

Attn:

Department of Planning, Housing and Industry

Department of Climate Change, Energy, the Environment and Water – Biodiversity Conservation Division

Resources Regulator - Subsidence Division.

Via: [Major Projects Planning Portal](#)

CHAIN VALLEY COLLIERY (SSD-5465) - BATHYMETRIC SCANNING MARCH 2025

Please find attached a report of the bathymetric survey completed above the Chain Valley Colliery Miniwall series S2 to S5 and the adjacent Northern Pillar Area within Lake Macquarie, completed in March 2025. Results of the surveys are provided in **Attachment A** (Miniwall S2-S5), **Attachment B** (Miniwalls S2-S5 cross section) and **Attachment C** (Northern Pillar Area).

Bathymetric monitoring results for March 2025 are summarised as follows:

- Minimal movement for the S2-S5 miniwall area between the previous monitoring (September 2024) and the March 2025 monitoring, mining of the miniwall blocks was completed in August 2021.
- Pre-extraction surveying of the Northern Pillar Area was completed in September 2024, at the time of the March 2025 bathymetric scan, partial pillar extraction had been completed in panels HBW5, HBW2 and HBW1. The bathymetric results did not identify vertical ground movement beyond the margin of error for the method being ± 200 mm.

In September 2022 level 1 of the Chain Valley Colliery Subsidence Management Plan Trigger Action Response Plan (TARP) was activated due to exceedance of subsidence predictions made for Miniwalls S2-S5. Bathymetric Monitoring in March 2025 indicated no tangible movement compared to the September 2024 bathymetric monitoring.

A hydrographic survey report was prepared by Astute Surveying who completed the survey in Lake Macquarie. The survey report has been included as **Attachment D**. A summary of the Miniwall S2-S5 measured subsidence post-extraction for each bathymetric survey completed has been provided in **Table 1**. A summary of subsidence post extraction for the Northern Pillar Area panels has been provided in **Table 2**.



Table 1 Miniwalls S2-S5 Measured Subsidence Post-Extraction

Survey Month and Year	Maximum seabed height decrease, observed in any one area, above S2-S5 miniwalls
September 2021 ¹	450 mm
September 2022 ¹	600 mm
September 2023	540-550 mm
March 2024	500-550 mm
September 2024	570-580 mm
March 2025	600mm

¹ Between March 2023 and September 2023 monitoring it was identified that the program utilised for hydrographic surveys on Lake Macquarie had a software error in the programming and altered height values by approximately 0.15m. In September 2023 modelling, this correction was applied to the data set to be utilised there-after.

Table 2 - Northern Pillar Area, Measured Subsidence Post Extraction

Panel and Subsidence Predictions	Maximum seabed height decrease, observed in any one area, above NPA panels – March 2025
HBW5 (up to 226 mm)	0-50mm
HBW2 (up to 226 mm)	50-100mm
HBW1 (up to 226 mm)	50-100mm

Under the Chain Valley Colliery Development Consent SSD-5465, underground mining specific conditions are presented in Schedule 4, **Table 3** details the subsidence performance criteria.

Table 3 - Subsidence Performance Measures, SSD-5465

Biodiversity	
Threatened species or endangered populations	Negligible environmental consequences
Seagrass beds	Negligible environmental consequences including: - Negligible changes in size and distribution of seagrass beds; - Negligible change in the function of seagrass beds; and - Negligible change to the composition or distribution of seagrass species within seagrass beds.
Benthic Communities	Minor environmental consequences, including minor changes to species composition and/or distribution.
Mine Workings	
First workings under an approved Extraction Plan beneath any feature	To remain long-term stable and non-subsiding.



where performance measures in this table require negligible environmental consequences.	
Second Workings	To be carried out only in accordance with an approved extraction plan.

MONITORING

Delta Coal will continue 6 monthly bathymetric surveys over the Northern Pillar Area and Miniwalls S2-S5 until workings are considered to have stabilised in line with the Subsidence Management TARP (**Attachment E**). While Miniwall S2-S5 workings are considered to have stabilised, with no change in maximum vertical subsidence observed, monitoring will continue until secondary extraction works are completed in panel HBE1 to confirm no cumulative impact or interactions occur.

Delta Coal has continued annual seagrass monitoring, previous monitoring undertaken in June 2024 indicated that there was no observed impact to seagrass as a result of subsidence.

Benthic communities monitoring undertaken in March 2025 did not identify any impact to benthic communities as a result of subsidence.

THIRD PARTY GEOTECHNICAL REVIEW MINI WALLS S2-S5

Delta Coal commissioned a third-party geotechnical review in 2023 (Byrnes Geotechnical) of the subsidence prediction for Miniwall S2-S5 based on the monitoring data:

- The review identified that there are likely issues of accuracy and precision in the bathymetric surveying, when compared to land surveying techniques.
- It was noted that the bathymetric measurements have a precision of ± 100 mm, with subsidence determined by the difference between 2 measurements indicating a precision of ± 200 mm.
- The surveys transects and influence of the systems accuracy were also observed in the bathymetric survey data via the pronounced lineation in the direction of the survey distant from the mining activity.
- It was considered that the level 1 trigger (>500 mm) had been met and there is possibly another 50mm of subsidence yet to develop with negligible chance of exceeding the level 2 trigger (>780 mm). Minimal movement was observed between the September 2024 and March 2025 bathymetric monitoring (~ 20 mm).

CONCLUSIONS

There was no significant change in bathymetric results between September 2024 and March 2025 for Miniwall S2-S5. Bathymetric monitoring of the northern secondary extraction areas commenced in March 2025, with comparison to pre-extraction surveys completed in September 2024, no significant movement was observed above completed panels. Further bathymetric scanning will be conducted in September 2025.



Please contact me on (02) 4358 0883 or at lmcwha@deltacoal.com.au if you have any questions or wish to discuss.

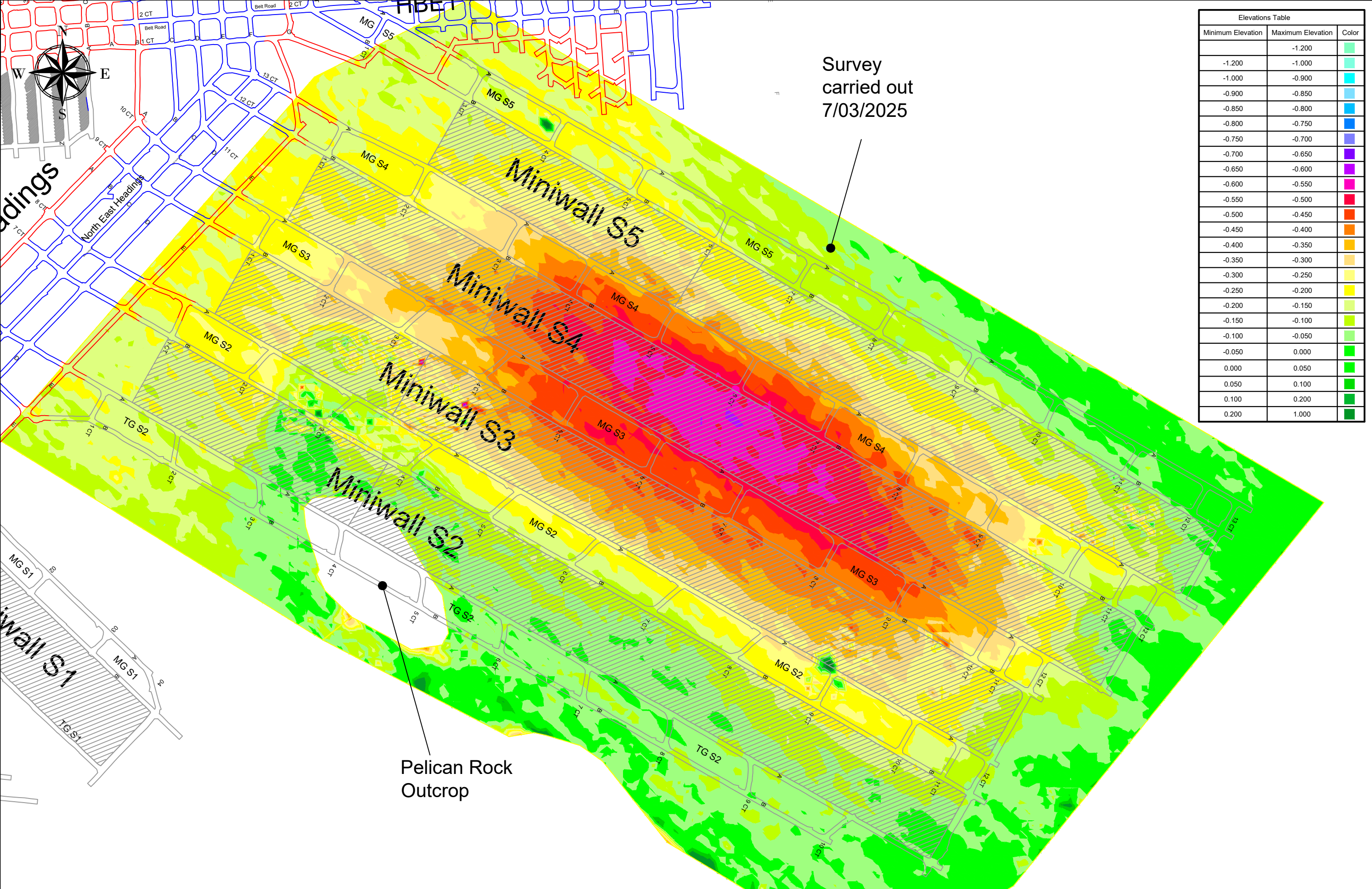
Yours sincerely,

Lachlan McWha – Delta Coal Environmental Compliance and Approvals Coordinator

30/05/2025



ATTACHMENT A – BATHYMETRIC SURVEY RESULTS MARCH 2025



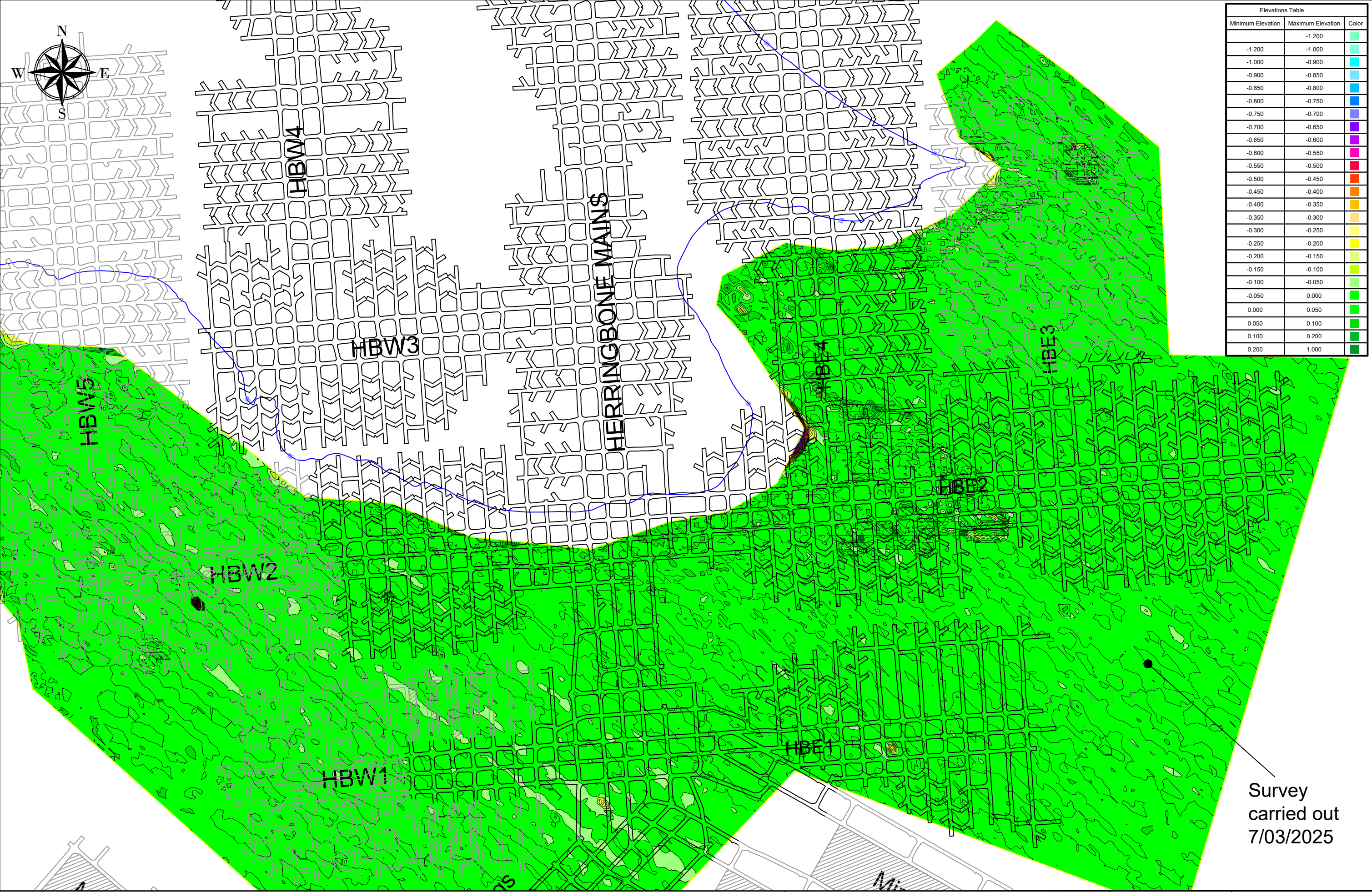
Elevations Table		
Minimum Elevation	Maximum Elevation	Color
	-1.200	
-1.200	-1.000	
-1.000	-0.900	
-0.900	-0.850	
-0.850	-0.800	
-0.800	-0.750	
-0.750	-0.700	
-0.700	-0.650	
-0.650	-0.600	
-0.600	-0.550	
-0.550	-0.500	
-0.500	-0.450	
-0.450	-0.400	
-0.400	-0.350	
-0.350	-0.300	
-0.300	-0.250	
-0.250	-0.200	
-0.200	-0.150	
-0.150	-0.100	
-0.100	-0.050	
-0.050	0.000	
0.000	0.050	
0.050	0.100	
0.100	0.200	
0.200	1.000	



ATTACHMENT B – MINIWALL S2-S5 CROSS SECTION



ATTACHMENT C – NORTHERN PILLAR AREA BATHYMETRIC SCANNING RESULTS



Elevations Table		
Minimum Elevation	Maximum Elevation	Color
-1.200	-1.000	
-1.000	-0.900	
-0.900	-0.850	
-0.850	-0.800	
-0.800	-0.750	
-0.750	-0.700	
-0.700	-0.650	
-0.650	-0.600	
-0.600	-0.550	
-0.550	-0.500	
-0.500	-0.450	
-0.450	-0.400	
-0.400	-0.350	
-0.350	-0.300	
-0.300	-0.250	
-0.250	-0.200	
-0.200	-0.150	
-0.150	-0.100	
-0.100	-0.050	
-0.050	0.000	
0.000	0.050	
0.050	0.100	
0.100	0.200	
0.200	1.000	

Pre extraction Survey carried out September 2024
Secondary extraction commenced November 2024



DELTA COAL
CHAIN VALLEY COLLIERY
Fassifern Seam - Northern Mining Area
Bathy Survey Results (March 2025)

SCALE:	AS SHOWN	DATE:	12 May 2025
DRAWN:	G. Lord	DRG NO:	C1S0309.dwg
CHECKED:	-	REV NO:	
SIGNED:	-	SIZE:	A3

Delta coal



ATTACHMENT D – ASTUTE SURVEYING BATHYMETRIC SURVEY REPORT MARCH 2025



HYDROGRAPHIC SURVEY REPORT

Lake Macquarie

NSW

For

Delta Coal

Surveyed on 4-7 March 2025

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+61 4 22 44 1017 (outside Australia)

General Information

Survey Class	IHO S44 – Special Order
Hydrographic Surveyors	Ben Gray CPHS1 Paul Davies
Survey Date	3-6 September 2024
Purpose of Survey	Hydrographic Survey
Port	Lake Macquarie
Regional Harbour Master	None
Survey Areas	Delta Coal

Reference documents

Rev No	Issue Date	Revision Details	Prepared By	Reviewed By	Approved By
0	18/03/2025	For review	Ben Gray	Paul Davies	Ben Gray

CONTENTS

CONTENTS	2
LIST OF TABLES	2
LIST OF FIGURES	3
ABBREVIATIONS	1
1 INTRODUCTION	2
2 STANDARDS	2
3 PROJECT PARTICULARS.....	2
3.1 CLIENT	2
3.2 PROJECT DETAILS	2
4 PERSONEL	2
5 PROJECT HORIZONTAL AND VERTICAL DATUM	3
5.1 HORIZONTAL DATUM	3
5.2 VERTICAL DATUM.....	3
6 SURVEY CONTROL	4
7 SURVEY EQUIPMENT	4
7.1 SURVEY VESSEL.....	4
7.2 BATHYMETRY SYSTEMS.....	4
7.2.1 <i>Position and motion sensor</i>	5
7.2.2 <i>RTK Rover</i>	5
7.2.3 <i>Radio RTK correction data receiver</i>	5
7.2.4 <i>Sound Velocity Probe</i>	5
7.2.5 <i>Acquisition and Processing Software</i>	5
7.2.6 <i>Calibration</i>	5
7.2.7 <i>Base Station</i>	5
7.2.8 <i>Heading Check</i>	6
7.2.9 <i>Position Check</i>	7
7.2.10 <i>Patch test</i>	7
7.2.11 <i>Sound Velocity Profile (SVP)</i>	8
8 SURVEY METHOD	8
8.1 SURVEY COVERAGE.....	8
8.2 LINE SPACING	9
8.3 SOUNDING SPEED.....	9
8.4 MULTIBEAM SETTINGS	9
8.5 ONLINE CHECKS	9
8.6 REJECTION CRITERIA FOR POSITION DATA	9
8.7 ONLINE SOFTWARE ALARMS	10
9 DATA REDUCTION	10
10 HEIGHT DIFFERENCE TO PREVIOUS SURVEYS	10
11 DATA DELIVERABLES	11
12 HYDROGRAPHIC SURVEYOR APPROVAL	11

LIST OF TABLES

TABLE 1 - MGA94 PARAMETERS	3
----------------------------------	---

TABLE 2 - BENCHMARK POSITION CHECK RESULTS 6

TABLE 3 - IMU POSITION AND HEADING CHECK..... 7

TABLE 4 - PATCH TEST RESULTS 7

LIST OF FIGURES

FIGURE 1 - GNSS BASE STATION DETAILS 4

FIGURE 2 - IMU POSITION INFORMATION..... 7

FIGURE 3 - LAKE MACQUARIE SURVEY AREA..... 8

ABBREVIATIONS

The following abbreviations may be used in this document

AAPMA	Association of Australian Port and Marine Authorities
AGD	Australian Geodetic Datum
AHD	Australian Height Datum
AHSCP	Australasian Hydrographic Surveyors Certification Panel
AMG	Australian Map Grid
BM	Bench Mark
CD	Chart Datum
CoG	Vessel Centre of Gravity
CoR	Vessel Centre of Rotation
CPHS1	Certified Practicing Hydrographic Surveyor Level 1
DGPS	Differential Global Positioning System
DTM	Digital Terrain Model
GAMS	GPS Azimuth Measurement Subsystem
GDA94	Geodetic Datum Australia 1994
GDA2020	Geodetic Datum Australia 2020
GNSS	Global Navigation Satellite System
HAT	Highest Astronomical Tide
ICSM	Intergovernmental Committee on Surveying and Mapping
IHO	International Hydrographic Organization
IMU	Inertial Motion Unit
kHz	Kilohertz
LAT	Lowest Astronomical Tide
MBES	Multi Beam Echo Sounder
MGA94	Mapping Grid of Australia 1994
MSL	Mean Sea Level
MRU	Motion Reference Unit
PDOP	Position Dilution of Precision
POSMV	Position Orientation System for Marine Vessel
PSM	Permanent Survey Mark
PTA	Performance Test Area
RL	Reduced Level
RMSE	Root Mean Square Error
RMS	Refer Manufacturer Specifications
RTK GPS	Real Time Kinematic Global Positioning System
SSSI	Surveying and Spatial Sciences Institute
SBES	Single Beam Echo Sounder
SSM	State Survey Mark (PSM)
SVP	Sound Velocity Profile
SVS	Sound Velocity Sensor
TBM	Tidal Bench Mark / Temporary Benchmark
UPS	Uninterruptible Power Supply
UTM	Universal Transverse Mercator
VDOP	Vertical Dilution of Precision
VRF	Vessel Reference Frame
WGS84	World Geodetic System 1984

1 INTRODUCTION

Astute Surveying Pty Ltd has been contracted by Delta Coal to undertake hydrographic monitoring surveys on Lake Macquarie, NSW. This report covers the GNSS control used, vessel, equipment, survey method and checks conducted while undertaking the surveys.

This survey was undertaken in accordance with and exceeds the IHO S-44 Standards for Hydrographic Surveys and the AAPMA - Standards for Hydrographic Surveys within Australian Waters.

2 STANDARDS

This survey complies with the latest versions of relevant codes and standards for:

- IHO S-44 - Standards for Hydrographic Surveys
- AAPMA - Standards for Hydrographic Surveys within Australian Waters
- ICSM - Australian Tides Manual - Special Publication No.9

3 PROJECT PARTICULARS

3.1 Client

Delta Coal

3.2 Project Details

Delta Coal Mine Site in the navigable waters of Lake Macquarie

The hydrographic surveys were carried out in compliance with the standards above.

4 PERSONEL

Surveys were directly supervised on-site by a CPHS Level 1 Surveyor.

Ben Gray (Supervising)
CPHS Level 1 (SSSI AHCP) MSSSI
Bachelor of Spatial Sciences MSQ
Astute Surveying Pty Ltd
18+ Years of continuous hydrographic survey operations

Paul Davies (Surveyor)
Survey Technician / Coxswain
15 + Years working in the hydrographic and spatial industry

5 PROJECT HORIZONTAL AND VERTICAL DATUM

5.1 Horizontal Datum

The project horizontal datum used is the Geocentric Datum of Australia 94 (GDA94) with coordinates projected onto the Map Grid of Australia 94 (MGA94) Zone 56.

Table 2 below lists the key settings for the datum.

PARAMETER	VALUE
Datum	Geocentric Datum of Australia 94 (GDA94)
Reference Frame	International Terrestrial Reference Frame 1992 (ITRF1992)
Ellipsoid	GRS80
Semi Major Axis	6,378,137.0 meters
Inverse flattening	298.257222101
Projection	Map Grid of Australia 94 (MGA94)
Projection Method	Universal Transverse Mercator (UTM),
Zone	56
Latitude of Origin	0° S
Longitude of Origin	153° E
Scale factor at Origin	0.9996
False Easting	500,000m
False Northing	10,000,000m

Table 1 - MGA94 Parameters

5.2 Vertical Datum

Depths were determined relative to the GDA94 ellipsoid, Australian Height Datum

Ausgeoid09 was utilised.

6 SURVEY CONTROL

The existing Smartnetaus (MNPk) GPS Base Station located at Mannering Park was used as the Primary RTK GPS Base Station.

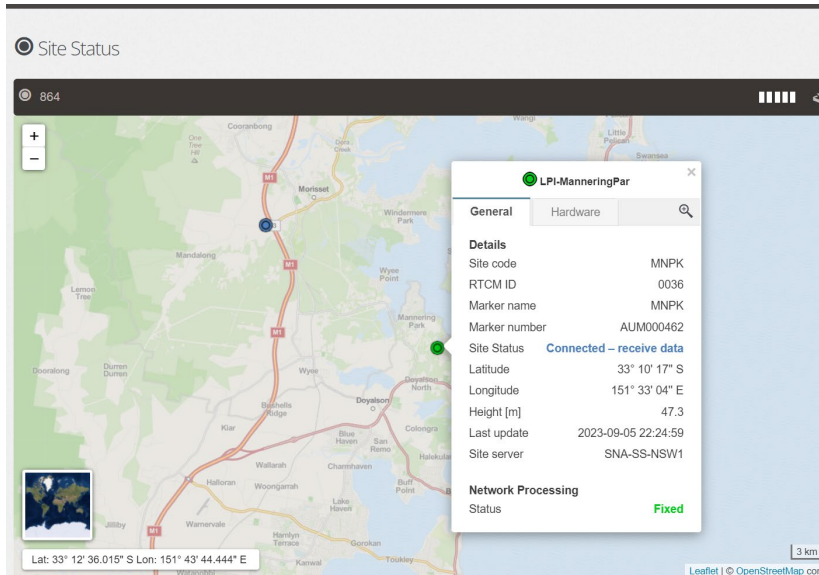


Figure 1 - GNSS Base Station Details

7 SURVEY EQUIPMENT

Primary Survey Equipment and Software

7.1 Survey Vessel

The hydrographic survey was carried out from Astute Surveying's survey vessel "Coastal Explorer".

Type:	Aluminium Single hull. Enclosed cabin
Survey:	Class 2C – EX40
Length:	6m
Beam:	2.5m
Draft:	0.3m
Propulsion:	200hp Suzuki outboard
Registration:	AHF540C

7.2 Bathymetry Systems

Type:	Norbit i77h
Transducer Frequencies:	200 to 400 kHz (400 kHz used)
Beams:	512 Beams of 1.0° x 1.0° (at 400 kHz)
Motion Compensation:	POSMV Ocean Master
Pitch/Roll Stabilisation:	Roll stabilised

Ping Rate:	26.6 per sec @ 20 m Range Setting
Beam Mode:	Equi-distant
Installation:	Over the Side
Limiting Sea Conditions:	Primarily aeration of transducers at > 1.5m swell

The MBES sonar head is mounted on an over the side pole located on the port side, close to midship and 1.3m from the centreline. The pole and mounting arrangement is designed to minimize flex and utilises specialised brackets on the side of the hull to ensure the pole locates to an identical position each time it is attached. The mount has been tested (by subsequent bar checks and patch tests) to accurately fit back to its original position each time the vessel is used for survey.

7.2.1 Position and motion sensor

- PosMV Oceanmaster
- RTK GPS primary antenna mounted on the cabin roof with the secondary antenna mounted on the opposite side of the cabin roof, both with unimpeded access to satellites.

7.2.2 RTK Rover

- Trimble SPS 985 RTK Receiver

7.2.3 Radio RTK correction data receiver

- 4G

7.2.4 Sound Velocity Probe

- AML Base X SVP – direct Sound Velocity profile measurement
- AML Micro-X SVP at the MBES Transducer

7.2.5 Acquisition and Processing Software

Hysweep 2023 is a powerful and specialised package by Hypack for multibeam data collection and processing. It allows users to design a survey, for both single and multibeam data, collect and edit the data, and post process it to create contours, cross-sections, volumes, TIN Models etc.

7.2.6 Calibration

Prior to any survey work the following checks were made to ensure the equipment was returning the correct information to the survey software. The data entered in the software was also checked by carrying out these tests.

7.2.7 Base Station

The Base Station used for the survey was the Mannering Park. The RTK correction service was Smartnetaus

The base station operation was checked by measuring with a Trimble SPS985 RTK receiver at known high order bench mark using constrained centring and logging for a minimum 180 epochs. This was to test the

horizontal and vertical position of the Mannering Park Base (MNPk). An accurate result proved the integrity the Base Station and GPS rover unit.

Mark	MGA2020 East	MGA2020 North	Height
ssm78857	365477.32	6336796.03	6.094
Measured	365477.331	6336796.025	6.12
Difference	-0.011	0.005	-0.026

Table 2 - Benchmark Position Check Results

As can be seen from the results above, the Mannering Park Base Station was outputting the correct RTK corrections.

7.2.8 Heading Check

A GPS Azimuth Measurement Subsystem (GAMS) test was carried out on the system before surveys commenced.

7.2.9 Position Check

Position checks were carried out on the reference point of the IMU using the calibrated RTK Rover.

These checks were used to test the positioning, the application of the heading and the measurement of the vessel offsets.

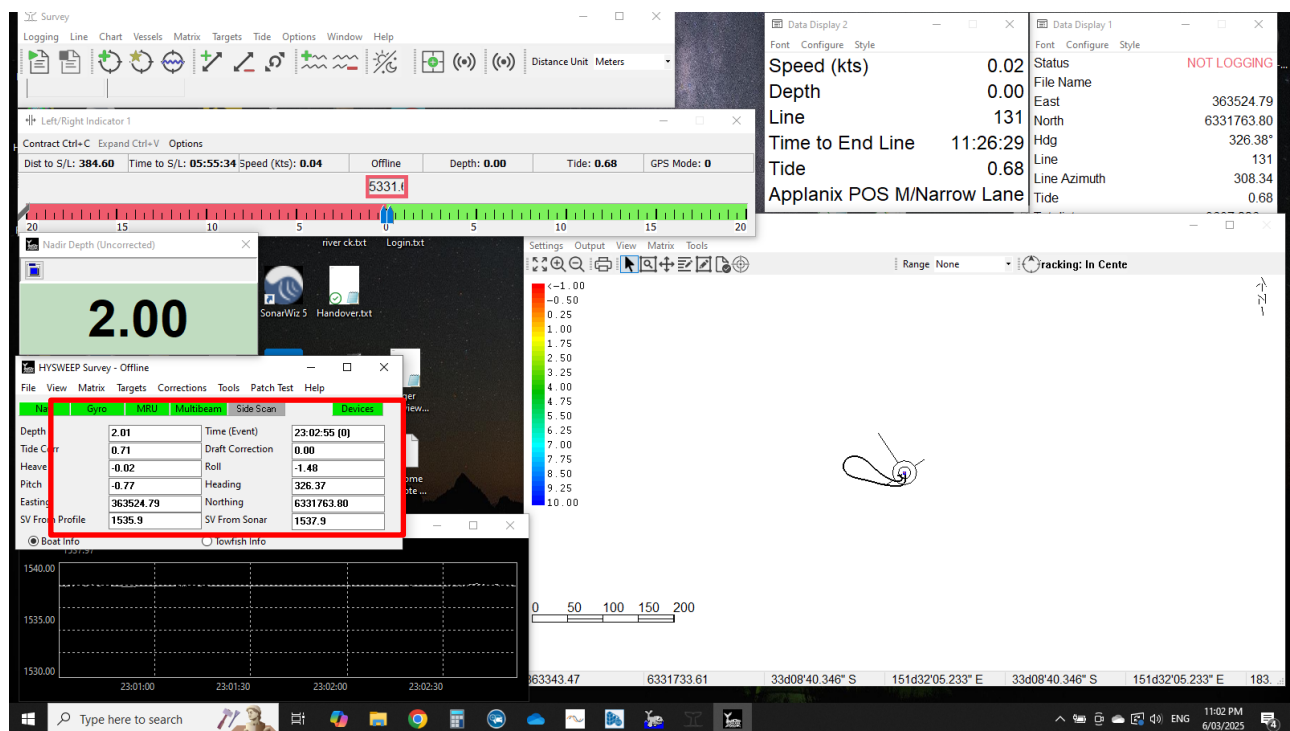


Figure 2 - IMU Position Information

Point	MGA2020 East	MGA2020 North	Height
Rover IMU Check	363524.741	633176.896	0.723
POSMV Position	363524.79	633176.8	0.71
Difference	-0.049	0.096	0.013

Table 3 - IMU Position and Heading Check

7.2.10 Patch test

Prior to the survey, patch tests were run in a suitably deep area within survey area.

DATE	LATENCY	ROLL	PITCH	YAW
7/03/2025	0°	0.10°	0.00°	0.00°

Table 4 - Patch Test Results

7.2.11 Sound Velocity Profile (SVP)

Manual SVP was compared with the sound velocity sensor (SVS) on the MBES Transducer. Regular consistency between the SVP and SVS was noted. There was satisfactory correlation between the down cast and up cast. In this depth, the system was considered adequate when the difference between SVP and SVS was less than 2m/s.

8 SURVEY METHOD

The survey was carried out to meet the following requirements:

- Horizontal Uncertainty $\pm 0.5\text{m}$ @ 95% confidence
- Vertical Uncertainty $\pm 0.15\text{m}$ @ 95% confidence
- 0.5m object detection (minimum of 3 hits in the along track direction)
- 100% coverage over the survey area in depths below 5m

8.1 Survey Coverage

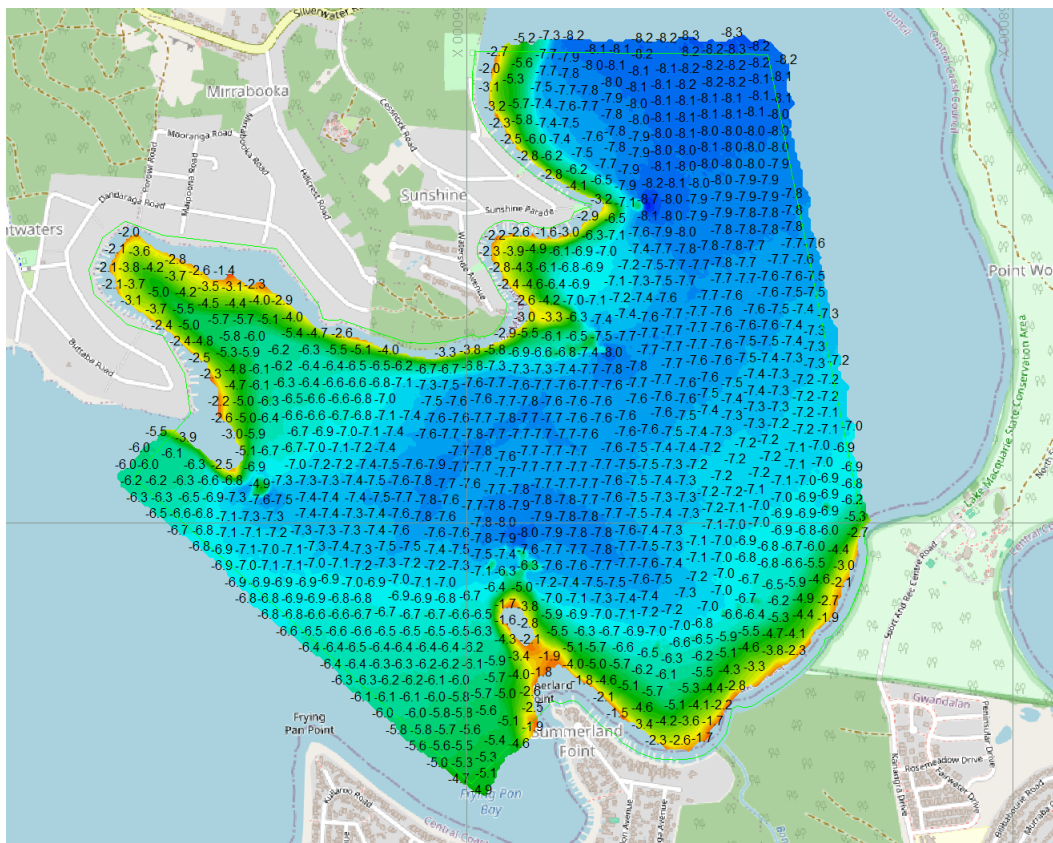


Figure 3 - Lake Macquarie Survey Area

8.2 Line Spacing

20m transects were undertaken.

8.3 Sounding Speed

The minimum ping rate during the surveys was 20Hz which can be set in the software. The vessel speed during survey was less than 6 knots (~3m/s). This meant the minimum number of pings from one pass in the along track direction is 3.333 pings per 0.5m.

8.4 Multibeam Settings

The MBES was setup to achieve the most accurate result utilising a 120-degree swath,

This had the effect of:

- Minimising the inaccuracies in the outer beams
- Concentrating the soundings over a shorter distance for better resolution
- Increasing the ping rate

Depth filters were utilised for the survey acquisition. This eliminated all returns that were clearly out of range thus allowing the MBES a more thorough acquisition of the seabed features. No other filters were applied as there is the possibility that some spot features could be eliminated by the software if aggressive filters were used.

8.5 Online Checks

During the survey, the system was checked by monitoring certain aspects.

In the surveyor's geographical display, we can plot the seabed depths (mean, Shallowest or Deepest), the Hit count per cell or the 95% confidence data layer. By monitoring these different layers, we can assess if there are discrepancies in the data.

POSwiew software allowed RTK accuracy and quality to be monitored independently of the Hypack survey system. This was used to assess the integrity of the results.

Any issues were examined, and additional survey lines were run to verify the data if necessary. All actions noted on the logs.

8.6 Rejection Criteria for Position Data

The following standards were used to ensure correct position reliability was maintained:

Minimum Satellite Elevation:	15°
Min Satellite Count:	6
Maximum HDOP:	4
Maximum VDOP:	4

Maximum Age of Corrections: 2 seconds

Data storage would have ceased had this criterion been exceeded

8.7 Online Software Alarms

All the equipment linked to the survey system was monitored for communication errors.

- The PPS time synchronisation signal was monitored for integrity.
- The RTK system timeout -2 seconds.
- VDOP limit alarm - 3
- IMU updates to the system
- MBES functions
- MBES head Sound Velocity compared to currently loaded Sound Velocity profile - 2m/s

If any of these systems fell outside the accepted limits then an alarm would have been raised in the system, and investigated by the survey team.

9 DATA REDUCTION

All bathymetry data was logged with Hysweep multibeam data collection and editing module within Hypack.

The same module was used to edit the data and carry out QC and performance testing.

The data was:

- Initially processed to remove any obvious data spikes using a broad filter deleting all points above a specified minimum depth and below a maximum acceptable depth.
- The data was then assessed manually and all spurious data removed.
- Once the dataset was finalised it was checked for hit count, coverage, and statistical acceptance. Any areas requiring more information to comply with the survey requirements were resurveyed.

A statistically derived surface was created with a grid spacing of 1m. This surface was used as the base for the 10m grid output.

10 HEIGHT DIFFERENCE TO PREVIOUS SURVEYS

Some time ago it was discovered that the project that we had been using for the hydrographic surveys on Lake Macquarie had a software error in the programming and altered our height values by approximately 0.15m. This correction has been applied to this data set.

11 DATA DELIVERABLES

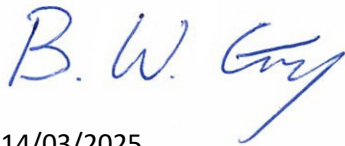
All processed data is delivered in the following formats:

Digital XYZ

20250307 - Delta Coal MGA94_AHD 10m grid.xyz

12 HYDROGRAPHIC SURVEYOR APPROVAL

Survey Report and Deliverables Approved By



14/03/2025

Ben Gray
Certified Professional Hydrographic Surveyor Level 1



ATTACHMENT E – MINIWALL S5 AND NORTHERN PILLAR AREA SUBSIDENCE MANAGEMENT TARP

 Delta coal	Trigger Action Response Plan TARP Delta Coal	Title:	Chain Valley Colliery- Subsidence Management TARP
		No:	Draft - TARP 00161 - Chain Valley and Mannering Colliery Dam Inspection TARP

This TARP should be read in conjunction with the Chain Valley Colliery Subsidence Monitoring Program.

	TRIGGER	MONITORING REQUIREMENTS	CONTAINMENT / REMEDIATION MEASURES	ADAPTIVE MANAGEMENT MEASURES	CONTINGENCY PLANS
BATHYMETRIC SURVEY Subsidence	NORMAL Subsidence ≤ 500mm	As per Subsidence Monitoring Program			
	TRIGGER LEVEL 1 Subsidence > 500mm to ≤ 780mm	6 monthly surveys until subsidence stabilises		Review and update subsidence predictions, Identify controlling mechanisms, Review potential change in impact on natural and built features, and Update management plans if required	Review ability to limit further increases based on understood mechanisms. Including extraction heights, panel widths, panel recovery
	TRIGGER LEVEL 2 Subsidence >780mm	6 monthly surveys until subsidence stabilises, and	Notify DPHI – immediately if incident or within 7 days if noncompliance, Notify RR, DECCW, and affected landholders or infrastructure owners. Review if increase is likely to create impact at foreshore/seagrass, or Exceed final subsidence prediction	Implement further controls on foreshore /seagrass as applicable from review , Review and update subsidence predictions, Review and update impact assessment on natural and built features.	Immediately review mine plan including panel width, pillar widths, extraction height and panel length, Consult with DPHI and RR, and Review and update Extraction Plan
FORESHORE SURVEYS Subsidence	NORMAL Subsidence ≤ 20mm	As per Subsidence Monitoring Program			
	TRIGGER LEVEL 1 Subsidence <20mm recorded movement with slow (3-5mm/month) creep	Validate increase with additional monthly survey/s then as per SM program		Review and update subsidence predictions, Identify controlling mechanisms, Review potential change in impact on natural and built features, and Update management plans if required	
	TRIGGER LEVEL 2 Subsidence >20mm recorded movement (associated with mining)	Implement Ecological Monitoring program for HWMSB exceedance, Increase frequency of subsidence monitoring until rates stabilises. Then as per SM program.	Notify DPHI – immediately if incident or within 7 days if noncompliance, Notify RR, DECCW, and affected landholders or infrastructure owners. Cease extraction in panel in question until review conducted in consultation with DPHI and DRNSW.	Investigate cause of exceedance, Review and update subsidence predictions, Review and update impact assessment on natural and built features.	Provide offsets for any ecological communities or threatened species in the HWMSB if impacts detected, Review mine plan including panel width, pillar widths, extraction height in consultation with DPHI and RR, Review and update Extraction Plan

LAST REVIEW DATE 06/06/2024	NEXT REVIEW DATE 06/06/2027	REVISION NO 0	DOCUMENT OWNER Technical Services Manager - Delta Coal	PAGE 1 of 4
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	TRIGGER	MONITORING REQUIREMENTS	CONTAINMENT / REMEDIATION MEASURES	ADAPTIVE MANAGEMENT MEASURES	CONTINGENCY PLANS
BUILT FEATURES	NORMAL No damage requiring remediation	Monitoring as per Subsidence Monitoring Program RMS routine monitoring navigation markers			
	TRIGGER LEVEL 1 Subsidence parameters exceeded such that Fassifern workings indicated to have potential impact on foreshore.	Monitoring as per Built Feature Management Plan	Review navigational marker freeboard and notify TfNSW if impacted, Notify DPHI – immediately if incident or within 7 days if noncompliance, Notify RR, DECCW, and affected landholders or infrastructure owners.		Develop Built Feature Management Plan in conjunction with owner for built features surrounding potential impact area.
	TRIGGER LEVEL 2 Impact to built feature	Monitoring as per Built Feature Management Plan	Cease extraction in panel in question until review conducted in consultation with DPHI and RR, Assist owner with information to aid in Subsidence Advisory NSW claim in accordance with Built Feature Management Plan	Update impact assessment based on observed damage	Immediately review mine plan including panel width, pillar widths, Consult with DPHI and RR, Review and update Extraction Plan
PUBLIC SAFETY (Foreshore area and steep slopes)	NORMAL No impact				
	TRIGGER LEVEL 1 Subsidence parameters exceeded such that Fassifern workings indicated to have potential impact on foreshore.				
	TRIGGER LEVEL 2 Area around foreshore becomes unstable / shows signs of mining induced impact, Flooding or drainage impacts considered likely as result of Fassifern extraction.	Visual inspections frequency to be commensurate with level of risk (ie increase until controls put in place) Inspect foreshore in vicinity of other steep slopes and retaining walls for signs of movement. Implement TARP as required.	Cease extraction in panel in question until review conducted in consultation with DPHI and RR, Geotechnical Engineer to inspect area immediately, Implement temporary safety controls (barricades and signage available from mine site). Arrange for assistance and stay at site if immediate risk to public exists, Notify LMCC and TfNSW, DECCW , DPHI and RR.	Implement longer term safety controls.	Foreshore stabilisation of unsafe areas in consultation with LMCC and RR as soon as possible, Flooding and drainage rectification works in consultation with infrastructure owner as soon as possible.

	TRIGGER	MONITORING REQUIREMENTS	CONTAINMENT / REMEDIATION MEASURES	ADAPTIVE MANAGEMENT MEASURES	CONTINGENCY PLANS
BENTHIC COMMUNITIES	NORMAL ANOVA/ANOSIM >5%	As per Benthic Management Plan			
	TRIGGER LEVEL 1 ANOVA/ANOSIM level is approaching 5%	Liaise with monitoring consultant & undertake internal review to determine if impacts are related to mining, Arrange a peer review of the monitoring results and statistical analysis.			
	TRIGGER LEVEL 2 ANOVA/ANOSIM <5%	Undertake follow up monitoring at affected sites to obtain confirmation of impacts, Incident report to be completed and distributed to relevant agencies	Notify DPHI – immediately if incident or within 7 days if noncompliance, Notify DPHI-Fisheries and LMCC.	Consult with relevant authorities about monitoring and management controls.	Consult with relevant authorities to identify if offsets are required and how these are to be implemented.
SEAGRASS	NORMAL Negligible impact.	As per Seagrass Management Plan			
	TRIGGER LEVEL 1 Approaching 20% decline in condition, Approaching 20mm of additional mine induced subsidence within mapped seagrass.	Liaise with monitoring consultant & undertake internal review to determine if impacts are related to mining.		Review if variation is within broader background variation range for the site.	
	TRIGGER LEVEL 2 >20% decline in conditions from year baseline survey >150mm of additional mine induced subsidence at survey location	Incident report to be completed and distributed to relevant agencies	Notify DPHI – immediately if incident or within 7 days if noncompliance, Notify DPHI-Fisheries and LMCC.	Consult with relevant authorities about monitoring and management controls.	Consult with relevant authorities to identify if offsets are required and how these are to be implemented.

	Trigger Action Response Plan TARP Delta Coal	Title:	Chain Valley Colliery- Subsidence Management TARP
		No:	Draft - TARP 00161 - Chain Valley and Mannering Colliery Dam Inspection TARP

	TRIGGER	MONITORING REQUIREMENTS	CONTAINMENT / REMEDIATION MEASURES	ADAPTIVE MANAGEMENT MEASURES	CONTINGENCY PLANS
THREATENED SPECIES AND ENDANGERED POPULATIONS	NORMAL Negligible impact.	Monitoring as per Subsidence Monitoring Program, Benthic Communities Management Plan and Seagrass Management Plan			
	TRIGGER LEVEL 1 As per Seagrass and Benthic Community Management Plans Monitoring Level 1 triggers.	Liaise with monitoring consultant & undertake internal review to determine if impacts are related to mining and greater than negligible environmental consequences.		Review if variation is within broader background variation range for the site.	
	TRIGGER LEVEL 2 As per Seagrass and Benthic Community Management Plans Monitoring Level 2 triggers >780mm subsidence	Incident report to be completed and distributed to relevant agencies	Notify DPHI – immediately if incident or within 7 days if noncompliance, Notify DPHI-Fisheries and LMCC.	Initiate ecological monitoring program to assess the impacts to ecological communities and threatened species. Consult with relevant authorities about monitoring and management controls.	Consult with relevant authorities to identify if offsets are required and how these are to be implemented.
WATER INFLOW	Ongoing monitoring of water inflows and site water management through operational Water Management and Monitoring TARP process				

ROLES AND RESPONSIBILITIES:

As per various Management Plans, specifically:
Extraction Plan,
Subsidence Management Plan,
Subsidence monitoring program,
Benthic Management Plan,
Seagrass Management Plan,
As-built Management plan,
Public Safety Management Plan,
Water Management Plan, and
Biodiversity Management Plan

ABBREVIATIONS

DECCW – Department of Environment, Climate Change and Water
DPHI – Department of Planning, Housing and Infrastructure
DRNSW – Department of Regional NSW
ECC – Enviro Compliance Coordinator
LMCC – Lake Macquarie City Council
RR – NSW Resources Regulator
TfNSW – Transport for NSW