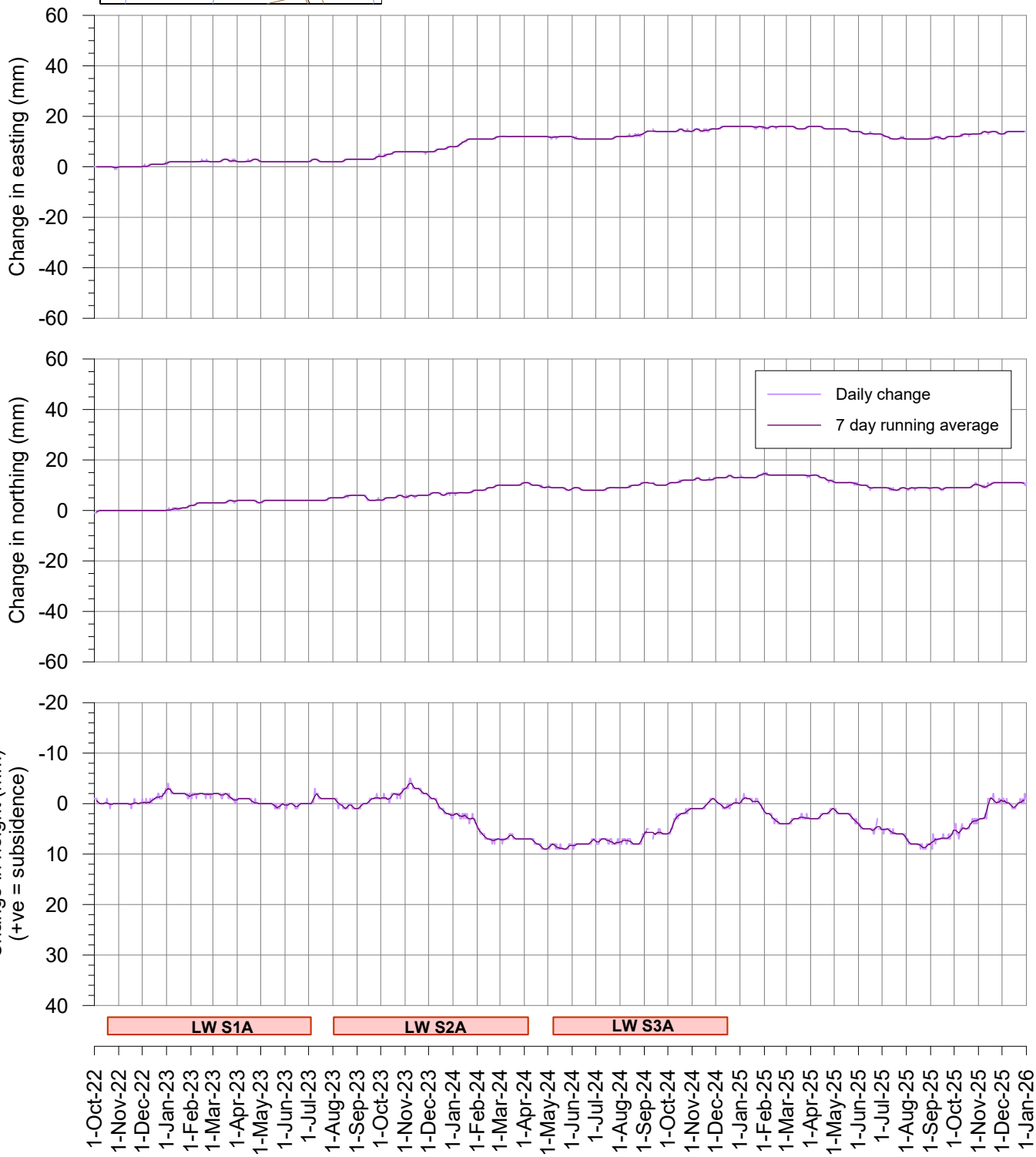
Site S14 on southern side of Picton Weir

I:\Projects\Tahmoor South\MSEC1430 - LW S3A Monitoring\Subsdata\Survey Data\Fig. S14 GNSS.grf







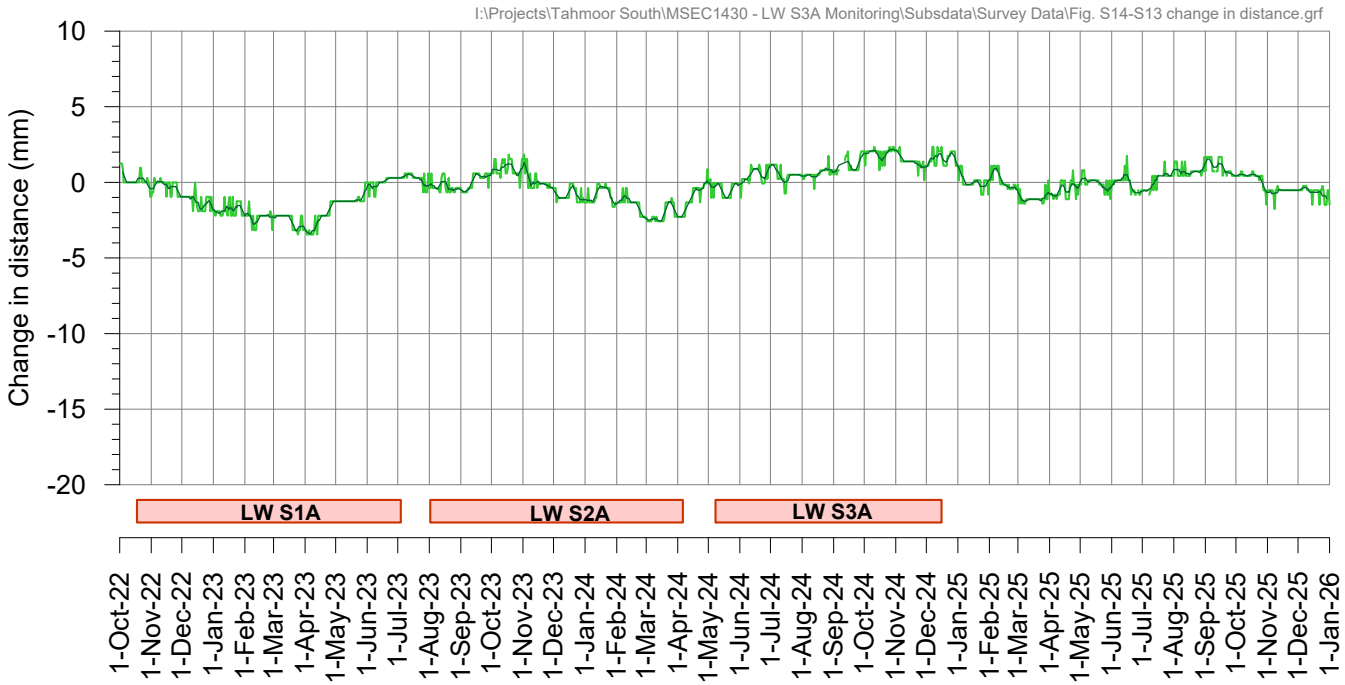


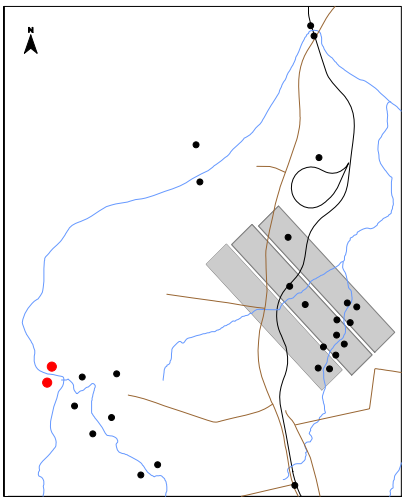
msec

Fig. S14-R36

Tahmoor South LW S3A - GNSS Monitoring

Change in distance across Picton Weir
Sites S13 and S14

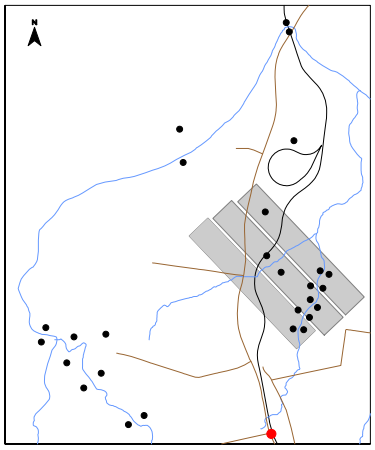




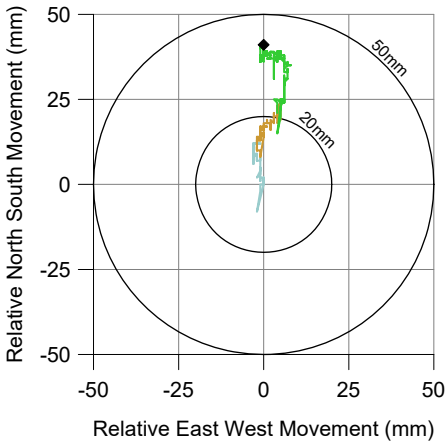
Tahmoor South LW S3A - GNSS Monitoring

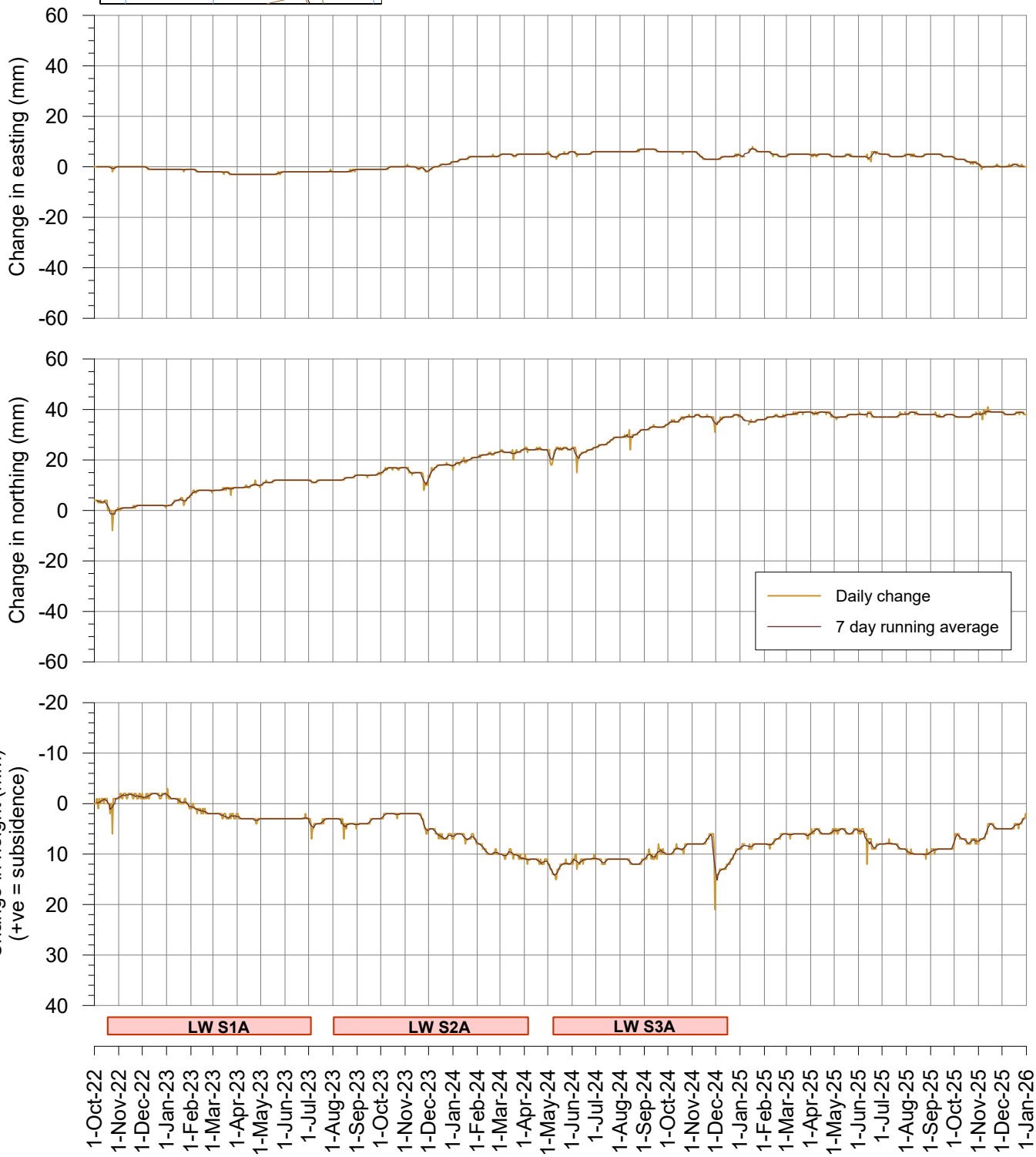
Site S15 at Wellers Road Overbridge

I:\Projects\Tahmoor South\MSEC1430 - LW S3A Monitoring\Subsdata\Survey Data\Fig. S15 GNSS.grf



During LW S1A
During LW S2A
During LW S3A





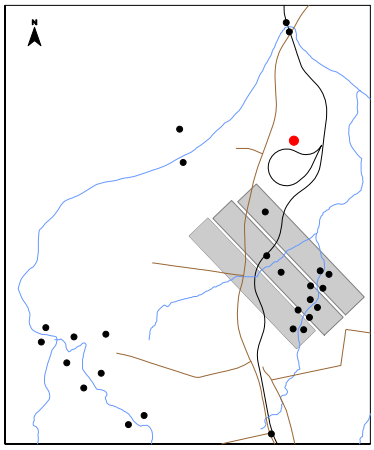
msec

Fig. S15-R36

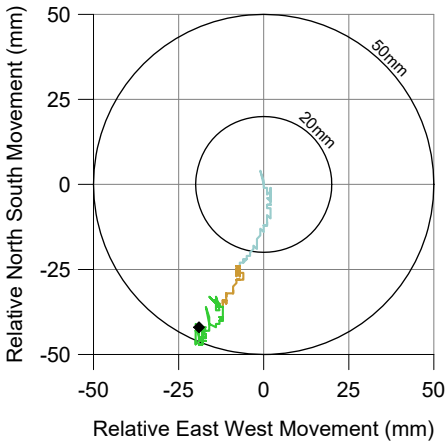
Tahmoor South LW S3A - GNSS Monitoring

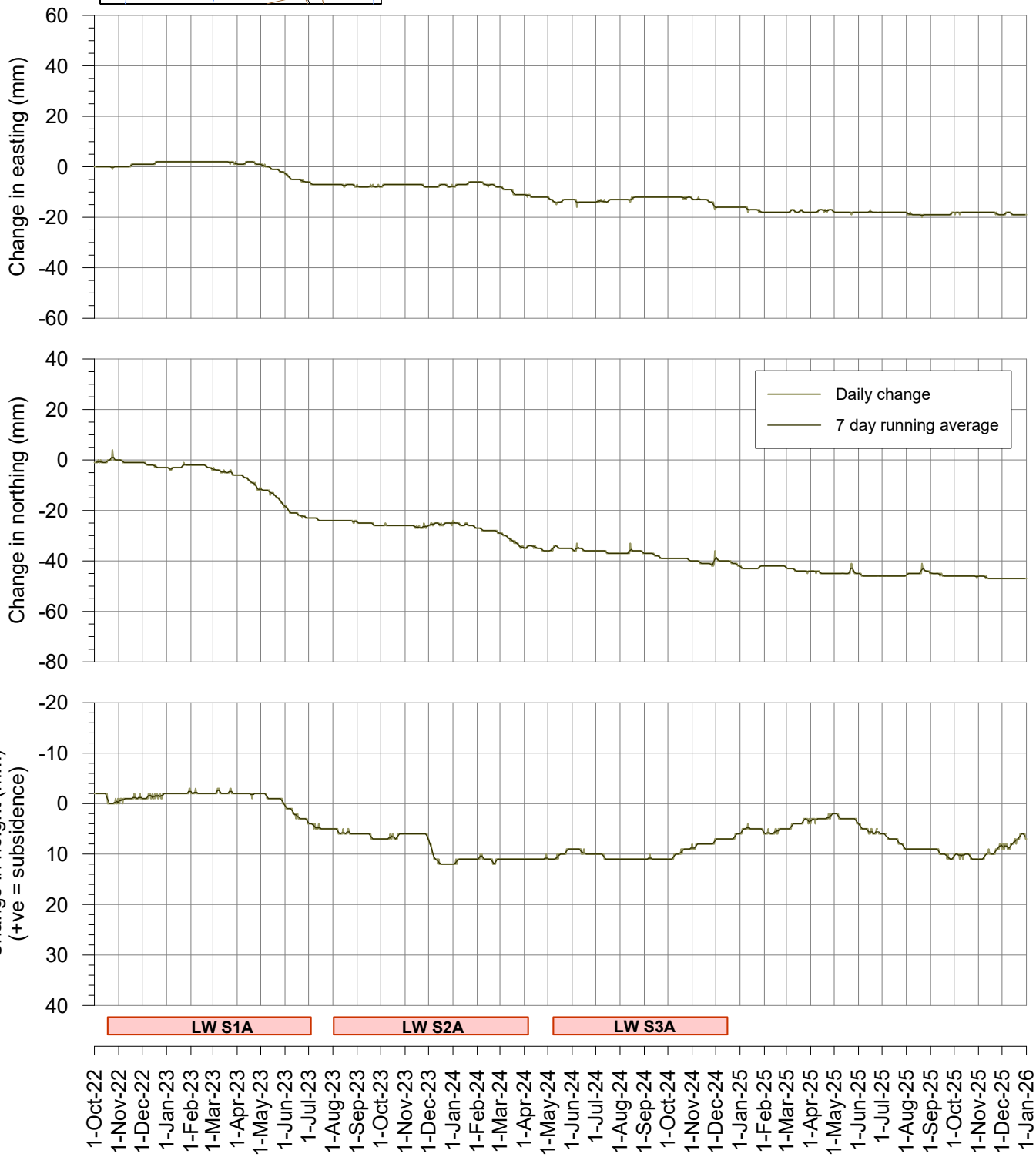
Site S16 at Tahmoor Mine site

I:\Projects\Tahmoor South\MSEC1430 - LW S3A Monitoring\Subsdata\Survey Data\Fig. S16 GNSS.grf



During LW S1A
During LW S1A
During LW S3A





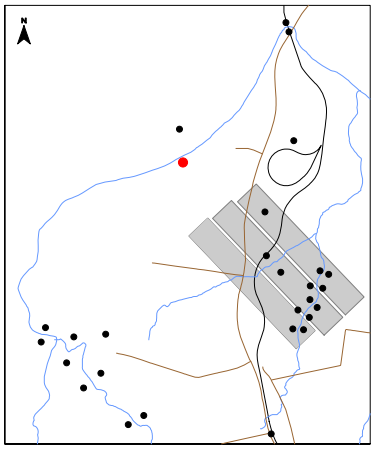
msec

Fig. S16-R36

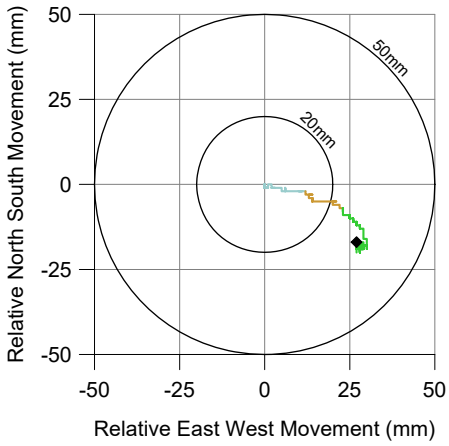
Tahmoor South LW S3A - GNSS Monitoring

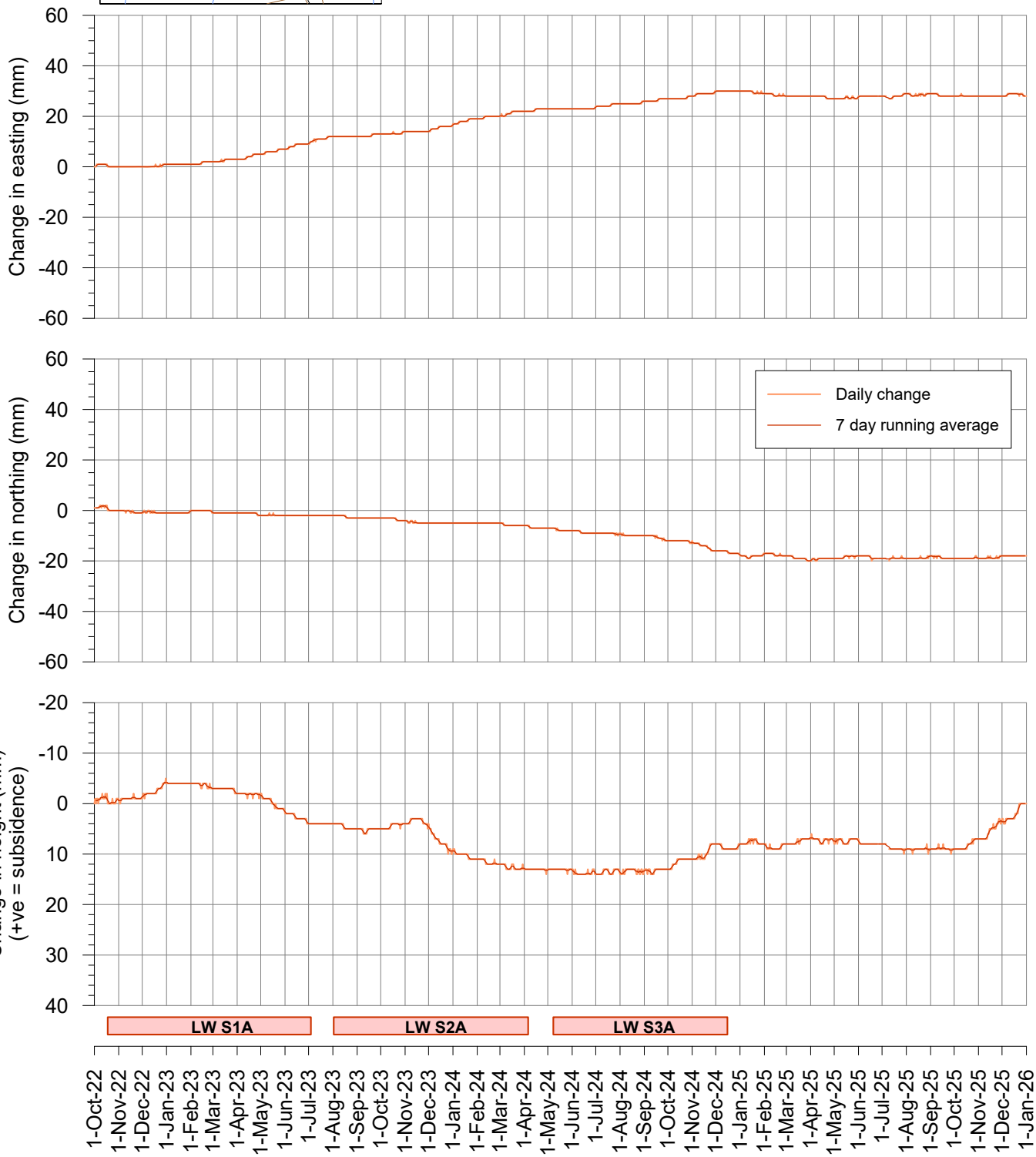
Site S17 on east bank of Bargo River

I:\Projects\Tahmoor South\MSEC1430 - LW S3A Monitoring\Subsdata\Survey Data\Fig. S17 GNSS.grf



During LW S1A
During LW S2A
During LW S3A





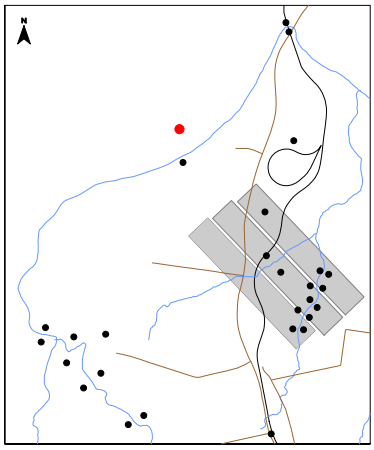
msec

Fig. S17-R36

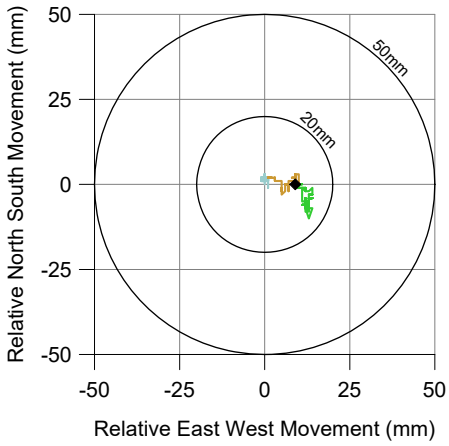
Tahmoor South LW S3A - GNSS Monitoring

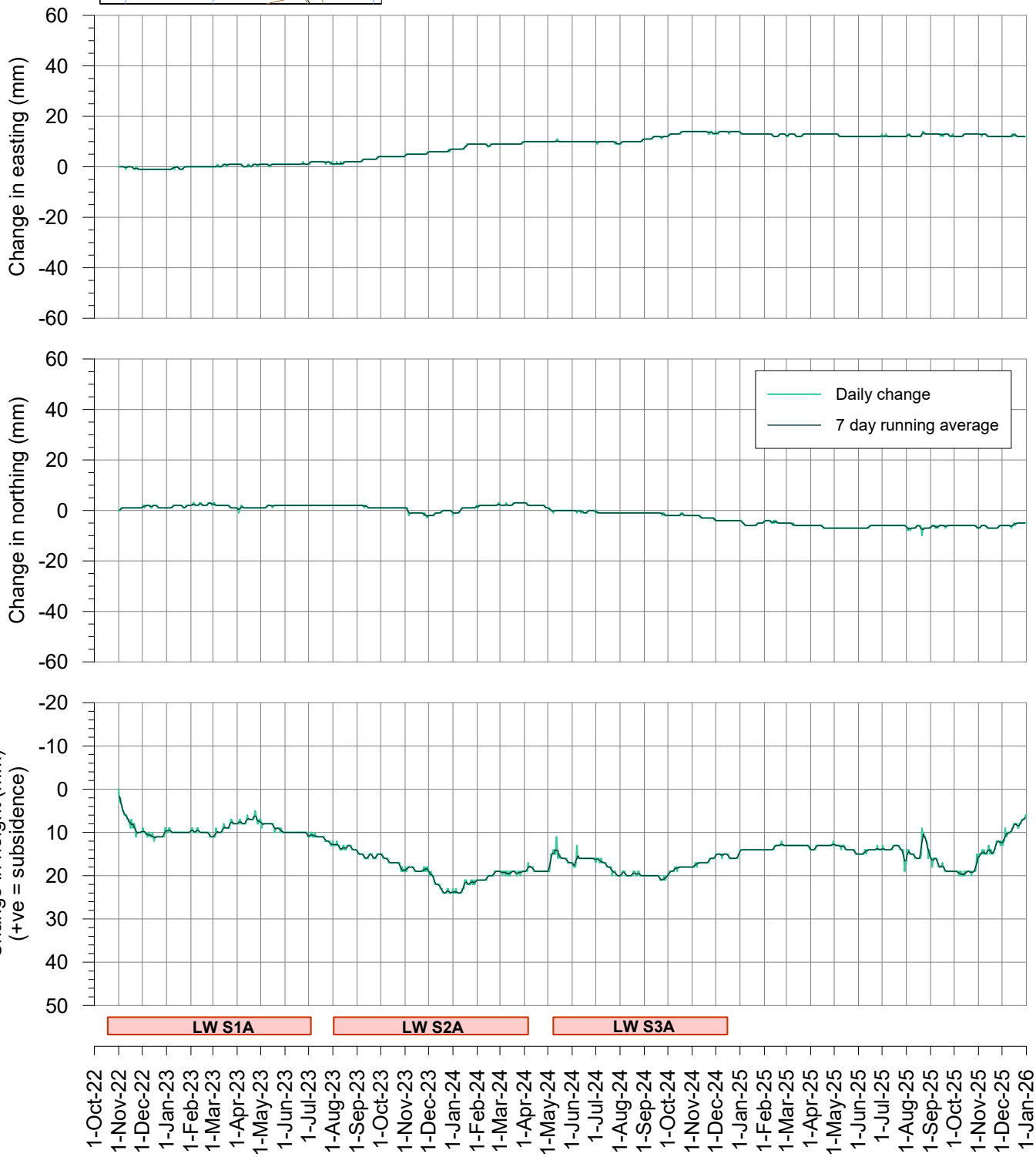
Site S18 on west bank of Bargo River

I:\Projects\Tahmoor South\MSEC1430 - LW S3A Monitoring\Subsdata\Survey Data\Fig. S18 GNSS.grf







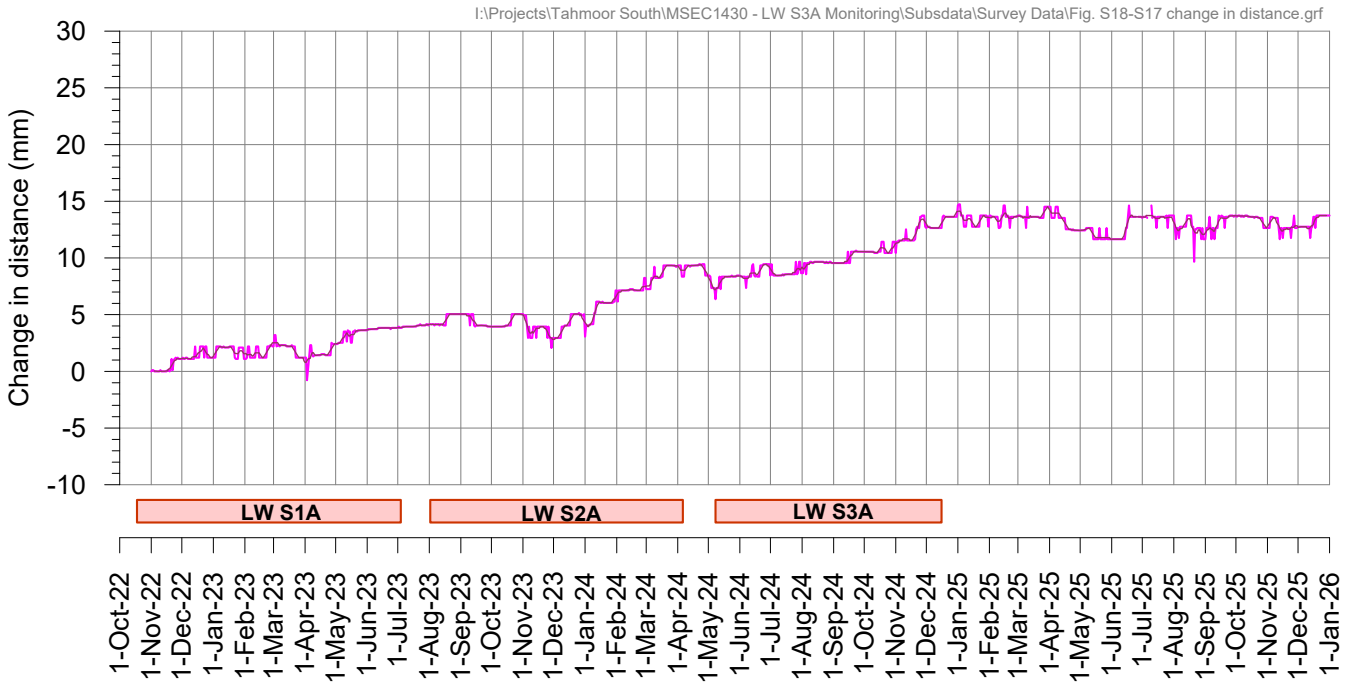


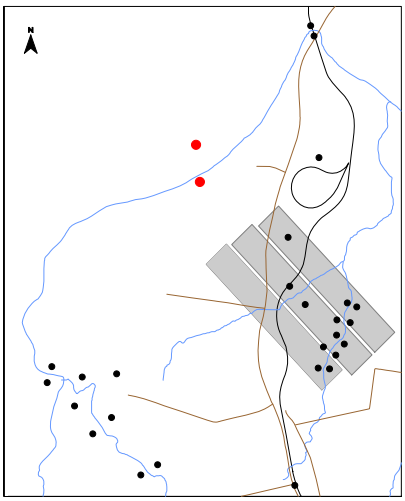
msec

Fig. S18-R36

Tahmoor South LW S3A - GNSS Monitoring

Change in distance across Bargo River
Sites S17 and S18

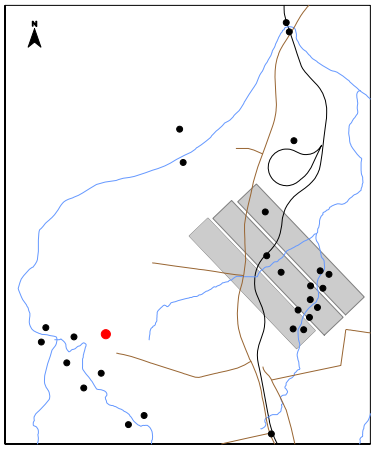




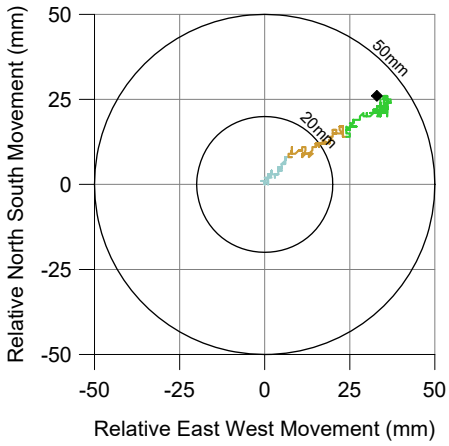
Tahmoor South LW S3A - GNSS Monitoring

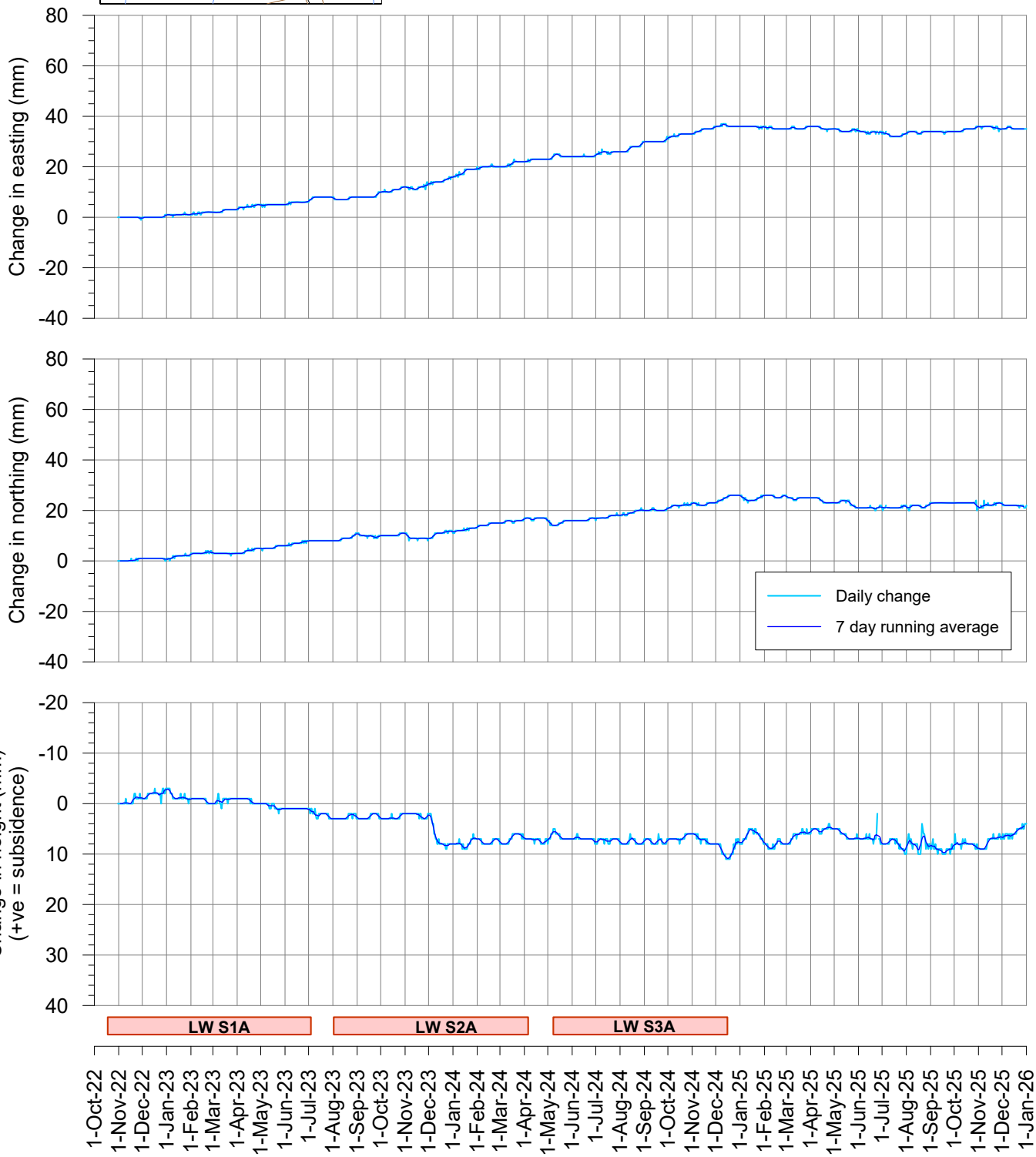
Site S19 near Hornes Creek

I:\Projects\Tahmoor South\MSEC1430 - LW S3A Monitoring\Subsdata\Survey Data\Fig. S19 GNSS.grf









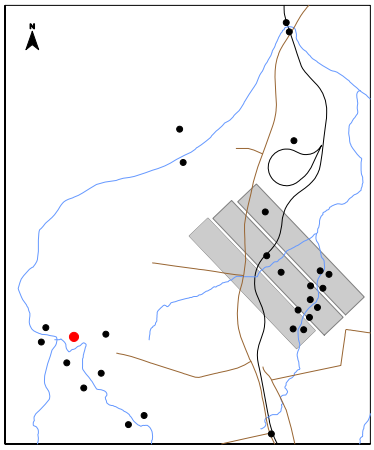
msec

Fig. S19-R36

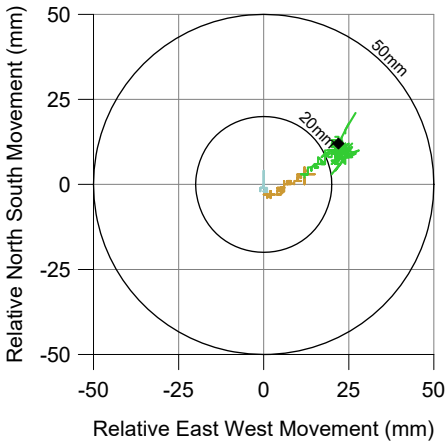
Tahmoor South LW S3A - GNSS Monitoring

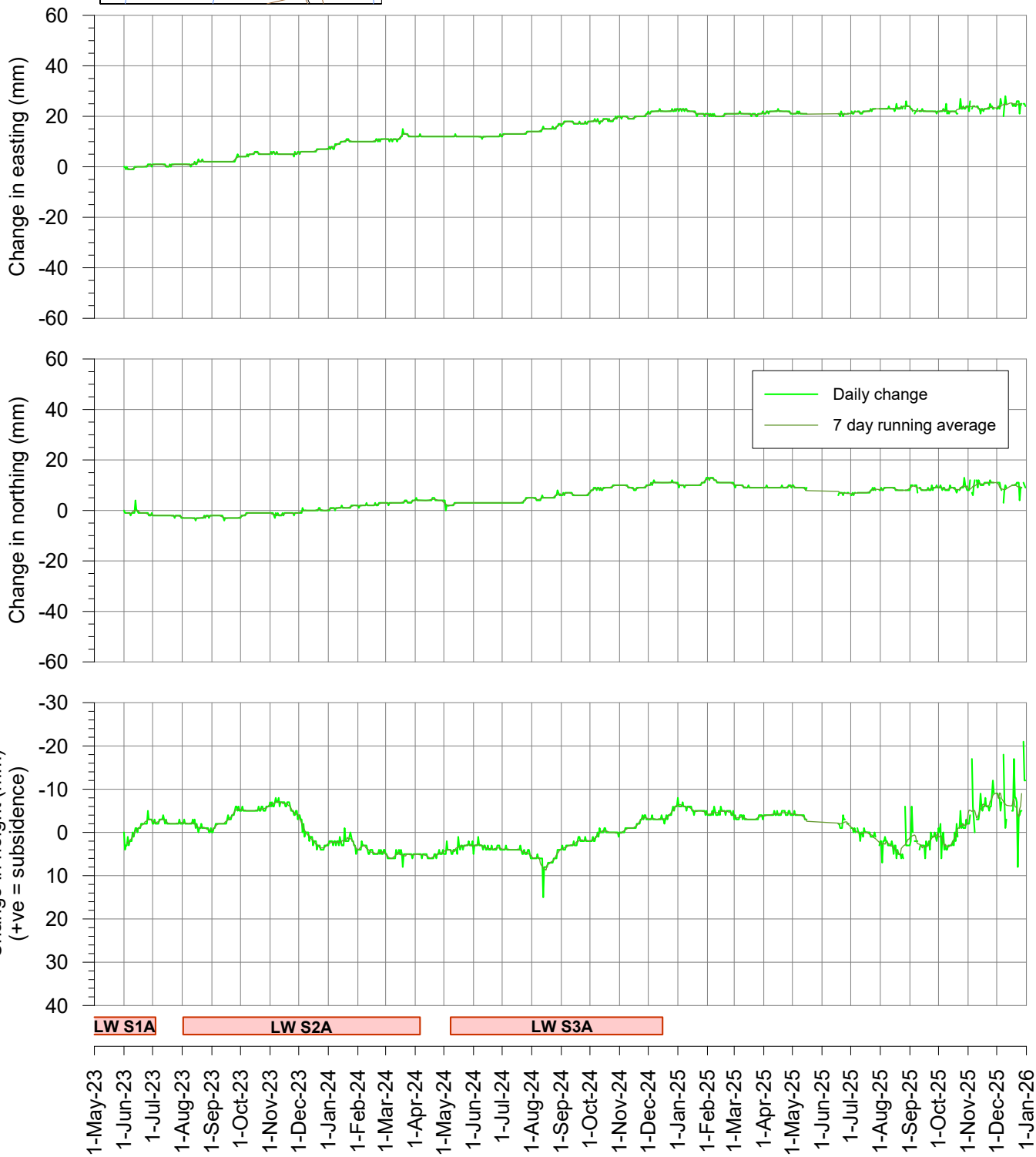
Site S20 on northern side of Hornes Creek

I:\Projects\Tahmoor South\MSEC1430 - LW S3A Monitoring\Subsdata\Survey Data\Fig. S20 GNSS.grf



During LW S1A
During LW S2A
During LW S3A





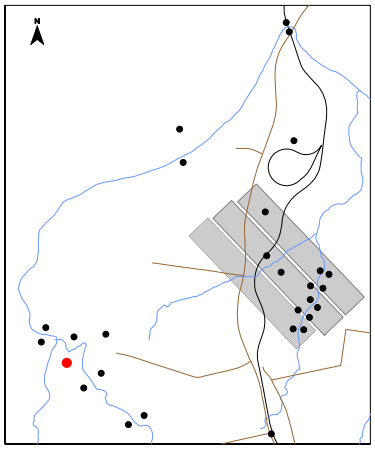
msec

Fig. S20-R36

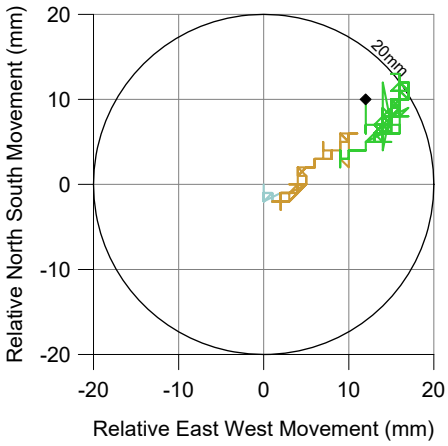
Tahmoor South LW S3A - GNSS Monitoring

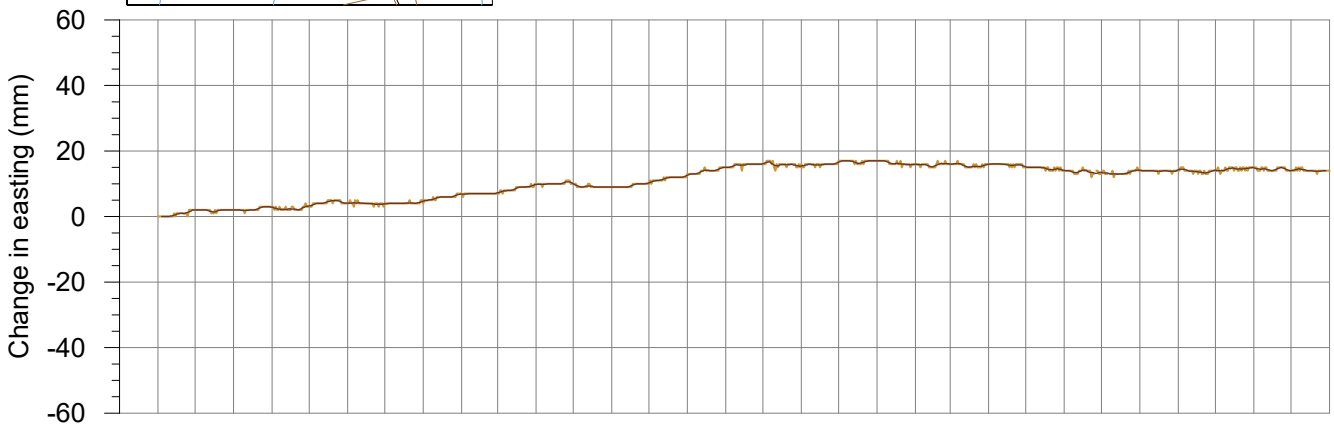
Site S21 on southern side of Hornes Creek

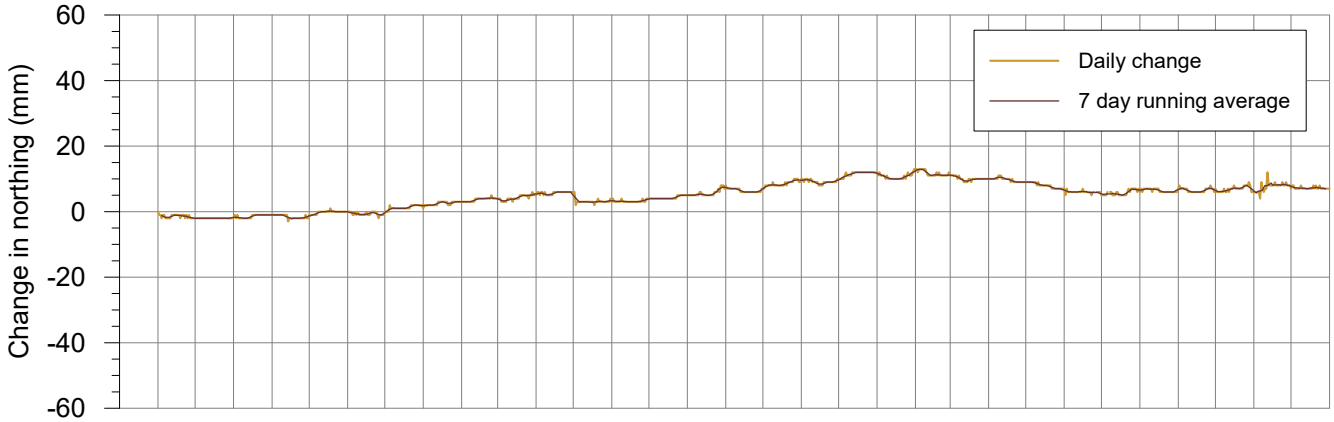
I:\Projects\Tahmoor South\MSEC1430 - LW S3A Monitoring\Subsdata\Survey Data\Fig. S21 GNSS.grf

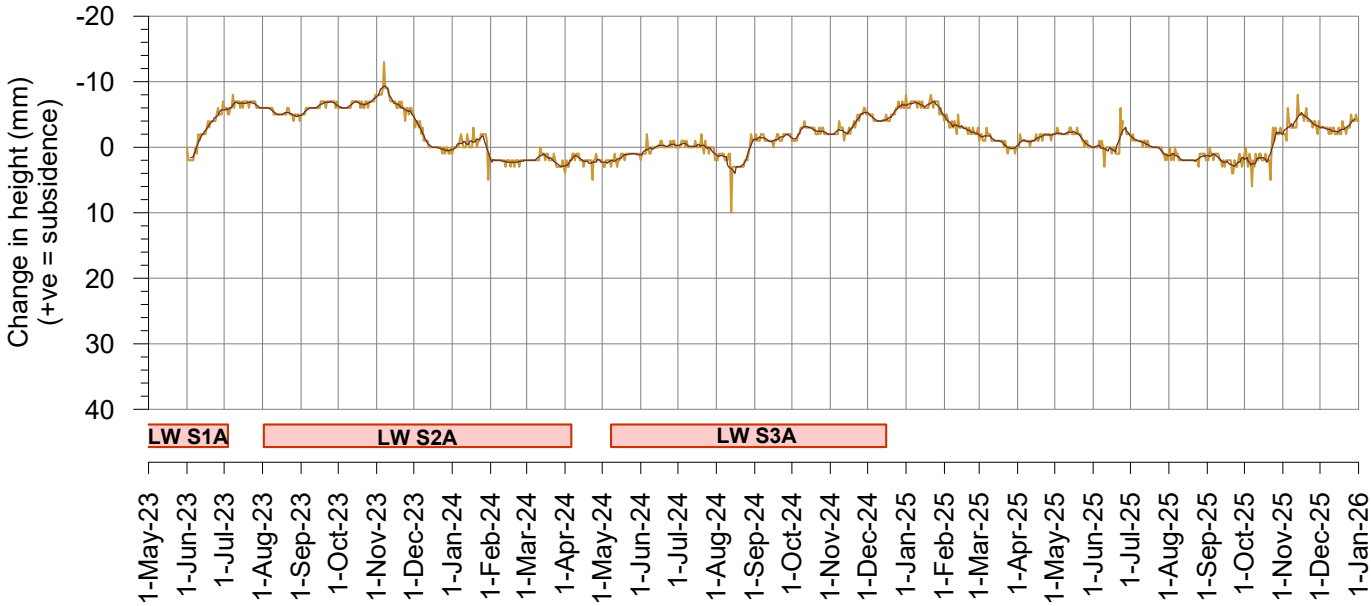


During LW S1A
During LW S2A
During LW S3A







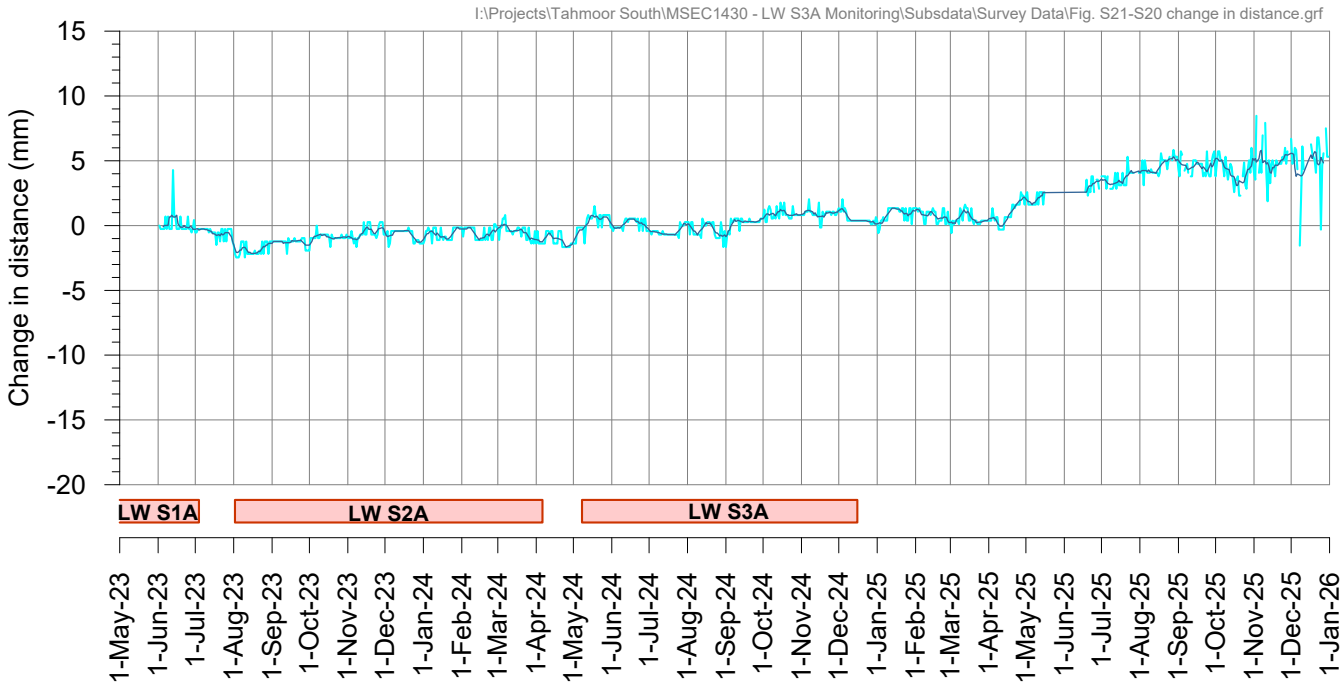


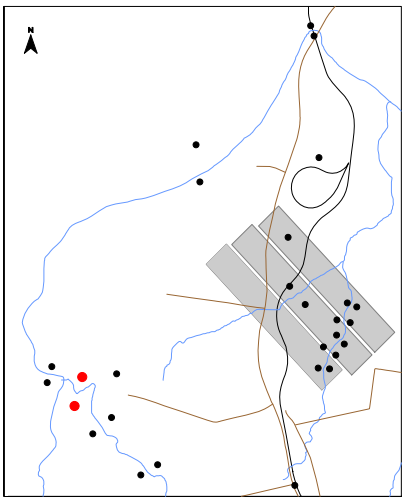
msec

Fig. S21-R36

Tahmoor South LW S3A - GNSS Monitoring

Change in distance across Hornes Creek
Sites S20 and S21

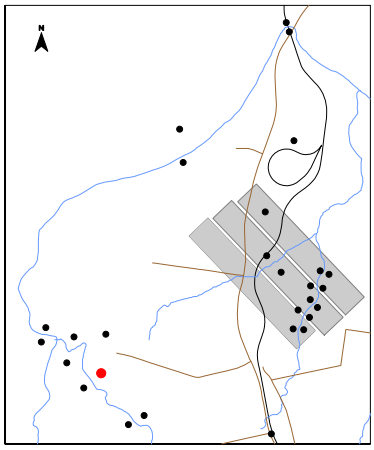




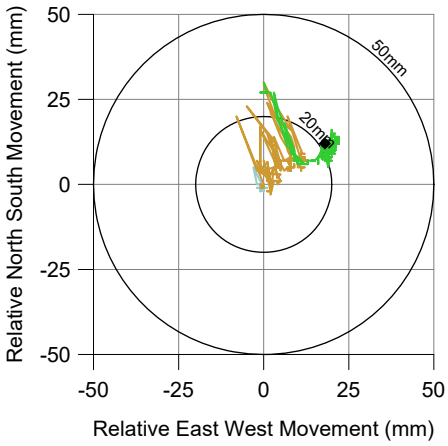
Tahmoor South LW S3A - GNSS Monitoring

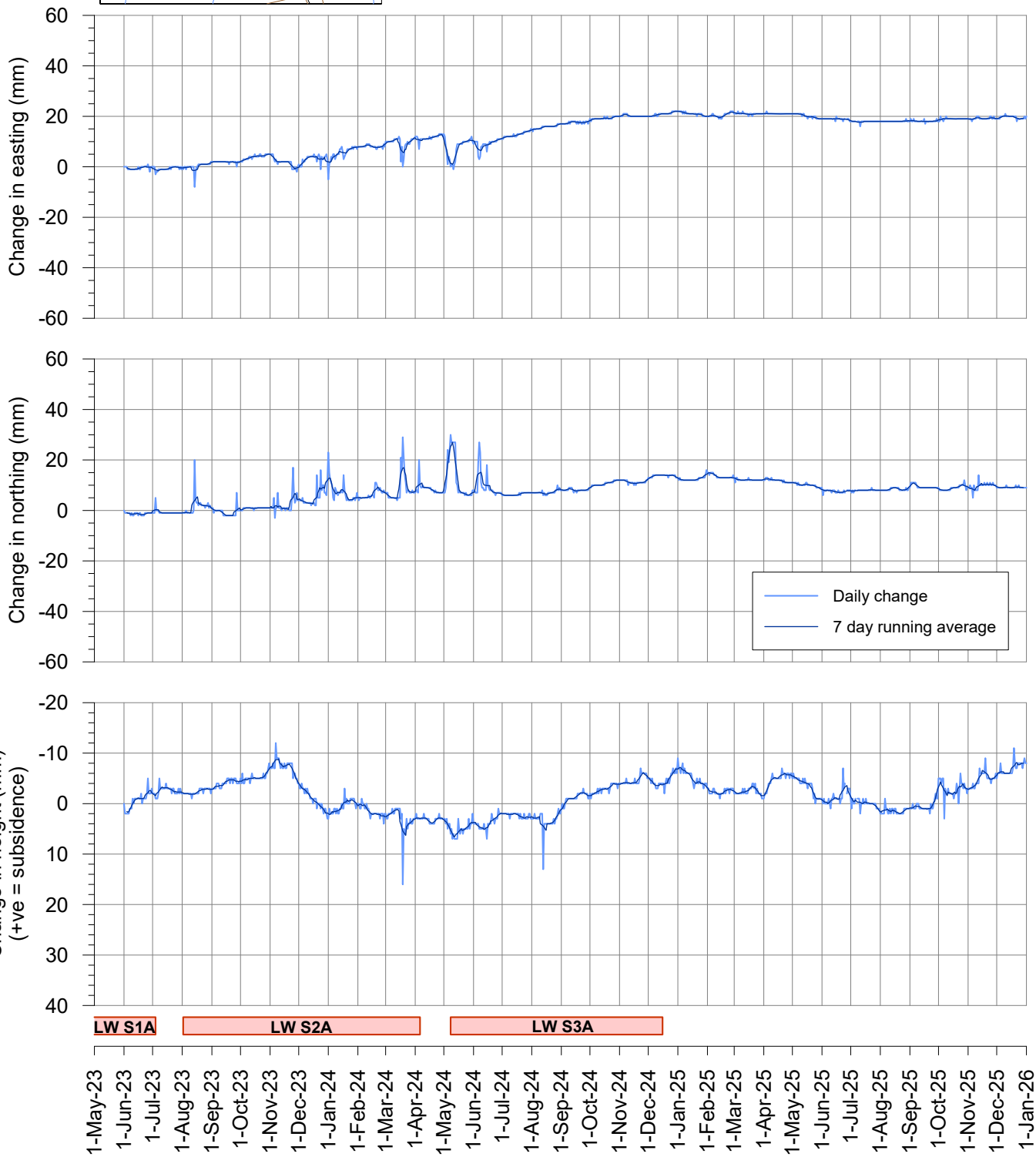
Site S22 on northern side of Hornes Creek

I:\Projects\Tahmoor South\MSEC1430 - LW S3A Monitoring\Subsdata\Survey Data\Fig. S22 GNSS.grf



During LW S1A
During LW S2A
During LW S3A





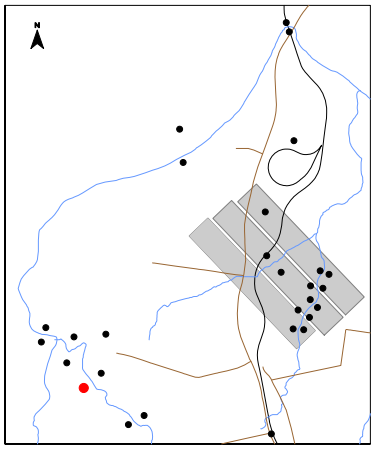
msec

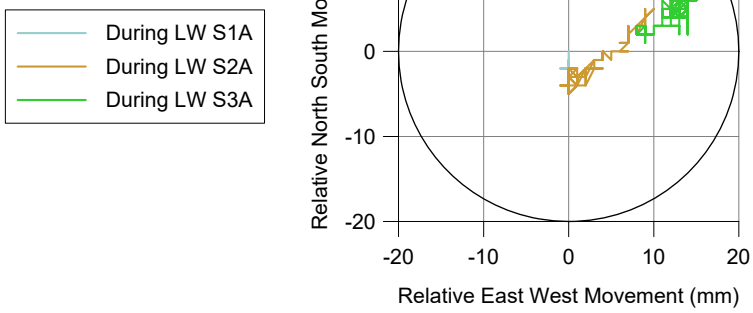
Fig. S22-R36

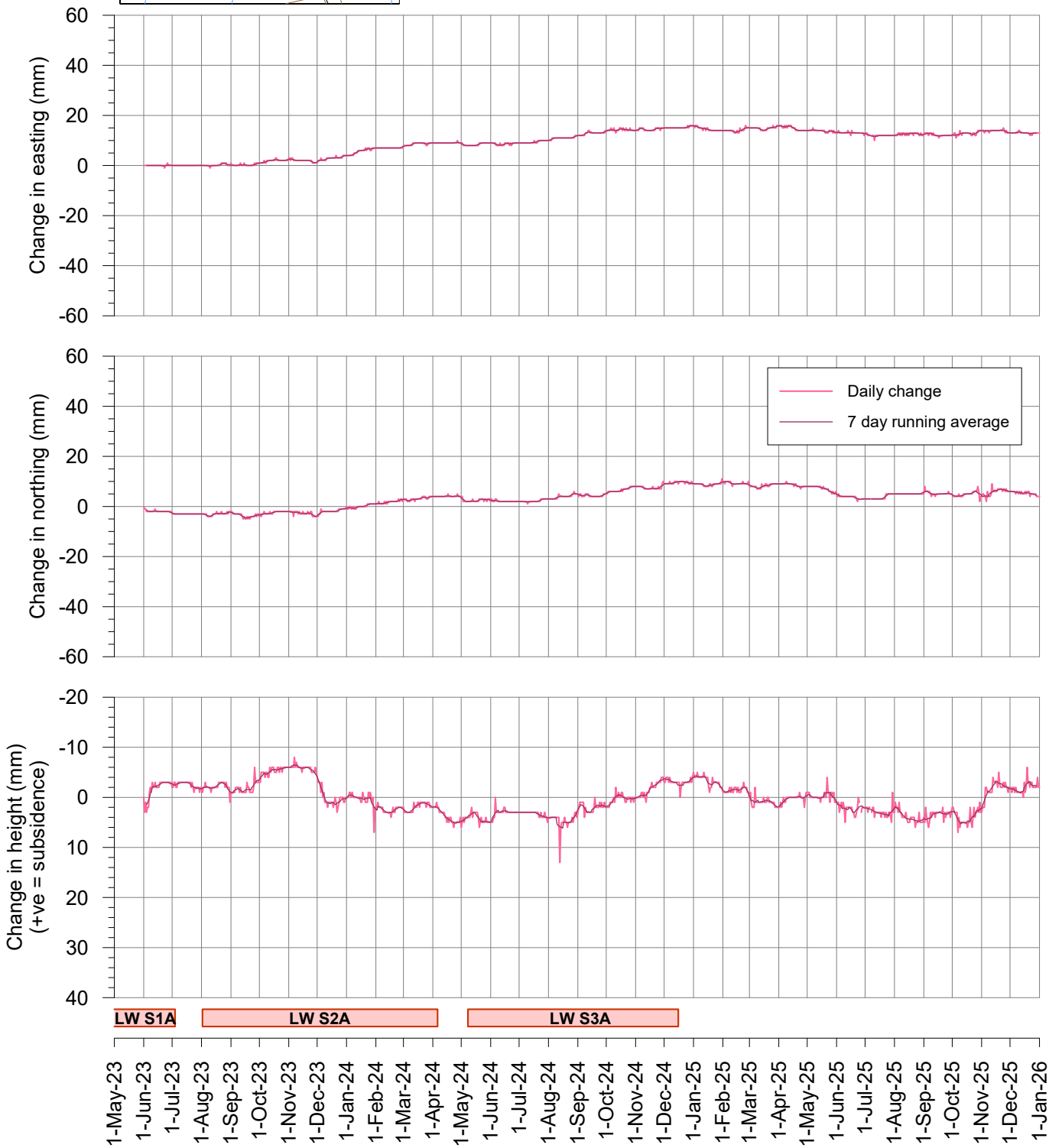
Tahmoor South LW S3A - GNSS Monitoring

Site S23 on southern side of Hornes Creek

I:\Projects\Tahmoor South\MSEC1430 - LW S3A Monitoring\Subsdata\Survey Data\Fig. S23 GNSS.grf





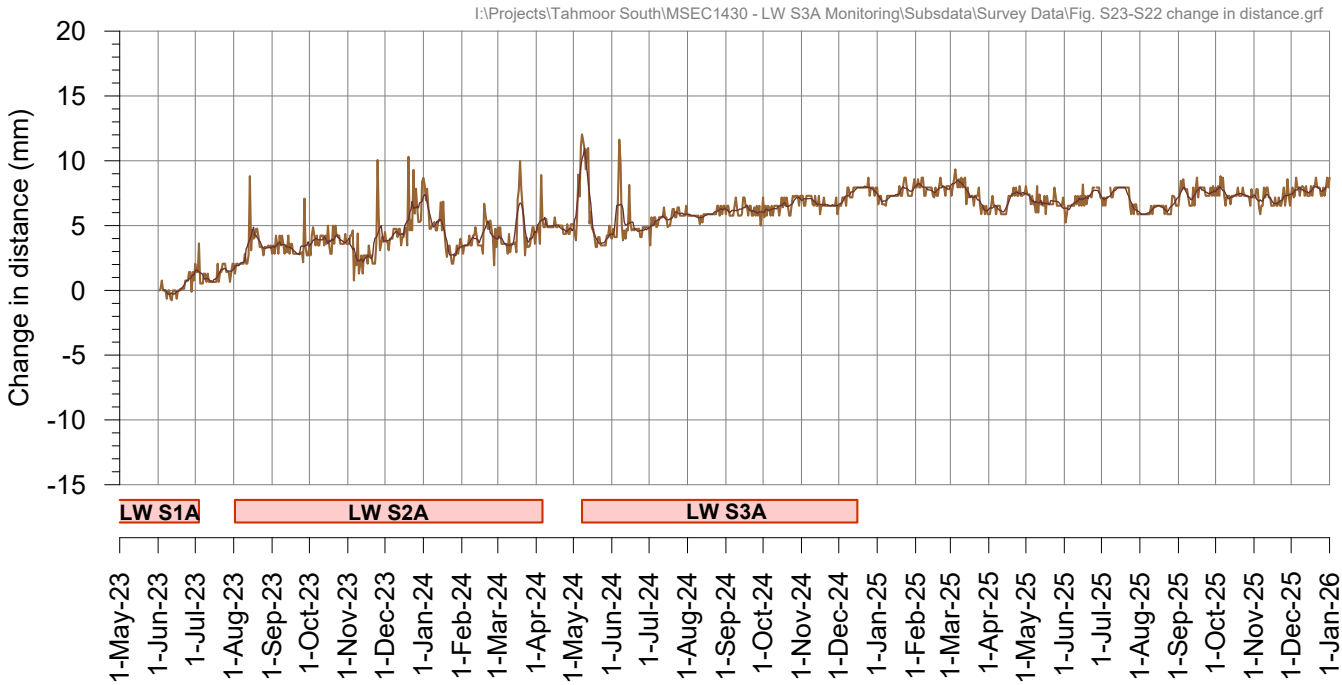


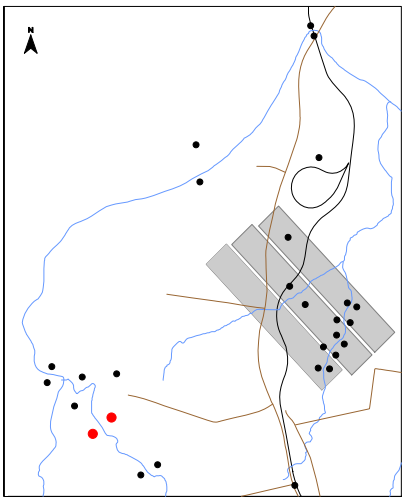
msec

Fig. S23-R36

Tahmoor South LW S3A - GNSS Monitoring

Change in distance across Hornes Creek
Sites S22 and S23

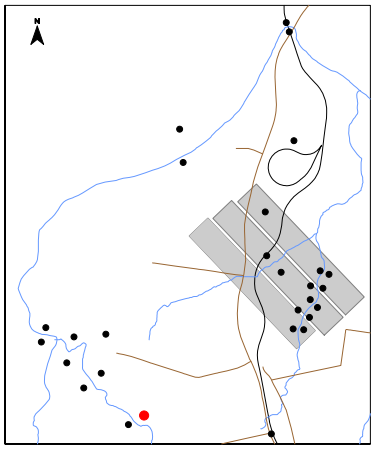




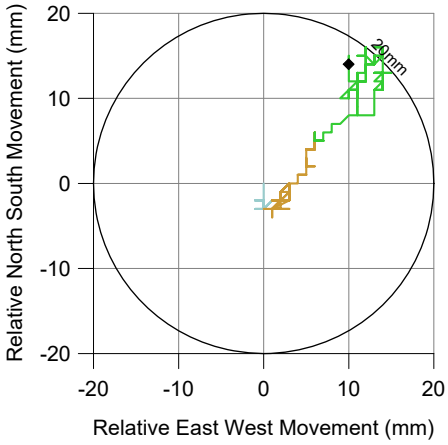
Tahmoor South LW S3A - GNSS Monitoring

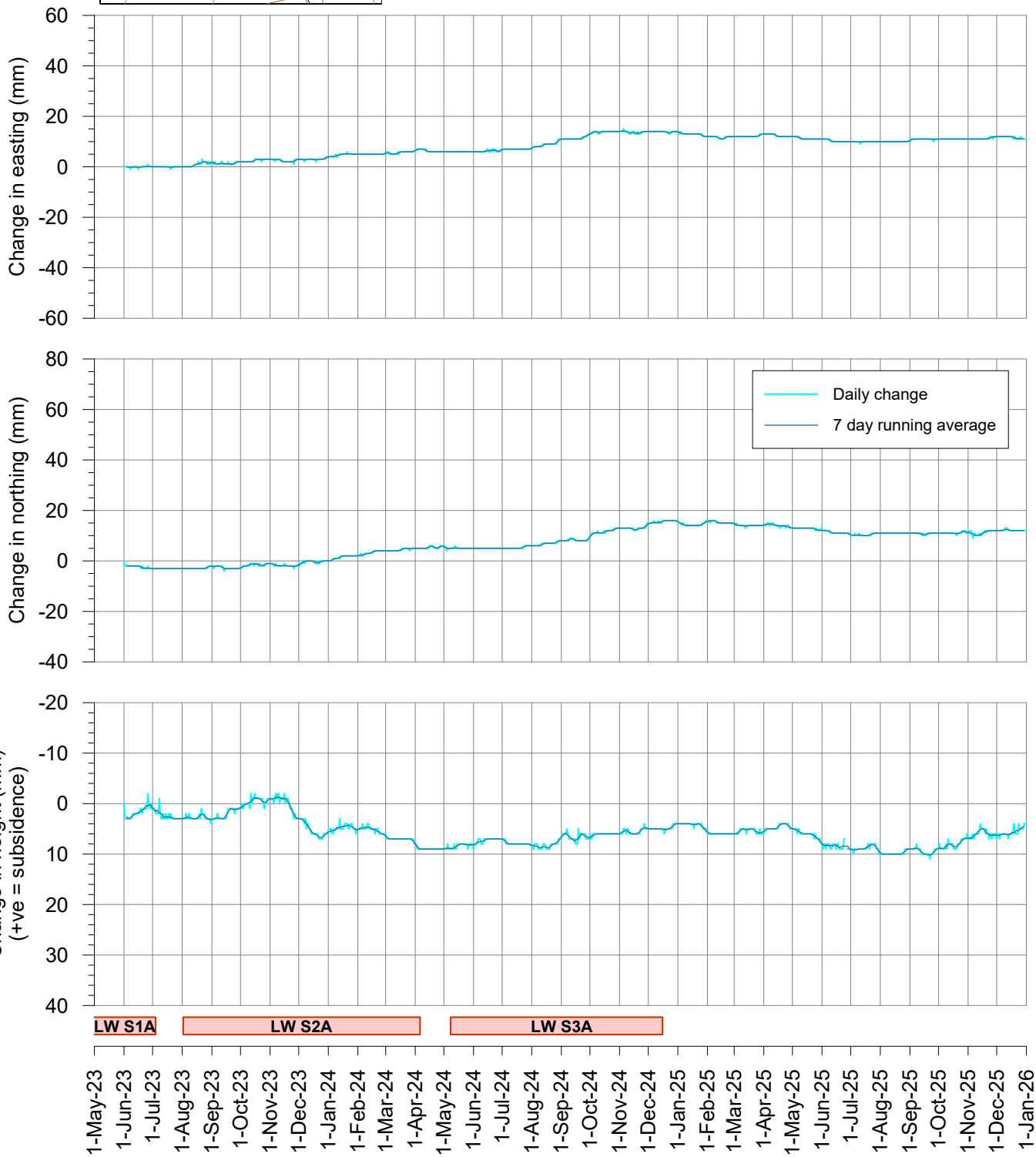
Site S24 on northern side of Hornes Creek

I:\Projects\Tahmoor South\MSEC1430 - LW S3A Monitoring\Subsdata\Survey Data\Fig. S24 GNSS.grf









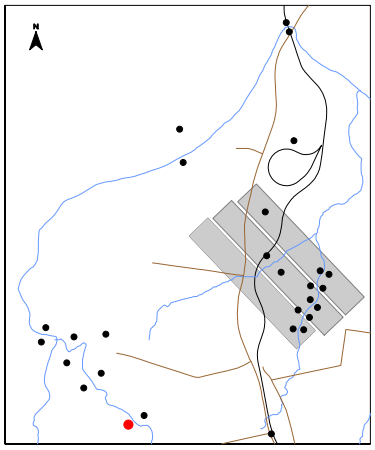
msec

Fig. S24-R36

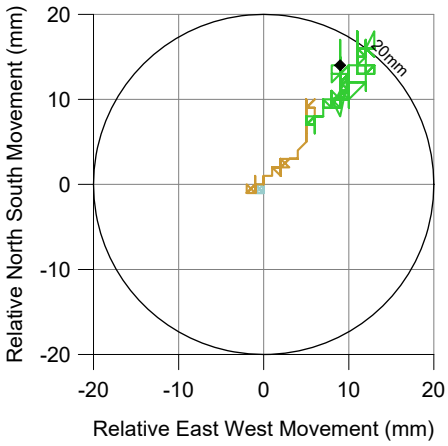
Tahmoor South LW S3A - GNSS Monitoring

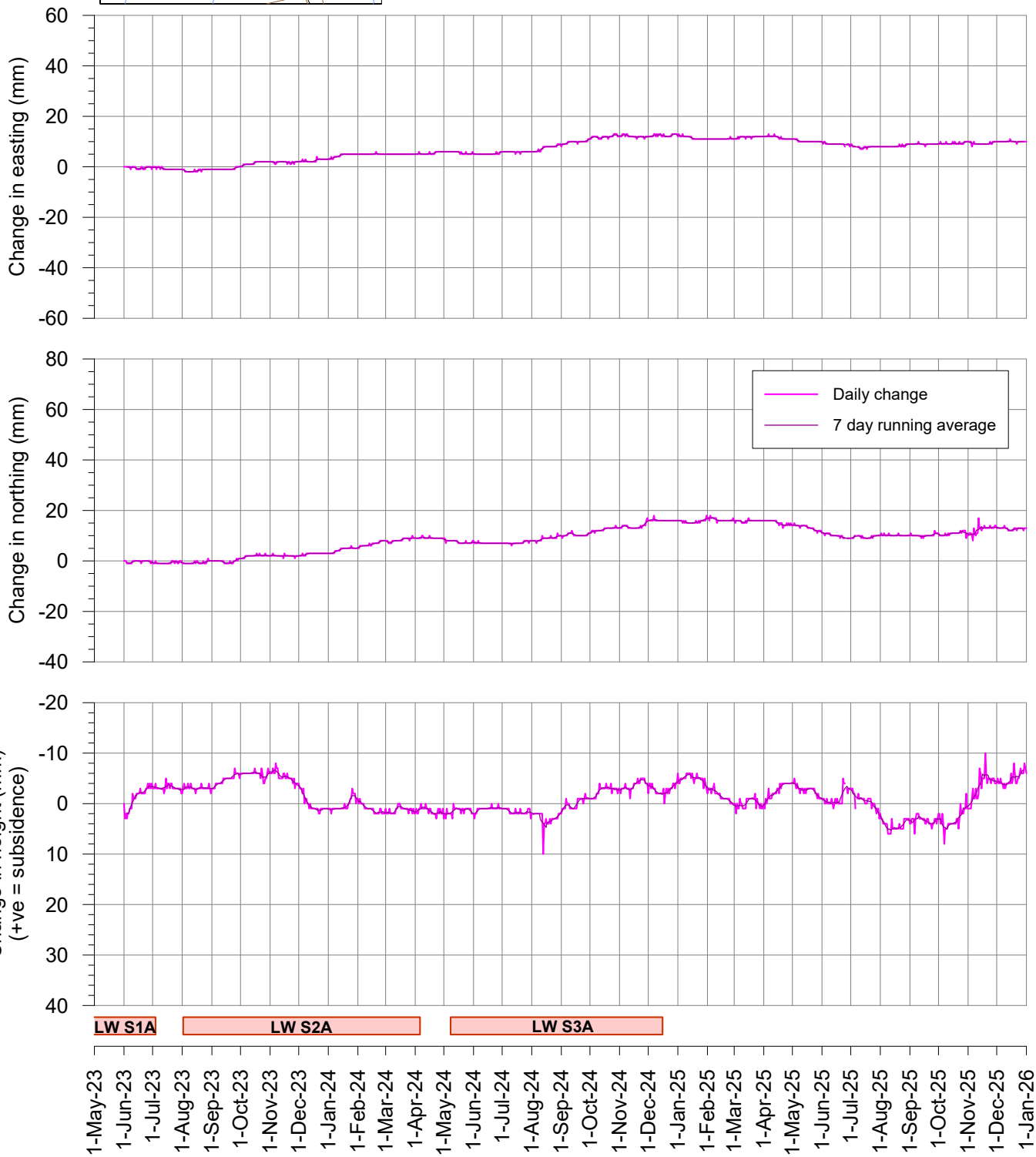
Site S25 on southern side of Hornes Creek

I:\Projects\Tahmoor South\MSEC1430 - LW S3A Monitoring\Subsdata\Survey Data\Fig. S25 GNSS.grf



During LW S1A
During LW S2A
During LW S3A



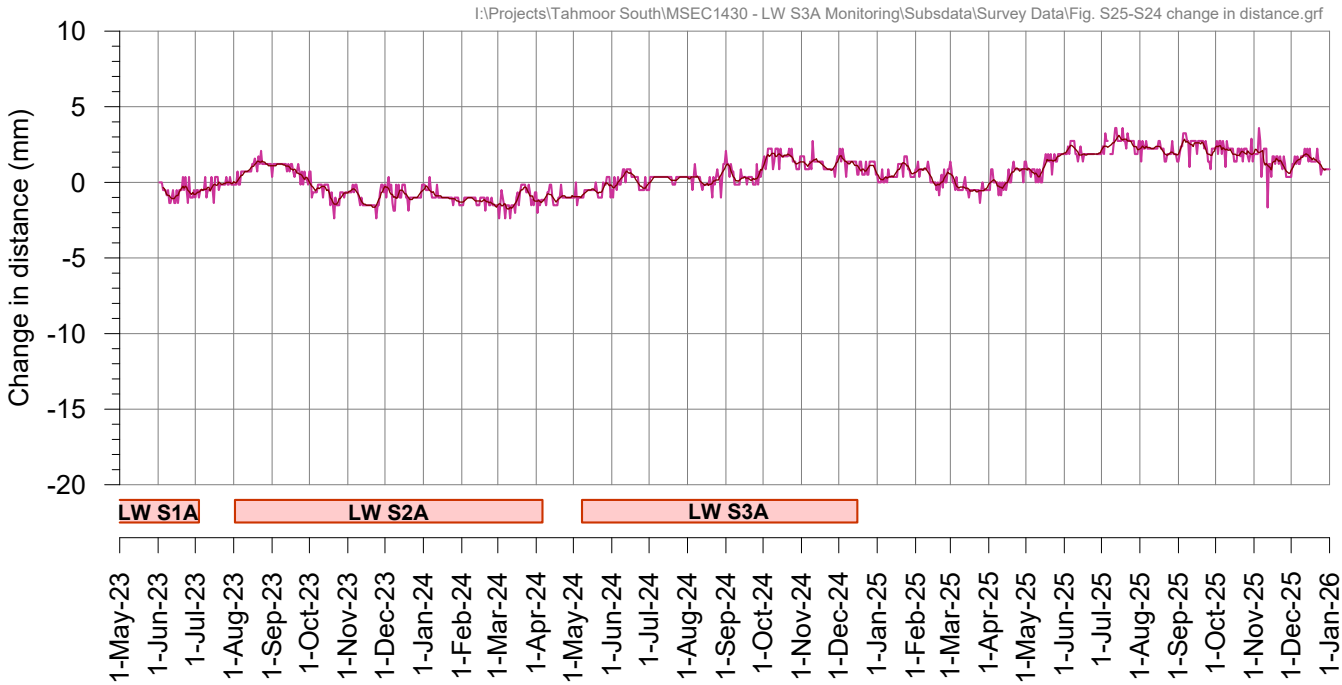


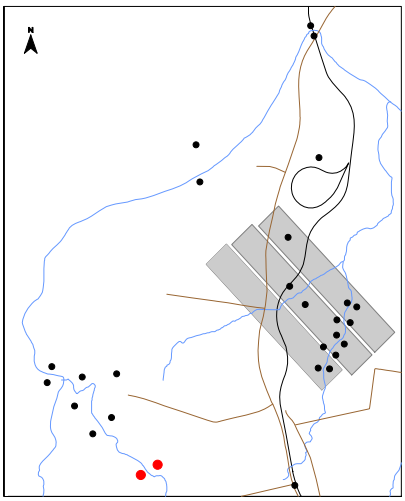
msec

Fig. S25-R36

Tahmoor South LW S3A - GNSS Monitoring

Change in distance across Hornes Creek
Sites S24 and S25

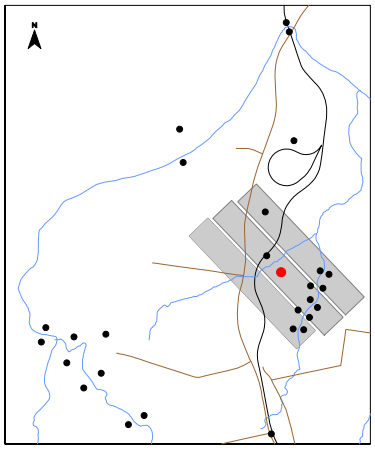


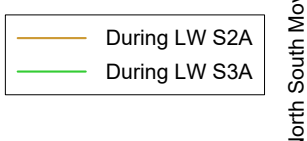


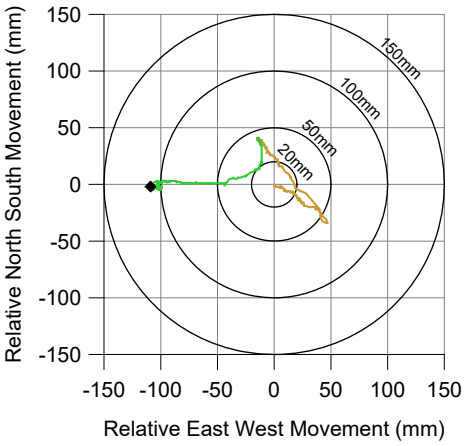
Tahmoor South LW S3A - GNSS Monitoring

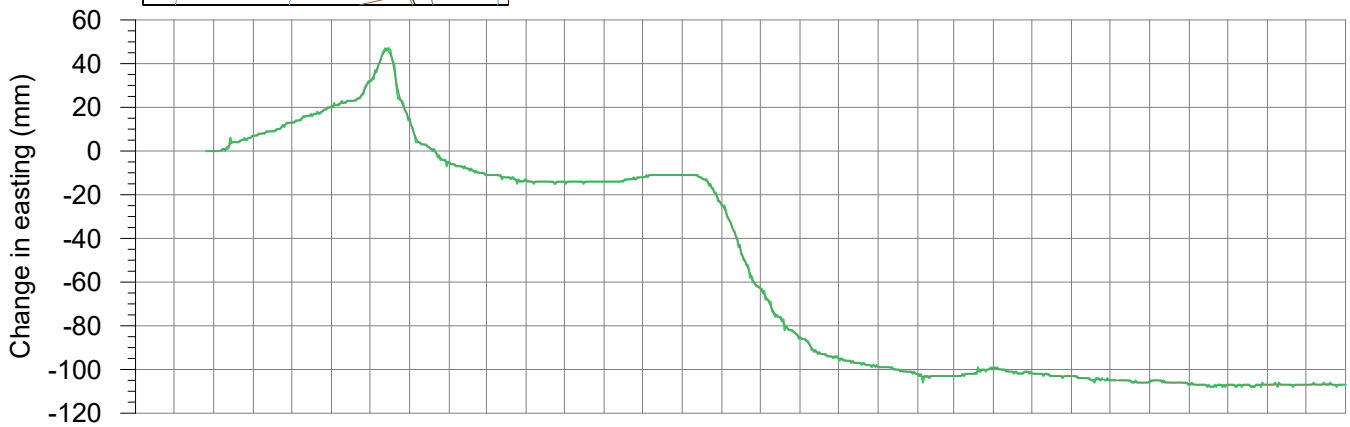
Site S26 above LW S2A

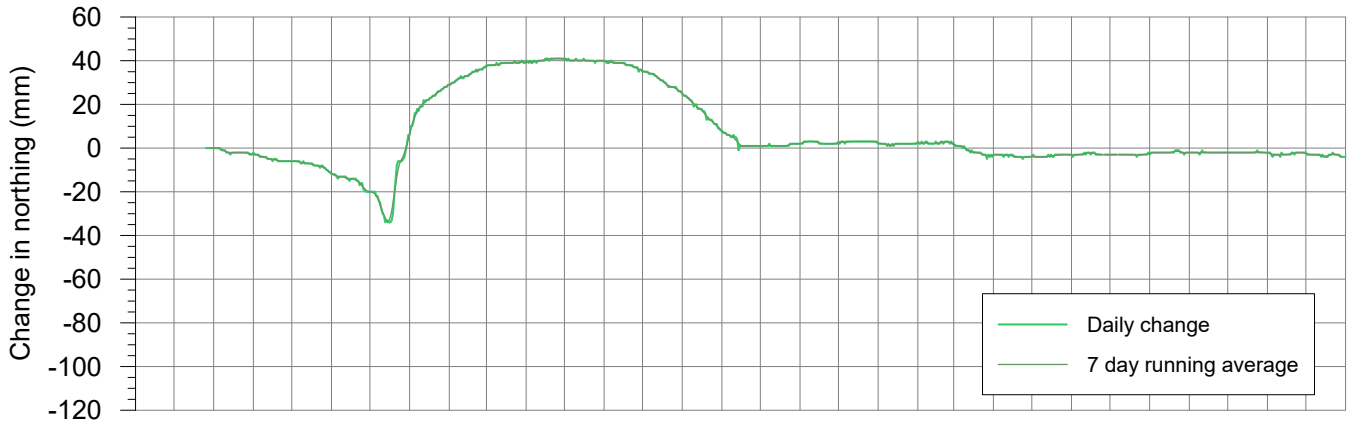
I:\Projects\Tahmoor South\MSEC1430 - LW S3A Monitoring\Subsdata\Survey Data\Fig. S26 GNSS.grf

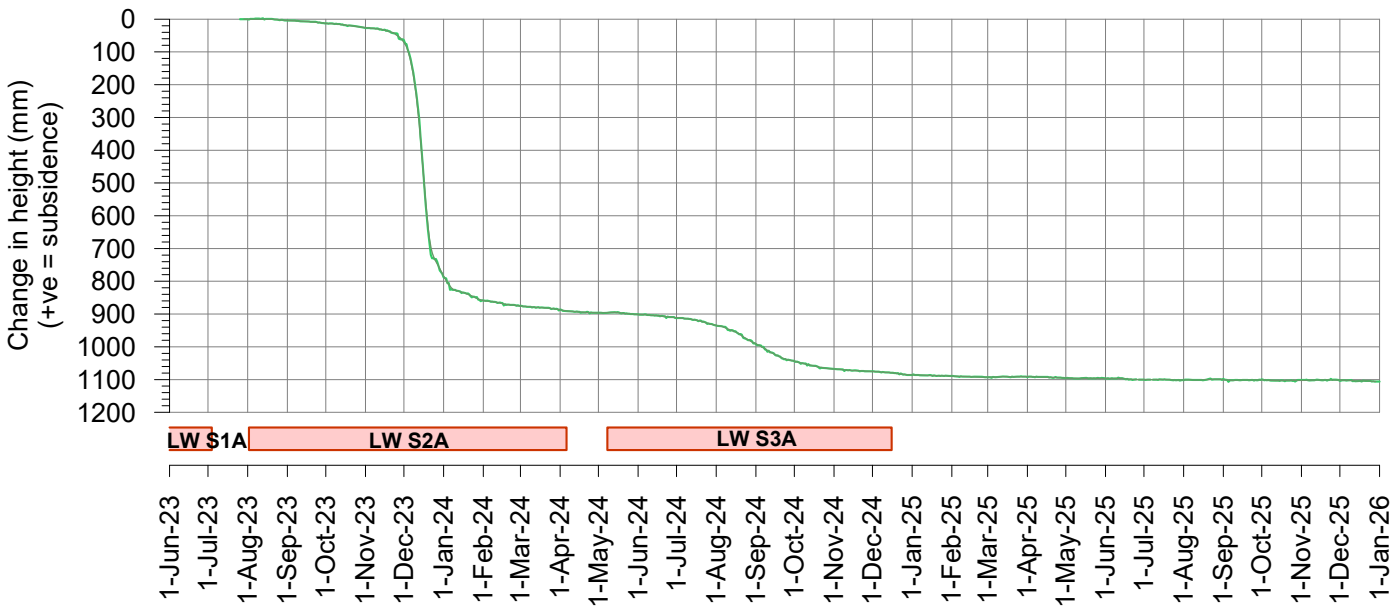












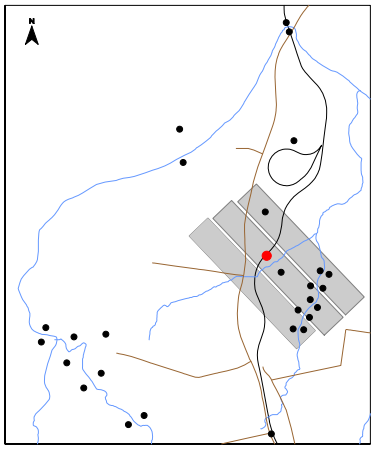
msec

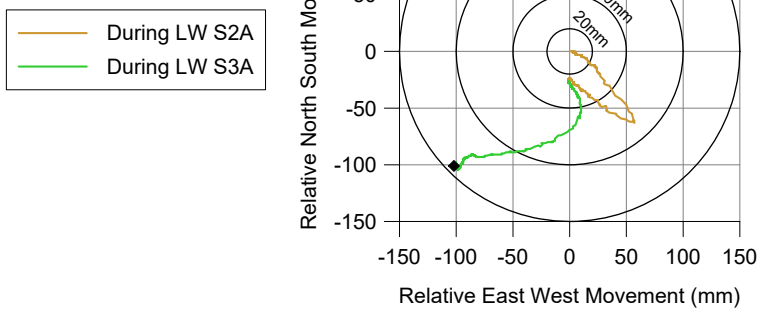
Fig. S26-R36

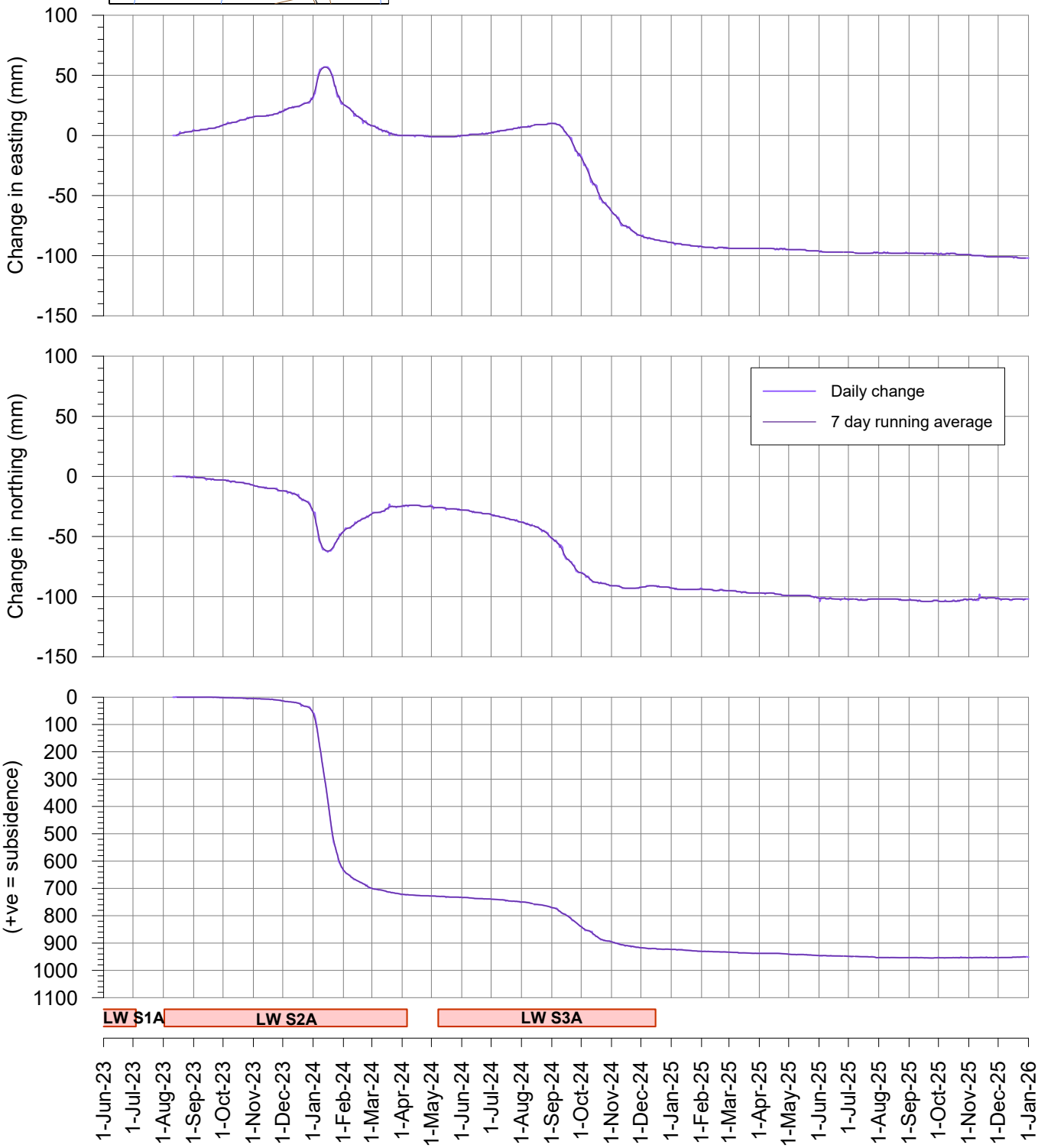
Tahmoor South LW S3A - GNSS Monitoring

Site S27 on railway embankment above LW S2A

I:\Projects\Tahmoor South\MSEC1430 - LW S3A Monitoring\Subsdata\Survey Data\Fig. S27 GNSS.grf





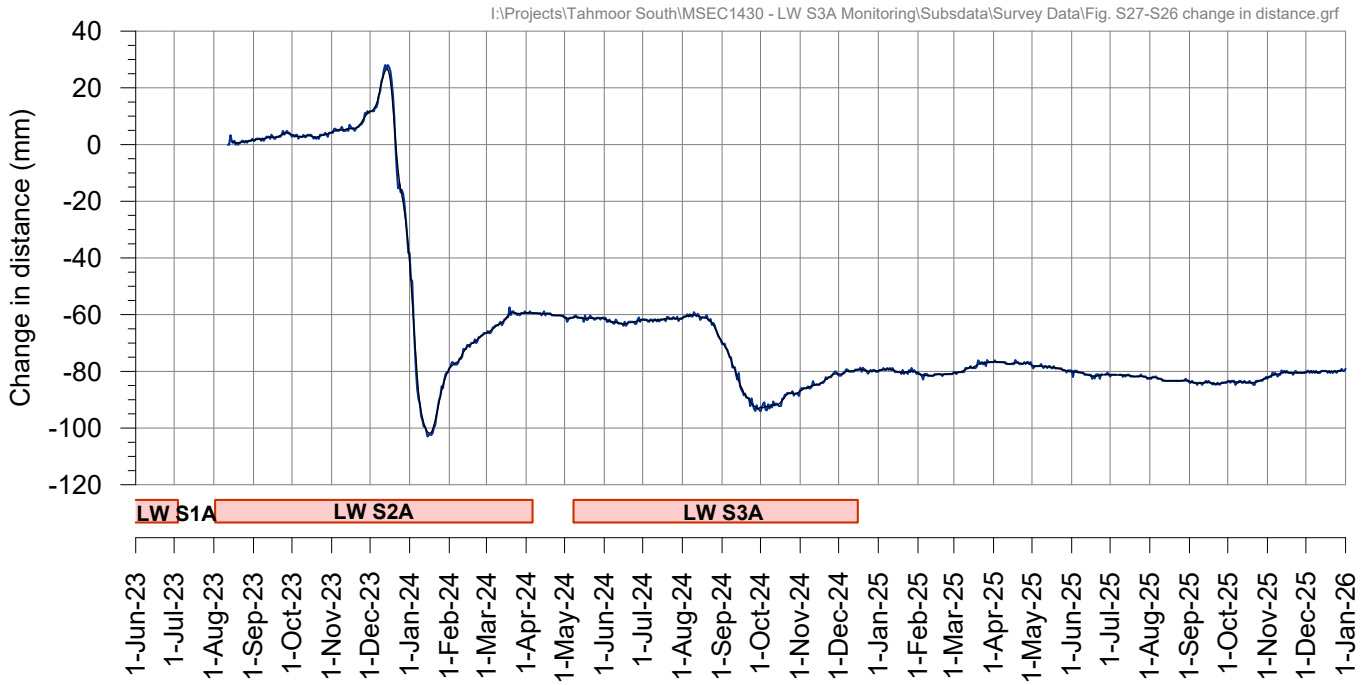


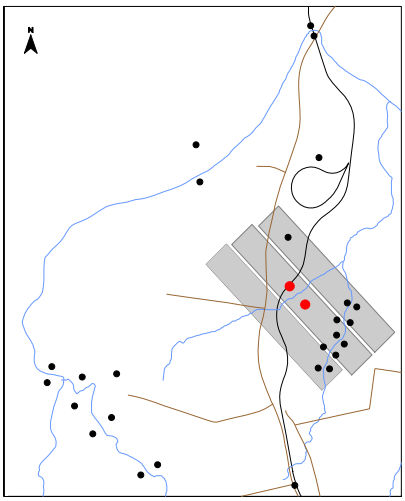
msec

Fig. S27-R36

Tahmoor South LW S3A - GNSS Monitoring

Change in distance across Teatree Hollow above LW S2A
Sites S26 and S27

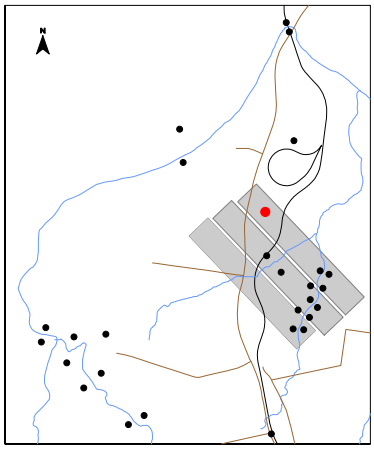




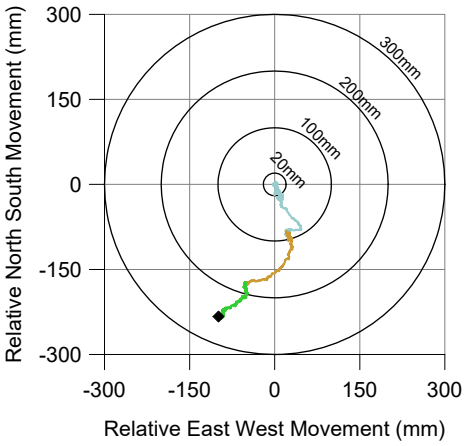
Tahmoor South LW S3A - GNSS Monitoring

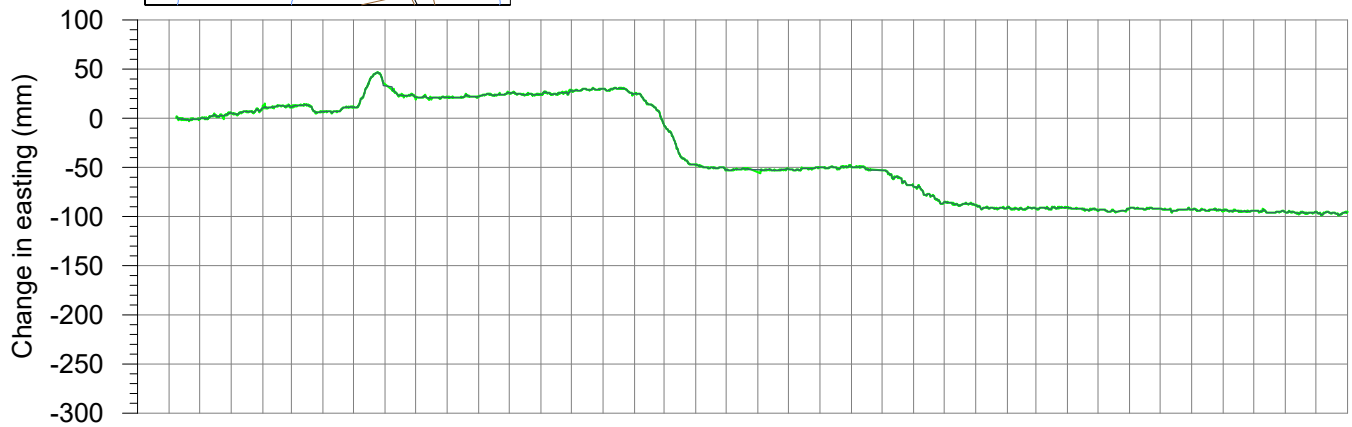
Gantry at Tahmoor Mine site

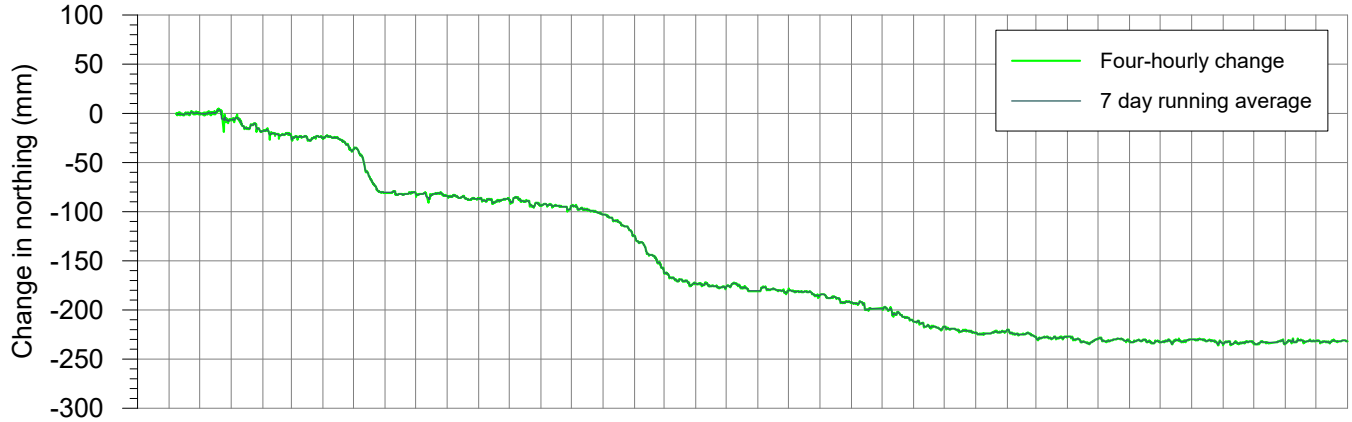
I:\Projects\Tahmoor South\MSEC1430 - LW S3A Monitoring\Subsdata\Survey Data\Fig. TM GNSS gantry.grf

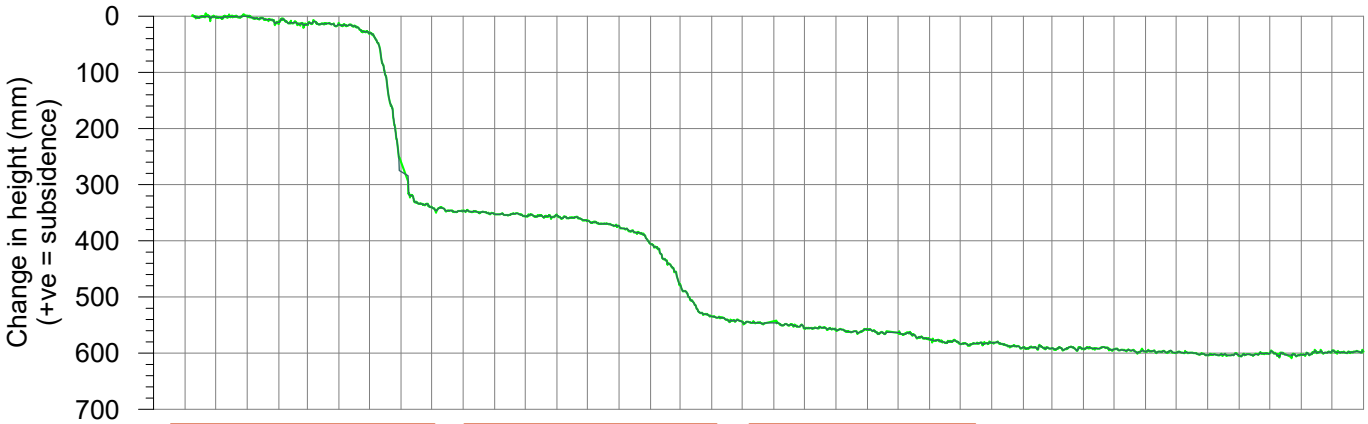


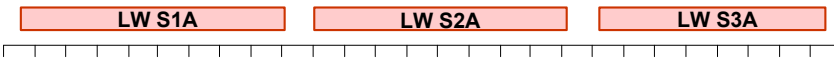
During LW S1A
During LW S2A
During LW S3A











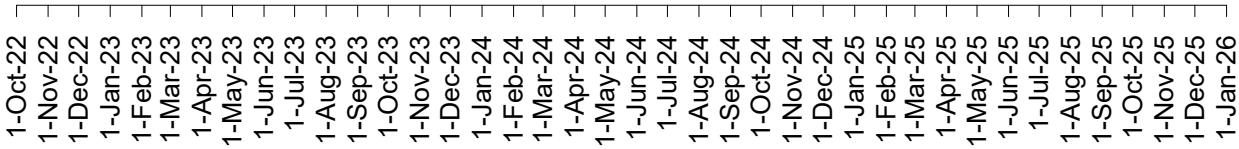


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Fig. TM-R36

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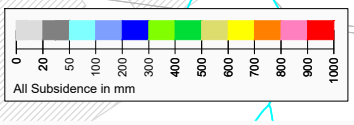
TAHMOOR SOUTH
LWS3A
OBSERVED INCREMENTAL
SUBSIDENCE DUE TO LW S3A

DATE:	SCALE:	DRAWING No:	Rev No
26 Jun 2026	1:10000	MSEC1430-02	36



LW S3A Started : 8-May-2024
LWS3A Completed : 17-Dec-2024

LW S3A
LW S1A
LW S2A
LW S4A
LW S5A
LW S6A
LWS3A Completed : 17-Dec-2024
LWS3A Started : 8-May-2024
1700m
1600m
1500m
1400m
1300m
1200m
1100m
1000m
900m
800m
700m
600m
500m
400m
300m
200m
100m
0m
Hidden creek
TEATREE HOLLOW
TRIBUTARY OF TEA TREE HOLLOW
BARGO R
CALOOLA RD
REMEMBRANCE DR
MAIN SOUTHERN RAILWAY
GREAT SOUTHERN ROAD
YARRAN ROAD
CHARLIES POINT RD
Gantry
Dam S2
Dam S3
Dam S4
625946
625925
625937
624471
853038
N

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TAHMOOR SOUTH
LWS3A
OBSERVED TOTAL SUBSIDENCE
SINCE START OF LW S1A

DATE:	SCALE:	DRAWING No:	Rev No
26 Jun 2026	1:10000	MSEC1430-03	36

All Subsidence in mm
0 20 50 100 200 300 400 500 600 700 800 900 1000 1100

LW S3A Started : 8-May-2024
LWS3A Completed : 17-Dec-2024

LWS3A Completed : 17-Dec-2024
LWS3A Started : 8-May-2024

LW S1A
LW S2A
LW S3A
LW S4A
LW S5A
LW S6A

1700m 1600m 1500m 1400m 1300m 1200m 1100m 1000m 900m 800m 700m 600m 500m 400m 300m 200m 100m 0m

Hidden creek
TEATREE HOLLOW
TRIBUTARY OF TEA TREE HOLLOW
CALOOLA RD
REMEMBRANCE DR
MAIN SOUTHERN RAILWAY
CHARLIES POINT RD
YARRAN ROAD
GREAT SOUTHERN RD
BARGO R
Gantry
Dam S2
Dam S3
Dam S4
625946
625925
625937
853038
524471
S01 S02 S03 S04 S05 S06 S07 S08 S09 S10 S26 S27

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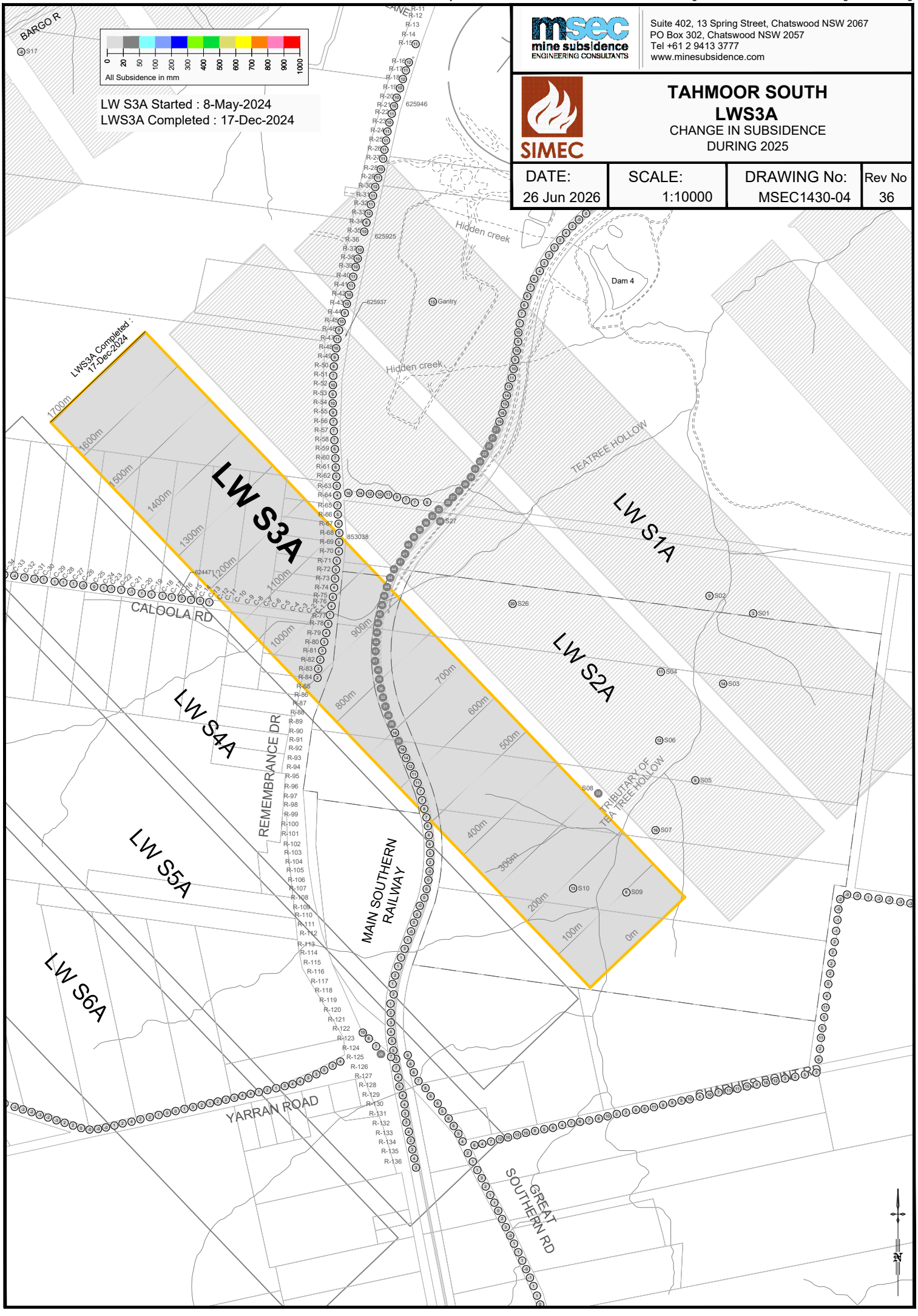
TAHMOOR SOUTH LWS3A

CHANGE IN SUBSIDENCE DURING 2025

DATE:	SCALE:	DRAWING No:	Rev No
26 Jun 2026	1:10000	MSEC1430-04	36



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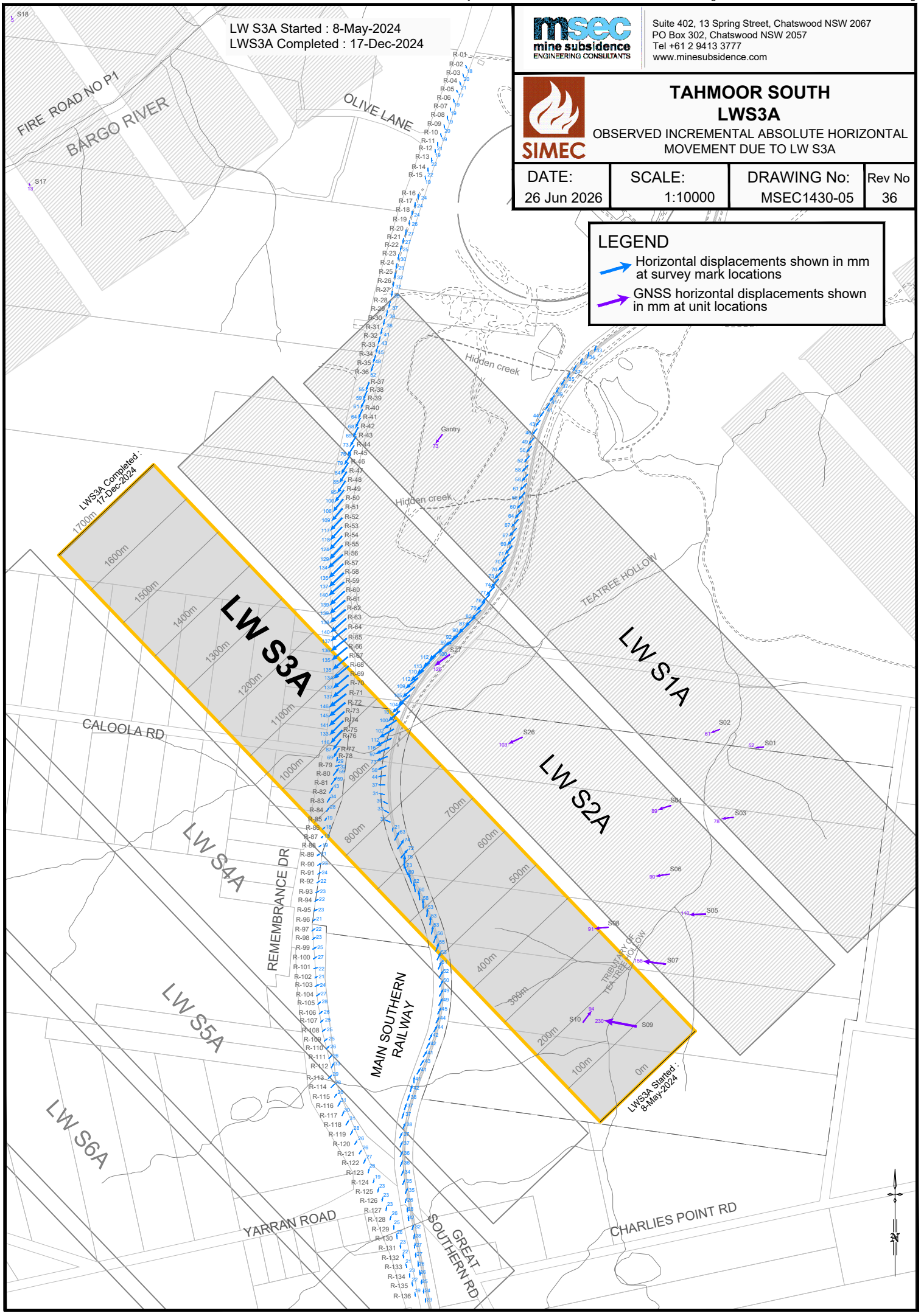

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TAHMOOR SOUTH
LWS3A

OBSERVED INCREMENTAL ABSOLUTE HORIZONTAL MOVEMENT DUE TO LW S3A

DATE:	SCALE:	DRAWING No:	Rev No
26 Jun 2026	1:10000	MSEC1430-05	36

LEGEND

- Horizontal displacements shown in mm at survey mark locations
- GNSS horizontal displacements shown in mm at unit locations

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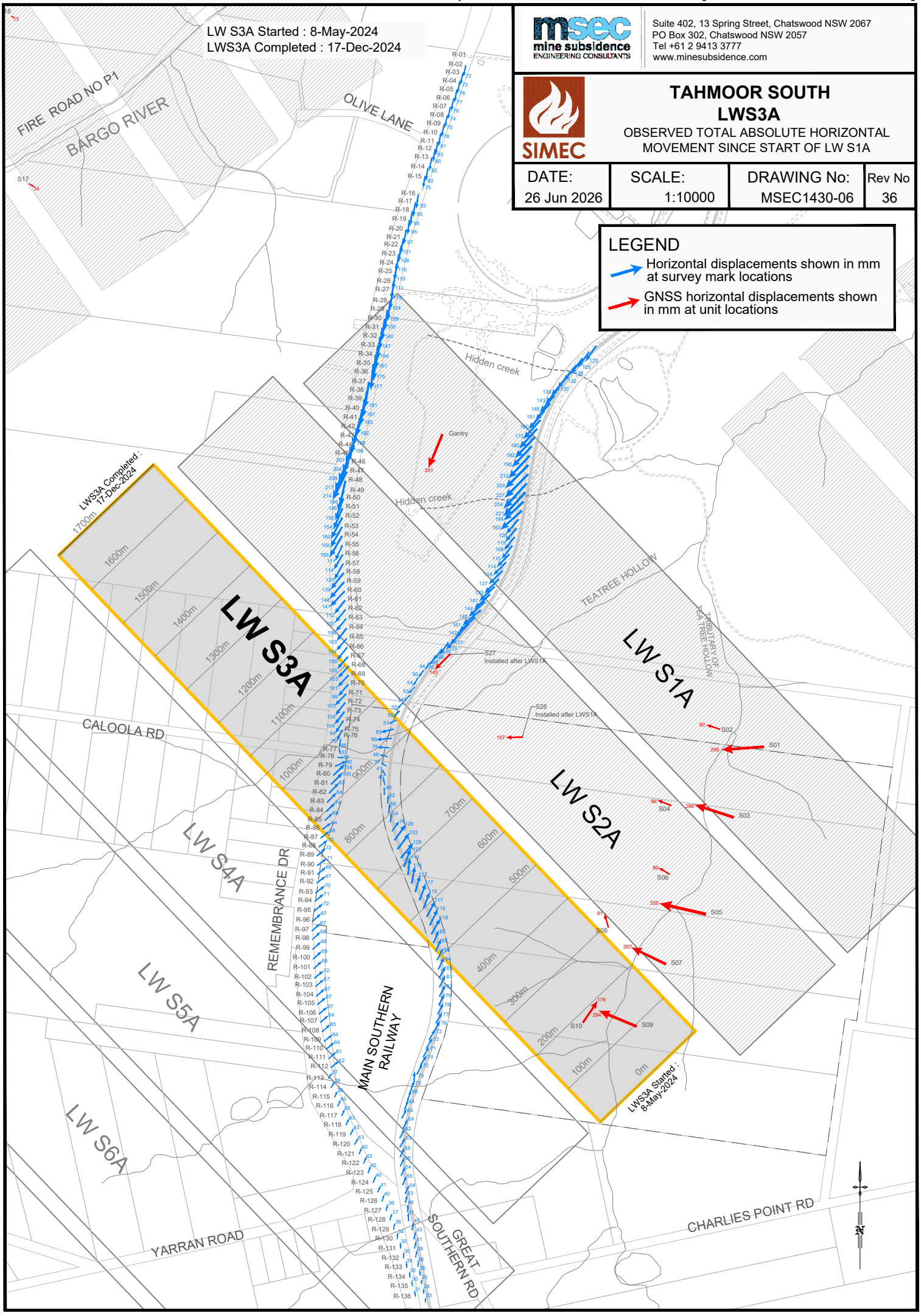

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TAHMOOR SOUTH
LWS3A

OBSERVED PATH OF TOTAL ABSOLUTE HORIZONTAL MOVEMENT SINCE START OF LW S1A

DATE:	SCALE:	DRAWING No:	Rev No
26 Jun 2026	1:10000	MSEC1430-07	36

LW S3A Started : 8-May-2024
LWS3A Completed : 17-Dec-2024

FIRE ROAD NO P1
BARGO RIVER
OLIVE LANE
Hidden creek
Hidden creek
Gantry
LWS3A Completed : 17-Dec-2024
1700m
1600m
1500m
1400m
1300m
1200m
1100m
1000m
900m
800m
700m
600m
500m
400m
300m
200m
100m
0m
LW S3A
LW S2A
LW S1A
LW S4A
LW S5A
TEATREE HOLLOW
CALOOLA RD
REMEMBRANCE DR
MAIN SOUTHERN RAILWAY
TRIBUTARY OF TEATREE HOLLOW
LWS3A Started : 8-May-2024
CHARLIES POINT RD
GREAT SOUTHERN RD
S01
S02
S03
S04
S05
S06
S07
S08
S09
S10
S26
S27

LEGEND

- Path of horizontal movement
- Path of horizontal movement during 2025
- Path of GNSS horizontal movement during LW S1A
- Path of GNSS horizontal movement during LW S2A
- Path of GNSS horizontal movement during LW S3A
- Path of GNSS horizontal movement during 2025

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APPENDIX 12

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TAHMOOR COAL: WESTERN DOMAIN

Residual Subsidence Monitoring Status Report No. 07
Post mining LW W1-W4 in the Western Domain

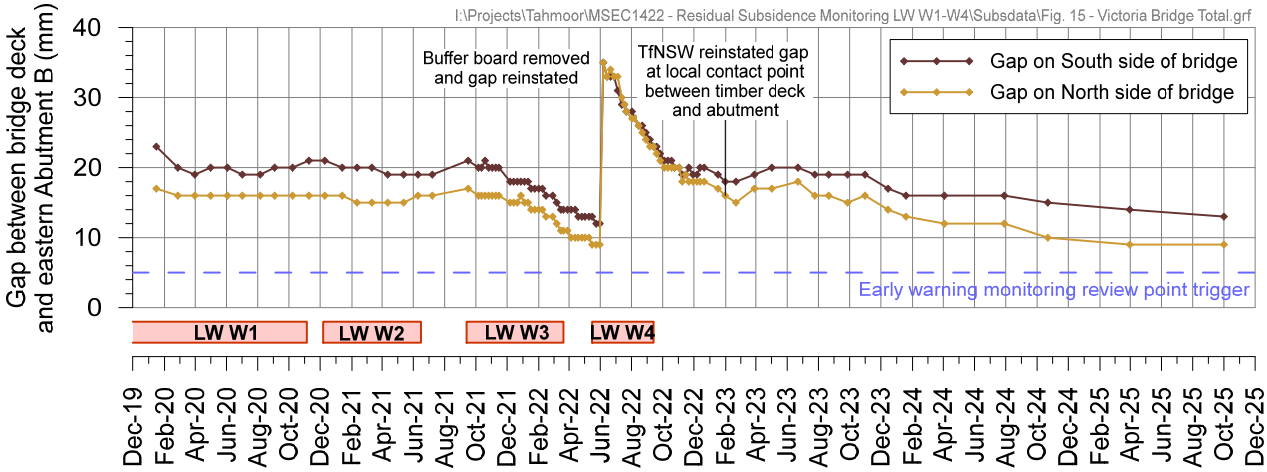
Reporting Period	15 August 2025 to 30 September 2025	
Total subsidence at end of reporting period	730 mm	at Site 24 on 30 September 2025
Maximum subsidence since MSR ground survey on 19 January 2024	44 mm	at Site 24 on 30 September 2025
Maximum change in subsidence during last quarter	9 mm	at Site 25 (14 August 2025 to 30 September 2025)

Summary of monitoring and inspections

Monitoring Activity	Total subsidence or change in distance	Change in subsidence during last quarter	Highest Trigger	Comments
GNSS units				
GNSS unit above centreline of LW W4 (Site 24)	730	-1	N/A	Trend of ongoing residual subsidence observed, with rates of change reducing to low levels. Very little change during 2025.
Main Southern Railway (ARTC)				
GNSS unit (Site 1) Picton Tunnel 87.85 km	-1	5		Very minor change in subsidence since MSR ground survey on 19 January 2024. Change in subsidence less than 20 mm trigger.
GNSS unit (Site 0) Picton Viaduct (85.42 km)	45	2		Very minor change in subsidence since MSR ground survey on 19 January 2024. Change in subsidence less than 20 mm trigger. New base values 19 July 2024. Slight southward movement since April 2024.
GNSS units (Site 2) Picton Viaduct (85.42 km)	1	3		Very minor change in subsidence since MSR ground survey on 19 January 2024. Change in subsidence less than 20 mm trigger.
Change in distance between Sites 0 and 2 across Picton Viaduct	-12 (ground shortening)	1 (ground extension)		Small changes in distance since MSR ground survey on 19 January 2024, exceeding 5 mm trigger. Additional Precision 2D survey on 11 June 2025 confirmed no material change. It is planned to upgrade both units.
GNSS unit (Site 26) at 88.78 km	-14	1		GNSS unit shifted to the south-west and upwards after installation, with small changes observed since early May 2024. Minor changes observed during reporting period. Change in subsidence less than 20 mm trigger.
GNSS unit (Site 27) at 88.60 km	4	-		Very minor change in subsidence since MSR ground survey on 19 January 2024. Change in subsidence less than 20 mm trigger. Last reading on 15 June 2025. Solar panel has been stolen, and unit will be replaced.

Monitoring Activity	Total subsidence or change in distance	Change during last quarter	Highest Trigger	Comments
Picton-Mittagong Loop Line (THNSW)				
GNSS unit (Site 7) Culvert at 87.850 km	468	3		Very minor change in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence less than 20 mm trigger.
GNSS unit (Site 8) Above LW W2 at 88.110 km	682	0		Very minor change in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence less than 20 mm trigger.
GNSS unit (Site 9) Above LW W1 at 88.550 km	530	2		Very minor change increase in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence less than 20 mm trigger.
GNSS unit (Site 10) at 89.000 km	201	3		Very minor change in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence exceeded 20 mm trigger intermittently. IMG met on 16 May 2025 and agreed to increase the trigger level to 40 mm. Observed rates of change are extremely small with no adverse impacts on the PMLL. Tahmoor Coal notified THNSW of the assessment. Change in subsidence less than 20 mm trigger.
GNSS unit (Site 11) at 89.629 km	82	8		Very minor change in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence less than 20 mm trigger.
GNSS unit (Site 19) at 89.440 km	87	-2		Very minor change in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence less than 20 mm trigger.
Victoria Bridge over Stonequarry Creek (TfNSW)				
GNSS unit (Site 3) on eastern abutment	27	7	N/A	Very little change during 2025. Change in subsidence less than 20 mm trigger.
GNSS unit (Site 25) on western abutment	-9	9	N/A	Unit repaired on 7 January 2025. Very minor ongoing southward movement. Very little change in subsidence during 2025. Change in subsidence approaching 20 mm trigger.
Change in distance between Sites 3 and 25 across Victoria Bridge	-28 (ground shortening)	-1 (ground shortening)	N/A	Very little change in distance during 2025. Change in distance less than 5 mm trigger.
Six monthly 2D ground survey between Pegs West Abut 2 Rock and East Abut 3 Rock	-55 (ground shortening)	-1 (since 31-Mar-25)	N/A	Very little change observed over the last 2.5 years. Slight increase in closure of 1 mm between 31 March 2025 and 1 October 2025.
Six monthly local 3D bridge survey (values in table represent maximum measured closure)	-64 (ground shortening)	0 (since 31-Mar-25)	N/A	Very little change observed over the last 2.5 years. After 2 mm increase in closure between S2 Pier to S3 Pier on 31 March 2025, no further change on 1 October 2025.
Laser distancemeters	-38.6 (top) -34.9 (base) (ground shortening)	-0.9 (top) -0.9 (base)		Minor ongoing closure of 4 mm since April 2024 and < 1 mm across top and base of valley during this reporting period.
Measure gap between bridge deck and eastern Abutment B	13 mm (Sth) 9 mm (Nth)	-1 mm (Sth) 0 mm (Nth)		TfNSW reinstated a gap between the timber deck and eastern abutment on 24 January 2023. Gap on 1 October 2025 was 13 mm on the south side (1 mm closure since 31 March 2025 survey) and 9 mm on the north side (no change since 31 March 2025 survey). Total closure along water pipe joints was 11 mm (decrease of 1 mm since 31 March 2025).

Monitoring Activity	Total subsidence or change in distance	Change during last quarter	Highest Trigger	Comments
Victoria Bridge over Stonequarry Creek (TfNSW) (continued)				
Visual inspection	-	-	N/A	TfNSW inspected the Bridge and reinstated a gap between the timber deck and the eastern abutment on 24 January 2023. Detailed inspection by structural engineer and TfNSW Bridge Inspector conducted on 20 November 2023. Expansion gap at Eastern abutment not fully closed (at least 10 mm), previously observed 10 mm gap in notch at Western abutment is closed. Bridge deck appears to be propped between abutments, with contact between bridge deck and Eastern abutment not yet known as hidden by timber retaining wall. Trusses in superstructure do not appear to have experienced significant compression. There are no immediate concerns with the bridge structure. No obvious changes observed on 19 January 2024. Termite activity observed at base of piers on 15 April 2024.
Natural Features				
Groundwater monitoring	Continuous	-	-	Groundwater data has been downloaded and analysed to end of December 2024. Trend of gradually increasing groundwater levels across the area in the shallower Hawkesbury and Wianamatta Formations. Deeper intakes within the Bulgo Sandstone and the Bulli Coal Seam remain depressurised.
Management Actions				
Other management actions since previous report: ● Nil				
Any additional and/or outstanding management actions: ● Maintenance on some GNSS units (upgrading Sites 0 and 2 and repairing Site 27).				
Consultation with stakeholders since previous report: ● Monitoring reports issued quarterly				
Forecast whether residual subsidence is likely to cause: **A. Track closure for any period unacceptable to ARTC** **B. Impact on the safety of operations on the Main Southern Railway** Based on monitoring results to date, and the controls implemented and available under the Residual Subsidence Monitoring Plan for Western Domain LW W1-W4, no triggers under this Monitoring Plan are expected to be exceeded in the next three months. Accordingly residual subsidence is not likely to result in the occurrence of either A or B above.				
Certified by Tahmoor Coal				
Name	Ross Barber			
Position	Project Manager			
Signature	*Ross Barber*			
Date	15 October 2025			



Copy of Report to:

Daniel Wakefield, Area Manager Ingleburn, ARTC
Sladjan Mitic, Senior Track & Civil Engineer Sydney, ARTC
Michael Irons, Property Manager – Wagga, ARTC
Brian Cooper, Manager Maintenance North-South, ARTC;
Peter Haskard, Manager Engineering, Interstate Network, ARTC

John Thorogood, Safety, Environment & Quality Manager, Transport Heritage NSW
Les Kelleher, Track Manager, Transport Heritage NSW

Cyril Gunaratne - TfNSW (Pavement Maintenance Planner)
Dony Castro - TfNSW (Bridge Maintenance Planner)
Richard Woods - Stantec (Senior Principal – Senior Bridge Engineer)

Clint Mason, Production Manager, Tahmoor Mine
Ian Cochran, Bridges and Structures Specialist, ONRSR
Ray Ramage, Principal Inspector – Subsidence, Mine Safety Inspectorate, Resources Regulator

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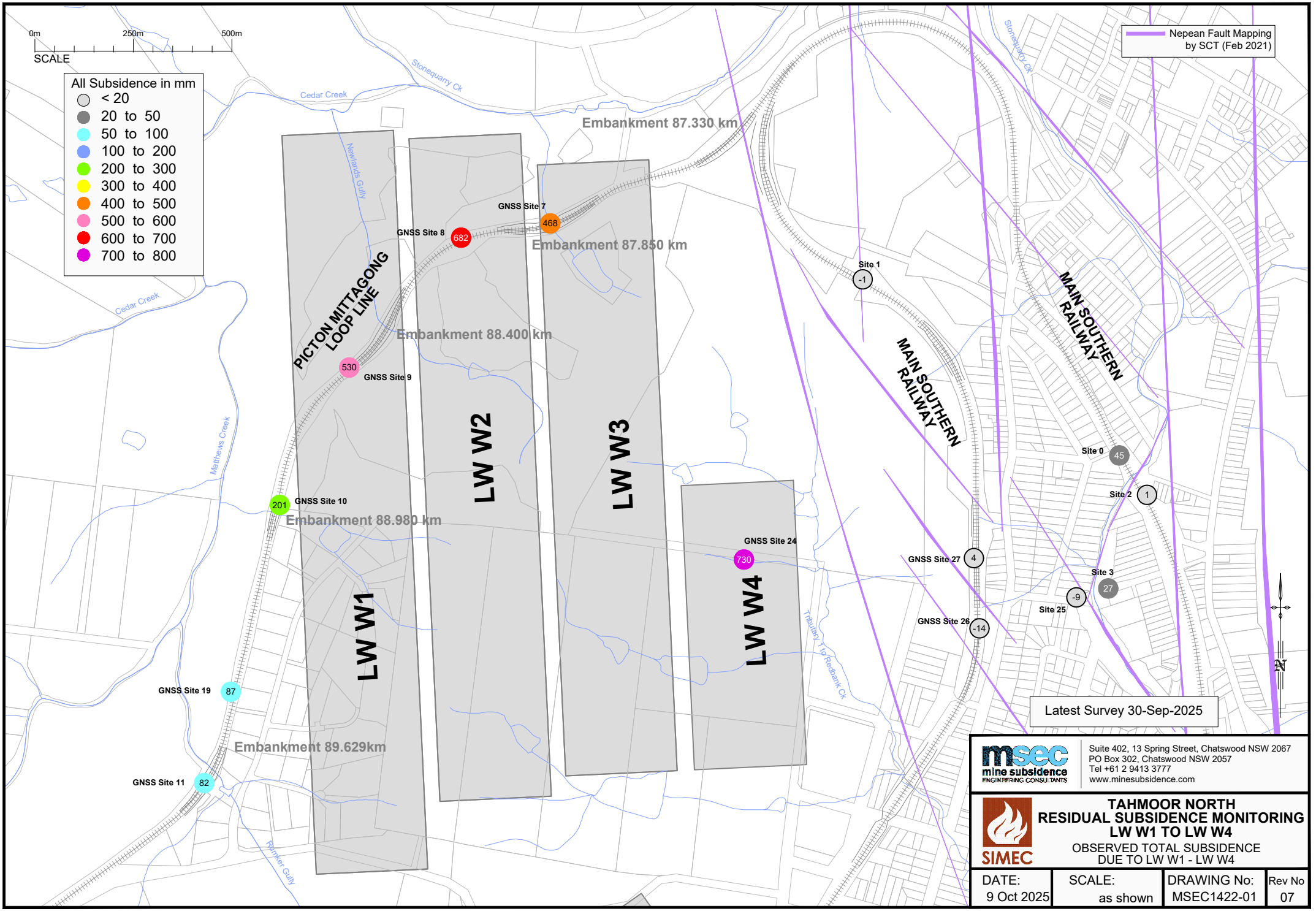

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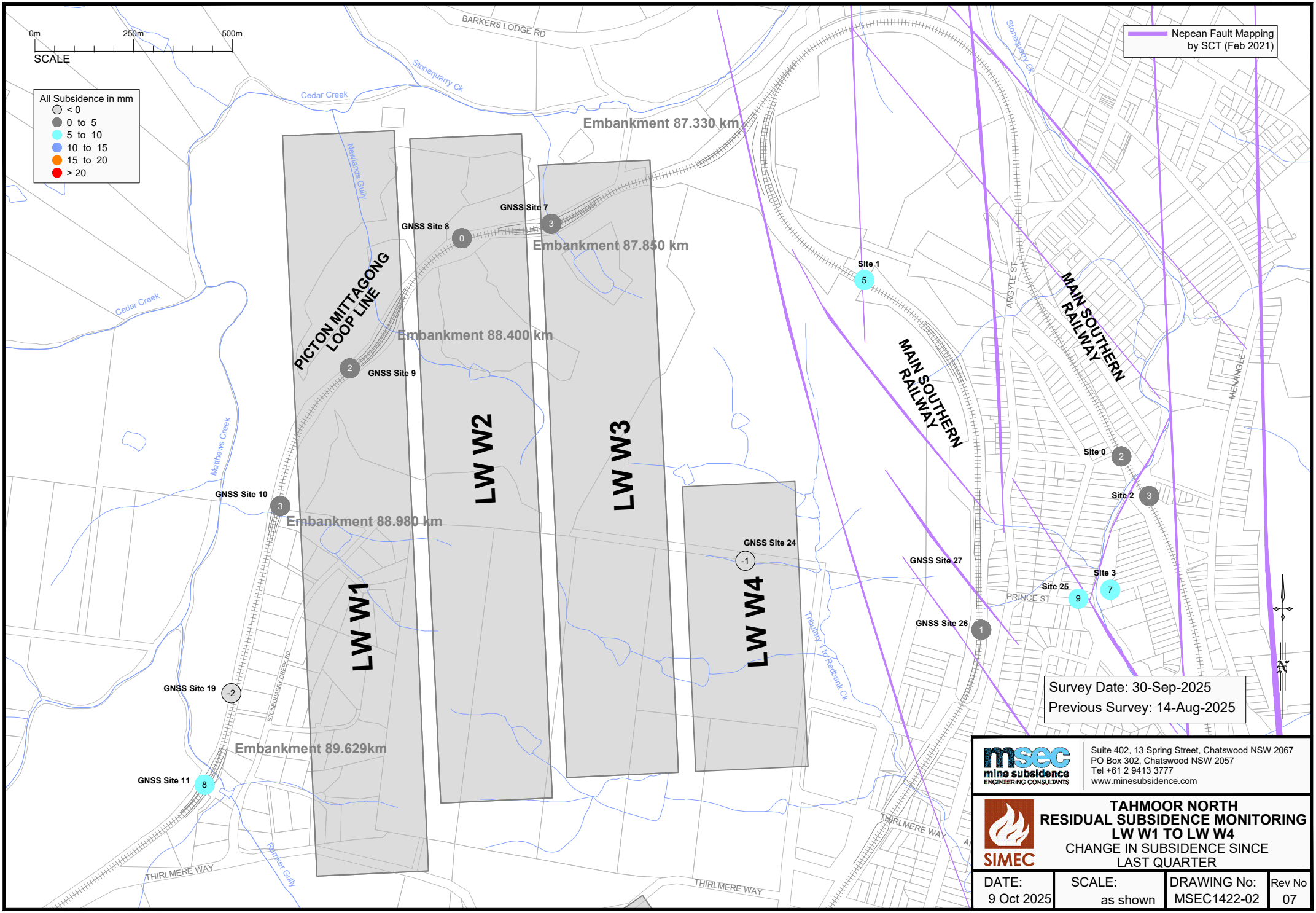

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TAHMOOR NORTH RESIDUAL SUBSIDENCE MONITORING LW W1 TO LW W4

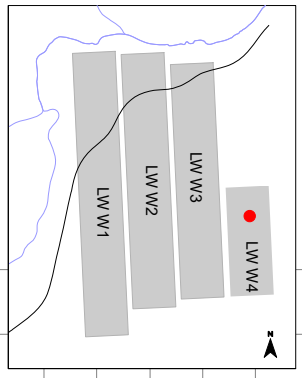
CHANGE IN SUBSIDENCE SINCE LAST QUARTER

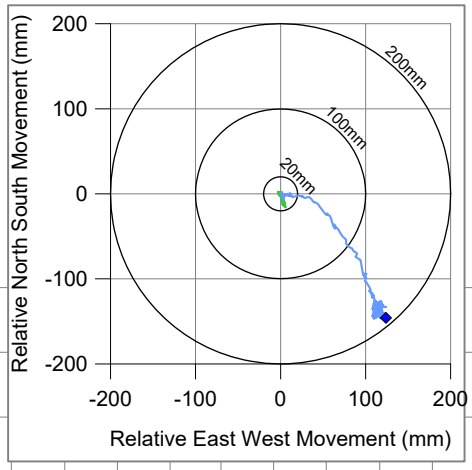
DATE:	SCALE:	DRAWING No:	Rev No
9 Oct 2025	as shown	MSEC1422-02	07

Tahmoor Western Domain - GNSS Monitoring

Site 24 above LW W4

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 1 - Site 24.grf



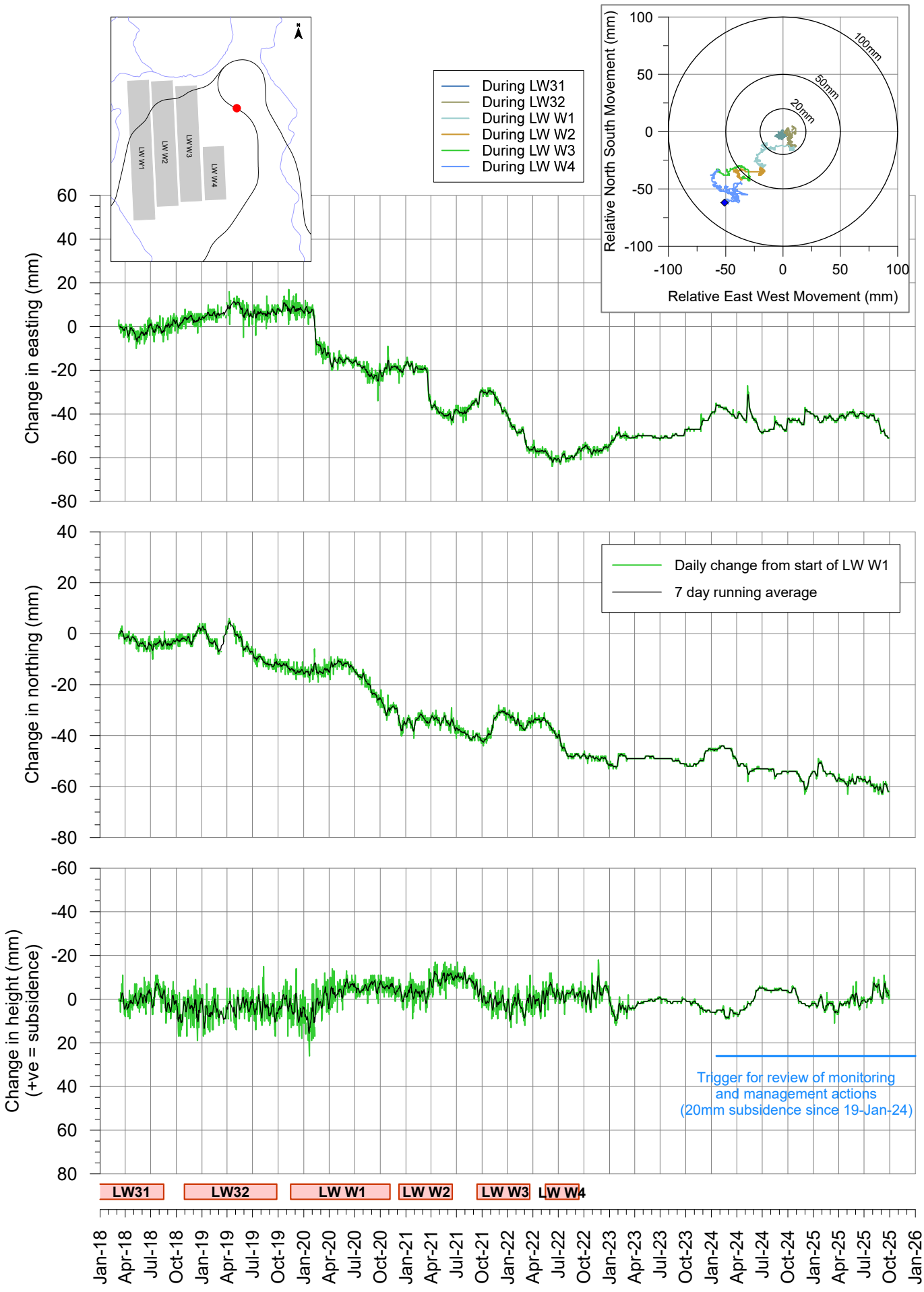


msec

Fig. 1-R07

Tahmoor Western Domain - Main Southern Railway
GNSS Monitoring at Picton Tunnel (Site 01)

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 2 - Site 1.grf



msec

Fig. 2-R07

Tahmoor Western Domain - Main Southern Railway
GNSS Monitoring at Picton Viaduct (Sites 00 and 02)

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 3 - Sites 0 and 2.grf

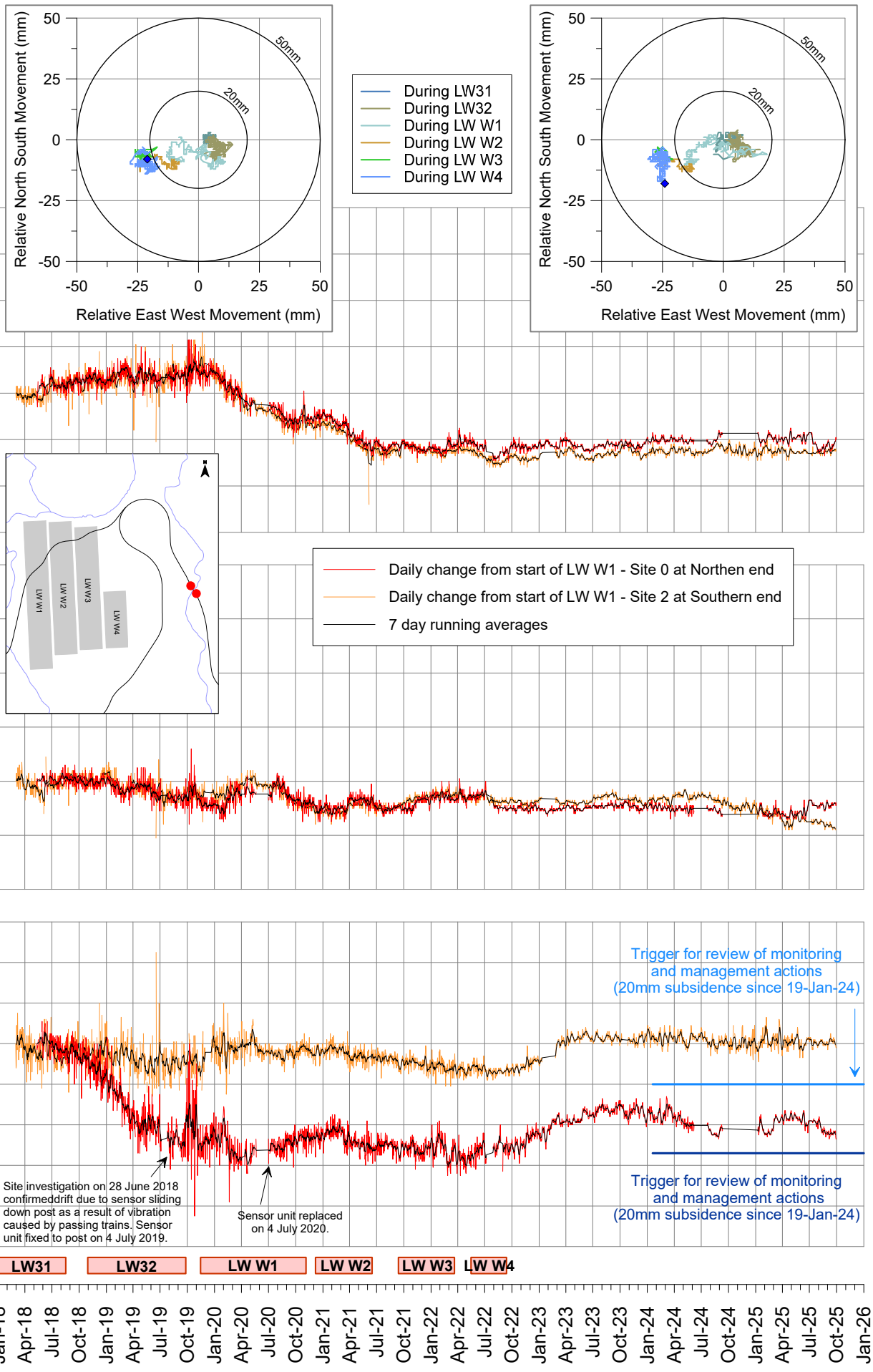


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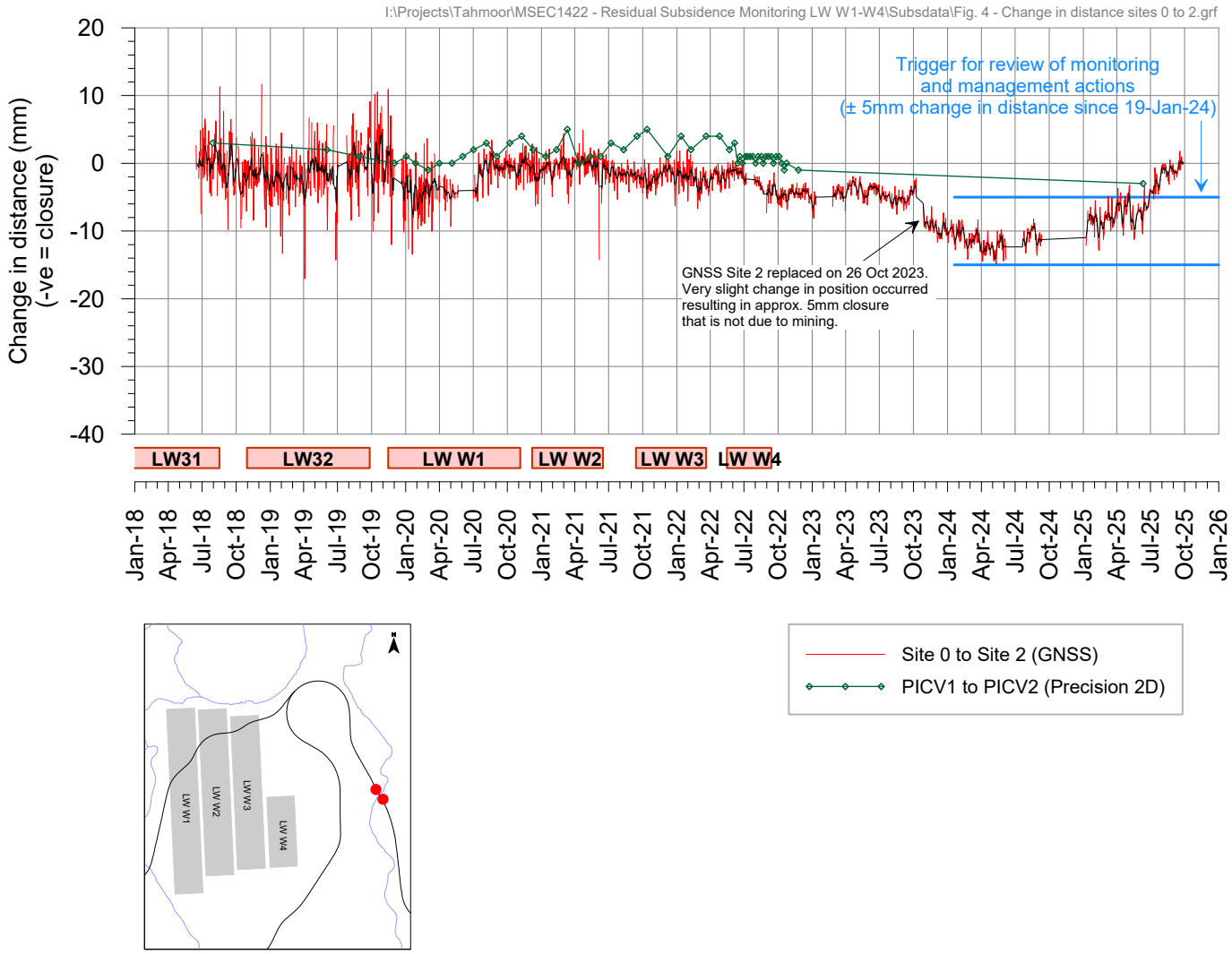
Fig. 3-R07

Tahmoor Western Domain - Main Southern Railway
GNSS Monitoring at Picton Viaduct (Sites 00 and 02)



Site 0 to Site 2 (GNSS)
PICV1 to PICV2 (Precision 2D)

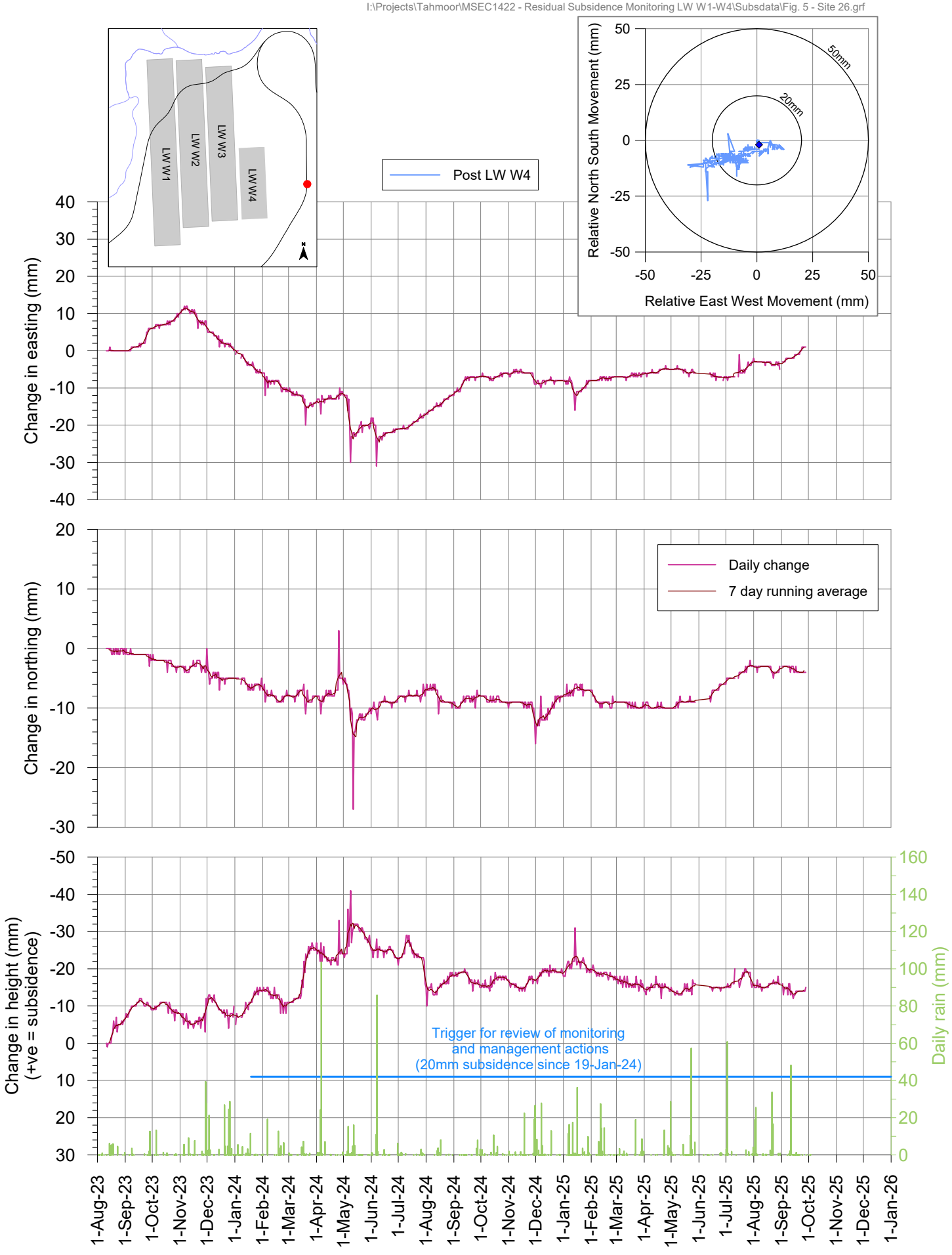
msec

Fig. 4-R07

Tahmoor Western Domain - GNSS Monitoring

Site 26 - MSR at 88.78km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 5 - Site 26.grf



msec

Fig. 5-R07

Tahmoor LW W4 - GNSS Monitoring

Site 27 - MSR at 88.60km

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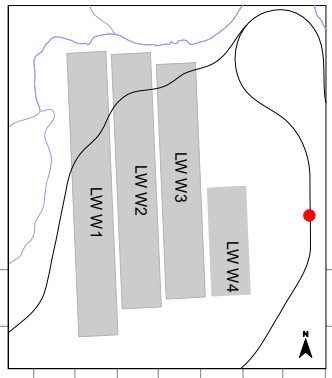

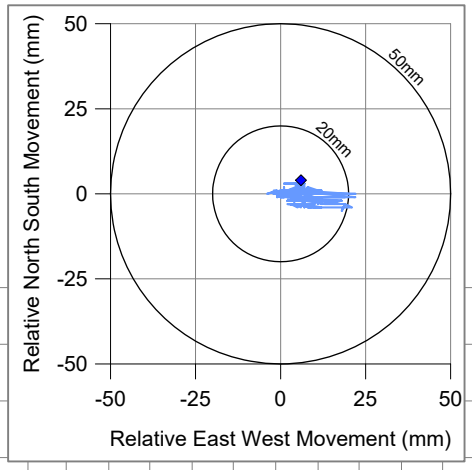

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Fig. 6-R07

Tahmoor Western Domain - GNSS Monitoring

Site 7 - PMLL culvert at 87.850km

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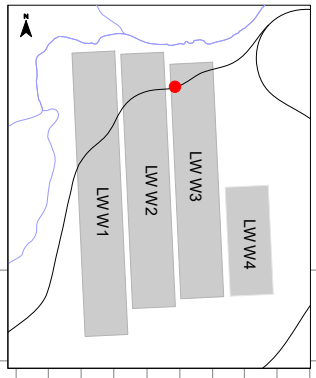
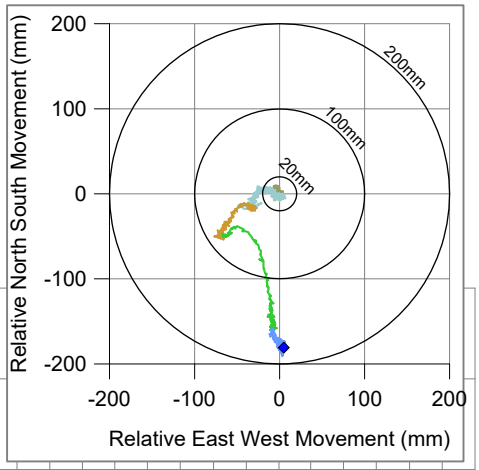




During LW W1
During LW W2
During LW W3
During LW W4

Change in easting (mm)

150
100
50
0
-50
-100

Daily change from start of LW W1
7 day running average

Change in northing (mm)

50
0
-50
-100
-150
-200
-250

Change in height (mm)
(+ve = subsidence)

-100
0
100
200
300
400
500
600

Trigger for review of monitoring and management actions
(20mm subsidence since 12-Mar-24)

LW W1 LW W2 LW W3 LW W4

Nov-19 Jan-20 Mar-20 May-20 Jul-20 Sep-20 Nov-20 Jan-21 Mar-21 May-21 Jul-21 Sep-21 Nov-21 Jan-22 Mar-22 May-22 Jul-22 Sep-22 Nov-22 Jan-23 Mar-23 May-23 Jul-23 Sep-23 Nov-23 Jan-24 Mar-24 May-24 Jul-24 Sep-24 Nov-24 Jan-25 Mar-25 May-25 Jul-25 Sep-25 Nov-25 Jan-26

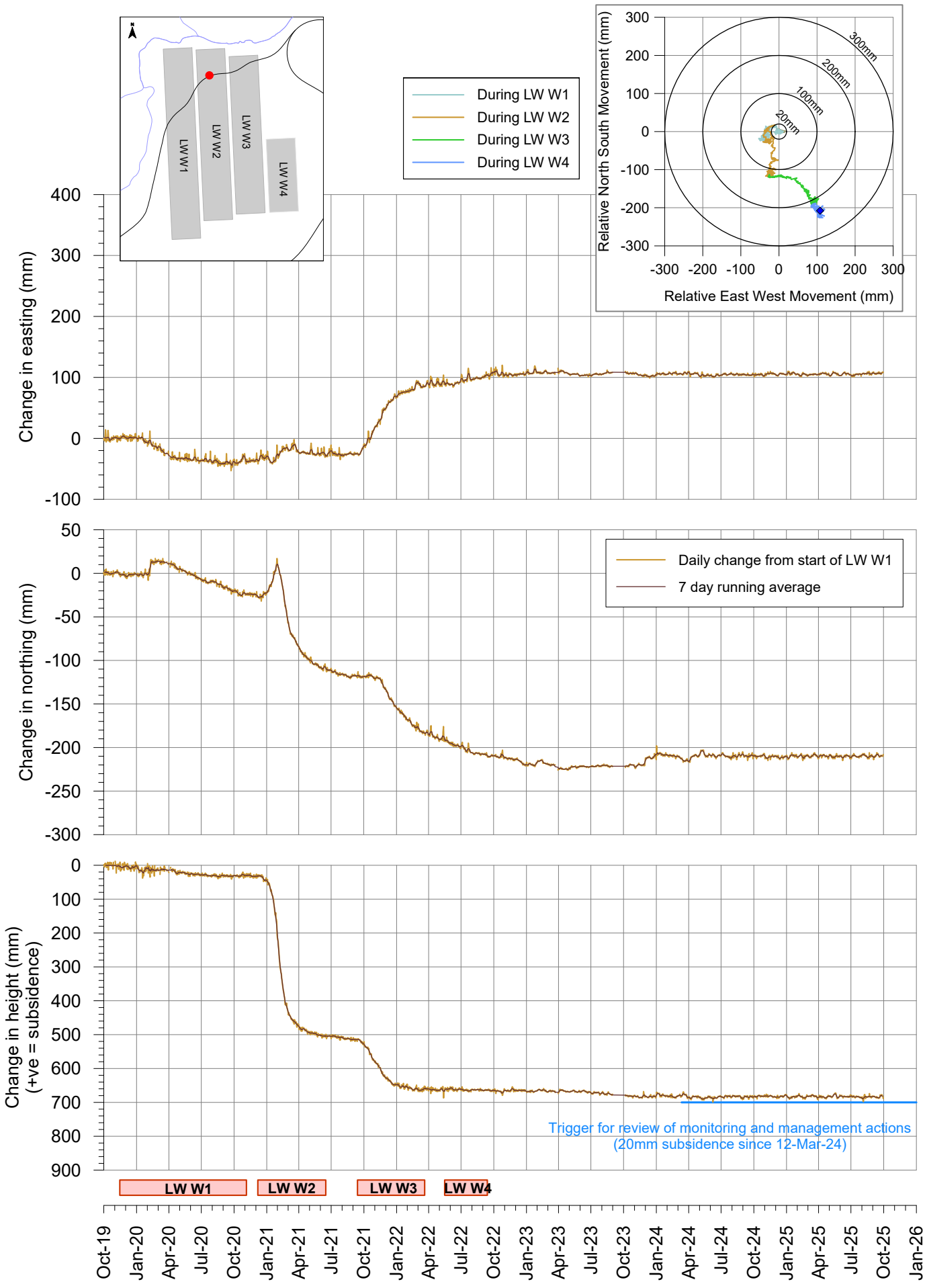
msec

Fig. 7-R07

Tahmoor Western Domain - GNSS Monitoring

Site 8 - LW W2 centreline - PMLL at 88.110km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 8 - Site 8.grf



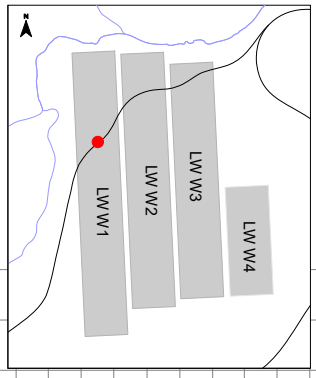
msec

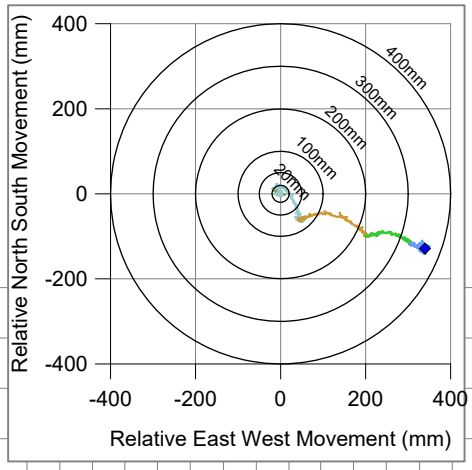
Fig. 8-R07

Tahmoor Western Domain - GNSS Monitoring

Site 9 - LW W1 centreline - PMLL at 88.550km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 9 - Site 9.grf





During LW W1
During LW W2
During LW W3
During LW W4

Change in easting (mm)

800 700 600 500 400 300 200 100 0 -100

Change in northing (mm)

50 0 -50 -100 -150 -200

Daily change from start of LW W1
7 day running average

Change in height (mm)
(+ve = subsidence)

-100 0 100 200 300 400 500 600 700

Trigger for review of monitoring and management actions
(20mm subsidence since 12-Mar-24)

LW W1 LW W2 LW W3 LW W4

Nov-19 Jan-20 Mar-20 May-20 Jul-20 Sep-20 Nov-20 Jan-21 Mar-21 May-21 Jul-21 Sep-21 Nov-21 Jan-22 Mar-22 May-22 Jul-22 Sep-22 Nov-22 Jan-23 Mar-23 May-23 Jul-23 Sep-23 Nov-23 Jan-24 Mar-24 May-24 Jul-24 Sep-24 Nov-24 Jan-25 Mar-25 May-25 Jul-25 Sep-25 Nov-25 Jan-26

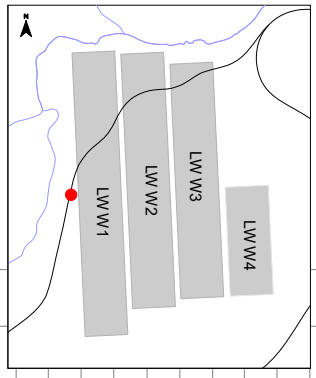
msec

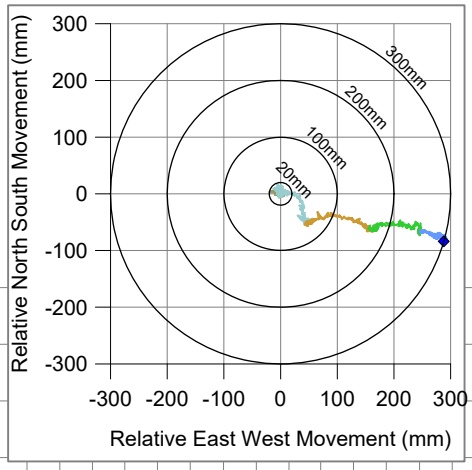
Fig. 9-R07

Tahmoor Western Domain - GNSS Monitoring

Site 10 - PMLL at 89.000km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 10 - Site 10.grf





During LW W1
During LW W2
During LW W3
During LW W4

Change in easting (mm)

700 600 500 400 300 200 100 0 -100

Change in northing (mm)

40 20 0 -20 -40 -60 -80 -100

Daily change from start of LW W1
7 day running average

Change in height (mm)
(+ve = subsidence)

-50 0 50 100 150 200 250 300

IMG agreed on 16 May 2025 to increase trigger level for the following reasons:
1. Rates of change are extremely small, with variations above and below the trigger levels.
2. The minor changes in subsidence have no adverse impact on the railway.
Tahmoor Coal notified PMLL of the assessment.

Trigger for review of monitoring and management actions
(20mm subsidence since 12-Mar-24)

LW W1 LW W2 LW W3 LW W4

Nov-19 Jan-20 Mar-20 May-20 Jul-20 Sep-20 Nov-20 Jan-21 Mar-21 May-21 Jul-21 Sep-21 Nov-21 Jan-22 Mar-22 May-22 Jul-22 Sep-22 Nov-22 Jan-23 Mar-23 May-23 Jul-23 Sep-23 Nov-23 Jan-24 Mar-24 May-24 Jul-24 Sep-24 Nov-24 Jan-25 Mar-25 May-25 Jul-25 Sep-25 Nov-25 Jan-26

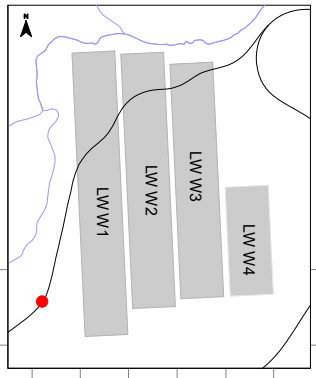
msec

Fig. 10-R07

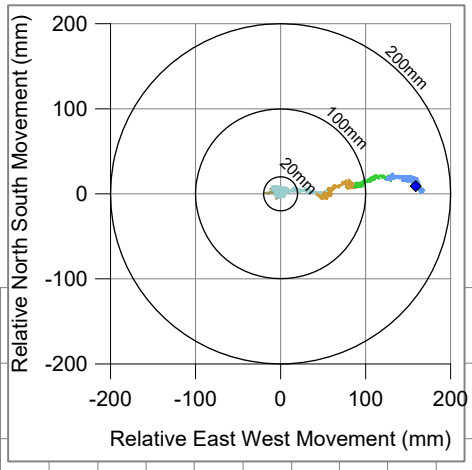
Tahmoor Western Domain - GNSS Monitoring

Site 11 - PMLL at 89.629km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 11 - Site 11.grf



During LW W1
During LW W2
During LW W3
During LW W4



Change in easting (mm)

500
400
300
200
100
0
-100

Change in northing (mm)

Daily change from start of LW W1
7 day running average

80
60
40
20
0
-20
-40

Change in height (mm)
(+ve = subsidence)

-20
0
20
40
60
80
100
120

Trigger for review of monitoring and management actions
(20mm subsidence since 12-Mar-24)

LW W1 LW W2 LW W3 LW W4

Oct-19 Jan-20 Apr-20 Jul-20 Oct-20 Jan-21 Apr-21 Jul-21 Oct-21 Jan-22 Apr-22 Jul-22 Oct-22 Jan-23 Apr-23 Jul-23 Oct-23 Jan-24 Apr-24 Jul-24 Oct-24 Jan-25 Apr-25 Jul-25 Oct-25 Jan-26

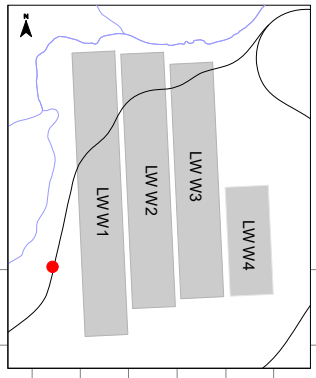
msec

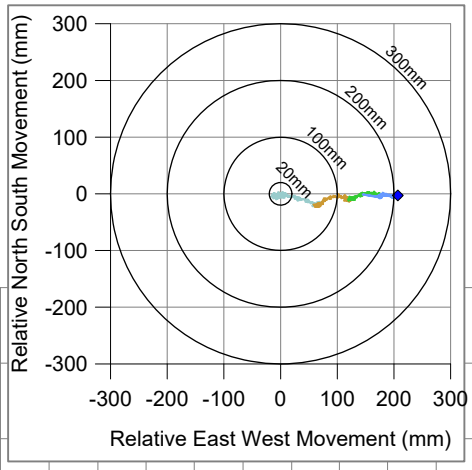
Fig. 11-R07

Tahmoor Western Domain - GNSS Monitoring

Site 19 - PMLL at 89.440km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 12 - Site 19.grf





During LW W1
During LW W2
During LW W3
During LW W4

Change in easting (mm)

500 400 300 200 100 0 -100

Daily change from start of LW W1
7 day running average

Change in northing (mm)

60 40 20 0 -20 -40 -60

Change in height (mm)
(+ve = subsidence)

-20 0 20 40 60 80 100 120 140

Trigger for review of monitoring and management actions
(20mm subsidence since 12-Mar-24)

LW W1 LW W2 LW W3 LW W4

Oct-19 Jan-20 Apr-20 Jul-20 Oct-20 Jan-21 Apr-21 Jul-21 Oct-21 Jan-22 Apr-22 Jul-22 Oct-22 Jan-23 Apr-23 Jul-23 Oct-23 Jan-24 Apr-24 Jul-24 Oct-24 Jan-25 Apr-25 Jul-25 Oct-25 Jan-26

msec

Fig. 12-R07

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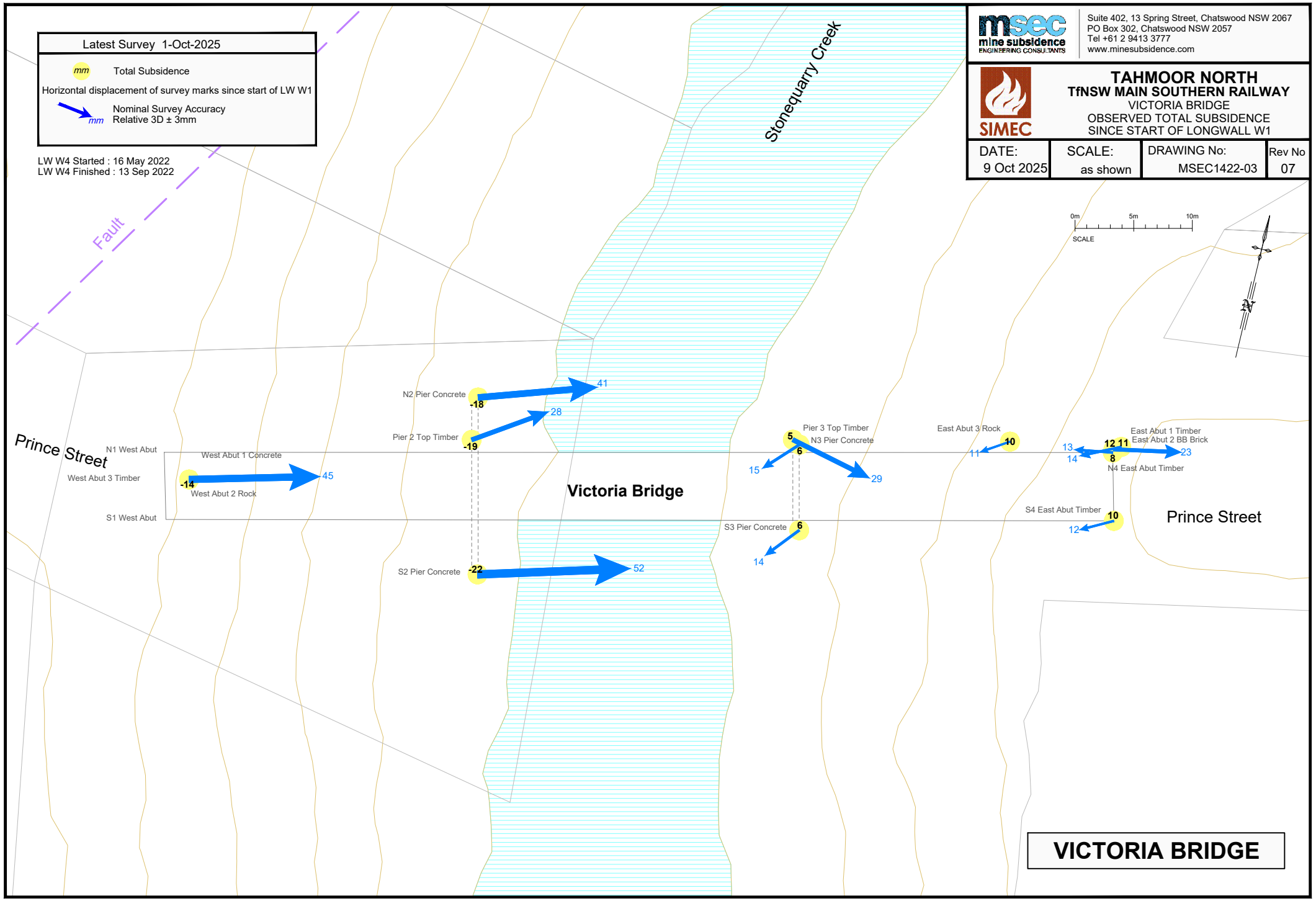

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Suite 402, 13 Spring Street, Chatswood NSW 2067
PO Box 302, Chatswood NSW 2057
Tel +61 2 9413 3777
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TAHMOOR NORTH
TfNSW MAIN SOUTHERN RAILWAY
VICTORIA BRIDGE
OBSERVED INCREMENTAL SUBSIDENCE
SINCE START OF LONGWALL W4

DATE:	SCALE:	DRAWING No:	Rev No
9 Oct 2025	as shown	MSEC1422-04	07

Latest Survey 1-Oct-2025

mm Incremental Subsidence

Horizontal displacement of survey marks since start of LW W4

mm Nominal Survey Accuracy
Relative 3D ± 3mm

LW W4 Started : 16 May 2022
LW W4 Finished : 13 Sep 2022

0m 5m 10m
SCALE

N

Stonequarry Creek

Fault

Prince Street

Victoria Bridge

Prince Street

N2 Pier Concrete -13 21

Pier 2 Top Timber -13 16

New West Abut North -14 25

N1 West Abut

West Abut 1 Concrete

West Abut 3 Timber -15 30

West Abut 2 Rock 26

New West Abut South

S1 West Abut -12

S2 Pier Concrete -11 25

Pier 3 Top Timber 3
N3 Pier Concrete 2
15 17

S3 Pier Concrete 4
13

East Abut 3 Rock 7
13

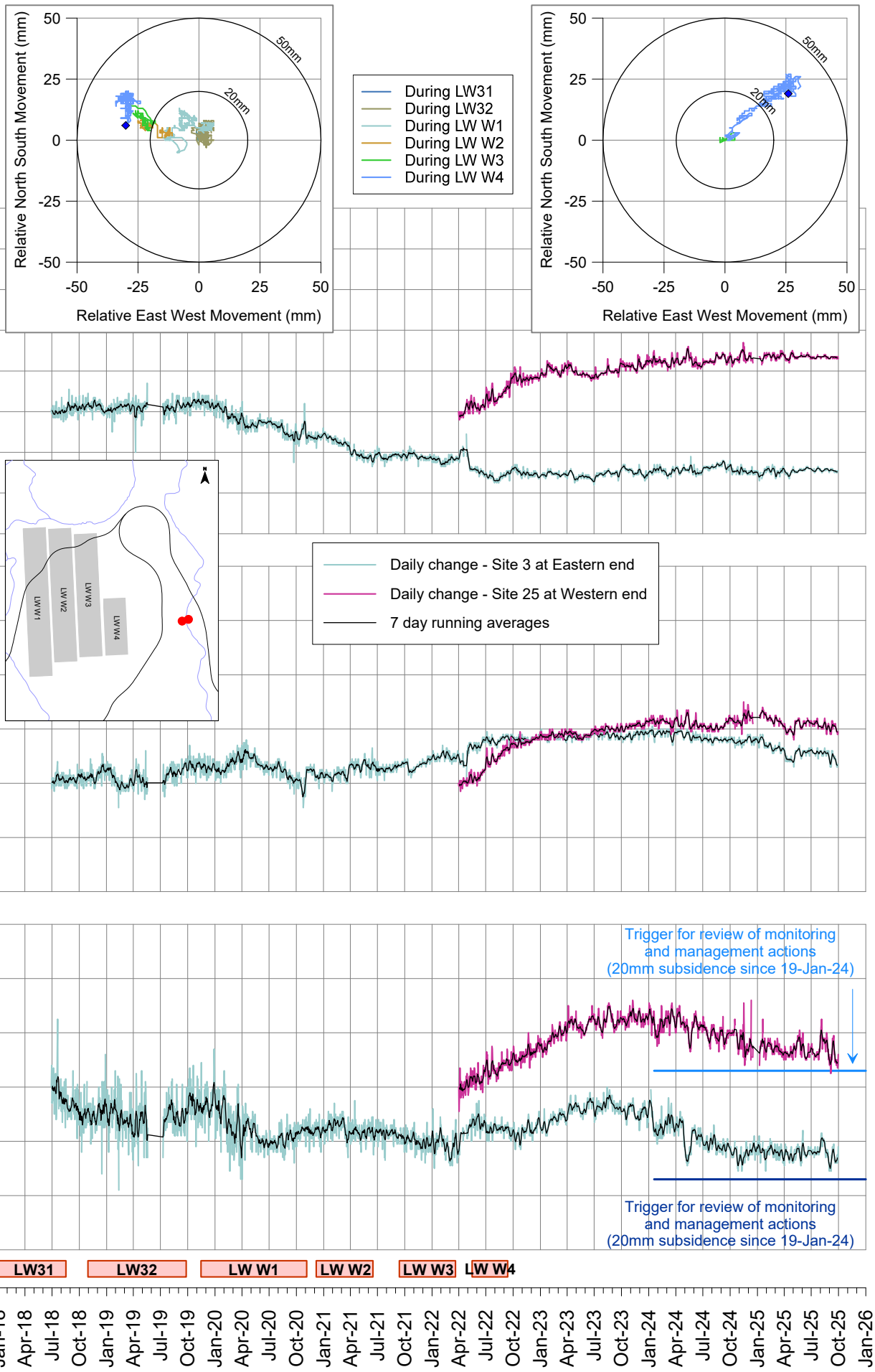
New East Abut North 7
East Abut 1 Timber 8 7
East Abut 2 BB Brick
14 17 15
11 8
N4 East Abut Timber

S4 East Abut Timber 8
12
New East Abut South 8
13

VICTORIA BRIDGE

Tahmoor Western Domain - Main Southern Railway
GNSS Monitoring at Victoria Bridge (Sites 03 and 25)

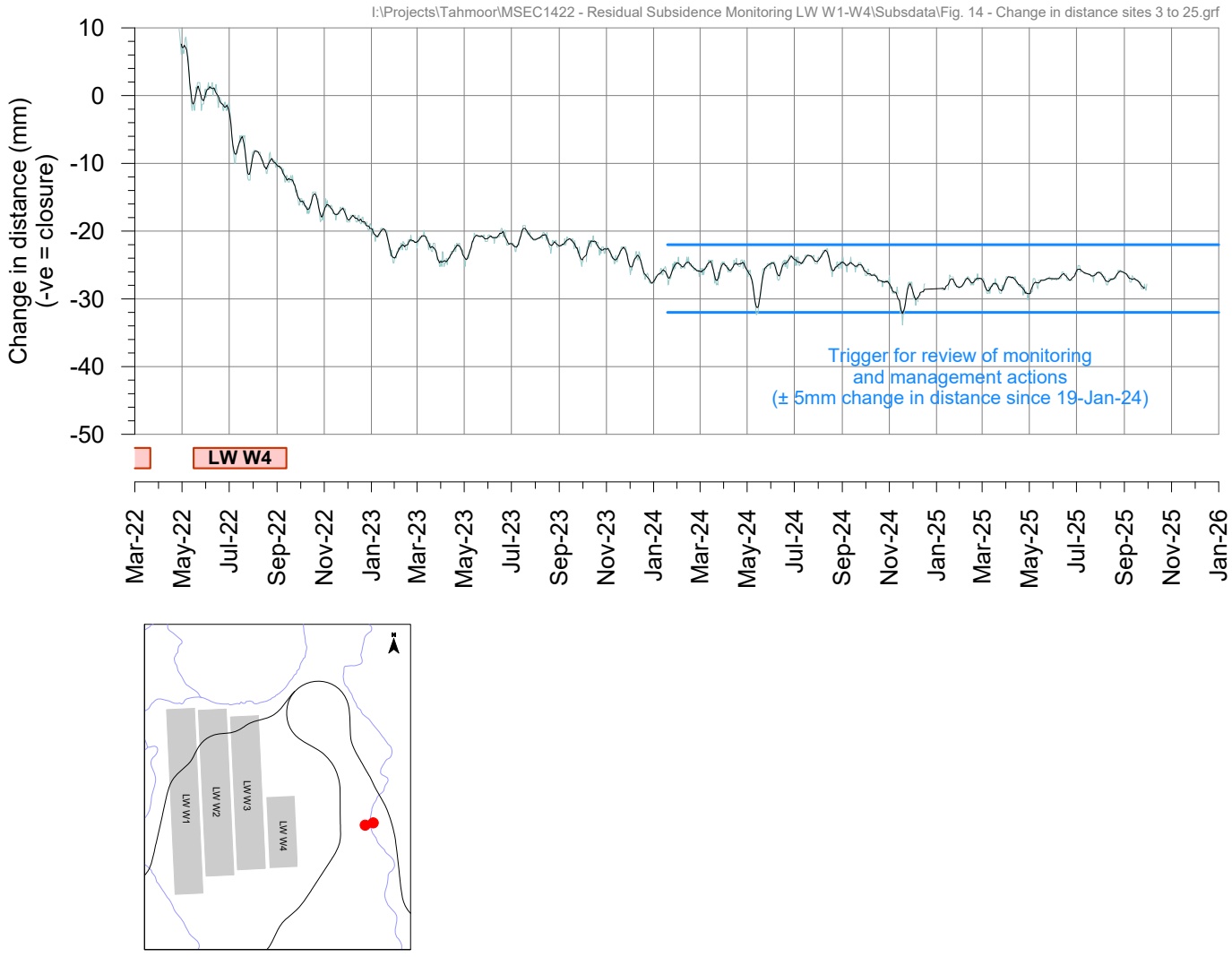
I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 13 - Sites 3 and 25.grf



msec

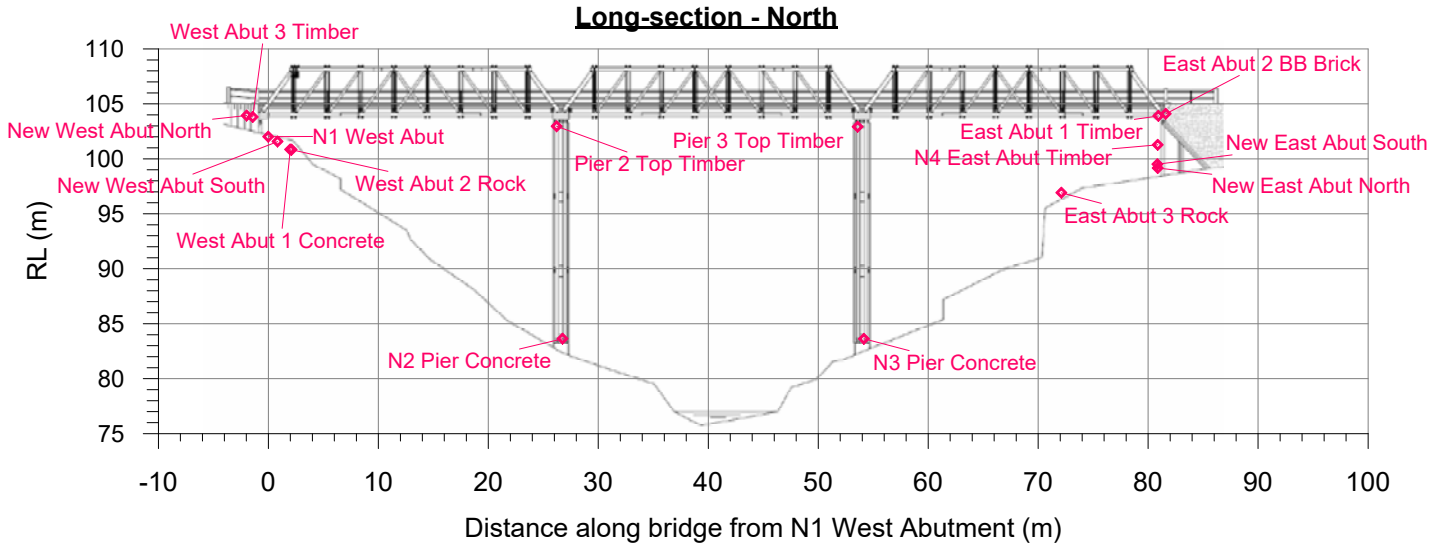
Fig. 13-R07

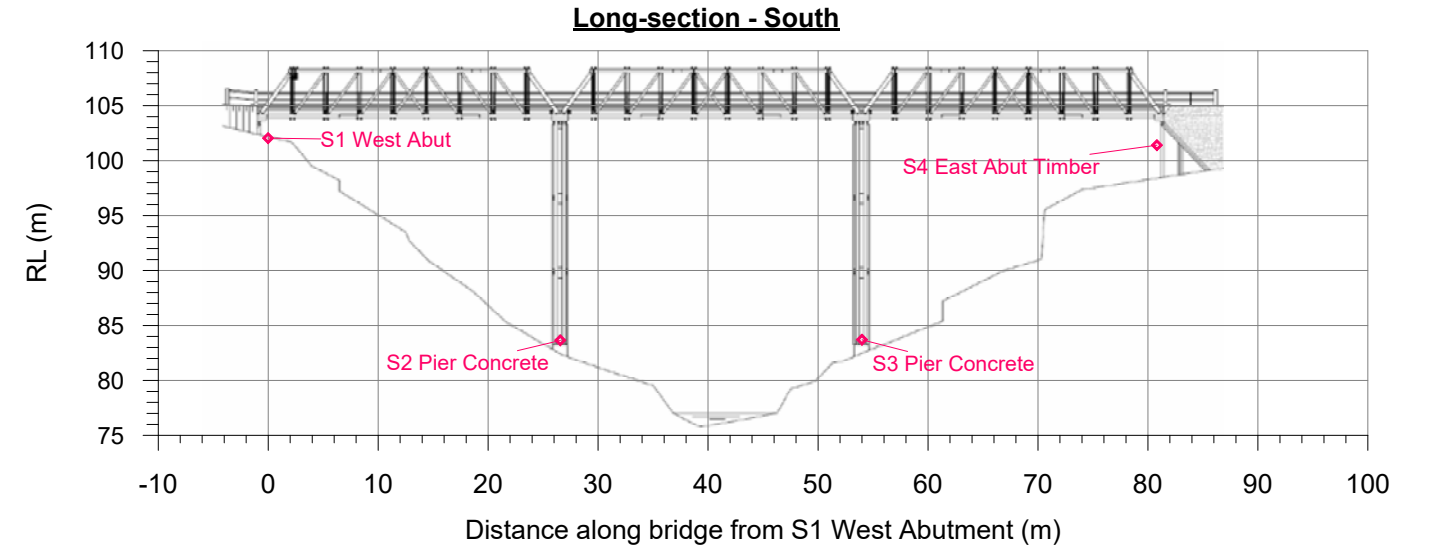
Tahmoor Western Domain - Main Southern Railway
GNSS Monitoring at Victoria Bridge (Sites 03 and 25)



Victoria Bridge over Stonequarry Creek - Total changes

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 15 - Victoria Bridge Total.grf





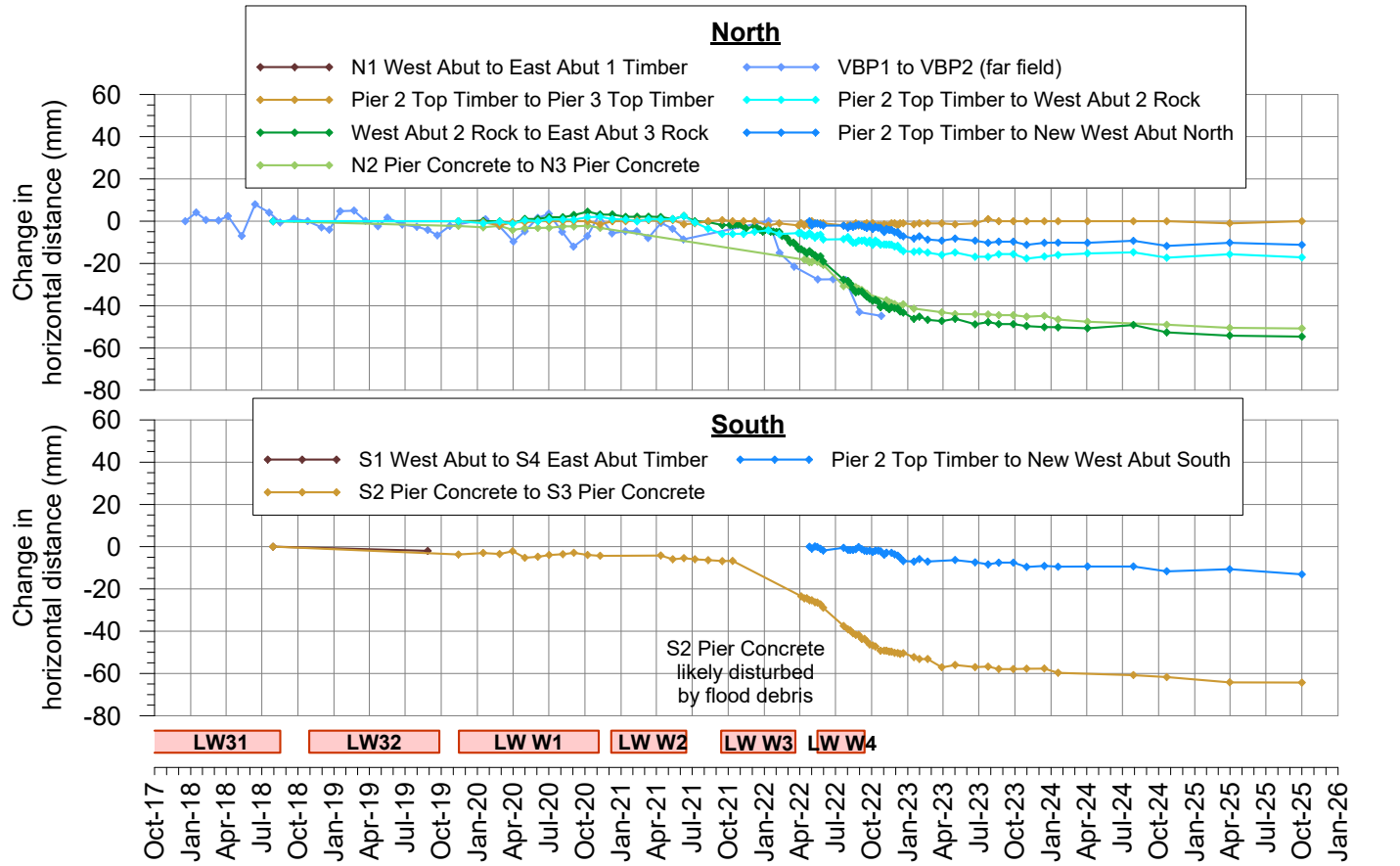
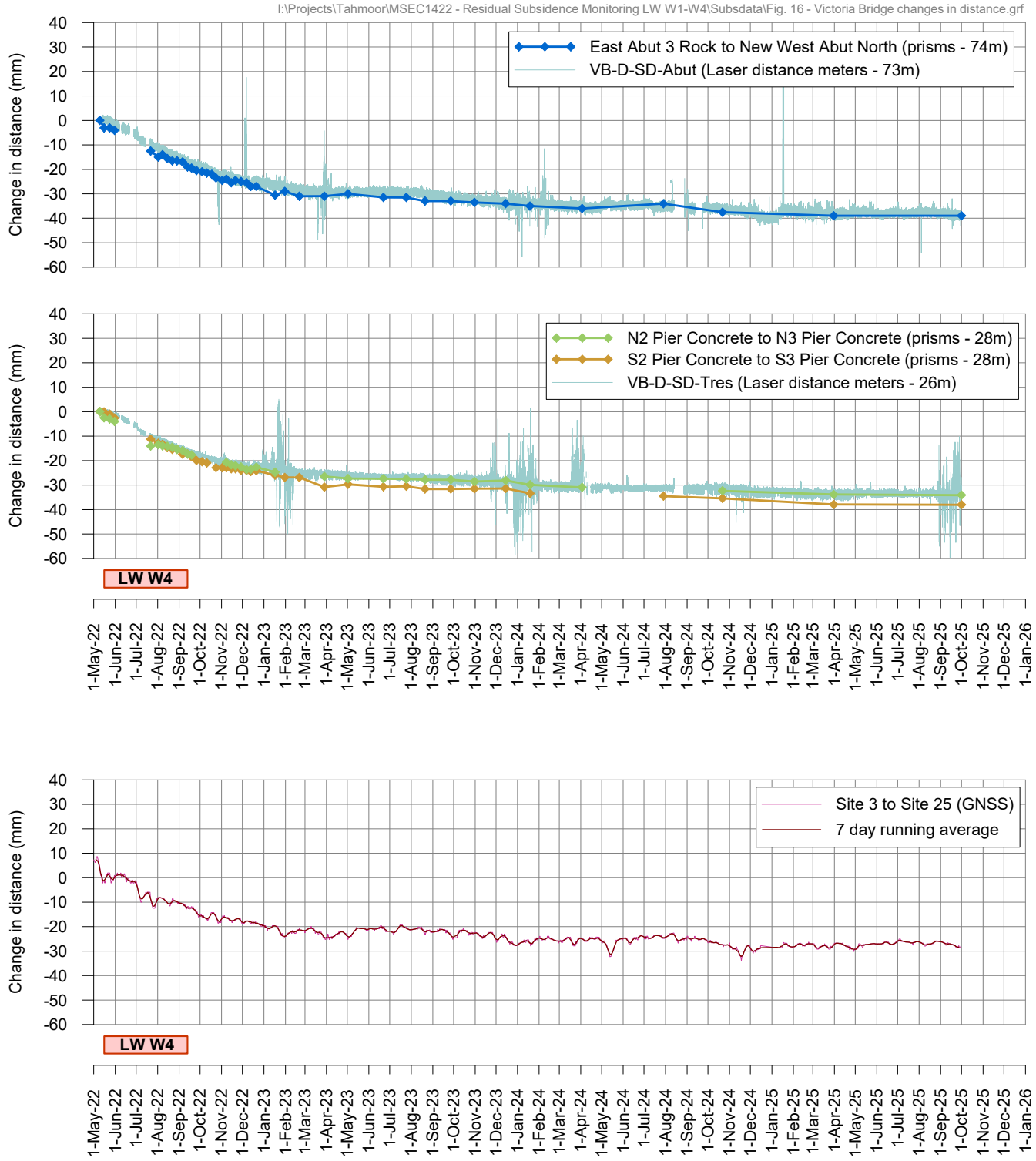


Fig. 15-R07

Incremental changes in distance along Victoria Bridge



TAHMOOR COAL: WESTERN DOMAIN

Residual Subsidence Monitoring Status Report No. 08
Post mining LW W1-W4 in the Western Domain

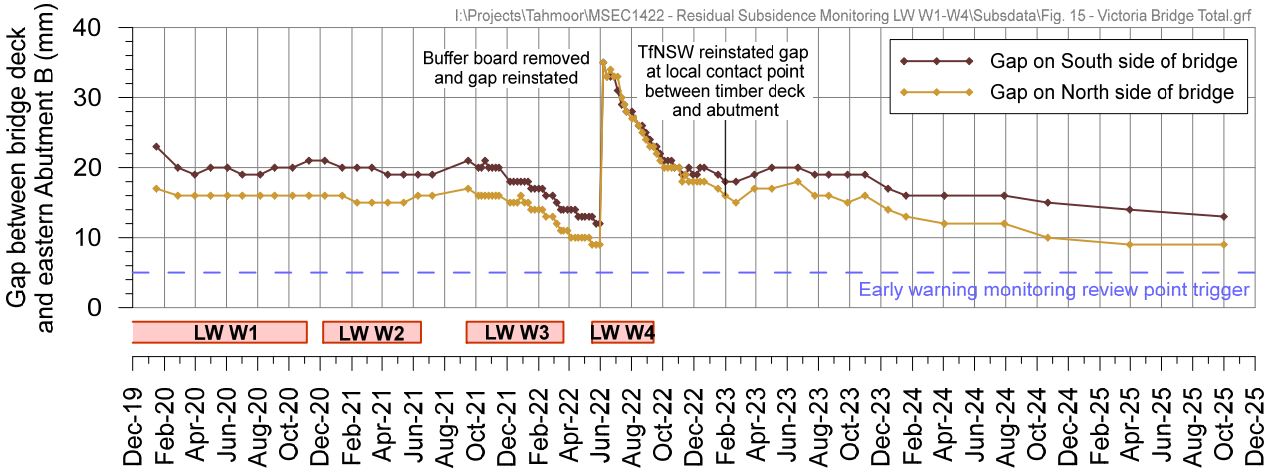
Reporting Period	1 October 2025 to 31 December 2025	
Total subsidence at end of reporting period	735 mm	at Site 24 on 31 December 2025
Maximum subsidence since MSR ground survey on 19 January 2024	49 mm	at Site 24 on 31 December 2025
Maximum change in subsidence during last quarter	8 mm	at Site 7 (30 September to 31 December 2025)

Summary of monitoring and inspections

Monitoring Activity	Total subsidence or change in distance	Change in subsidence during last quarter	Highest Trigger	Comments
GNSS units				
GNSS unit above centreline of LW W4 (Site 24)	735	5	N/A	Trend of ongoing residual subsidence observed, with rates of change reducing to low levels. Very little change during 2025.
Main Southern Railway (ARTC)				
GNSS unit (Site 1) Picton Tunnel 87.85 km	-2	-1		Very minor change in subsidence since MSR ground survey on 19 January 2024. Change in subsidence less than 20 mm trigger.
GNSS unit (Site 0) Picton Viaduct (85.42 km)	42	-3		Very minor change in subsidence since MSR ground survey on 19 January 2024. Change in subsidence less than 20 mm trigger. New base values 19 July 2024.
GNSS units (Site 2) Picton Viaduct (85.42 km)	-3	-4		Very minor change in subsidence since MSR ground survey on 19 January 2024. Change in subsidence less than 20 mm trigger. Slight southward movement since April 2024.
Change in distance between Sites 0 and 2 across Picton Viaduct	-3 (ground shortening)	0		Small changes in distance since MSR ground survey on 19 January 2024, exceeding 5 mm trigger. Additional Precision 2D survey on 11 June 2025 confirmed no material change.
GNSS unit (Site 26) at 88.78 km	-13	1		GNSS unit shifted to the southwest and upwards after installation. Small movements to the east and north observed since early May 2024. Minor changes observed during reporting period. Change in subsidence less than 20 mm trigger.
GNSS unit (Site 27) at 88.60 km	4	-		Very minor change in subsidence since MSR ground survey on 19 January 2024. Change in subsidence less than 20 mm trigger. Last reading on 15 June 2025. Solar panel has been stolen.

Monitoring Activity	Total subsidence or change in distance	Change during last quarter	Highest Trigger	Comments
Picton-Mittagong Loop Line (THNSW)				
GNSS unit (Site 7) Culvert at 87.850 km	476	8		Very minor change in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence approaching but just less than 20 mm trigger.
GNSS unit (Site 8) Above LW W2 at 88.110 km	687	5		Very minor change in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence less than 20 mm trigger.
GNSS unit (Site 9) Above LW W1 at 88.550 km	534	4		Very minor change increase in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence less than 20 mm trigger.
GNSS unit (Site 10) at 89.000 km	195	-6		Very minor change in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence exceeded 20 mm trigger intermittently. IMG met on 16 May 2025 and agreed to increase the trigger level to 40 mm. Observed rates of change are extremely small with no adverse impacts on the PMLL. Tahmoor Coal notified THNSW of the assessment. Change in subsidence less than 20 mm trigger.
GNSS unit (Site 11) at 89.629 km	86	4		Very minor change in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence has exceeded 20 mm trigger intermittently during reporting period.
GNSS unit (Site 19) at 89.440 km	91	4		Very minor change in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence less than 20 mm trigger.
Victoria Bridge over Stonequarry Creek (TfNSW)				
GNSS unit (Site 3) on eastern abutment	21	-6	N/A	Very little change during 2025. Change in subsidence less than 20 mm trigger.
GNSS unit (Site 25) on western abutment	-20	-11	N/A	Unit repaired on 7 January 2025. Very little change in subsidence during 2025. Change in subsidence less than 20 mm trigger.
Change in distance between Sites 3 and 25 across Victoria Bridge	-31 (ground shortening)	-3 (ground shortening)	N/A	Very little change in distance during 2025. Change in distance less than 5 mm trigger.
Six monthly 2D ground survey between Pegs West Abut 2 Rock and East Abut 3 Rock	-55 (ground shortening)	-1 (31 Mar 25 to 1 Oct 25)	N/A	Very little change observed over the last 2.5 years. Slight increase in closure of 1 mm between 31 March 2025 and 1 October 2025.
Six monthly local 3D bridge survey (values in table represent maximum measured closure)	-64 (ground shortening)	0 (31 Mar 25 to 1 Oct 25)	N/A	Very little change observed over the last 2.5 years. After 2 mm increase in closure between S2 Pier to S3 Pier on 31 March 2025, no further change on 1 October 2025.
Laser distancemeters	-39.3 (top) -33.2 (base) (ground shortening)	-0.7 (top) +1.7 (base)		Minor ongoing closure of 4 mm since April 2024 and < 1 mm across top and base of valley during this reporting period.
Measure gap between bridge deck and eastern Abutment B	13 mm (Sth) 9 mm (Nth)	-1 mm (Sth) 0 mm (Nth) (31 Mar 25 to 1 Oct 25)		TfNSW reinstated a gap between the timber deck and eastern abutment on 24 January 2023. Gap on 1 October 2025 was 13 mm on the south side (1 mm closure since 31 March 2025 survey) and 9 mm on the north side (no change since 31 March 2025 survey). Total closure along water pipe joints was 11 mm (decrease of 1 mm since 31 March 2025).

Monitoring Activity	Total subsidence or change in distance	Change during last quarter	Highest Trigger	Comments
Victoria Bridge over Stonequarry Creek (TfNSW) (continued)				
Visual inspection	-	-	N/A	TfNSW inspected the Bridge and reinstated a gap between the timber deck and the eastern abutment on 24 January 2023. Detailed inspection by structural engineer and TfNSW Bridge Inspector conducted on 20 November 2023. Expansion gap at Eastern abutment not fully closed (at least 10 mm), previously observed 10 mm gap in notch at Western abutment is closed. Bridge deck appears to be propped between abutments, with contact between bridge deck and Eastern abutment not yet known as hidden by timber retaining wall. Trusses in superstructure do not appear to have experienced significant compression. There are no immediate concerns with the bridge structure. No obvious changes observed on 19 January 2024. Termite activity observed at base of piers on 15 April 2024.
Natural Features				
Groundwater monitoring	Continuous	-	-	Groundwater data has been downloaded and analysed to end of December 2024. Trend of gradually increasing groundwater levels across the area in the shallower Hawkesbury and Wianamatta Formations. Deeper intakes within the Bulgo Sandstone and the Bulli Coal Seam remain depressurised.
Management Actions				
Other management actions since previous report: ● Nil				
Any additional and/or outstanding management actions: ● Maintenance on GNSS unit Site 27.				
Consultation with stakeholders since previous report: ● Monitoring reports issued quarterly				
Forecast whether residual subsidence is likely to cause: **A. Track closure for any period unacceptable to ARTC** **B. Impact on the safety of operations on the Main Southern Railway** Based on monitoring results to date, and the controls implemented and available under the Residual Subsidence Monitoring Plan for Western Domain LW W1-W4, no triggers under this Monitoring Plan are expected to be exceeded in the next three months. Accordingly residual subsidence is not likely to result in the occurrence of either A or B above.				
Certified by Tahmoor Coal				
Name	Ross Barber			
Position	Project Manager			
Signature	*Ross Barber*			
Date	21 January 2026			



Copy of Report to:

Daniel Wakefield, Area Manager Ingleburn, ARTC
Sladjan Mitic, Senior Track & Civil Engineer Sydney, ARTC
Michael Irons, Property Manager – Wagga, ARTC
Brian Cooper, Manager Maintenance North-South, ARTC;
Peter Haskard, Manager Engineering, Interstate Network, ARTC

John Thorogood, Safety, Environment & Quality Manager, Transport Heritage NSW
Les Kelleher, Track Manager, Transport Heritage NSW

Cyril Gunaratne - TfNSW (Pavement Maintenance Planner)
Dony Castro - TfNSW (Bridge Maintenance Planner)
Richard Woods - Stantec (Senior Principal – Senior Bridge Engineer)

Clint Mason, Production Manager, Tahmoor Mine
Ian Cochran, Bridges and Structures Specialist, ONRSR
Ray Ramage, Principal Inspector – Subsidence, Mine Safety Inspectorate, Resources Regulator

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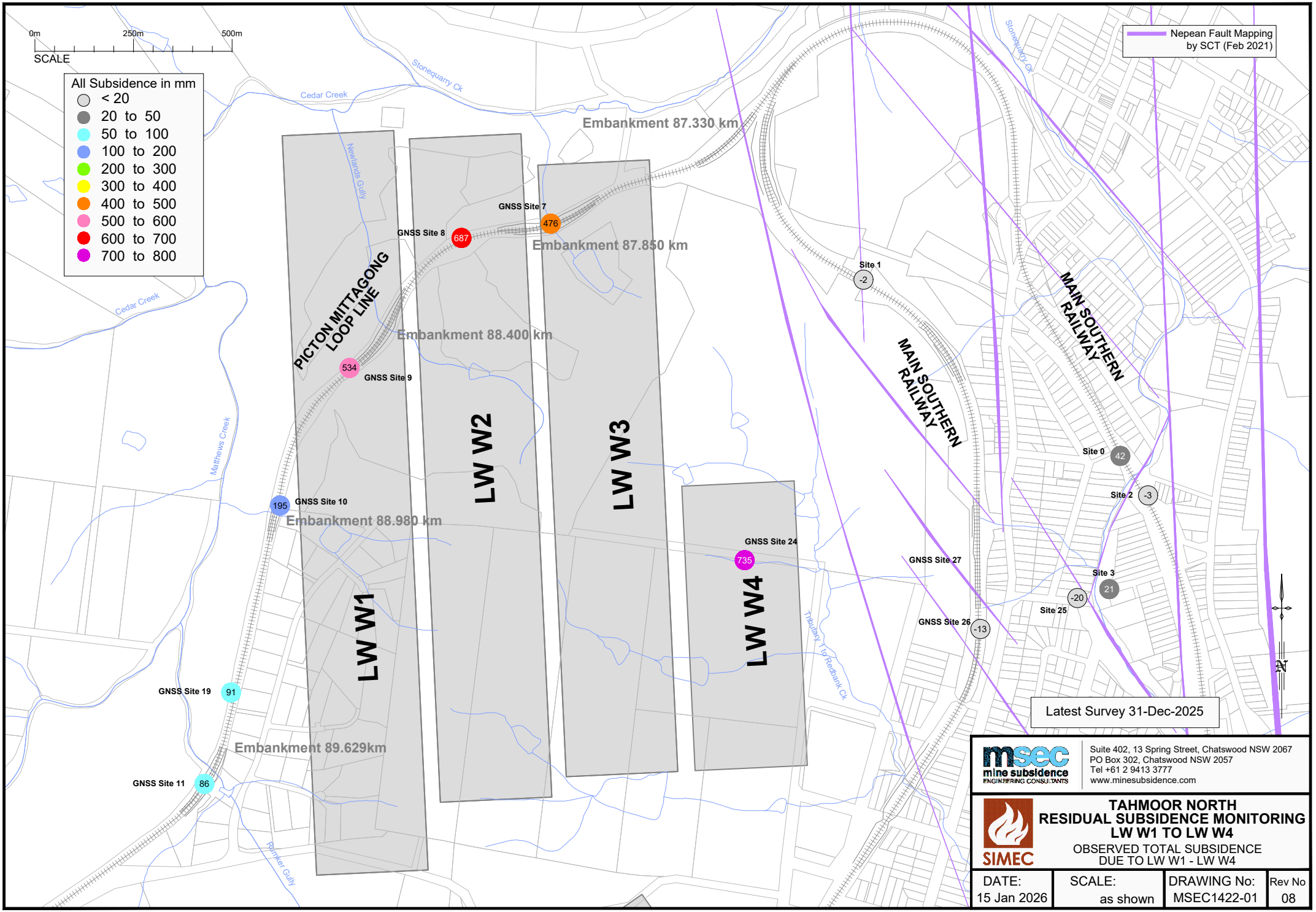

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PO Box 302, Chatswood NSW 2057
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TAHMOOR NORTH RESIDUAL SUBSIDENCE MONITORING LW W1 TO LW W4

OBSERVED TOTAL SUBSIDENCE DUE TO LW W1 - LW W4

DATE:	SCALE:	DRAWING No:	Rev No
15 Jan 2026	as shown	MSEC1422-01	08

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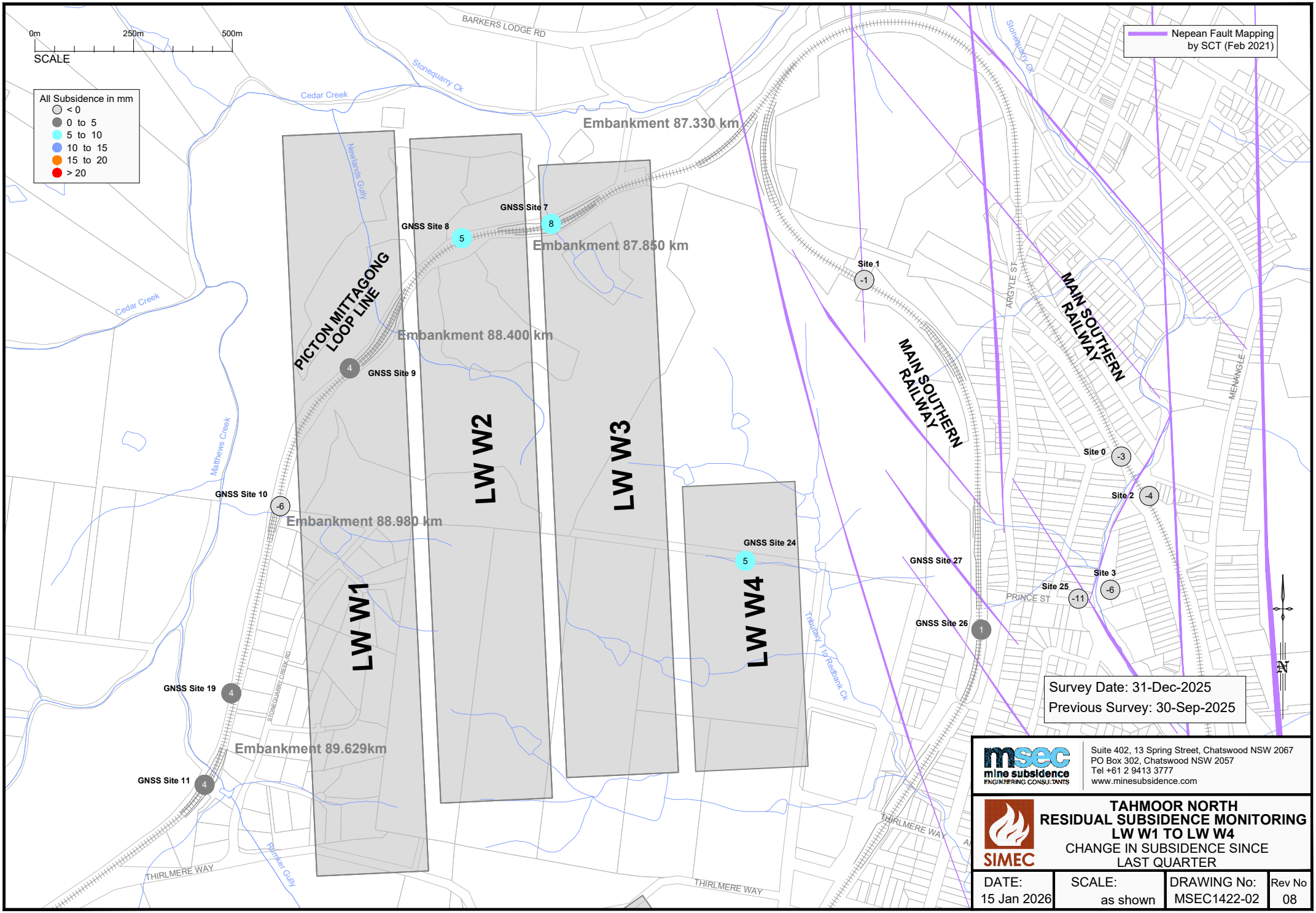

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TAHMOOR NORTH RESIDUAL SUBSIDENCE MONITORING LW W1 TO LW W4

CHANGE IN SUBSIDENCE SINCE LAST QUARTER

DATE:	SCALE:	DRAWING No:	Rev No
15 Jan 2026	as shown	MSEC1422-02	08

Tahmoor Western Domain - GNSS Monitoring

Site 24 above LW W4

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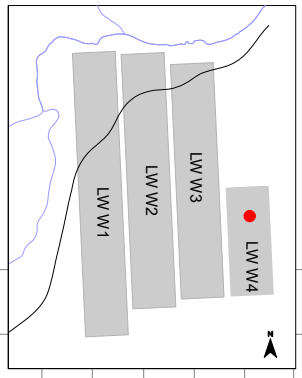
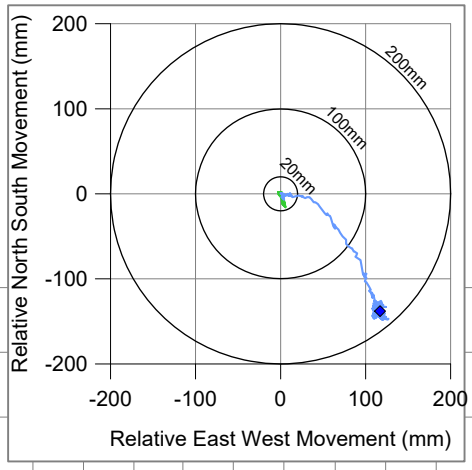




During LW W4

Change in easting (mm)

300
250
200
150
100
50
0
-50

Change in northing (mm)

20
0
-20
-40
-60
-80
-100
-120
-140
-160
-180

Daily change

7 day running average

Unit affected by solar flare activity in March 2024.
The GNSS chip was replaced on 16 April 2024.

Change in height (mm)
(+ve = subsidence)

0
100
200
300
400
500
600
700
800
900

LW W4

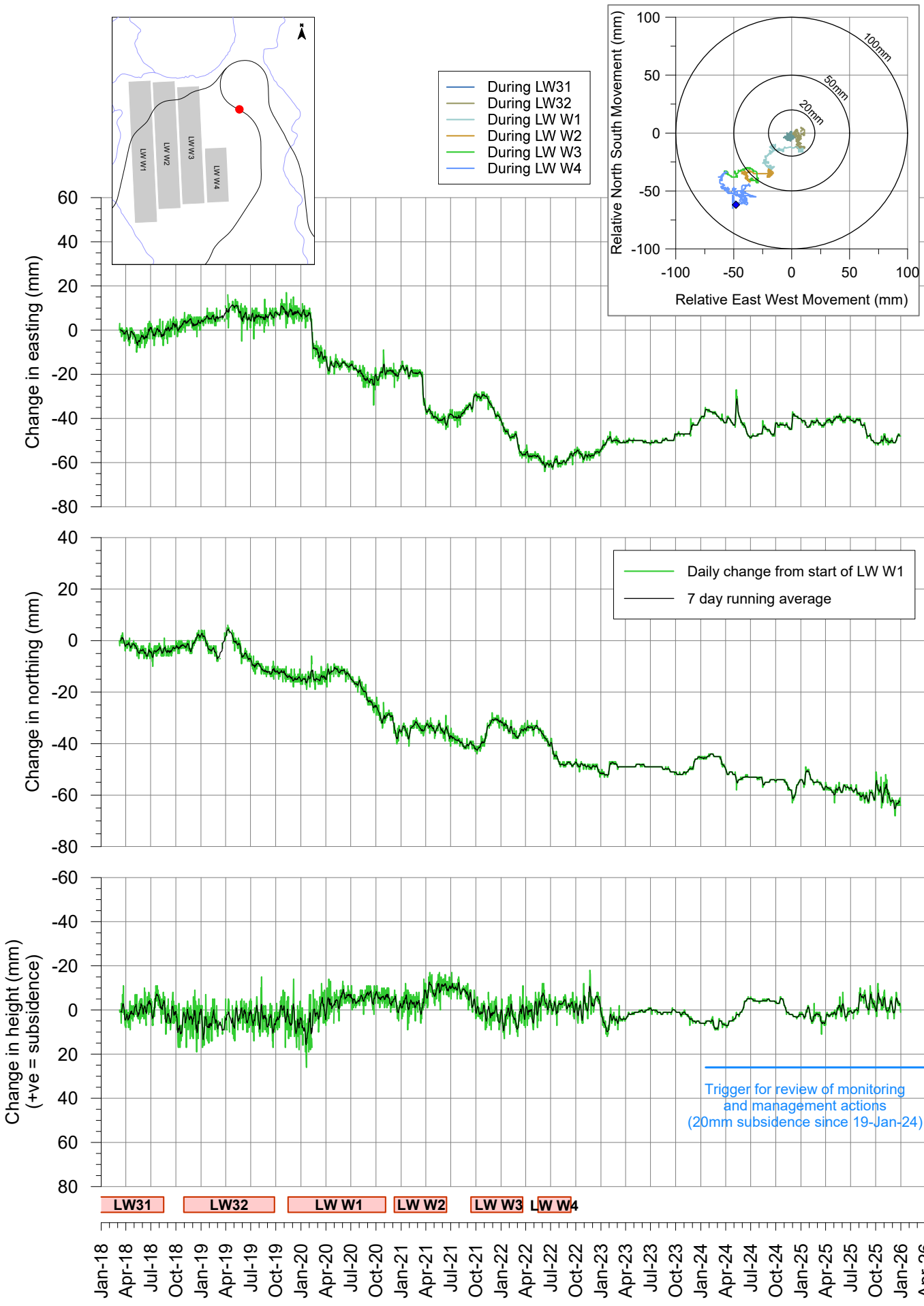
1-Mar-22
1-May-22
1-Jul-22
1-Sep-22
1-Nov-22
1-Jan-23
1-Mar-23
1-May-23
1-Jul-23
1-Sep-23
1-Nov-23
1-Jan-24
1-Mar-24
1-May-24
1-Jul-24
1-Sep-24
1-Nov-24
1-Jan-25
1-Mar-25
1-May-25
1-Jul-25
1-Sep-25
1-Nov-25
1-Jan-26
1-Mar-26

msec

Fig. 1-R08

Tahmoor Western Domain - Main Southern Railway
GNSS Monitoring at Picton Tunnel (Site 01)

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 2 - Site 1.grf



msec

Fig. 2-R08

Tahmoor Western Domain - Main Southern Railway
GNSS Monitoring at Picton Viaduct (Sites 00 and 02)

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 3 - Sites 0 and 2.grf

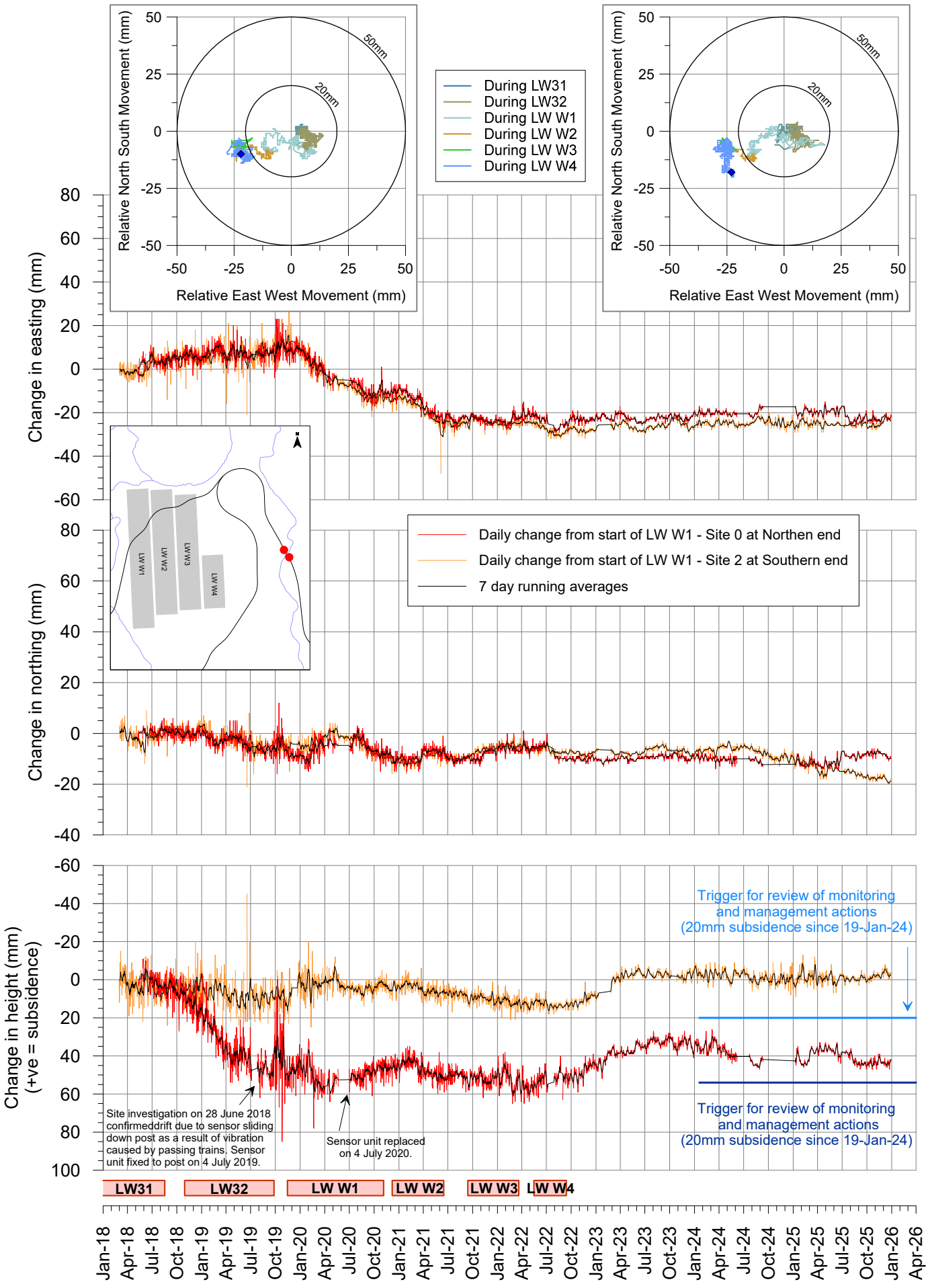
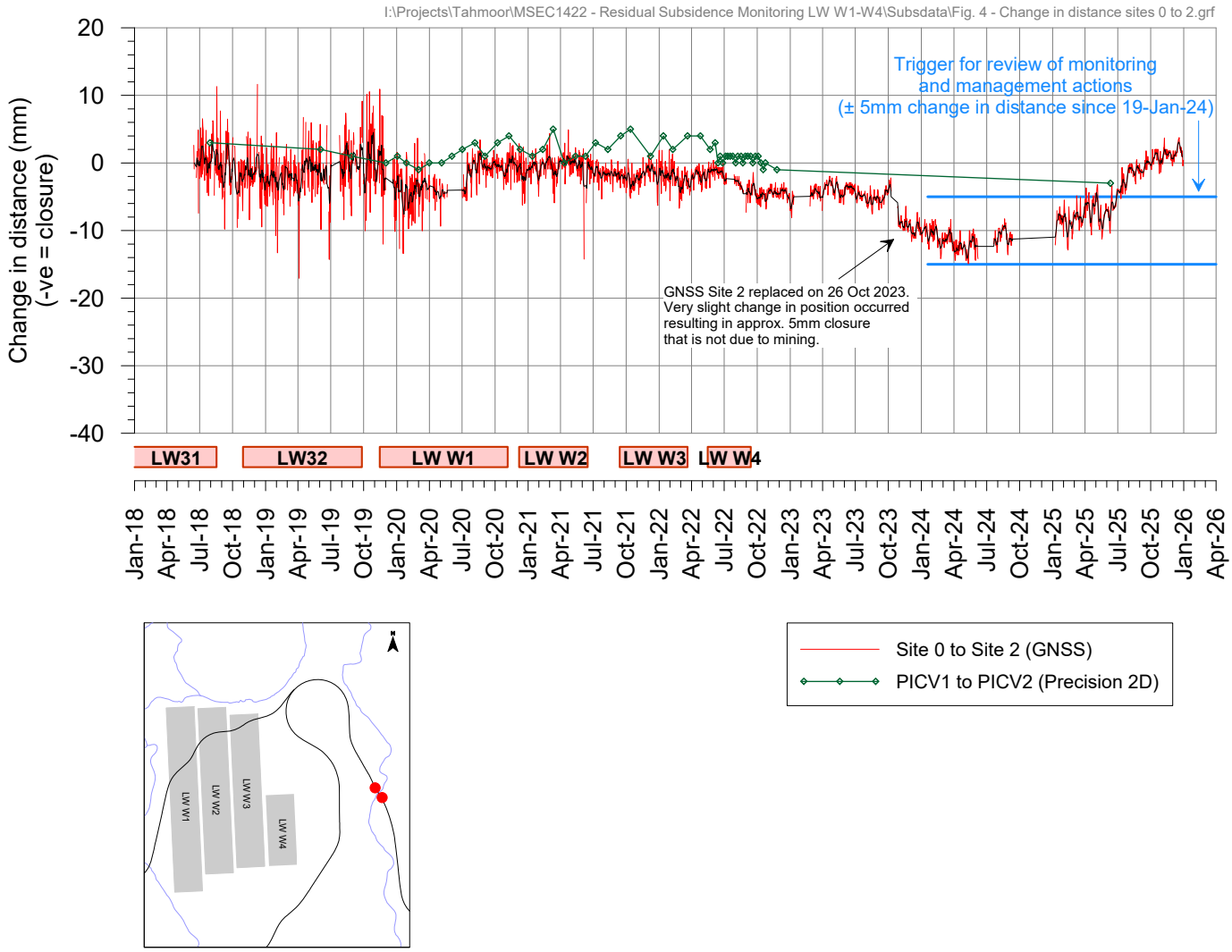


Fig. 3-R08

Tahmoor Western Domain - Main Southern Railway
GNSS Monitoring at Picton Viaduct (Sites 00 and 02)



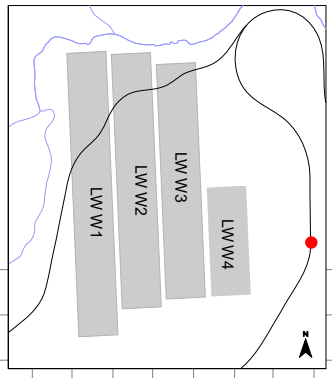
msec

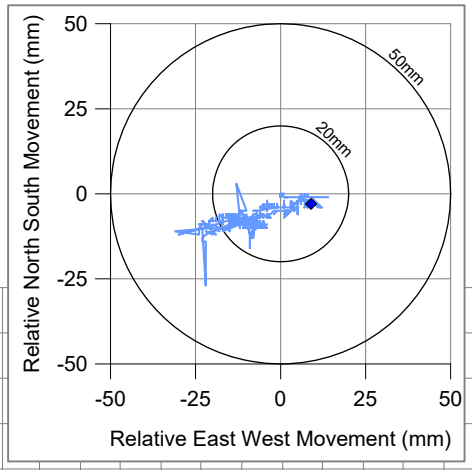
Fig. 4-R08

Tahmoor Western Domain - GNSS Monitoring

Site 26 - MSR at 88.78km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 5 - Site 26.grf





Post LW W4

Change in easting (mm)

60 50 40 30 20 10 0 -10 -20 -30 -40

Change in northing (mm)

20 10 0 -10 -20 -30

Daily change
7 day running average

Change in height (mm)
(+ve = subsidence)

-50 -40 -30 -20 -10 0 10 20 30

Daily rain (mm)

160 140 120 100 80 60 40 20 0

Trigger for review of monitoring
and management actions
(20mm subsidence since 19-Jan-24)

1-Aug-23 1-Sep-23 1-Oct-23 1-Nov-23 1-Dec-23 1-Jan-24 1-Feb-24 1-Mar-24 1-Apr-24 1-May-24 1-Jun-24 1-Jul-24 1-Aug-24 1-Sep-24 1-Oct-24 1-Nov-24 1-Dec-24 1-Jan-25 1-Feb-25 1-Mar-25 1-Apr-25 1-May-25 1-Jun-25 1-Jul-25 1-Aug-25 1-Sep-25 1-Oct-25 1-Nov-25 1-Dec-25 1-Jan-26 1-Feb-26

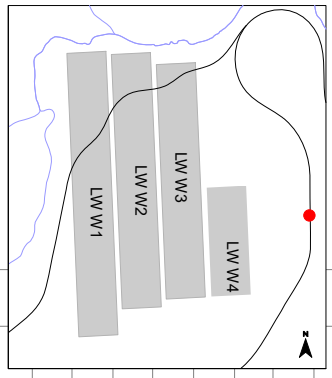
msec

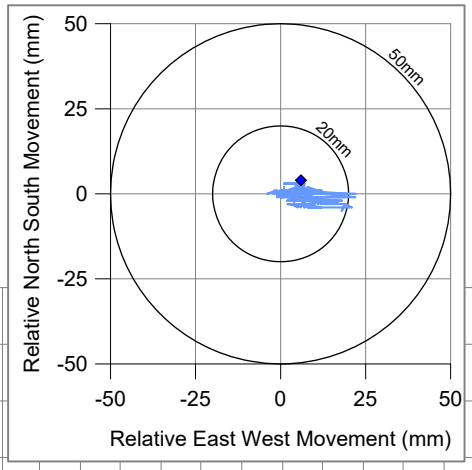
Fig. 5-R08

Tahmoor LW W4 - GNSS Monitoring

Site 27 - MSR at 88.60km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 6 - Site 27.grf





Post LW W4

Change in easting (mm)

60
50
40
30
20
10
0
-10
-20

Daily change
7 day running average

Change in northing (mm)

30
20
10
0
-10
-20
-30

Unit offline since 15-June-25.

Change in height (mm)
(+ve = subsidence)

-20
-10
0
10
20
30
40

Trigger for review of monitoring and management actions
(20mm subsidence since 19-Jan-24)

1-Aug-23
1-Sep-23
1-Oct-23
1-Nov-23
1-Dec-23
1-Jan-24
1-Feb-24
1-Mar-24
1-Apr-24
1-May-24
1-Jun-24
1-Jul-24
1-Aug-24
1-Sep-24
1-Oct-24
1-Nov-24
1-Dec-24
1-Jan-25
1-Feb-25
1-Mar-25
1-Apr-25
1-May-25
1-Jun-25
1-Jul-25
1-Aug-25
1-Sep-25
1-Oct-25
1-Nov-25
1-Dec-25
1-Jan-26
1-Feb-26

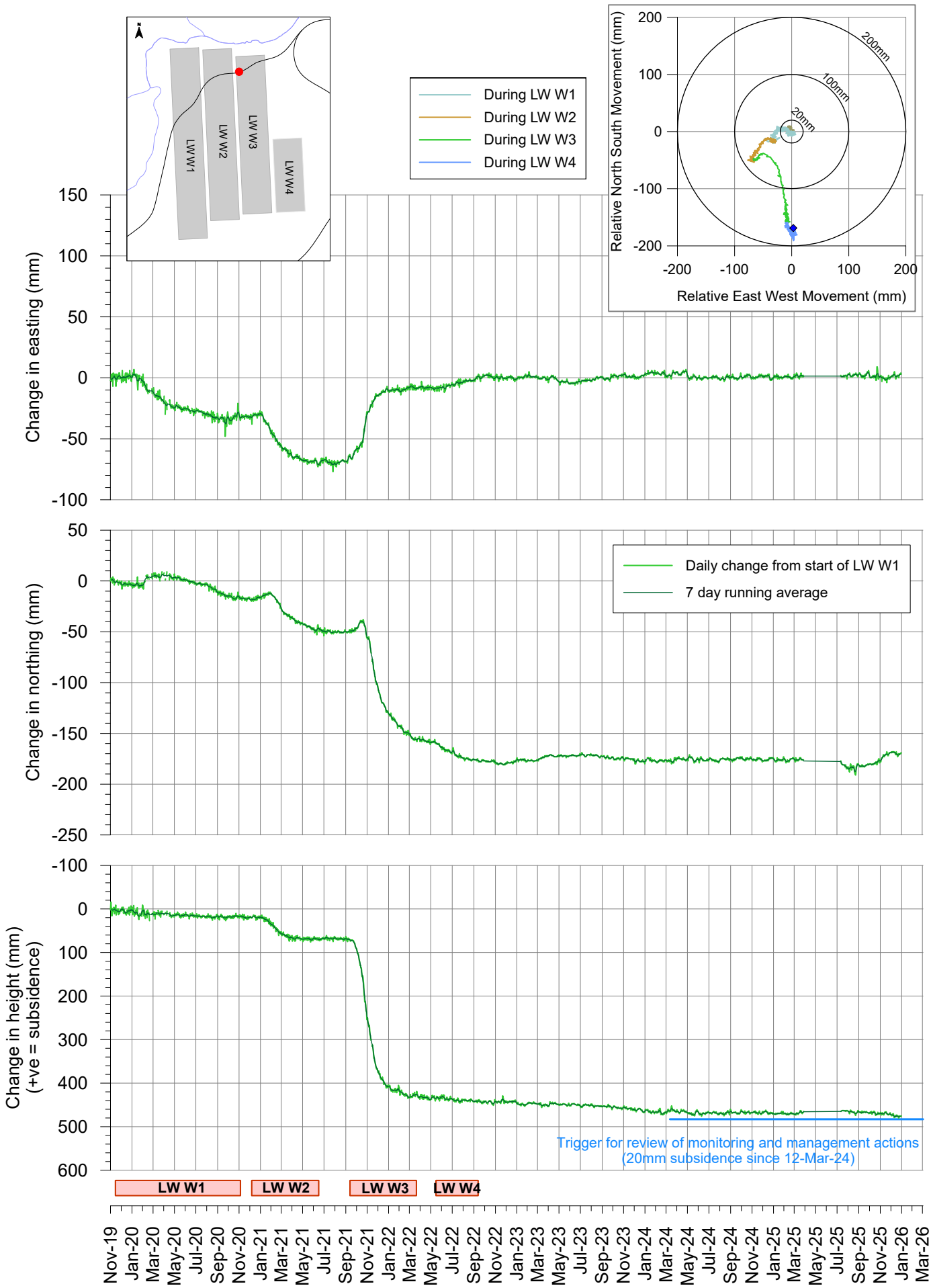
msec

Fig. 6-R08

Tahmoor Western Domain - GNSS Monitoring

Site 7 - PMLL culvert at 87.850km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 7 - Site 7.grf



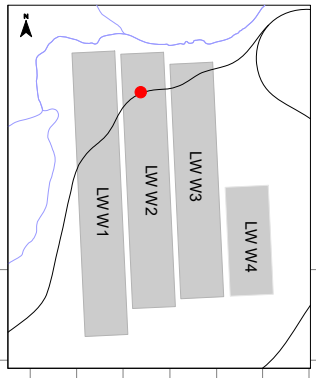
msec

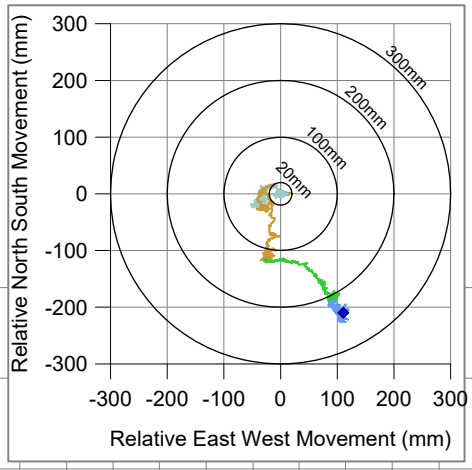
Fig. 7-R08

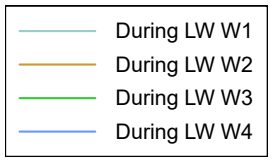
Tahmoor Western Domain - GNSS Monitoring

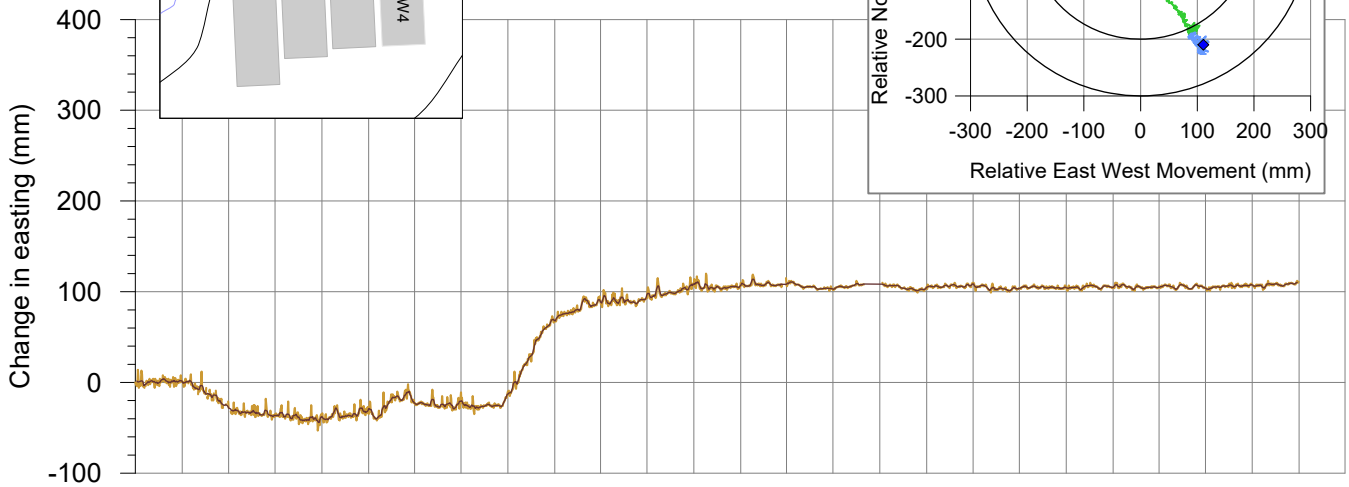
Site 8 - LW W2 centreline - PMLL at 88.110km

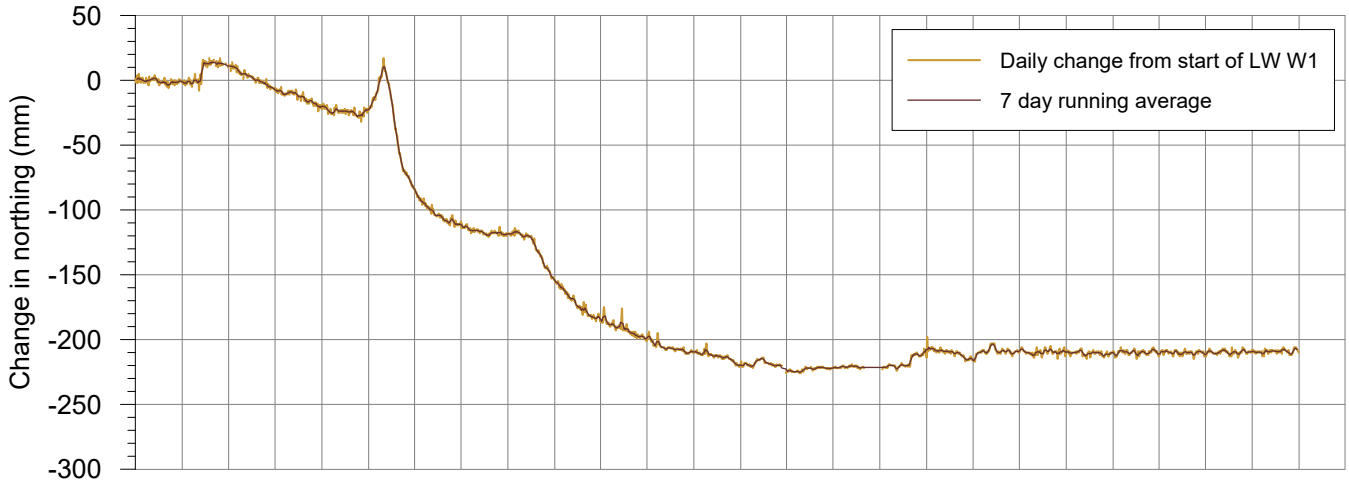
I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 8 - Site 8.grf

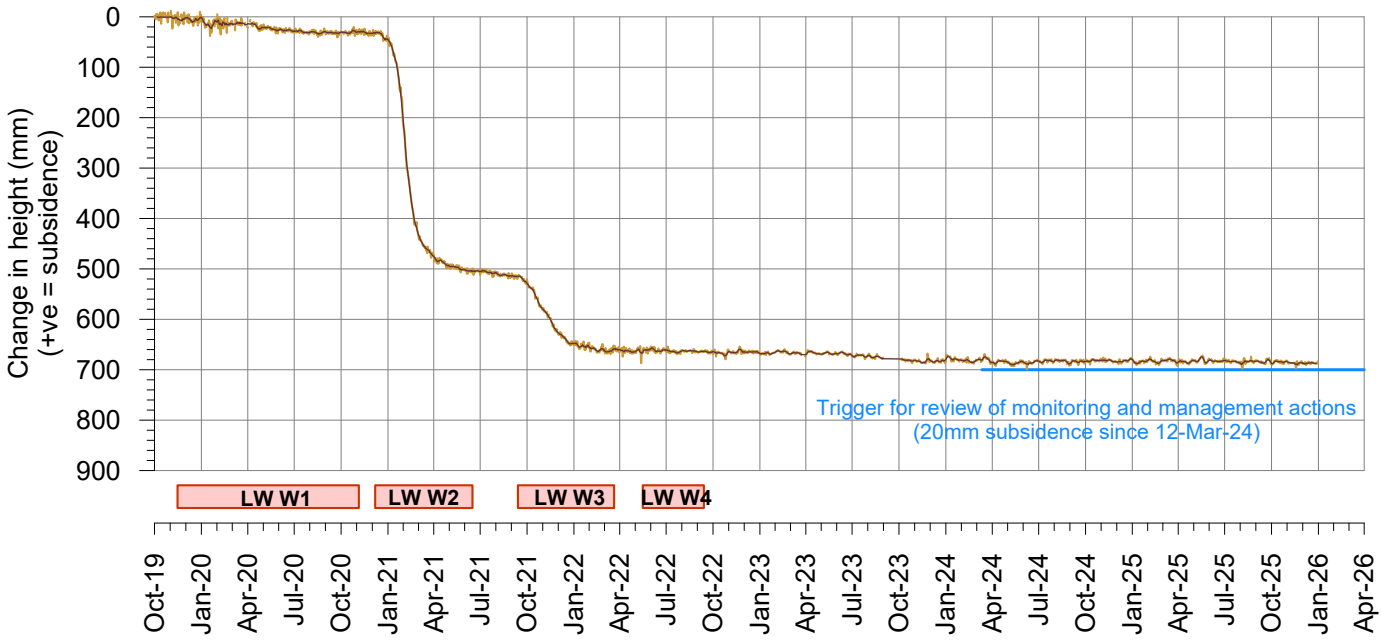












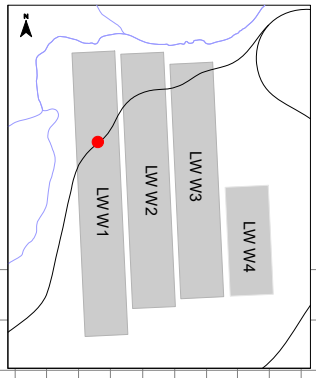
msec

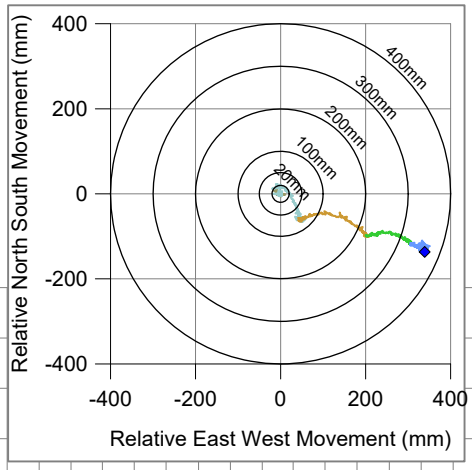
Fig. 8-R08

Tahmoor Western Domain - GNSS Monitoring

Site 9 - LW W1 centreline - PMLL at 88.550km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 9 - Site 9.grf





During LW W1
During LW W2
During LW W3
During LW W4

Change in easting (mm)

800 700 600 500 400 300 200 100 0 -100

Daily change from start of LW W1
7 day running average

Change in northing (mm)

50 0 -50 -100 -150 -200

Change in height (mm)
(+ve = subsidence)

-100 0 100 200 300 400 500 600 700

Trigger for review of monitoring and management actions
(20mm subsidence since 12-Mar-24)

LW W1 LW W2 LW W3 LW W4

Nov-19 Jan-20 Mar-20 May-20 Jul-20 Sep-20 Nov-20 Jan-21 Mar-21 May-21 Jul-21 Sep-21 Nov-21 Jan-22 Mar-22 May-22 Jul-22 Sep-22 Nov-22 Jan-23 Mar-23 May-23 Jul-23 Sep-23 Nov-23 Jan-24 Mar-24 May-24 Jul-24 Sep-24 Nov-24 Jan-25 Mar-25 May-25 Jul-25 Sep-25 Nov-25 Jan-26 Mar-26

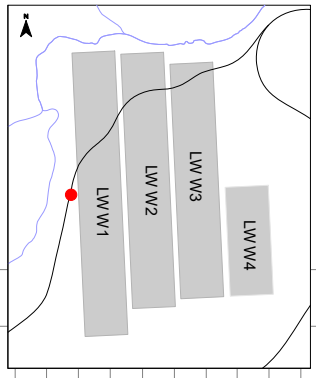
msec

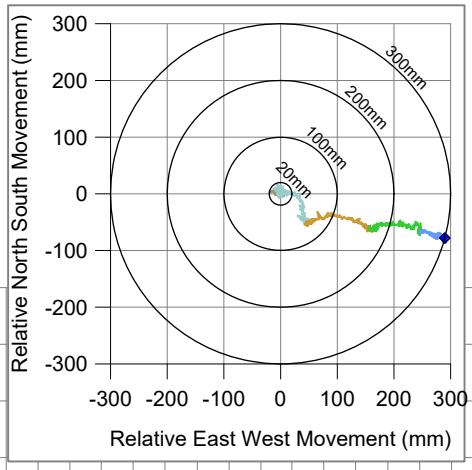
Fig. 9-R08

Tahmoor Western Domain - GNSS Monitoring

Site 10 - PMLL at 89.000km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 10 - Site 10.grf





During LW W1
During LW W2
During LW W3
During LW W4

Change in easting (mm)

700 600 500 400 300 200 100 0 -100

Change in northing (mm)

40 20 0 -20 -40 -60 -80 -100

Daily change from start of LW W1
7 day running average

Change in height (mm)
(+ve = subsidence)

-50 0 50 100 150 200 250 300

IMG agreed on 16 May 2025 to increase trigger level for the following reasons:
1. Rates of change are extremely small, with variations above and below the trigger levels.
2. The minor changes in subsidence have no adverse impact on the railway.
Tahmoor Coal notified PMLL of the assessment.

Trigger for review of monitoring and management actions
(20mm subsidence since 12-Mar-24)

LW W1 LW W2 LW W3 LW W4

Nov-19 Jan-20 Mar-20 May-20 Jul-20 Sep-20 Nov-20 Jan-21 Mar-21 May-21 Jul-21 Sep-21 Nov-21 Jan-22 Mar-22 May-22 Jul-22 Sep-22 Nov-22 Jan-23 Mar-23 May-23 Jul-23 Sep-23 Nov-23 Jan-24 Mar-24 May-24 Jul-24 Sep-24 Nov-24 Jan-25 Mar-25 May-25 Jul-25 Sep-25 Nov-25 Jan-26 Mar-26

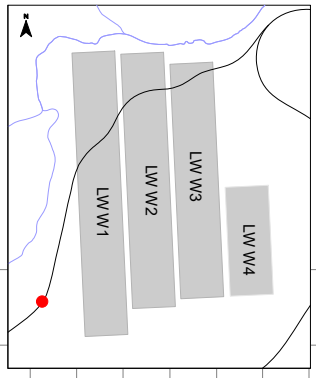
msec

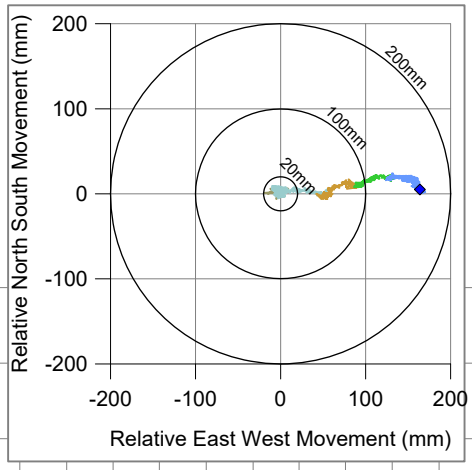
Fig. 10-R08

Tahmoor Western Domain - GNSS Monitoring

Site 11 - PMLL at 89.629km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 11 - Site 11.grf





During LW W1
During LW W2
During LW W3
During LW W4

Change in easting (mm)

500
400
300
200
100
0
-100

Daily change from start of LW W1
7 day running average

Change in northing (mm)

80
60
40
20
0
-20
-40

Change in height (mm)
(+ve = subsidence)

-20
0
20
40
60
80
100
120

Trigger for review of monitoring and management actions
(20mm subsidence since 12-Mar-24)

LW W1 LW W2 LW W3 LW W4

Oct-19 Jan-20 Apr-20 Jul-20 Oct-20 Jan-21 Apr-21 Jul-21 Oct-21 Jan-22 Apr-22 Jul-22 Oct-22 Jan-23 Apr-23 Jul-23 Oct-23 Jan-24 Apr-24 Jul-24 Oct-24 Jan-25 Apr-25 Jul-25 Oct-25 Jan-26 Apr-26

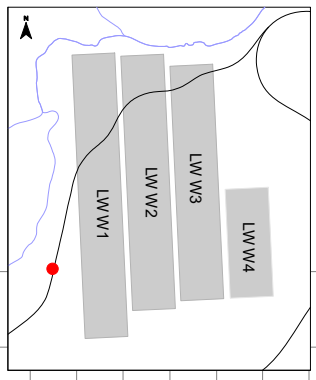
msec

Fig. 11-R08

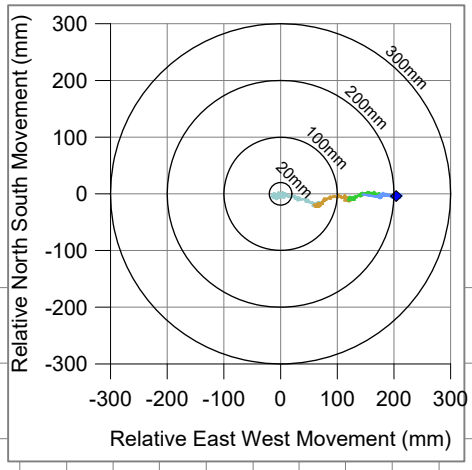
Tahmoor Western Domain - GNSS Monitoring

Site 19 - PMLL at 89.440km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 12 - Site 19.grf



During LW W1
During LW W2
During LW W3
During LW W4



Change in easting (mm)

500 400 300 200 100 0 -100

Change in northing (mm)

60 40 20 0 -20 -40 -60

Daily change from start of LW W1
7 day running average

Change in height (mm)
(+ve = subsidence)

-20 0 20 40 60 80 100 120 140

Trigger for review of monitoring and management actions
(20mm subsidence since 12-Mar-24)

LW W1 LW W2 LW W3 LW W4

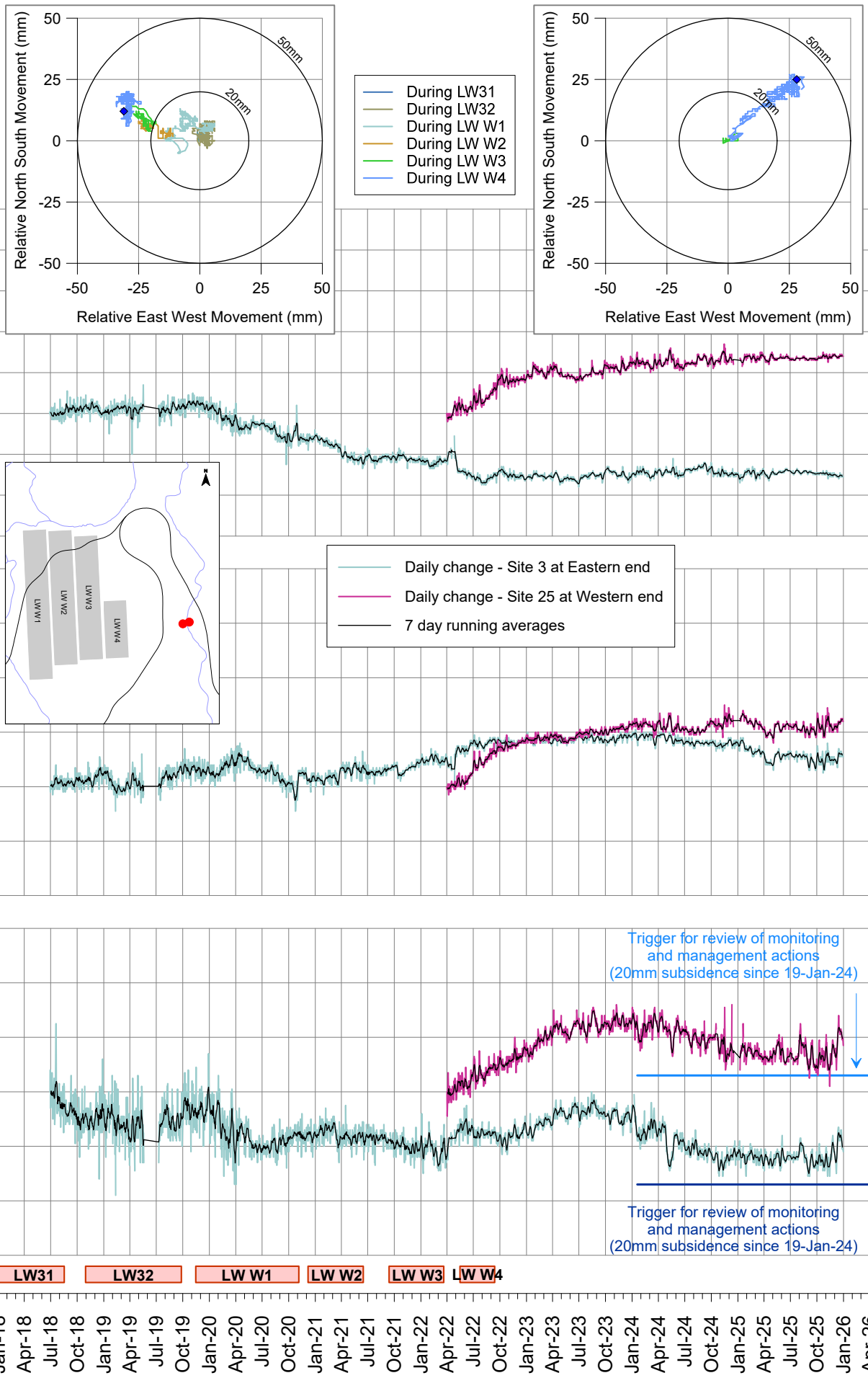
Oct-19 Jan-20 Apr-20 Jul-20 Oct-20 Jan-21 Apr-21 Jul-21 Oct-21 Jan-22 Apr-22 Jul-22 Oct-22 Jan-23 Apr-23 Jul-23 Oct-23 Jan-24 Apr-24 Jul-24 Oct-24 Jan-25 Apr-25 Jul-25 Oct-25 Jan-26 Apr-26

msec

Fig. 12-R08

Tahmoor Western Domain - Main Southern Railway
GNSS Monitoring at Victoria Bridge (Sites 03 and 25)

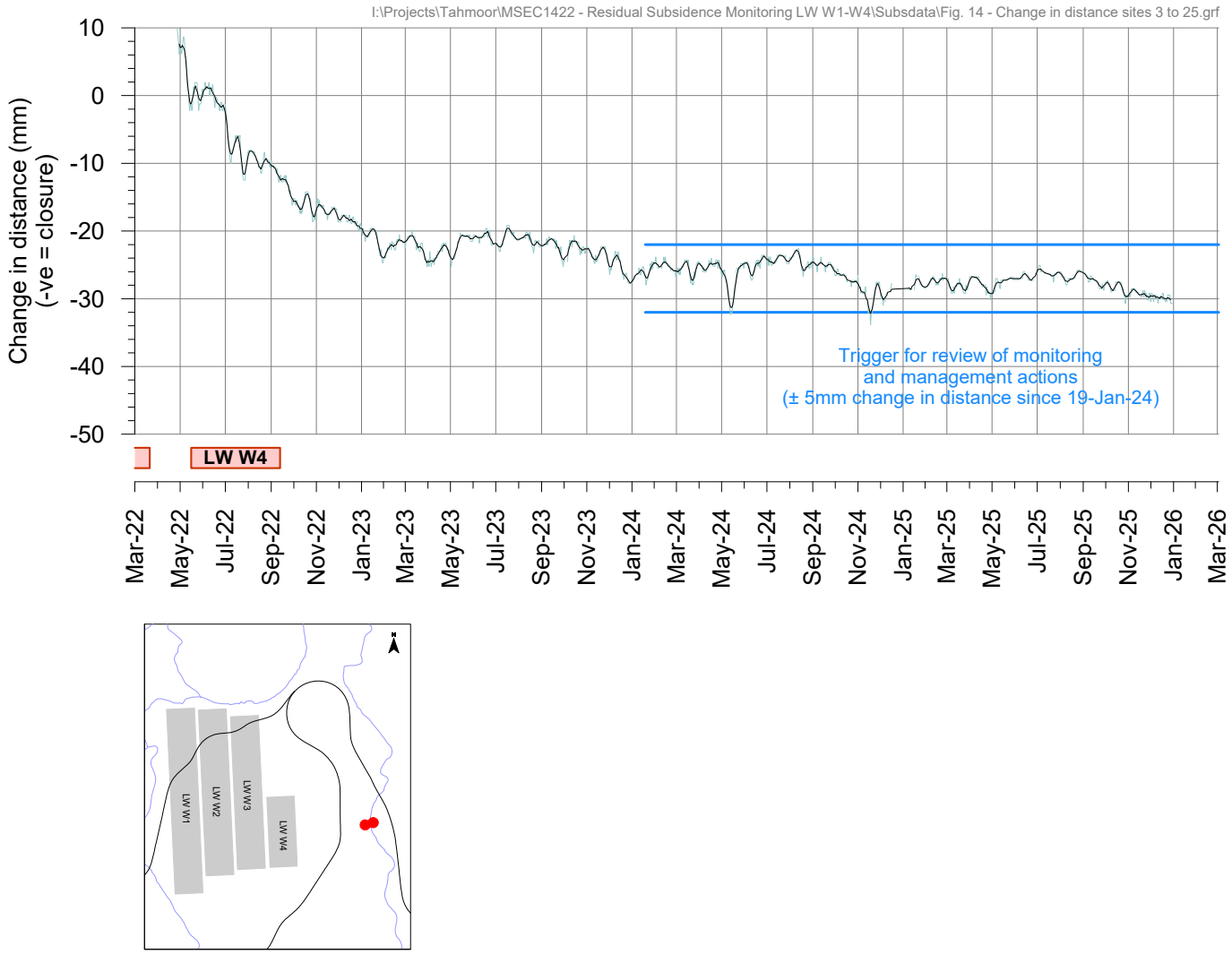
I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 13 - Sites 3 and 25.grf



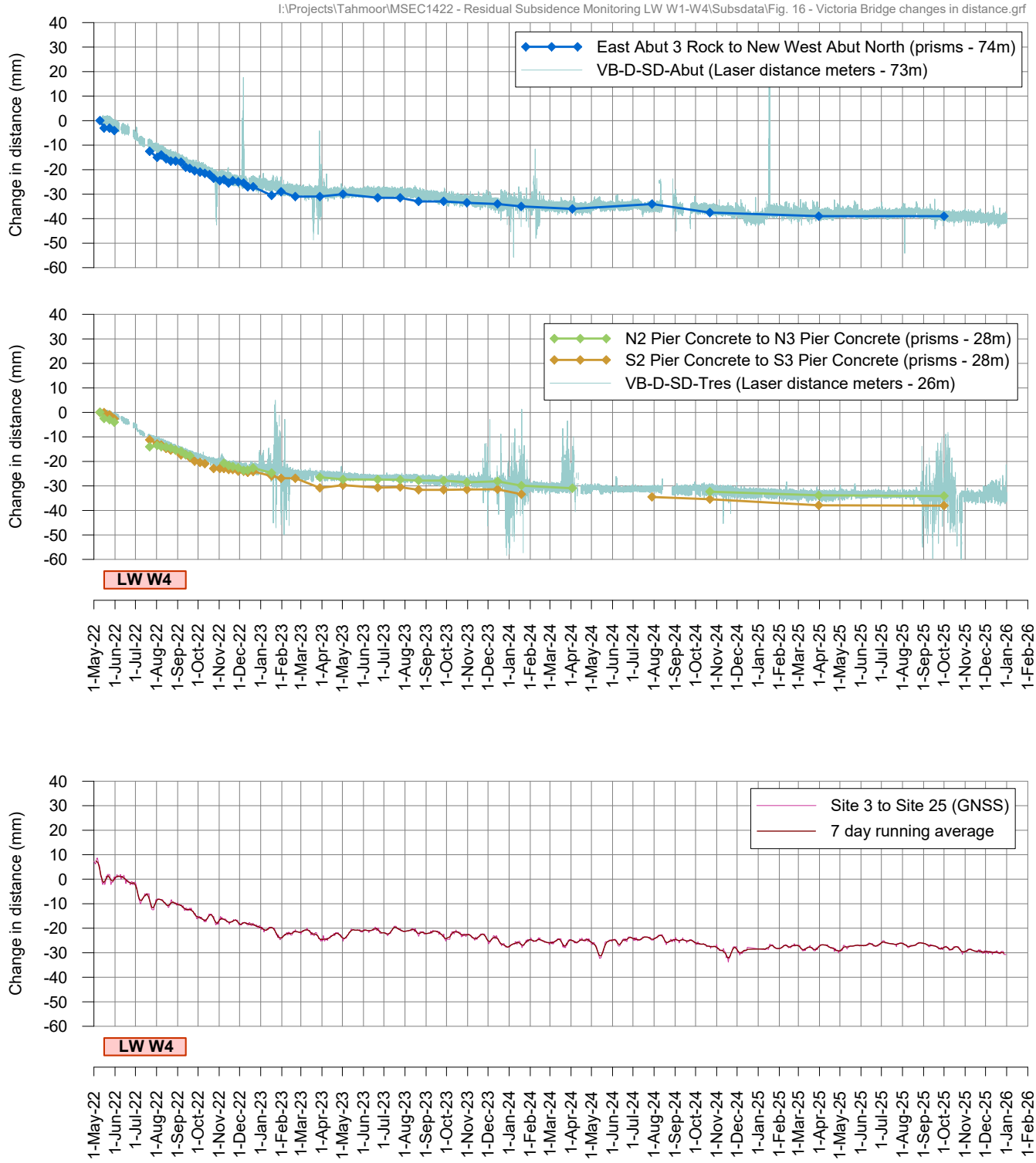
msec

Fig. 13-R08

Tahmoor Western Domain - Main Southern Railway
GNSS Monitoring at Victoria Bridge (Sites 03 and 25)



Incremental changes in distance along Victoria Bridge



TAHMOOR COAL: WESTERN DOMAIN

Residual Subsidence Monitoring Status Report No. 05
Post mining LW W1-W4 in the Western Domain

Reporting Period	1 January 2025 to 31 March 2025	
Total subsidence at end of reporting period	736 mm	at Site 24 on 31 March 2025
Maximum subsidence since MSR ground survey on 19 January 2024	50 mm	at Site 24 on 31 March 2025
Maximum change in subsidence during last quarter	11 mm	at Site 24 (31 December 2024 to 31 March 2025)

Summary of monitoring and inspections

Monitoring Activity	Total subsidence or change in distance	Change in subsidence during last quarter	Highest Trigger	Comments
GNSS units				
GNSS unit above centreline of LW W4 (Site 24)	736	11	N/A	Trend of ongoing residual subsidence observed, with rates of change reducing to low levels since Nov 2023. GNSS unit provided erratic results in March 2024. The GNSS chip was replaced on 16 April.
Main Southern Railway (ARTC)				
GNSS unit (Site 1) Picton Tunnel 87.85 km	2	0		Very minor change in subsidence since MSR ground survey on 19 January 2024. Change in subsidence less than 20 mm trigger. Unit offline since 8 January 2025, awaiting access to investigate.
GNSS unit (Site 0) Picton Viaduct (85.42 km)	42	-		Very minor change in subsidence since MSR ground survey on 19 January 2024. Change in subsidence less than 20 mm trigger. New base values 19 July 2024. Unit offline since 11 September 2024 and repaired on 7 January 2025. One reading on 8 January, and unit offline since.
GNSS units (Site 2) Picton Viaduct (85.42 km)	0	3		Very minor change in subsidence since MSR ground survey on 19 January 2024. Change in subsidence less than 20 mm trigger.
Change in distance between Sites 0 and 2 across Picton Viaduct	-19	-3		Small change in distance since MSR ground survey on 19 January 2024. Change in distance is less than 5 mm trigger. Site 0 offline since 11 September 2024 and repaired on 7 January 2025. One reading on 8 January, and unit offline since.
GNSS unit (Site 26) at 88.78 km	-21	-2		GNSS unit shifted to the south-west and upwards after installation, with small changes observed since early May 2024. Minor changes observed during reporting period. Change in subsidence less than 20 mm trigger. Unit offline since 8 January 2025, awaiting access to investigate.
GNSS unit (Site 27) at 88.60 km	5	1		Very minor change in subsidence since MSR ground survey on 19 January 2024. Change in subsidence less than 20 mm trigger. Unit offline since 27 February 2025, awaiting access to investigate.

Monitoring Activity	Total subsidence or change in distance	Change in subsidence during last quarter	Highest Trigger	Comments
Picton-Mittagong Loop Line (THNSW)				
GNSS unit (Site 7) Culvert at 87.850 km	470	-		Very minor change in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence less than 20 mm trigger. Unit offline since 28 July 2024, awaiting access to investigate.
GNSS unit (Site 8) Above LW W2 at 88.110 km	682	-		Very minor change increase in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence less than 20 mm trigger. Unit offline since 28 July 2024, awaiting access to investigate.
GNSS unit (Site 9) Above LW W1 at 88.550 km	540	3		Very minor change increase in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence less than 20 mm trigger. Unit offline since 5 October 2024, awaiting access to investigate.
GNSS unit (Site 10) at 89.000 km	207	8		Very minor change in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence exceeded 20 mm trigger intermittently between 30 October and 31 March 2025 and is currently exceeding the trigger level.
GNSS unit (Site 11) at 89.629 km	83	8		Very minor change in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence less than 20 mm trigger.
GNSS unit (Site 19) at 89.440 km	87	-		Very minor change in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence less than 20 mm trigger. Unit offline since 25 April 2024, awaiting access to investigate.
Victoria Bridge over Stonequarry Creek (TfNSW)				
GNSS unit (Site 3) on eastern abutment	23	4	N/A	Minor change in subsidence. Change in subsidence less than 20 mm trigger.
GNSS unit (Site 25) on western abutment	-12	3	N/A	Unit repaired on 7 January 2025. Very minor ongoing change in horizontal movement. Change in subsidence less than 20 mm trigger.
Change in distance between Sites 3 and 25 across Victoria Bridge	-28	0	N/A	Very minor ongoing change in distance. Change in distance less than 5 mm trigger.
2D ground survey between Pegs West Abut 2 Rock and East Abut 3 Rock	31 Mar	Six monthly	N/A	Very little change observed over the last 2 years. Slight increase in closure of 1 mm since October 2024 survey.
Local 3D bridge survey	31 Mar	Six monthly	N/A	Very little change observed over the last 2 years.
Laser distancemeters	Hourly			Minor ongoing closure of 4 mm since April 2024 and 1 mm across top of valley during this reporting period.
Measure gap between bridge deck and eastern Abutment B	31 Mar	Six monthly		TfNSW reinstated a gap between the timber deck and eastern abutment on 24 January 2023. Gap is currently 14 mm on the south side (1 mm closure since October 2024 survey) and 9 mm on the north side (1 mm closure since October 2024 survey). Total closure along water pipe joints was 12 mm (increase of 1 mm since 22 October 2024).

Monitoring Activity	Total subsidence or change in distance	Change in subsidence during last quarter	Highest Trigger	Comments
Victoria Bridge over Stonequarry Creek (TfNSW) (continued)				
Visual inspection	-	-	N/A	TfNSW inspected the Bridge and reinstated a gap between the timber deck and the eastern abutment on 24 January 2023. Detailed inspection by structural engineer and TfNSW Bridge Inspector conducted on 20 November 2023. Expansion gap at Eastern abutment not fully closed (at least 10 mm), previously observed 10 mm gap in notch at Western abutment is closed. Bridge deck appears to be propped between abutments, with contact between bridge deck and Eastern abutment not yet known as hidden by timber retaining wall. Trusses in superstructure do not appear to have experienced significant compression. There are no immediate concerns with the bridge structure. No obvious changes observed on 19 January 2024. Termite activity observed to base of piers on 15 April 2024.
Natural Features				
Groundwater monitoring	Continuous Last downloaded in Dec 2023	-	-	Trend of gradually increasing groundwater levels across the area, approaching groundwater levels measured prior to the start of LW W1. Next download in Dec 2024.
Management Actions				
Other management actions since previous report: ● Nil				
Any additional and/or outstanding management actions: ● Nil				
Consultation with stakeholders since previous report: ● Monitoring reports issued quarterly				
Forecast whether residual subsidence is likely to cause: **A. Track closure for any period unacceptable to ARTC** **B. Impact on the safety of operations on the Main Southern Railway** Based on monitoring results to date, and the controls implemented and available under the Residual Subsidence Monitoring Plan for Western Domain LW W1-W4, no triggers under this Monitoring Plan are expected to be exceeded in the next three months. Accordingly residual subsidence is not likely to result in the occurrence of either A or B above.				
Certified by Tahmoor Coal				
Name	Ross Barber			
Position	Project Manager			
Signature	*Ross Barber*			
Date	9 April 2025			

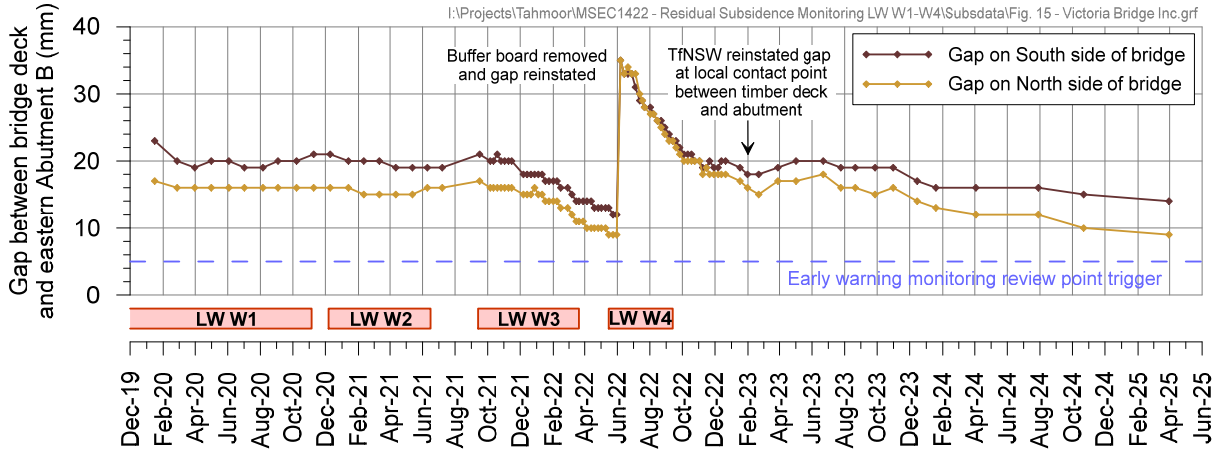
Copy of Report to:

Daniel Wakefield, Area Manager Ingleburn, ARTC
Sladjan Mitic, Senior Track & Civil Engineer Sydney, ARTC
Michael Irons, Property Manager – Wagga, ARTC
Brian Cooper, Manager Maintenance North-South, ARTC;
Peter Haskard, Manager Engineering, Interstate Network, ARTC

John Thorogood, Safety, Environment & Quality Manager, Transport Heritage NSW
Les Kelleher, Track Manager, Transport Heritage NSW

Cyril Gunaratne - TfNSW (Pavement Maintenance Planner)
Dony Castro - TfNSW (Bridge Maintenance Planner)
Richard Woods - Stantec (Senior Principal – Senior Bridge Engineer)

Clint Mason, Production Manager, Tahmoor Mine
Ian Cochran, Bridges and Structures Specialist, ONRSR
Ray Ramage, Principal Inspector – Subsidence, Mine Safety Inspectorate, Resources Regulator



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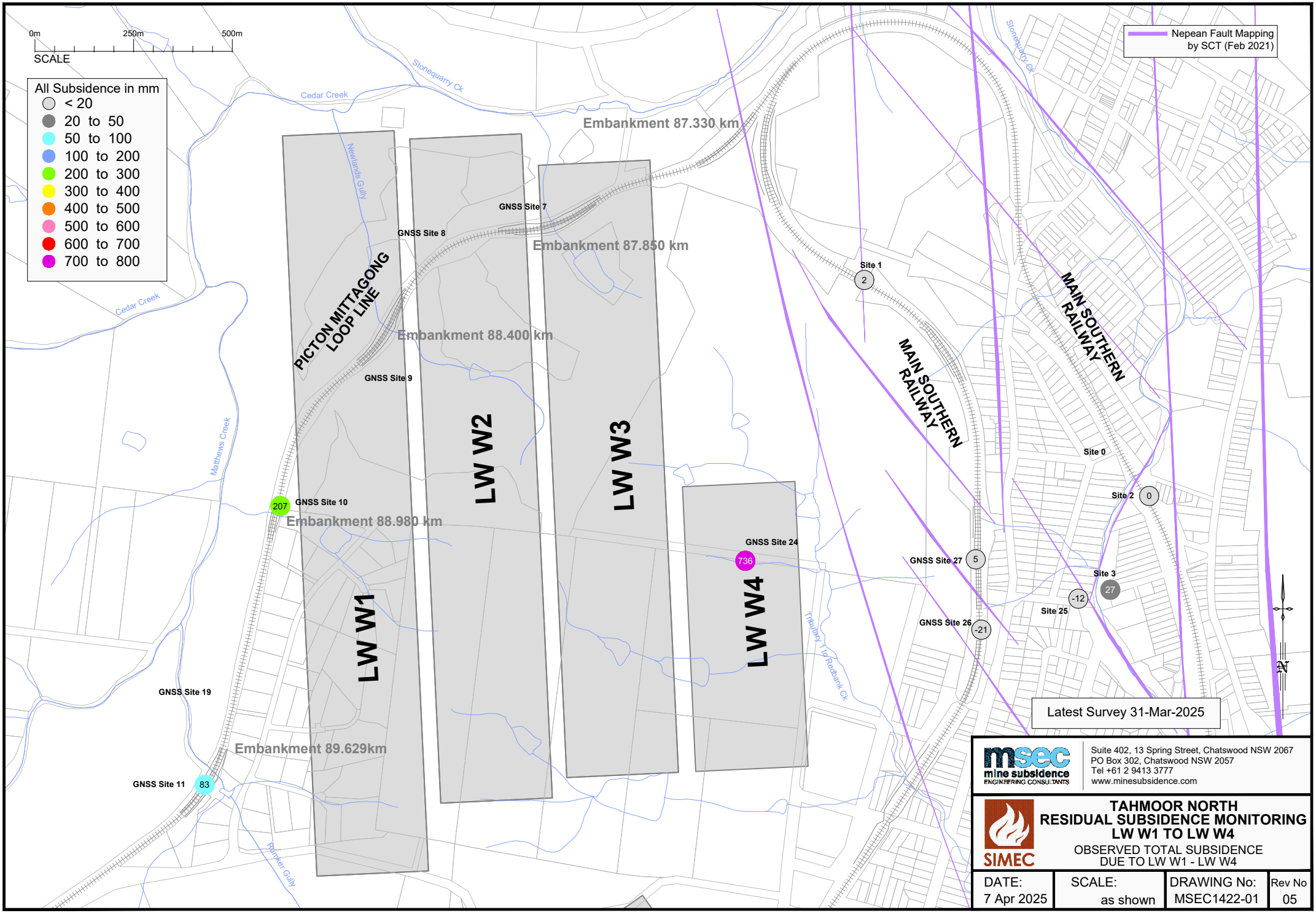

msec mine subsidence ENGINEERING CONSULTANTS
Suite 402, 13 Spring Street, Chatswood NSW 2067
PO Box 302, Chatswood NSW 2057
Tel +61 2 9413 3777
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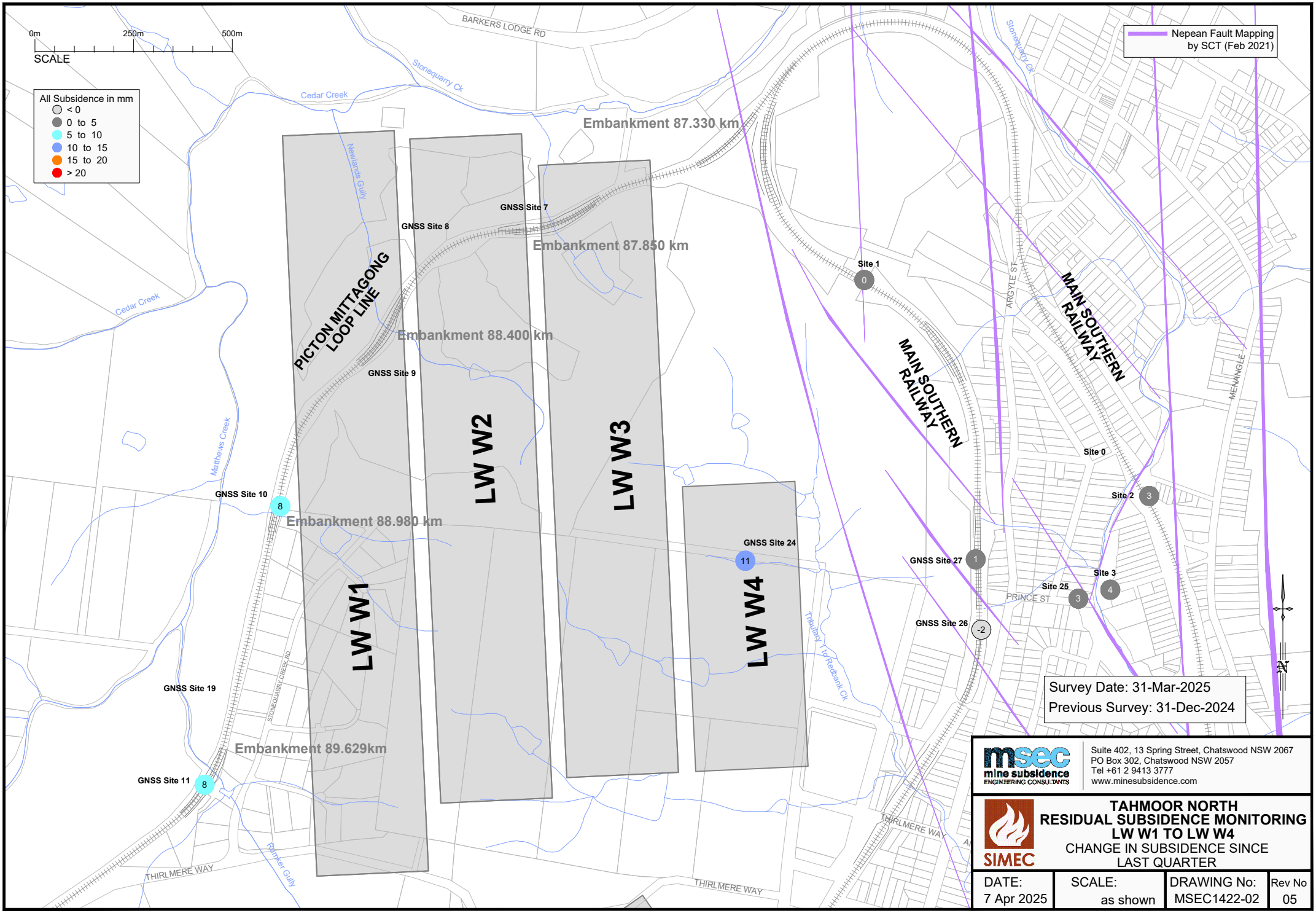
TAHMOOR NORTH RESIDUAL SUBSIDENCE MONITORING LW W1 TO LW W4

OBSERVED TOTAL SUBSIDENCE DUE TO LW W1 - LW W4

DATE:	SCALE:	DRAWING No:	Rev No
7 Apr 2025	as shown	MSEC1422-01	05

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\AcadData\MSEC1422-02 Quarterly Change in Subsidence.dwg



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PO Box 302, Chatswood NSW 2057
Tel +61 2 9413 3777
www.minesubsidence.com

SIMEC

TAHMOOR NORTH RESIDUAL SUBSIDENCE MONITORING LW W1 TO LW W4

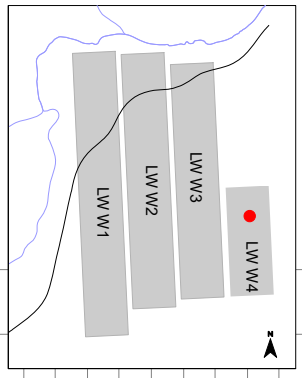
CHANGE IN SUBSIDENCE SINCE LAST QUARTER

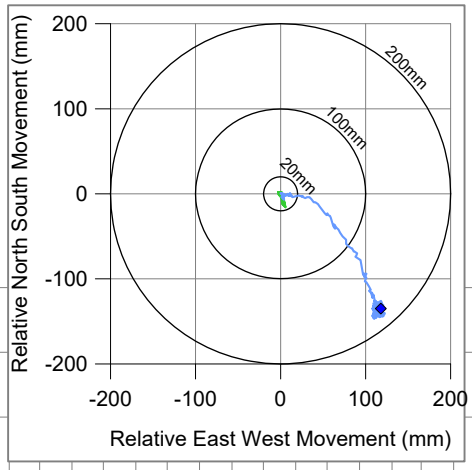
DATE:	SCALE:	DRAWING No:	Rev No
7 Apr 2025	as shown	MSEC1422-02	05

Tahmoor Western Domain - GNSS Monitoring

Site 24 above LW W4

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 1 - Site 24.grf



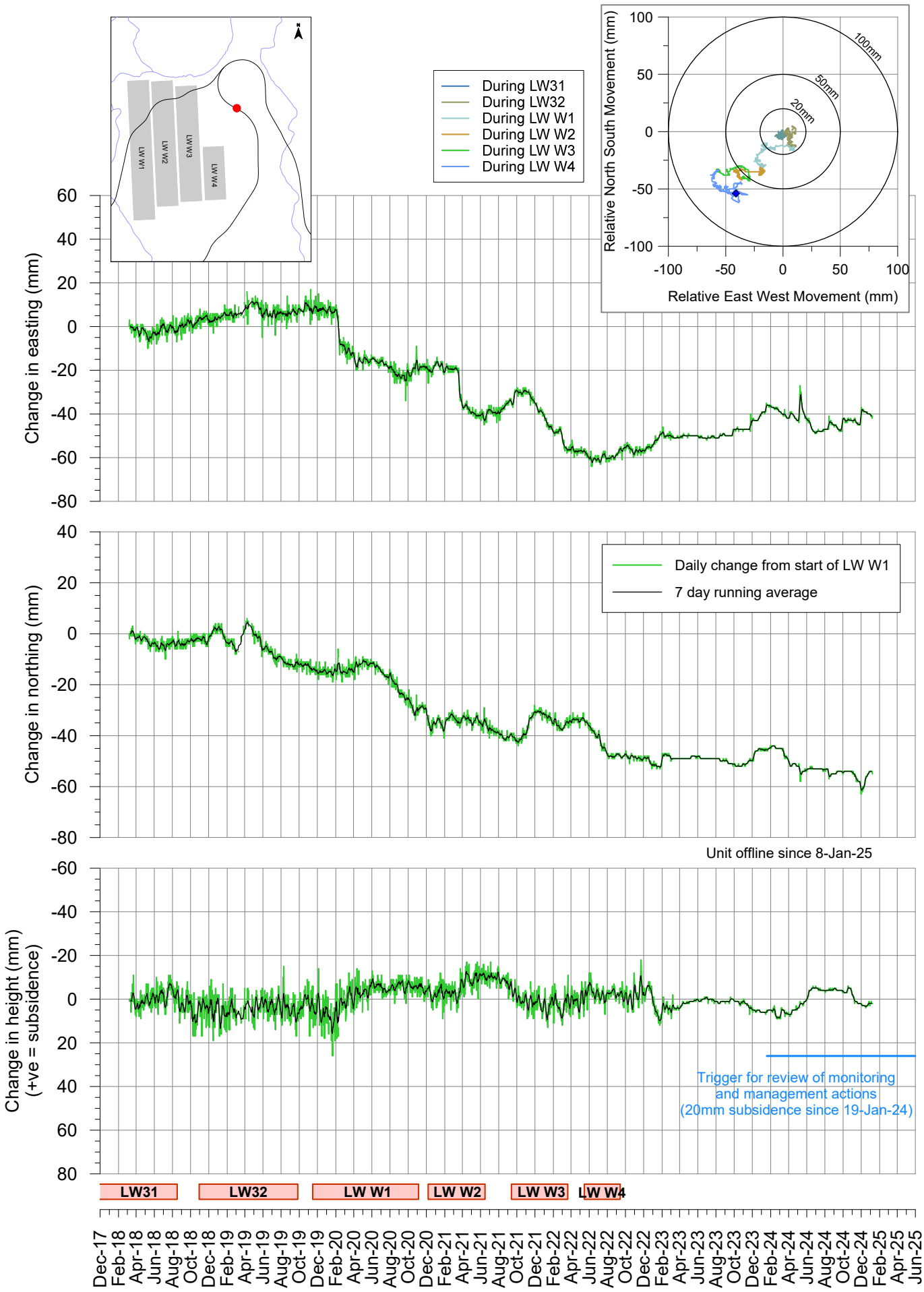


msec

Fig. 1-R05

Tahmoor Western Domain - Main Southern Railway
GNSS Monitoring at Picton Tunnel (Site 01)

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 2 - Site 1.grf



msec

Fig. 2-R05

Tahmoor Western Domain - Main Southern Railway
GNSS Monitoring at Picton Viaduct (Sites 00 and 02)

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 3 - Sites 0 and 2.grf

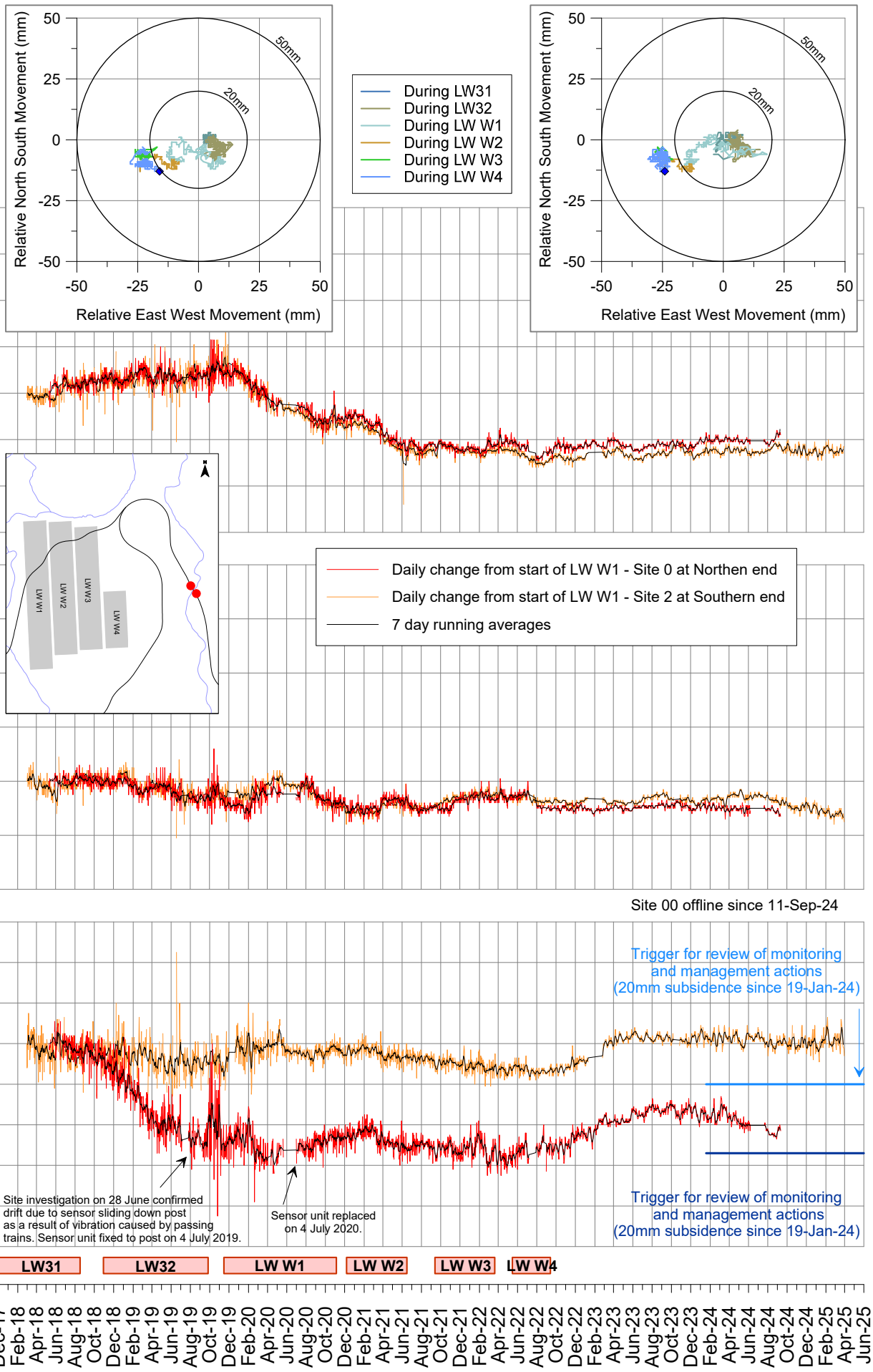
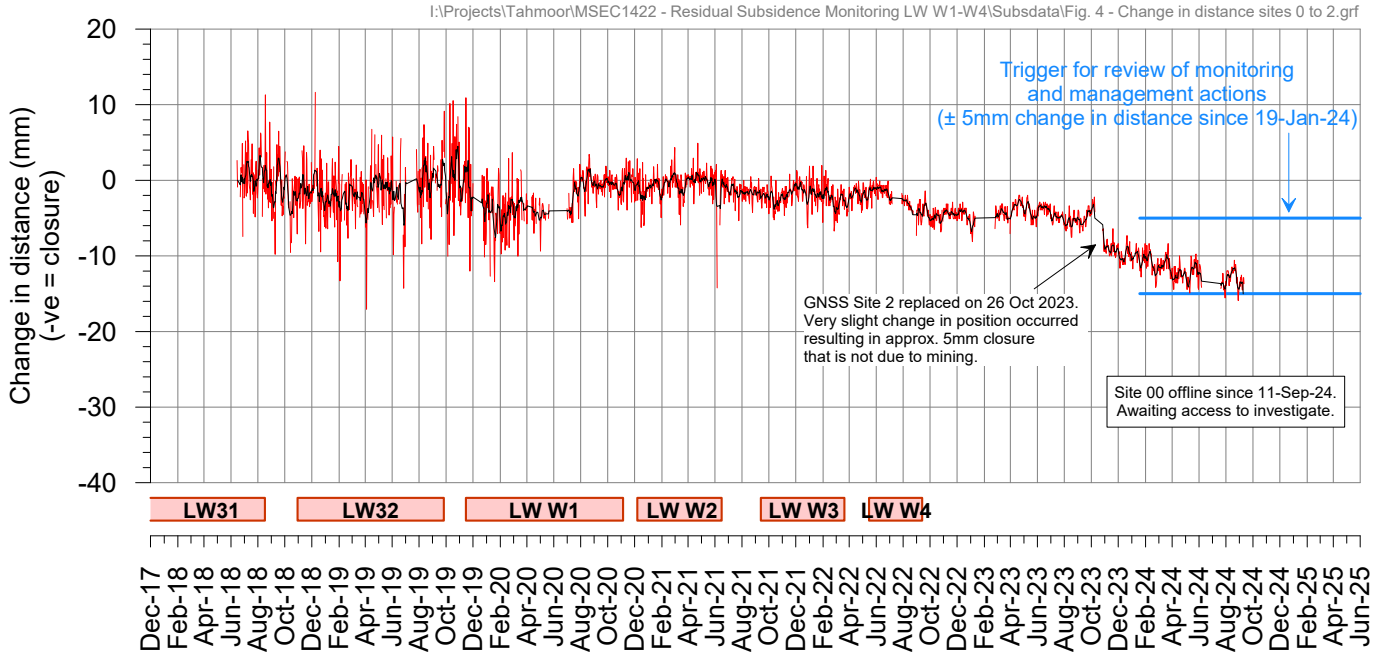
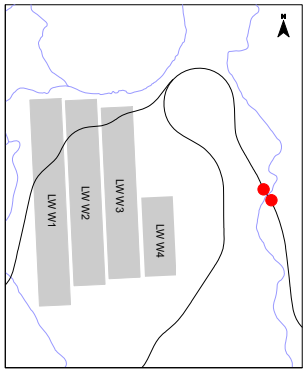


Fig. 3-R05

Tahmoor Western Domain - Main Southern Railway
GNSS Monitoring at Picton Viaduct (Sites 00 and 02)

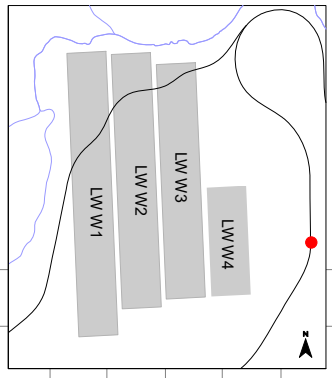


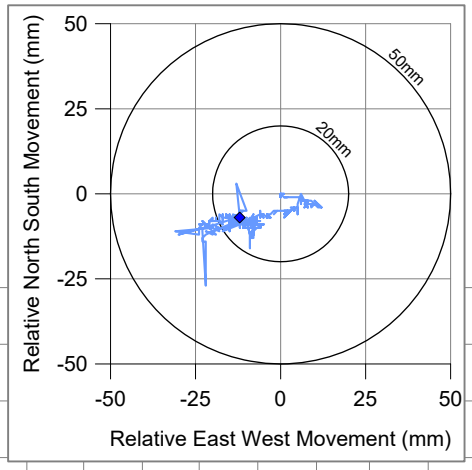


Tahmoor Western Domain - GNSS Monitoring

Site 26 - MSR at 88.78km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 5 - Site 26.grf





Post LW W4

Change in easting (mm)

40
30
20
10
0
-10
-20
-30
-40

Daily change
7 day running average

Change in northing (mm)

20
10
0
-10
-20
-30

Unit offline since 13-Jan-25

Change in height (mm)
(+ve = subsidence)

-50
-40
-30
-20
-10
0
10
20
30

Trigger for review of monitoring
and management actions
(20mm subsidence since 19-Jan-24)

Daily rain (mm)

160
140
120
100
80
60
40
20
0

1-Aug-23
1-Sep-23
1-Oct-23
1-Nov-23
1-Dec-23
1-Jan-24
1-Feb-24
1-Mar-24
1-Apr-24
1-May-24
1-Jun-24
1-Jul-24
1-Aug-24
1-Sep-24
1-Oct-24
1-Nov-24
1-Dec-24
1-Jan-25
1-Feb-25
1-Mar-25
1-Apr-25
1-May-25

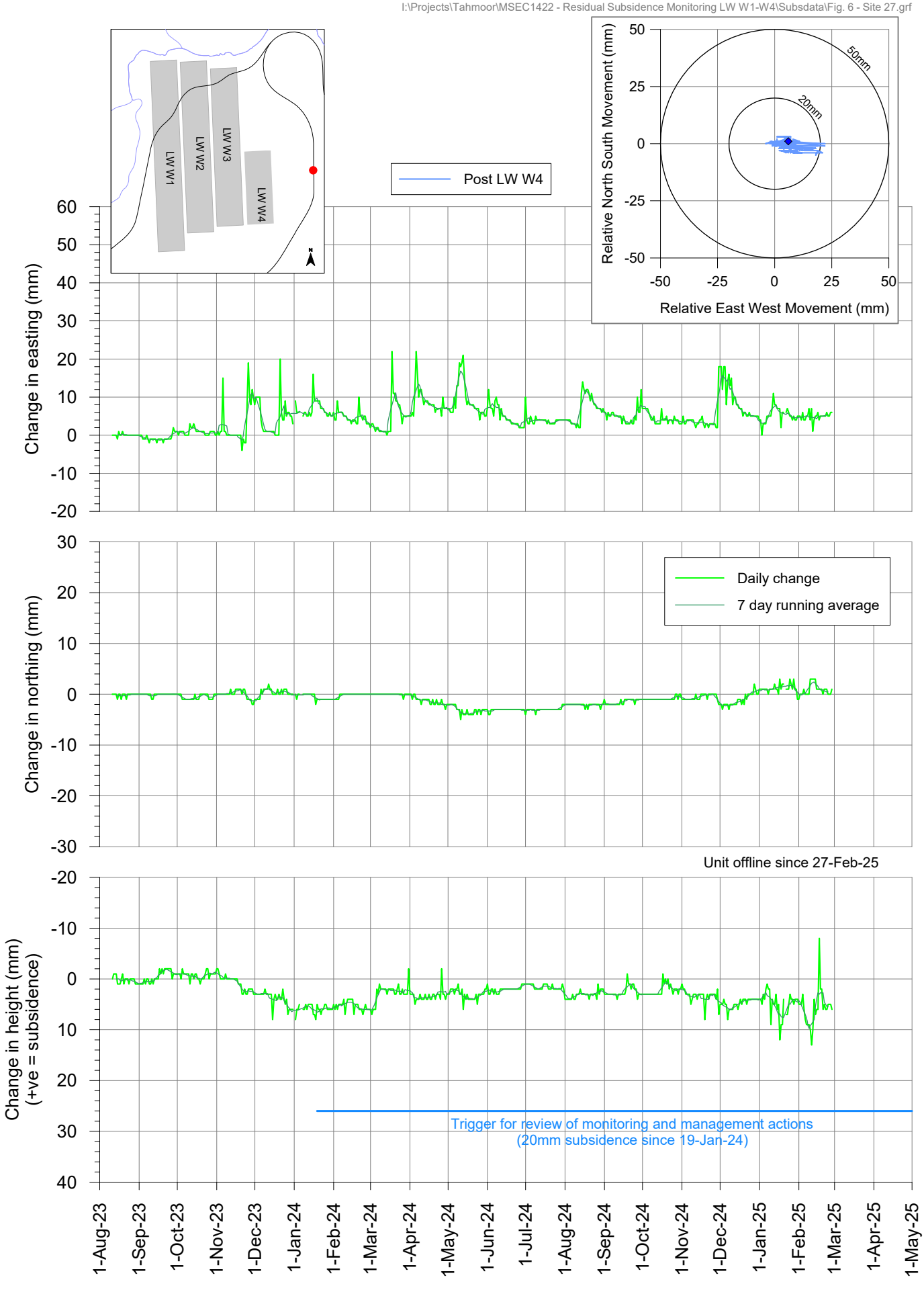
msec

Fig. 5-R05

Tahmoor LW W4 - GNSS Monitoring

Site 27 - MSR at 88.60km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 6 - Site 27.grf



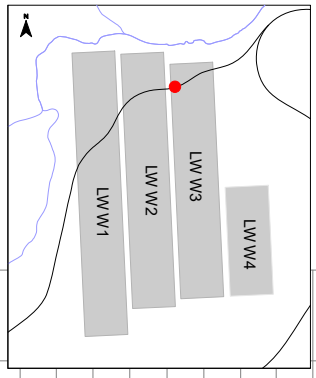
msec

Fig. 6-R05

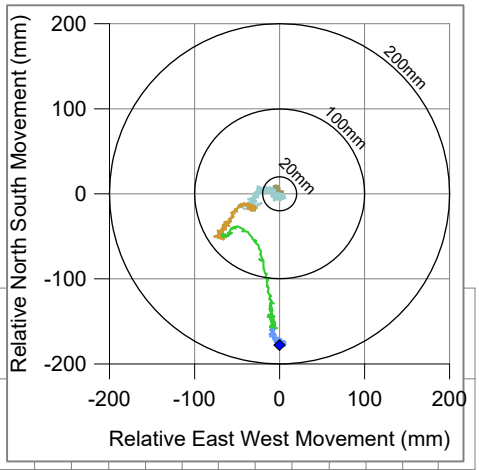
Tahmoor Western Domain - GNSS Monitoring

Site 7 - PMLL culvert at 87.850km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 7 - Site 7.grf



During LW W1
During LW W2
During LW W3
During LW W4



Change in easting (mm)

Change in northing (mm)

Daily change from start of LW W1
7 day running average

Unit offline since 28-Jul-24.
Awaiting access to investigate.

Change in height (mm)
(+ve = subsidence)

Trigger for review of monitoring and management actions
(20mm subsidence since 12-Mar-24)

LW W1 LW W2 LW W3 LW W4

Nov-19 Jan-20 Mar-20 May-20 Jul-20 Sep-20 Nov-20 Jan-21 Mar-21 May-21 Jul-21 Sep-21 Nov-21 Jan-22 Mar-22 May-22 Jul-22 Sep-22 Nov-22 Jan-23 Mar-23 May-23 Jul-23 Sep-23 Nov-23 Jan-24 Mar-24 May-24 Jul-24 Sep-24 Nov-24 Jan-25 Mar-25 May-25

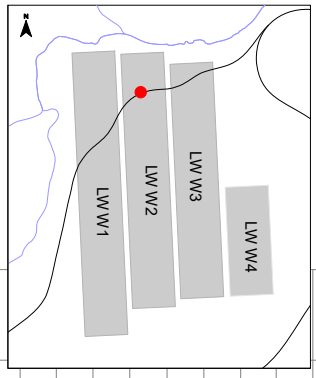
msec

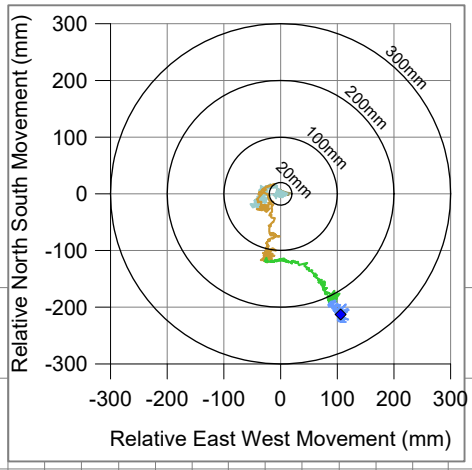
Fig. 7-R05

Tahmoor Western Domain - GNSS Monitoring

Site 8 - LW W2 centreline - PMLL at 88.110km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 8 - Site 8.grf





During LW W1
During LW W2
During LW W3
During LW W4

Change in easting (mm)

400 300 200 100 0 -100

Change in northing (mm)

50 0 -50 -100 -150 -200 -250 -300

Daily change from start of LW W1
7 day running average

Unit offline since 28-Jul-24.
Awaiting access to investigate.

Change in height (mm)
(+ve = subsidence)

0 100 200 300 400 500 600 700 800 900

Trigger for review of monitoring and management actions
(20mm subsidence since 12-Mar-24)

LW W1 LW W2 LW W3 LW W4

Nov-19 Jan-20 Mar-20 May-20 Jul-20 Sep-20 Nov-20 Jan-21 Mar-21 May-21 Jul-21 Sep-21 Nov-21 Jan-22 Mar-22 May-22 Jul-22 Sep-22 Nov-22 Jan-23 Mar-23 May-23 Jul-23 Sep-23 Nov-23 Jan-24 Mar-24 May-24 Jul-24 Sep-24 Nov-24 Jan-25 Mar-25 May-25

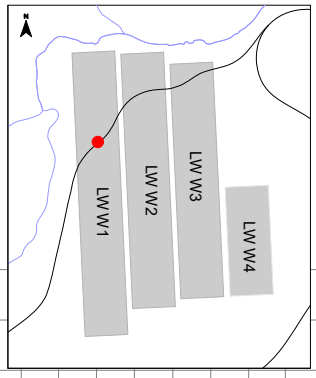
msec

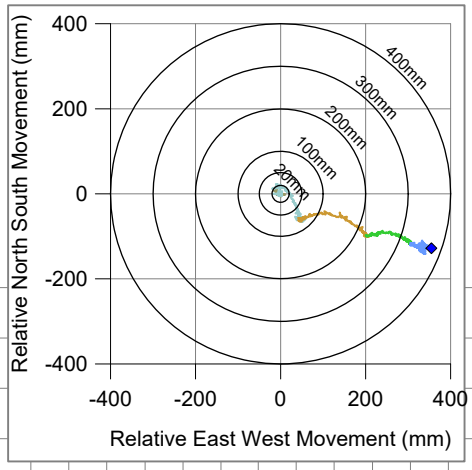
Fig. 8-R05

Tahmoor Western Domain - GNSS Monitoring

Site 9 - LW W1 centreline - PMLL at 88.550km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 9 - Site 9.grf





During LW W1
During LW W2
During LW W3
During LW W4

Change in easting (mm)

800 700 600 500 400 300 200 100 0 -100

Change in northing (mm)

50 0 -50 -100 -150 -200

Daily change from start of LW W1
7 day running average

Unit offline since 5-Oct-24

Change in height (mm)
(+ve = subsidence)

-100 0 100 200 300 400 500 600 700

Trigger for review of monitoring and management actions
(20mm subsidence since 12-Mar-24)

LW W1 LW W2 LW W3 LW W4

Nov-19 Jan-20 Mar-20 May-20 Jul-20 Sep-20 Nov-20 Jan-21 Mar-21 May-21 Jul-21 Sep-21 Nov-21 Jan-22 Mar-22 May-22 Jul-22 Sep-22 Nov-22 Jan-23 Mar-23 May-23 Jul-23 Sep-23 Nov-23 Jan-24 Mar-24 May-24 Jul-24 Sep-24 Nov-24 Jan-25 Mar-25

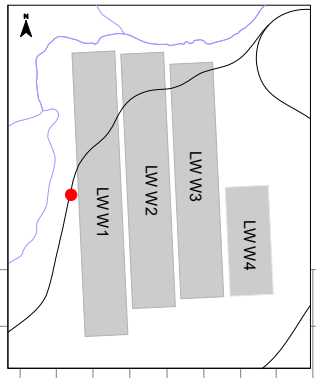
msec

Fig. 9-R05

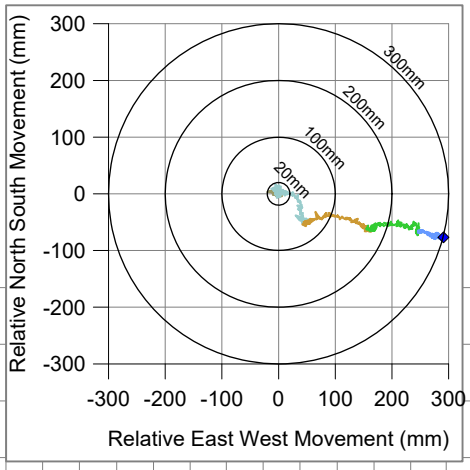
Tahmoor Western Domain - GNSS Monitoring

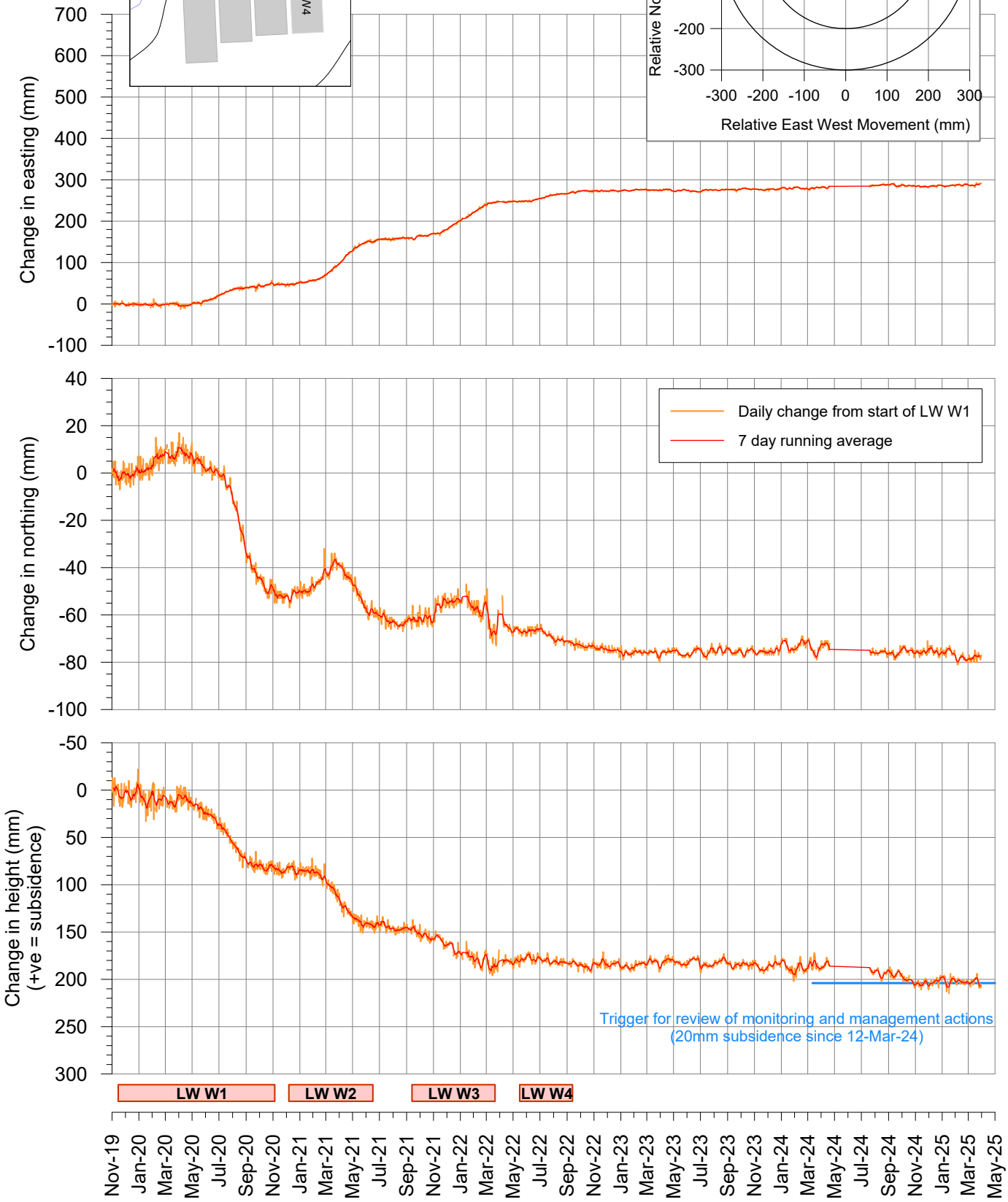
Site 10 - PMLL at 89.000km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 10 - Site 10.grf



During LW W1
During LW W2
During LW W3
During LW W4





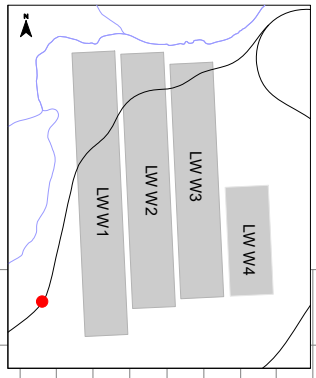
msec

Fig. 10-R05

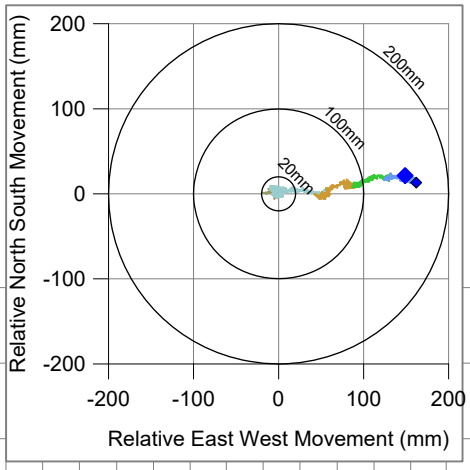
Tahmoor Western Domain - GNSS Monitoring

Site 11 - PMLL at 89.629km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 11 - Site 11.grf



During LW W1
During LW W2
During LW W3
During LW W4



Change in easting (mm)

500
400
300
200
100
0
-100

Change in northing (mm)

Daily change from start of LW W1
7 day running average

80
60
40
20
0
-20
-40

Change in height (mm)
(+ve = subsidence)

-20
0
20
40
60
80
100
120

Trigger for review of monitoring and management actions
(20mm subsidence since 12-Mar-24)

LW W1 LW W2 LW W3 LW W4

Nov-19 Jan-20 Mar-20 May-20 Jul-20 Sep-20 Nov-20 Jan-21 Mar-21 May-21 Jul-21 Sep-21 Nov-21 Jan-22 Mar-22 May-22 Jul-22 Sep-22 Nov-22 Jan-23 Mar-23 May-23 Jul-23 Sep-23 Nov-23 Jan-24 Mar-24 May-24 Jul-24 Sep-24 Nov-24 Jan-25 Mar-25 May-25

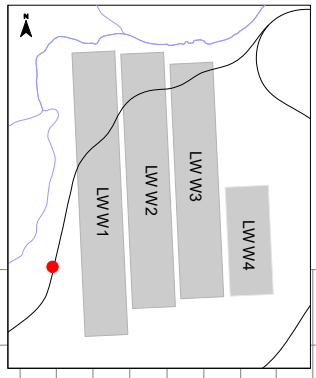
msec

Fig. 11-R05

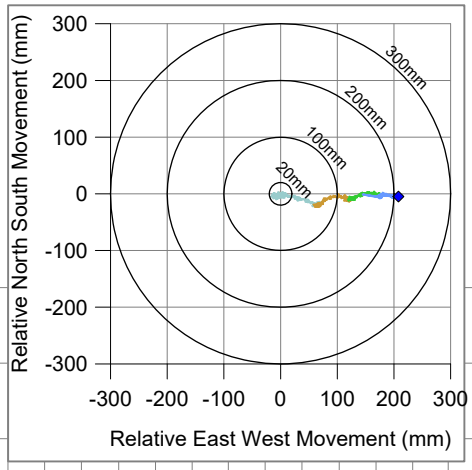
Tahmoor Western Domain - GNSS Monitoring

Site 19 - PMLL at 89.440km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 12 - Site 19.grf



During LW W1
During LW W2
During LW W3
During LW W4



Change in easting (mm)

500 400 300 200 100 0 -100

Change in northing (mm)

60 40 20 0 -20 -40 -60

Daily change from start of LW W1
7 day running average

Site 19 offline since 25-Apr-24.
Awaiting access to investigate.

Change in height (mm)
(+ve = subsidence)

-20 0 20 40 60 80 100 120 140

Trigger for review of monitoring and management actions
(20mm subsidence since 12-Mar-24)

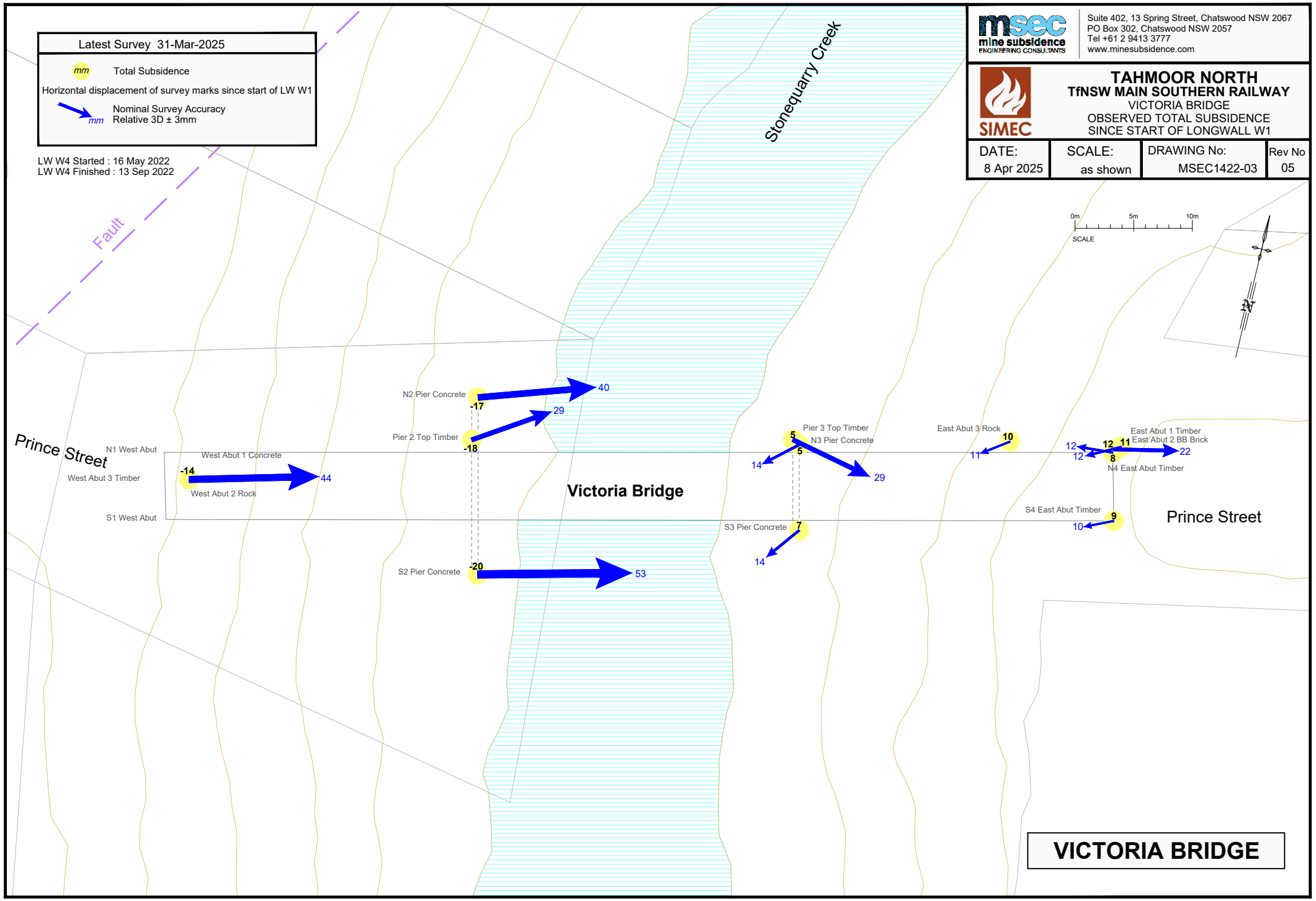
LW W1 LW W2 LW W3 LW W4

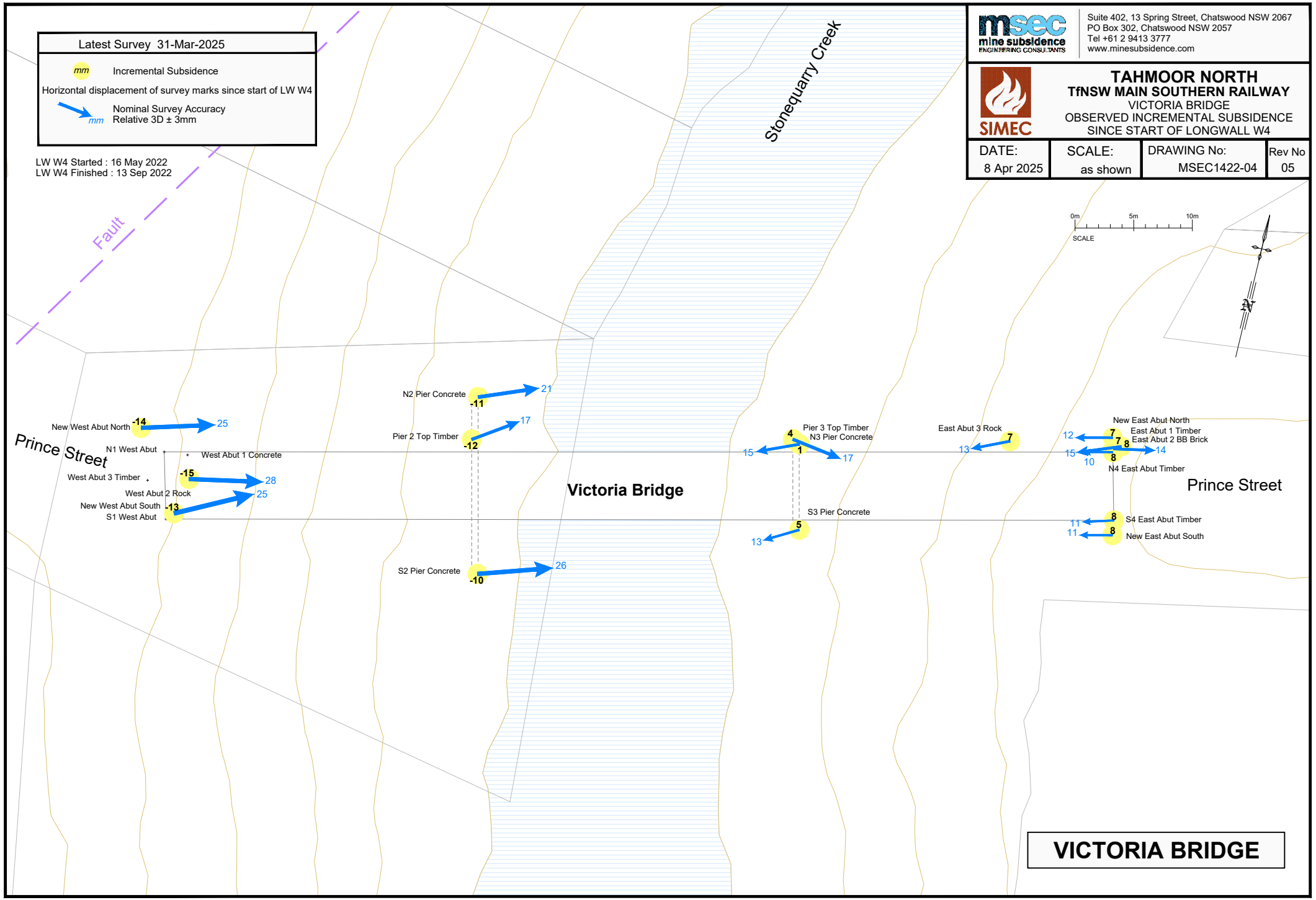
Nov-19 Jan-20 Mar-20 May-20 Jul-20 Sep-20 Nov-20 Jan-21 Mar-21 May-21 Jul-21 Sep-21 Nov-21 Jan-22 Mar-22 May-22 Jul-22 Sep-22 Nov-22 Jan-23 Mar-23 May-23 Jul-23 Sep-23 Nov-23 Jan-24 Mar-24 May-24 Jul-24 Sep-24 Nov-24 Jan-25 Mar-25 May-25

msec

Fig. 12-R05

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\AcadData\MSEC1422-03 Victoria Bridge - Total.dwg




Latest Survey 31-Mar-2025
mm Incremental Subsidence
Horizontal displacement of survey marks since start of LW W4
mm Nominal Survey Accuracy
Relative 3D ± 3mm
LW W4 Started : 16 May 2022
LW W4 Finished : 13 Sep 2022
Fault
Stonequarry Creek
Prince Street
Victoria Bridge
Prince Street
N2 Pier Concrete
-11
21
Pier 2 Top Timber
-12
17
New West Abut North
-14
25
N1 West Abut
West Abut 1 Concrete
West Abut 3 Timber
-15
28
West Abut 2 Rock
25
New West Abut South
-13
S1 West Abut
S2 Pier Concrete
-10
26
Pier 3 Top Timber
N3 Pier Concrete
4
1
15
17
S3 Pier Concrete
5
13
East Abut 3 Rock
7
13
New East Abut North
East Abut 1 Timber
East Abut 2 BB Brick
12
7
7
8
15
14
10
8
N4 East Abut Timber
8
S4 East Abut Timber
11
8
11
New East Abut South
0m
5m
10m
SCALE
N
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Suite 402, 13 Spring Street, Chatswood NSW 2067
PO Box 302, Chatswood NSW 2057
Tel +61 2 9413 3777
www.minesubsidence.com
SIMEC
TAHMOOR NORTH
TfNSW MAIN SOUTHERN RAILWAY
VICTORIA BRIDGE
OBSERVED INCREMENTAL SUBSIDENCE
SINCE START OF LONGWALL W4
DATE: 8 Apr 2025
SCALE: as shown
DRAWING No: MSEC1422-04
Rev No 05
VICTORIA BRIDGE

Tahmoor Western Domain - Main Southern Railway
GNSS Monitoring at Victoria Bridge (Sites 03 and 25)

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 13 - Sites 3 and 25.grf

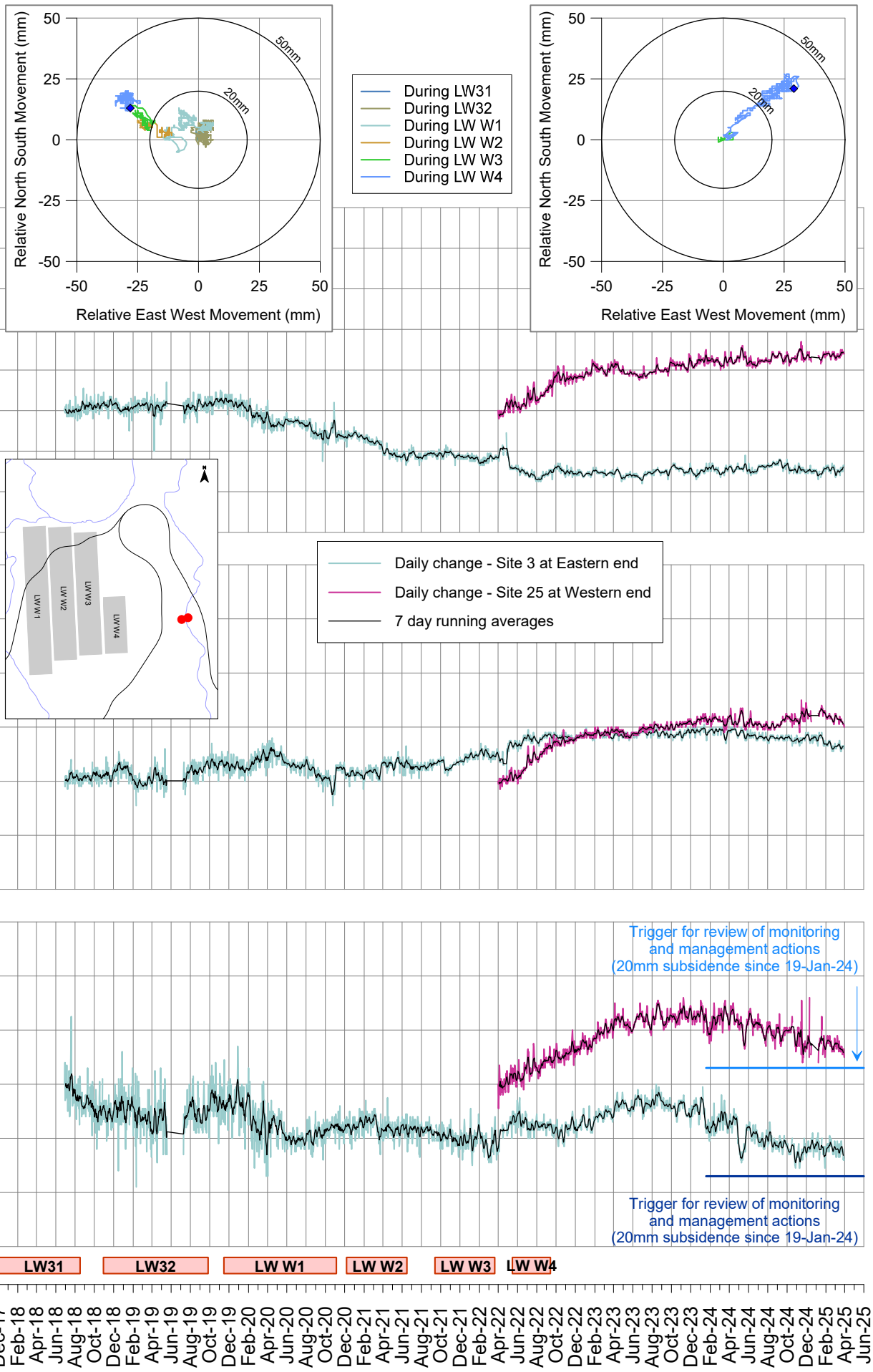
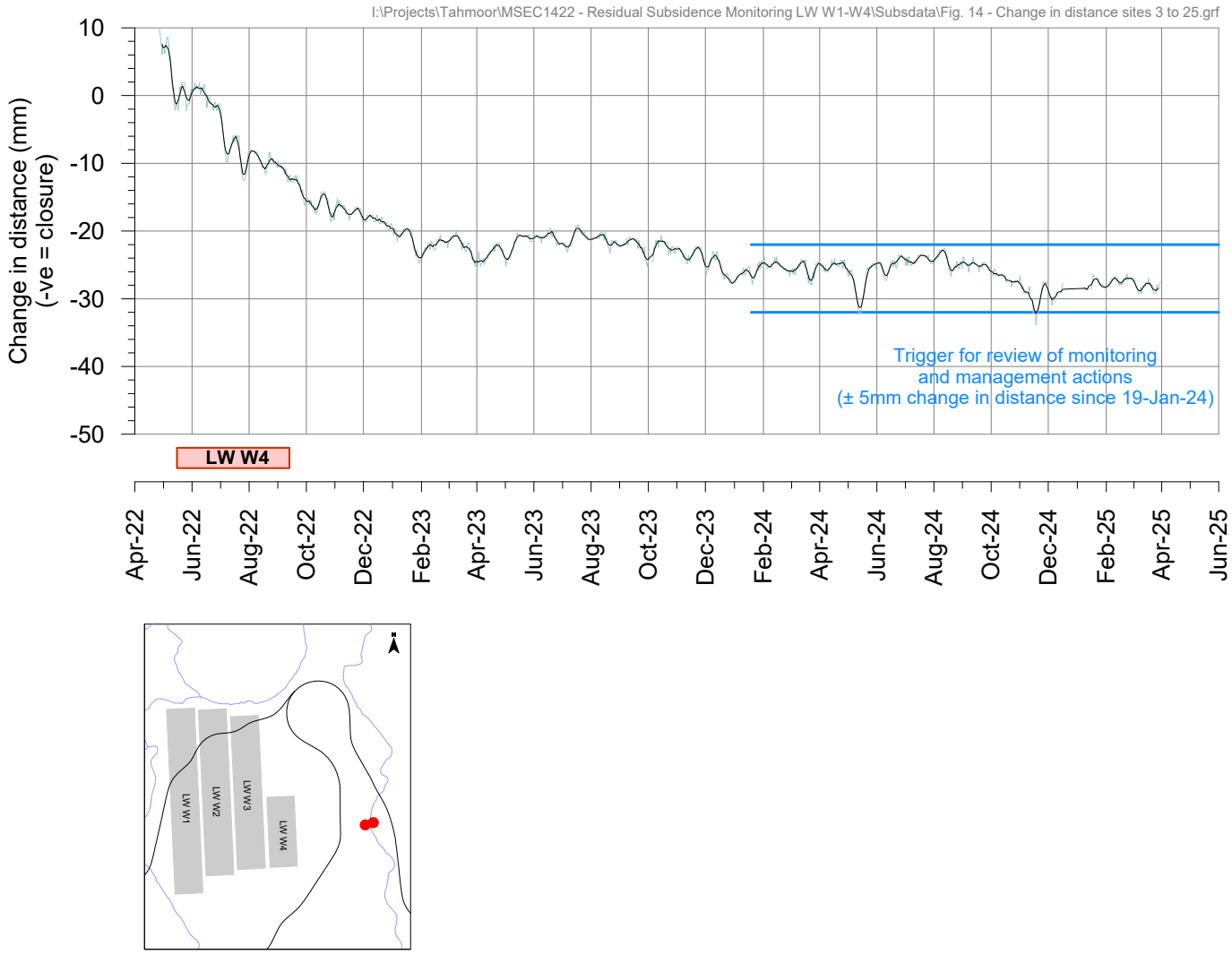


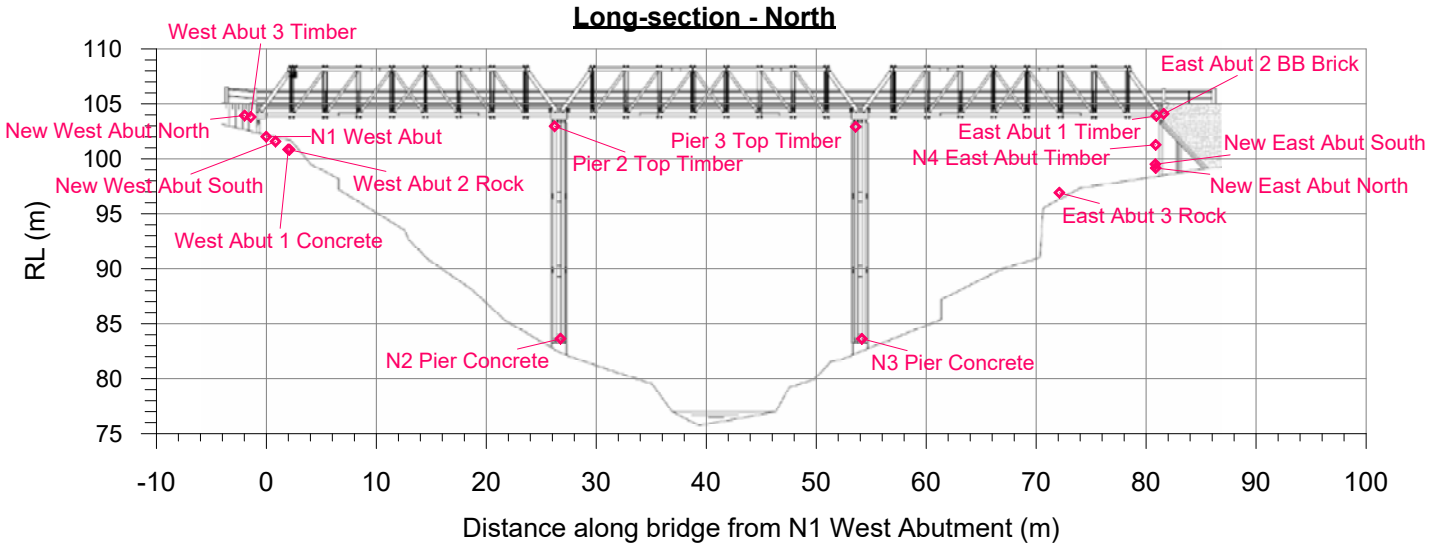
Fig. 13-R05

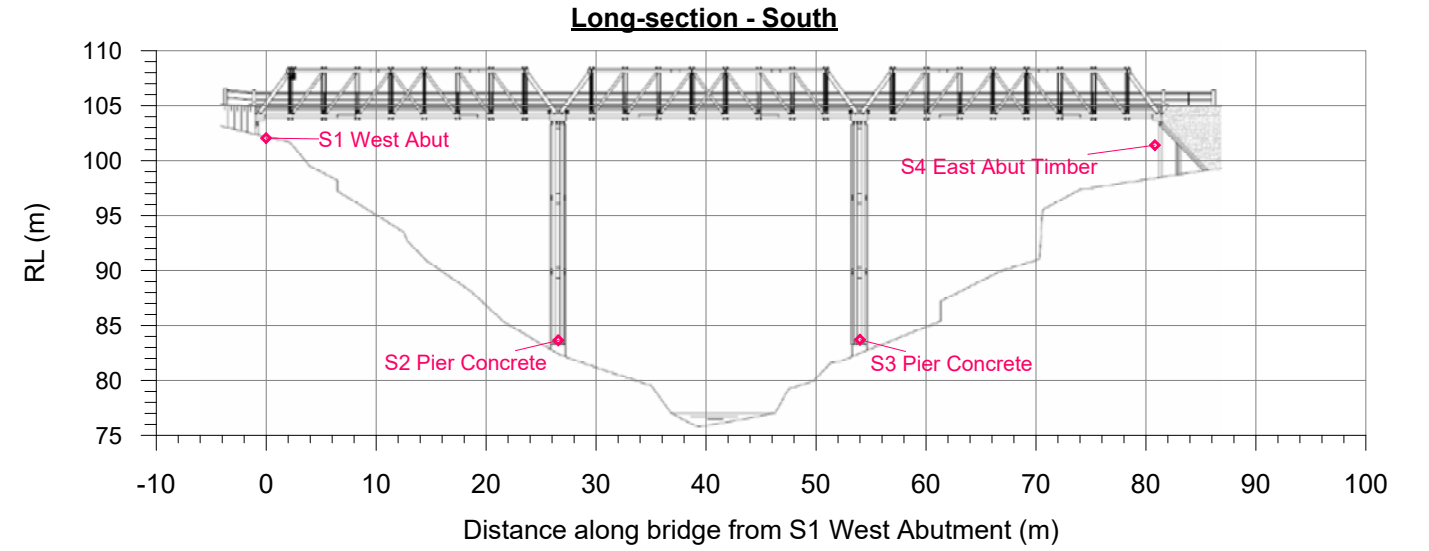
Tahmoor Western Domain - Main Southern Railway
GNSS Monitoring at Victoria Bridge (Sites 03 and 25)

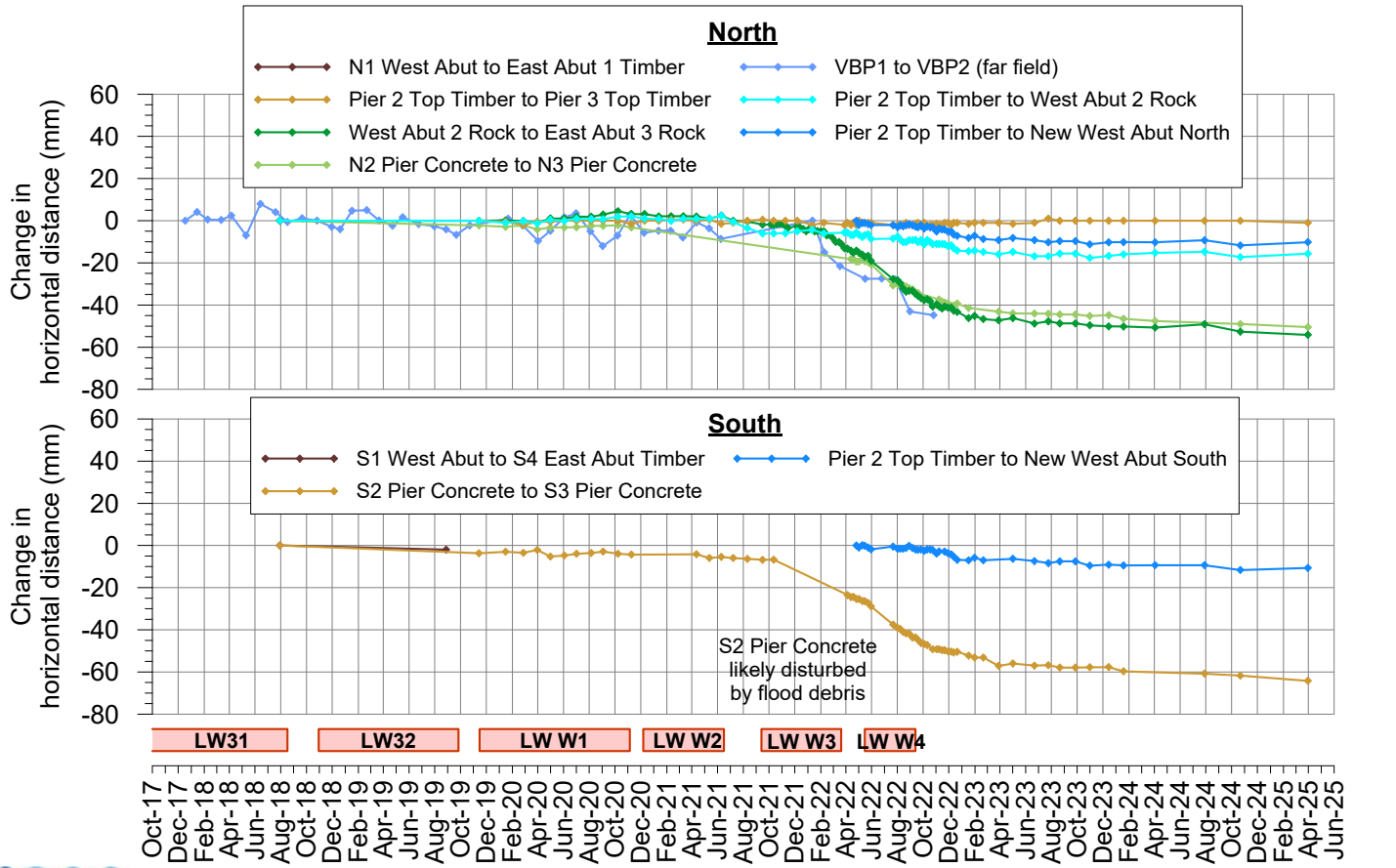


Victoria Bridge over Stonequarry Creek - Total changes

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 15 - Victoria Bridge Total.grf



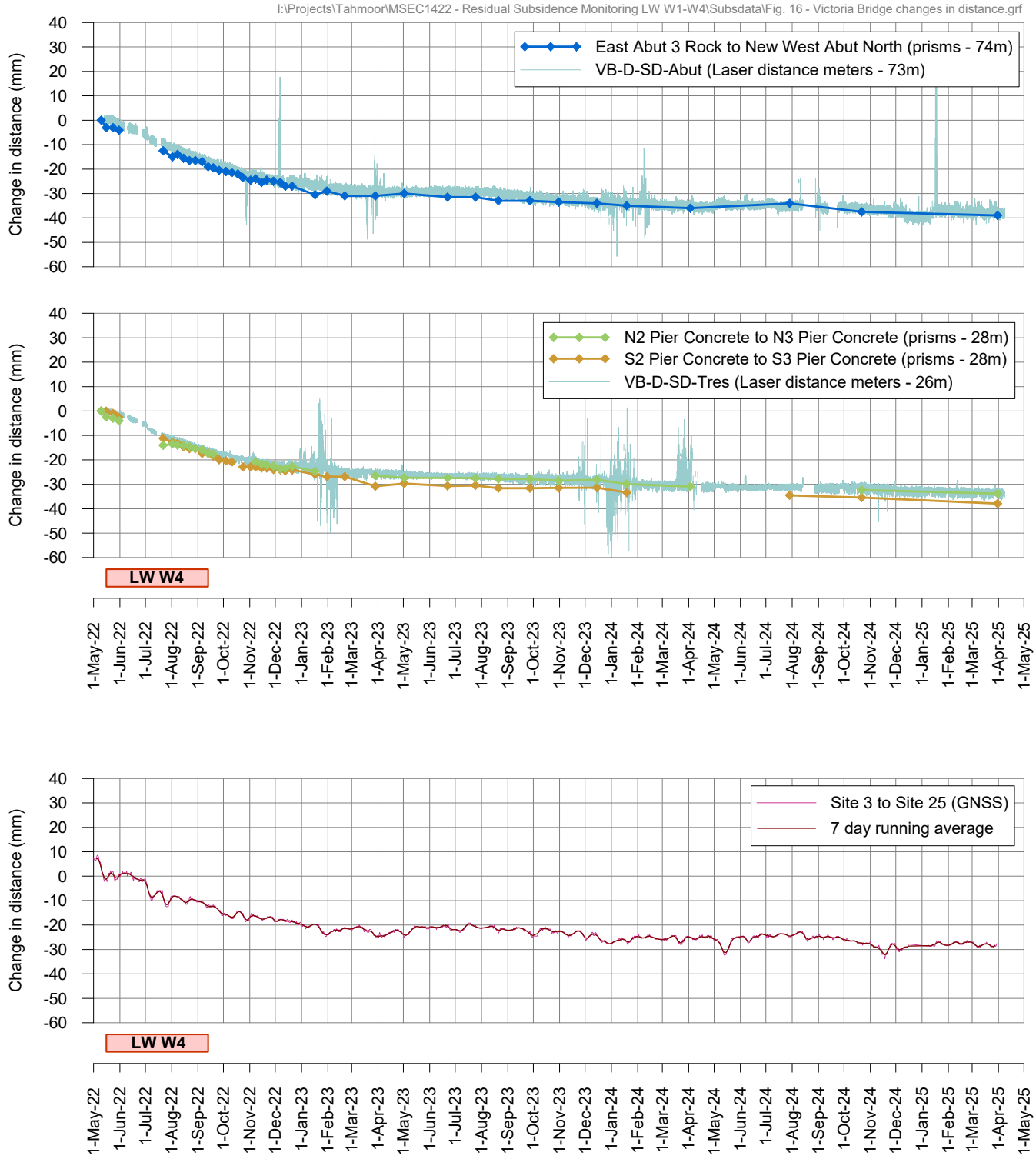




msec

Fig. 15-R05

Incremental changes in distance along Victoria Bridge



TAHMOOR COAL: WESTERN DOMAIN

Residual Subsidence Monitoring Status Report No. 06
Post mining LW W1-W4 in the Western Domain

Reporting Period	1 April 2025 to 14 August 2025	
Total subsidence at end of reporting period	736 mm	at Site 24 on 14 August 2025
Maximum subsidence since MSR ground survey on 19 January 2024	45 mm	at Site 24 on 14 August 2025
Maximum change in subsidence during last quarter	7 mm	at Site 0 (31 March 2025 to 14 August 2025)

Summary of monitoring and inspections

Monitoring Activity	Total subsidence or change in distance	Change in subsidence during last quarter	Highest Trigger	Comments
GNSS units				
GNSS unit above centreline of LW W4 (Site 24)	731	-5	N/A	Trend of ongoing residual subsidence observed, with rates of change reducing to low levels since Nov 2023. Very little change during 2025.
Main Southern Railway (ARTC)				
GNSS unit (Site 1) Picton Tunnel 87.85 km	-6	-12		Very minor change in subsidence since MSR ground survey on 19 January 2024. Change in subsidence less than 20 mm trigger. Data missing since 8 January 2025 has been recovered.
GNSS unit (Site 0) Picton Viaduct (85.42 km)	43	7		Very minor change in subsidence since MSR ground survey on 19 January 2024. Change in subsidence less than 20 mm trigger. New base values 19 July 2024. Data missing since 8 January has been recovered.
GNSS units (Site 2) Picton Viaduct (85.42 km)	-2	-2		Very minor change in subsidence since MSR ground survey on 19 January 2024. Change in subsidence less than 20 mm trigger.
Change in distance between Sites 0 and 2 across Picton Viaduct	-12	8		Small changes in distance since MSR ground survey on 19 January 2024. Change in distance is less than 5 mm trigger. Data missing since 8 January 2024 has been recovered. Results showed a recovery of previously observed closure between the GNSS units. Additional Precision 2D survey on 11 June 2025 confirms no material change.
GNSS unit (Site 26) at 88.78 km	-18	-6		GNSS unit shifted to the south-west and upwards after installation, with small changes observed since early May 2024. Minor changes observed during reporting period. Change in subsidence less than 20 mm trigger. Data missing since 8 January has been recovered.
GNSS unit (Site 27) at 88.60 km	5	-1		Very minor change in subsidence since MSR ground survey on 19 January 2024. Change in subsidence less than 20 mm trigger. Data missing between 27 February and 15 April 2025 has been recovered. Last reading on 15 June 2025. Solar panel has been stolen and awaiting repairs.

Monitoring Activity	Total subsidence or change in distance	Change in subsidence during last quarter	Highest Trigger	Comments
Picton-Mittagong Loop Line (THNSW)				
GNSS unit (Site 7) Culvert at 87.850 km	465	-3		Very minor change in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence less than 20 mm trigger. Data missing since 28 July 2024 has been recovered. Unit back online on 12 July 2025.
GNSS unit (Site 8) Above LW W2 at 88.110 km	682	-4		Very minor change in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence less than 20 mm trigger. Data missing since 28 July 2024 has been recovered.
GNSS unit (Site 9) Above LW W1 at 88.550 km	528	-7		Very minor change increase in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence less than 20 mm trigger. Data missing between 5 October 2024 and 20 April 2025 has been recovered. Unit back online on 12 July 2025.
GNSS unit (Site 10) at 89.000 km	198	-9		Very minor change in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence exceeded 20 mm trigger intermittently. IMG met on 16 May 2025 and agreed to increase the trigger level to 40 mm. Observed rates of change are extremely small with no adverse impacts on the PMLL. Tahmoor Coal notified THNSW of the assessment.
GNSS unit (Site 11) at 89.629 km	73	-10		Very minor change in subsidence since briefing on Residual Monitoring Plan on 12 March 2024.
GNSS unit (Site 19) at 89.440 km	87	3		Very minor change in subsidence since briefing on Residual Monitoring Plan on 12 March 2024. Change in subsidence less than 20 mm trigger. Data missing since 25 April 2024 has been recovered.
Victoria Bridge over Stonequarry Creek (TfNSW)				
GNSS unit (Site 3) on eastern abutment	20	-7	N/A	Minor change in subsidence. Change in subsidence less than 20 mm trigger.
GNSS unit (Site 25) on western abutment	-18	-6	N/A	Unit repaired on 7 January 2025. Very minor ongoing change in horizontal movement. Change in subsidence less than 20 mm trigger.
Change in distance between Sites 3 and 25 across Victoria Bridge	-27	1	N/A	Very minor ongoing change in distance. Change in distance less than 5 mm trigger.
2D ground survey between Pegs West Abut 2 Rock and East Abut 3 Rock	-	Six monthly	N/A	Last survey 31 March 2025. Very little change observed over the last 2 years. Slight increase in closure of 1 mm since October 2024 survey.
Local 3D bridge survey	-	Six monthly	N/A	Last survey 31 March 2025. Very little change observed over the last 2 years.
Laser distancemeters	Hourly			Minor ongoing closure of 4 mm since April 2024 and < 1 mm across top of valley during this reporting period.
Measure gap between bridge deck and eastern Abutment B	-	Six monthly		TfNSW reinstated a gap between the timber deck and eastern abutment on 24 January 2023. Gap on 31 March 2025 was 14 mm on the south side (1 mm closure since October 2024 survey) and 9 mm on the north side (1 mm closure since October 2024 survey). Total closure along water pipe joints was 12 mm (increase of 1 mm since 22 October 2024).

Monitoring Activity	Total subsidence or change in distance	Change in subsidence during last quarter	Highest Trigger	Comments
Victoria Bridge over Stonequarry Creek (TfNSW) (continued)				
Visual inspection	-	-	N/A	TfNSW inspected the Bridge and reinstated a gap between the timber deck and the eastern abutment on 24 January 2023. Detailed inspection by structural engineer and TfNSW Bridge Inspector conducted on 20 November 2023. Expansion gap at Eastern abutment not fully closed (at least 10 mm), previously observed 10 mm gap in notch at Western abutment is closed. Bridge deck appears to be propped between abutments, with contact between bridge deck and Eastern abutment not yet known as hidden by timber retaining wall. Trusses in superstructure do not appear to have experienced significant compression. There are no immediate concerns with the bridge structure. No obvious changes observed on 19 January 2024. Termite activity observed to base of piers on 15 April 2024.
Natural Features				
Groundwater monitoring	Continuous	-	-	Trend of gradually increasing groundwater levels across the area, approaching groundwater levels measured prior to the start of LW W1. Groundwater data has been downloaded, with report due in the next month.
Management Actions				
Other management actions since previous report: ● Maintenance on some GNSS units.				
Any additional and/or outstanding management actions: ● Nil				
Consultation with stakeholders since previous report: ● Monitoring reports issued quarterly				
Forecast whether residual subsidence is likely to cause: **A. Track closure for any period unacceptable to ARTC** **B. Impact on the safety of operations on the Main Southern Railway** Based on monitoring results to date, and the controls implemented and available under the Residual Subsidence Monitoring Plan for Western Domain LW W1-W4, no triggers under this Monitoring Plan are expected to be exceeded in the next three months. Accordingly residual subsidence is not likely to result in the occurrence of either A or B above.				
Certified by Tahmoor Coal				
Name	Ross Barber			
Position	Project Manager			
Signature	*Ross Barber*			
Date	15 August 2025			

Copy of Report to:

Daniel Wakefield, Area Manager Ingleburn, ARTC
Sladjan Mitic, Senior Track & Civil Engineer Sydney, ARTC
Michael Irons, Property Manager – Wagga, ARTC
Brian Cooper, Manager Maintenance North-South, ARTC;
Peter Haskard, Manager Engineering, Interstate Network, ARTC

John Thorogood, Safety, Environment & Quality Manager, Transport Heritage NSW
Les Kelleher, Track Manager, Transport Heritage NSW

Cyril Gunaratne - TfNSW (Pavement Maintenance Planner)
Dony Castro - TfNSW (Bridge Maintenance Planner)
Richard Woods - Stantec (Senior Principal – Senior Bridge Engineer)

Clint Mason, Production Manager, Tahmoor Mine
Ian Cochran, Bridges and Structures Specialist, ONRSR
Ray Ramage, Principal Inspector – Subsidence, Mine Safety Inspectorate, Resources Regulator

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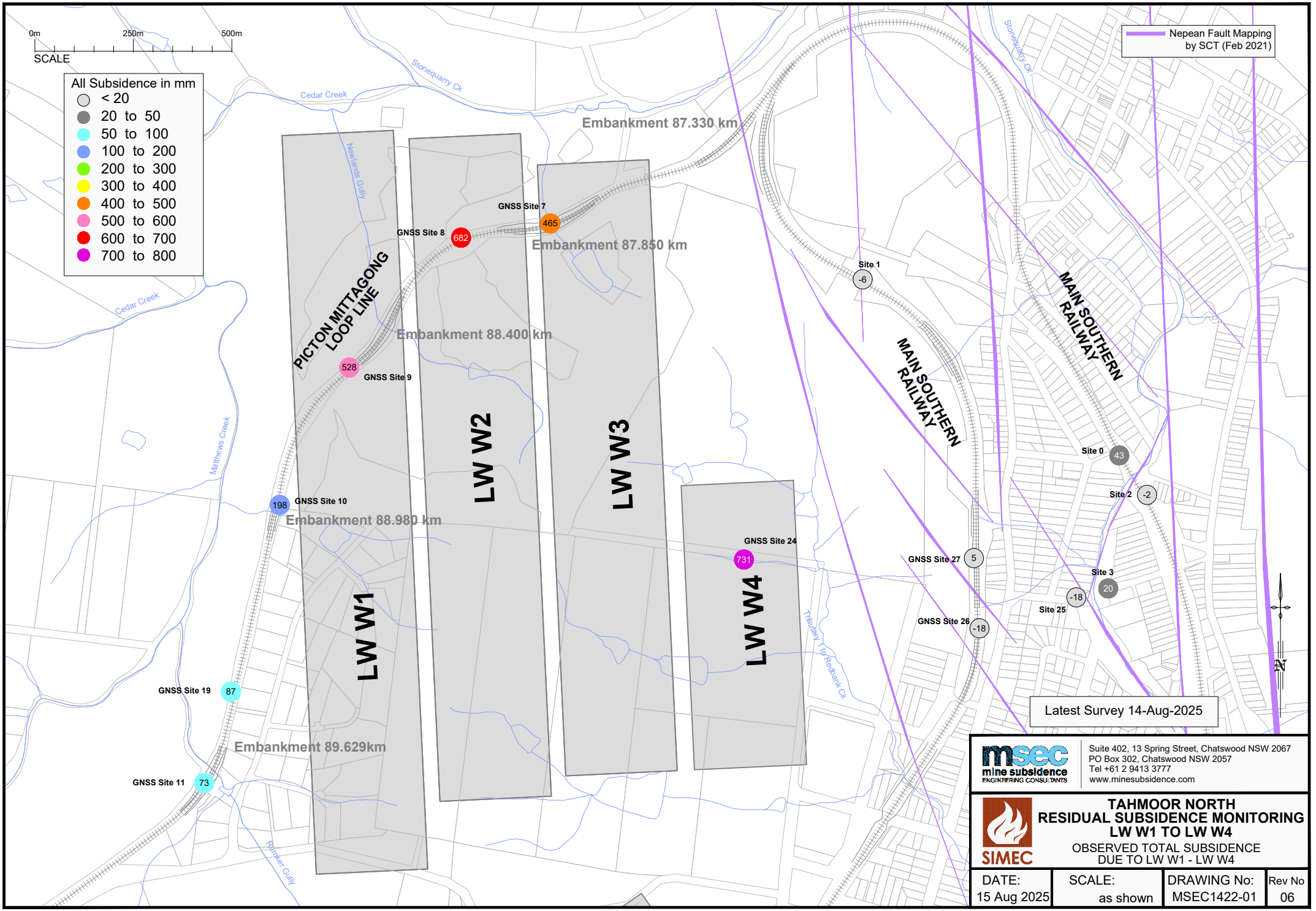

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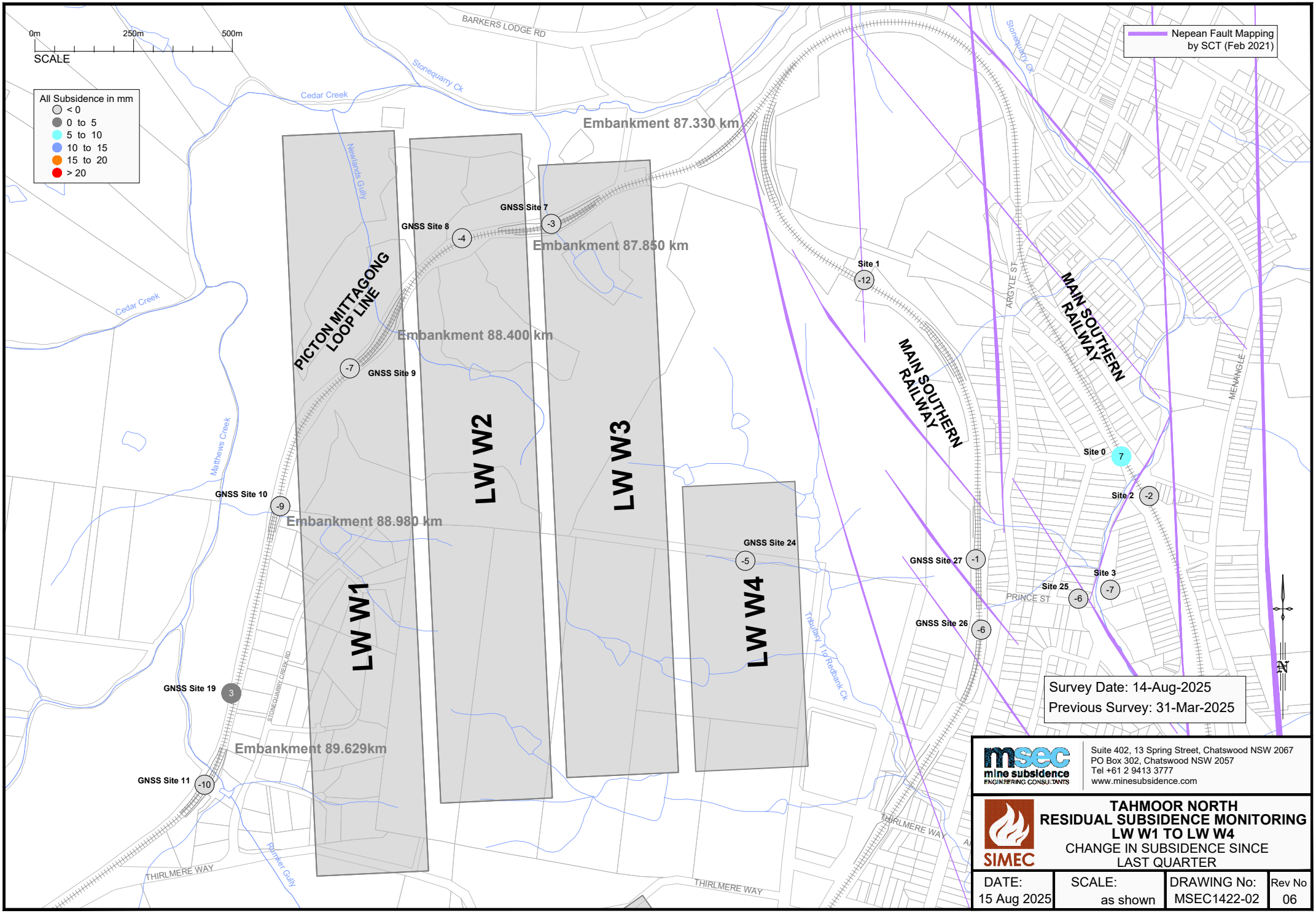

msec mine subsidence ENGINEERING CONSULTANTS
Suite 402, 13 Spring Street, Chatswood NSW 2067
PO Box 302, Chatswood NSW 2057
Tel +61 2 9413 3777
www.minesubsidence.com

SIMEC

TAHMOOR NORTH RESIDUAL SUBSIDENCE MONITORING LW W1 TO LW W4

CHANGE IN SUBSIDENCE SINCE LAST QUARTER

DATE:	SCALE:	DRAWING No:	Rev No
15 Aug 2025	as shown	MSEC1422-02	06

Tahmoor Western Domain - GNSS Monitoring

Site 24 above LW W4

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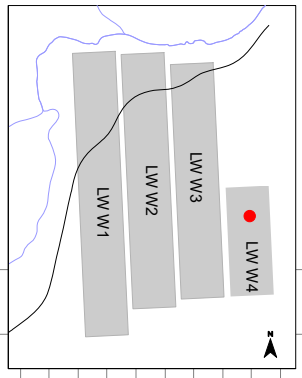
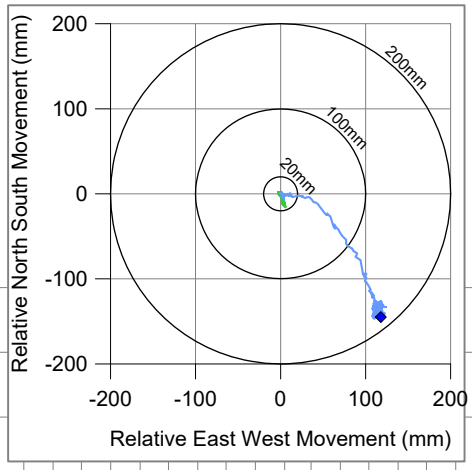




During LW W4

Change in easting (mm)

300
250
200
150
100
50
0
-50

Daily change

7 day running average

Change in northing (mm)

20
0
-20
-40
-60
-80
-100
-120
-140
-160
-180

Unit affected by solar flare activity in March 2024.
The GNSS chip was replaced on 16 April 2024.

Change in height (mm)
(+ve = subsidence)

0
100
200
300
400
500
600
700
800
900

LW W4

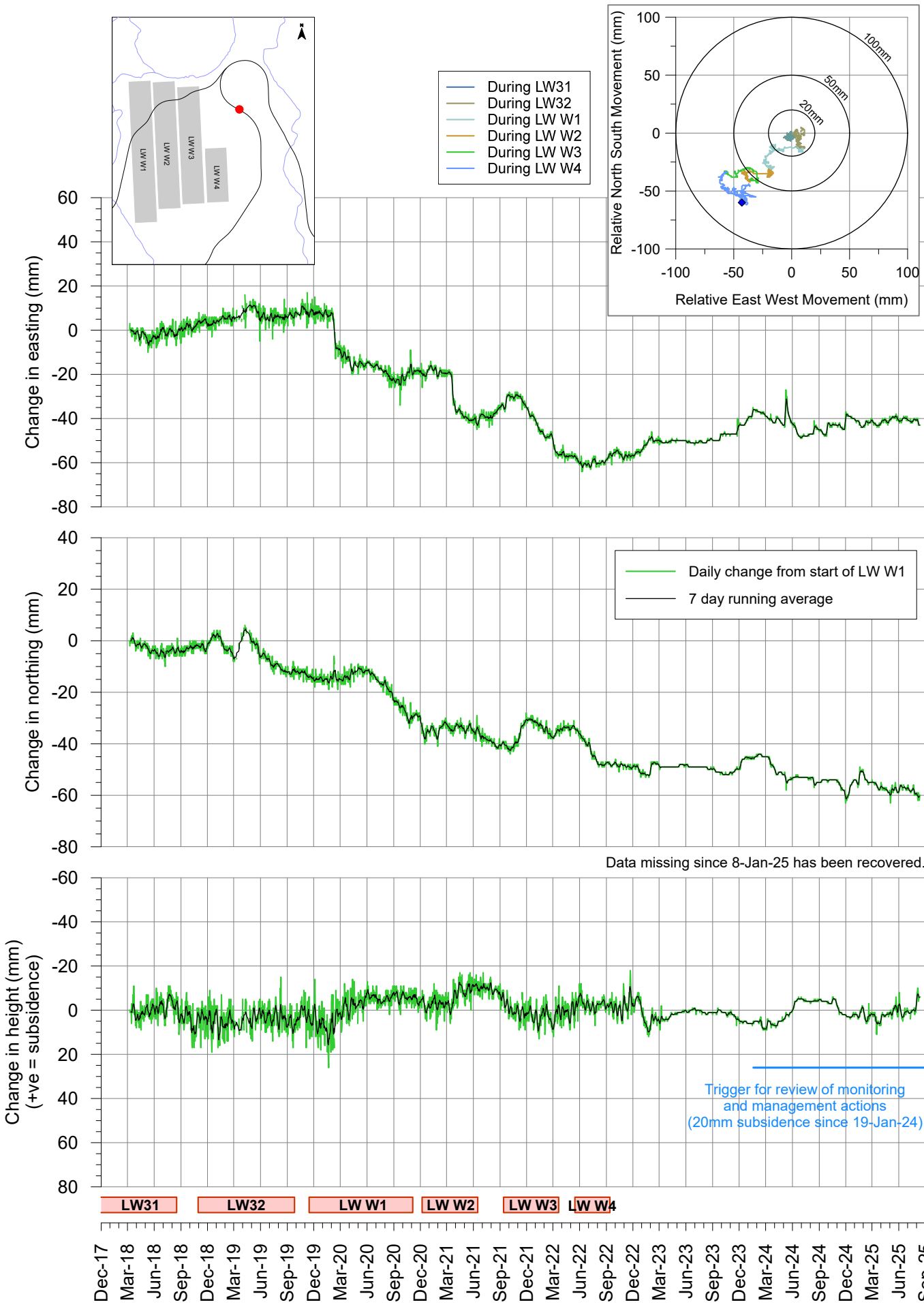
1-Mar-22
1-Apr-22
1-May-22
1-Jun-22
1-Jul-22
1-Aug-22
1-Sep-22
1-Oct-22
1-Nov-22
1-Dec-22
1-Jan-23
1-Feb-23
1-Mar-23
1-Apr-23
1-May-23
1-Jun-23
1-Jul-23
1-Aug-23
1-Sep-23
1-Oct-23
1-Nov-23
1-Dec-23
1-Jan-24
1-Feb-24
1-Mar-24
1-Apr-24
1-May-24
1-Jun-24
1-Jul-24
1-Aug-24
1-Sep-24
1-Oct-24
1-Nov-24
1-Dec-24
1-Jan-25
1-Feb-25
1-Mar-25
1-Apr-25
1-May-25
1-Jun-25
1-Jul-25
1-Aug-25
1-Sep-25

msec

Fig. 1-R06

Tahmoor Western Domain - Main Southern Railway
GNSS Monitoring at Picton Tunnel (Site 01)

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 2 - Site 1.grf



msec

Fig. 2-R06

Tahmoor Western Domain - Main Southern Railway
GNSS Monitoring at Picton Viaduct (Sites 00 and 02)

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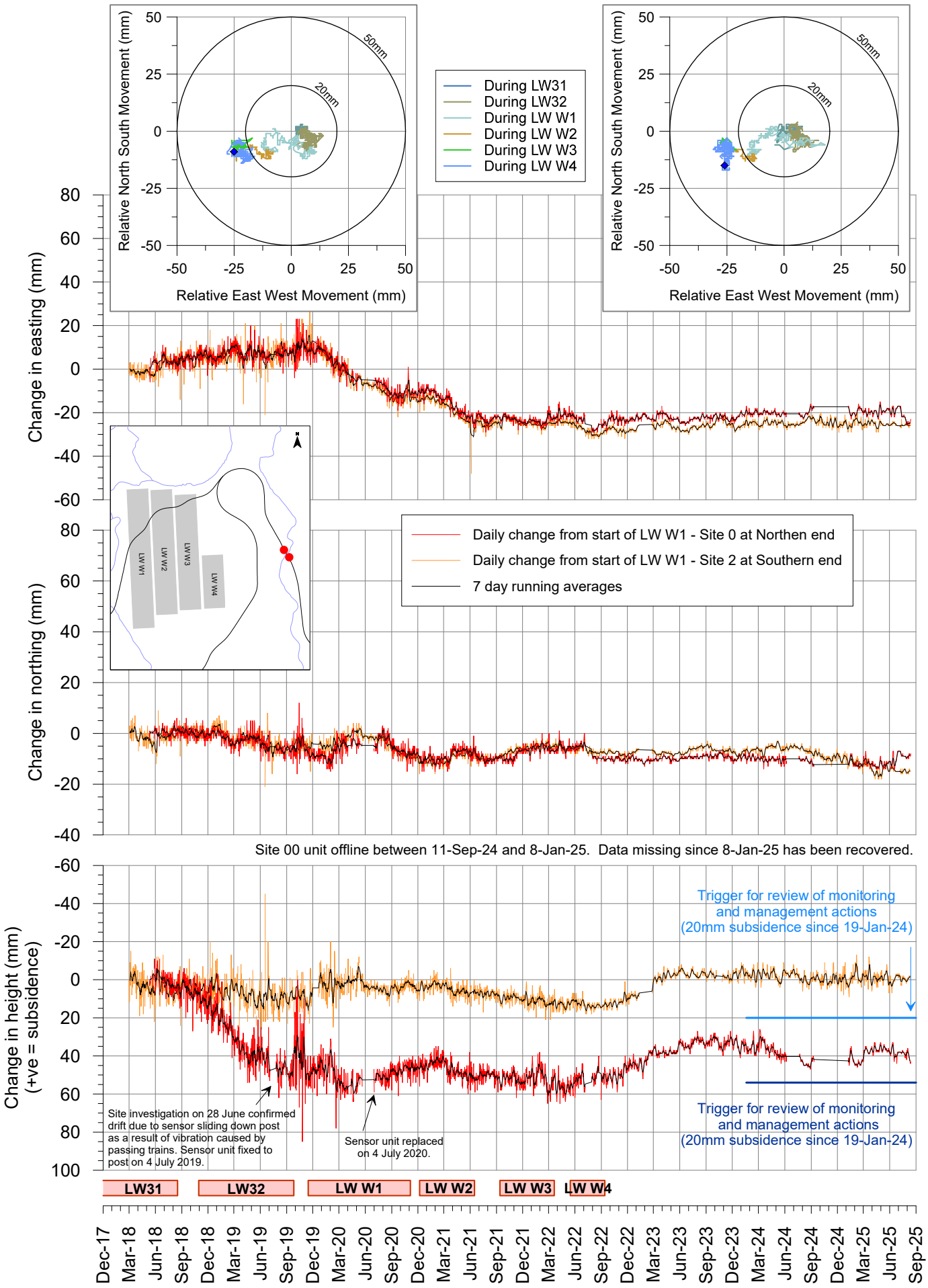
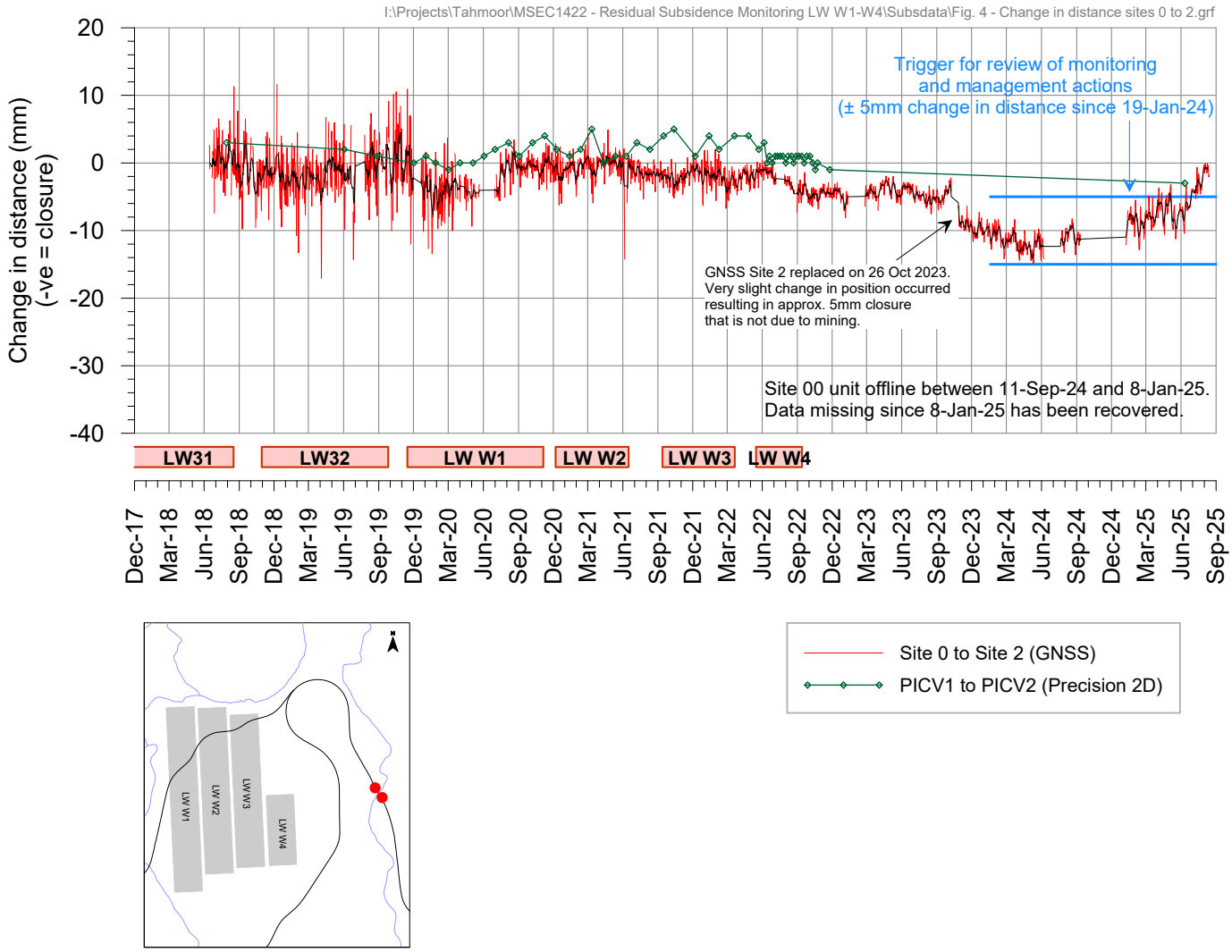


msec

Fig. 3-R06

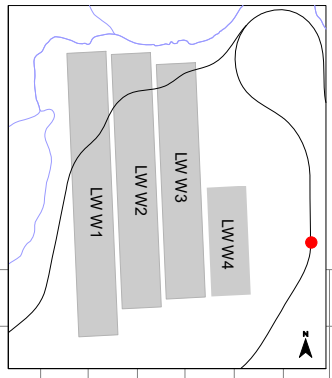
Tahmoor Western Domain - Main Southern Railway
GNSS Monitoring at Picton Viaduct (Sites 00 and 02)

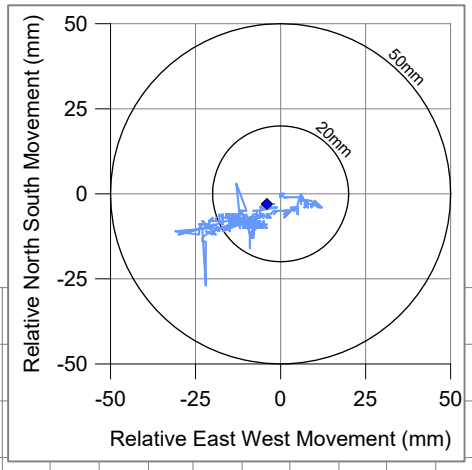


Tahmoor Western Domain - GNSS Monitoring

Site 26 - MSR at 88.78km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 5 - Site 26.grf





Post LW W4

Change in easting (mm)

40 30 20 10 0 -10 -20 -30 -40

Change in northing (mm)

20 10 0 -10 -20 -30

Daily change

7 day running average

Data missing since 8-Jan-25 has been recovered.

Change in height (mm)
(+ve = subsidence)

-50 -40 -30 -20 -10 0 10 20 30

Daily rain (mm)

160 140 120 100 80 60 40 20 0

Trigger for review of monitoring
and management actions
(20mm subsidence since 19-Jan-24)

1-Aug-23 1-Sep-23 1-Oct-23 1-Nov-23 1-Dec-23 1-Jan-24 1-Feb-24 1-Mar-24 1-Apr-24 1-May-24 1-Jun-24 1-Jul-24 1-Aug-24 1-Sep-24 1-Oct-24 1-Nov-24 1-Dec-24 1-Jan-25 1-Feb-25 1-Mar-25 1-Apr-25 1-May-25 1-Jun-25 1-Jul-25 1-Aug-25 1-Sep-25

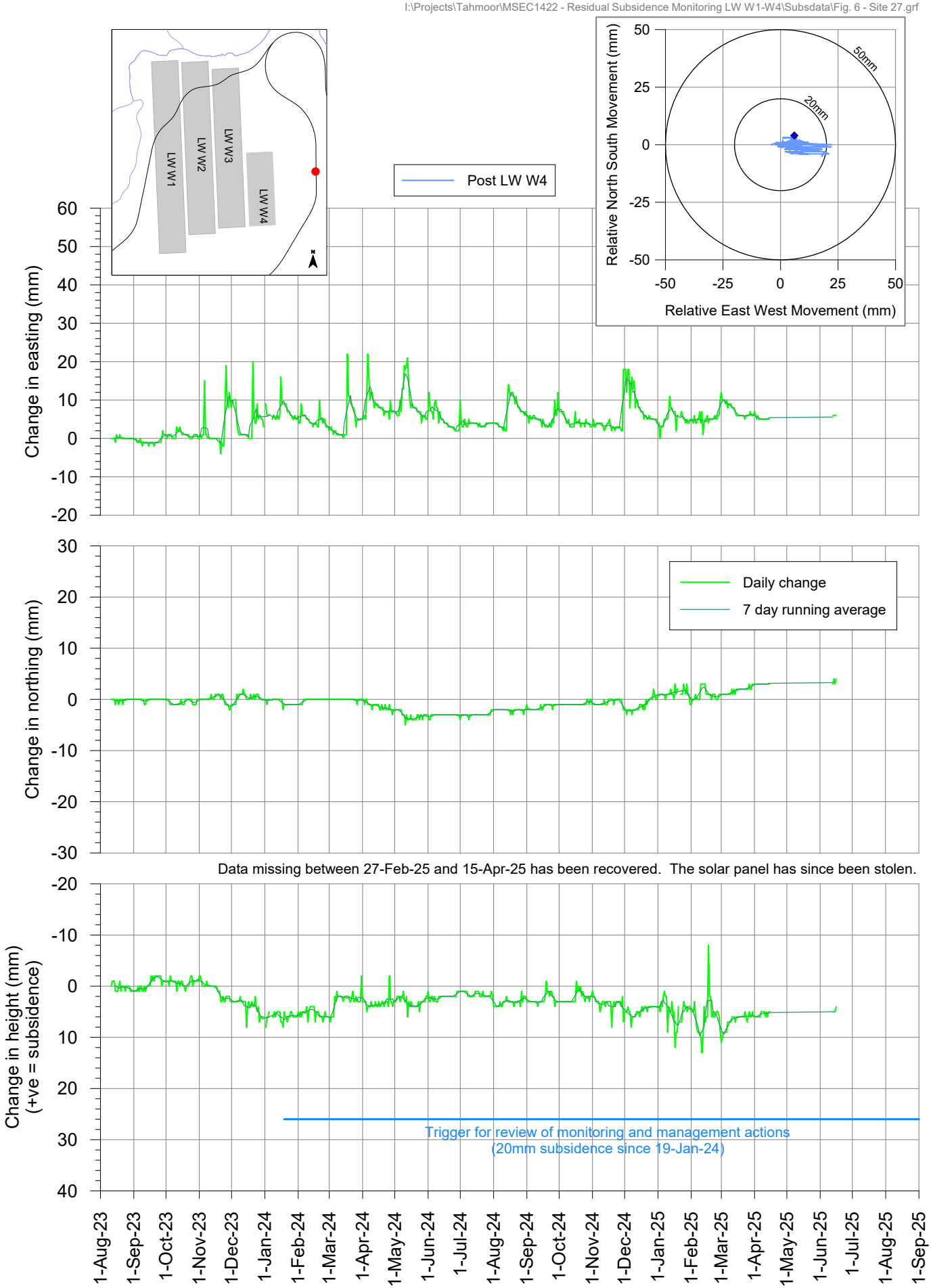
msec

Fig. 5-R06

Tahmoor LW W4 - GNSS Monitoring

Site 27 - MSR at 88.60km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 6 - Site 27.grf



Data missing between 27-Feb-25 and 15-Apr-25 has been recovered. The solar panel has since been stolen.

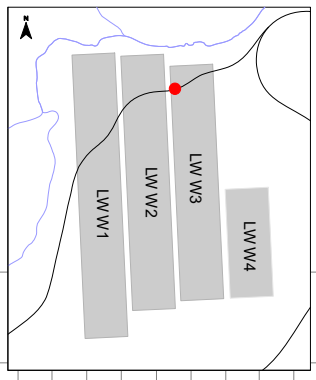
msec

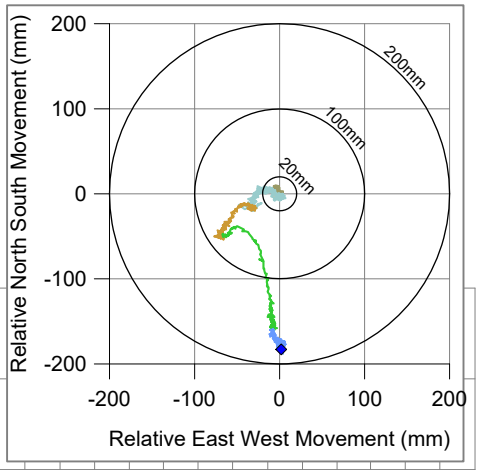
Fig. 6-R06

Tahmoor Western Domain - GNSS Monitoring

Site 7 - PMLL culvert at 87.850km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 7 - Site 7.grf





During LW W1
During LW W2
During LW W3
During LW W4

Change in easting (mm)

150
100
50
0
-50
-100

Change in northing (mm)

50
0
-50
-100
-150
-200
-250

Daily change from start of LW W1
7 day running average

Data missing between 28-Jul-24 and 28-Mar-25 has been recovered. Unit back online on 12-Jul-25.

Change in height (mm)
(+ve = subsidence)

-100
0
100
200
300
400
500
600

Trigger for review of monitoring and management actions
(20mm subsidence since 12-Mar-24)

LW W1
LW W2
LW W3
LW W4

Nov-19
Jan-20
Mar-20
May-20
Jul-20
Sep-20
Nov-20
Jan-21
Mar-21
May-21
Jul-21
Sep-21
Nov-21
Jan-22
Mar-22
May-22
Jul-22
Sep-22
Nov-22
Jan-23
Mar-23
May-23
Jul-23
Sep-23
Nov-23
Jan-24
Mar-24
May-24
Jul-24
Sep-24
Nov-24
Jan-25
Mar-25
May-25
Jul-25
Sep-25

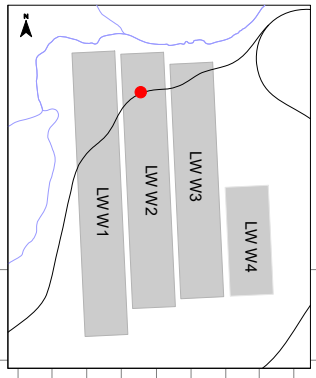
msec

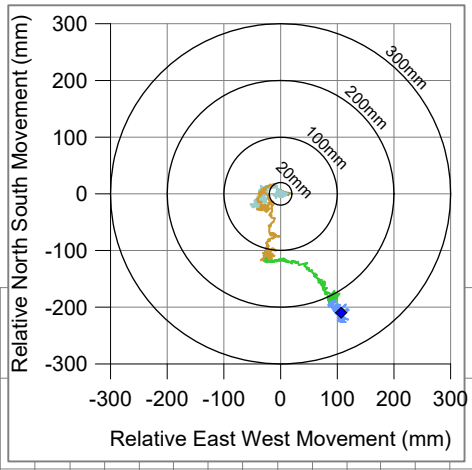
Fig. 7-R06

Tahmoor Western Domain - GNSS Monitoring

Site 8 - LW W2 centreline - PMLL at 88.110km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 8 - Site 8.grf





During LW W1
During LW W2
During LW W3
During LW W4

Change in easting (mm)

400 300 200 100 0 -100

Change in northing (mm)

50 0 -50 -100 -150 -200 -250 -300

Daily change from start of LW W1
7 day running average

Data missing since 28-Jul-24 has been recovered.

Change in height (mm)
(+ve = subsidence)

0 100 200 300 400 500 600 700 800 900

Trigger for review of monitoring and management actions
(20mm subsidence since 12-Mar-24)

LW W1 LW W2 LW W3 LW W4

Nov-19 Jan-20 Mar-20 May-20 Jul-20 Sep-20 Nov-20 Jan-21 Mar-21 May-21 Jul-21 Sep-21 Nov-21 Jan-22 Mar-22 May-22 Jul-22 Sep-22 Nov-22 Jan-23 Mar-23 May-23 Jul-23 Sep-23 Nov-23 Jan-24 Mar-24 May-24 Jul-24 Sep-24 Nov-24 Jan-25 Mar-25 May-25 Jul-25 Sep-25

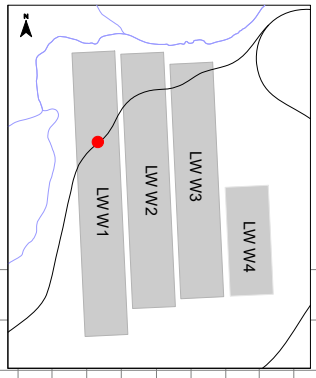
msec

Fig. 8-R06

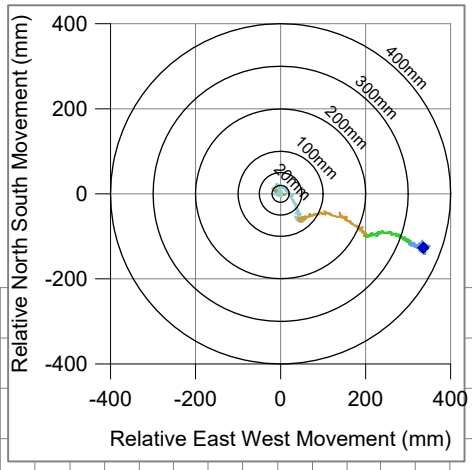
Tahmoor Western Domain - GNSS Monitoring

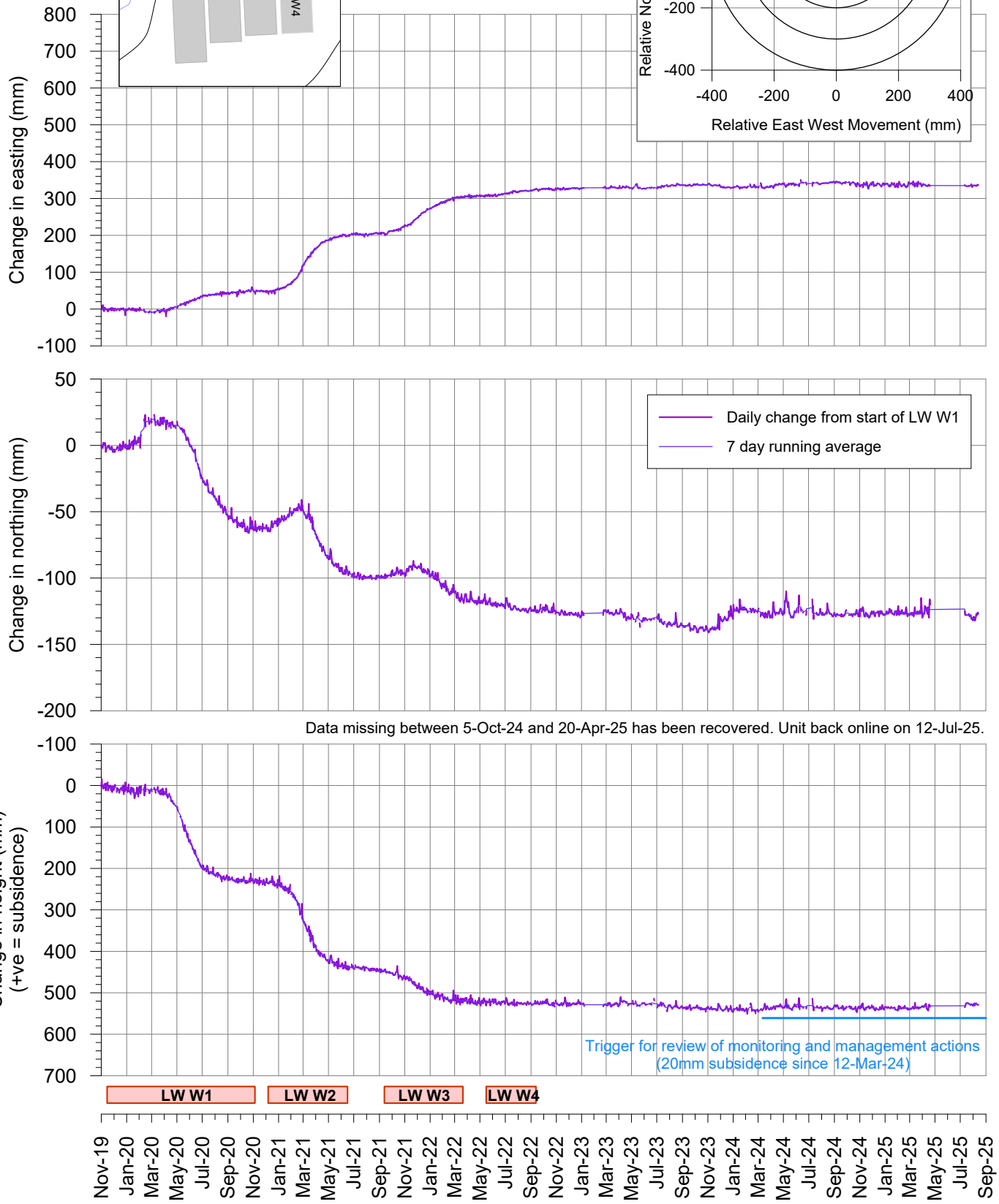
Site 9 - LW W1 centreline - PMLL at 88.550km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 9 - Site 9.grf



During LW W1
During LW W2
During LW W3
During LW W4





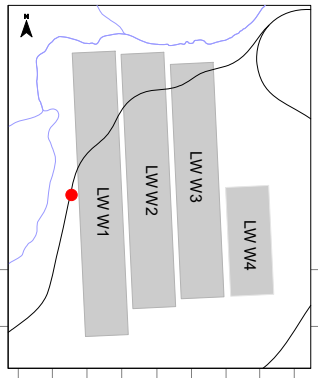
msec

Fig. 9-R06

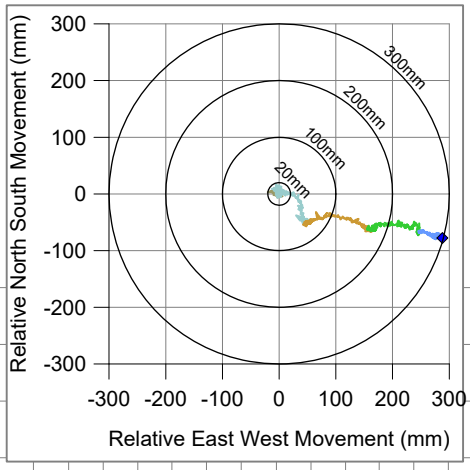
Tahmoor Western Domain - GNSS Monitoring

Site 10 - PMLL at 89.000km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 10 - Site 10.grf



During LW W1
During LW W2
During LW W3
During LW W4



Change in easting (mm)

700 600 500 400 300 200 100 0 -100

Change in northing (mm)

40 20 0 -20 -40 -60 -80 -100

Daily change from start of LW W1
7 day running average

Change in height (mm)
(+ve = subsidence)

-50 0 50 100 150 200 250 300

IMG agreed on 16 May 2025 to increase trigger level for the following reasons:
1. Rates of change are extremely small, with variations above and below the trigger levels.
2. The minor changes in subsidence have no adverse impact on the railway.
Tahmoor Coal notified PMLL of the assessment.

Trigger for review of monitoring and management actions
(20mm subsidence since 12-Mar-24)

LW W1 LW W2 LW W3 LW W4

Nov-19 Jan-20 Mar-20 May-20 Jul-20 Sep-20 Nov-20 Jan-21 Mar-21 May-21 Jul-21 Sep-21 Nov-21 Jan-22 Mar-22 May-22 Jul-22 Sep-22 Nov-22 Jan-23 Mar-23 May-23 Jul-23 Sep-23 Nov-23 Jan-24 Mar-24 May-24 Jul-24 Sep-24 Nov-24 Jan-25 Mar-25 May-25 Jul-25 Sep-25

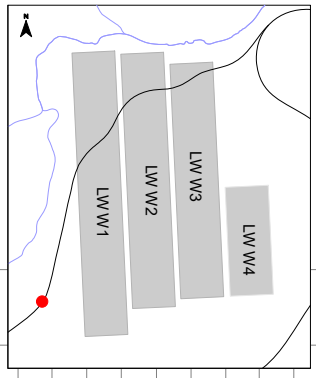
msec

Fig. 10-R06

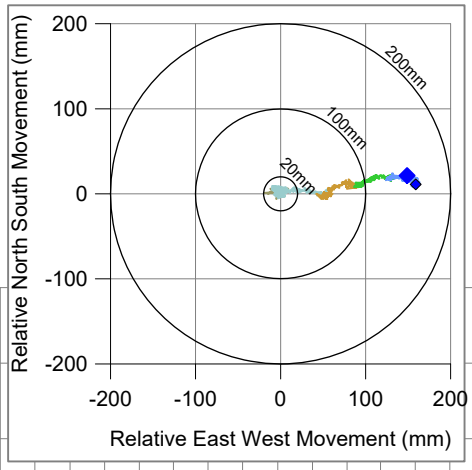
Tahmoor Western Domain - GNSS Monitoring

Site 11 - PMLL at 89.629km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 11 - Site 11.grf



During LW W1
During LW W2
During LW W3
During LW W4



Change in easting (mm)

500
400
300
200
100
0
-100

Change in northing (mm)

Daily change from start of LW W1
7 day running average

80
60
40
20
0
-20
-40

Change in height (mm)
(+ve = subsidence)

-20
0
20
40
60
80
100
120

Trigger for review of monitoring and management actions
(20mm subsidence since 12-Mar-24)

LW W1 LW W2 LW W3 LW W4

Nov-19 Jan-20 Mar-20 May-20 Jul-20 Sep-20 Nov-20 Jan-21 Mar-21 May-21 Jul-21 Sep-21 Nov-21 Jan-22 Mar-22 May-22 Jul-22 Sep-22 Nov-22 Jan-23 Mar-23 May-23 Jul-23 Sep-23 Nov-23 Jan-24 Mar-24 May-24 Jul-24 Sep-24 Nov-24 Jan-25 Mar-25 May-25 Jul-25 Sep-25

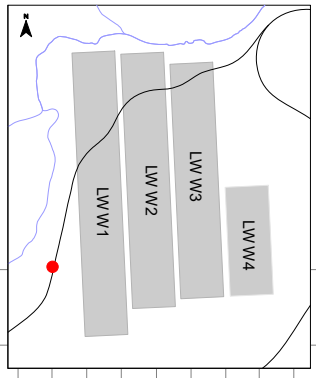
msec

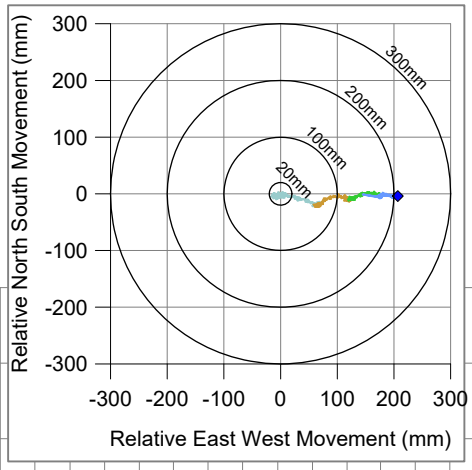
Fig. 11-R06

Tahmoor Western Domain - GNSS Monitoring

Site 19 - PMLL at 89.440km

I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 12 - Site 19.grf





During LW W1
During LW W2
During LW W3
During LW W4

Change in easting (mm)

500
400
300
200
100
0
-100

Daily change from start of LW W1
7 day running average

Change in northing (mm)

60
40
20
0
-20
-40
-60

Data missing since 25-Apr-24 has been recovered.

Change in height (mm)
(+ve = subsidence)

-20
0
20
40
60
80
100
120
140

Trigger for review of monitoring and management actions
(20mm subsidence since 12-Mar-24)

LW W1 LW W2 LW W3 LW W4

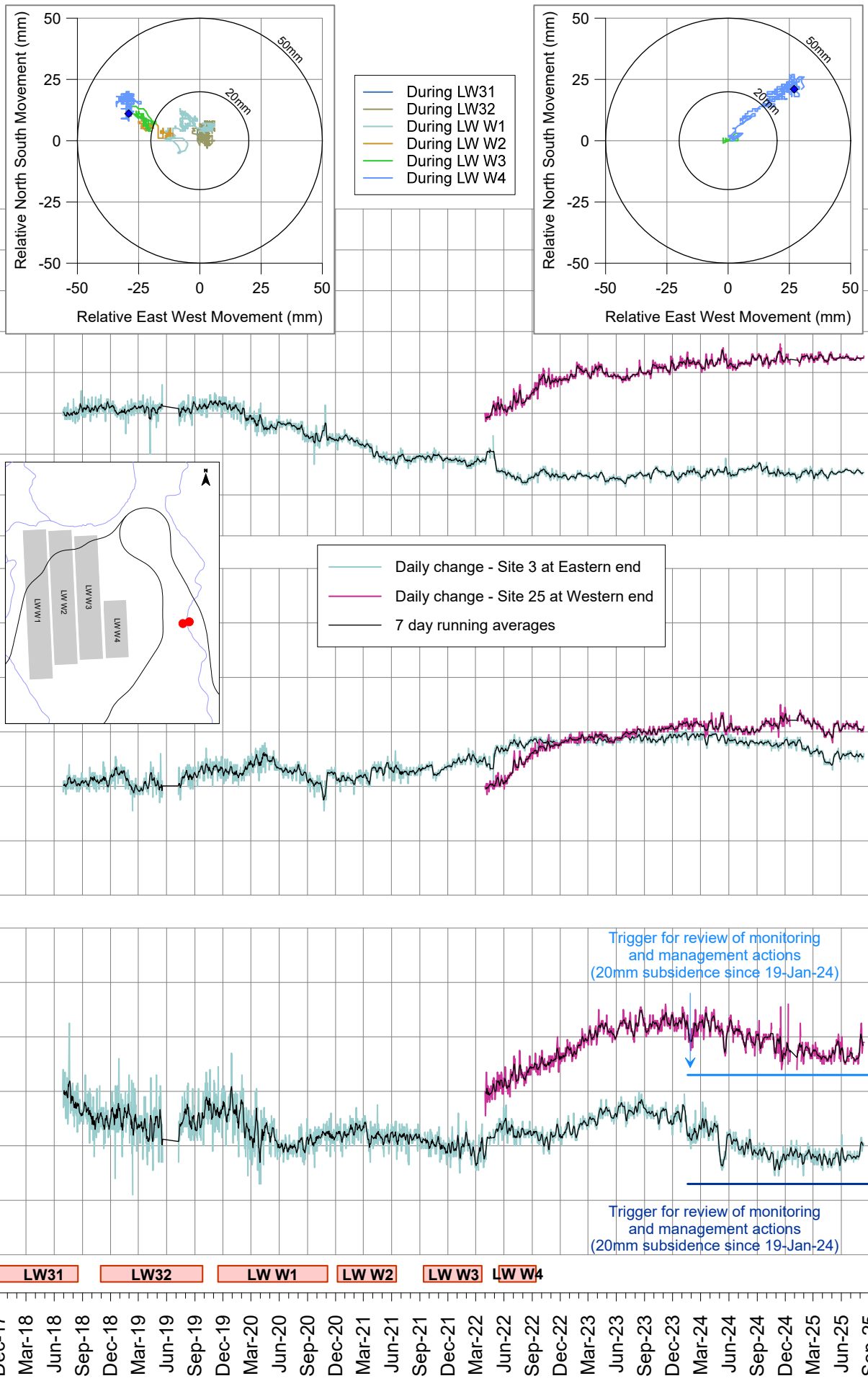
Nov-19 Jan-20 Mar-20 May-20 Jul-20 Sep-20 Nov-20 Jan-21 Mar-21 May-21 Jul-21 Sep-21 Nov-21 Jan-22 Mar-22 May-22 Jul-22 Sep-22 Nov-22 Jan-23 Mar-23 May-23 Jul-23 Sep-23 Nov-23 Jan-24 Mar-24 May-24 Jul-24 Sep-24 Nov-24 Jan-25 Mar-25 May-25 Jul-25 Sep-25

msec

Fig. 12-R06

Tahmoor Western Domain - Main Southern Railway
GNSS Monitoring at Victoria Bridge (Sites 03 and 25)

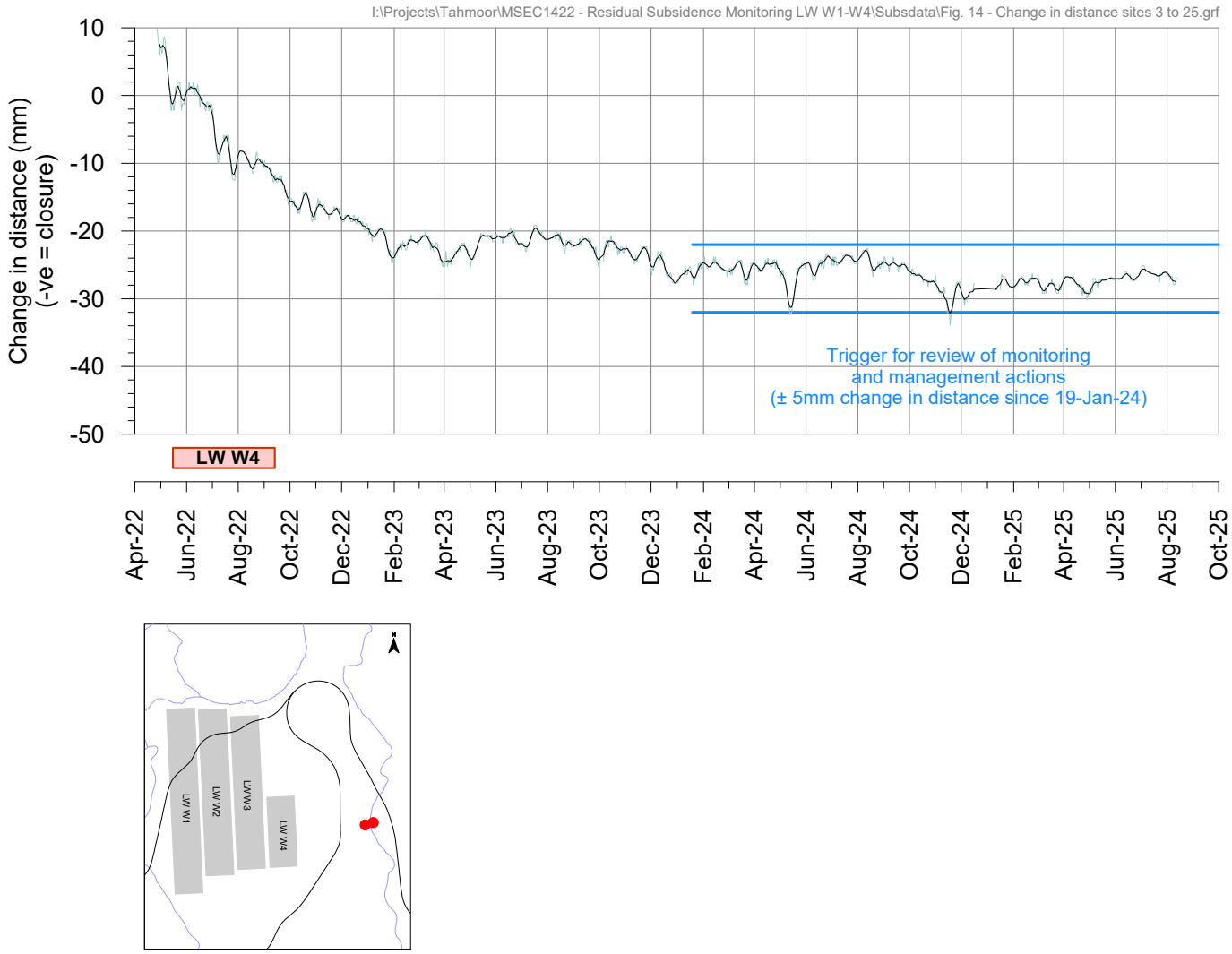
I:\Projects\Tahmoor\MSEC1422 - Residual Subsidence Monitoring LW W1-W4\Subsdata\Fig. 13 - Sites 3 and 25.grf



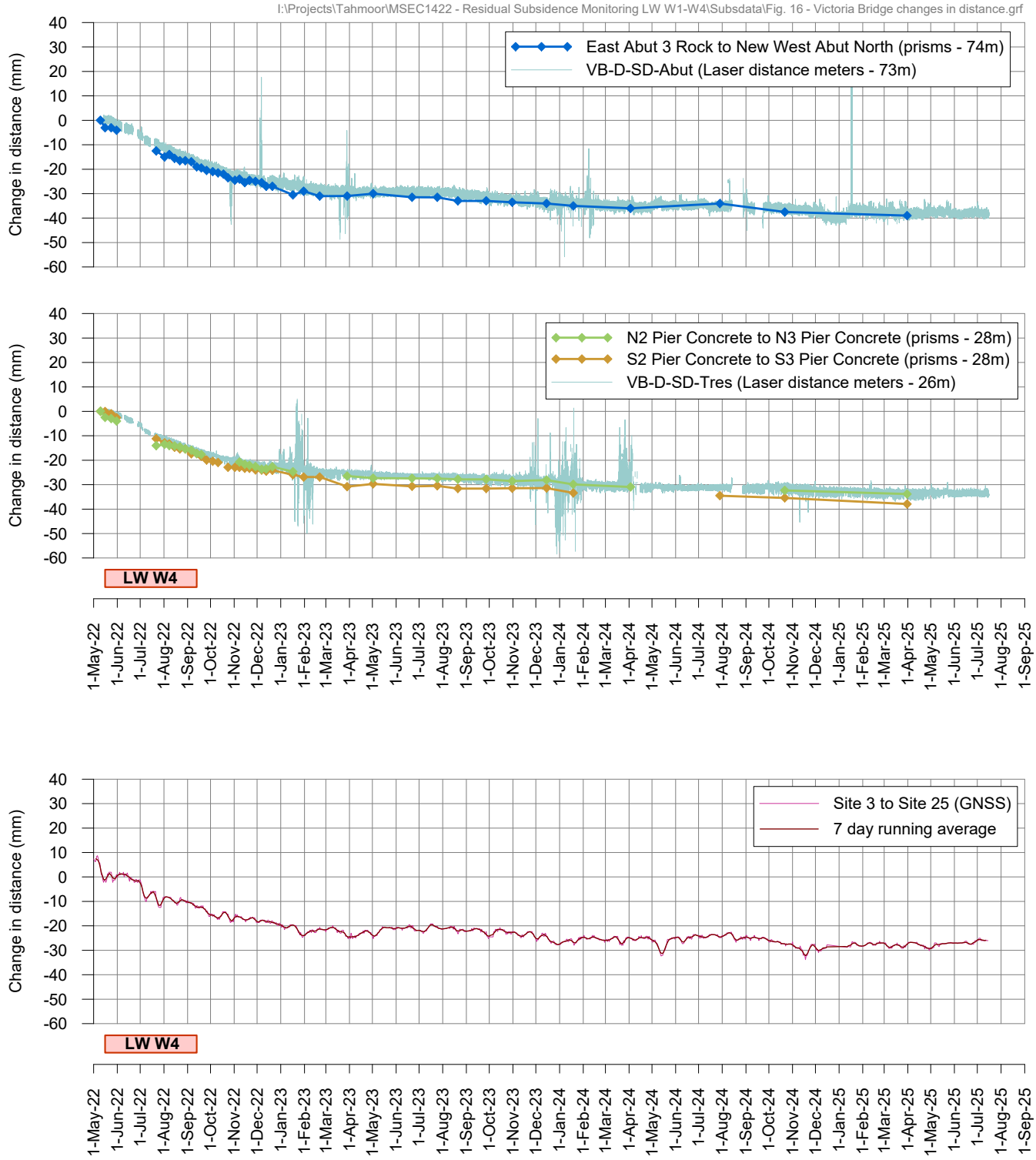
msec

Fig. 13-R06

Tahmoor Western Domain - Main Southern Railway
GNSS Monitoring at Victoria Bridge (Sites 03 and 25)



Incremental changes in distance along Victoria Bridge



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MEMBER OF GFG ALLIANCE

APPENDIX 13

simecgfg.com

Technical Memorandum

To:	Nick Le Baut	**From:**	Raymond Minnaar
Company:	Tahmoor Coal Pty Ltd	**SLR Consulting Australia Pty Ltd**	
cc:	Natalie Brumby	**Date:**	29 September 2025
		Project No.	610.033041.00002

RE: Tahmoor Western Domain Groundwater Monitoring Review

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1.0 Introduction

Tahmoor Coal has requested a focused review of groundwater level behaviour in the Western Domain (LW W1 – W4) to determine whether residual subsidence-related groundwater monitoring can be rationalised or ceased in accordance with the Western Domain Water Management Plan (WMP). This memorandum outlines the objectives, scope, decision framework and analytical approach applied to recent bore hydrographs and associated datasets, and provides recommendations regarding the future monitoring regime for the Western Domain.

1.1 Background and Context

Mining at Western Domain commenced on 15 November 2019, and concluded on 13 September 2022. The Western Domain mining area lies within Mining Lease (ML) 1376 and ML 1539. Western Domain comprises 4 longwalls; Longwall (LW) West 1 (W1), LW West 2 (LW W2), LW West 3 (LW W3) and LW West 4 (LW W4).

The governing document, pertinent here for understand monitoring requirements, is the Longwall W3-W4 Water Management Plan (Tahmoor Coal, 2021).

Post-mining groundwater monitoring was undertaken for approximately fifteen months and the Western Domain post-mining monitoring program was recorded as complete in December 2023 (SLR, 2024). This memorandum consolidates the most recent groundwater observations and provides a structured assessment of post-mining trends and stability to support decisions on residual monitoring in the Western Domain.

1.2 Regulatory Framework and Decision Criteria (Western Domain)

Groundwater monitoring and post-mining residual assessment for the Western Domain are governed by LW W3 – W4 Water Management Plan (TAH-HSEC-326). The WMP defines groundwater Trigger Action Response Plans (TARPs) for levels, pressures and quality; identifies the monitoring network and the role of each asset (impact or control); and specifies post-mining monitoring for at least twelve months following completion of LW W4, extendable at the Environmental Response Group's discretion.

The decision context adopted here is therefore straightforward: where hydrographs exhibit material ongoing change, residual monitoring remains warranted; where water levels are demonstrably stable or recovered, rationalisation or cessation is justified under the WMP.

1.3 Objectives

The assessment objectives are to:

- quantify the magnitude of historical mining-related depressurisation in the Western Domain and characterise post-mining behaviour,
- determine whether groundwater levels are stable or continuing to change using formal statistical and variability tests,
- normalise groundwater responses for climate effects to separate mining recovery from climatic variability,
- review current groundwater levels against TARP trigger levels, and
- provide clear recommendations regarding ongoing monitoring requirements.

1.4 Scope and Study Area

This memorandum focuses on the available Western Domain bores and instruments, including operational open standpipe piezometers (OSPs) and vibrating-wire piezometers (VWPs), together with the concurrent climate record. The primary evaluation window is 1 January 2024 to 31 December 2024. Earlier records are used, where relevant, to confirm pre-mining baselines, quantify mining-period drawdown, and trace post-mining behaviour. Decommissioned or inaccessible sites are acknowledged for context but are excluded from quantitative assessment. A brief statement on the current Tahmoor South monitoring status is provided for context only. No South Domain datasets are analysed or interpreted.

1.4.1 Data Sources

This assessment draws on datasets supplied by Tahmoor Coal for the available Western Domain bores and instruments, together with the concurrent climate record. The data received comprised:

- Continuous logger water-level series for P14A, P14B, P14C, P14D and P16A, P16B, P16C.
- Vibrating-wire piezometer pressure series for TNC036 with operational intakes at approximately 65 m, 97 m, 169 m, 214 m and 412.5 m below ground level. Historical records note removal of the ~298.5 m intake and a deepest intake at ~463.5 m in the Bulli Coal seam.
- Vibrating-wire piezometer pressure series for TNC040 with operational shallow intakes at approximately 27 m (Wianamatta Group) and 65 m (Hawkesbury Sandstone).
- Vibrating-wire piezometer pressure series for WD02 (post-mining height-of-fracturing (HoF) installation) with eight functional sensors and continuous records since construction.

1.5 Assessment Methodology

The assessment examines groundwater levels and pressures at each monitoring location to determine whether post-mining conditions are stable or still adjusting. Hydrographs are interpreted alongside a cumulative rainfall residual departure derived from the site gauge so that climate-driven fluctuations are distinguished from mining-related behaviour. Established hydrogeological time-series techniques are applied, including non-parametric trend testing, slope estimation and rolling variability statistics, together with recovery indicators that relate

present heads to pre-extraction baselines and mining-period drawdown. Results are synthesised across monitoring locations to classify behaviour as recovered or stable, recovering, continuing change or uncertain. The same approach is applied consistently across bores and vibrating-wire piezometer sensors, with the underlying datasets and full methodology documented in **Section 3.0**.

1.6 Stability Assessment Criteria

Classification is based on hydrograph behaviour at each monitoring location, interpreted using consistent diagnostics. The interpretation considers the recent trend result from the seasonal Mann–Kendall test, the magnitude of the fitted Sen's slope, variability relative to the pre mining baseline, residual drawdown, and the rainfall-normalised context. The aim is to determine whether heads have achieved a stable post mining condition or are still adjusting.

The four classifications include recovered or stable, recovering, continuing change or uncertain, with each detailed below.

A monitoring location is classified as *recovered or stable* when the recent window shows no statistically significant monotonic trend and the fitted slope is near zero. In this state, the hydrograph shows variability reconverging toward the pre mining envelope, residual drawdown that is small and not increasing, and hydraulic heads oscillating within a narrow range around an equilibrium consistent with post mining conditions in the relevant stratigraphic unit.

A monitoring location is classified as *recovering* when the recent window shows a statistically significant upward trend and the slope magnitude is smaller than in earlier post mining periods. In this condition, variability contracts toward the baseline range and residual drawdown decreases through time, indicating attenuation of mining influence. The hydrograph therefore shows heads migrating toward the pre mining baseline or trending toward a new equilibrium consistent with the hydrogeological setting.

A monitoring location is classified as *continuing change* when a statistically significant trend persists away from baseline conditions, or when variability remains elevated without reconvergence after climatic forcing is accounted for. In this condition, residual drawdown does not reduce or new departures from baseline emerge, and the pressure response is not consistent with stabilisation.

Where records are incomplete or diagnostics are inconsistent, the status is recorded as *uncertain*. In such cases, monitoring continues under a precautionary approach until subsequent observations allow classification against the criteria above.

2.0 Western Domain Setting and Monitoring Context

The Western Domain comprises four longwall panels located west of the Tahmoor South extraction area together with a dedicated groundwater monitoring network. Monitoring includes open standpipe piezometers at P14 and P16 and vibrating-wire piezometers at TNC036, TNC040 and WD02.

The initial monitoring network utilised during mining activities, included seven monitoring bores sites, P12, P13, P14, P15, P16 and P17, five private landholder bores, was reduced post-mining in accordance with landholder agreements and ongoing access. WD01 was decommissioned at the outset of the post-mining period. Nearby private bores are referenced for context where records are available. The network samples the principal stratigraphic units and provides both vertical and lateral coverage across the domain.

2.1 Western Domain Mining Sequence

Longwall extraction in the Western Domain proceeded sequentially across four panels between 15 November 2019 and 13 September 2022. Longwall W1 operated from 15 November 2019 to 6 November 2020, a period of 357 days (about 11.7 months). Longwall W2 operated from 7 December 2020 to 17 June 2021, a period of 192 days (about 6.3 months). Longwall W3 operated from 13 September 2021 to 21 March 2022, a period of 189 days (about 6.2 months). Longwall W4 operated from 16 May 2022 to 13 September 2022, a period of 120 days (about 3.9 months).

Taken together, active extraction across W1 to W4 amounts to 858 days (about 28.2 months, or 2.35 years) of mining time. Across the full calendar span from the start of W1 to the end of W4 there were 1033 days (about 33.9 months, or 2.82 years), which includes planned non-mining intervals totalling 175 days between panels. Those intervals comprised approximately 31 days between W1 and W2, 88 days between W2 and W3, and 56 days between W3 and W4. For groundwater assessment purposes, the post-mining period commences on 13 September 2022, the date on which extraction of W4 concluded. The Western Domain mining sequence is summarised in **Table 1**.

Table 1 Western Domain Mining Operations

Longwall	Start Date	End Date
LW W1	15 November 2019	6 November 2020
LW W2	7 December 2020	17 June 2021
LW W3	13 September 2021	21 March 2022
LW W4	16 May 2022	13 September 2022

2.2 Hydrogeological Setting

The Western Domain overlies a typical Sydney Basin sequence. Near-surface soils and weathered materials are underlain by the Wianamatta Group, which generally exhibits lower hydraulic conductivity and can support perched or semi-confined conditions. The Hawkesbury Sandstone forms a more transmissive fractured-rock aquifer and hosts many of the standpipe installations at P14 and P16. Beneath the Hawkesbury Sandstone the Narrabeen Group includes the Bulgo Sandstone, which presents moderate transmissivity and is monitored via selected vibrating-wire intakes. The Bulli Coal seam is the mined horizon at depth. Bedding, joint sets and local structures influence fracture connectivity, and subsidence associated with extraction can modify vertical and lateral permeability within the overburden. This stratigraphic framework explains the differing sensitivities of shallow piezometers and deeper pressure sensors and provides the structural context for the assessment.

2.3 Climatic Setting

Rainfall at Tahmoor follows a temperate regime with year-round precipitation and seasonal variability that influences shallow groundwater responses. Climatic context for this memorandum is derived from the site rainfall gauge daily record and long-term monthly averages from the SILO gridded dataset centred near Tahmoor. For 2024, the site gauge recorded approximately 878.7 mm, which is about six per cent above the long-term annual average (828.8 mm). Departures from monthly averages are presented with the rainfall analysis in Section 4.1. Rainfall recorded over the reporting period (January 2024 to December 2024), compared to the long-term average (i.e., from January 1970 to the present), is summarised in **Table 2** and presented on **Figure 2**.

Table 2 Monthly Rainfall vs Long-Term Average Rainfall

SILO (-34.25, 150.60)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Long-term average rainfall (mm)	84.9	112.3	97.5	71.6	55.8	63.4	40.8	46.8	43.4	63.0	81.7	67.6
January - December 2024 monthly rainfall (mm)	69.7	69.0	34.8	190.8	105.7	135.9	31.8	21.9	30.5	30.0	107.5	51.1

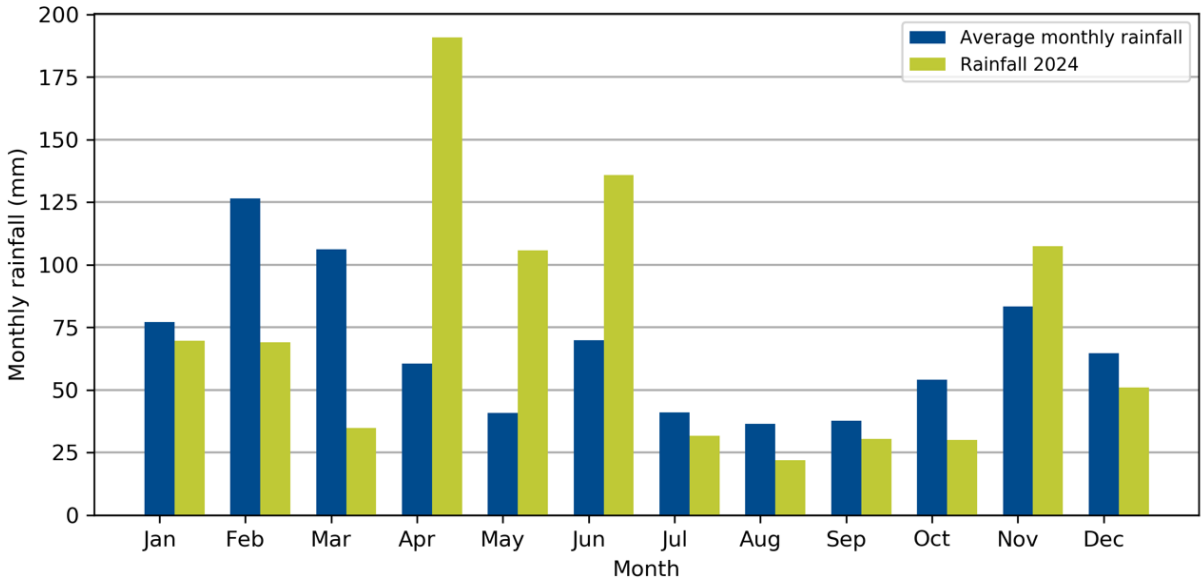


Figure 1 Monthly rainfall and long term average monthly rainfall (2000 – 2024)

2.4 Monitoring Network Overview and Status

The Western Domain monitoring network provides coverage across the principal hydrostratigraphic units and along positions that surround longwalls W1 to W4. OSPs at P14 and P16 chiefly monitor the Hawkesbury Sandstone. The nested construction at each site allows depth-discrete observations and sensitivity to vertical gradients.

The VWP installations extend coverage through the overburden into the coal measures. At TNC036, intakes are installed within the Hawkesbury Sandstone and the Bulgo Sandstone, and the deepest intake is located in the Bulli Coal seam. At TNC040, shallow intakes monitor the Wianamatta Group and the Hawkesbury Sandstone, while deeper intakes were sheared during mining the operation period and consequently not active during the evaluation period. WD02 is a post-mining multi-level installation commissioned in 2023. Its eight sensors step from the Hawkesbury Sandstone into the Narrabeen Group and down to the seam interval, providing a vertical profile of pressure response through the overburden to the coal measures.

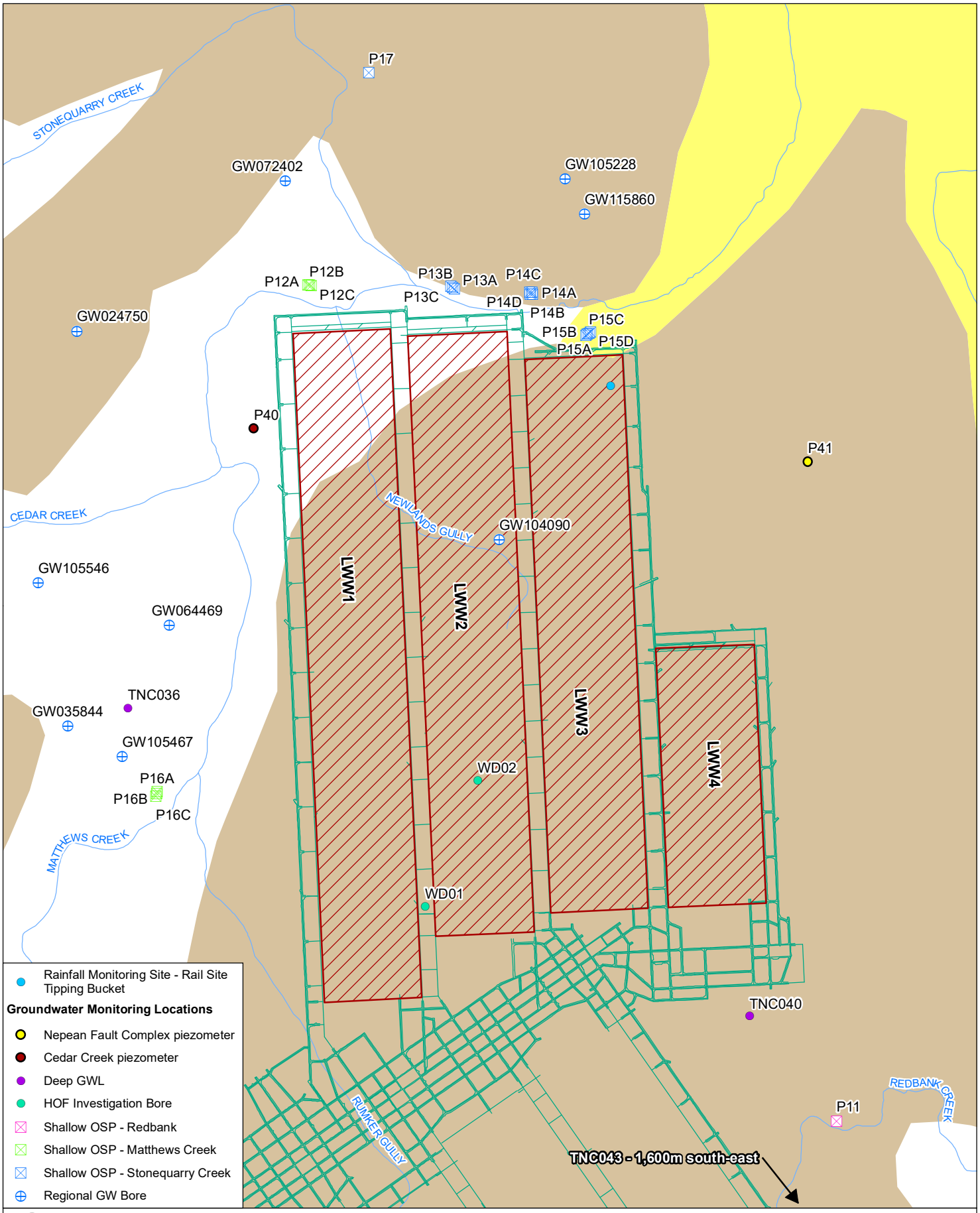
Not all monitoring locations remain accessible or instrumented. The assessment draws on the available Western Domain bores and VWP sensors that have sufficient recent record and acceptable data quality for the evaluation window. No new data were available for surrounding private groundwater bores. No data were received from the client and a check of the Bureau of Meteorology Groundwater Explorer and the NSW Water Insights real-time databases did not identify additional records for the reporting period.

The current configuration is summarised in **Table 3**, which lists each monitoring location and intake, the screened interval and stratigraphic assignment, the mode of measurement (continuous logging or manual), operational status, and data coverage during 2024. The monitoring bores and Western Domain longwalls are illustrated in **Figure 2**.

Table 3 Western Domain Groundwater Monitoring Network and Current Status Summary

Site ID	Type	VWP Sensor ID	Ground RL (mAHD)	Total Depth / Sensor Depth (mBGL))	Piezometer Ground Elevation (mAHD)	Target Formation	Operational Status	Groundwater Level Monitoring Data	
								Minimum available date	Maximum available date
P14A	SP	NA	173.03	6.0	167.03	Alluvium/colluvium	Functional	19-06-2019	18-06-2025
P14B	SP	NA	173.20	16.6	156.60	Hawkesbury Sandstone	Functional	19-06-2019	18-06-2025
P14C	SP	NA	173.81	31.6	142.21	Hawkesbury Sandstone	Functional	19-06-2019	18-06-2025
P14D	SP	NA	173.88	61.6	112.28	Hawkesbury Sandstone	Functional	19-06-2019	18-06-2025
P16A	SP	NA	227.94	27.5	200.44	Hawkesbury Sandstone	Functional	14-05-2019	18-06-2025
P16B	SP	NA	228.41	45.5	182.91	Hawkesbury Sandstone	Functional	14-05-2019	18-06-2025
P16C	SP	NA	228.96	75.5	153.46	Hawkesbury Sandstone	Functional	14-05-2019	19-06-2025
TNC36	VWP	Sensor 1	231.25	65.0	166.25	Hawkesbury Sandstone	Functional	20-01-2016	29-07-2025
	VWP	Sensor 2		97.0	134.25	Hawkesbury Sandstone	Functional	20-01-2016	29-07-2025
	VWP	Sensor 3		169.0	62.25	Bulgo Sandstone	Functional	20-01-2016	29-07-2025
	VWP	Sensor 4		214.0	17.25	Bulgo Sandstone	Functional	20-01-2016	29-07-2025
	VWP	Sensor 5		298.5	-67.25	Bulgo Sandstone	Removed from monitoring network in 2020 (GES, 2020)	20-01-2016	29-10-2020
	VWP	Sensor 6		412.5	-181.25	Bulgo Sandstone	Functional	20-01-2016	29-07-2025
	VWP	Sensor 7		463.5	-232.25	Bulli Coal Seam	Functional	20-01-2016	29-07-2025
TNC40	VWP	Sensor 1	229.03	27.0	202.03	Wianamatta Formation	Functional	18-12-2009	29-07-2025
	VWP	Sensor 2		65.0	164.03	Hawkesbury Sandstone	Functional	18-12-2009	29-07-2025
	VWP	Sensor 3		111.0	118.03	Hawkesbury Sandstone	Not active/failed since 2019 (GES, 2019)	18-12-2009	01-02-2019
	VWP	Sensor 4		225.0	4.03	Hawkesbury Sandstone	Not active/failed since 2019 (GES, 2019)	18-12-2009	21-03-2019
	VWP	Sensor 5		252.0	-22.97	Bald Hill Claystone	Not active/failed since 2019 (GES, 2019)	18-12-2009	20-06-2019
	VWP	Sensor 6		352.0	-122.97	Bulgo Sandstone	Not active/failed since 2019 (GES, 2019)	18-12-2009	21-03-2019
	VWP	Sensor 7		482.0	-252.97	Scarborough Sandstone	Not active/failed since 2019 (GES, 2019)	18-12-2009	11-01-2019
	VWP	Sensor 8		501.9	-272.86	Bulli Coal Seam	Not active/failed since 2018 (GES, 2019)	18-12-2009	26-08-2018
WD02	VWP	Sensor 1	270.72	130.0	140.72	Hawkesbury Sandstone	Functional	27-03-2023	14-07-2025
	VWP	Sensor 2		200.0	70.72	Hawkesbury Sandstone	Functional	27-03-2023	14-07-2025
	VWP	Sensor 3		240.0	30.72	Newport Formation	Functional	27-03-2023	14-07-2025
	VWP	Sensor 4		280.0	-9.28	Bulgo Sandstone	Functional	27-03-2023	14-07-2025
	VWP	Sensor 5		305.0	-34.28	Bulgo Sandstone	Functional	27-03-2023	14-07-2025
	VWP	Sensor 6		330.0	-59.28	Bulgo Sandstone	Functional	27-03-2023	14-07-2025
	VWP	Sensor 7		355.0	-84.28	Bulgo Sandstone	Functional	27-03-2023	14-07-2025
	VWP	Sensor 8		410.0	-139.28	Bulgo Sandstone	Functional	27-03-2023	14-07-2025

SP: Standpipe Piezometer
VWP: Vibrating Wire Piezometer
mAHD: meters Australian Height Datum
mBGL: meters below ground level
NA: not applicable


P17
STONEQUARRY CREEK
GW072402
GW105228
GW115860
P12A
P12B
P12C
P13B
P13A
P13C
P14C
P14A
P14D
P14B
P15C
P15B
P15D
P15A
GW024750
P40
P41
CEDAR CREEK
NEWLANDS GULLY
GW104090
GW105546
GW064469
LWW1
LWW2
LWW3
LWW4
TNC036
GW035844
GW105467
P16A
P16B
P16C
MATTHEWS CREEK
WD02
WD01
TNC040
RUMKER GULLY
REDBANK CREEK
P11
TNC043 - 1,600m south-east
Rainfall Monitoring Site - Rail Site Tipping Bucket
Groundwater Monitoring Locations
Nepean Fault Complex piezometer
Cedar Creek piezometer
Deep GWL
HOF Investigation Bore
Shallow OSP - Redbank
Shallow OSP - Matthews Creek
Shallow OSP - Stonequarry Creek
Regional GW Bore
0
100
200
m
Coordinate System: GDA 1994 MGA Zone 56
Scale: 1:14,000 at A4
Project Number: 610.033041.00002
Date: 23-Nov-2023
Drawn by: AS
Town
Tahmoor Mine Plan Layout
Major Roads
Watercourses
LW W4 Extraction Void (complete on 19/09/2022)
Alluvium
Wianamatta Formation
Hawkesbury Sandstone
SLR
TAHMOOR COAL
WESTERN DOMAIN MONITORING REVIEW
Groundwater Monitoring Network
FIGURE 1
H:\Projects-SLR\640-MEL\640.030985.00001 Tahmoor WD Quaterly July-Sept\06 SLR Data\01 CAD\GIS\GIS\640.030985 Fig1 Tahmoor Coal Groundwater Monthly Review (Oct 2022).mxd

3.0 Groundwater Monitoring Results

This section presents the monitoring outcomes for the Western Domain. Rainfall context is first summarised from the site gauge using a cumulative rainfall residual departure to frame subsequent groundwater responses. Hydrographs then show heads for the P14–P16 standpipes, followed by depth-discrete pressure results from VWP intakes at TNC036, TNC040 and WD02. Reported values include recent and post-mining trend estimates, variability relative to pre-extraction baselines, residual drawdown and percentage recovery. Interpretation of causes and implications for the monitoring program is also provided.

3.1 Cumulative Rainfall Departure

Monthly rainfall totals were compiled from the site gauge daily record and aggregated to calendar months. Climatic variability for groundwater interpretation is expressed using a cumulative rainfall residual departure (CRD) constructed against long-term monthly means from the SILO grid centred near Tahmoor. Positive CRD slope indicates months wetter than average; negative slope indicates months drier than average. The accompanying figure presents the monthly totals and CRD on a common time axis.

Total site rainfall in 2024 was approximately 878.7 mm, which is about six per cent above the long-term annual average (~828.8 mm). Within the year, January – March were below their long-term monthly means, April – June were above average (approximately 119 mm, 50 mm and 73 mm, respectively), August was below average (approximately 25 mm), and November exceeded its monthly mean; the remaining months were close to average. Consistent with these departures, the CRD exhibits a pronounced rise through autumn 2024, a flattening to slight decline in late winter, and a smaller rise in November (**Figure 3**).

Placed in the broader context since 2019, the CRD indicates a wetter-than-average phase through much of 2020 to early 2023, a drier interval during mid to late 2023, and conditions that were broadly near average through 2024 apart from the autumn wet pulse noted above.

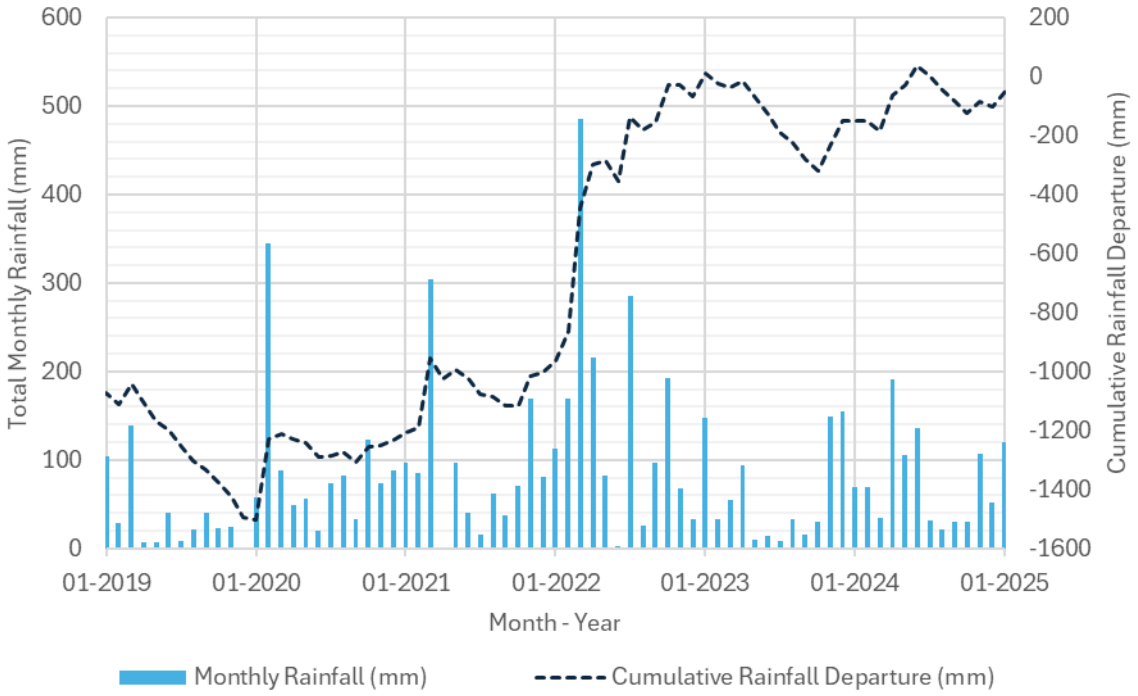


Figure 3 Tahmoor Monthly Rainfall and Cumulative Rainfall Departure

3.2 Groundwater Level Monitoring Data

Groundwater levels and pressures were converted to head (mAHD) using surveyed collar levels; routine QA reconciled logger and manual measurements and removed obvious artefacts.

The groundwater level trend analyses use cleaned logger records with hydraulic head expressed in metres AHD for OSPs and VWPs. The pre-extraction baseline for each standpipe is the median head prior to 15 November 2019. Maximum mining-period drawdown is measured between 15 November 2019 and 13 September 2022. Residual drawdown at the end of the assessment window is the difference between the baseline and the mean head over the final ninety days. Percentage recovery is the proportion of the mining-period drawdown that has been regained.

Two trend measures are reported. The post-mining slope is fitted from 13 September 2022 to the latest measurement and describes the overall rate of change since extraction ceased. The recent-window slope is fitted to the most recent twelve months and reflects current behaviour. Sen's slope is a robust estimate of the rate of change in hydraulic head, calculated as the median of all pairwise slopes so it copes with irregular sampling and outliers. The seasonal Mann–Kendall test is a non-parametric test that checks for a consistent upward or downward trend after allowing for repeating monthly patterns. The reported p value is its significance level. Values below 0.05 indicate a statistically detectable trend. The rainfall cumulative residual departure is plotted for context and is not used in the slope calculations.

3.2.1 OSP Statistical Analysis

3.2.1.1 P14 (A-D)

Across the P14 cluster, heads presently sit above their pre-extraction medians and recent slopes are not statistically different from zero. At P14A, the recent-window slope is −0.307 metres per year with p = 0.50, while the post-mining slope is +0.077 metres per year with p = 0.59. The standpipe did not experience material mining-period drawdown, with a maximum of 0.18 metres, and the twelve-month mean head to June 2025 is 1.35 metres above baseline.

At P14B, the recent-window slope is −0.102 metres per year with p = 0.67, and the post-mining slope is +0.018 metres per year with p = 0.72. The maximum drawdown during extraction was 1.64 metres, and current heads are 1.26 metres above baseline.

At P14C, the recent-window slope is +0.161 metres per year with p = 0.25, and the post-mining slope is +0.013 metres per year with p = 0.84. The maximum drawdown was 1.96 metres, and current heads are 1.49 metres above baseline.

At P14D, the recent-window slope is −0.013 metres per year with p = 0.95, and the post-mining slope is +0.043 metres per year with p = 0.46. The maximum drawdown was 2.37 metres, and current heads are 2.35 metres above baseline.

The hydrograph for P14A–D is shown in **Figure 4**.

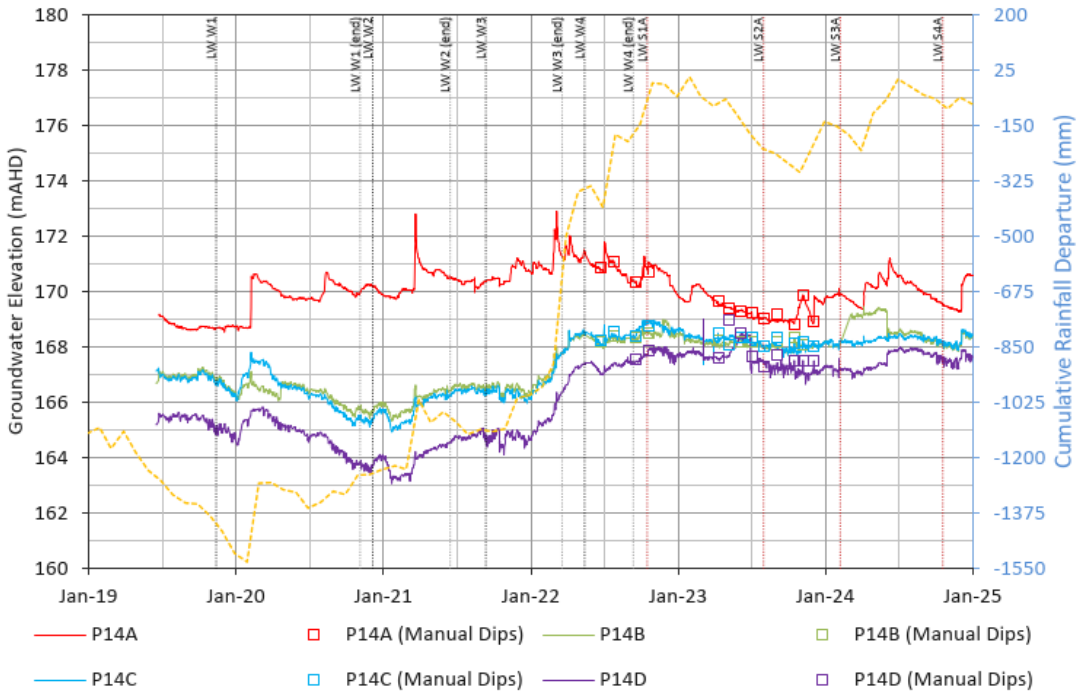


Figure 4 P14A–D groundwater elevations and CRD

3.2.1.2 P16 (A-C)

The P16 cluster shows post-mining rises, with differing degrees of residual drawdown. At P16A, the recent-window slope is −0.053 metres per year with p = 0.50, whereas the post-mining slope is +0.188 metres per year with p = 2.5×10^{-4}, indicating a statistically detectable rise since September 2022. The maximum mining-period drawdown was 1.41 metres, and

the current residual drawdown is 0.58 metres, which represents approximately 59 per cent recovery toward the baseline.

At P16B, both the recent and post-mining slopes are positive and statistically detectable. The recent-window slope is +0.317 metres per year with p = 3.2 x10^{-4}, and the post-mining slope is +0.409 metres per year with p = 7.6 x10^{-12}. The maximum drawdown during extraction was 6.70 metres, and the present residual drawdown is 0.23 metres, corresponding to approximately 96.5 per cent recovery.

At P16C, the recent-window slope is +0.416 metres per year with p = 0.60 (nine months of recent data), and the post-mining slope is +1.861 metres per year with p = 9.0 x10^{-10}. The maximum drawdown was 15.62 metres, and heads are now 0.10 metres above the pre-extraction baseline, indicating effective completion of recovery.

The hydrograph for P16A–C is shown in **Figure 5**.

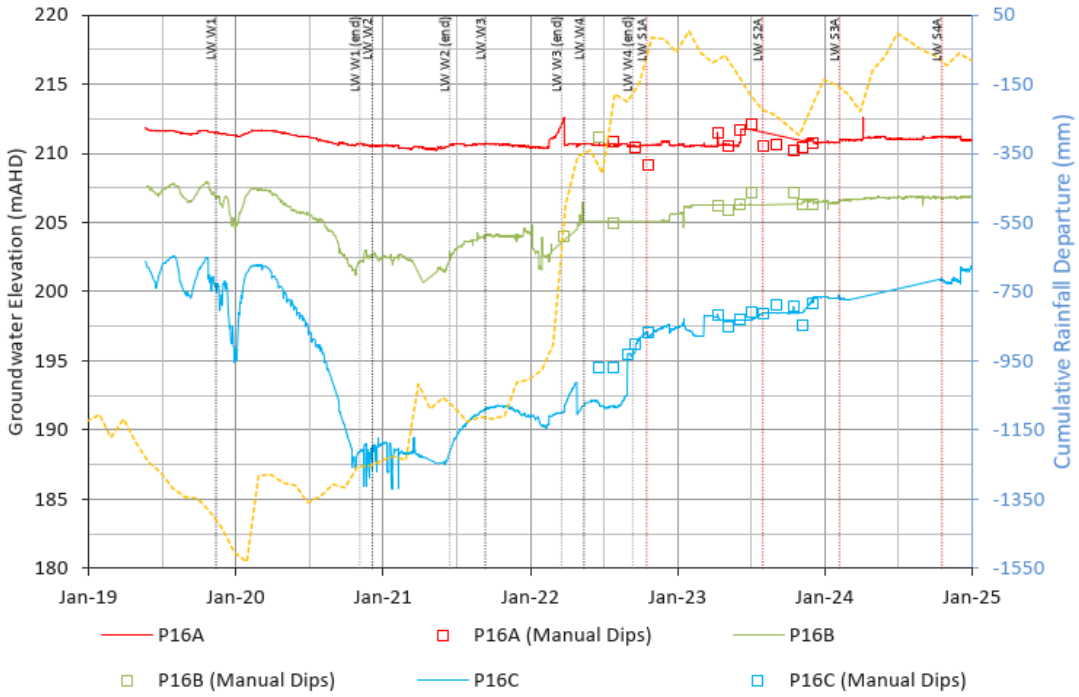


Figure 5 P16A–C groundwater elevations and CRD

3.2.2 VWP Statistical Analysis

3.2.2.1 TNC036

HBSS-65 m (Hawkesbury Sandstone). The post-mining slope is +0.395 metres per year (p = 0.011) and the recent-window slope is +0.814 metres per year (p = 0.044). The maximum drawdown during extraction was 4.59 metres. Heads at the end of the period are 4.24 metres above the pre-extraction baseline, indicating full recovery and subsequent rise relative to baseline conditions.

HBSS-97 m (Hawkesbury Sandstone). The post-mining slope is +1.610 metres per year (p < 0.001) and the recent-window slope is +0.329 metres per year (p = 0.059). The maximum drawdown was 28.74 metres. Residual drawdown is 5.75 metres, which corresponds to approximately eighty per cent recovery toward baseline.

BGSS-169 m (Bulgo Sandstone). The post-mining slope is +3.906 metres per year ($p < 0.001$) and the recent-window slope is +0.308 metres per year ($p = 0.200$). The maximum drawdown was 49.26 metres. Residual drawdown is 4.59 metres, indicating approximately ninety-one per cent recovery.

BGSS-214 m (Bulgo Sandstone). The post-mining slope is +14.256 metres per year ($p < 0.001$) and the recent-window slope is +1.299 metres per year ($p = 0.044$). The maximum drawdown was 103.37 metres. Residual drawdown is 41.50 metres, indicating approximately sixty per cent recovery with a relatively large residual.

BGSS-412.5 m (deep Bulgo Sandstone). The post-mining slope is −8.316 metres per year ($p < 0.001$) and the recent-window slope is −1.536 metres per year ($p = 0.127$). The maximum drawdown within the extraction window was 107.50 metres. The current residual drawdown is 134.76 metres, which exceeds the mining-period drawdown, indicating continued depressurisation after mining ceased and that the minimum head occurred in the post-mining period.

BUSM-463.5 m (Bulli Coal seam). The post-mining slope is −5.490 metres per year ($p < 0.001$) and the recent-window slope is −3.068 metres per year ($p = 0.044$). The maximum drawdown during the extraction window was 13.73 metres. The present residual drawdown is 29.69 metres, also greater than the mining-period drawdown, which is consistent with ongoing depressurisation within the coal measures, likely associated with ongoing extractive operations in Tahmoor South.

The hydrograph for TNC036 is shown in **Figure 6**.

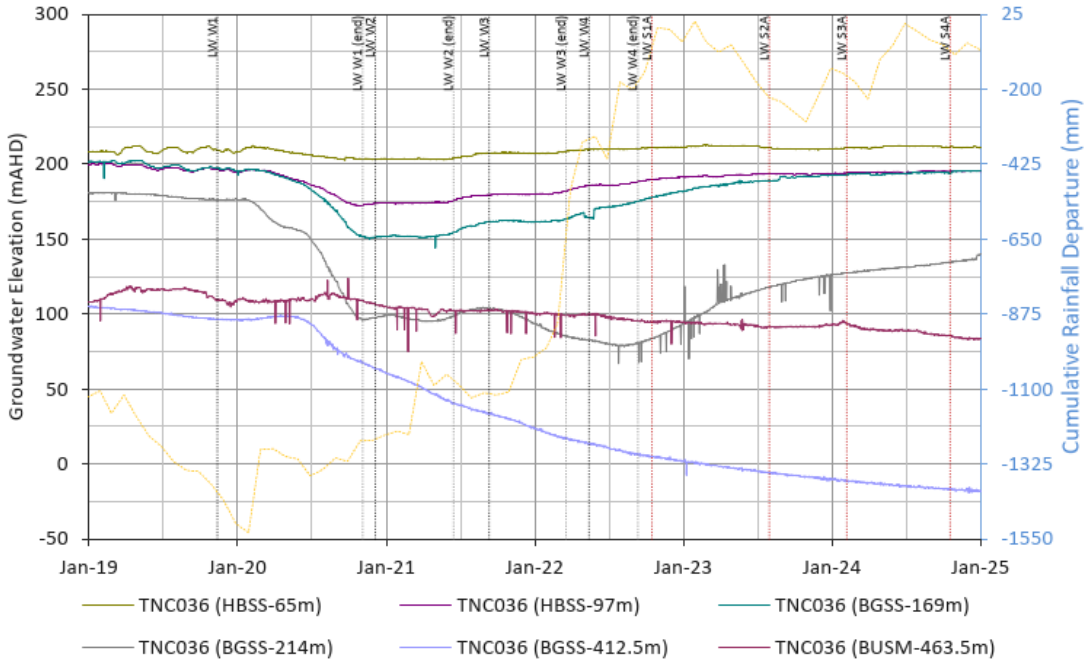


Figure 6 TNC036 groundwater elevations and CRD

3.2.2.2 TNC040

HBSS-65 m (Hawkesbury Sandstone). The post-mining slope is −0.141 metres per year ($p = 0.159$) and the recent-window slope is −0.231 metres per year ($p = 0.0059$). The maximum drawdown during extraction was 2.38 metres. The current residual drawdown is 1.25 metres, which equates to approximately forty-seven per cent recovery. This intake shows a statistically detectable recent decline with a moderate residual relative to baseline.

WMFM-27 m (Wianamatta Formation). The post-mining slope is −0.482 metres per year (p = 0.0286), indicating a detectable decline over the post-mining interval. The recent-window slope is −0.600 metres per year (p = 0.0769), which is not statistically distinguishable from zero at the 0.05 level. The maximum drawdown during extraction was 0.484 metres. The current residual drawdown is 0.034 metres, which corresponds to approximately ninety-three per cent recovery.

The hydrograph for TNC040 is shown in **Figure 7**.

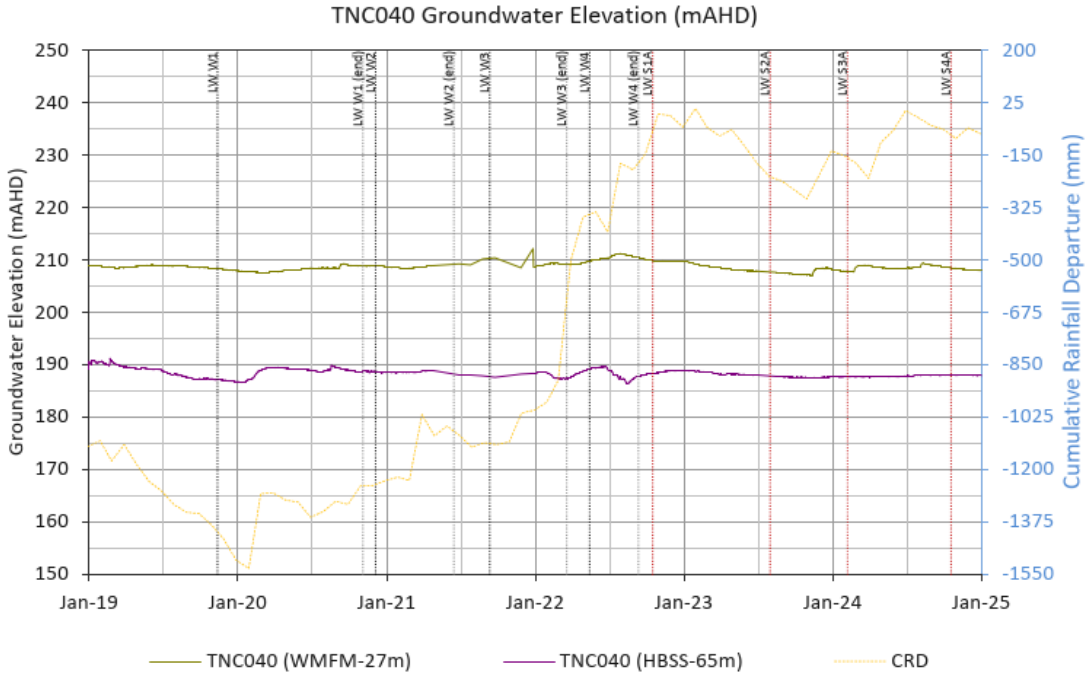


Figure 7 TNC040 groundwater elevations and CRD

3.2.2.3 WD02

For WD02, the logger records begin after 15 November 2019 and therefore do not establish a pre-extraction baseline within this dataset. Maximum mining-period drawdown, residual drawdown and percentage recovery cannot be evaluated on this basis. Trends are nonetheless informative and are reported below.

HBSS-130 m (Hawkesbury Sandstone). The post-mining slope is −0.113 metres per year (p = 0.200). The recent-window slope is +0.144 metres per year (p = 0.428). Heads are essentially stable at this intake.

HBSS-200 m (Hawkesbury Sandstone). The post-mining slope is +2.482 metres per year (p < 0.001) and the recent-window slope is +0.429 metres per year (p = 0.017), indicating a statistically detectable rise with continued, but slower, recent increase.

NPFM-240 m (Newport Formation). The post-mining slope is +9.574 metres per year (p < 0.001) and the recent-window slope is +0.341 metres per year (p = 0.0586), indicating a strong post-mining rise with a recent rate that is smaller and not statistically distinguishable from zero at the 0.05 level.

BGSS-280 m (Bulgo Sandstone). The post-mining slope is +7.379 metres per year (p < 0.001) and the recent-window slope is +1.989 metres per year (p = 0.006), consistent with a continuing rise.

BGSS-305 m (Bulgo Sandstone). The post-mining slope is +0.494 metres per year (p = 0.347) and the recent-window slope is +4.637 metres per year (p = 0.044), indicating a recent acceleration upward.

BGSS-330 m (Bulgo Sandstone). The post-mining slope is −12.463 metres per year (p < 0.001) and the recent-window slope is −5.000 metres per year (p = 0.006), indicating a pronounced and continuing decline.

BGSS-355 m (Bulgo Sandstone). The post-mining slope is −1.631 metres per year (p < 0.001). The recent-window slope is −0.167 metres per year (p = 0.077), showing a small, not statistically detectable, recent decline.

BGSS-410 m (Bulgo Sandstone). The post-mining slope is −1.757 metres per year (p < 0.001) and the recent-window slope is −0.273 metres per year (p = 0.044), indicating continued decline with a modest, statistically detectable, recent rate.

The hydrograph for WD02 is shown in **Figure 8**.

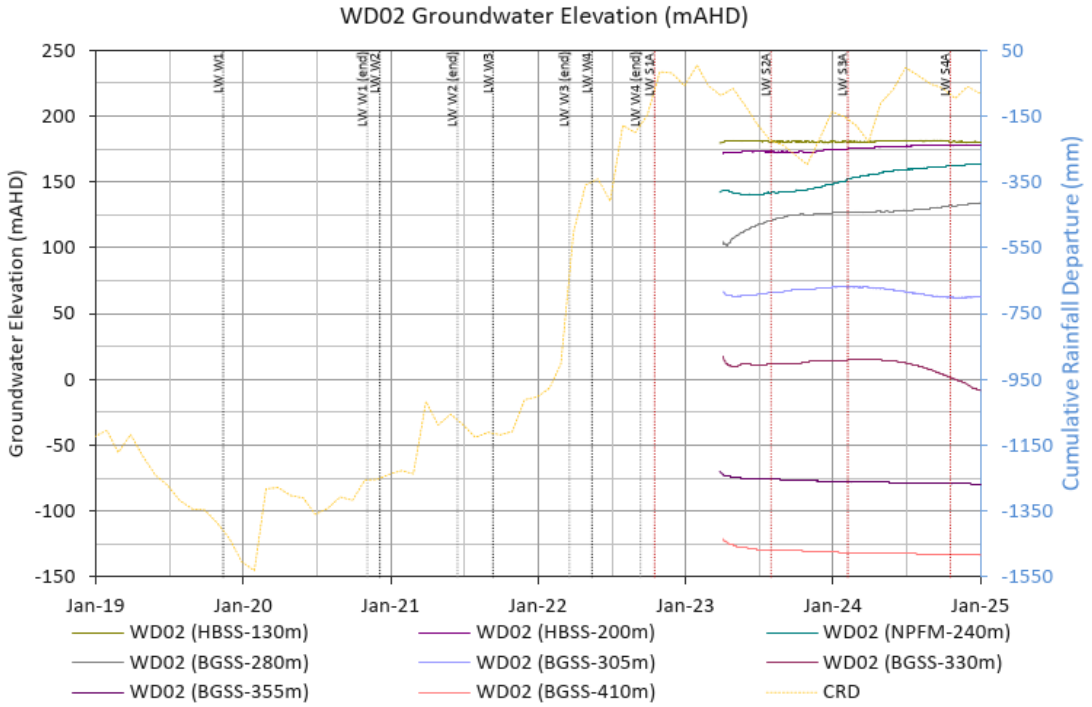


Figure 8 WD02 groundwater elevations and CRD

3.2.3 OSP TARP Trigger Analysis

TARP Level 1 is considered representative of baseline conditions, whilst a breach of TARP Level 2 indicated potential impact requiring action. The TARP Level 2 trigger values have been plotted with the groundwater elevations and are presented in the following sub-sections.

3.2.3.1 P14 (A – D)

Figure 9 presents the groundwater elevation time-series with the TARP Trigger Level 2 elevation for each OSP (colour matched). All the P14 bores are above the level 2 trigger, indicating no active exceedances and groundwater can be considered within to be representative of baseline conditions.

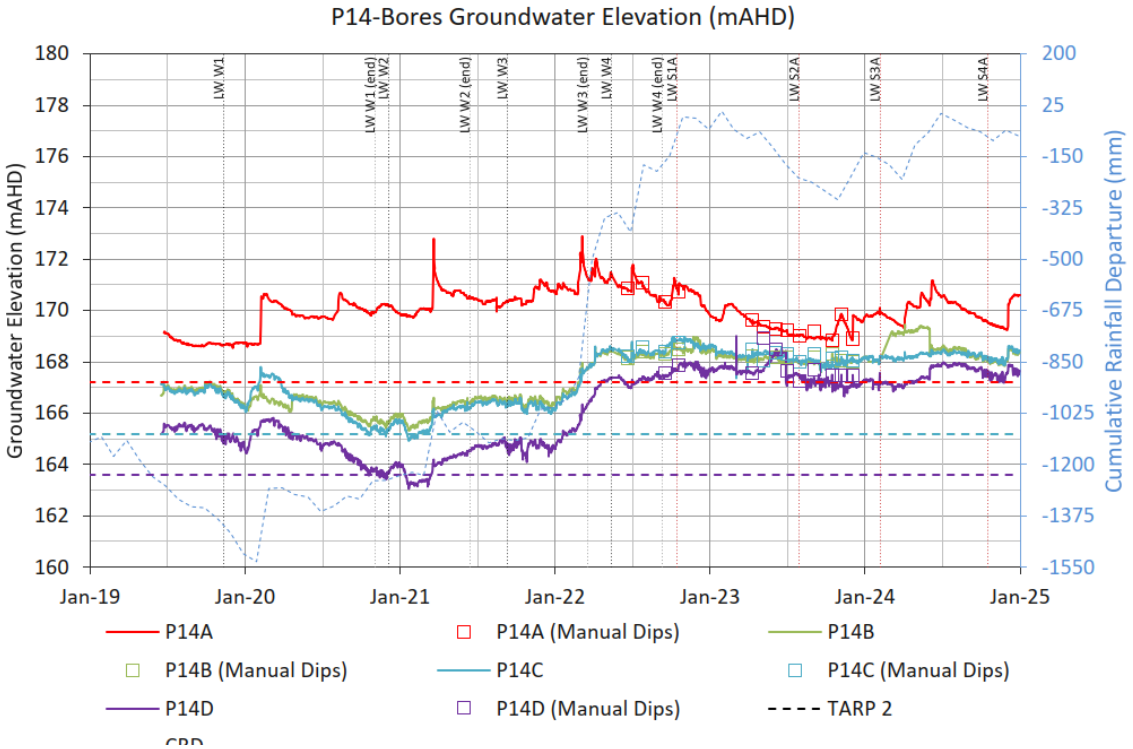


Figure 9 P14 groundwater elevations with TARP Level 2 trigger

3.2.3.2 P16 (A – C)

Figure 10 presents the groundwater elevation time-series with the TARP Trigger Level 2 elevation for each OSP (colour matched). All the P16 bores are above the level 2 trigger, indicating no active exceedances and groundwater can be considered within to be representative of baseline conditions.

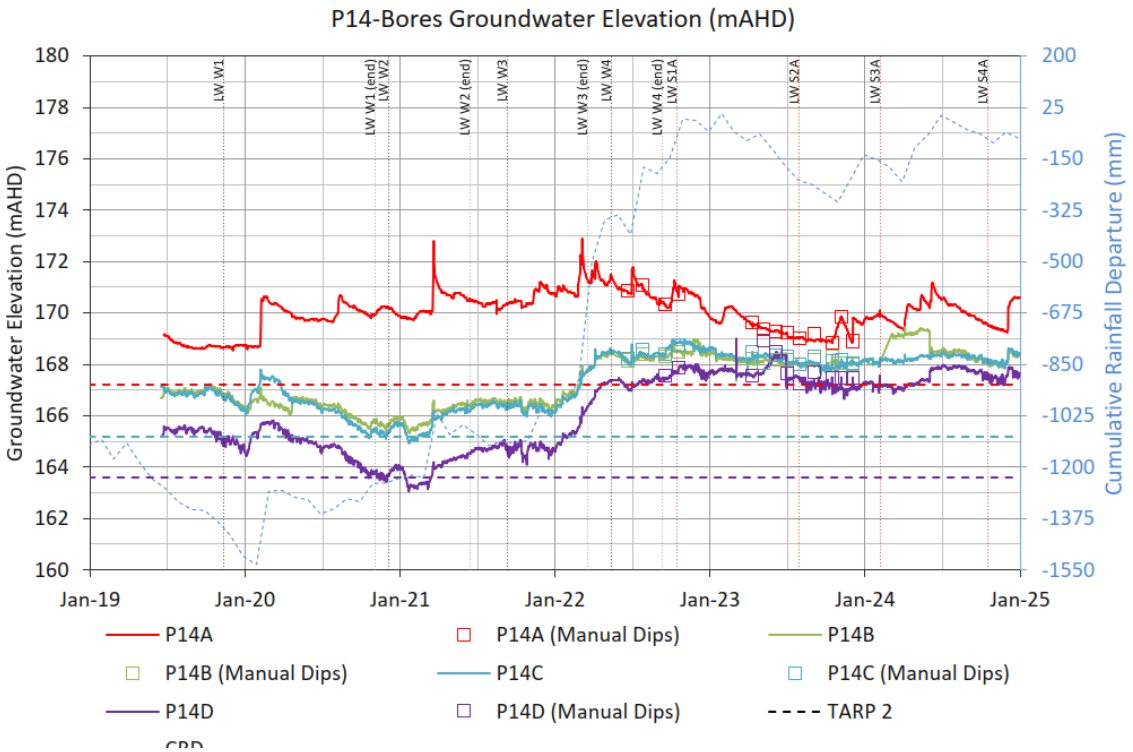


Figure 10 P14 groundwater elevations with TARP Level 2 trigger

3.2.4 VWP TARP Trigger Analysis

The shallow VWPs have approved trigger levels as per the shallow OSPs. These are presented below.

3.2.4.1 TNC036 (shallow sensors)

The shallow VWP sensors and they're associates TARP Level 2 triggers are presented in **Figure 11**. All sensors indicate no exceedance of the Level 2 trigger, indicating baseline conditions exist.

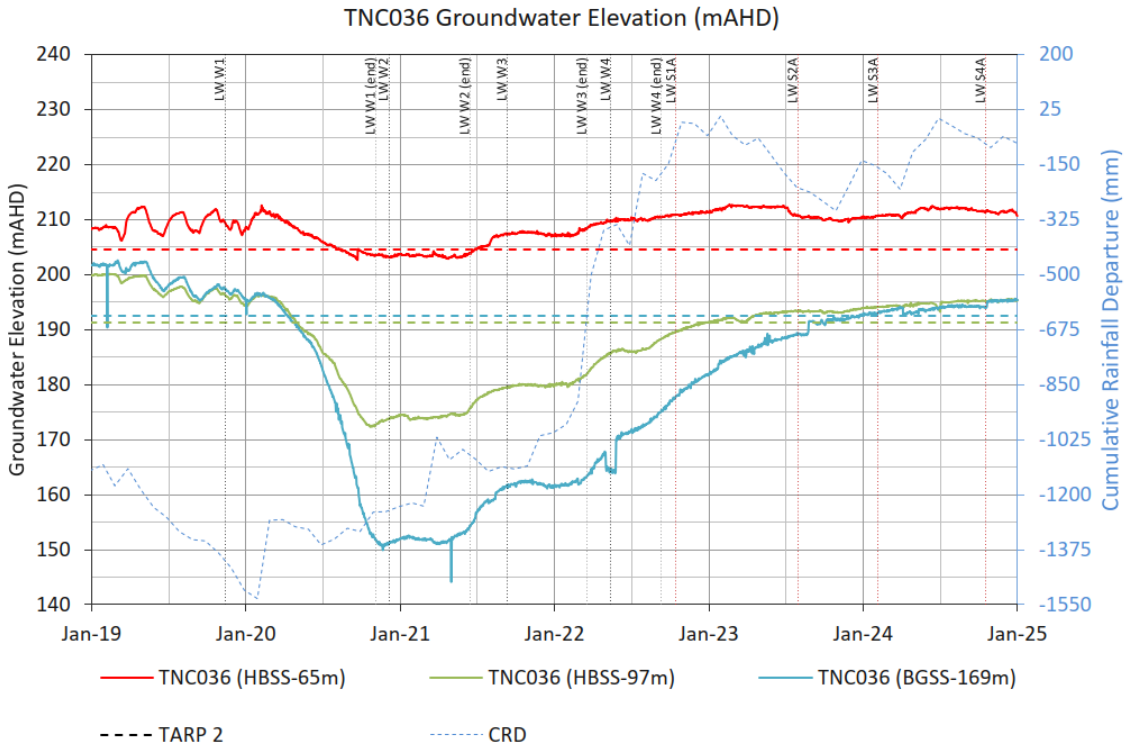


Figure 11 TNC036 shallow sensors (<200m) groundwater elevations with TARP Level 2 trigger

3.2.4.2 TNC036 (deep sensors)

The deep (>200 metres) sensors have approved drawdown criteria upon which the TARP levels are based. A level 1 (or no exceedance) is active if the observed drawdown does not exceed the predicted drawdown. **Figure 12** through **Figure 14** show the observed and modelled drawdown for the three deep sensors at TNC036. None of the deep sensors exceed predicted drawdown.

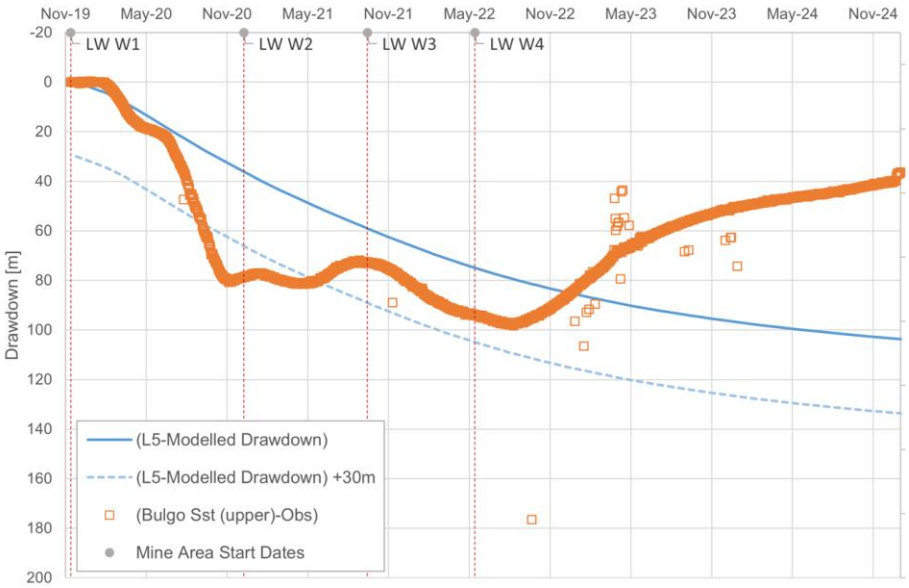


Figure 12 TNC036 (214m) observed and modelled drawdown

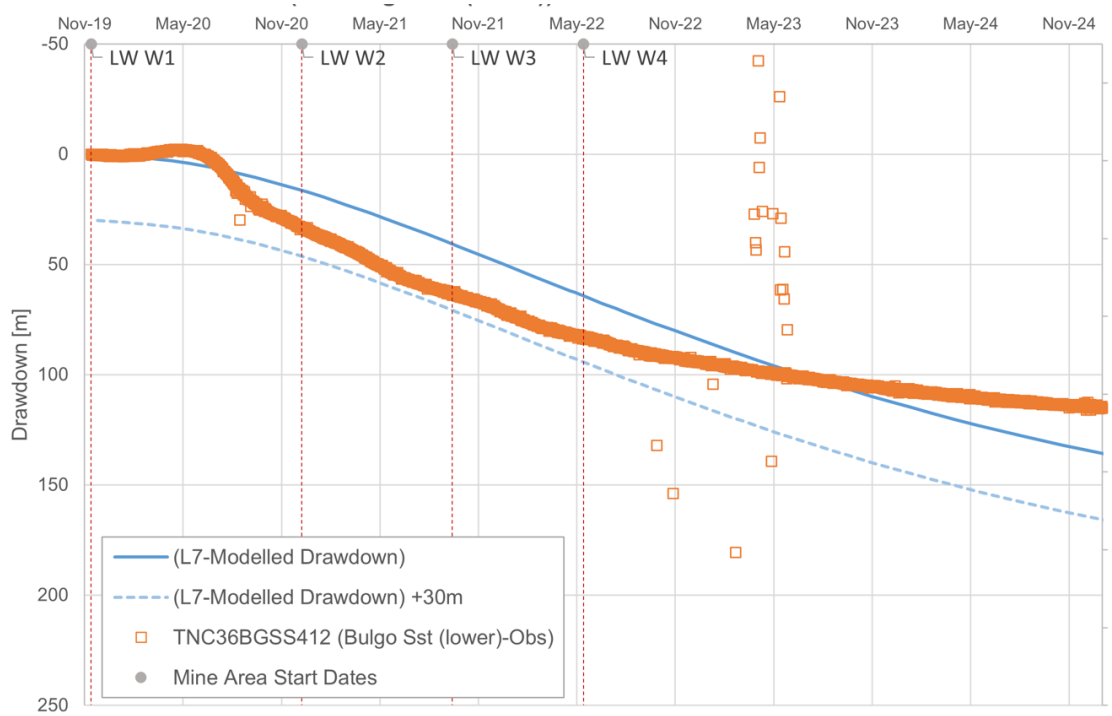


Figure 13 TNC036 (412m) observed and modelled drawdown

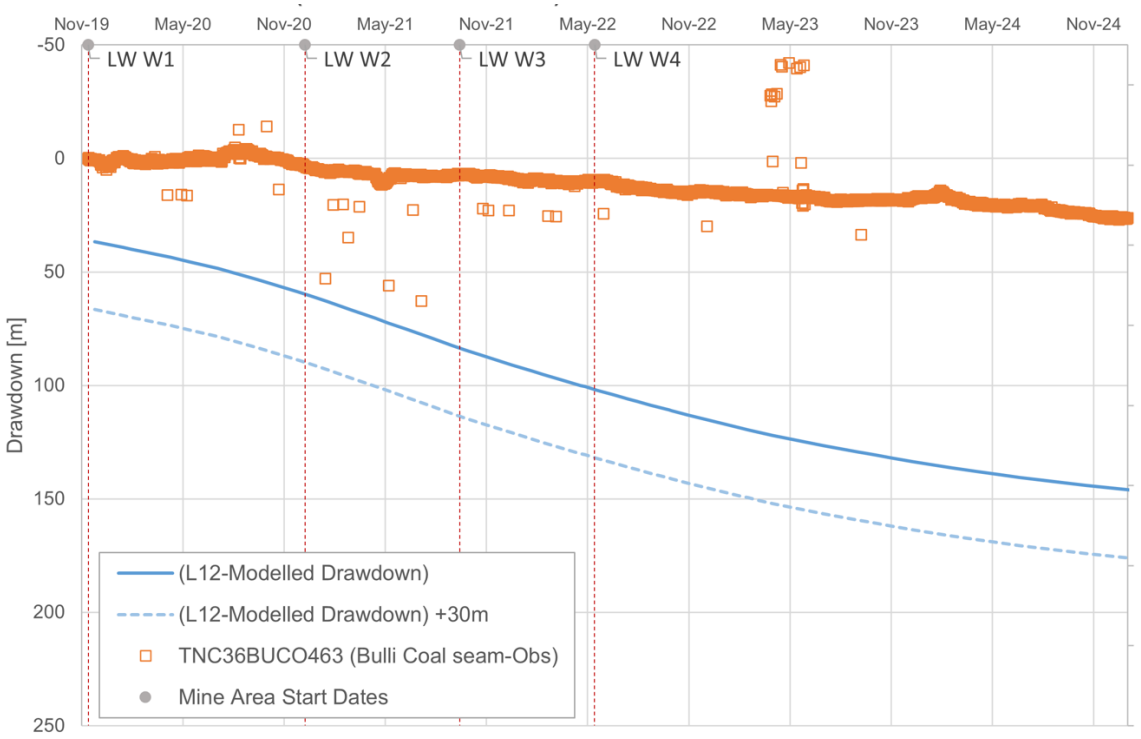


Figure 14 TNC036 (463m) observed and modelled drawdown

3.2.4.3 TNC040

Both sensors of VWP TNC040 are above the Level 2 TARP Trigger, indicating they are representative of baseline conditions (**Figure 15**).

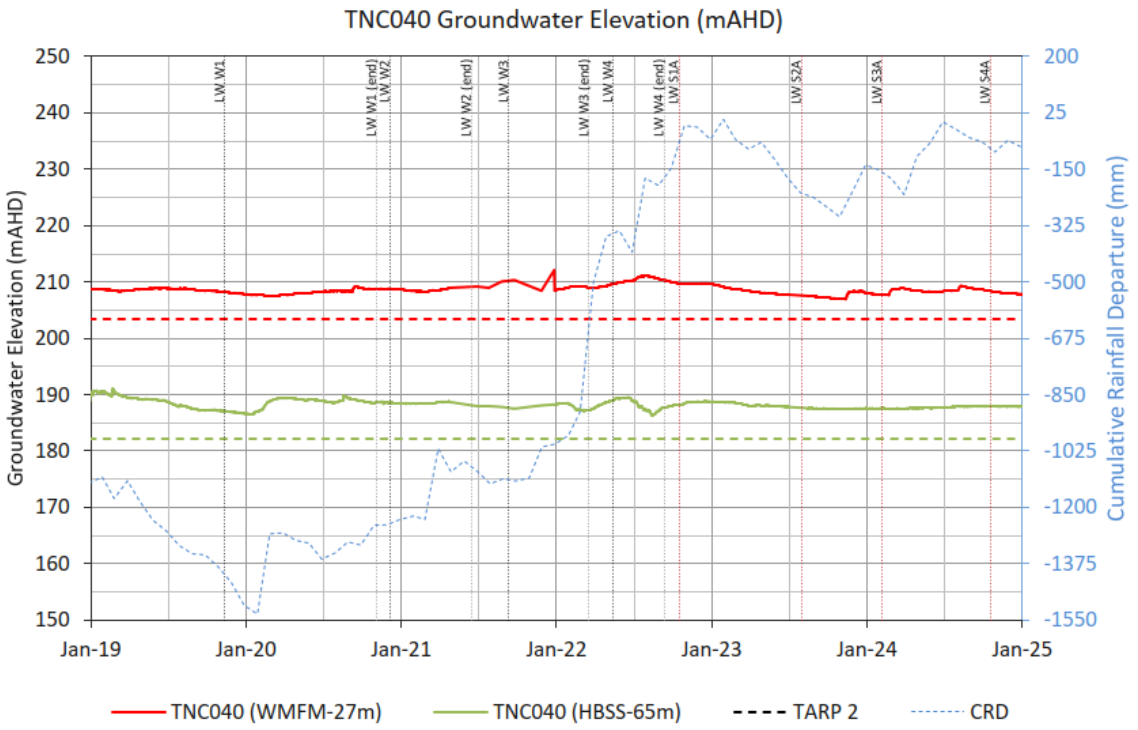


Figure 15 TNC040 shallow sensors (<200m) groundwater elevations with TARP Level 2 trigger

3.2.4.4 WD02

Nothing the installation of WD02 post-mining, there are no trigger levels established for this VWP.

3.2.5 Summary

Table 4 provides a summary of the trend and TARP analysis for each monitoring point.

Table 4 Summary of statistical and TARP trigger analysis

Site ID	Total Depth / Sensor Depth (mBGL))	Target Formation	Groundwater Level Monitoring Data		Recent Window Slope	Post Mining Slope	Stability Assessment Criteria	TARP Trigger Level
			Minimum available date	Maximum available date	m/year	m/year		
P14A	6	Alluvium/colluvium	19-06-2019	18-06-2025	-0.307	0.077	Stable (recovered)	Level 1
P14B	16.6	Hawkesbury Sandstone	19-06-2019	18-06-2025	-0.102	0.018	Stable (recovered)	Level 1
P14C	31.6	Hawkesbury Sandstone	19-06-2019	18-06-2025	0.161	0.013	Stable (recovered)	Level 1
P14D	61.6	Hawkesbury Sandstone	19-06-2019	18-06-2025	-0.013	0.043	Stable (recovered)	Level 1
P16A	27.5	Hawkesbury Sandstone	14-05-2019	18-06-2025	-0.053	0.188	Recovering	Level 1
P16B	45.5	Hawkesbury Sandstone	14-05-2019	18-06-2025	0.317	0.409	Stable (recovered)	Level 1
P16C	75.5	Hawkesbury Sandstone	14-05-2019	19-06-2025	0.406	1.861	Stable (recovered)	Level 1
TNC36	65	Hawkesbury Sandstone	20-01-2016	29-07-2025	0.814	0.395	Stable (recovered)	Level 1
	97	Hawkesbury Sandstone	20-01-2016	29-07-2025	0.329	1.61	Recovering	Level 1
	169	Bulgo Sandstone	20-01-2016	29-07-2025	0.308	3.906	Stable (recovered)	Level 1
	214	Bulgo Sandstone	20-01-2016	29-07-2025	1.299	14.256	Continuing change	Level 1
	412.5	Bulgo Sandstone	20-01-2016	29-07-2025	-1.536	-8.316	Continuing change	Level 1
	463.5	Bulli Coal Seam	20-01-2016	29-07-2025	-3.068	-5.49	Continuing change	Level 1
TNC40	27	Wianamatta Formation	18-12-2009	29-07-2025	-0.231	-0.141	Recovering	Level 1
	65	Hawkesbury Sandstone	18-12-2009	29-07-2025	-0.6	-0.482	Stable (recovered)	Level 1
WD02	130	Hawkesbury Sandstone	27-03-2023	14-07-2025	0.144	-0.113	n/a*	n/a
	200	Hawkesbury Sandstone	27-03-2023	14-07-2025	0.429	2.482	n/a*	n/a
	240	Newport Formation	27-03-2023	14-07-2025	0.341	9.574	n/a*	n/a

Site ID	Total Depth / Sensor Depth (mBGL))	Target Formation	Groundwater Level Monitoring Data		Recent Window Slope	Post Mining Slope	Stability Assessment Criteria	TARP Trigger Level
			Minimum available date	Maximum available date	m/year	m/year		
	280	Bulgo Sandstone	27-03-2023	14-07-2025	1.989	7.379	n/a*	n/a
	305	Bulgo Sandstone	27-03-2023	14-07-2025	4.637	0.494	n/a*	n/a
	330	Bulgo Sandstone	27-03-2023	14-07-2025	-5	-12.463	n/a*	n/a
	355	Bulgo Sandstone	27-03-2023	14-07-2025	-0.167	-1.631	n/a*	n/a
	410	Bulgo Sandstone	27-03-2023	14-07-2025	-0.273	-1.757	n/a*	n/a

* insufficient historical data to establish maximum mining-period drawdown, residual drawdown and percentage recovery

3.3 Integrated Groundwater Interpretation and Site-Wide Residual Status

This section synthesises responses from the standpipes (P14, P16) and the VWPs (TNC036, TNC040, WD02) to assess whether post-mining depressurisation at depth is affecting the principal aquifer units and informs recommendations regarding monitoring in the Western Domain.

3.3.1 Depth-Resolved Behaviour by Bore Cluster

3.3.1.1 West of W1 (P16 and TNC036)

P16 and TNC036 is west of W1 and the shallow Hawkesbury Sandstone standpipes show stable to rising heads consistent with recovery (P16A, P16B and P16C), as do the upper VWP intakes at TNC036 (HBSS-65 m and HBSS-97 m). At depth the Bulgo Sandstone intakes at TNC036 indicate continuing post-mining recovery (BGSS-169 m and BGSS-214 m), with the very deep Bulgo and Bulli measures still depressurising (BGSS-412.5 m and BUSM-463.5 m). There is no indication that these deeper trends are propagating upward into the Hawkesbury Sandstone at this locality.

3.3.1.2 W2 and W3 (P14 and WD02)

P14 is north of W3 and WD02 is located directly above W2. The Hawkesbury Sandstone standpipes at P14 indicate stable to rising heads (P14A, P14B, P14C and P14D) and the upper Hawkesbury intakes at WD02 are likewise stable to rising (HBSS-130 m and HBSS-200 m). Mid-depth behaviour above W2 shows post-mining recovery that is moderating toward stability in the Newport Formation (NPFM-240 m). Within the deeper Bulgo interval at WD02, heads at BGSS-280 m and BGSS-305 m are increasing post-mining. By contrast, BGSS-330 m, BGSS-355 m and BGSS-410 m continue to decline (depressurisation). The overlying Hawkesbury Sandstone intakes (HBSS-130 m and HBSS-200 m) remain stable to rising. This pattern is consistent with vertical decoupling between the principal aquifer and deeper measures.

3.3.1.3 South of W4 (TNC040)

TNC040 is located south of W4. The Wianamatta and Hawkesbury intakes are stable or rising with small residuals relative to pre-extraction levels where a baseline exists (WMFM-27 m and HBSS-65 m). No upward transmission from deeper measures is evident at this location.

3.3.2 Spatial Coherence Relative to the Western Domain Longwall Sequence

Across the domain, behaviour varies systematically with position relative to the longwall sequence from west (W1) to east (W4). Locations up-panel and lateral to W1 (P16 and TNC036) show recovery in shallow units with continuing adjustment confined to deeper Bulgo and the coal seam. Above and adjacent to W2 and W3 (WD02, P14) the shallow units are stable, while selected deep Bulgo sensors continue to adjust. South of W4 (TNC040) the shallow system is recovered or stable. There is no clear indication of domain-wide upward propagation of depressurisation into the Hawkesbury Sandstone or shallow aquifer units.

3.3.3 Climate Influence

Hydrographs with monthly CRD overlays in **Section 3.2** show that shallow Hawkesbury and Wianamatta heads display modest seasonal or climatic change but have broadly stabilised



or risen since September 2022. In contrast, deeper Bulgo and Bulli responses are largely decoupled from CRD and reflect post-mining pressure redistribution. This distinction supports the interpretation that remaining declines at depth are mining-related adjustments that are not materially influencing the principal aquifer.

4.0 Conclusions and Recommendations

4.1 Summary of Findings

Analysis of active OSPs (P14, P16) and VWPs (TNC036, TNC040, WD02) shows that groundwater heads in the Hawkesbury Sandstone and Wianamatta Formation are stable or rising across assessed locations and, where a pre-extraction baseline is available, have largely reconverged toward the pre-mining envelope. Deeper intakes within the Bulgo Sandstone and the Bulli Coal seam display localised post-mining adjustment, including continued depressurisation at some depths. These deeper responses are not synchronous with rainfall residuals and are interpreted as confined to the coal measures and immediately underlying sandstones, without indications of upward transmission into the principal aquifer.

There are no active TARP exceedances at any sites.

4.2 Western Domain Post-Mining Monitoring

On technical grounds, and consistent with the SLR (2024) interpretation, the stand-alone Western Domain post-mining monitoring program can be concluded. The current dataset provides sufficient evidence that the principal aquifer units in the Western Domain are not exhibiting ongoing mining-related decline.

In accordance with recommendations via approved *Development Consent SSD 8445 MOD2* (determination date 13 June 2023), a selection of current monitoring points associated with the historical working, namely the Western Domain, will be incorporated into the Tahmoor South ongoing monitoring regime. The VWPs selected for ongoing monitoring include WD02, TNC036 and TNC040.As per the additional VWPs incorporated from the historical workings monitoring network, P14 and P16 open standpipes are included in the Tahmoor South monitoring network.

Accordingly, the Western Domain program should conclude as a discrete post-mining requirement, with ongoing monitoring of WD02, TNC036, TNC040, P14 and P16 undertaken within the Tahmoor South GWMP and considered part of Tahmoor South reporting.

4.3 Annual Review under the Tahmoor South GWMP

The Western Domain locations included in the Tahmoor South network will be subject to an annual review. The review will collate any new logger data, update the hydrographs, and summarise post-mining and recent-window trends using established non-parametric statistics used in this study. The emphasis will be on confirming that shallow units (Hawkesbury and Wianamatta) remain stable or rising and that any deeper adjustments remain confined to the Bulgo and Bulli intervals. Where material changes in trend are identified, recommendations on monitoring or additional work will be made within the Tahmoor South annual review.



Regards,

SLR Consulting Australia Pty Ltd





Raymond Minnaar
Associate Hydrogeologist

Sharon Hulbert
Principal Hydrogeologist

5.0 References

SLR Consulting Pty Ltd Australia (SLR), 2024. Tahmoor Coal Pty Ltd Six - Monthly Groundwater Reporting: July – December 2023. Project number 640.031086.00001. 13 March 2024.

Tahmoor Coal Pty Ltd, 2021. Tahmoor North - Western Domain, LW W3-W4 Water Management Plan. TAH-HSEC-326 (September 2021, Ver4)

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APPENDIX 14

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Tahmoor South A Series: Preliminary Aquatic Monitoring Report

Autumn 2026

Prepared for:
Tahmoor Coal Pty Ltd

18 September 2026

Prepared by:
Stantec Pty Ltd

Project/File:
304501634



Stantec Australia Pty Ltd

Revision	Description	Author	Date	Quality Check	Date	Independent Review	Date
V1	Internal Draft	Yesmin Chikhani	01-09-2026	Daniel Pygas	02-09-2026	Will Macbeth	17-09-2026

The conclusions in the Report titled Tahmoor South A Series: Preliminary Aquatic Monitoring Report are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

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Prepared by 

Signature

Yesmin Chikhani

Printed Name

Reviewed by 

Signature

Daniel Pygas

Printed Name

Approved by 

Signature

Will Macbeth

Printed Name

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Acronyms / Abbreviations

ANZECC	Australian and New Zealand Environment and Conservation Council
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
ANZG	Australian and New Zealand Guidelines
AUSRIVAS	Australian River Assessment System
BACI	Before-After, Control-Impact
BMP	Biodiversity Management Plan
BoM	Bureau of Meteorology
DGV	Default guideline value
DO	Dissolved oxygen
DPE	Department of Planning and Environment
DPHI	Department of Planning, Housing and Infrastructure
EC	Electrical conductivity
EPT	Ephemeroptera, Plecoptera and Trichoptera
LW	Longwall
Niche	Niche Environment and Heritage Pty Ltd
NTU	Nephelometric turbidity units
OE50	Observed to Expected ratio
ORP	Oxidation reduction potential
ppt	Parts per thousand
SIGNAL2	Stream Invertebrate Grade Number Average Level
SILO	Scientific Information for Landowners
Tahmoor Coal	Tahmoor Coal Pty Ltd
TARP	Trigger Action Response Plan
°C	Degrees Celsius

1 Introduction

1.1 Background

Tahmoor Coal Pty Ltd (In Liquidation) (Tahmoor Coal) owns and operates Tahmoor Colliery, an underground coal mine approximately 80 km south-west of Sydney in the Southern Coalfields of New South Wales.

In April 2021, Tahmoor Coal received State Significant Development Application Approval (SSD) from the NSW Department of Planning, Housing and Infrastructure (DPHI) (formerly Department of Planning and Environment (DPE), for mining in the Tahmoor South Domain, which would extend existing underground mining operations and associated infrastructure development to the south of the current mine workings. The Tahmoor South Domain is located south of the Bargo River and east of Remembrance Driveway and the township of Bargo. The extended underground coal mining area will continue to be accessed via the existing surface facilities at Tahmoor Colliery. In May 2025, DPHI approved Modification 3, which incorporated additional longwall panel Longwall South 7A (LW S7A), into the approved mine plan (DPHI, 2025). In total, the approved mine plan comprises thirteen longwalls, including seven northern longwalls (A Series; Longwalls S1A to S7A) and six southern longwalls (B Series; Longwalls S1B to S6B). Extraction of coal from the A Series longwalls commenced in October 2022 and is expected to continue until approximately 2029 (Table 1). The southern, B Series longwalls will be extracted following completion of the A Series longwalls, subject to future extraction plan approvals (Tahmoor Coal, 2025b). The extension of these mining operations, extraction of the northern and southern longwalls, and associated infrastructure works, collectively comprise the Tahmoor South Project (the Project).

As part of the development consent, a Biodiversity Management Plan (BMP) was prepared for the approved Longwalls S1A-S7A Extraction Plan (Tahmoor Coal, 2025b). The BMP outlines the terrestrial and aquatic biodiversity monitoring framework for the approved Longwalls S1A-S7A Extraction Plan and describes biannual (autumn and spring) biodiversity monitoring undertaken to assess environmental performance and compliance with approval requirements. The biodiversity monitoring program for the A Series longwalls commenced in Spring 2019 and has continued throughout the baseline and mining phases of the project.

*Table 1 A Series longwall commencement and completion dates**

Longwall	Mining Commenced	Mining Completed
LW S1A	18 October 2022	4 July 2023
LW S2A	2 August 2023	6 April 2024
LW S3A	8 May 2024	17 December 2024
LW S4A	January 2027	October 2027
LW S5A	November 2027	July 2028
LW S6A	August 2028	March 2029
LW S7A	April 2029	October 2029

*Tahmoor Coal, 2025b

1.2 A Series Longwalls Aquatic Monitoring

The main objective of the aquatic ecology monitoring program is to assess the condition of waterways that may be affected by mining and compare the selected ecological indicators against the BMP Trigger Action Response Plans (TARPs) (Tahmoor, 2025b). The *BMP1 TARP – Aquatic Habitat and Macroinvertebrates Indicators (Stream Health)* (Tahmoor, 2025b) defines levels of deviation in aquatic habitat and associated stream health from normal conditions, that could indicate an impact due to mining, and the actions required to be implemented in response to each level of deviation.

Aquatic ecology monitoring for the A Series longwalls commenced 2019, involving the sampling of both 'Impact' and 'Control' sites that are representative of the waterways within the Tahmoor South Domain. Niche Environment and Heritage Pty Ltd (Niche) previously undertook baseline monitoring (Spring 2019 to Autumn 2022) (Niche, 2020a; 2020b; 2021; 2022), as well as the ongoing 'during mining' monitoring (Spring 2022 to Autumn 2024) (Niche, 2023a; 2023b; 2024a; 2024b) for the A Series longwalls. The Spring 2025 monitoring campaign was not undertaken due to SIMEC Mining facing voluntary administration and the mine entering liquidation. Since the commencement of the program, several modifications have been made to the monitoring design in response to mine water discharge, changes to site access, changes in the mine plan, and to enhance the overall effectiveness of the program (Tahmoor, 2025b).

The current monitoring and report include Impact sites within the Teatree Hollow and Bargo River catchments, and Control sites to the southwest on Hornes Creek and Moore Creek. At the time of the Autumn 2026 field surveys, extraction from Longwalls S1A, S2A, and S3A had been completed (Figure 1, Figure 2, Table 1; MSEC, 2024). The monitoring focuses on biotic indicators derived from aquatic macroinvertebrate data collected using NSW AUSRIVAS methodology **(Section 2.5**), supplemented with data on rainfall and limited in-situ water quality sampling.

1.3 Report Objectives

This report presents the results of monitoring undertaken in Autumn 2026. The results allow a preliminary assessment of aquatic ecosystem health against the BMP1 TARP criteria, supporting early identification of any acute stream health concerns potentially linked to the Project.

The A Series aquatic ecology monitoring program includes aquatic habitat observations, water quality monitoring, AUSRIVAS macroinvertebrate assessment and quantitative macroinvertebrate sampling. While quantitative macroinvertebrate samples were collected during the Autumn 2026 survey where sufficient surface water was present, their analysis is outside the scope of this preliminary report. This report focuses on aquatic habitat observations, water quality and AUSRIVAS indicators to provide an initial review against the BMP1 TARP criteria. Quantitative macroinvertebrate results and broader temporal analyses will be presented in the full Autumn 2026 A Series aquatic monitoring report.

The purpose of this preliminary assessment is to identify any potential change in the selected indicators that might suggest impacts have occurred to aquatic health. This may in turn prompt further assessment and / or management actions prior to further monitoring and the more comprehensive assessment that will be undertaken as part of the full aquatic monitoring report.

2 Summary of Methods

2.1 Monitoring Sites

Thirteen monitoring sites are currently included in the program. These include five Control sites, with three in Hornes Creek and two in Moore Creek (Figure 1, Table 2). Seven Impact sites are located within the Teatree Hollow stream network, and one Impact site is on a tributary of the Bargo River ('Bargo River Tributary') (Figure 1, Figure 2, Table 2). Impact sites are defined as those located within a 600 m buffer of active or proposed longwall mining and therefore may experience potential mining-related impacts (currently or in future), including those due to subsidence. The 600 m buffer is based on the Extraction Plan study area and includes features that may be susceptible to predicted subsidence, far-field movements or valley-related movements (Tahmoor, 2025a). Control sites are located outside the 600 m buffer and outside the predicted subsidence impacts.

Not all monitoring sites are included for every monitoring method. The Moore Creek sites (MC14 and MC15) form part of the quantitative macroinvertebrate monitoring program but are not included in the AUSRIVAS assessment presented in this report. Thus, the AUSRIVAS assessment includes the Hornes Creek Control sites (HC6, HC7 and HC8) and the relevant Impact sites within Teatree Hollow and the Bargo River tributary. Quantitative macroinvertebrate samples collected during the Autumn 2026 survey will be assessed in the full aquatic monitoring report.

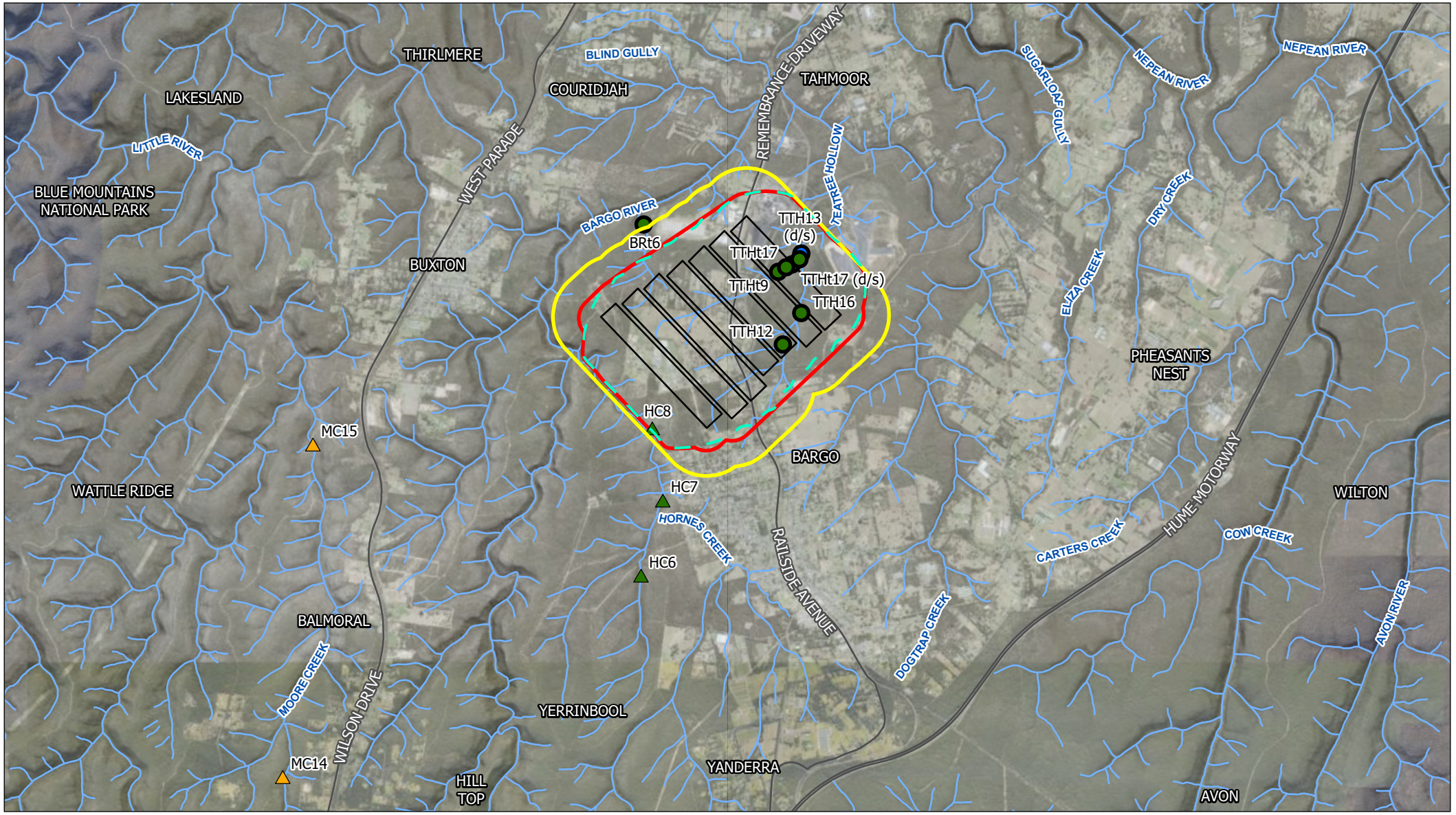
Teatree Hollow and its tributaries are those watercourses most likely to experience mining-related impacts. Hornes Creek and Moore Creek are Control creeks and provide a reference dataset for comparison with Impact waterways located within the approved mining area (Tahmoor, 2025a). While Site HC8 on Hornes Creek currently provides Control data, the planned April 2029 extraction of recently approved (May 2025) Longwall S7A would mean this site will provide Impact data in the future. In response, and to ensure adequate temporal streams of Control data are available during future monitoring, site HC6 was added to the monitoring program in Spring 2023. HC8 will continue to serve as a Control site within the monitoring program until extraction of Longwall S7A commences. Should future impacts be detected, data collected at HC8 will provide a valuable reference point for comparison against pre-mining baseline conditions (Tahmoor, 2025a).

Table 2 outlines the site positions and planned monitoring at each site as part of the A Series monitoring.

Table 2 Site sampling methods for the A Series aquatic monitoring program.

Site Code	Waterway	Required Sampling Methods	Monitoring Period	Easting	Northing
TTHt9	Teatree Hollow tributary	AUSRIVAS and quantitative	Spring 2023 – Autumn 2026	277146	6206543

Site Code	Waterway	Required Sampling Methods	Monitoring Period	Easting	Northing
TTHt17	Teatree Hollow tributary	AUSRIVAS and quantitative	Spring 2022 – Autumn 2026	277246	6206601
TTHt17(d/s)	Teatree Hollow tributary	AUSRIVAS	Autumn 2023 – Autumn 2026	277315	6206638
TTH12	Teatree Hollow	AUSRIVAS and quantitative	Spring 2019 – Autumn 2026	277204	6205632
TTH16	Teatree Hollow	AUSRIVAS and quantitative	Spring 2022 – Autumn 2026	277432	6206040
TTH13	Teatree Hollow	AUSRIVAS and quantitative	Autumn 2020 – Autumn 2026	277411	6206699
TTH13(d/s)	Teatree Hollow	AUSRIVAS	Autumn 2023 – Autumn 2026	277436	6206771
BRt6	Bargo River tributary	AUSRIVAS and quantitative	Spring 2023 – Autumn 2026	275464	6207135
MC14	Moore Creek	Quantitative	Autumn 2020 – Autumn 2026	270959	6200225
MC15	Moore Creek	Quantitative	Spring 2019 – Autumn 2026	271328	6204392
HC6	Hornes Creek	AUSRIVAS and quantitative	Spring 2023 – Autumn 2026	275438	6202753
HC7	Hornes Creek	AUSRIVAS and quantitative	Spring 2019 – Autumn 2026	275705	6203691
HC8	Hornes Creek	AUSRIVAS and quantitative	Spring 2019 – Autumn 2026	275575	6204588



A-series Aquatic Monitoring Sites Overview

Tahmoor South, NSW

Figure 1

Project Code: 304501634-GS-002
Drawn By: KS, Checked By: MM
Date: 2026-08-26
Revision: 03

Stantec

Legend

- Study Area
- Watercourse
- Road

Aquatic Monitoring Site

- Control- Quantitative
- Control- Quantitative and AUSRIVAS
- Impact- AUSRIVAS
- Impact- Quantitative and AUSRIVAS

- Predicted 20mm Total Subsidence
- 600 m Longwall Buffer
- Longwall

Notes:
1. Map displayed in GDA2020 MGA Zone 56

References:
1. Aerial imagery (Aerometrex, March 2026)
2. Watercourse and Roads (NSW SS)

0 0.5 1 1.5 2 Kilometers

Scale at A4: 1:65,000



\\au2012-ntap01_cifs02\shared_projects\304501634\gis\mapdocs\Aquatic Ecology Workspace - KS\304501634_TahmoorEcologicalMonitoring.aprx | 304501634-GS-002 A-Series Aquatic Monitoring Sites Overview | Last updated 2026-08-26 By: jmcculchen

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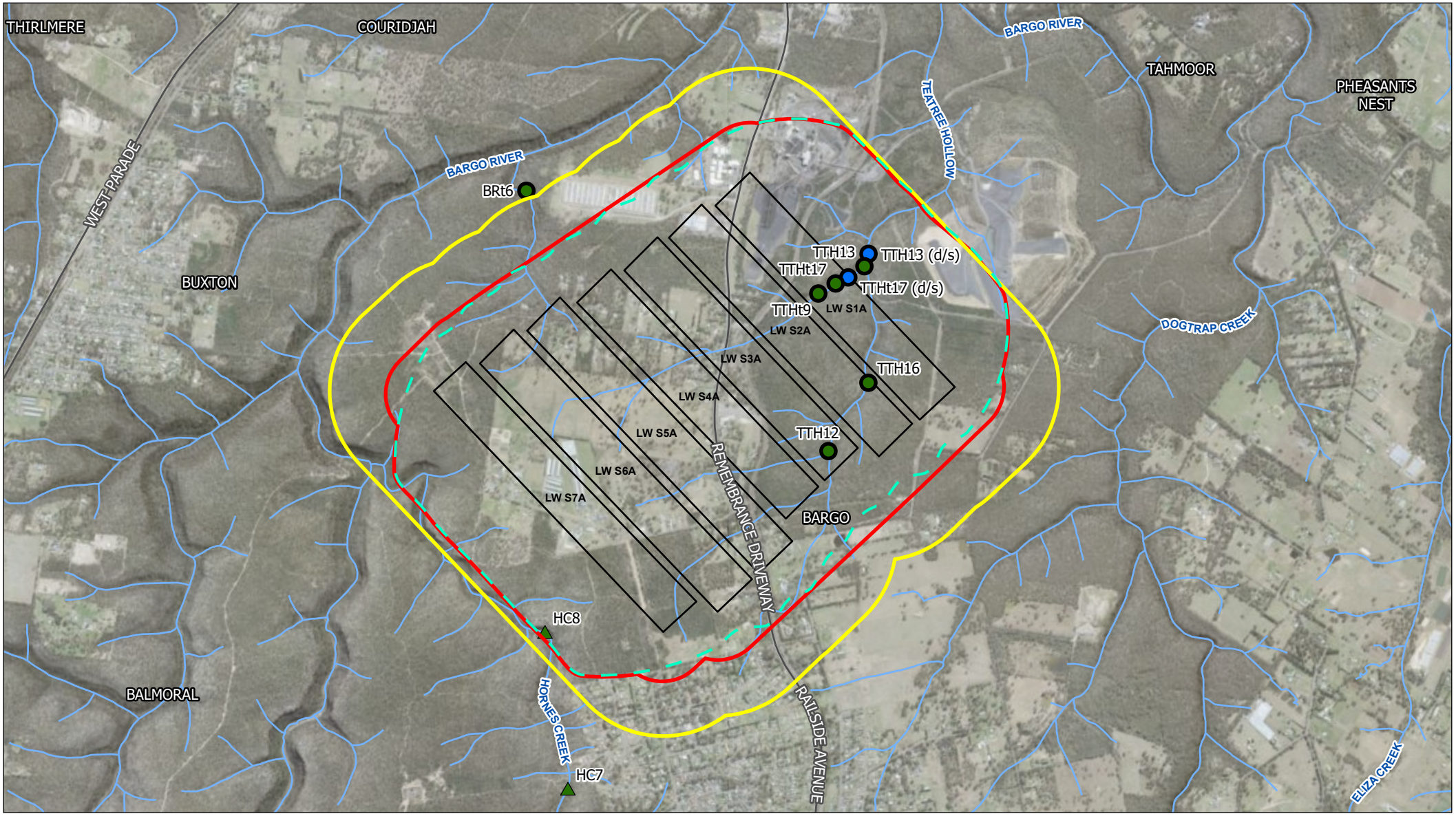

A-series Aquatic Impact Monitoring Sites

Tahmoor South, NSW

Figure 2

Project Code: 304501634-GS-003
Drawn By: KS, Checked By: MM
Date: 2026-08-26
Revision: 03

Stantec

Legend

- Study Area
- Watercourse
- Road

Aquatic Monitoring Site

- Control- Quantitative
- Control- Quantitative and AUSRIVAS
- Impact- AUSRIVAS
- Impact- Quantitative and AUSRIVAS

- Longwall
- 600 m Longwall Buffer
- Predicted 20mm Total Subsidence

Notes:
1. Map displayed in GDA2020 MGA Zone 56

References:
1. Aerial imagery (Aerometrex, March 2026)
2. Watercourse and Roads (NSW SS)

0 250 500 750 1,000 Meters

Scale at A4: 1:30,000



\\au2012-ntap01_cifs02\shared_projects\304501634\gis\mapdocs\Aquatic Ecology Workspace - KS\304501634_TahmoorEcologicalMonitoring.aprx | 304501634-GS-003 A-Series Aquatic Impact Monitoring Sites | Last updated 2026-08-26 By: jmcculchen

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2.2 Survey Timing

Autumn 2026 field surveys were conducted by Stantec ecologists between 28 May and 10 June 2026. Sampling was subject to site access and the availability of sufficient surface water to undertake the applicable monitoring methods. Surface water availability was assessed visually at each site, including noting the presence or absence of surface water, apparent pool depth and flow conditions. These observations were used to determine which monitoring methods could be undertaken at each site.

2.3 Rainfall Assessment

Rainfall data were reviewed to provide additional context for observed aquatic ecosystem health.

Long-term median rainfall data (1966–2021) were sourced from Bureau of Meteorology (BoM) station 68166 (Buxton–Amaroo). This station is no longer operational. Rainfall data recorded at the Tahmoor Colliery stockpile weather station (coordinates: -34.255135, 150.575761) were also incorporated into the data review. The long-term BoM dataset was used to characterise typical rainfall conditions for the area, while the stockpile weather station data were used to assess rainfall conditions immediately preceding the Autumn 2026 survey and compare these conditions with long-term rainfall patterns.

Previously, interpolated rainfall data from the Scientific Information for Landowners (SILO) grid point (-34.25, 150.60) were used for this purpose. However, the stockpile weather station data are now considered more locally representative and have been adopted for current analyses.

2.4 Water Quality

In-situ water quality was sampled at each site (unless the site was dry or had insufficient water) in accordance with AS/NZS 5667.1:1998 ‘Water quality – Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples’. Two sets of measurements were collected from a flowing section of the waterway using a calibrated handheld YSI ProDSS water quality probe, at depths ranging from just below the water surface to 0.5 m, when site conditions permitted. Where the water was deeper than 1 m, the second measurement was collected at the maximum depth practicable, immediately above the substrate and without disturbing bottom sediments. Water quality measurements were collected prior to disturbance associated with macroinvertebrate sampling.

Each set of measurements recorded the following water quality variables:

- Temperature (°C)
- Electrical conductivity (EC) (µS/cm)
- pH
- Salinity (ppt)
- Turbidity (NTU)
- Dissolved oxygen (DO) (mg/L and %sat)
- Oxidation reduction potential (ORP) (mV)

Alkalinity using a standard titration kit (mg CaCO3/L) was also measured using field titration kits. The measurements at each site were averaged and compared to the Australian and New Zealand

Environment and Conservation Council (ANZECC & ARMCANZ, 2000) physical and chemical stressors for protection of slightly upland aquatic ecosystems in South-Eastern Australia default guideline values (DGVs), as recommended by the Australian and New Zealand Guidelines (ANZG). No guidelines exist for alkalinity. ORP values varied among sites but generally reflected the observed differences in dissolved oxygen and water chemistry. As no guideline values are available for ORP, these results were used as supporting information when interpreting overall water quality conditions.

Relevant DGVs for upland streams include:

- Electrical conductivity (30–350 µS/cm)
- Turbidity (2–25 NTU)
- pH (6.5–8.0)
- Dissolved oxygen (90–110%)

2.5 AUSRIVAS Macroinvertebrate Sampling

2.5.1 Field

Aquatic macroinvertebrates were sampled at each site using the NSW AUSRIVAS rapid assessment methodology (Turak et al., 2004). A single edge sample was collected at all sites containing water as no riffle habitat was present at any site. Each sample was collected from pool edges for a cumulative length of 10 m, representing each of the structural habitats present within the edge zone. The edge substrate was disturbed to dislodge animals. A dip net (250 µm mesh size) was swept through the water to catch dislodged animals. The dip net was used to agitate and scoop up material from vegetated river edges.

Each sample was rinsed from the net onto a white sorting tray from which macroinvertebrates were live-sorted on site, following the NSW AUSRIVAS protocol, with the aim of collecting the maximum possible number of macroinvertebrate taxa. The macroinvertebrates collected at each site were preserved in a labelled jar containing a 70% ethanol solution for laboratory identification.

The chemical and physical variables required for running the AUSRIVAS predictive model, including water alkalinity, modal depth and width of the stream, percentage bedrock, boulder or cobble and geographical coordinates, were recorded. The distance from stream source, altitude, land-slope and rainfall predictor variables were determined using desktop data sources.

2.5.2 Laboratory Identification

Samples were processed in Stantec's in-house laboratory and identified to family level with the exception of Oligochaeta and Polychaeta (to Class), Ostracoda (to Subclass), Nematoda and Nemertea (to Phylum), Acarina (to Order) and Chironomidae (to Subfamily). If possible, mayflies, caddisflies and stoneflies were identified to genus level as this taxonomic resolution may be more appropriate to detection of changes in aquatic habitat and water quality (i.e., some genera may respond more rapidly to changed water quality than others).

An extensive reference collection of aquatic macroinvertebrates in conjunction with taxonomic keys were used to identify macroinvertebrates (Cranston, 1995; Cranston, 1999; CSIRO, 1991; Dean &

Suter, 1996; Dean et al., 2004; Gooderham & Tsyrlin, 2002; Gunn et al., 1999; Hawking, 1995; Hawking & Theischinger, 1999; Hawking, 2000; Horwitz et al., 1995; Pinder & Brinkhurst, 1994; Smith, 1996; Theischinger, 2000 and Williams, 1980).

2.5.3 Analysis and Indicators

Samples collected using AUSRIVAS protocol were analysed using the predictive models for NSW edge habitats (Turak et al., 2004). The AUSRIVAS model predicts the number and type of aquatic macroinvertebrate fauna expected to occur at a site in the absence of disturbance or environmental stressors, such as pollution or habitat degradation. The AUSRIVAS NSW autumn model was used to calculate the Observed to Expected (OE50) scores and assign biological condition bands. Additional indicators including the Stream Invertebrate Grade Number Average Level (SIGNAL2) score, taxonomic richness, and the Ephemeroptera, Plecoptera, and Trichoptera (EPT) index, were also derived from the AUSRIVAS data.

2.5.3.1 AUSRIVAS Modelling

Samples collected using AUSRIVAS protocol were analysed using the predictive models for NSW edge habitats (Turak et al., 2004). The AUSRIVAS protocol uses an internet-based software package to determine the environmental condition of a waterway based on predictive models of the distribution of aquatic macroinvertebrates at undisturbed, reference sites (Coysh et al., 2000). The health of the stream / creek is assessed by comparing the observed freshwater macroinvertebrate assemblages (i.e., those collected in the field) with macroinvertebrate assemblages expected to occur in reference waterways with similar environmental characteristics. The data from this study were analysed using the NSW models for pool edge habitat sampled in autumn.

The following indices were calculated to assess macroinvertebrate communities:

OE50 Score

The OE50 ratio was calculated for each site by determining the number of macroinvertebrate taxa observed at a site (NTC50) in relation to the number of taxa expected to occur at that site (NTE50), based upon the reference site data generated by the predictive model. Only macroinvertebrate taxa with a predicted probability of occurrence greater than 50% were used by the model. The OE50 ratio provides an indication of biological impairment at the site based on the ‘band’ (see below) in which the ratio falls (Table 3).

Overall Bands

Overall biological condition bands for each site, which indicate the level of impairment of the assemblage, were derived from OE50 Taxa scores as per the AUSRIVAS modelling. These bands are graded as described in Table 3.

Table 3 Interpretation of OE50 score and bands (Autumn model)

Score	Band	Impairment Indication
> 1.17	X	Higher biologically diversity at the test site than the reference site
< 1.17	A	Similar biologically diversity at the test site and the reference site
< 0.81	B	Biological diversity significantly impaired at the test site in comparison to the reference site
< 0.46	C	Biological diversity severely impaired at the test site in comparison to the reference site
< 0.11	D	Biological diversity extremely impaired at the test site in comparison to the reference site

SIGNAL2 Score

The SIGNAL2 score was calculated for each site by assigning grade numbers to each of the macroinvertebrate taxa based largely on their response to a range of environmental conditions (Chessman, 2003). Grade numbers range from one to ten, with a value of one indicating a taxon tolerant to pollution and a value of ten indicating a taxon sensitive to pollution. The sum of all grade numbers of macroinvertebrates found at a site was divided by the total number of taxa recorded at that site for which SIGNAL2 grades are available. SIGNAL2 scores provide the average sensitivity of macroinvertebrates occurring at a site to present an indirect indication of water quality at the site (Table 4).

Table 4 Interpretation of SIGNAL2 scores

SIGNAL2 Score	Water Quality Indication
> 6	Not impaired
5–6	Mildly impaired
4–5	Moderately impaired
< 4	Severely impaired

Taxonomic Richness

The taxonomic richness at each site was determined by calculating the total number of macroinvertebrate taxa present to provide an indication of ecosystem health.

EPT Richness

The EPT richness was determined at each site by calculating the number of distinct taxa present from orders Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies) (EPT taxa). EPT taxa are sensitive to many pollutants in the stream environment, with mayflies considered sensitive to salinity in particular (Chadwick, 2001). Large numbers of EPT taxa are usually more representative of healthy conditions, whereas few or none of these groups can indicate more impaired conditions.

2.6 Limitations

The physico-chemical water quality data collected provide an indication of conditions at the time of sampling. Some of these parameters are typically variable and may change considerably over short time periods. These parameters are highly sensitive to stochastic events (e.g., high rainfall periods). As such, these physico-chemical readings are used to inform and support the interpretation of the biological analyses only.

Low SIGNAL2 scores may not necessarily be indicative of water pollution and should be interpreted with caution. For example, low SIGNAL2 scores may arise due to naturally low pH or other natural site-specific characteristics unrelated to any anthropogenic disturbance. Taxa with low SIGNAL2 grades are also a component of natural macroinvertebrate communities in the absence of any anthropogenic disturbance.

AUSRIVAS models may have difficulty detecting subtle or specific ecological changes in individual taxa given derived indices are based on the combined response of multiple taxa.

3 Results

3.1 General Observations

Surface water availability (apparent pool depth and flow) during the Autumn 2026 survey appeared similar to that observed in Autumn 2025, with water present at five of the eight Impact sites and at all Control sites. This allowed completion of water quality and macroinvertebrate sampling at most monitoring sites, although TTHt9, TTH16 and TTHt17 remained dry. The condition of aquatic habitat overall was generally consistent with during previous monitoring periods, with no notable changes observed in channel morphology, substrate composition or riparian structure.

Table 5 summarises the hydrological status and sampling undertaken at each monitoring site from Spring 2019 to Autumn 2026. Sites were progressively incorporated into the monitoring program as mining advanced and monitoring requirements evolved. In Table 5, ‘Wet’ (W) indicates that water was present at the site during the monitoring event, ‘Dry’ (D) indicates that the site was dry at the time of monitoring, and ‘Not yet included’ (NYI) indicates that the site had not yet been incorporated into the monitoring program during that survey period. Consecutive dry periods represent the number of successive monitoring events during which a site was recorded as dry.

As of the Autumn 2026 survey, TTH16 and TTHt17 have now been dry for six consecutive monitoring periods, while TTHt9 has been dry for five consecutive monitoring periods. Sites TTHt17(d/s), TTH13 and BRt6, which were dry during previous monitoring periods, retained sufficient water to be sampled during both the Autumn 2025 and Autumn 2026 surveys. Similarly, TTH12, which was dry during Spring 2024, retained sufficient water for sampling during both the Autumn 2025 and Autumn 2026 surveys.

Overall, surface water availability during the Autumn 2026 survey remained higher than that observed during the relatively drier monitoring period of Spring 2024, allowing water quality and macroinvertebrate sampling to be completed at most Impact and Control sites. However, the continued absence of surface water at TTHt9, TTH16 and TTHt17 indicates that habitat availability remains substantially reduced at these sites relative to other monitored waterways.

Results

Table 5 Monitoring history and consecutive dry periods recorded for each site

Site details		Baseline monitoring period						During-mining monitoring period						
Site	**Waterway**	**Spring 2019**	**Autumn 2020**	**Spring 2020**	**Autumn 2021**	**Spring 2021**	**Autumn 2022**	**Autumn 2023**	**Spring 2023**	**Autumn 2024**	**Spring 2024**	**Autumn 2025**	**Autumn 2026**	**Consecutive dry periods**
TTHt9	Teatree Hollow tributary	NYI	NYI	NYI	NYI	NYI	NYI	NYI	D^	D	D	D	D	5
TTHt17	Teatree Hollow tributary	NYI	NYI	NYI	NYI	W*	W*	D	D	D	D	D	D	6
TTHt17(d/s)	Teatree Hollow tributary	NYI	NYI	NYI	NYI	NYI	NYI	A/WQ	A/WQ	D	D	A/WQ	A/WQ	0
TTH12	Teatree Hollow	W*	W*	W*	W*	W*	W*	A/Q/WQ	A/Q/WQ	A/Q/WQ	D	A/Q/WQ	A/Q/WQ	0
TTH16	Teatree Hollow	NYI	NYI	NYI	NYI	W*	W*	D	D	D	D	D	D	6
TTH13	Teatree Hollow	NYI	W*	W*	W*	W*	W*	D	A/Q/WQ	D	D	A/Q/WQ	A/Q/WQ	0
TTH13(d/s)	Teatree Hollow	NYI	NYI	NYI	NYI	NYI	NYI	A/WQ	A/WQ	A/WQ	A/WQ	A/WQ	A/WQ	0
BRt6	Bargo River tributary	NYI	NYI	NYI	NYI	NYI	NYI	NYI	A/Q/WQ^	D	WQ/D	A/Q/WQ	A/Q/WQ	0
MC14	Moore Creek	NYI	W*	W*	W*	W*	W*	Q/WQ	Q/WQ	D	Q/WQ	Q/WQ	Q/WQ	0
MC15	Moore Creek	W*	W*	W*	W*	W*	W*	Q/WQ	Q/WQ	Q/WQ	Q/WQ	Q/WQ	Q/WQ	0
HC6	Hornes Creek	NYI	NYI	NYI	NYI	NYI	NYI	NYI	A/Q/WQ^	A/Q/WQ	A/Q/WQ	A/Q/WQ	A/Q/WQ	0
HC7	Hornes Creek	W*	W*	W*	W*	W*	W*	A/Q/WQ	A/Q/WQ	A/Q/WQ	A/Q/WQ	A/Q/WQ	A/Q/WQ	0
HC8	Hornes Creek	W*	W*	W*	W*	W*	W*	A/Q/WQ	A/Q/WQ	A/Q/WQ	A/Q/WQ	A/Q/WQ	A/Q/WQ	0

- ^ New sampling site introduced during the Spring 2023 monitoring period.
- * The Spring 2024 report states that no Impact or Control sites were dry during the six pre-extraction surveys completed up to and including Autumn 2022. Wet confirms water presence only and does not indicate that all sampling methods were completed.
- Quantitative macroinvertebrate samples collected during the Autumn 2026 survey are not assessed in this preliminary report and will be presented in the full aquatic monitoring report.
- Monitoring commenced in Spring 2019. Sites entered the program progressively. TTH12, HC7, HC8 and MC15 commenced in Spring 2019; MC14 and TTH13 in Autumn 2020; TTH16 and TTHt17 in Spring 2021; and HC6, TTHt9 and BRt6 in Spring 2023.
- TTH13, TTH16 and TTHt17 were first recorded dry in Autumn 2023. TTH16 and TTHt17 remained dry in subsequent surveys. Water was present at TTH13 in Spring 2023, but it was dry in Autumn and Spring 2024.
- MC14 was dry in Autumn 2024 and was not reported dry at any other monitoring occasion. Its current consecutive dry-period count is therefore 0.
- TTH13(d/s) and TTHt17(d/s) were initially sampled opportunistically in Autumn 2023 where water was present downstream and were subsequently incorporated into the monitoring program.
- MC14 and MC15 were historically included for quantitative macroinvertebrate and water-quality monitoring rather than AUSRIVAS sampling.
- Sources: Niche Spring 2022, Spring 2023 and Autumn 2024 aquatic monitoring reports; Stantec Spring 2024 A Series aquatic monitoring report.

3.2 Rainfall Assessment

Rainfall in the two months preceding the Autumn 2026 survey was variable (Table 6, Figure 3). Rainfall during March 2026 (88.0 mm) was slightly greater than the long-term median monthly rainfall (81.2 mm), while rainfall in April 2026 was lower than the long-term median, with a median of 4.0 mm of rainfall recorded compared with a long-term median of 39.2 mm. Rainfall was then greater during May 2026, with a total of 82.0 mm recorded, more than twice the long-term median monthly rainfall of 32.4 mm. The highest daily rainfall event during May occurred on 25 May 2026, when 21.5 mm of rainfall was recorded at the Tahmoor Colliery stockpile weather station. A further 14.5 mm of rainfall was recorded on the day monitoring commenced. In total, approximately 50 mm of rainfall was recorded during the two weeks preceding the survey. These rainfall events are likely to have contributed to increased surface water availability immediately prior to sampling and should be considered when interpreting the monitoring results. While rainfall occurred in the weeks preceding the survey, no evidence of recent high-flow disturbance was observed at the monitoring sites.

Table 6 Rainfall data from BoM and Tahmoor Colliery stockpile weather station

Month	Median Monthly Rainfall (1966–2021) (mm) [1]	Total Monthly Rainfall (October–December 2025 to January–June 2026) (mm) [2]
October	50.8	9.0
November	50.8	45.4
December	67.0	60.4
January	81.3	103.0
February	76.3	89.5
March	81.2	88.0
April	39.2	4.0
May	32.4	82.0
June	38.8	3.0 (up to 20 June 2026)

[1] BoM station 68166
[2] Tahmoor Coal stockpile weather station (-34.255135, 150.575761)

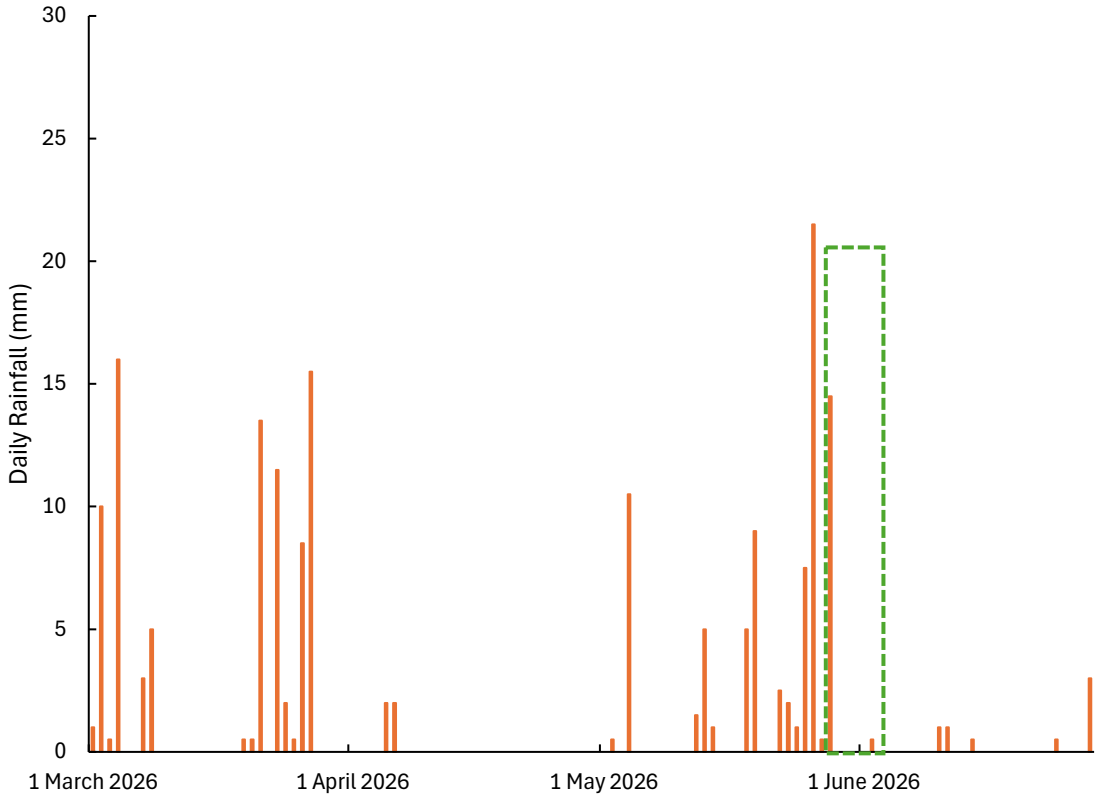

Figure 3 Daily rainfall totals for the four months preceding and during the Autumn 2026 survey, extracted from Tahmoor Colliery stockpile weather station. The green dotted area indicates the Autumn 2026 survey period.

3.3 Water Quality

Water quality readings are provided in Table 7. Three Impact sites (TTHt9, TTH16 and TTHt17) were dry at the time of sampling and could not be assessed. The key findings regarding water quality for Autumn 2026 were:

- DO measures were the indicators most frequently outside the ANZG default guideline values (DGVs). Dissolved oxygen concentrations were below the DGV range (90–110%) at TTH12, TTH13(d/s), TTHt17(d/s), BRt6 and MC14, with the lowest values recorded at TTH12 (53.5%), BRt6 (55.9%) and TTHt17(d/s) (65.2%). In contrast, DO at TTH13, MC15, HC6, HC7 and HC8 were within the DGV range.
- Turbidity values were generally low across the monitoring program, with TTH13(d/s) the only site to exceed the upper ANZG DGV (25 NTU), recording 31.7 NTU. Several sites, including TTHt17(d/s), BRt6, MC14, MC15 and HC6, recorded turbidity values below the lower guideline threshold of 2 NTU.
- pH values were below the DGV range (6.5–8.0) at TTH13, TTH13(d/s), TTHt17(d/s), BRt6, MC14, MC15 and HC6. The lowest pH values were recorded at MC15 (4.5), BRt6 (5.3),

TTHt17(d/s) (5.3) and HC6 (5.8). Control sites HC7 and HC8 recorded pH values within the DGV range, while TTH12 was consistent with the lower guideline threshold (pH 6.5).

- EC was generally within the DGV range (30–350 µS/cm) at all sampled sites, with the exception of TTH13(d/s), where EC was 510 µS/cm and above the upper DGV.

Water quality values outside the DGV ranges were recorded at both Impact and Control sites, particularly for pH and DO. Overall, the Autumn 2026 results were generally consistent with patterns observed during previous monitoring events, with no obvious changes in water quality observed across the monitoring program.

Table 7 Autumn 2026 in-situ water quality results. Values are mean of individual readings at each site.

Treatment	Impact								Control				
Waterway	**Teatree Hollow**				**Teatree Hollow tributary**			**Bargo River tributary**	**Moore Creek**		**Hornes Creek**		
Site	**TTH12**	**TTH16**	**TTH13**	**TTH13(d/s)**	**TTHt9**	**TTHt17**	**TTHt17(d/s)**	**BRt6**	**MC14**	**MC15**	**HC6**	**HC7**	**HC8**
Temperature (°C)	11.2	Dry	10.7	11.8	Dry	Dry	9.2	12.1	11.7	11.9	12.0	14.7	9.7
Electrical Conductivity (mS/cm)	204	Dry	293	**510**	Dry	Dry	165	169	203	166	109	292	277
Turbidity (NTU)	6.4	Dry	4.8	**31.7**	Dry	Dry	**1.4**	**1.0**	**0.0**	**0.0**	**0.0**	7.9	2.8
Dissolved Oxygen (% sat)	**53.5**	Dry	92.0	**84.8**	Dry	Dry	**65.2**	**55.9**	**67.0**	93.9	90.4	97.2	93.5
Dissolved Oxygen (mg/L)	5.86	Dry	10.21	9.16	Dry	Dry	7.49	6.00	7.26	10.13	9.72	9.82	10.63
pH (pH units)	6.5	Dry	**6.4**	**6.1**	Dry	Dry	**5.3**	**5.3**	**5.3**	**4.5**	**5.8**	6.7	6.8
ORP	131.2	Dry	71.35	27.8	Dry	Dry	164.4	165.3	108.7	170.0	90.3	127.7	127.7
Alkalinity (mg CaCO3/L)	10	Dry	16	25	Dry	Dry	<100	10	<100	<100	10	25	20

Default Guideline Values:

- Electrical conductivity: 30–350 µS/cm
- Turbidity: 2–25 NTU
- pH: 6.5–8.0
- Dissolved oxygen: 90–110% sat

Bold text denotes values outside the ANZC default guideline value (DGV)

3.4 AUSRIVAS Macroinvertebrate Sampling

Five of the eight Impact sites (TTH12, TTH13, TTH13(d/s), TTHt17(d/s), and BRt6) contained sufficient surface water to allow AUSRIVAS macroinvertebrate sampling during the Autumn 2026 survey. All five of these Impact sites recorded OE50 scores within Band C, with scores ranging from 0.19 at TTHt17(d/s) to 0.37 at TTH13 (Table 8, Figure 4). Among the Control sites, HC6 recorded Band A (0.92), while HC7 and HC8 recorded Band C (0.44 and 0.28, respectively) (Table 8, Figure 5).

OE50 results varied among sites in terms of changes from Autumn 2025 to Autumn 2026 (Figure 4). OE50 values at the sampled Teatree Hollow sites in Autumn 2026 were generally lower than or similar to those recorded during the previous monitoring period, while BRt6 recorded an increase in OE50 score. Among the Hornes Creek Control sites, HC6 improved from Band B to Band A, while HC7 and HC8 declined from Band B to Band C (Figure 4, Figure 5). These results highlight the spatial and temporal variability in OE50 scores across both the Impact and Control groups.

SIGNAL2 scores ranged from 2.5 to 4.7 across sampled sites (Table 8, Figure 6, Figure 7). Four of the five sampled Impact sites recorded scores below 4, corresponding to the severely impaired category, while TTHt17(d/s) recorded 4.7, corresponding to the moderately impaired category. Among Control sites, HC6 recorded 4.1, while HC7 and HC8 each recorded 3.1. Overall, SIGNAL2 scores indicated a degree of water quality impairment across all Impact and Control sites.

Taxonomic richness ranged from 7 to 11 taxa at sampled Impact sites and from 9 to 14 taxa at Control sites (Table 8). The highest richness was recorded at HC6 (14 taxa), followed by HC7 (13 taxa). Among Impact sites, BRt6 recorded the highest richness (11 taxa), while TTH12 recorded the lowest (7 taxa). Richness in Autumn 2026 was generally similar to Autumn 2025 across most monitored sites, although some inter-survey variability was evident, particularly at the Hornes Creek Control sites.

EPT richness was low across all sampled sites, ranging from zero to two taxa (Table 8). No EPT taxa were recorded at TTH12, TTH13 or TTHt17(d/s). One EPT taxon was recorded at each of TTH13(d/s), BRt6, HC7 and HC8, while HC6 recorded two EPT taxa. Overall, there appeared to be slightly greater taxonomic richness and EPT taxa richness at the Control sites compared with the Impact sites. The generally low EPT richness indicates a limited representation of pollution-sensitive macroinvertebrate groups across both Impact and Control sites.

Interpretation of these results will be further informed by quantitative macroinvertebrate analyses, temporal trends and corresponding surface water monitoring results as part of the full aquatic monitoring assessment.

Table 8 Autumn 2026 AUSRIVAS results.

Treatment	Impact								Control		
Waterway	**Teatree Hollow**				**Teatree Hollow tributary**			**Bargo River tributary**	**Hornes Creek**		
Site	**TTH12**	**TTH16**	**TTH13**	**TTH13(d/s)**	**TTHt9**	**TTHt17**	**TTHt17(d/s)**	**BRt6**	**HC6**	**HC7**	**HC8**
OE50	0.27	Dry	0.37	0.28	Dry	Dry	0.19	0.34	0.92	0.44	0.28
Band	C	Dry	C	C	Dry	Dry	C	C	A	C	C
Signal2	2.7	Dry	2.5	2.8	Dry	Dry	4.7	3.1	4.1	3.1	3.1
Taxonomic Richness	7	Dry	10	9	Dry	Dry	8	11	14	13	9
EPT Richness	0	Dry	0	1	Dry	Dry	0	1	2	1	1

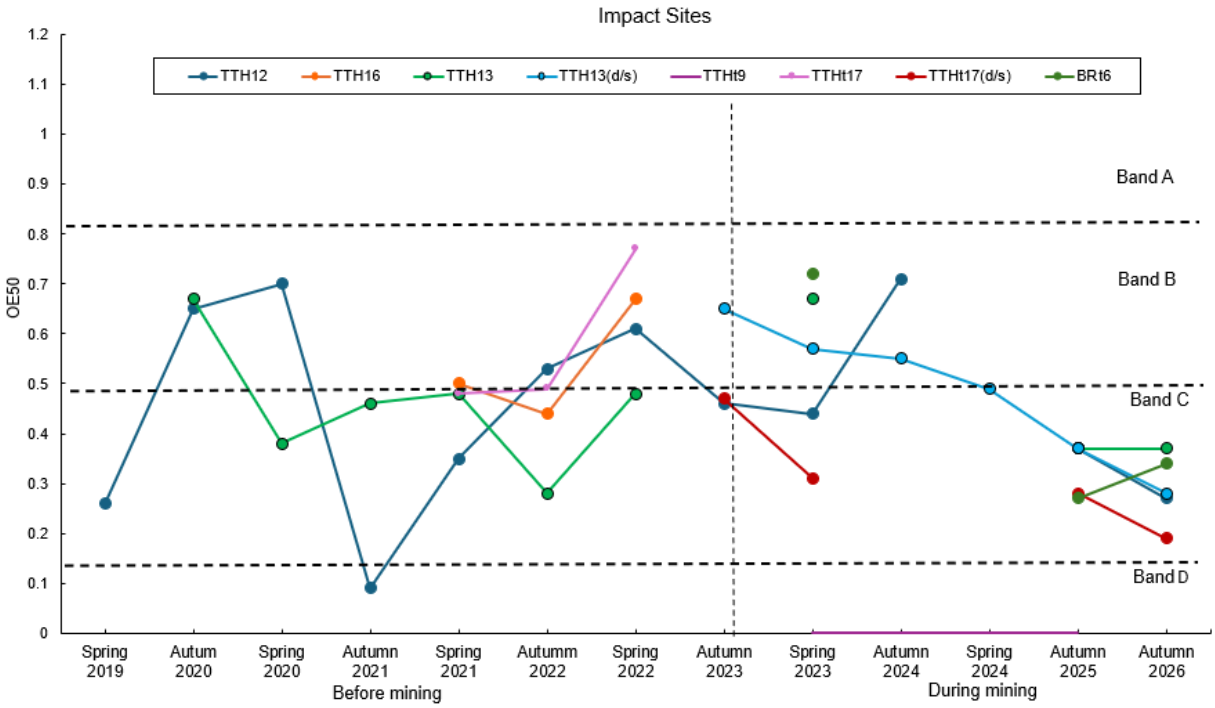

Figure 4 OE50 ratios and bands recorded at Impact sites (2019–2026). Black dashed lines represent Autumn band levels.

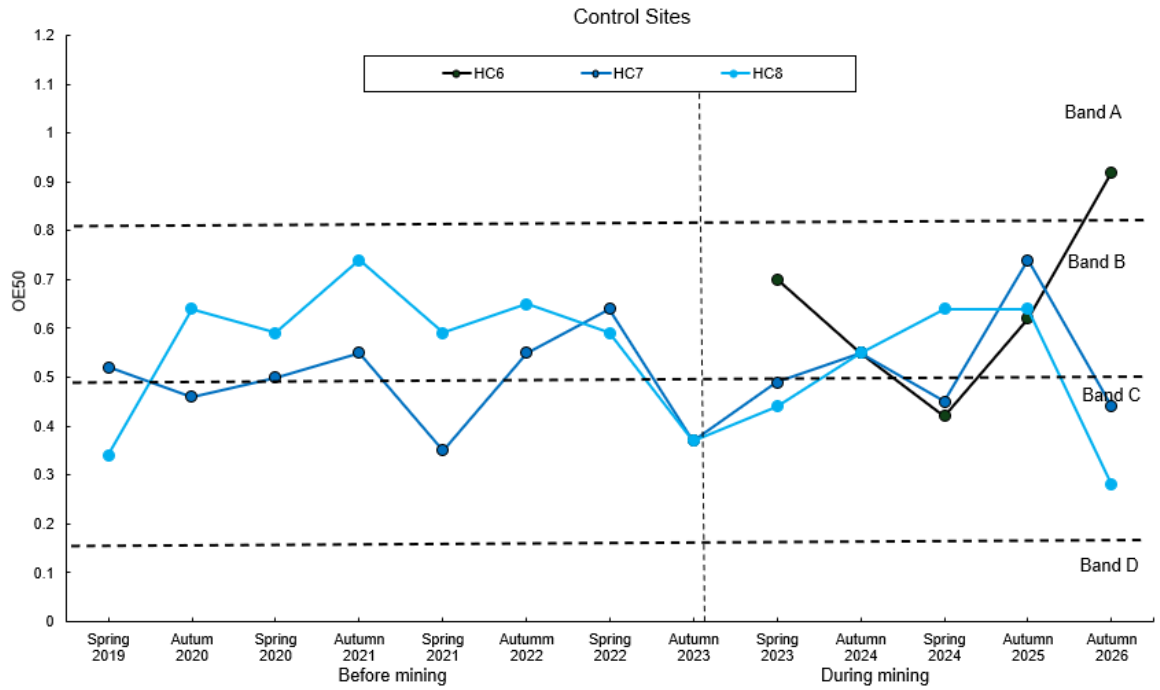

Figure 5 OE50 ratios and bands recorded at Control sites (2019–2026) Black dashed lines represent Autumn band levels.

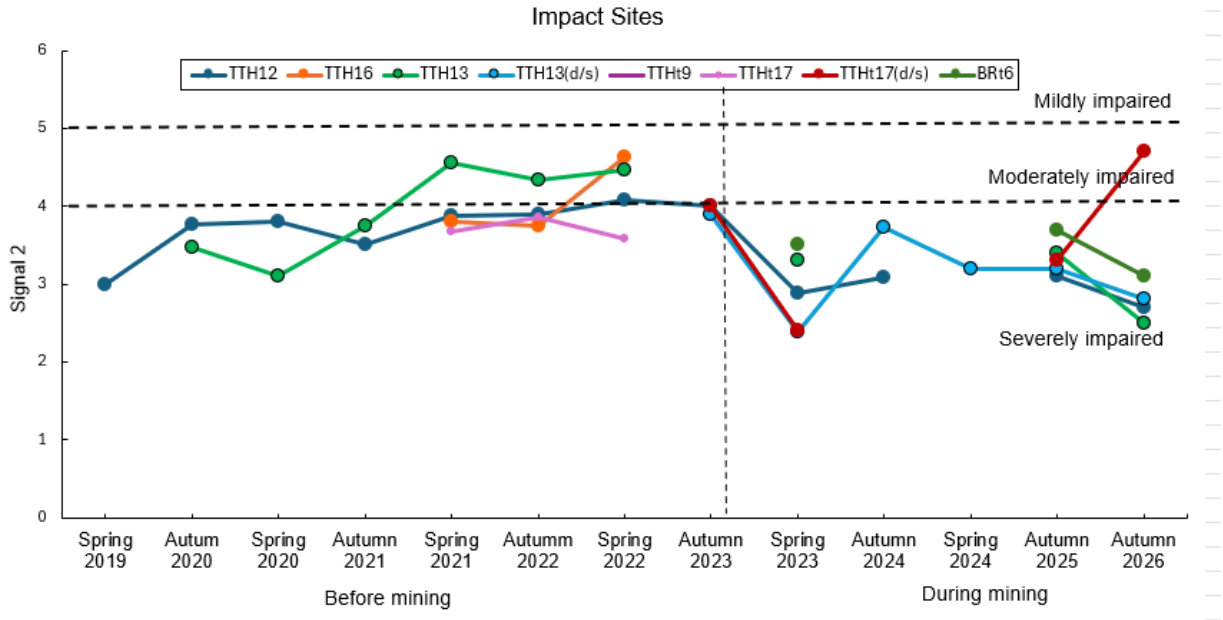

Figure 6 SIGNAL2 scores recorded at Impact sites (2019–2026)

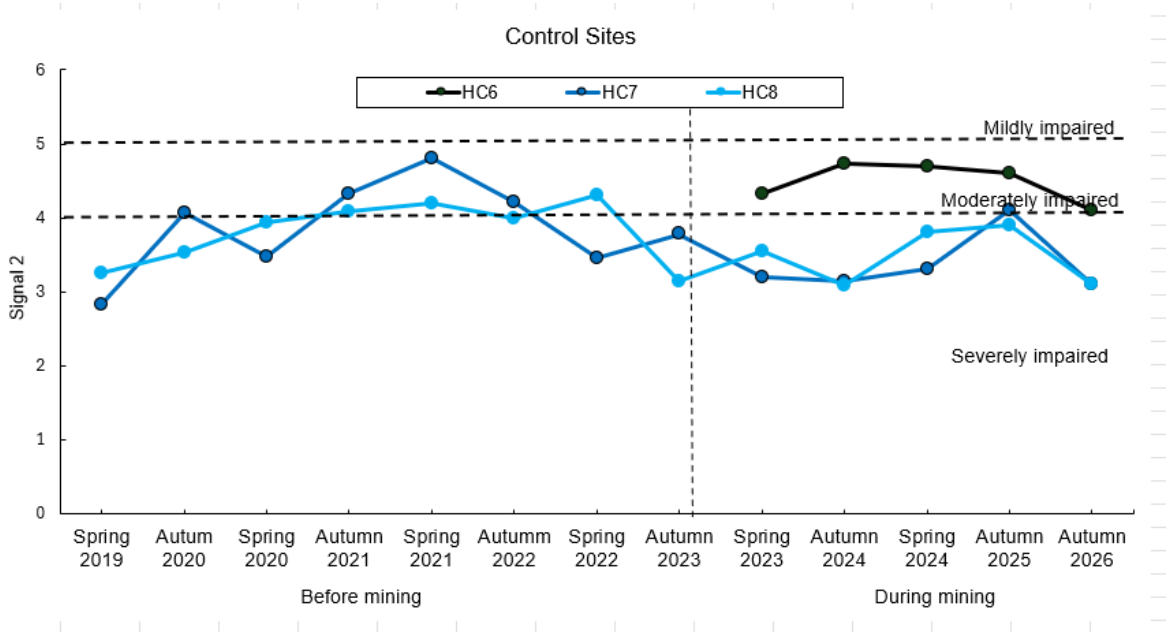

Figure 7 SIGNAL2 scores recorded at Control sites (2019–2026)

4 Preliminary TARP Assessment

Table 9 summarises the results for the key stream health indicators assessed against the BMP1 TARP criteria. The primary indicators used to inform TARP trigger levels are aquatic pool habitat condition (including the presence or absence of water) and AUSRIVAS scores. Under BMP1, a Level 1 trigger is assigned where a reduction in aquatic pool habitat relative to baseline observations, or an AUSRIVAS Band D result, is recorded for two consecutive sampling occasions at one or more aquatic ecology monitoring sites. Level 2 and Level 3 triggers apply where these conditions persist for three and four consecutive sampling occasions, respectively (Tahmoor Coal, 2025b).

The BMP1 TARP trigger criteria are assessed across the aquatic ecology monitoring program. For reporting purposes, Table 9 and Table 10 identify the monitoring sites at which the relevant conditions were observed and present the corresponding TARP level, actions, responses and outcomes associated with those observations. The presentation of sites within these tables does not indicate that the BMP1 TARP operates as a separate trigger framework for each individual site.

All sites that retained water during the current sampling period recorded AUSRIVAS scores above Band D.

Table 9 Summary of stream health indicators at monitoring sites

Stream	Site	Stream health indicator summary
Teatree Hollow	TTH12	• Pool retained sufficient surface water for sampling. • DO was below the DGV (53.5%), while pH was at the lower DGV (6.5). • Pool scored in Band C for the OE50 ratio (0.27), had a SIGNAL2 score of 2.7 and had no EPT taxa present among the seven taxa recorded. The OE50 result indicates lower macroinvertebrate condition relative to modelled reference expectations.
	TTH16	• Pool was dry for the sixth consecutive monitoring period. • Water quality and macroinvertebrate sampling could not be completed.
	TTH13	• Pool retained sufficient surface water for sampling. • Pool had pH below the DGV (6.4), while DO was within the DGV range (92.0%). • Pool scored in Band C for the OE50 ratio (0.37), had a SIGNAL2 score of 2.5 and had no EPT taxa present among the 10 taxa recorded. The site recorded a Band C AUSRIVAS result and pH below the DGV range.
	TTH13(d/s)	• Pool retained sufficient surface water for sampling. • EC (510 µS/cm) and turbidity (31.7 NTU) were above the upper DGVs, while DO (84.8%) and pH (6.1) were below the DGV ranges.

Stream	Site	Stream health indicator summary
		• Pool scored in Band C for the OE50 ratio (0.28), had a SIGNAL2 score of 2.8 and had one EPT taxon present among the nine taxa recorded. Several water quality variables were outside the DGV ranges and the site recorded a Band C AUSRIVAS result.
Teatree Hollow tributary	TTHt9	• Pool was dry for the fifth consecutive monitoring period. • Water quality and macroinvertebrate sampling could not be completed.
	TTHt17	• Pool was dry for the sixth consecutive monitoring period. • Water quality and macroinvertebrate sampling could not be completed.
	TTHt17(d/s)	• Pool retained sufficient surface water for sampling. • Pool had DO (65.2%) and pH (5.3) below the DGV ranges. • Pool scored in Band C for the OE50 ratio (0.19), had a SIGNAL2 score of 4.7 and had no EPT taxa present among the eight taxa recorded. The OE50 result indicates lower macroinvertebrate condition relative to modelled reference expectations.
Bargo River tributary	BRt6	• Pool retained sufficient surface water for sampling. • Pool had DO (55.9%) and pH (5.3) below the DGV ranges. • Pool scored in Band C for the OE50 ratio (0.34), had a SIGNAL2 score of 3.1 and had one EPT taxon present among the 11 taxa recorded. The OE50 result indicates lower macroinvertebrate condition relative to modelled reference expectations.
Moore Creek	MC14	• Pool retained sufficient surface water for sampling. • Pool had DO (67.0%) and pH (5.3) below the DGV ranges. • AUSRIVAS macroinvertebrate sampling was not included in the required sampling methods for this site.
	MC15	• Pool retained sufficient surface water for sampling. • Pool had pH below the DGV range (4.5), while DO was within the DGV range (93.9%). • AUSRIVAS macroinvertebrate sampling was not included in the required sampling methods for this site.
Hornes Creek	HC6	• Pool retained sufficient surface water for sampling. • Pool had pH below the DGV range (5.8), while DO was within the DGV range (90.4%). • Pool scored in Band A for the OE50 ratio (0.92), had a SIGNAL2 score of 4.1 and had two EPT taxa present among the 14 taxa recorded. • The OE50 result indicates macroinvertebrate condition similar to modelled reference expectations, although the

Stream	Site	Stream health indicator summary
		SIGNAL2 score and low EPT richness indicate a limited representation of pollution-sensitive taxa.
	HC7	• Pool retained sufficient surface water for sampling. • DO (97.2%) and pH (6.7) were within the DGV ranges. • Pool scored in Band C for the OE50 ratio (0.44), had a SIGNAL2 score of 3.1 and had one EPT taxon present among the 13 taxa recorded. The Band C AUSRIVAS result indicates lower macroinvertebrate condition relative to modelled reference expectations.
	HC8	• Pool retained sufficient surface water for sampling. • DO (93.5%) and pH (6.8) were within the DGV ranges. • Pool scored in Band C for the OE50 ratio (0.28), had a SIGNAL2 score of 3.1 and had one EPT taxon present among the nine taxa recorded. The Band C AUSRIVAS result indicates lower macroinvertebrate condition relative to modelled reference expectations.

The preliminary TARP assessment is intended to identify whether the BMP1 trigger criteria have been met and whether additional investigation or management actions should be considered. Assignment of a TARP trigger level does not, in isolation, demonstrate that an observed condition is attributable to mining activities. Further assessment of potential contributing factors, including climatic conditions, temporal trends and other monitoring datasets, will be undertaken as part of the full aquatic monitoring assessment.

Table 10 lists preliminary TARP assessment for the aquatic ecology monitoring program and identifies the Impact sites at which the relevant trigger conditions were observed. The table also presents the actions and responses specified in the BMP and summarises the preliminary findings and recommended next steps arising from the Autumn 2026 aquatic monitoring review.

Table 10 Preliminary review of ecological indicators against TARP criteria

Sites	Trigger level Preliminary TARP level Autumn 2025	Trigger level Preliminary TARP level Autumn 2026	Actions	Responses	Outcomes
TTH12	**Normal** TTH12 contained water in Autumn 2025. Visual monitoring indicates aquatic pool habitat parameters were similar to baseline observations at aquatic ecology monitoring sites. AND AUSRIVAS score equal to or greater than Band C.	**Normal** TTH12 contained water in Autumn 2026. Visual monitoring indicates aquatic pool habitat parameters were similar to baseline observations at aquatic ecology monitoring sites. AND AUSRIVAS score equal to or greater than Band C.	Continue monitoring and review of data per monitoring program.	No response required.	Completed as part of this report. TTH12 contained sufficient water for aquatic monitoring in Autumn 2026 and remained within a Normal preliminary TARP level. No further response is required at this stage beyond continued monitoring.
TTH13, BRt6	**Normal** Both sites retained water in Autumn 2025. Visual monitoring indicates aquatic pool habitat parameters were similar to baseline observations at aquatic ecology monitoring sites. AND AUSRIVAS score equal to or greater than Band C.	**Normal** Both sites retained water in Autumn 2026. Visual monitoring indicated aquatic pool habitat parameters were similar to baseline observations at aquatic ecology monitoring sites. AND AUSRIVAS scores equal to or greater than Band C.	Continue monitoring and review of data per monitoring program.	No response required.	Completed as part of this report. Both sites contained sufficient water for aquatic monitoring in Autumn 2026 and remained within a Normal preliminary TARP level. No further response is required at this stage beyond continued monitoring.
TTHt9	**Level 3**	**Level 3**	Actions as stated in Level 2	Responses as stated in Level 2.	Completed as part of this preliminary review. TTHt9 remains at a preliminary Level 3 TARP trigger due

	This site was found dry for the fourth consecutive monitoring period. No macroinvertebrate sampling was able to be completed.	This site was found dry for the fifth consecutive monitoring period. No macroinvertebrate sampling was able to be completed.	Increase monitoring frequency for sites where Level 3 has been reached and at corresponding reference sites, subject to land access. Add additional monitoring sites as required. Undertake a detailed investigation to assess if the change in behaviour is related to mining effects (e.g., whether there has been subsidence induced fracturing, other catchment changes, effects unrelated to mining or the prevailing climate). Undertake an investigation to determine if an exceedance of the performance measure is likely.	If it is concluded that pools/aquatic habitat have been damaged by subsidence impacts, offer a site visit with DPHI and key stakeholders. If relevant, notify DCCEEW of any prediction of an exceedance of a performance measure. Develop a Rehabilitation Management Plan in consultation with DPHI and key stakeholders. Implement Rehabilitation Management Plan, subject to land access. Continue monitoring to determine if an exceedance of the performance measure will occur.	to five consecutive dry monitoring periods. No additional sites are recommended at this stage, as the existing monitoring network is considered fit for purpose. Further assessment will be completed as part of the full biannual reporting process, informed by the corresponding surface water monitoring review.
TTH16, TTHt17	**Level 3** Both sites were dry for the fifth consecutive monitoring period. No macroinvertebrate sampling was able to be completed Visual monitoring indicates a reduction in	**Level 3** Both sites were dry for the sixth consecutive monitoring period. No macroinvertebrate sampling was able to be completed Visual monitoring indicates a reduction in	Actions as stated in Level 2. Increase monitoring frequency for sites where Level 3 has been reached and at corresponding reference sites, subject to land access. Add additional monitoring sites as required.	Responses as stated in Level 2. If it is concluded that pools/aquatic habitat have been damaged by subsidence impacts: Offer site visit with DPHI and key stakeholders. If relevant, notify Commonwealth DCCEEW of any predictions of an	Completed as part of this preliminary review. TTH16 and TTHt17 remain at a preliminary Level 3 TARP trigger due to persistent dry conditions over six consecutive monitoring periods. No additional sites are currently recommended. The adequacy of the monitoring network will continue to be reviewed through the full aquatic monitoring assessment and corresponding surface water monitoring review.

	aquatic pool habitat compared to baseline observations at aquatic ecology monitoring sites for four consecutive sampling occasions.	aquatic pool habitat compared to baseline observations at aquatic ecology monitoring sites for four consecutive sampling occasions.	Undertake a detailed investigation to assess if the change in behaviour is related to mining effects (e.g., whether there has been subsidence induced fracturing, other catchment changes, effects unrelated to mining or the prevailing climate). Undertake an investigation to determine if an exceedance of the performance measure is likely.	exceedance of a performance measure. Develop a Rehabilitation Management Plan in consultation with DPHI and key stakeholders. Implement Rehabilitation Management Plan, subject to land access. Continue monitoring to determine if an exceedance of the performance measure will occur	Further assessment will be completed as part of the full biannual reporting process, informed by the corresponding surface water monitoring review.

5 Summary and Recommendations

This report presents the preliminary findings of the Autumn 2026 aquatic ecology monitoring program for the A Series longwall, conducted in support of the Biodiversity Management Plan (BMP) for the Tahmoor South Project.

The key findings were:

- Surface water was present at five of the eight Impact sites and all Control sites during the Autumn 2026 survey. TTHt9, TTH16 and TTHt17 remained dry and could not be assessed for water quality or macroinvertebrate communities. TTHt9 was dry for the fifth consecutive monitoring period, while TTH16 and TTHt17 were dry for the sixth consecutive monitoring period.
- Water quality values outside ANZG default guideline value ranges were recorded at both Impact and Control sites, most commonly for pH and DO (% sat). Elevated EC and turbidity were recorded at TTH13(d/s), while several sites recorded low pH and DO (% sat) values.
- All sampled Impact sites recorded OE50 scores within Band C, indicating reduced macroinvertebrate condition relative to reference expectations. Results at Control sites were variable, with HC6 recording Band A and HC7 and HC8 recording Band C. SIGNAL2 scores and EPT richness were generally low across both Impact and Control sites.
- No sampled sites recorded AUSRIVAS Band D scores during Autumn 2026. Consistent with Autumn 2025, TTH12, TTH13 and BRt6 remained at a preliminary Normal TARP level, while TTHt9, TTH16 and TTHt17 remained at a preliminary Level 3 TARP level due to persistently reduced aquatic habitat availability.

Overall, the Autumn 2026 monitoring results were generally consistent with those recorded during recent monitoring periods. While TTHt9, TTH16 and TTHt17 continued to exhibit reduced habitat availability, these sites remained at the same preliminary TARP level as the previous survey. No additional Impact sites progressed to a higher TARP level, and no sampled sites recorded a Band D AUSRIVAS result. Accordingly, the preliminary assessment does not indicate evidence of a substantial deterioration in aquatic ecosystem condition relative to recent monitoring periods. Based on the Autumn 2026 findings and preliminary TARP assessment, no additional monitoring or management actions are currently recommended beyond those already specified in the Biodiversity Management Plan.

The preliminary TARP review identified TTHt9, TTH16 and TTHt17 as remaining at a preliminary Level 3 TARP level due to the continued absence of surface water and the associated reduction in aquatic habitat availability. TTH16 and TTHt17 previously contained surface water during earlier monitoring periods, and their continued dry condition therefore represents a reduction in aquatic habitat relative to those previously observed conditions. In contrast, TTHt9 has remained dry since its inclusion in the monitoring program in Spring 2023 and therefore does not have a site-specific aquatic habitat reference condition for comparison. Nevertheless, consistent with the BMP1 TARP framework,

TTHt9 remains at a preliminary Level 3 TARP level due to the ongoing absence of surface water. A comprehensive assessment of these sites will be undertaken as part of the full biannual review and informed by the corresponding surface water monitoring assessment.

Recommendations

- Continue the biannual aquatic ecology monitoring program in accordance with the Biodiversity Management Plan.
- Continue monitoring TTHt9, TTH16 and TTHt17 and assess the ongoing absence of surface water at these sites as part of the full aquatic monitoring assessment, incorporating temporal aquatic ecology results, quantitative macroinvertebrate analyses and the corresponding surface water monitoring review.

A comprehensive assessment against the aquatic ecology TARP criteria will be completed as part of the full aquatic monitoring report, including integration of quantitative macroinvertebrate and corresponding surface water monitoring results.

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