



# **MACKAS SAND ANNUAL REVIEW 2025**

January to December 2025

**FINAL**

March 2026

<b>Name of operation</b>	Mackas Sand Project
<b>Name of operator</b>	Mackas Sand Pty Limited
<b>Development Consent / Project Approval No.</b>	PA 08_0142 (MOD 2)
<b>Name of holder of development consent/project approval</b>	Mackas Sand Pty Limited
<b>Mining lease No.</b>	No Mining Lease applicable to site under the Mining Act (1992).
<b>Name of holder of mining lease</b>	N/A
<b>Water licence #</b>	N/A
<b>Name of holder of water licence</b>	N/A
<b>MOP/RMP start date</b>	N/A
<b>MOP/RMP end date</b>	N/A
<b>Annual Review start date</b>	1 January 2025
<b>Annual Review end date</b>	31 December 2025
<p>I, Robert Mackenzie, certify that this audit report is a true and accurate record of the compliance status of Macka's Sand Pty Ltd for the period 1 January 2025 to 31 December 2025 and that I am authorised to make this statement on behalf of Macka's Sand Pty Ltd.</p> <p>Note: The Annual Review is an 'environmental audit' for the purposes of section 122B (2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000.</p> <p>The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement – maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents – maximum penalty 2 years imprisonment or \$22,000, or both).</p>	
<b>Name of authorised reporting officer:</b>	Robert MacKenzie
<b>Title of authorised reporting officer:</b>	Director
<b>Signature of authorised reporting officer:</b>	
<b>Date:</b>	

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# 1.0 Statement of Compliance

Mackas Sand Pty Limited (Mackas Sand) operate the Mackas Sand Project (the Project), a sand quarry on Lot 218/DP 1044608 and Lot 220/DP 1049608, located approximately 25 kilometres (km) north-east of Newcastle, near Salt Ash in the Port Stephens Local Government Area (LGA) of New South Wales (NSW). The Mackas Sand directors have operated sand extraction operations in the area since 1992.

Lot 218 and Lot 220 are owned by the Worimi Local Aboriginal Land Council, with the Project being operated under agreement with Mackas Sand.

This Annual Review provides a summary of Mackas Sands' operational performance against the approvals listed in **Table 1-1** over the period 1 January 2025 to 31 December 2025 (referred to hereafter as the reporting period). The compliance status of Grafil operations (Environment Protection Licence (EPL) 12108) has not been discussed in this Annual Review.

The compliance of the operation against relevant approvals was managed during the reporting period by Mackas Sand and is summarised in **Table 1-1**. For the reporting period, three (3) non-compliances were identified. These three (3) non-compliances have been ranked according to the risk matrix included in **Table 1-3**. Further information is provided in **Section 11.1**.

**Table 1-1 Statement of Compliance**

Relevant approval	All conditions complied with?
Development consent PA 08_0142 (MOD 2)	No – refer to <b>Table 1-3</b> for further details
Environment Protection Licence EPL 13218	Yes – refer to <b>Table 1-3</b> for further details
EPBC Approval 2011/6214	Yes – refer to <b>Table 1-3</b> for further details

The non-compliances for the reporting period are detailed below in **Table 1-3**.

**Table 1-2 Compliance Status Key (NSW Government, 2015)**

Risk Level	Colour Code	Description
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Non-compliant	Non-compliance with: <ul style="list-style-type: none"> <li>Potential for serious environmental consequences, but is unlikely to occur.</li> <li>Potential for moderate environmental consequences but is likely to occur.</li> </ul>
Low	Non-compliant	Non-compliance with: <ul style="list-style-type: none"> <li>Potential for moderate environmental consequences, but is unlikely to occur.</li> <li>Potential for low environmental consequences but is likely to occur.</li> </ul>
Administrative non-compliance	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions).

**Table 1-3 Non-Compliances during the Reporting Period**

Relevant Approval	Condition No.	Condition Description	Compliance Status	Comment
PA 08_0142	Schedule 3 Condition 4B (d)	Laden truck movements exiting the site do not exceed 8 per hour during the period from 6 am to 9 am, Monday to Friday (except for Public Holidays);	Administrative non-compliance	<p>Following an upgrade to the weighbridge software on 6 May 2025 which controls the truck numbers exiting the site during specific periods an incident occurred where an additional truck exited the site during the hours of 7:00am and 8:00am on Thursday 8 May 2025.</p> <p>Newcastle weight services (NWS) - providers of the software upgrade - investigated and identified the cause of the issue. A “hot fix” was installed on the afternoon of 8 May 2025 that corrected the system. No environmental harm was observed as a result of the non-compliance.</p>
PA 08_0142	Schedule 3, Condition 22	The GW TARP requires Mackas Sand to notify DPIE of the incident with 24 hours following the identification of three consecutive monitoring results exceeding the minimum or maximum trigger values	Low	<p>Mackas Sand notified DPHI on 19 June 2025 that the groundwater monitoring results indicated an exceedance over three consecutive quarterly sampling periods (2 Sept 2024, 16 Dec 2024, 10 Mar 2025 ) for groundwater level outside the TARP trigger levels at borehole monitoring site SP2. These results demonstrate a continuous decreasing trend for SP2</p> <p>As required by the GWMP TARP, Mackas Sand has investigated the potential cause of the elevated groundwater levels in SP2. Inspections of the area have not identified any operational activities with potential to influence the groundwater levels at SP2. DPHI requested Macks Sand to update the GW TARP to remove ambiguity regarding reporting timeframe. Mackas Sand engaged GHD to review the Soil Water Management Plan and GW TARP and provided a revised SWMP.</p>
PA 08_0142	Schedule 3, Condition 22	The GW TARP requires Mackas Sand to notify DPIE of the incident with 24 hours following the identification of three consecutive monitoring results exceeding the minimum or maximum trigger values	Low	<p>Mackas Sand notified DPHI on 6 January 2026 that the groundwater monitoring results indicated an exceedance over three consecutive quarterly sampling periods (30 June 2025, 29 Sept 2025, 5 Dec 2025) for groundwater level outside the TARP trigger levels at borehole monitoring sites SP2 and SP3. These results demonstrate a continuous decreasing trend for SP2 and SP3.</p> <p>As required by the GW TARP, Mackas Sand has investigated the potential cause of the change in ground water level at SP2 and SP3. It was concluded that this decreasing trend is likely due to receding groundwater levels over time and heavy rainfall experience in last 6 months of 2025.</p>

## 2.0 Introduction

Mackas Sand was granted PA 08\_0142 on 20 September 2009 by the Minister for Planning under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to operate sand extraction operations at Lot 220 and Lot 218. It is estimated that in excess of 21 million tonnes of sand resource will be extracted from Lot 218 and Lot 220, with Lot 218 having an indefinite extraction life due to the ongoing movement of sand from the adjoining mobile dunes.

A modification to PA 08\_0142 (MOD 1) was approved on 30 September 2013 by the then NSW Planning Assessment Commission (PAC) under delegation of the Minister for the former Planning and Infrastructure (DPI), now Department of Planning, Housing and Infrastructure (DPHI). The modification included a reduction in extraction level during operations, and the approval of an alternate route to access Lot 218. The alternate route connects directly from Lot 218, northward to Nelson Bay Road, as depicted within Figure 2-1.

A second modification to PA 08\_0142 (MOD 2), was approved by the PAC on 16 March 2016. The modification allows for an increase in maximum hourly truck movements from Lot 218 via the approved alternate access road.

Mackas Sand has prepared this Annual Review document for the reporting period to meet the requirement Schedule 5, Condition 4 of PA 08\_0142 (MOD 2). The report has been produced in accordance with the NSW Government Annual Review Guideline: Post-approval requirements for State significant mining developments (October, 2015).

Requirements for the Annual Review under PA 08\_0142 (MOD 2) are presented in **Table 2-1**.

**Table 2-1 PA 08\_0142 Conditions for the Annual Review**

PA 08_0142 Condition	Section of
1. By the end of March each year, or other timing agreed by the Secretary, the Proponent shall review the environmental performance of the Project to the satisfaction of the Secretary. This review must:	This Document
2. describe the development (including any rehabilitation) that was carried out in the past calendar year, and the development that is proposed to be carried out over the next year	Section 4.0 and Section 8.0
3. include a comprehensive review of the monitoring results and complaints records of the project over the past calendar year, which includes a comparison of these results against the: <ul style="list-style-type: none"> <li>• relevant statutory requirements, limits or performance measures/criteria</li> <li>• requirements of any plan, program or strategy required under this approval</li> <li>• monitoring results of previous years</li> <li>• relevant predictions in the EA and the EA (MOD 1).</li> </ul>	Section 6.0
4. identify any non-compliance over the past calendar year, and describe what actions were (or are being) taken to ensure compliance	Section 1.0 and Section 11.0

<b>PA 08_0142 Condition</b>	<b>Section of</b>
5. identify any trends in the monitoring data over the life of the project	Sections 6.0 and Section 7.0
6. identify any discrepancies between the predicted and the actual impacts of the Project, and analyse the potential cause of any significant discrepancies	Sections 6.0 and Section 7.0
7. describe what measures will be implemented over the current calendar year to improve the environmental performance of the Project.	Sections 6.0

## 2.1 Quarry Contacts

The Mackas Sand Quarry Manager is responsible to the regulatory authorities for all aspects of environmental compliance at the site including day-to-day site environmental management, reporting, monitoring and supervision of operations including any environmental works.

Contact details for Mackas Sand personnel are listed in **Table 2-2**.

**Table 2-2 Personnel Responsible for Environmental Management during 2025**

<b>Name</b>	<b>Position</b>	<b>Company</b>	<b>Contact Phone No.</b>
<b>Robert Mackenzie</b>	Quarry Manager	Mackas Sand	(w) 02 4982 6227 (m) 0408 490 911
<b>Bret Jenkins</b>	HSE Manager	Mackas Sand	(w) 02 4982 6227 (m) 0427 665523



Image Source: Nearmap (Mar 2023)

### Legend

- Lot Boundaries
- Biodiversity Offset Area
- Approval Areas
- Approved Site Access (not-utilised)
- Approved Site Access (utilised)
- Approved Alternate Site Access (utilised)

Figure 2-1 Locality Plan

## 3.0 Approvals and Management Plans

### 3.1 Status of Approvals, Licences and Permits

The operation of the Mackas Sand quarry during the reporting period was regulated by a range of approvals and licences. Table 3.1 provides a list of the relevant approvals, licences and their status for the reporting period.

**Table 3-1 Current Approvals, Licences and Permits**

Approval	Development	Date Granted	Expiry Date	Status	Authority
PA 08_0142 (as modified)	Sand Extraction Operations from Lots 218 and 220, Salt Ash	20 September 2009	31 December 2029	Current	DPHI
Commonwealth EPBC Act Approval 2011/6214	Construction and use of Alternate Access Road (Lot 218)	29 November 2013	31 December 2029	Current	Commonwealth DCCEEW
Environment Protection Licence 13218	Mackas Sand	24 December 2009	Reviewed every 5 years	Current	EPA
Hunter Water Regulation (2015) Approval	Mackas Sand	7 June 2012	31 December 2029	Current	Hunter Water Corporation

Environment Protection Licence (EPL) No. 13218 authorises Mackas Sand to carry out activities at Nelson Bay Road, Salt Ash, NSW, 2318 (the premises). In November 2024, the NSW EPA completed a review of the Mackas Sand EPL 13218 following completion of Condition U1.1 and U1.2 of EPL 13218. As an outcome of the review, the EPA provided Mackas Sand with a draft notice of variation of EPL 13218 which included minor administrative changes whilst also including special conditions related to the next update of the Mackas Sand groundwater model and Maximum Extraction Depth Map (MEDM). The EPA issued a variation of EPL 13218 on 18 February 2025 (refer to **Section 7.2**). The MEDM will be updated by July 2027 in accordance with regulatory timeframes.

### 3.2 Management Plans

In accordance with PA 08\_0142 (MOD 2), Mackas Sand is required to implement a range of environmental management plans and the Environmental Management Strategy (EMS) for the Project. Table 3.2 identifies the environmental management strategy and plans and their approval status as at the end of the reporting period.

Mackas Sand operated under a set of DPHI approved environmental management plans during the reporting period. In accordance with Schedule 5 Condition 4A of PA 08\_0142 (MOD 2), the respective management plans for the Mackas Sand quarry were reviewed during 2025 following the submission of the 2024 Annual Review. Additionally, management plans were also reviewed following completion of the 2024 Independent Environmental Audit in accordance with Schedule 5 Condition 7 (a) of PA 08\_0142 (MOD 2). Selected management plans were updated with a number of the management plans being determined to not require a revision.

**Table 3-2 Status of Management Plans**

<b>Management Strategy/Plan</b>	<b>Revision Date of</b>	<b>Relevant Agency</b>	<b>Review Status</b>
<b>Environmental Management Strategy (EMS)</b>	July 2016	DPHI	Mackas Sand committed to update the EMS by 4 October 2024 following the submission of the 2024 Independent Environmental Audit on 4 July 2024. Mackas Sand is seeking a revised timeframe to update the EMS in 2025. This has not been reported as a non-compliance in <b>Table 1.1</b> .
<b>Noise Management Plan (NMP)</b>	November 2018	DPHI	Reviewed following the submission of the 2024 Independent Environmental Audit on 4 July 2024. No update required.
<b>Air Quality Management Plan (AQMP)</b>	June 2025	DPHI	Reviewed due to impacts on monitoring results from activities undertaken outside of Mackas Sand operations, with the proposed revision also incorporating changes to the proposed monitoring onsite. A revised draft AQMP was submitted to DPHI and EPA for comment on 6 February 2025. The revised AQMP was approved by DPHI 13 June 2025.
<b>Soil and Water Management Plan (SWMP)</b>	November 2021	DPHI	SWMP required to be updated following DPHI acceptance of Mackas Sand MEDM update (refer to <b>Section 7.2.3</b> ). A response from DPHI has not yet been provided to Mackas Sand.
<b>Unexploded Ordnance Management Plan (UOMP)</b>	September 2011	DPHI	Reviewed following the submission of the 2024 Independent Environmental Audit on 4 July 2024. No update required.
<b>Landscape Management Plan</b>	November 2021	DPHI	Reviewed following the submission of the 2024 Independent Environmental Audit on 4 July 2024. No update required.
<b>Aboriginal Cultural Heritage Management Plan (ACHMP)</b>	July 2016	DPHI	Reviewed following the submission of the 2024 Independent Environmental Audit on 4 July 2024. No update required.
<b>Non-Indigenous Heritage Management Plan (NIHMP)</b>	July 2016	DPHI	Mackas Sand committed to include records of consultation to the NIHMP by 4 October 2024 following the submission of the 2024 Independent Environmental Audit on 4 July 2024. Mackas Sand will update the NIHMP following the submission of a forthcoming modification in 2026.
<b>Drivers Code of Conduct</b>	February 2023	DPHI	Reviewed following the submission of the 2024 Independent Environmental Audit on 4 July 2024. No update required.
<b>Pollution Incident Response Management Plan (PIRMP)</b>	December 2024	EPA	Reviewed following the PIRMP being tested on 10 October 2024. Revised in December 2024.
<b>EPBC Landscape Management Plan</b>	December 2013	Cth DCCEEW	Reviewed following the submission of the 2024 EPBC Compliance Report. No update required.

Management Strategy/Plan	Revision Date of	Relevant Agency	Review Status
Operations Management Procedures	January 2014 [Draft]	HWC	Reviewed following the submission of the 2024 Independent Environmental Audit on 4 July 2024. No update required.

1 Note: All references to management plans within this Annual Review refer to the current DPHI approved version of the management plan at the time of writing this Annual Review. The current version of the management plans can also be found on the Mackas Sand website

# 4.0 Operations Summary

A summary of the operations undertaken at Mackas Sand Quarry during the report period is included in the following sections.

## 4.1 Extraction Operations

Sand extraction was undertaken at Lot 218 during the reporting period. Minor sand extraction activities have occurred in Lot 220 during the reporting period, with operations involving rehabilitation tree planting and some minor earthworks reshaping. An overview of the operations for each Lot is featured in **Section 4.1.1** and **Section 4.1.2**.

There was no hydrocarbon spills recorded during the reporting period.

### 4.1.1 Lot 218

Sand extraction operations at Lot 218 commenced during February 2015 following the construction of an alternate haul route, as approved by Modification 1 of the PA 08\_0142.

During the reporting period, there were no significant changes to operations in Lot 218. Sand continued to be extracted from the dune face using front end loaders, screened, and stockpiled before being transported offsite by road truck via the alternate haul route.

No trucks used the Lavis Lane haul route to enter or exit the site during the reporting period.

Extraction activities were primarily undertaken in the eastern portion of Lot 218, adjacent to the northern (i.e. landward) extraction boundary. Minimal sand extraction activities also occurred near the southern extraction boundary of Lot 218, extracting the wind-blown sand resource. The full extent of the extraction boundary has not been reached. Extraction activities are therefore continuing to progress in a linear fashion, as well as recovering wind-blown sand which enters the full length of the extraction area. Sand extraction status for Lot 218 can be found in **Appendix 1**.

An automated weighbridge and traffic light system servicing Lot 218 is used to manage vehicle movement compliance with the requirements of PA 08\_0142 (MOD 2). In addition to this traffic light system, Mackas Sand completes a secondary validation process on the weighbridge logs to confirm compliance with truck movement PA 08\_0142 (MOD 2) conditions. Traffic data is discussed further in **Section 6.9**.

### 4.1.2 Lot 220

Sand extraction operations at Lot 220 commenced in November 2009. Sand extraction at Lot 220 is largely completed with current operations involving rehabilitation works to establish the final landform of the area. Current extraction operations involve excess sand resulting from final landform re-shaping for rehabilitation purposes. Rehabilitation works of Lot 220 are discussed in **Section 8.1.2**.

Operations at Lot 220 are within 250 m of the nearest resident (R27). Operations conducted within 250 m of the R27 are undertaken within the hours outlined within Schedule 3 Condition 3 of PA 08\_0142 (MOD 2).

No land was cleared during the reporting period at Lot 220.

## 4.2 Extraction Depth and Extent Survey Control

Mackas Sand operates a GPS unit in at least one operating loader at Lot 218 which is used to check the vertical and horizontal extraction limits of the active extraction/processing areas at each lot.

GPS checks have been supported by quarterly surveys by an independent surveyor. Copies of the quarterly surveys are provided in Appendix 1.

## 4.3 Production Limits

During the reporting period a total of approximately 979,229.63 tonnes of product was transported from Lot 218. Approximately 3,130.45 tonnes of product was transported from Lot 220. This is below the 1,000,000 tonnes per annum for each Lot permitted under PA 08\_0142 (MOD 2).

provides the annual amount of product transported for the 2024 and 2025 reporting years and a forecast for the 2026 reporting period. The 2024 and 2025 tonnages provided are based on the weighbridge data.

**Table 4-1 Production Summary (Lot 218 and Lot 220)**

Material	Approved Limit (Source – PA 08_0142 (MOD 2))	2024 Reporting Period (Actual Tonnes)	2025 Reporting Period (Actual Tonnes)	2026 Reporting Period (Forecast Tonnes)	Compliance with Approved Limit (Yes/ No)
<b>Total Saleable Product from Lot 218</b>	1,000,000 tonnes from Lot 218	925,333	979,229.63	1,000,000	Yes
<b>Total Saleable Product from Lot 220</b>	1,000,000 tonnes from Lot 220	4,630	3,130.45	30,000	Yes
<b>Total Saleable Product from Lot 218 and 220 combined</b>	2,000,000 tonnes of product in a calendar year (1,000,000 tonnes from Lot 218; 1,000,000 tonnes from Lot 220).	929,963	982,360.08	1,030,000	Yes

Note: Forecast tonnes are subject to external factors including market demand, operating conditions, resource quality etc.

### 4.3.1 Hours of Operations

Quarrying operations at Lot 220 have been undertaken between 7:00 am and 5:30 pm Monday–Friday. Sand extraction at Lot 220 is largely completed with current operations involving rehabilitation activities to establish the final landform of the area. Current extraction operations involve excess sand resulting from final landform re-shaping for rehabilitation purposes. The need to hold an extended hours agreement with the owners of private residence R27 has not been triggered, as per Schedule 3, Condition 9(a) of PA 08\_0142 (MOD 2).

Extraction and haulage activities within the reporting period complied with the operating hours as detailed in Schedule 3, condition 9 of PA 08\_0142 (MOD 2). Quarrying operations at Lot 218 are permitted 24 hours / 7 days a week.

Mackas Sand holds agreements with the owners of specified residences on Nelson Bay Road and Oakvale Drive for extended trucking hours, in accordance with Schedule 3 Condition 9(a) of PA 08\_0142 (MOD 2). Copies of these agreements have previously been provided to the DPHI.

#### **4.4 Construction and Demolition Activities**

There were no construction or demolition activities undertaken during the reporting period at Lot 218 or Lot 220. Mackas Sand will report any future construction activities in future Annual Review documents.

#### **4.5 2026 Report Period Extraction Operations**

2026 is expected to see a continuation of sand extraction operations at Lot 218 and Lot 220. Sand extraction is projected to occur in Lot 220 in minimum volumes and will be undertaken in conjunction with establishing final landform areas. Mackas Sand does not expect any significant changes to quarrying methods during the next reporting period relative to that undertaken in 2025.

## **5.0 Actions Required from Previous Annual Review**

In accordance with Schedule 5 Condition 4 of PA 08\_0142 (MOD 2), the 2024 Annual Review was submitted to DPHI on 31 March 2025. Mackas Sand received correspondence from DPHI on 04 August 2025 accepting the 2024 Annual Review. DPHI considered the 2024 Annual Review to generally satisfy the reporting requirements of the consent. No additional actions to the 2025 Annual Review were required to be undertaken as a result of the Annual review reporting requirement in 2024.

## 6.0 Environmental Performance

The following sections provide a summary of environmental monitoring and management undertaken during the reporting period. In accordance with the *Annual Review Guideline* (NSW Government, 2015) this report contains a summary of environmental monitoring data where it is required to explain trends or environmental performance during the reporting period.

It is noted that environmental monitoring data has also been published on the Mackas Sand website (<http://www.Mackassand.com.au>) in accordance with Schedule 5 Condition 10 of PA 08\_0142 (MOD 2).

A range of environmental monitoring is required to be undertaken by the Development Consent, EPL and management plans.

**Figure 6.1** shows the Mackas Sand environmental monitoring locations.



Image Source: Nearmap (Mar 2023)



- Legend**
- ▭ Lot Boundaries
  - ▭ Approval Area
  - ▭ Approved Site Access (not-utilised)
  - ▭ Approved Site Access (utilised)
  - ▭ Approved Alternate Site Access (utilised)
  - Noise Monitoring Location
  - Dust Monitoring Location
  - Groundwater Monitoring Site
  - Residential Receivers
  - ◆ Williamtown RAAF BOM Meteorological Station

FIGURE 6.1

Mackas Sand Monitoring Locations

Figure 6-1 Mackas Sand Monitoring locations

## 6.1 Noise

Noise monitoring is undertaken in accordance with the approved Noise Management Plan (NMP) (Umwelt, 2018) which sets out the procedures and management measures to monitor, mitigate and assess the noise impacts from Mackas Sand. The noise monitoring network consists of five monitoring locations (Site 1, Site 2, Site 4, Site 5, Site 6), which are used to measure noise levels on an annual basis (refer **Figure 6.1**). Monitoring is generally undertaken during winter to early spring as this is when noise propagation from the premises is likely to be at its worst.

Mackas Sand holds agreements with the specified residences on Nelson Bay Road and Oakvale Drive for extended trucking hours and noise levels above that stated in the PA 08\_0142 (MOD 2). Copies of these agreements have been provided to DPHI.

### 6.1.1 Environmental Assessment Predictions

#### Operational Noise

A Noise Impact Assessment (2009) was developed in support of the Mackas Sand Project Environmental Assessment (2009) (EA). The Noise Impact Assessment concluded that operational noise would remain within project specific noise criteria during all operational periods at all residential receivers nearest to Lot 218 and Lot 220, if project specific controls were put in place whilst operations were within 250 m of private residence R27.

Controls included limiting work to daytime only (7.00 am – 6.00 pm Monday – Saturday and 8.00 am-6.00 pm on Sundays and Public Holidays).

#### Sleep Disturbance

Predicted noise levels are expected to be less than the project specific noise criteria. The Noise Impact Assessment further stated that predicted noise levels are expected to comply with the recommended sleep disturbance noise goals at all residential receivers of 41 dB(a) LA<sub>1,1 minute</sub>.

The noise impact assessment criteria specified in the Schedule 3 Condition 4 of PA 08\_0142 (MOD 2) that relate to operational noise generated specifically by sand quarrying are set out in **Table 6-1**.

#### Alternate Access Road Traffic Noise

Noise impact assessment criteria specified in the Schedule 3 Condition 4A of PA 08\_0142 (MOD 2) that relate to the Alternate Access Road are shown in **Table 6-2**.

**Table 6-1 Industrial Noise Impact Assessment Criteria, dB(A)**

Location	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>1</sup>	Night <sup>1</sup>
	LA <sub>eq,15 minute</sub>	LA <sub>eq,15 minute</sub>	LA <sub>eq,15 minute</sub>	LA <sub>1,1 minute</sub>
R18 – 300 Nelson Bay Road	39	39	40	45
R01 – Lavis Lane residence	39	39	39	45
R19 – 316 Nelson Bay Road	36	36	37	45
R26 – Residence opp. Oakvale Farm	36	36	35	45
R27 – Hufnagl residence	36	35	35	45

Location	Day <sup>1</sup> LA <sub>eq,15 minute</sub>	Evening <sup>1</sup> LA <sub>eq,15 minute</sub>	Night <sup>1</sup> LA <sub>eq,15 minute</sub>	Night <sup>1</sup> LA <sub>1,1 minute</sub>
R17 – 287 Nelson Bay Road	35	35	36	45
All other residences	35	35	35	45

**Table 6-2 Alternate Access Road Noise Impact Assessment Criteria dB(A)**

Location	Shoulder <sup>1</sup> LA <sub>eq,15 minute</sub>	Day <sup>1</sup> LA <sub>eq,15 minute</sub>	Evening <sup>1</sup> LA <sub>eq,15 minute</sub>
2344 Nelson Bay Road, Williamtown	38	40	40
2353 Nelson Bay Road, Williamtown	39	41	41
2367 Nelson Bay Road, Williamtown	36	38	38
2368 Nelson Bay Road, Williamtown	38	40	40
All other residences	35	35	35

*Note 1: Day time is 7.00 am to 6.00 pm Monday to Saturday and 8.00 am to 6.00 pm Sundays and Public Holidays, evening is 6.00 pm to 10.00 pm (NSW Industrial Noise Policy (INP) EPA, 2000). Shoulder is the period from 5am to 7am on Monday to Friday, but only for the use of the Alternate access road (see Condition 4A of Schedule 3 of PA 08\_0142 MOD 2).*

As noted in Schedule 3 Condition 4 of PA 08\_0142 (MOD 2), the Alternate Access Road noise impact assessment criteria do not apply if Mackas Sand has an agreement with the relevant owner/s of these residences/land to generate higher noise levels, and Mackas Sand has advised the DPHI in writing of the terms of this agreement.

### Road Traffic Noise

The following noise criteria in **Table 6-3** were assigned to road traffic from trucks servicing the Mackas Sand quarry using Lavis Lane, Oakvale Road and Nelsons Bay Road in Schedule 3 Condition 7 of PA 08\_0142 (MOD 2).

**Table 6-3 Traffic Noise Impact Assessment Criteria, dB(A)**

Road	Day/Evening	Night - Shoulder
Lavis Lane, Oakvale Drive	60 LA <sub>eq,1 hour</sub>	55 LA <sub>eq,1 hour</sub>
Nelson Bay Road	60 LA <sub>eq,15 hour</sub>	55 LA <sub>eq,9 hour</sub>

## 6.1.2 Noise Monitoring Results

During the reporting period, attended noise monitoring was undertaken by Umwelt Australia Pty Limited between 11 and 13 August 2025, at the noise monitoring locations shown on **Figure 6.1**. These locations are representative of the nearest sensitive receivers to the extractive and haulage operations in accordance with NSW Industrial Noise Policy (EPA, 2000) and Australian Standard 1055:2018. For example, measurements of industrial noise levels at Site 6 are taken to be representative of industrial noise levels received at Site 5, as Site 5 is slightly farther than Site 6 from Lot 218 and from the Alternate Access Road.

In determining compliance, since noise levels reduce with increasing distance from a noise source, it is deemed that the noise level at receivers located further from Site 6, for example at Site 5 being located in approximately the same direction, would therefore be lower than noise levels measured at Site 6. Macka's Sand advised that operations during the 2025 monitoring period were typical of normal activities and that operations have moved approximately 600 m to the east since the previous noise monitoring undertaken in 2024.

**Table 6-4 2025 Night Time Industrial Noise Levels – Sand Extraction Activities versus Noise Criteria, dB(A)**

Location	LAeq,15 minute Noise criteria	Mackas Sand noise level contribution	LA1,1 minute Noise criteria	Mackas Sand noise level contribution	Compliant with EPL and PA
Site 1	35	Inaudible	45	Inaudible	Yes
Site 2	35	Inaudible	45	Inaudible	Yes
Site 4	36	Inaudible	45	Inaudible	Yes
Site 5 <sup>1</sup>	35	-	45	-	Yes
Site 6	35	Inaudible	45	Inaudible	Yes

<sup>1</sup> Monitoring not required as Site 6 is representative of Site 5 and if compliance is measured at Site 6 then compliance is achieved at Site 5.

**Table 6-5 2025 Day Time Industrial Noise Levels – Sand Extraction Activities versus Noise Criteria, dB(A)**

Location	LAeq,15 minute Noise criteria	Mackas Sand noise level contribution	Compliant with EPL and PA
Site 1	36	Inaudible	Yes
Site 2	36	Inaudible	Yes
Site 4	35	Inaudible	Yes
Site 5 <sup>1</sup>	35	-	Yes
Site 6	35	Inaudible	Yes

<sup>1</sup> Monitoring not required as Site 6 is representative of Site 5 and if compliance is measured at Site 6 then compliance is achieved at Site 5.

**Table 6-6 2025 Evening Industrial Noise Levels – Sand Extraction Activities versus Noise Criteria, dB(A)**

Location	LAeq,15 minute Noise criteria	Mackas Sand noise level contribution	Compliant with EPL and PA
Site 1	35	Inaudible	Yes
Site 2	36	Inaudible	Yes
Site 4	35	Inaudible	Yes
Site 5 <sup>1</sup>	35	-	Yes
Site 6	35	Inaudible	Yes

<sup>1</sup> Monitoring not required as Site 6 is representative of Site 5 and if compliance is measured at Site 6 then compliance is achieved at Site 5.

**Table 6-7 2025 Industrial Noise Levels– Alternate Access Road to Lot 218, dB(A)**

Location	Period	Noise Criteria	Estimated Macka's Sand	Compliant with EPL and PA
Site 5 <sup>1</sup>	Day Time	41	-	Yes
Site 6	Day Time	40	32	Yes
Site 5 <sup>1</sup>	Night Time/Shoulder	39	-	Yes
Site 6	Night Time/Shoulder	38	34	Yes
Site 5 <sup>1</sup>	Evening	41	-	Yes
Site 6	Evening	40	Inaudible	

<sup>1</sup> Monitoring not required as Site 6 is representative of Site 5 and if compliance is measured at Site 6 then compliance is achieved at Site 5.

**Table 6-8 Mackas Sand 1 hour Night and Day Time Road Traffic Noise Level Contribution for Nelson Bay Road truck traffic noise versus Noise Criteria, dB(A)**

Road	Period	Noise Criteria	Estimated Macka's Sand	Compliant with
Site 4 (Oakvale Road)	Night	55	Inaudible	Yes
	Day	60	Inaudible	Yes
Site 6 (Nelson Bay Road)	Night	55	44	Yes
	Day	60	47	Yes

### 6.1.3 Trends in Data

The 2025 attended noise monitoring indicates Mackas Sand was compliant with the industrial and traffic noise criteria at all industrial and traffic sites in accordance with Schedule 3 Conditions 4 to 8 of PA 08\_0142, and Condition L3 of EPL 13218.

The 2025 annual noise monitoring results are consistent with the long-term trend of complying with the industrial and traffic noise criteria at all sites in accordance with Schedule 3 Conditions 4 to 8 of PA 08\_0142, and Condition L3 of EPL 13218.

### 6.1.4 Proposed Improvements or Actions for the Next Reporting Period

No additional management or mitigation measures are proposed to be implemented which are in addition to the approved NMP (Umwelt, 2018a).

## 6.2 Air Quality

Air quality monitoring was previously undertaken in accordance with the approved Air Quality Management Plan (AQMP) until such time as the AQMP was amended to remove monitoring during 2025 (Umwelt, 2025).

Previous years have demonstrated that the natural process of Aeolian transport of dune sand during periods of high winds will result in conditions where deposition levels, which can naturally exceed the air quality impact assessment criteria of 4 g/m<sup>2</sup>/month.

In June 2025 the revised AQMP was approved by the DPI. It was determined that no further monthly monitoring of dust was required. The results for air quality monitoring undertaken in 2025 up to June have been included in this report, see **section 6.2.2**.

## 6.2.1 Environmental Assessment Predictions

An Air Quality Impact Assessment (2009) was developed in support of the Mackas Sand EA. The Air Quality Impact Assessment considered the direct and cumulative air quality impacts associated with the Project's ongoing operations. Modelling was undertaken which concluded that dust control measures at Lot 218 and Lot 220 would be required to remain within relevant compliance limits for PM<sub>10</sub>, TSP and Depositional Dust. As noted in the EA, the primary source of the dust generation at Mackas Sand was predicted to be from Wheel Generated Dust (Haulage). The alternate access road has been fully sealed to mitigate the risk of dust generation from this potential source.

Air Impact Assessment Criteria are specified in Schedule 3 Condition 11 of PA 08\_0142 (MOD 2). These criteria are used to assess the environmental performance of the Project and are represented in **Table 6-9 to Table 6-11**.

**Table 6-9 Long term Impact Assessment Criteria for Particulate Matter**

Pollutant	Averaging period	Criterion
Total suspended particulate (TSP) matter	Annual	90 µg/m <sup>3</sup>
Particulate matter < 10 µm (PM <sub>10</sub> )	Annual	30 µg/m <sup>3</sup>

**Table 6-10 Short term Impact Assessment Criterion for Particulate Matter**

Pollutant	Averaging period	Criterion
Particulate matter <10 µm (PM <sub>10</sub> )	24 hours	50 µg/m <sup>3</sup>

**Table 6-11 Long term Impact Assessment Criteria for Deposited Dust**

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust
Deposited dust	Annual	2 g/m <sup>2</sup> /month	4 g/m <sup>2</sup> /month

## 6.2.2 Air Quality Monitoring Results

Depositional dust gauge samples were collected during the reporting period on approximately a monthly basis from each of the monitoring location DDG1 and DDG2. The monthly average results for DDG1 and DDG2 are shown in **Table 6-12** and **Table 6-13**. Monitoring ceased in June following the approval of the revised AQMP.

**Table 6-12 Total Dust Deposition Levels at DDG 1 – Lot 220 (g/m<sup>2</sup>/month)**

Sample date	Exposure Period (Days)	Total Insoluble Matter (g/m <sup>2</sup> /month)
8/01/2025	34	0.7
6/02/2025	29	0.4
6/03/2025	28	1.8
6/04/2025	31	N/A
6/05/2025	30	N/A
1/06/2025	26	N/A

<sup>1</sup> Sample results considered to have been influenced by external activities outside Mackas Sand operations.

**Table 6-13 Total Dust Deposition Levels at DDG 2 – Lot 218 (g/m<sup>2</sup>/month)**

Sample date	Exposure Period (Days)	Total Insoluble Matter (g/m <sup>2</sup> /month)
8/01/2025	34	6.8
6/02/2025	29	3.6
6/03/2025	28	0.8
6/04/2025	31	N/A
6/05/2025	30	N/A
1/06/2025	26	N/A

<sup>1</sup> Sample results considered to have been influenced by external activities outside Mackas Sand operations.

Agricultural activity was noted to be observed from an adjacent Lot in proximity to DDG1 during these months. Agricultural activity and earthworks in neighbouring properties was observed in proximity to DDG2 during these months. No monthly samples were recorded during April and May as DDG1 and DDG2 were inaccessible due to flooding. In June the revised AQMP was approved and as a result no further monthly monitoring was required.

### 6.2.3 Trends in Data

The monthly results during the reporting period for DDG1 ranged from 0.4 g/m<sup>2</sup>/month to 1.8 g/m<sup>2</sup>/month. The monthly results for DDG2 ranged from 0.8 g/m<sup>2</sup>/month to 6.8 g/m<sup>2</sup>/month. Monthly dust monitoring sampling results for the months of January, February and March, were determined by Mackas Sand to be influenced by external activities outside Mackas Sand operations. The criteria for dust deposition measurements is an annual average, and given that less than 12 months of data was recorded in this reporting period, no annual average can be determined.

## 6.3 Meteorology

Meteorological data is collected monthly from the Bureau of Meteorology station at the nearby Williamtown RAAF Base (Station 061078). As shown on **Figure 6.1**, Station 061078 is located approximately 5.3 km north-west of Lot 218 and 7.8 km west of Lot 220 and has been active prior to the commencement of operations at Lot 218 and Lot 220.

### 6.3.1 Rainfall

During the reporting period 1721.8 mm of rainfall was recorded across 166 rain days. Approximately 68% of the annual recorded rainfall for 2025 was experienced across January, April, May, and August amounting to 1182.4 mm. The month with the highest percentage for annual rainfall over 2025 was May (29%, 255.2mm) while the month which experienced the lowest percentage of annual rainfall was November (1%, 206mm).

Rainfall data for the reporting period is summarised in **Table 6-14**.

**Table 6-14 Monthly Rainfall and Number of Rain Days during 2025**

Month	Rainfall (mm)	Highest Daily (mm)	Rain Days (i.e. ≥0.2 mm)
January	247.2	225	15

February	33.2	276	7
March	145	148.8	18
April	180	156	19
May	502	149	23
June	65.6	147	16
July	152.4	133	12
August	255.2	100.8	21
September	58.4	122.9	8
October	30.8	128.8	7
November	20.6	100	12
December	31.4	99.4	10
<b>TOTAL</b>	<b>1721.8</b>	<b>N/A</b>	<b>166</b>

Figure 6-2 provides a comparison of monthly rainfall from 2021–2025.

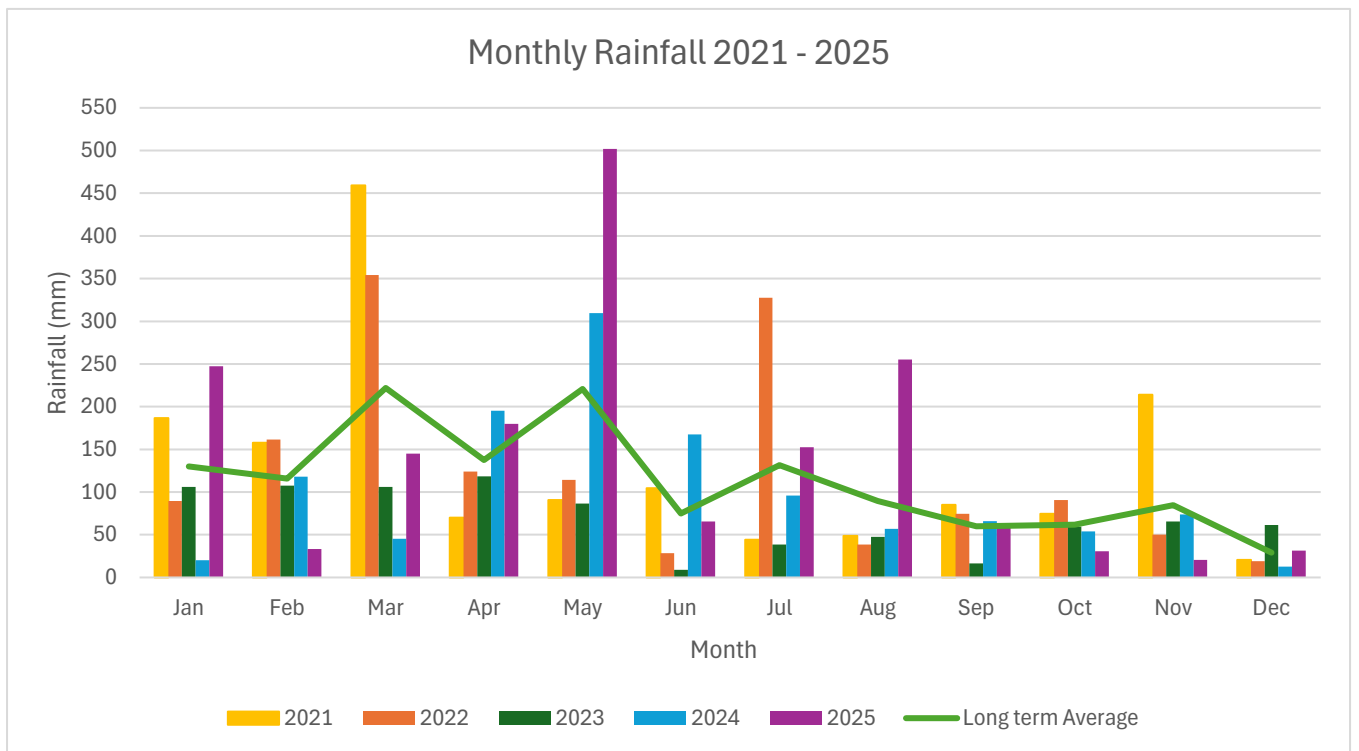


Figure 6-2 Monthly Rainfall 2021-2025

### 6.3.2 Temperature

Maximum and minimum temperature data for the reporting period is summarised below in **Table 6-15**. November and December were the warmest month of the year with an average maximum daily temperature of 28.6 °C and 28.9°C. Both June and July were the coolest months of the year, with an average minimum daily temperature of 7.9°C.

**Table 6-15 Monthly Minimum and Maximum Daily Temperatures during 2025**

Month	Minimum Temperature (°C)	Average Minimum Temperature (°C)	Average Maximum Temperature (°C)	Maximum Temperature (°C)
January	13.8	18.7	28.1	40.7
February	12.6	18.7	28.6	36.9
March	15	19.1	26.8	35.3
April	11.8	14.8	24.7	28.9
May	8.83	13	20.5	26
June	4.1	7.9	17.5	21.8
July	2.3	7.9	17.6	22.8
August	4.7	9.2	18.6	25.1
September	5.5	10.2	23.9	29.4
October	6.9	13.8	27.8	39.8
November	8.3	15.7	28.6	37.7
December	11.3	17.2	28.9	42.6

## 6.4 Biodiversity Offset Strategy

In accordance with PA 08\_0142 Mackas Sand holds an approved Landscape Management Plan (LMP) (Umwelt, 2021a). The LMP sets out the procedures and management requirements associated with the site's rehabilitation areas.

Originally, the Biodiversity Offset Strategy (BOS) (as required by Schedule 3 Condition 28A of PA 08\_0142) for Mackas Sand was included as part of the Mackas Sand LMP. However, following consultation with DPHI the Biodiversity Offset Strategy was required to be developed as a standalone document. Mackas Sand subsequently extracted all the relevant BOS information from the LMP to create a standalone BOS document. The standalone BOS document was reviewed by stakeholders and subsequently revised with the final version submitted to DPHI on 22 September 2023 (Umwelt, 2023b). The BOS was approved by DPHI on 11 January 2024.

The 2025 annual Biodiversity Offset Area (BOA) monitoring report was completed by Cool Burn Pty Ltd (Cool Burn, 2025). Monitoring of the BOA was undertaken by both Worimi LALC and Cool Burn during the reporting period. Various means were utilised to ascertain the peak flowering time period for each orchid species. This included:

- Inspection of a reference site (8 August, 21 August, 3 September 2025)
- Preliminary inspection of BOA (20 August 2025)
- Communications from Port Stephens Council and Central Coast Council.

### 6.4.1 Environmental Assessment Predictions

A detailed ecological assessment was undertaken to support the Mackas Sand EA (Umwelt, 2009). This assessment identified the existing natural environment and likely impacts of the proposal on the biodiversity of the area, particularly on threatened species, populations and communities.

The ecology impacts at Mackas Sand are predominantly related to clearance of vegetation for quarrying activities in Lot 220, but also for the establishment of the alternate access road to Lot 218. To address these impacts a pre-clearance procedure, rehabilitation of Lot 220 and the establishment of a biodiversity area to offset the impact of construction of the alternate access road on two orchids (i.e. Newcastle Doubletail (*Diuris praecox*) and Sand Doubletail (*Diuris arenaria*) and a number of fauna species have been undertaken by Mackas Sand.

### 6.4.2 Biodiversity Impact Mitigation

The rehabilitation, ecological and biodiversity impact mitigation measures for the sand operations including rehabilitation are associated with the procedures detailed in the LMP (Umwelt, 2021a) and the BOA management measures are outlined in the BOS (Umwelt,2023b). These are summarised below:

Extraction Operations:

- Ecological pre-clearance surveys.

- Limiting vegetation impacts to the approved areas (e.g., extraction area and haul roads).
- Salvage of topsoil and woody debris for rehabilitation of the extraction area at Lot 220.
- Weed management.
- Bushfire management.
- Rehabilitation of the extraction area at Lot 220.
- Monitoring the performance and progression of the rehabilitation areas.

#### Biodiversity Offset Area:

- Arranging for the long-term security of the biodiversity offset area.
- Fencing and access.
- Weed management.
- Bushfire management.
- Biodiversity monitoring and reporting.

### 6.4.3 Monitoring Results

#### 6.4.3.1 Rehabilitation and Ecological

The alternate access road to Lot 218 has been constructed and is fully sealed. As the alternate access road is in use, rehabilitation of the alternate access road and subsequent rehabilitation performance monitoring has not been commenced.

During the reporting period, Mackas Sand monitored the progress of land under rehabilitation at Lot 220 to identify the need for any rehabilitation management measures. Refer to **Section 7.2.4** for further details.

#### 6.4.3.2 Biodiversity Offset

In accordance with Schedule 3 Condition 28B of PA 08\_0142, Mackas Sand is required to provide long-term security for the BOA. On 30 June 2020, the Coordinator General, Environment, Energy and Science Group, Department of Planning, Industry and Environment executed the Mackas Sand BOA Conservation Agreement (VC00532).

Monitoring of the biodiversity offset area is undertaken generally during August/September to align with the peak flowering season of the Newcastle Doubletail (*Diuris praecox*) and Sand Doubletail (*Diuris arenaria*). During the reporting period, orchid monitoring of the BOA was undertaken by Cool Burn and Worimi LALC ecologists. Orchid monitoring was completed in the BOA on 8 August, 21 August and 3 September 2025. The preliminary inspection of BOA was completed on 20 August 2025.

While the timing of the monitoring is designed to target and monitor the orchid population numbers, the following additional ecological information is also collected:

- Habitat Assessment - including dominant flora species in each stratum, groundcover, evidence of disturbance and dieback, presence of standing and fallen dead timber and hollow-bearing trees.

- Vegetation Structure Assessment - Two permanent 50 m transects have been established at the eastern section of the Lot and are surveyed to monitor structural change to vegetation assemblage and habitat surrounding known orchid populations.
- Photo Monitoring – Five photo monitoring points have been established to monitor structural development and identify temporal changes in vegetation assemblage.
- Exotic Species Monitoring and Management – Monitoring and management of exotic species with target species including Whisky grass (*Andropogon virginicus*), Bitou Bush (*Chrysanthemoides monilifera* sp.) and Lantana (*Lantana camara*).
- Site Walk Through – An opportunistic assessment to identify and record potential impacts (e.g. weeds, pest animals, bushfire etc.) or positive observations (e.g. threatened species, points of interest) within the BOA.

### Orchid Monitoring

The results of the monitoring data for Newcastle Doubletail (*Diuris praecox*) and Sand Doubletail (*Diuris arenaria*) between 2021 and 2025 are shown in **Table 6-16** and **Table 6-17**. Baseline results recorded during 2014 and the management criteria from the BOS (Umwelt, 2023b) are also provided in **Table 6-16** and **Table 6-17** for reference.

**Table 6-16 Results of *Diuris praecox* Searches Baseline**

	2014 (baseline)	Criteria*	2021	2022	2023	2024	2025
<b>Date of survey</b>	27/08/14	N/A	13/09/21	26/08/22	24/08/23	23/08/24	20/08/25
<b>Number of stems</b>	64	16	0	3	1	29	2
<b>Maximum flowers per stem</b>	9	N/A	0	7	6	7	5
<b>Minimum flowers per stem</b>	0	N/A	0	3	1	0	4
<b>Mean flowers per stem</b>	4.2	N/A	0	5	4	2.6	4.5

\*25% of baseline for 3 consecutive years.

**Table 6-17 Results of *Diuris arenaria* Searches Baseline**

	2014 (baseline)	Criteria*	2021	2022	2023	2024	2025
<b>Date of survey</b>	10/08/14	N/A	13/09/21	16/09/22	24/08/23	09/09/24	20/08/25
<b>Number of stems</b>	72	18	82	62	131	129	96

<b>Maximum flowers per stem</b>	7	N/A	7	7	7	6	5
<b>Minimum flowers per stem</b>	1	N/A	0	13	0	0	1
<b>Mean flowers per stem</b>	2.2	N/A	2.51	3.2	2.3	1.9	4.4

## Habitat Assessment Monitoring

The results of the 2025 habitat monitoring are shown in Table 6-18 below. The table also shows the accumulated results from 2021–2025 and baseline survey results from 2014.

**Table 6-18 Results of Habitat Assessment for Baseline**

Habitat Attribute	2014 (Baseline)	2021	2022	2023	2024	2025
Weeds (density/species)	Low Whiskey grass ( <i>Andropogon virginicus</i> )	Moderate Whiskey grass ( <i>Andropogon virginicus</i> ), several mapped clusters as well as scattered individual occurrences throughout. Bitou bush ( <i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> ) saplings scattered throughout. Low levels of fireweed ( <i>Senecio madagascariensis</i> ), catsear ( <i>Hypochaeris radicata</i> ) and quaking grass ( <i>Briza maxima</i> ) scattered throughout.	Low Whiskey grass ( <i>Andropogon virginicus</i> ), mapped clusters have decreased since 2021. Small patches recorded. Low levels of bitou bush ( <i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> ) saplings scattered throughout. Low levels of fireweed ( <i>Senecio madagascariensis</i> ) and catsear ( <i>Hypochaeris radicata</i> ) scattered throughout.	Moderate Whiskey grass ( <i>Andropogon virginicus</i> ) relatively consistent with 2022. Low densities still present in previously mapped areas. Some new occurrences observed in previously inundated areas. Bitou bush ( <i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> ) saplings scattered throughout. Low levels of fireweed ( <i>Senecio madagascariensis</i> ) and catsear ( <i>Hypochaeris radicata</i> ) scattered throughout the BOA, particularly in the SE corner.	Low Whiskey grass ( <i>Andropogon virginicus</i> ) identified along eastern boundary. Low densities of several scattered plants located in western area. Three Bitou Bush ( <i>Chrysanthemoides monilifera</i> subsp.) seedlings identified and removed. Two semi- mature plants were recorded along the eastern fence line outside the BOA. Low levels of Quaking Grass ( <i>Briza maxima</i> ) and Catsear.	Weed occurrence remains minimal throughout the BOA. Whisky Grass was the dominant weed, it was identified in two locations in 2024 and persists in these areas. The infestation along the eastern boundary has been subject to inundation which has destroyed part of the infestation. It can be expected that seeds will germinate throughout this area once the water has subsided. Additional weeds recorded sporadically within the BOA included: <ul style="list-style-type: none"> <li><i>Briza maxima</i> (Quaking Grass), scattered plants in exposed areas in the south</li> <li><i>Chrysanthemoides monilifera</i> (Bitou Bush), small seedlings along the southern boundary</li> <li><i>Hypochaeris radicata</i> (Catsear), isolated plants in exposed areas in the south</li> <li><i>Stenotaphrum secundatum</i> (Buffalo</li> </ul>

						Grass), one isolated patch but can easily spread.
<b>Pests</b>	Nil identified	Rabbit ( <i>Oryctolagus cuniculus</i> ) – minimal impact	Nil identified. Evidence of digging in SE corner in proximity to previous orchid records. Likely fox scat recorded.	Nil identified. Evidence of digging in SW and SE corner, likely bandicoot.	No evidence of pest animals observed during the assessment.	No evidence of pest animals observed during the assessment.
<b>Fire</b>	Evidence of previous	Nil	Nil	Nil	No evidence of fire activity was observed during the assessment.	No evidence of fire activity was observed during the assessment.
<b>Grazing</b>	Cattle	No cattle present at time of survey	No cattle present at the time of survey.	No cattle present at the time of survey. Evidence of grazing 1m inside the western boundary fence.	No evidence of grazing was observed within the BOA.	No evidence of grazing was observed within the BOA.
<b>Erosion</b>	Minor (Aeolian)	None identified	None identified.	None identified	None identified	No evidence of erosion was observed within the BOA.
<b>Logging</b>	Historic (cut stumps)	Nil since 2014	Nil since 2014	Nil Since 2014	Nil since 2014	No evidence of logging was observed within the BOA.
<b>Features (Relative Abundance)</b>						
<b>Fallen timber/ logs</b>	Moderate	Moderate	Moderate	Moderate	The BOA contains positive levels of logs and fallen timber	The BOA recorded an average of 13m of fallen logs per transect. Fallen debris is common throughout the site.
<b>Stags</b>	Nil	Scarce	Scarce	Scarce	The BOA contains several stags of medium size.	The BOA contains several stags of medium size that provide habitat for fauna. They include

						dead Old Man Banksia trees and eucalypts.
<b>Ground cover (litter and vegetation)**</b>	Moderate	Moderate areas of litter concentrated under dense vegetation but bare areas common where cattle activity was highest previously (albeit improving).  Native ground cover now moderate (grasses, forbs, ferns and lichens) in terms of foliage cover now grazing no longer occurring.	Moderate to high levels of ground cover/littler observed throughout the BOA.  Increased areas of lichen cover due to increased moisture levels.	Moderate to high levels of leaf litter observed throughout. SE corner reasonably sparse – low ground cover and high level of digging.	Low to moderate levels of litter. Bare soil (sand) patches can be observed around the BOA but they are not common. Litter build is generally 0 – 2cm deep.	The site has varying levels of ground cover. In the southeast where the canopy is generally absent, bare earth (sand) is common and litter is scattered (<30% groundcover). Litter increases underneath the eucalypt community and can be dense around stands of Broad-leaved Paperbark.
<b>Mistletoe</b>	Nil	Scarce	Few	Scarce	Mistletoe plants can be seen within the BOA growing on Old Man Banksia.	<i>Muellerina celastroides</i> (Banksia Mistletoe) can be seen within the BOA growing on several Old Man Banksia trees (Plate 2). This occurs only within the southwest corner, but the plants appear to be spreading; no mistletoe was recorded during the baseline assessment. Banksia Mistletoe is an important habitat species for the region, and its occurrence is a positive outcome of the BOA
<b>Dieback</b>	Nil	Minor canopy dieback	Minor - midstory and ground cover (predominantly bracken fern but also in some leptospermum)	Minor – Predominantly ground cover, bracken fern and wetland associated species on higher points of the	Some dieback is evident in some Old Man Banksia trees. This may be related to Banksia Mistletoe	Dieback was observed in several Old Man Banksia trees within the BOA. Senescence (natural aging and dieback) is a part of the Banksia lifecycle.

			dieback due to increased inundation levels.	site (likely due to high previous rainfall). Some dieback in these species observed due to reduced rainfall and inundated areas retreating. Minor shrub dieback observed	and/or natural senescence of this rapid regenerative species. No dieback was observed in <i>Melaleuca quinquenervia</i> (Broad- leaved Paperbark) or <i>Eucalyptus pilularis</i> (Blackbutt).	They are also vulnerable to Phytophthora (Grose 1986), particularly where drainage is impeded as is evident with the elevated water table and persistent waterbodies across the BOA. Minor regeneration of Old Man Banksia was observed onsite.
<b>Loose bark on trees</b>	Moderate	Scarce. Former damage to tree bark as a result of cattle rubbing recovering.	Few	Few	Loose bark can be observed on Broad- leaved paperbark trees	Decorticating (loose) bark is common on Broad-leaved Paperbark trees. Decorticating bark can support microbats, small reptiles, and various insects.
<b>Tree Hollows</b>						
<b>Number of trees with hollows</b>	12	12	12	12	10	5 hollow bearing trees recorded along transect
<b>Size classes present</b>	Very small (vs), small (s), medium (m), large (l) and very large (vl)	vs, s, m, l, vl	Vs, s, m, l, vl	vs, s, m, l, vl	vs, s, m, l, vl	vs, s, m, l, vl

\*Vegetation removed along northern and western boundary – approximately 5m – 7m in width along with additional areas to stockpile.

\*\*Categories of ground cover range from scarce, low, moderate, abundant, and very abundant.

\*\*\*Size classes of tree hollows were not undertaken by Cool Burn in 2024 (Cool Burn, 2025).

## Vegetation Structure Assessment, Exotic Species and Photo Monitoring

The results of the 2025 vegetation structure monitoring at Transect 1 and Transect 2 are shown below. The tables also show the accumulated results from 2021– 2025.

**Table 6-19 Transect 1 Results of 50 m Transect Data**

% Cover	2021	2022	2023	2024	2025
<b>Canopy Cover</b>					
Native Over-storey	21%	16%	14%	22%	19%
Native Mid-storey	4.5%	7%	22.7%	17%	9%
<b>Ground Cover</b>					
Native Grass	42%	44%	22%	20%	28%
Native Shrubs	6%	8%	28%	24%	42%
Native other (e.g. Forbs)	16%	52%	26%	58%	40%
Exotic	2%	2%	0%	4%	2%
Bare Earth	44%	34%	66%	10%	18%

**Table 6-20 Transect 2 Results of 50 m Transect Data**

% Cover	2021	2022	2023	2024	2025
<b>Canopy Cover</b>					
Native Over-storey	10%	14.5%	17%	26%	31%
Native Mid-storey	11.5%	8%	11.3%	0.5%	0%
<b>Ground Cover</b>					
Native Grass	34%	58%	8%	20%	44%
Native Shrubs	26%	2%	8%	5%	8%
Native other (e.g. Forbs)	20%	34%	74%	92%	88%
Exotic	4%	0%	16%	18%	10%
Bare Earth	36%	28%	16%	0%	6%

## 6.4.4 Trends in Data

### 6.4.4.1 Orchids

Monitoring results show that there are annual fluctuations in the monitoring data for Newcastle Doubletail (*Diuris praecox*) and Sand Doubletail (*Diuris arenaria*). Results for the Sand Doubletail were above respective criteria during the reporting period, but slightly below the long term average of 104 stems (2014 – 2024), recording 96 stems. Average flowers per stem was recorded at 4.4 which was above the long term average of 2. One stem recorded 11 flowers, this is the highest flowers per stem identified over the ten year survey period.

The Sand Double tail was primarily recorded in the southern and southeastern areas of the BOA. It was also recorded outside the BOA to the west within grazed areas, and to the east within the Worimi National Park where numerous plants were observed in areas burnt by recent fire. Newcastle Double tail stem counts were significantly lower than respective criteria, recording only 2 stems. These two plants were recorded within close proximity in the southeast corner of the BOA. The low number of Newcastle Doubletail plants (2) is not of immediate concern. The ten years of site monitoring has demonstrated that annual fluctuations in population occur, and could be attributed to weather and / or climatic conditions. August was the wettest year on record for the area (Williamtown RAAF Weather Station SITE 61078) with minimal days of sun and warmth. The species is not well studied and long term flowering patterns associated to seasonal weather are subjective.

The results of Newcastle Doubletail and Sand Doubletail during 2024 and 2025 period indicates some degree of resilience and recovery in the BOA, likely influenced by favourable rainfall conditions in 2024 and 2025, and the exclusion of cattle from the area since 2020. No Diuris orchids were recorded in the northeastern corner of the BOA where they have been identified in recent years. A healthy population of Sand Doubletail and Newcastle Doubletail orchids was recorded onsite and in adjoining areas outside the BOA. The distribution of the orchids population has changed since baseline surveys. The majority of the orchids are located in the southern portion of the site where there are more open areas. The northeastern area has seen an increase in Whisky Grass and Baloskion tetraphyllum. Dense wetland groundcover species have increased, particularly in response to a wet winter, but also as a response to the exclusion of grazing. The dense wetland groundcover growth may increase competition and inhibit orchid growth. The implementation of the planned prescribed burn resulted in a reduction in the cover of these species and it is anticipated this reduction in competition could encourage orchid re-emergence in the following years, and it will be important to monitor the response of the Diuris orchids to this disturbance.

#### **6.4.4.2 Habitat Assessment**

The 2025 monitoring results showed continued improvement in conservation values within the BOA with conservation values being maintained and in a satisfactory condition.

The BOA has mature trees that contain hollowing features Five hollows were recorded which was a reduction from the previous year (10) however this may be due to variation in assessment methodology (original methodology not defined) and certainty of hollowing. The BOA has adequate level of fallen logs and debris, and provides hollow-bearing trees with small, medium, and large hollows.

The BOA has a good diversity of shrub species, and many were in flower during the survey period, providing good foraging habitat for native insects. Plants such as *Monotoca elliptica* were bearing abundant fruit. Several species of orchid were observed in flower, and mistletoe plants were observed in a number of Old Man Banksia trees, demonstrating the structural diversity and functional health of the offset. The population counts for the Sand Doubletail and the Newcastle Doubletail were significantly lower than previous years. The Sand Doubletail was primarily recorded in the southern and southeastern areas of the BOA. It was also recorded outside the BOA to the west within grazed areas, and to the east within the Worimi National Park where numerous plants were observed in areas burnt by recent fire. This information supports the use of fire as a disturbance mechanism within the BOA. Previously average flowers per stem has decreased for both orchids year on year, the reason for this is unknown and likely to be highly variable (methodology, human error, timing etc.); however, the 2025 results demonstrate the BOA is being effective in protecting habitat for these two orchid species (Cool Burn, 2025). For the 2025 reporting period average flowers per stem was recorded at 4.4 which was above the long-term average of 2. One stem recorded 11 flowers, this is the highest flowers per stem identified over the ten year survey period

Weed occurrence remains minimal throughout the BOA. Whisky Grass was the dominant weed, it was identified in two locations in 2024 and persists in these areas. The infestation along the eastern boundary

has been subject to inundation which has destroyed part of the infestation. It can be expected that seeds will germinate throughout this area once the water has subsided. Whisky Grass occurs around the native *Themeda australis* (Kangaroo Grass). These two species can look very similar when they are not in seed and management actions will need to incorporate positive identification techniques to avoid impacts to Kangaroo Grass (or other native plants within the area of infestation).

Points of interest noted from the 2025 site walk through were numerous other orchids were recorded in flower throughout the BOA during surveys and the walk around. These included a Sun Orchid (*Thelymitra* sp.), Pink Fingers (*Caladenia carnea*), an Onion Orchid (*Microtis* sp.), a Mosquito Orchid (*Acianthus* sp.) Red Beard Orchid (*Calochilus paludosus*). A high diversity of shrubs in flower was evident during the walkaround, providing a high level of nectar / pollen for foraging insects. Fruit resources were also abundant on species such as *Monotoca elliptica*. Other notable species included the carnivorous *Drosera peltata* (Sundew).

The Smooth-barked Apple - Blackbutt - Old Man Banksia Woodland is a functional and regenerating ecosystem with good habitat values and has minimal exposure to disturbance. The BOA has a good diversity of shrub species, and many were in flower during the survey period, providing good foraging habitat for native insects. Plants such as *Monotoca elliptica* were bearing abundant fruit. Several species of orchid were observed in flower, and mistletoe plants were observed in a number of Old Man Banksia trees, demonstrating the structural diversity and functional health of the offset. The BOA has adequate level of fallen logs and debris, and provides hollow-bearing trees with small, medium, and large hollows.

### 6.4.4.3 Vegetation Structure, Exotic Species and Photo Monitoring

In 2025, the BOA was generally moderate in coverage and native diversity (grasses, forbs, shrubs, sedges and rushes). The absence of previous impacts from cattle and drought have contributed to the general improvement, particularly in native over-storey and native grasses/other species. Results from the 2025 monitoring observed reasonable stability in native shrubs, improvements in native over-storey, improvements in other native cover, and a decrease in bare earth at both transects. The canopy recorded a slight decrease in percentage cover at Transect 1, and an increase in Transect 2. The change is within the range expected for annual and seasonal variation. An unseasonal September-October resulted in high temperature anomalies and well below average rainfall. This can result in increased leaf fall as observed in Transect 1 where the dominant canopy is *Eucalyptus pilularis* (Blackbutt). Conversely, residual water is likely to promote canopy cover from wetland species, including *Melaleuca quinquenervia* (Broad-leaved Paperbark), that is common along Transect 2. Transect 1 showed a mid-storey decrease from 17% to 9% between 2024 and 2025. The overstorey also decreased from 22% in 2024 to 19% in 2025. Transect 2 showed a mid-storey decrease from 1% to 0% between 2024 and 2025. However, the overstorey increased from 26% cover in 2024 to 36% cover in 2025. *Banksia serrata* (Old Man Banksia) is the primary midstorey species within the BOA and senescence (aging and dieback) is common within the population onsite.

Native grass cover had increased from 20% at both transects in 2024 to 28% and 44% in transect 1 and 2 respectively. Native shrub cover had increased from 24% in 2024 to 42% in 2025 in Transect 1 and from 5% in 2024 to 8% in 2025 in Transect 2. Other native cover has decreased at both transects since the last monitoring period, increasing from 58% to 40% at Transect 1, and from 92% to 80% at Transect 2.

Native grass cover at Transect 1 was primarily influenced by an increase in *Panicum simile* and *Themeda australis* (Kangaroo Grass). The wetter areas of Transect 2 saw an increase in *Cynodon dactylon* (Green Couch) which resulted in a 22% increase in native grass cover. *Baloskion tetraphyllum* and *Machaerina juncea* (Bare Twig-rush) remain the dominant understorey species at Transect 2, (classified as Native 'Other') due to the presence of wetland conditions and waterbodies that have persisted throughout winter and spring. Exotic species cover decreased at both transects during 2025, from 4% to 2% at Transect 1, and from 18% to 10% at Transect 2. The changes observed at Transect 2 are primarily related to the occurrence of *Andropogon virginicus* (Whisky Grass) which was recorded to be dominant along the central portion of the study area.

The results from Transect 2 triggered a management action related to weed density from the BOS as weed cover higher than the revised baseline cover (2018) was observed for more than two consecutive years. This baseline value is 4% cover at Transect 2, which was exceeded in both 2024 (18%) and 2025 (10%), while the baseline value at Transect 1 (6%) has not been exceeded. This has resulted in a revised approach to weed management actions as discussed in **Section 6.4.7**.

Photo monitoring undertaken in the 2025 monitoring period of the BOA can be found in the BOA Annual Monitoring Report (Cool Burn, 2025) and are accompanied by a description of vegetation, including type, health, changes and management issues. Photo monitoring has been compared to those taken in 2022 with the results not highlighting any significant or negative changes occurring within the BOA. Temporal changes within the BOA can be identified through annual photo monitoring. Photo monitoring was conducted from five photo monitoring points around the BOA. The images also support compliance of management works and visual assessment of the functionality of the BOA from various points and aspects within the site.

#### 6.4.5 Comparison of Results against Performance Indicators

To track the biodiversity value changes of the BOA, the 2025 monitoring results were compared to the relevant performance criteria within the BOS. **Table 6-21** summarises how aspects of the BOA are performing against the relevant action triggers. If a management action trigger is activated, it is assessed to determine whether it is likely to be a result of natural fluctuation in the biological system or whether it relates to current management actions.

**Table 6-21 Comparison of 2025 BOA Monitoring Results Against Performance Criteria from the BOS**

BOA Performance Criteria	Trigger Response	Further Action / Comment
<b>Short Term Action Triggers</b>		
<p>Any area of Coastal Sands Apple – Blackbutt Forest, Newcastle Doubletail (<i>Diuris praecox</i>) or Sand Doubletail (<i>Diuris arenaria</i>) habitat, identified during the revised baseline (2018) survey, is cleared either by natural processes such as fire or anthropogenic processes such as clearing.</p>	<p><b>Trigger: Not triggered</b></p>	<p>No further actions required.</p>
<p>The Newcastle Doubletail (<i>Diuris praecox</i>) or Sand Doubletail (<i>Diuris arenaria</i>) stem count is less than 25% of the revised baseline count for three consecutive years.</p>	<p><b>Trigger: Not Triggered</b> Stem count is above 25% of the revised baseline count for both the Newcastle Doubletail (<i>Diuris praecox</i>) and Sand Doubletail (<i>Diuris arenaria</i>).</p>	<p>The 2024 monitoring observed 29 Newcastle Doubletail (<i>Diuris praecox</i>) stems within the BOA. This is above the 25% revised baseline count trigger for Newcastle Doubletail and is an increase since 2023 (15 individuals), 2022 (three individuals) and zero in 2021. The 2024 monitoring observed 129 Sand Doubletail (<i>Diuris arenaria</i>) stems within the BOA, also above the 25% revised baseline count for Sand Doubletail. A slight decrease from 131 stems in 2023 occurred, however, this is still an increase from the previous two years with 62 stems in 2022 and 82 stems in 2021. Mackas Sand will implement the actions prescribed in <b>Section 6.4.7</b> during 2025.</p>
<p>The diversity or density of weed species is higher than the revised baseline (2018) results for more than two consecutive years.</p>	<p><b>Trigger: Triggered in Transect 2 but Not Triggered in Transect 1</b> Increased weed density in Transect 2 will require a revised approach to weed management actions. Density of weeds within Transect 1 has slightly increased but is below the 2018 revised baseline. Across the BOA, weed diversity and abundance is generally increasing, with a substantial increase in the extent of the areas occupied by whiskey grass.</p>	<p>Hand weeding in Transect 2 has helped to manage weed density and diversity; however, this needs to continue, particularly for Whisky Grass. Exotic cover is minimal and has decreased in 2025, although this is likely to be seasonal and it is expected that this cover could increase in future years. If exotic cover remains on average above the baseline assessment, a weed strategy will need to be implemented to reduce infestations and manage the seed bank (primarily of Whisky Grass)</p>

## 6.4.6 Management in the Biodiversity Offset Area

A culturally lead burn by the Worimi LALC was delivered in November 2025. Approval for the burn was granted by the BCT in 2025 in accordance with Annexure C Item 3 of the Conservation Agreement (permissions and guidelines – fire management). An ecologist was present for the burn. The practice was also conducted for fire sensitive species including mature Old man Banksia trees and areas below low-lying Banksia Mistletoe. Fire response crews monitored the fire closely and any fire run up tree trunks were extinguished. It was intended to burn no more than 50% of the BOA. The burn resulted in approximately 55% of the site being burnt and this is considered a good outcome given the high fuel loads in the near surface fuel layer in the central and northern areas of the BOA. The fire was professionally conducted, resulted in no impacts to biodiversity values, and did not enter the canopy.

## 6.4.7 Proposed Improvements or Actions for the Next Reporting Period

During the 2026 reporting period Mackas Sand will implement the recommendations from the 2025 BOA report (Cool Burn, 2025), being:

Weed management actions:

- Increase Whisky Grass control to twice per year beginning Autumn 2026
- Whisky Grass should be controlled manually inside the BOA where Diuris orchids are known to occur. All seed heads should be removed offsite. Herbicide may be considered for dense patches, this must be done in accordance with the Conservation Agreement.
- Whisky Grass and Bitou Bush should be controlled out to 20m from the BOA boundary (within the Macka's Sand landholding) and should include any pronounced infestations beyond this distance.
- All other weeds within the BOA can be hand pulled.

Fencing:

- The top strand of wire requires reconnection to the strainer in the southwest corner.
- Continue regular monthly inspections and maintenance.

Prescribed burning:

- The 2026 annual monitoring report must provide sufficient focus on the results of the prescribed burn in relation to habitat enhancement for Diuris orchids and other positive outcomes to biodiversity values within the BOA.

## 6.5 Aboriginal Heritage

### 6.5.1 Aboriginal Cultural Heritage Management

In accordance with PA 08\_0142 (MOD 2) Mackas Sand holds an approved Aboriginal Cultural Heritage Management Plan (ACHMP). The ACHMP sets out the procedures and management requirements associated with the Aboriginal Cultural Heritage matters and consultation regarding the rehabilitation, ecological and biodiversity offset matters as well as the establishment of the Aboriginal Cultural Heritage Group (ACHG) as the primary consultation mechanism for ongoing Aboriginal Cultural Heritage management matters for the project.

It is noted that the Mackas Sand extraction area is owned by the Worimi Local Aboriginal Land Council (Worimi LALC), who at the time of the environmental assessment dedicated a significant area of remnant coastal vegetation adjacent to the sand extraction area to permanent conservation status as National Park. Worimi LALC are members of the ACHG.

### 6.5.2 Environmental Assessment Predictions

A detailed Aboriginal Cultural Heritage Assessment (ACHA) was prepared to support the Mackas Sand EA. The study area was determined to have high Aboriginal cultural significance through consultation undertaken with Aboriginal stakeholders.

The ACHA determined that the sand extraction operations at Lot 218 may uncover buried former soil horizons within the transient sand dunes that may contain archaeological material. As these soil surfaces are distributed discontinuously at varying depths across and within the dune field, significant logistical and safety issues have been experienced with traversing the transient sand dunes with mechanical sampling equipment prior to extraction occurring. As such, it has not been possible to safely undertake a typical sub-surface sampling program prior to extraction of the sand, in order to accurately identify where the remnant soil horizons occur prior to extraction commencing.

In contrast, all of Lot 220 consists of stabilised soils which will be impacted by the project, making it safe and achievable to undertake further archaeological investigations where required. One area of Potential Archaeological Deposit (PAD) was identified in the low-lying central area of Lot 220. Impacts to the area of PAD in the central section of this site were expected to be minimal, as any impact is limited to the construction of up to two vehicle access tracks across the narrowest sections of the PAD area. The key impacts associated with the project will occur in the elevated dunes and associated slopes that have been assessed as unlikely to contain PAD, although may contain low densities of archaeological material.

### 6.5.3 Aboriginal Cultural Heritage Impact Assessment Criteria

The Aboriginal cultural heritage impact assessment criteria are associated with the following procedures as detailed in the ACHMP:

- Establishment of an ACHG.
- Cultural awareness training.
- The recording and salvage of known Archaeological sites and PADs.
- Monitoring inspections by the ACHG.

- Analysis and interpretation of results of mitigation activities.
- Care and control of salvaged material.

#### **6.5.4 Aboriginal Cultural Heritage Results**

Mackas Sand has established an ACHG, and the plant operators have completed cultural awareness training as part of the induction process. This training is supplemented by the plant operator(s) also attending and participating in the ACHG meeting and the monitoring inspections conducted by the ACHG.

Artefacts identified during inspections are typically inspected and analysed by the ACHG. All artefacts are stored securely onsite as well as those found as part of ACHG inspections. Artefacts collected from screened material are buried at the ACHG's nominated keeping place.

The ACHG has previously indicated there is no need to bag materials from Lot 220 for later analysis, however any artefacts are to be stored and returned to Lot 220 as part of the site rehabilitation process.

ACHWG inspection of screened material occurred in February 2026 with material collected during 2025 inspected and reviewed. Screened material is collected and bagged each week, with bags stored in secure storage container near site. Some shell material was found, no stone artefacts were found.

#### **6.5.5 Proposed Improvements or Actions for the Next Reporting Period**

Mackas Sand will continue to collect potential artefacts from Lot 218 and Lot 220 in the next reporting period as per the requirements of the ACHMP, for inspection by ACHG members in 2026. No additional management or mitigation measures are proposed to be implemented which are outside the approved ACHMP.

## 6.6 Non-Aboriginal Heritage

The Mackas Sand Environmental Assessment (EA) identified an alignment of World War II era tank traps traversing a section of Lot 220. These tank traps are also believed to exist beneath the mobile sand dunes on north-eastern end of Lot 218. No other historical heritage items were identified within the study area.

The tanks traps within the Lot 220 extraction area have been temporarily relocated during a previous reporting period. They will be returned to their original position when they will not restrict extraction and/or rehabilitation activities. No additional tanks traps were uncovered at Lot 218 and Lot 220 during the reporting period. No further tank traps are anticipated to be found as Mackas Sands is not disturbing any area where they are known to exist or be mapped for in the EIS. No actions or impacts in relation to non-Aboriginal heritage occurred during the reporting period.

### 6.6.1 Proposed Improvements or Actions for the Next Reporting Period

No additional management or mitigation measures are proposed to be implemented which are outside the approved NIHMP.

## 6.7 Erosion and Sediment Control

In accordance with PA 08\_0142 (MOD 2) Mackas Sand holds an approved Soil and Water Management Plan (SWMP) (Umwelt, 2021b), which sets out the procedures and management requirements.

The Mackas Sand EA identified that small quantities of surface run-off will be generated from access roads and small parking areas, with this surface run-off readily managed through the establishment of table drains and flow dissipation structures, such as level spreaders along each access road.

Mackas Sand completed an extensive road sealing program during 2017. This effectively eliminated the potential for erosion and sediment transport along the Lot 218 alternate access road and the Lot 220 access roads. Spoon drains and localised erosion sediment controls are located near the entrance to the sand extraction areas where the road has not been sealed.

Mackas Sand's experience in relation to the extraction area is that the in-situ sand is highly permeable. This in combination with the extraction area being the lowest point in the landscape results in there being negligible potential for the operation to generate runoff from the site or impact on surface waters.

No additional erosion and sediment control works were completed during the 2025 reporting period. An updated SWMP was submitted to in DPHI in 2025, a response is yet to be received. Mackas Sand will continue to operate in accordance with the approved SWMP (Umwelt, 2021b) during the next reporting period. Should the revised SWMP be approved by the Department during the next reporting period, Mackas Sand will undertake activities in accordance with the revised SWMP and implement the management or mitigation measures of the revised SWMP, where necessary.

## 6.8 Waste Management

The Mackas Sand EA identified that wastes from the Project include sand processing and ablution wastes.

During the reporting period sand processing wastes (i.e., screen waste) have consisted of sand aggregates, fallen vegetation and leaf litter. These natural waste materials have been incorporated into the final landform of the site as per the EA. No additional management or mitigation measures for waste are proposed to be implemented during the 2026 reporting period.

## 6.9 Traffic

Traffic Management at Mackas Sand is undertaken in accordance with the approved Drivers Code of Conduct (DCC) (Umwelt, 2023a). The DCC applies to drivers of all project related vehicles, including trucks that haul sand from Mackas Sand operations on Lot 218 and Lot 220. The DCC details:

- safety considerations when operating on site and when on public road haulage routes
- times of heavy traffic
- school bus travel times and bus stop locations
- potential interactions with traffic and fauna on roads
- emergency and accident contact details (including details for care of injured fauna)
- local road condition updates
- measures to minimise truck noise impacts including on-site speed restrictions
- the requirement for all truck loads to be covered when leaving site, and
- measures to minimise movement to site prior to 5am weekdays.

### 6.9.1 Environmental Assessment Predictions

A detailed Traffic Assessment was prepared by GHD to support a modification to the Mackas Sand Project and was included as an appendix within the Environmental Assessment (Umwelt, 2015) (i.e. Modification 2). The modification allowed for an increase in maximum hourly truck movements from Lot 218 via the approved alternate access road. All other traffic aspects remained unchanged from that approved as part of the 2009 EA. No changes to the transport routes were sought by the modification.

The traffic impact assessment concluded that the site access and the intersection with Nelson Bay Road will continue to operate with spare capacity from 2015 to 2035 and that the existing road network will continue to operate with minimal negative impacts as a result of the proposed modification to the approved truck movements.

### 6.9.2 Monitoring Results

#### 6.9.2.1 Vehicle Movements

Transport of product material was undertaken in accordance with the hourly truck limits specified in PA 08\_0142 (MOD 2) during the reporting period.

Mackas Sand received one non-compliance involving a truck departing via the Lot 218 access roads intersection with Nelson Bay Road during the reporting period see Section 11.0.

### **6.9.2.2 Road Haulage**

Schedule 3 Condition 33 of PA 08\_0142 (MOD 2) states that all vehicles entering and leaving the site are covered and that all loaded vehicles leaving the site are cleaned of materials that may fall on the road, before they leave the site.

Mackas Sand notes there were no non-compliances with Schedule 3 Condition 33 of PA 08\_0142 (MOD 2) during the reporting period.

### **6.9.2.3 Fauna Strikes**

Schedule 3 Conditions 33B and 33C of PA 08\_0142 (MOD 2) details the requirement for the commitments made in the DCC to be discussed in each Annual Review. This shall include details of all fauna injured or killed by vehicle strikes, time and date of any such strike, species involved, action taken immediately following the strike and any consequent measures put in place to prevent or minimise a recurrence of fauna strikes.

There were no reported fauna strikes during the reporting period.

## **6.9.3 Trend in Data**

From Lot 218, Mackas Sand recorded two additional traffic movements in 2018 and one additional movement in 2019. The operation complied with traffic movement limits during the 2020 and 2021 reporting periods. One exceedance occurred in 2022, while full compliance was achieved again in 2023 and 2024. However, one non-compliance related to traffic movements was identified during the 2025 reporting period.

## **6.9.4 Proposed Improvements or Actions for the Next Reporting Period**

No additional management or mitigation measures are proposed to be implemented in the 2026 reporting period which are outside the approved DCC (Umwelt, 2023a).

# 7.0 Water Management

Mackas Sand does not extract groundwater for use at either Lot 218 or Lot 220 and does not hold any licences for the extraction of groundwater for use at either Lot 218 or Lot 220. Water management needs on-site are negligible and are limited to surface runoff from the sealed access road. The remainder of the site is comprised of sand which is free draining. There is no surface water runoff at either of the Lots that requires diversion or specific management.

The potential major water demands for the Project are the approved wash plant and dust suppression associated with the minimisation of vehicle generated dust emission. Mackas Sand has however, effectively minimised its water demand as the approved wash plant has not been constructed and the access roads have been sealed. As noted in the Soil and Water Management Plan (SWMP, 2021b), Mackas Sand will keep a record of any extraordinary water usage on-site and will compile and present this information as part of the Annual Review.

No extraordinary water usage was recorded at Mackas Sand during the reporting period.

## 7.1 Surface Water

There are no surface flows or drainage lines on either Lot 218 or Lot 220 due to the high permeability of the underlying sand. As a result, there is no surface water that can be monitored to establish baseline conditions other than in low-lying areas that may intermittently flood following an intense rainfall event due to the infiltration rate being exceeded (i.e., perched water).

## 7.2 Groundwater

In accordance with the PA 08\_0142 (MOD 2), Mackas Sand holds an approved SWMP, which sets out the procedures and management requirements for groundwater. The groundwater monitoring network consists of six bores, which are monitored each quarter. The location of the monitoring bores is shown on **Figure 6.1**.

### 7.2.1 Environmental Assessment Predictions

The Mackas Sand EA identified that the sand extraction areas are located on the Stockton Sand beds, which form part of the Tomago-Tomaree-Stockton groundwater source that is managed in accordance with the Hunter Water (Special Areas) Regulation 2003, Tomago-Tomaree-Stockton Groundwater Management Plan 1996 and Water Sharing Plan for the Tomago-Tomaree-Stockton Groundwater Sources 2003.

A Groundwater Impact Assessment was developed in support of the Mackas Sand EA. The EA predicted that the sand extraction operations at Lot 218 and Lot 220 would have a negligible impact at both locations under average rainfall conditions.

The EA does not include information on groundwater quality impacts. The assessment findings for the temporary reduction in extraction level (i.e., Modification 1 of PA 08\_0142) were unchanged from the 2009 EA (Umwelt, 2009).

## 7.2.2 Impact Assessment Criteria

### 7.2.2.1 Groundwater Level

To ensure adequate protection of the underlying groundwater resource, the SWMP includes a Maximum Extraction Depth Map (MEDM) for Lot 218 and Lot 220, which satisfies the requirements of Schedule 2 Conditions 7 and 7A of PA 08\_0142 (MOD 2). The history of MEDM updates for the Mackas Sand SWMP is detailed in **Section 7.2.4**. It is noted that additional groundwater monitoring has been undertaken and an updated MEDM has been prepared based on modelling results from an updated Visual MODFLOW Pro Version 2009.1 groundwater model using meteorological data from the Australian Bureau of Meteorology (BoM) Williamtown RAAF Base station (station no. 061078).

The groundwater levels included in **Table 7-1** are the currently approved levels presented in the SWMP. The SWMP will be updated as required following DPHI's response to the revised MEDM when submitted in 2027. **Table 7-1** shows the predicted maximum groundwater levels at each groundwater monitoring bore.

**Table 7-1 Predicted Maximum Groundwater Levels**

Groundwater Monitoring Bore	Approximate Predicted Maximum (mAHD)
SP1	3.60
SP2	2.80
SP3	2.60
SP4	1.25
SP5	3.60
BL158	3.70

### 7.2.2.2 Groundwater Quality

The SWMP includes a suite of groundwater monitoring parameters and trigger levels which are measured each quarter, as shown in **Table 7-2**. The list of tested analytes has been in place since 2008, except for chromium, cobalt and zinc which were included as part of the 2019 revision of the SWMP.

**Table 7-2 SWMP Groundwater Quality Investigation Trigger Values**

Parameter	Units	Minimum	Maximum
pH	pH Unit	4.5**	8.5*
Conductivity	µS/cm	NA	600**
Turbidity	NTU	NA	50**
Arsenic (Total)	mg/L	NA	0.01*

Parameter	Units	Minimum	Maximum
Manganese (Total)	mg/L	NA	0.1*
Iron (Total)	mg/L	NA	5.7**
Chromium (Total)	mg/L	NA	0.0906***
Cobalt (Total)	mg/L	NA	0.15***
Zinc (Total)	mg/L	NA	3*

\*Values are based on the Australian Drinking Water Guidelines 2011 (NHMRC, 2011).

\*\*Values are based on long term groundwater monitoring from a previous operation in the local area.

\*\*\*Values are based on ANZECC (2000) guidelines

## 7.2.3 Monitoring Results

### 7.2.3.1 Groundwater Level

During the reporting period measured groundwater levels for SP1, SP4, SP5, and BL158 were below the predicted maximum groundwater levels. It is noted throughout the groundwater quality results below that for the July 2025 monitoring event the BL158 monitoring bore was unable to be tested. This is as a result of inaccessibility to the bore due to flooding at the time of attempted monitoring. The results for July for BL158 are shown in the tables below as 'NT' for 'Not Tested'.

SP2 and SP3 exceeded the predicted maximum groundwater levels for the following months:

- July, October and December 2025.

Groundwater levels results continued to exceed the predicted maximum mAHD for three consecutive monitoring events with an exceedance of SWMP trigger level notification provided to DPHI on 6 February 2025.

Groundwater levels responded to rainfall at SP2 and SP3 more so than the other bores which remained more stable over the 2025 report period.

Following acceptance of Mackas Sand MEDM update, the DPHI requested that Mackas Sand updated the GW TARP to remove ambiguity regarding reporting timeframe. Mackas Sand engaged GHD to review the Soil Water Management Plan and GW TARP. Mackas Sand provided a draft revised SWMP to DPHI in 2025. A response from DPHI is yet to be received. The revised SWMP would not result in an exceedance being triggered.

**Table 7-3** shows the recorded groundwater levels for the reporting period. The groundwater results since 2017 are shown graphically in **Appendix 2**.

**Table 7-3 Groundwater Levels (mAHD)**

Sample Date	Groundwater Monitoring Bore					
	SP1	SP2	SP3	SP4	SP5	BL158
Approximate Predicted Maximum (mAHD)	3.60	2.80	2.60	1.25	3.60	3.70
Observed Groundwater Level (24/03/2025)	1.88	2.98	2.40	0.74	1.88	2.157

<b>Observed Groundwater Level (14/07/2025)</b>	3.57	4.27	4.08	1.31	3.12	NT
<b>Observed Groundwater Level (09/10/2025)</b>	3.63	4.06	3.92	1.29	3.01	3.88
<b>Observed Groundwater Level (16/12/2025)</b>	3.01	3.54	3.27	0.84	2.62	3.23

Note: Red values indicate exceedance of trigger values.

### 7.2.3.2 Groundwater pH

The pH results for the reporting period remained within the SWMP (Umwelt, 2021b) specified trigger value range and were generally consistent with historical records. The groundwater pH results since 2017 are shown graphically in **Appendix 2. Table 7-4** shows the recorded pH groundwater levels for the reporting period.

All monitoring locations except for SP2 and SP3 showed a trend of overall stability between January and December 2025.

**Table 7-4 Groundwater Quality – pH**

Sample Date	Groundwater Monitoring Bore					
	SP1	SP2	SP3	SP4	SP5	BL158
Trigger Value Minimum/Maximum (pH)	4.5/8.5	4.5/8.5	4.5/8.5	4.5/8.5	4.5/8.5	4.5/8.5
Recorded pH (24/03/2025)	5.2	5.3	4.8	5.5	5.2	5.2
Recorded pH (14/07/2025)	5.5	5.4	5.0	5.6	5.5	[NT]
Recorded pH (09/10/2025)	5.8	5.30	5.1	5.5	5.5	5.4
Recorded pH (16/12/2025)	5.7	5.20	5.0	5.60	5.6	5.4

**7.2.3.3 Groundwater Electrical Conductivity**

Table 7-5 shows the recorded EC levels for the reporting period. The groundwater EC results recorded since 2017 are shown graphically in Appendix 2.

Monitoring point BL158 showed a decreasing trend in EC across the reporting period and were below the historical maximum recorded of 728 µS/cm. While quarry activities were near BL158, the extraction area surveys show that extraction was being undertaken in accordance with the approved MEDM. SP5 showed a slight increase in EC for the reporting period.

All EC results recorded over the reporting period were below the historical maximums for each monitoring site.

**Table 7-5 Groundwater Quality – Electrical Conductivity (µs/cm)**

Sample Date	Groundwater Monitoring Bore					
	SP1	SP2	SP3	SP4	SP5	BL158
Trigger Value Maximum (µs/cm)	600	600	600	600	600	600
Recorded EC (24/03/2025)	119	105	251	222	97	476
Recorded EC (14/07/2025)	242	108	256	237	98	[NT]
Recorded EC (09/10/2025)	113	113	236	213	119	349
Recorded EC (16/12/2025)	141	92	185	173	131	387

Note: Red values indicate result above trigger values.

**7.2.3.4 Groundwater Turbidity**

The turbidity results for all monitoring points during the reporting period remained below the specified trigger value, with the exception of SP1. The turbidity recorded at SP1 in July, October and December, exceeding the trigger value maximum of 50.0 NTU. As advised to DPHI in letter correspondence from Mackas Sand dated 6 January 2026, turbidity results for borehole SP1 are higher than the trigger but do not demonstrate a continuous trend as required in the TARP and were therefore provided for information only. Result at other boreholes do not show any exceedances of turbidity trigger levels in this period.

Mackas Sand have advised that elevated turbidity in SP1 for the second half of 2025 is not considered a result of Mackas Sand operations. Sampling Point SP1 is located outside the operating area of Lot 220 and no operations have been undertaken in proximity of SP1. Therefore, the result would appear to be caused by non-quarrying activities outside the operating zone, and may also be reflective of high rainfall during the time and surface water recharge outside of the quarry pit. Also, as discussed in Section 7.2.3 and 7.2.5 ,

Mackas Sand have revised the SWMP to clarify the reporting requirement and are awaiting approval or response from DPHI in this regard.

**Table 7-6** shows the recorded NTU groundwater levels for the reporting period.

The groundwater turbidity results since 2017 are shown graphically in **Appendix 2**. Monitoring results for the reporting period remained below the historical maximum with the exception of SP1.

**Table 7-6 Groundwater Quality – Turbidity (NTU)**

Sample Date	Groundwater Monitoring Bore					
	SP1	SP2	SP3	SP4	SP5	BL158
Trigger Value Maximum (NTU)	50	50	50	50	50	50
Recorded Turbidity (24/03/2025)	7.7	6.4	1.1	3.8	11	8.4
Recorded Turbidity (14/07/2025)	70	20	0.8	2.8	11	[NT]
Recorded Turbidity (09/10/2025)	85	11	1.3	2.9	7.5	3.5
Recorded Turbidity (16/12/2025)	60	9.3	1.0	6.1	3.1	1.0

Note: Red values indicate exceedance of trigger values, however not exceedance of the TARP criteria

### 7.2.3.5 Groundwater Arsenic

Arsenic concentrations for all monitoring points were recorded below the SWMP trigger value of 0.01 mg/L and are generally consistent with historical values. Over 2025, concentrations were only detected above the laboratory limit of reporting (LoR) of 0.001 mg/L at monitoring sites , SP5 and BL158. Concentrations fluctuated in SP5 with a spike recorded of 0.007mg/L in March and a second spike of 0.006 mg/L recorded in December 2025. **Table 7-7** shows the recorded groundwater arsenic concentrations over the reporting period.

The concentration of arsenic in groundwater recorded since 2017 is shown graphically in **Appendix 2**. Since 2017, arsenic concentrations have generally been well below the trigger value of 0.01 mg/L). However, SP4 and SP5 have historically shown spikes in arsenic concentrations with SP4 exceeding trigger values in 2020, and SP5 exceeding trigger values in 2022.

**Table 7-7 Groundwater Quality – Arsenic (mg/L)**

Sample Date	Groundwater Monitoring Bore					
	SP1	SP2	SP3	SP4	SP5	BL158
Trigger Value Maximum (mg/L)	0.01	0.01	0.01	0.01	0.01	0.01
Recorded Arsenic (24/03/2025)	<0.001	<0.001	<0.001	<0.001	0.007	<0.001
Recorded Arsenic (14/07/2025)	<0.001	<0.001	<0.001	<0.001	0.003	NT
Recorded Arsenic (09/10/2025)	<0.001	<0.001	<0.001	<0.001	0.002	0.002
Recorded Arsenic (16/12/2025)	<0.001	<0.001	<0.001	<0.001	0.006	0.001

### 7.2.3.6 Groundwater Manganese

Manganese results for all monitoring points were below the trigger level during the reporting period. **Table 7-8** shows the recorded manganese groundwater levels for the reporting period.

The groundwater manganese results since 2017 are shown graphically in **Appendix 2**. The manganese results recorded during the reporting period are generally consistent with historical observations.

**Table 7-8 Groundwater Quality – Manganese (mg/L)**

Sample Date	Groundwater Monitoring Bore					
	SP1	SP2	SP3	SP4	SP5	BL158
Trigger Value Maximum (mg/L)	0.1	0.1	0.1	0.1	0.1	0.1
Recorded Manganese (24/03/2025)	0.01	0.02	<0.005	0.010	0.020	0.010
Recorded Manganese (14/07/2025)	0.007	0.010	<0.005	0.009	0.007	NT
Recorded Manganese (09/10/2025)	0.007	0.01	<0.005	0.006	0.008	0.030
Recorded Manganese (16/12/2025)	<0.005	0.01	<0.005	0.007	0.01	0.007

### 7.2.3.7 Groundwater Iron

**Table 7-9** shows the concentration of iron within groundwater over the reporting period. During the reporting period, iron concentrations for all monitoring points were below the trigger level of 5.7 mg/L.

The iron concentration results since 2017 are shown graphically in **Appendix 2**.

**Table 7-9 Groundwater Quality – Iron (mg/L)**

Sample Date	Groundwater Monitoring Bore					
	SP1	SP2	SP3	SP4	SP5	BL158
Trigger Value Maximum (mg/L)	5.7	5.7	5.7	5.7	5.7	5.7
Recorded Iron (24/03/2025)	0.03	1.1	0.20	0.74	0.84	1.1
Recorded Iron (14/07/2025)	<0.01	0.78	0.32	0.39	0.3	NT
Recorded Iron (09/10/2025)	0.01	0.97	0.27	0.25	0.32	1.4
Recorded Iron (16/12/2025)	0.01	1.3	0.31	0.27	0.62	1.3

### 7.2.3.8 Groundwater Chromium

Chromium concentrations in groundwater for all monitoring points were below the trigger value during the reporting period. **Table 7-10** shows the recorded chromium concentrations recorded over the reporting period.

The chromium results since 2017 are shown graphically in **Appendix 2**. The chromium results recorded during the reporting period are generally consistent with historical observations.

**Table 7-10 Groundwater Quality – Chromium (mg/L)**

Sample Date	Groundwater Monitoring Bore					
	SP1	SP2	SP3	SP4	SP5	BL158
Trigger Value Maximum (mg/L)	0.0906	0.0906	0.0906	0.0906	0.0906	0.0906
Recorded Chromium (24/03/2025)	0.001	0.002	0.002	0.002	0.002	0.003
Recorded Chromium (14/07/2025)	0.001	0.002	0.001	0.001	<0.001	NT
Recorded Chromium (09/10/2025)	<0.001	0.002	0.002	0.001	<0.001	0.003
Recorded Chromium (16/12/2025)	<0.001	0.002	0.002	0.001	<0.001	0.002

**7.2.3.9 Groundwater Cobalt**

Cobalt concentrations in groundwater for all monitoring points were below the trigger value during the reporting period. **Table 7-11** shows the recorded cobalt concentrations over the reporting period.

The cobalt results since 2017 are shown graphically in **Appendix 2**. The cobalt results recorded during the reporting period are generally consistent with historical observations.

**Table 7-11 Groundwater Quality – Cobalt (mg/L)**

Sample Date	Groundwater Monitoring Bore					
	SP1	SP2	SP3	SP4	SP5	BL158
Trigger Value Maximum (mg/L)	0.15	0.15	0.15	0.15	0.15	0.15
Recorded Cobalt (24/03/2025)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Recorded Cobalt (14/07/2025)	<0.001	<0.001	<0.001	<0.001	<0.001	NT
Recorded Cobalt (09/10/2025)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Recorded Cobalt (16/12/2025)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Note: **Bold** values indicate values greater than laboratory LoR (0.001 mg/L) (i.e. limit of detection).

**7.2.3.10 Groundwater Zinc**

Zinc concentrations in groundwater for all monitoring points were below the trigger level during the reporting period. **Table 7-12** shows the recorded zinc concentrations over the reporting period.

The zinc results since 2017 are shown graphically in **Appendix 2**. The zinc results recorded during the reporting period are generally consistent with historical observations.

**Table 7-12 Groundwater Quality – Zinc (mg/L)**

Sample Date	Groundwater Monitoring Bore					
	SP1	SP2	SP3	SP4	SP5	BL158
Trigger Value Maximum (mg/L)	3	3	3	3	3	3
Recorded Zinc (24/03/2025)	0.41	0.053	0.025	0.025	0.042	0.024
Recorded Zinc (14/07/2025)	0.039	0.053	0.020	0.021	0.039	NT
Recorded Zinc (09/10/2025)	0.074	0.028	0.034	0.021	0.031	0.041
Recorded Zinc (16/12/2025)	0.044	0.026	0.034	0.022	0.030	0.025

## 7.2.4 Groundwater Model Validation

Following completion of the 2024 Mackas Sand Project Independent Environmental Audit (IEA) (JBA, 2024) on 27 June 2024 and in accordance with Schedule 3 Condition 3 of PA 08\_0142 (MOD 2), a review and subsequent update of the Maximum Extraction Depth Map (MEDM) was required to be undertaken. As detailed in the response to the recommendations of the 2024 IEA, Mackas Sand proposed not to review the MEDM until 3 years after the IEA, noting the Groundwater Model and MEDM was updated and submitted to EPA on 21 December 2023, and to DPHI on 28 March 2024 via the 2023 Annual Review. This was supported by the groundwater model and MEDM compliance surveys not identifying any non-compliances during the IEA period.

On the 14 November 2024 the EPA advised Mackas Sand the groundwater model and MEDM update satisfied Condition U1.1 and U1.2 of EPL 13218 and requested Mackas Sand to incorporate additional actions into the next groundwater model update prior to June 2027. On the 6 December 2024 the EPA provided a draft notice of variation of EPL 13218 which removed satisfied Condition U1.1 and U1.2 and included a special condition that requires incorporation of some quantitative metrics to objectively evaluate the performance of the updated groundwater model against observed groundwater levels.

A licence variation of EPL 13218 was issued by the EPA on 18 February 2025.

In response to the request to delay the IEA-related update of the MEDM, and following the EPA review of the groundwater model and MEDM update, DPHI acknowledged to defer the subsequent update of the MEDM and requested Mackas Sand to update the approved Mackas Sand SWMP to include the updated MEDM, as reviewed by EPA.

A draft updated version of the revised SWMP has been submitted for approval. The MEDM will be updated before July 2027 as required by regulatory timeframes.

## 7.2.5 Trends in Data

During the reporting period, four quarterly groundwater monitoring events were undertaken in accordance with the current SWMP.

The results are compiled and compared against trigger values provided in **Table 7-1** and **Table 7-2**, the minimum/maximum range and trends in the previous results.

In accordance with Section 5.4 of the current SWMP, if groundwater monitoring results exceed the nominated investigation trigger values, the Quarry Manager is required to investigate.

The Quarry Manager is required to interrogate and explore any reasons for results exceeding the nominated trigger value and requires notification to be made to DPHI in the event of three or more consecutive quarterly monitoring results outside of the nominated trigger value.

Mackas Sand provided notification to the DPHI on 19 June 2025 and 6 January 2026 regarding groundwater results recorded above the SWMP trigger values. Details of this notification are summarised below.

During the reporting period, Mackas Sand investigated elevated groundwater level monitoring results recorded at SP2 and SP3.

Elevated groundwater level recorded at SP2 and SP3 during the Q3 2024, Q4 2024 and Q1 2025 and during the Q2 2025 Q3 2025 and Q4 2025 quarterly monitoring rounds. This reported to DPHI as the results were outside of the nominated trigger value for three consecutive quarterly periods, as required under the current SWMP .

Following acceptance of Mackas Sand MEDM update, the DPHI requested that Mackas Sand updated the GW TARP to remove ambiguity regarding reporting timeframe. Mackas Sand engaged GHD to review the Soil Water Management Plan and GW TARP. Mackas Sand provided a draft revised SWMP to DPHI in 2025. A response from DPHI is yet to be received. The revised SWMP would not result in an exceedance being triggered.

The Mackas Sand Project EIS (Umwelt, 2009) identified and assessed the potential for the extraction of groundwater for supply to sand processing activities, including recharge through an aquifer recharge basin. This was modelled in the groundwater impact assessment.

Mackas Sand advised there was no groundwater extraction or recharge undertaken for the benefit of operations during the reporting period. However, it is noted that the observed groundwater levels have exceeded the trigger levels at SP2 and SP3. The groundwater levels increased in response to above average rainfall from 2020 to 2023 and more recently following significant rainfall in 2025. The numerical groundwater modelling was reviewed by GHD (GHD 2023b), which recommended that the model be re-calibrated to better replicate observed groundwater conditions and update the MEDM for the site.

GHD found that surface water ponding near SP2 was likely to be recharging in a localised area and raising the groundwater levels recorded in SP2 due to localised recharge effects, not indicative of regional groundwater trends.

Mackas Sand will undertake a review and update of the Groundwater Model and associated Maximum Extraction Depth Map, in accordance with the revised conditions of EPL 13218.

### **7.3 Proposed Improvement or Actions Next Reporting Period**

A report on the review and calibration of the groundwater model and updated MEDM is not required to be completed until 2 July 2027 in accordance with the EPL 13218 variation .

# 8.0 Rehabilitation

## 8.1 Rehabilitation of Disturbed Land

In accordance with Schedule 3, Condition 24 of PA 08\_0142 (MOD 2) progressive rehabilitation of disturbed area at Lot 220 is to be undertaken in a manner that is generally consistent with the final landform in the EA, in alignment with statutory conditions and requirements within management plans.

### 8.1.1 Lot 218

Rehabilitation requirements at Lot 218 include the establishment of a vegetative bund on the northern edge of the western extraction area as the site is governed by the natural movement of sand into the extraction area.

Initial plans for a bund along the northern boundary to stop encroachment of sand into the vegetation post closure of the site have been investigated. The objective of the bund is to provide a physical barrier between the mobile sand and native vegetation on the landward side of the mobile dunes to the north, post closure of operations. Further analysis of this option have identified that the size of the bund required would be in excess of 5 m in height and would not stop the eventual natural process of sand migrating into the vegetation in the long term, therefore these plans are not considered to be practicable or achievable.

### 8.1.2 Lot 220

Rehabilitation at Lot 220 is undertaken progressively as sand extraction and operating space on the active quarry floor permits.

Rehabilitation activities in Lot 220 during the reporting period included regular inspections of revegetation progress, including reviewing for evidence of feral animals and weeds. Passive rehabilitation also occurred in Lot 220 in the form of wind-blown seeds and the migration of sand and/ or flora across the area.

Mackas Sand has scheduled the planting of additional tube stock during 2025 as part of the next rehabilitation works program. **Table 8-1** and **Figure 8.1** show the status of rehabilitation at Lot 220 for the 2025 reporting period. **Figure 8.1** shows rehabilitation of Lot 220 as of February 2026. This figure is indicative of the current rehabilitation status of Lot220.

**Table 8-1 Summary of Rehabilitation Status at Mackas Sand (Lot 220)**

	2024 Report Period (ha)	2025 Report Period (ha)	2026 Report Period (ha) (forecast)
<b>Total Mine Footprint</b>	36.2	36.2	36.2
<b>Total Active Disturbance</b>	9.3	9.3	7.3
<b>Land being prepared for rehabilitation</b>	3.0	2.3	2.5
<b>Land under active rehabilitation</b>	23.9	24.6	26.4
<b>Completed Rehabilitation</b>	0	0	0

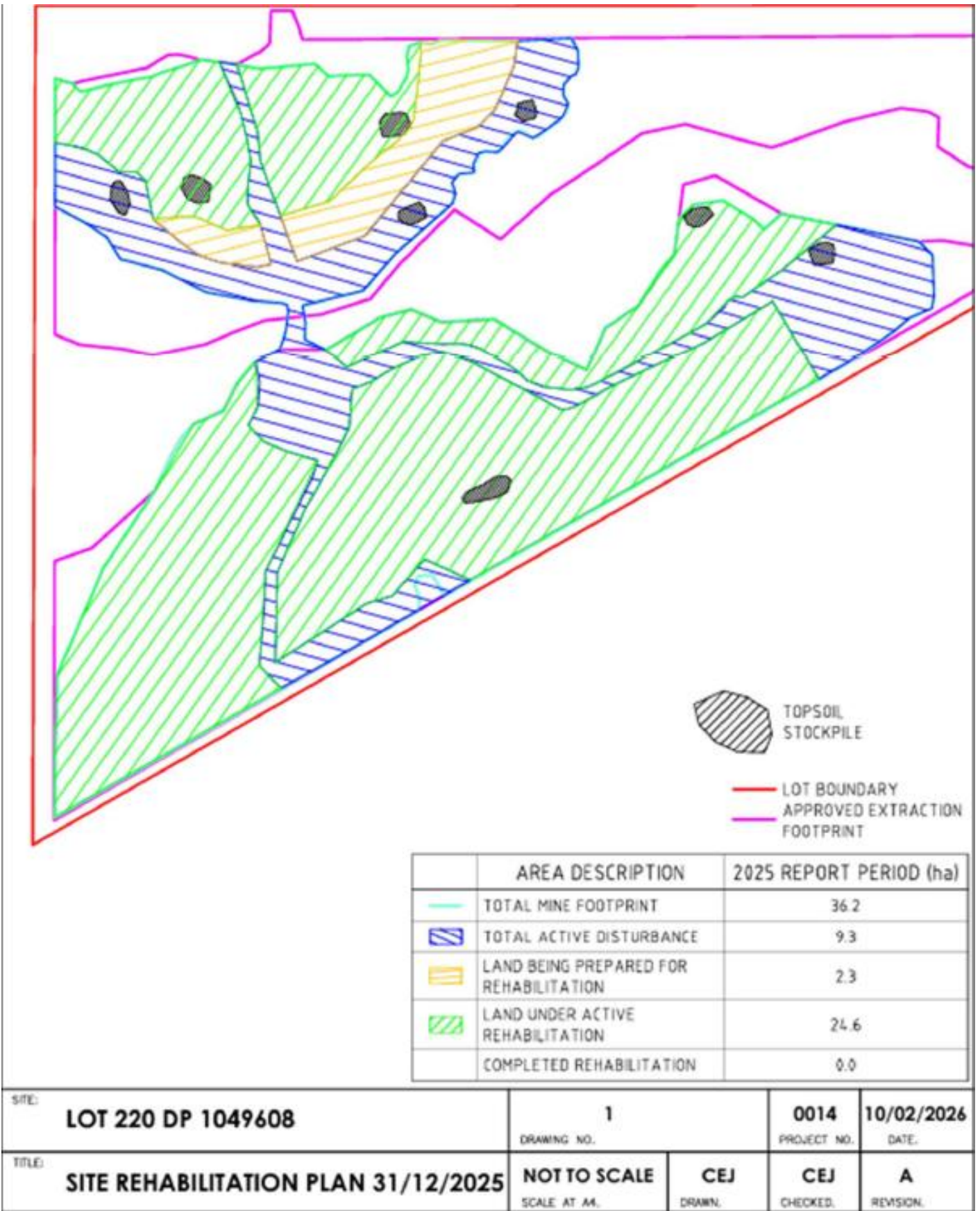


Figure 8-1 Site Rehabilitation Plan

## 8.2 Annual Rehabilitation Inspection

Rehabilitation areas at Mackas Sand range in age from approximately 12 months to nine years.

Mackas Sand have identified rehabilitation actions to be undertaken in 2025 in Table 8.2.

As noted within the LMP, the annual rehabilitation inspection utilises qualitative monitoring practices during the early stages of rehabilitation and typically until vegetation within the rehabilitation zone has reached a level of maturity where a quantitative assessment is of benefit. As a result, qualitative monitoring practices continue to be undertaken across all rehabilitation areas at Mackas Sand due to the level of maturity of the rehabilitation.

The annual rehabilitation inspection of Lot 220 was undertaken by on site environmental personal and quarry manager on 10 February 2026. The annual inspection is undertaken to track current rehabilitation progress and to inform any rehabilitation management actions required onsite.

The 2025 rehabilitation inspection key observations and proposed improvements or actions for the next reporting period are included Table 8-2.

**Table 8-2 Key observations 2025 Lot 220 Rehabilitation Inspection and Proposed Actions**

Aspect	2025 Annual Inspection Findings	Proposed Actions for 2026
Landform	<ul style="list-style-type: none"> <li>The post extraction landform was found to have a minimum cover of 1m above MPG, per annual survey.</li> <li>No erosion or hazardous material present.</li> </ul>	Final batters on S/E side of Lot 220 to be revegetated.
Soil	<ul style="list-style-type: none"> <li>Topsoil re-spread on rehabilitation areas in Lot 220.</li> <li>Leaf litter layer is starting to form in Lot 220 rehabilitation, depending on age of rehabilitation vegetation established.</li> </ul>	No proposed improvements or additional actions for 2026. Continue current rehab.
Vegetation	<ul style="list-style-type: none"> <li>Revegetation area species includes species representative of <b>Coastal Sand Apple – Blackbutt Forest community</b> as planted.</li> <li>Second generation re-seeded plants evident in various locations. Trend likely to improve over time as vegetation and soils mature.</li> <li>More than 75% of trees appear to be healthy and growing. Very few trees show evidence of not surviving, or subject to insect attack or other issues.</li> </ul>	No proposed improvements or additional actions for 2026. Continue current rehab.
Fauna	<ul style="list-style-type: none"> <li>It was observed that mature tree stags were placed in rehabilitated areas for hollows/habitat, plus logs in place. As revegetation matures, understory species are recruiting into the area from adjoining forested areas.</li> </ul>	No proposed improvements or additional actions for 2026. Continue current rehab.
Bushfire Hazard	<ul style="list-style-type: none"> <li>Appropriate bushfire hazard controls have been implemented on the advice from the NSW Rural Fire Service</li> </ul>	No proposed improvements or additional actions for 2026. Continue current rehab.



Figure 8-2 Lot 220 Rehabilitation and Inspection Area

### **8.3 Rehabilitation Trials and Research**

No rehabilitation trials were undertaken during the report period.

### **8.4 Rehabilitation Bond**

Following the completion of the 2024 IEA (JBA, 2024), Mackas Sand reviewed and revised the rehabilitation bond associated with Lot 218 and Lot 220 in accordance with Schedule 3 Condition 28 of PA 08\_0142 (MOD 2). The reviewed and revised rehabilitation bond was submitted to DPHI for approval on 22 November 2024. The revised rehabilitation bond was approved by DPHI on 19 March 2025.

# 9.0 Community

## 9.1 Community Complaints

Mackas Sand received one community complaint during the 2025 reporting period. A summary of community complaints received for the 2025 reporting period is displayed in Table 9-1

**Table 9-1 Summary of Mackas Sand Community Complaints 2025**

Date & Time	Nature of Complaint	Company Response
20/08/2025 1:00pm	Material on public road	A resident complained about material on road from trucks. Quarry Manager discussed with complainant, material is not sand but could be material from wet haul road due to heavy rain. Road sweeper is used on the haul road and Nelson Bay road on a regular basis, in response to the complaint the road sweeper was utilised to minimise mud / dirt tracking.

## 9.2 Community Consultative Committee

The last Community Consultative Committee (CCC) meeting was held on 19 July 2023. At this meeting the CCC unanimously agreed the chairperson seek DPHI approval to suspend the committee until there is activity that necessitates another meeting. The Mackas CCC 2023 Annual Report was prepared by the CCC Chairperson and provided to Mackas Sand on 31 January 2024. The report confirmed the disbandment of the CCC with DPHI subsequently agreeing to suspend the CCC in August 2023.

As a result, Macka’s Sand representative agreed to advise members of any future activities or proposals, and keep members informed on Lot 218.

## 9.3 Community Engagement

Community support and donations from Mackas Sand for 2025 are:

- \$500 RFS lollies for Santa Run
- \$260 Talk 2 Me Bro Donation
- \$258 Tour De Cure
- \$500 Mater Foundation
- \$6,000 materials for Port Stephens Archery Club plus use of Land
- \$2,700 Costs for Worimi Cultural Festival at cost
- \$785 Sand donated to Newcastle Show
- \$1,000 Fuel to local junior moto rider

Mackas Sand has a strong ongoing working relationship with Worimi Local Aboriginal Land Council which includes the following activities:

- Quarterly progress reports provided to WLALC covering:
  - operational progress,
  - operational compliance

- WLALC interactions
  - future extraction plans
- Joint meetings with key agencies including Transport for NSW regarding plans for Nelson Bay Road and associated impacts
- Provision of royalty payments for sand extracted
- Provision of joint training opportunities such as fork-lift operator training
- Annual inspection of operations by senior WLALC members
- Annual inspection of potential artefact material by Aboriginal Heritage Working Group members
- Substantial assistance with Worimi Cultural Festival organisation and attendance by Mackenzie family members
- Mackas Sand staff attended Worimi cultural sand dune quad bike tour for Christmas event.
- Worimi Green Team now undertake biodiversity management activities on Mackas Sand Biodiversity Conservation offset area including :
  - Weed management
  - Cool burn undertaken on conservation area.
  - Annual biodiversity monitoring and reporting program undertaken by Worimi ecologists

## 10.0 Independent Audit

The most recent IEA report was finalised, submitted, and approved by DPHI during the 2024 reporting period.

A few administrative and low-risk non-compliances and recommendations were identified during the IEA period, that have been resolved in 2025 refer to **Table 10-1**.

The next IEA is scheduled to be undertaken post April 2027.

**Table 10-1 Auditor Non-compliances and Recommendations**

Referenced ID	Condition ID and Text	Audit Finding/ Recommendation	Mackas Sand Response	Action Status – end of 2025
<b>PA 08_0142</b>				
<b>NC-03</b>	<p><i>Schedule 3, Condition 13</i></p> <p>The Proponent shall prepare an Air Quality Monitoring Program for the project to the satisfaction of the Secretary. This program must:</p> <p>(a) be prepared in consultation with EPA, and be submitted to the Secretary for approval within 3 months of the date of this approval; and</p> <p>(b) include details of how the air quality performance of the project will be monitored, and include a protocol for evaluating compliance with the relevant air quality criteria in this approval. Note: Initially, this program should concentrate on monitoring the dust deposition impacts of the project. However, in time, it may be expanded to include other pollutants. The Proponent shall implement the approved monitoring program as approved from time to time by the Secretary.</p>	<p>Non-compliances with the AQMP were identified by Mackas Sand during the audit period:</p> <ul style="list-style-type: none"> <li>• Table 1.2, Section 1 of the 2022 AR notes that a late air quality monitoring sample for January 2022 depositional dust was taken on 2 February 2022;</li> <li>• It is recommended that air quality monitoring samples are taken within the required sample period outlined in the AQMP;</li> <li>• Table 1.2 Section 1 of the 2023 AR. Air quality monitoring samples for July 2023 were damaged whilst being transported and subsequently, no dust monitoring results were recorded for July 2023. This noncompliance was reported via the DPE portal dated 11/04/24. A courier has subsequently been engaged to transport dust samples from site to the lab for analysis; and</li> <li>• Table 1.2 Section 1 of the 2023 AR. During September 2023, the air quality monitor at EPA point 8 was recorded as damaged and replaced.</li> </ul>	<p>Action: As recorded in the 2024 IEA Report, a courier has been engaged to transport future air quality monitoring samples from the Mackas Sand site to an approved laboratory for analysis. There are no updates to the AQMP in response to the recommendations of the Audit report.</p>	<p><b>Closed out.</b> Due to the proposed monitoring methodology not being appropriate for Mackas Sand operations and impacts on monitoring results from agricultural and other activities outside of Mackas Sand operations, Mackas Sand submitted a revised draft AQMP to the DPPI and EPA on 6 February 2025 for comment. The revised AQMP has been approved and this action is now closed out</p>

		<b>It is recommended that air quality monitoring samples are taken within the required sample period outlined in the AQMP.</b>		
<b>NC-07</b>	<p><i>Schedule 3, Condition 30</i></p> <p>The Proponent shall prepare a non- indigenous Heritage Management Plan for the project to the satisfaction of the Secretary. This plan must:</p> <p>(a) be prepared in consultation with the Heritage Branch and Council, and be submitted to the Secretary for approval prior to the disturbance of any heritage item, including the identified tank traps;</p> <p>(b) include:</p> <ul style="list-style-type: none"> <li>• archival recording of the tank traps, in accordance with the requirements and guidelines of the Heritage Branch;</li> <li>• a protocol for the investigation, removal and storage of the tank traps, and for their reinstallation following quarrying operations; and</li> <li>• a description of the measures that would be implemented if any new heritage objects or items are discovered during the project.</li> </ul> <p>The Proponent shall implement the approved management plan as approved from time to time by the Secretary.</p>	<p>Viewed the Non-Indigenous Heritage Management Plan (NIHMP) prepared for the Project by Umwelt, dated July 2016. (a) Consultation records for the 2016 NIHMP are not included in the approved plan.</p> <p><b>It is recommended that records of consultation and approval of the NIHMP are included in the next revision of the document.</b></p>	<p>Noted. The NIHMP was approved by Department of Planning in December 2017.</p> <p><b>Action:</b> Mackas Sand will review and add correspondence to the NIHMP.</p>	<b>Closed out.</b> Mackas Sand will update the NIHMP in the next review, when required, in concurrence with the close out of the action below
<b>NC-12</b>	<p><i>SoC 1.10.1</i></p> <p>High visibility fencing with appropriate set back from the extraction face and signage will be erected on the seaward side of the Lot 218 operational area.</p>	<p>High visibility fencing around extraction areas within Lot 218 was not in place at the time of audit.</p> <p><b>It is recommended that Mackas Sand seek to formalise the arrangement for not installing high visibility fencing</b></p>	<p>Noted. <b>Action:</b> Mackas Sand will consult with landholder (Worimi LALC) to formalise and retain evidence of landholder request to not install high-visibility fencing by December 2024.</p>	<b>Closed out.</b> Mackas Sand commenced consultation with Worimi Local Aboriginal Land Council, being both land owners and TO representatives. Worimi LALC agreed to update ACH Management Plan, which is

		<b>and signage on the seaward side of the Lot 218 extraction face, in consultation with the landholder.</b>		agreed to occur following completion of Project Approval 08_0142 Modification 4 which is proposed to be lodged in 2026.
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# 11.0 Incidents and Non-compliances during the Report Period

## 11.1 Incidents, Notifications and Non-Compliances

As noted in **Section 1.0**, Mackas Sand identified three (3) non-compliances during the 2025 reporting period. Mackas Sand has addressed the three (3) non-compliances that were identified during the reporting period, further details of which are provided in Table 11.1.

**Table 11-1 2025 Incidents and Non-compliances**

Relevant Approval	Condition No.	Condition Description	Compliance Status	Comment
PA 08_0142	Schedule 3 Condition 4B (d)	Laden truck movements exiting the site do not exceed 8 per hour during the period from 6 am to 9 am, Monday to Friday (except for Public Holidays);	NC	<p>Following an upgrade to the weighbridge software on 6 May 2025 which controls the truck numbers exiting the site during specific periods an incident occurred where an additional truck exited the site during the hours of 7:00am and 8:00am on Thursday 8 May 2025.</p> <p>Newcastle weight services (NWS) who provided and implemented the software update investigated and identified the cause of the issue. A “hot fix” was installed on the afternoon of 8 May 2025 that corrected the system. No environmental harm was observed as a result of the non-compliance.</p>
PA 08_0142	Schedule 3, Condition 22	<p>Groundwater impact assessment criteria, including trigger levels for investigating any potentially adverse groundwater impacts</p> <p>The GW TARP requires Mackas Sand to notify DPIE of the incident with 24 hours following the identification of three consecutive monitoring results exceeding the minimum or maximum trigger values</p>	NC	<p>Mackas Sand notified DPHI on 19 June 2025 that the groundwater monitoring results indicated an exceedance over three consecutive quarterly sampling periods (2 Sept 2024, 16 Dec 2024, 10 Mar 2025 ) for groundwater level outside the TARP trigger levels at borehole monitoring site SP2. These results demonstrate a continuous decreasing trend for SP2</p> <p>As required by the GWMP TARP, Mackas Sand has investigated the potential cause of the elevated groundwater levels in SP2. Inspections of have not identified any operational activities with potential to influence the groundwater levels at SP2. The DPHI requested that Mackas Sand update the GW TARP to remove ambiguity regarding reporting timeframe. Mackas Sand engaged GHD to review the Soil Water Management Plan and GW TARP. Mackas Sand provided a draft revised SWMP to DPHI in 2025. A response from DPHI is yet to be received. The revised SWMP would not result in an exceedance being triggered.</p>
PA 08_0142	Schedule 3, Condition 22	Groundwater impact assessment criteria, including trigger levels for investigating	NC	Mackas Sand notified DPHI on 6 January 2026 that the groundwater monitoring results indicated an exceedance over three consecutive quarterly

		<p>any potentially adverse groundwater impacts</p> <p>The GW TARP requires Mackas Sand to notify DPIE of the incident with 24 hours following the identification of three consecutive monitoring results exceeding the minimum or maximum trigger values</p>		<p>sampling periods (30 June 2025, 29 Sept 2025, 5 Dec 2025) for groundwater level outside the TARP trigger levels at borehole monitoring sites SP2 and SP3. These results demonstrate a continuous decreasing trend for SP2 and SP3.</p> <p>As required by the GW TARP, Mackas Sand has investigated the potential cause of the change in ground water level at SP2 and SP3. It was concluded that this decreasing trend is likely due to receding groundwater levels over time and heavy rainfall experience in last 6 months of 2025.</p>
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## **11.2 Regulatory Correspondence**

In accordance with the Annual Review Guideline (NSW Government, 2015) a summary of official cautions or warning letters, penalty notices or prosecution proceedings by any regulatory authority and Mackas Sand is required to be included within the Annual Review. There were no official cautions, warning letters, penalty notices or prosecution proceedings for Mackas Sand during the report period.

# 12.0 Activities Proposed in the 2026 Report Period

The anticipated environmental management activities for Mackas Sand during the 2026 report period are included in Table 12.1.

**Table 12-1 Environmental Management Activities Proposed for 2026**

Document Section	Area/ Nature of Activity	Actions Proposed during 2025
6.4.8	Biodiversity Offset Area	Mackas Sand will implement the proposed actions recommended in the 2025 BOA monitoring report (Cool Burn, 2025) detailed in <b>Section 6.4.7</b> . Proposed actions will be undertaken in accordance with VC 00532.
6.5.5	Aboriginal Heritage	Mackas Sand will continue to collect potential artefacts from Lot 218 and Lot 220 in the next reporting period as per the requirements of the ACHMP. These will be inspected by ACHG members.
7.2.4	Water Management - Groundwater	Review the requirements from the updated EPL 13218 licence variation, specifically the requirements of the updated special condition. A report on the review and calibration of the groundwater model and updated MEDM is not required to be completed until 2 July 2027 in accordance with the EPL 13218 variation ( <b>Section 7.2.4</b> ) awaiting approval of the revised Mackas Sand SWMP by DPHI.
8.5	Rehabilitation	Mackas Sand will implement the proposed actions recommended in the 2025 rehabilitation inspection report detailed in <b>Section 8.2</b> .

## 13.0 References

Cool Burn Fire Pty Ltd (2024) Mackas Sand Biodiversity Offset Area Annual Monitoring Report. *Lot 122 DP753192 Nelson Bay Road, Williamtown NSW. January 2025.*

GHD Pty Limited (2023a) Macka's Sand Groundwater Model Rerun. Prepared for Mackas Sand Pty Limited.

GHD Pty Limited (2023b) Macka's Sand Groundwater data review and model update – Phase 1, Report Prepared for Macka's Sand Pty Limited. *August 2023.*

GHD Pty Limited (2023c) Phase 2 – 2023 Groundwater Model Update. Macka's Sand Groundwater Data Review and Model Update. *December 2023.*

James Bailey & Associates (2024) Mackas Sand Project Independent Environmental Audit. *For Mackas Sand Pty Limited. 27 June 2024.*

NSW Government (2015) Annual Review Guideline: Post-approval requirements for State significant mining developments. *October 2015.*

Umwelt (Australia) Pty Limited (2009) Environmental Assessment of Sand Extraction Operations from Lot 218 DP 1044608 and Lot 220 DP 1049608, Salt Ash. Prepared for Macka's Sand Pty Limited.

Umwelt (Australia) Pty Limited (2015) Environmental Assessment of Modifications to Macka's Sand Extraction Operations on Lot 218, Salt Ash. Prepared for Macka's Sand Pty Limited.

Umwelt (Australia) Pty Limited (2025) *Mackas Sand Environmental Noise Monitoring Report 2025.* Prepared for Macka's Sand Pty Limited.

Umwelt (Australia) Pty Limited (2023d) *Mackas Sand EPBC 2011/6214 2022 Annual Compliance Report.* Prepared for Macka's Sand Pty Limited.

# **Appendix 1**

**Quarterly Extraction Level Survey Plans of Lot 218 and 220 Extraction Area**

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DRAWN: CJ  
CHECKED: CJ  
DATUM: AHD  
ISSUE DATE: 30/09/2024  
REVISION: A

CLIENT & JOB:

MACKAS  
SAND & SOIL

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P: (02) 4967 5927  
M: 0429 987 821  
Unit 11 56 Industrial Dr  
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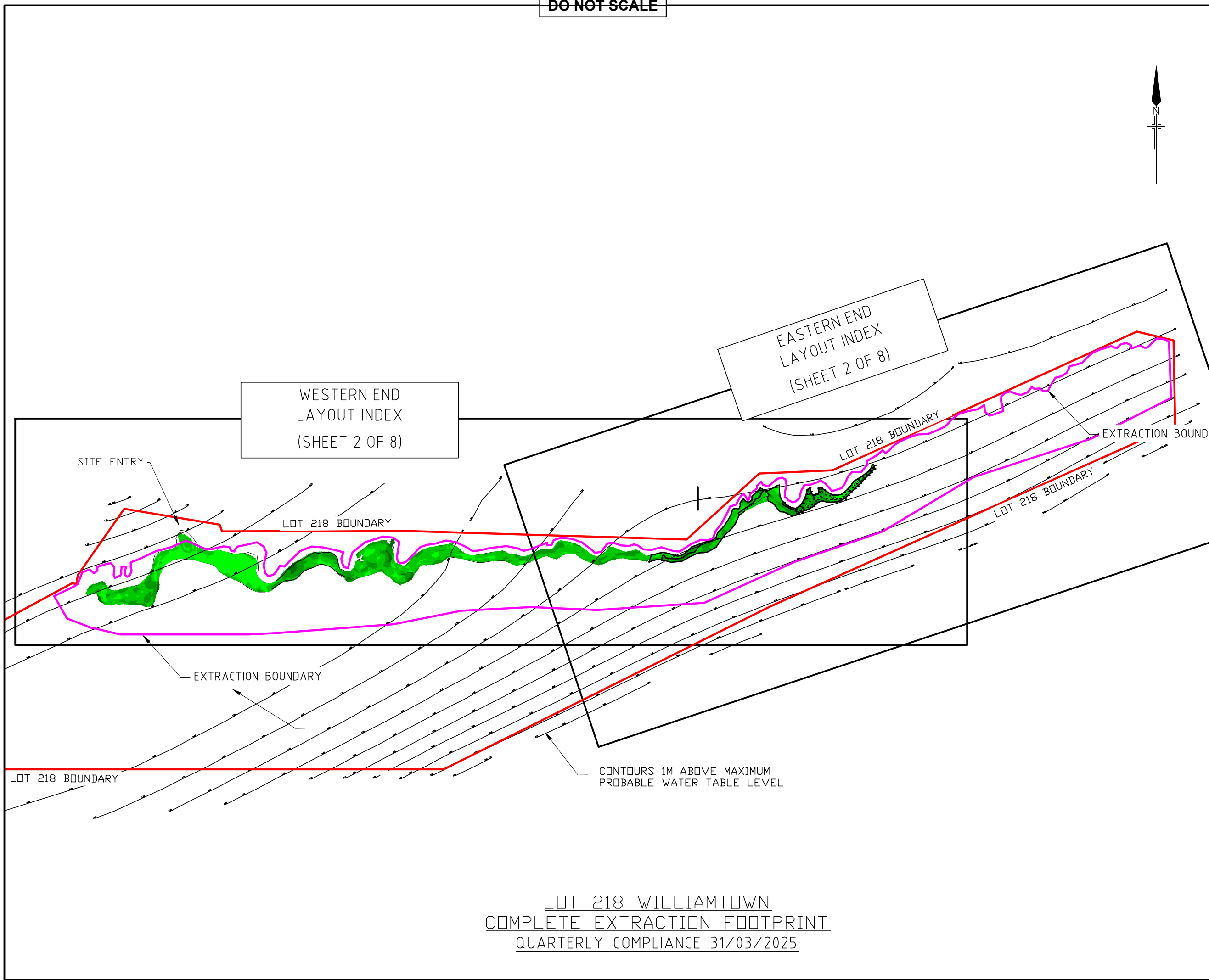
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LOT 218  
QUARTERLY COMPLIANCE  
SHEET LAYOUT INDEX

STATUS:  
MARCH 2025

DRAWING NUMBER:

SHEET 1 OF 8 SHEETS

A3



LOT 218 WILLIAMTOWN  
COMPLETE EXTRACTION FOOTPRINT  
QUARTERLY COMPLIANCE 31/03/2025

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SCALE: NOT TO SCALE

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DATUM: AHD  
ISSUE DATE: 30/09/2024  
REVISION: A

CLIENT & JOB:

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P: (02) 4967 5927  
M: 0429 987 821  
Unit 11 56 Industrial Dr  
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TITLE:

LOT 218  
SHEET INDEX  
PLAN

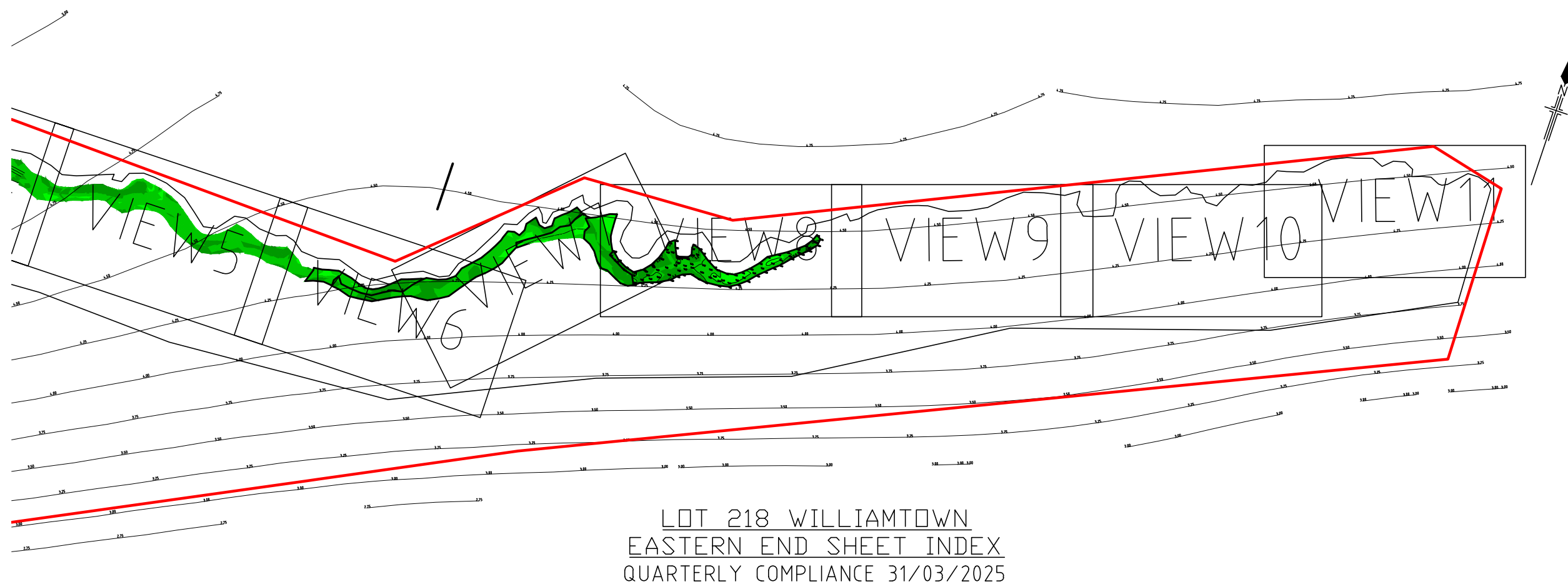
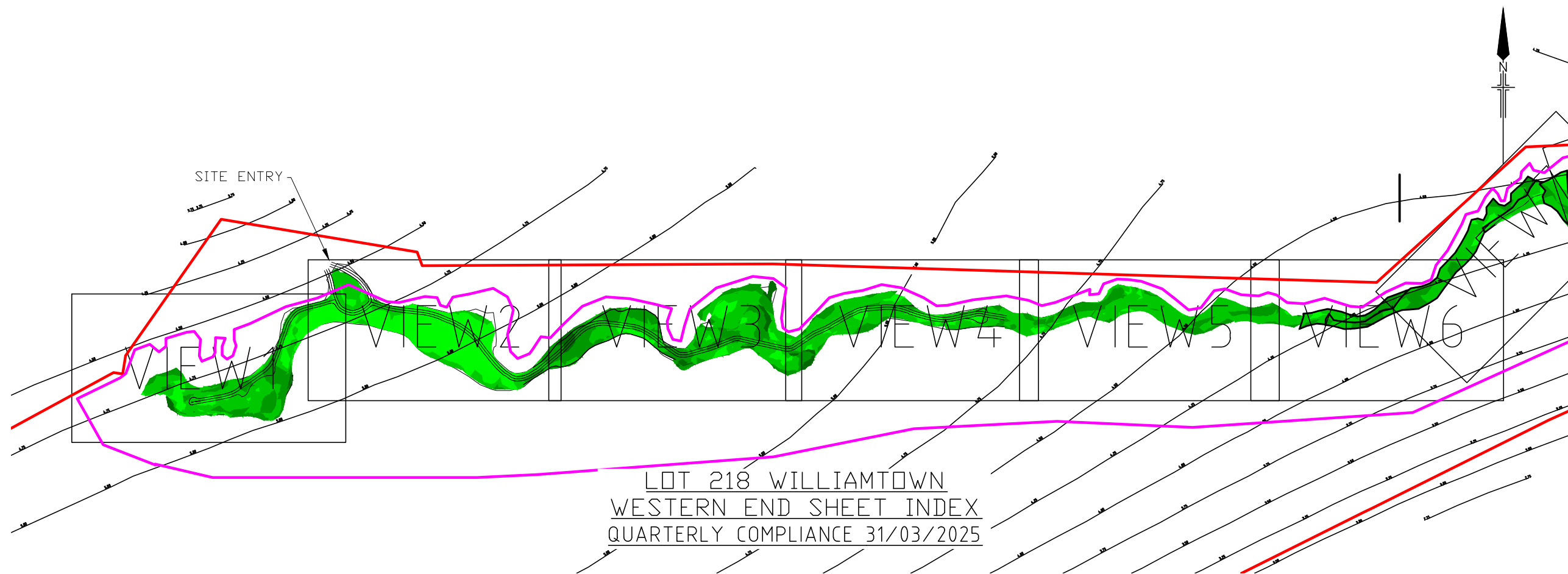
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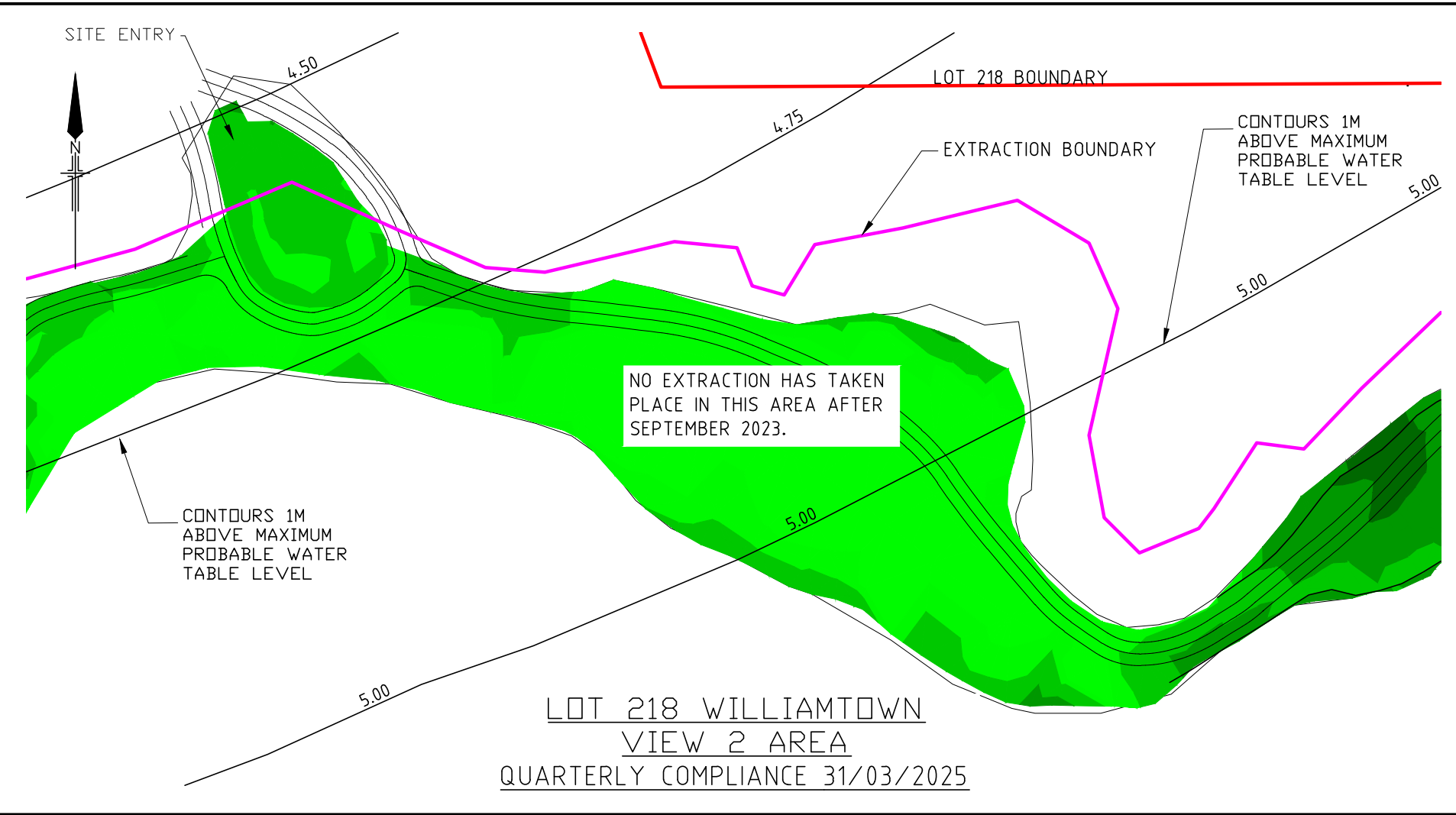
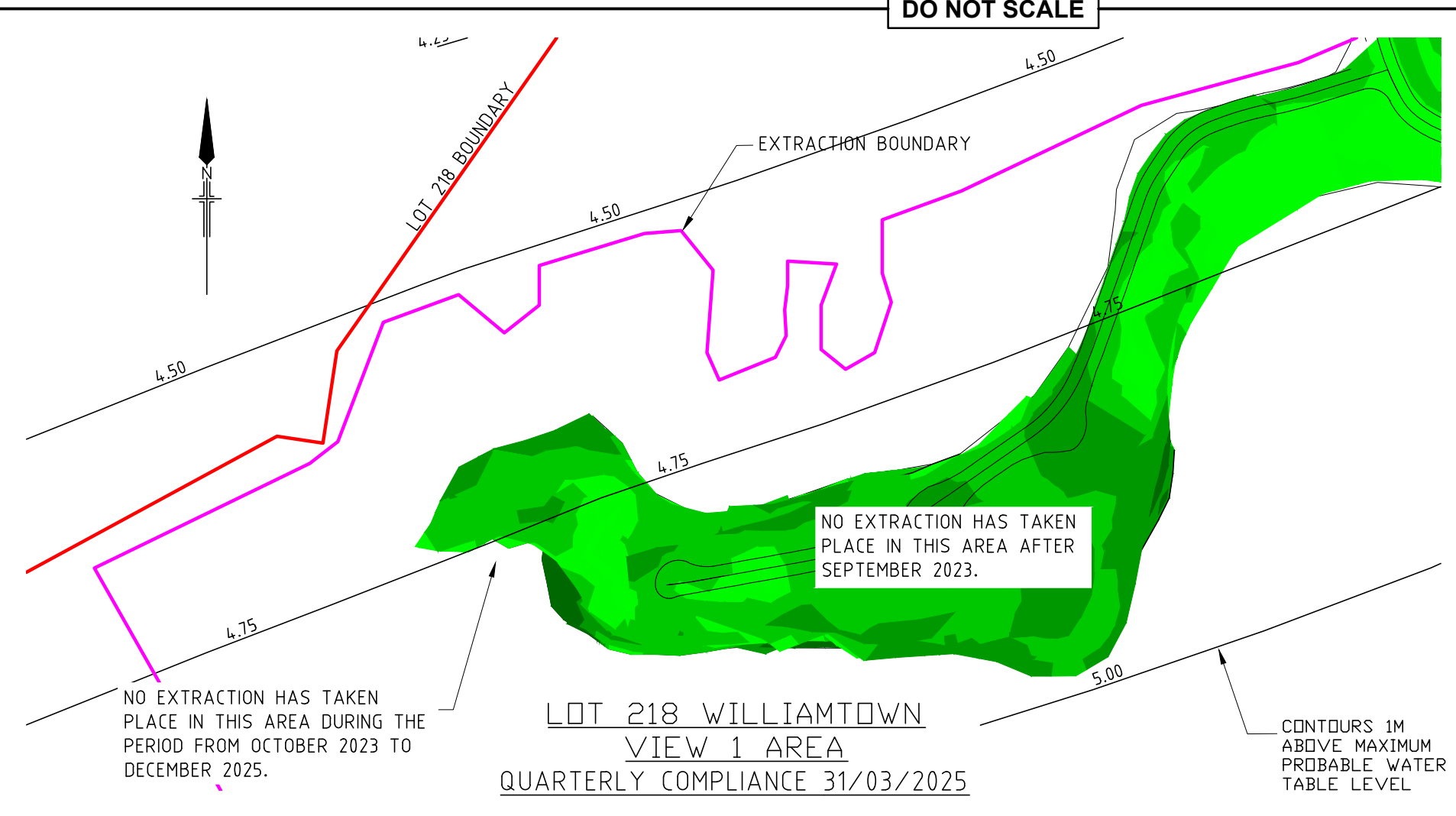
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**NOTES:**

1. THE ROAD SURFACE LEVEL HAS BEEN RAISED TO A MINIMUM OF 300mm-400mm ABOVE THE EXTRACTION SURFACE.
2. THE SURFACE LEVEL EITHER SIDE OF THE ACCESS ROAD IN OPERATIONAL AREAS IS COMPLIANT AS AT 31/03/2025.
3. SHOT HEIGHTS SHOWN ARE FOR THE CURRENT OPERATIONAL FOOTPRINT AND CAN BE USED TO IDENTIFY THE EXTENT OF THE SURVEY.
4. AREAS WITHOUT SPOT HEIGHT SHOWN WERE IDENTIFIED AS COMPLYING IN PREVIOUS SURVEYS. THESE AREAS DO NOT FORM PART OF THE ACTIVE EXTRACTION OPERATION AND DO NOT FORM PART OF THIS SURVEY REPORT AND ARE ONLY SHOWN TO IDENTIFY THE CURRENT EXTENT OF THE EXTRACTION FLOOR.
5. SURVEY TO CONFIRM COMPLIANCE AT WESTERN END FOR THE QUARTER ENDING 31/03/2025 WAS COMPLETED 17/10/2023.
6. DATE OF CURRENT SURVEY: 04/04/2025

DEPTH COMPLIANCE COMPARISON TO 1m ABOVE MAXIMUM PROBABLE GROUND WATER LEVEL			COLOUR
LOWER VALUE	UPPER VALUE		
-0.35	to -0.3	m	Red
-0.3	to -0.2	m	Orange
-0.2	to -0.1	m	Yellow-Orange
-0.1	to 0.0	m	Yellow
0.0	to 0.1	m	Light Green
0.1	to 0.2	m	Green
0.2	to 0.5	m	Dark Green
0.5	to 1.0	m	Very Dark Green
1.0	to 2.0	m	Black

SCALE: NOT TO SCALE

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CHECKED: CJ

DATUM: AHD

ISSUE DATE: 30/09/2024

REVISION: A

CLIENT & JOB:

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**WILLIAMTOWN COMPLIANCE REPORTING**

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P: (02) 4967 5927  
M: 0429 987 821  
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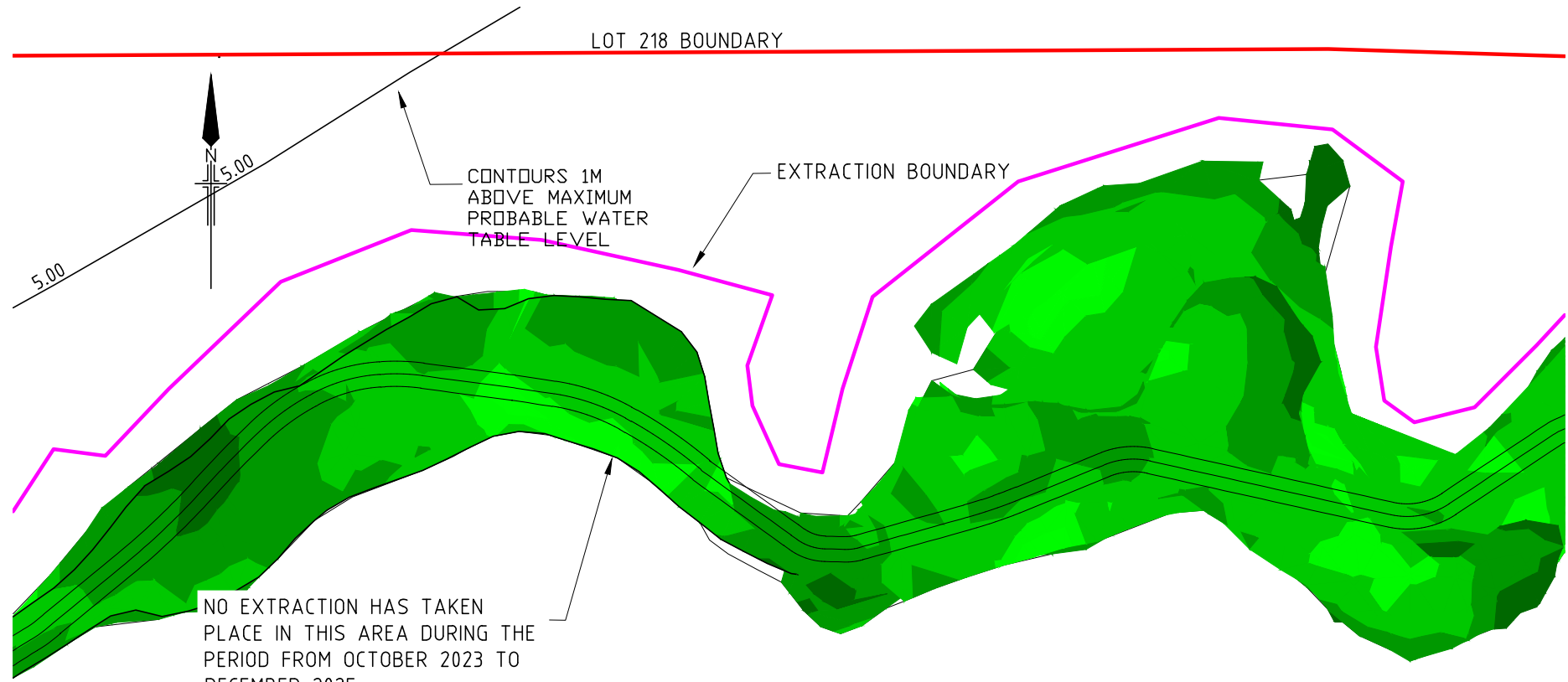
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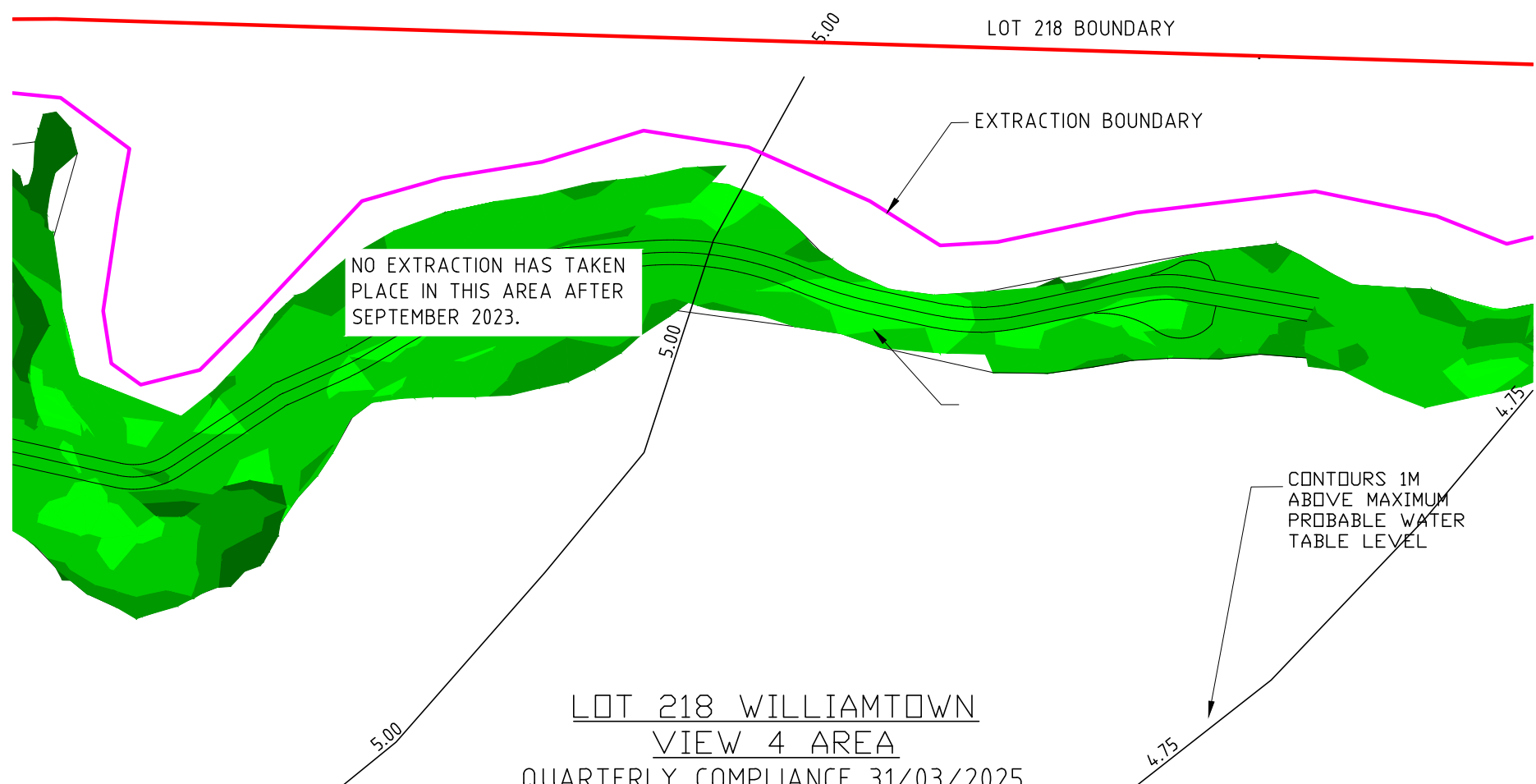
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LOT 218 WILLIAMTOWN  
VIEW 3 AREA  
QUARTERLY COMPLIANCE 31/03/2025



LOT 218 WILLIAMTOWN  
VIEW 4 AREA  
QUARTERLY COMPLIANCE 31/03/2025

**NOTES:**

1. THE ROAD SURFACE LEVEL HAS BEEN RAISED TO A MINIMUM OF 300mm-400mm ABOVE THE EXTRACTION SURFACE.
2. THE SURFACE LEVEL EITHER SIDE OF THE ACCESS ROAD IN OPERATIONAL AREAS IS COMPLIANT AS AT 31/03/2025.
3. SHOT HEIGHTS SHOWN ARE FOR THE CURRENT OPERATIONAL FOOTPRINT AND CAN BE USED TO IDENTIFY THE EXTENT OF THE SURVEY.
4. AREAS WITHOUT SPOT HEIGHT SHOWN WERE IDENTIFIED AS COMPLYING IN PREVIOUS SURVEYS. THESE AREAS DO NOT FORM PART OF THE ACTIVE EXTRACTION OPERATION AND DO NOT FORM PART OF THIS SURVEY REPORT AND ARE ONLY SHOWN TO IDENTIFY THE CURRENT EXTENT OF THE EXTRACTION FLOOR.
5. SURVEY TO CONFIRM COMPLIANCE AT WESTERN END FOR THE QUARTER ENDING 31/03/2025 WAS COMPLETED 17/10/2023.
6. DATE OF CURRENT SURVEY: 04/04/2025

DEPTH COMPLIANCE COMPARISON TO 1m ABOVE MAXIMUM PROBABLE GROUND WATER LEVEL			COLOUR
LOWER VALUE	UPPER VALUE		
-0.35	to -0.3	m	
-0.3	to -0.2	m	
-0.2	to -0.1	m	
-0.1	to 0.0	m	
0.0	to 0.1	m	
0.1	to 0.2	m	
0.2	to 0.5	m	
0.5	to 1.0	m	
1.0	to 2.0	m	

SCALE: NOT TO SCALE

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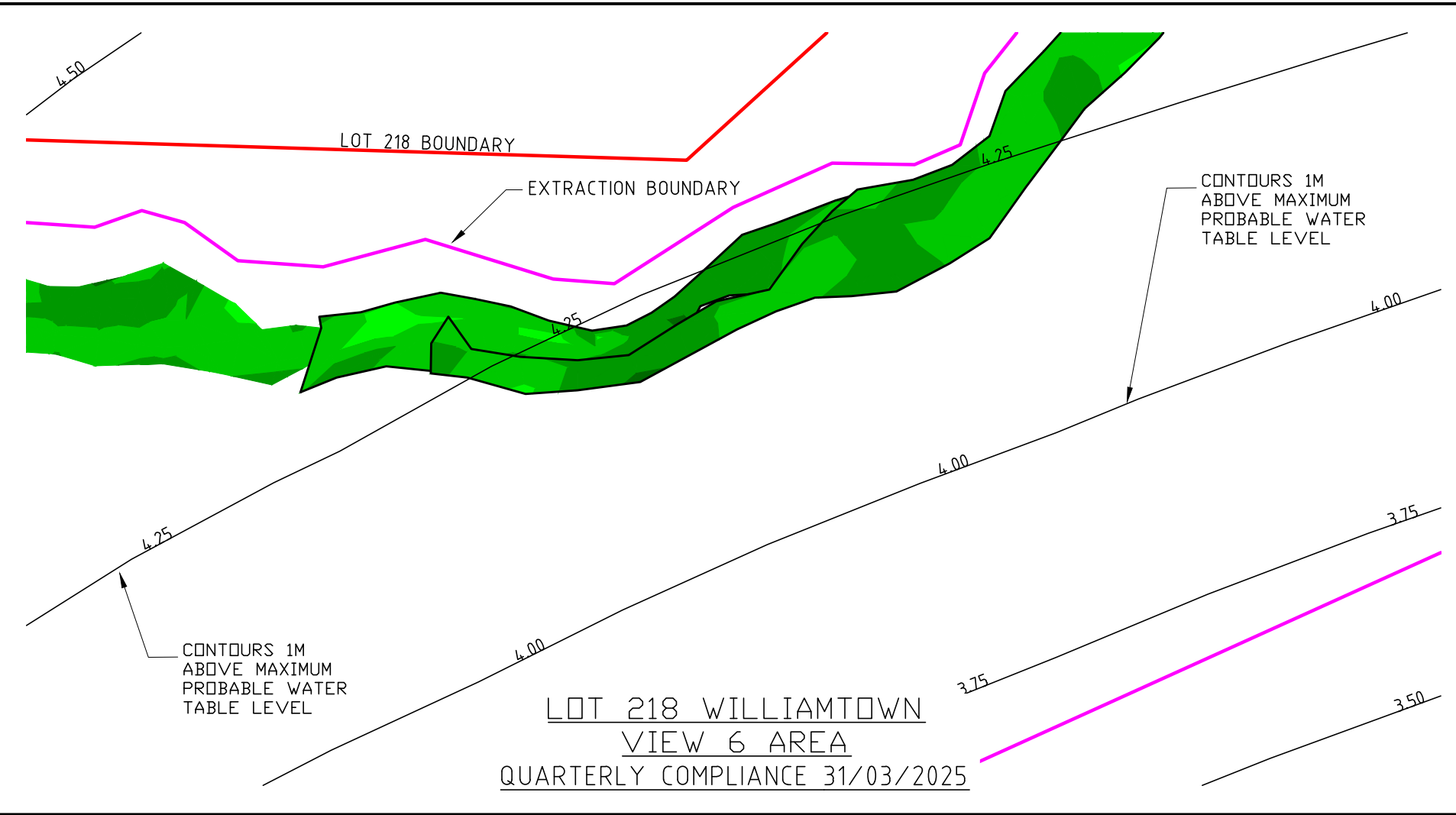
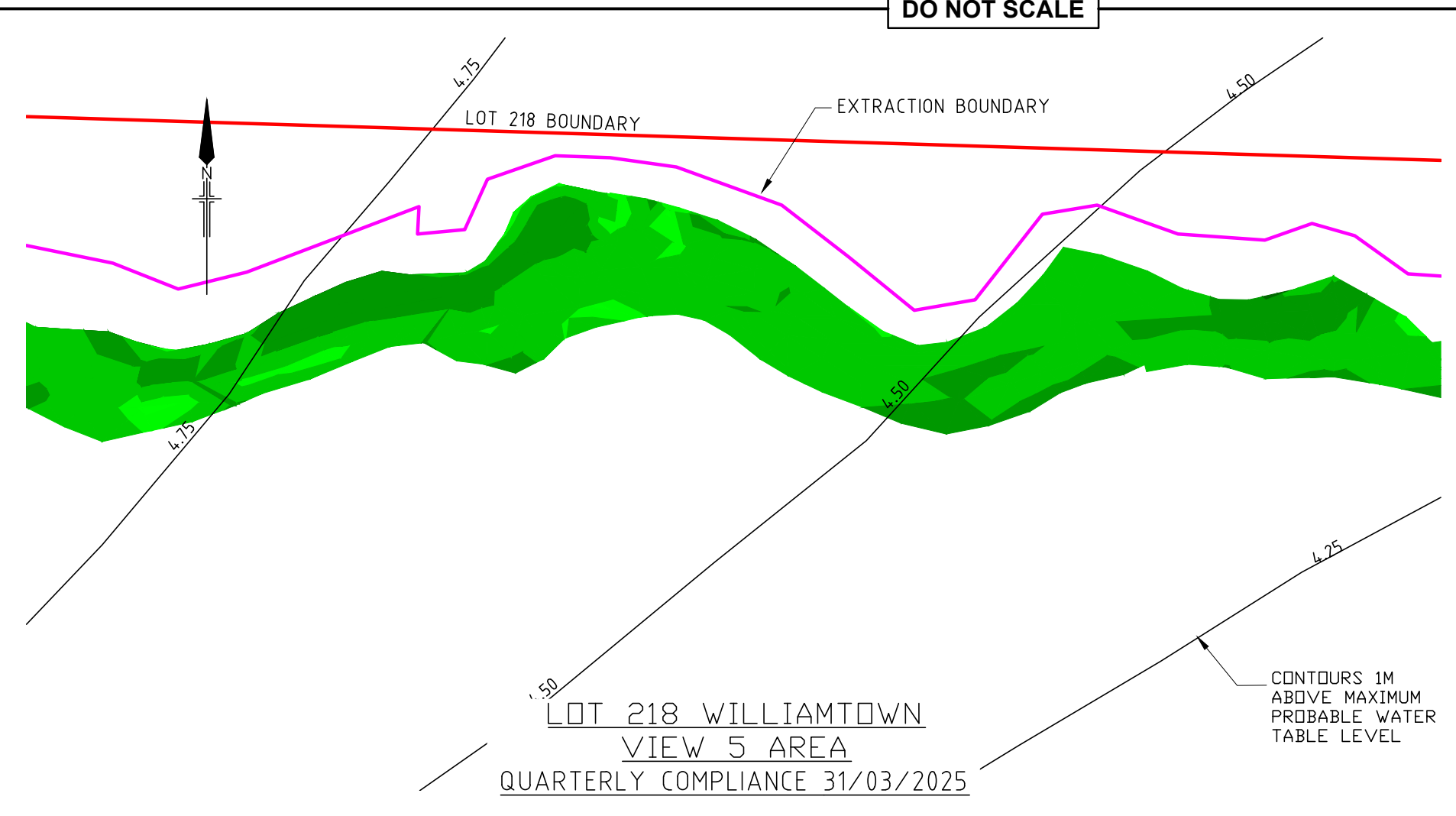
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 M: 0429 987 821  
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TITLE:  
**LOT 218 EXTRACTION COMPLIANCE VIEW AREA 3 & 4**

STATUS:  
**MARCH 2025**

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NOTES:

1. THE ROAD SURFACE LEVEL HAS BEEN RAISED TO A MINIMUM OF 300mm-400mm ABOVE THE EXTRACTION SURFACE.
2. THE SURFACE LEVEL EITHER SIDE OF THE ACCESS ROAD IN OPERATIONAL AREAS IS COMPLIANT AS AT 31/03/2025.
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LOWER VALUE	UPPER VALUE		
-0.35	to -0.3	m	Red
-0.3	to -0.2	m	Orange
-0.2	to -0.1	m	Yellow
-0.1	to 0.0	m	Light Green
0.0	to 0.1	m	Green
0.1	to 0.2	m	Dark Green
0.2	to 0.5	m	Very Dark Green
0.5	to 1.0	m	Black
1.0	to 2.0	m	Black

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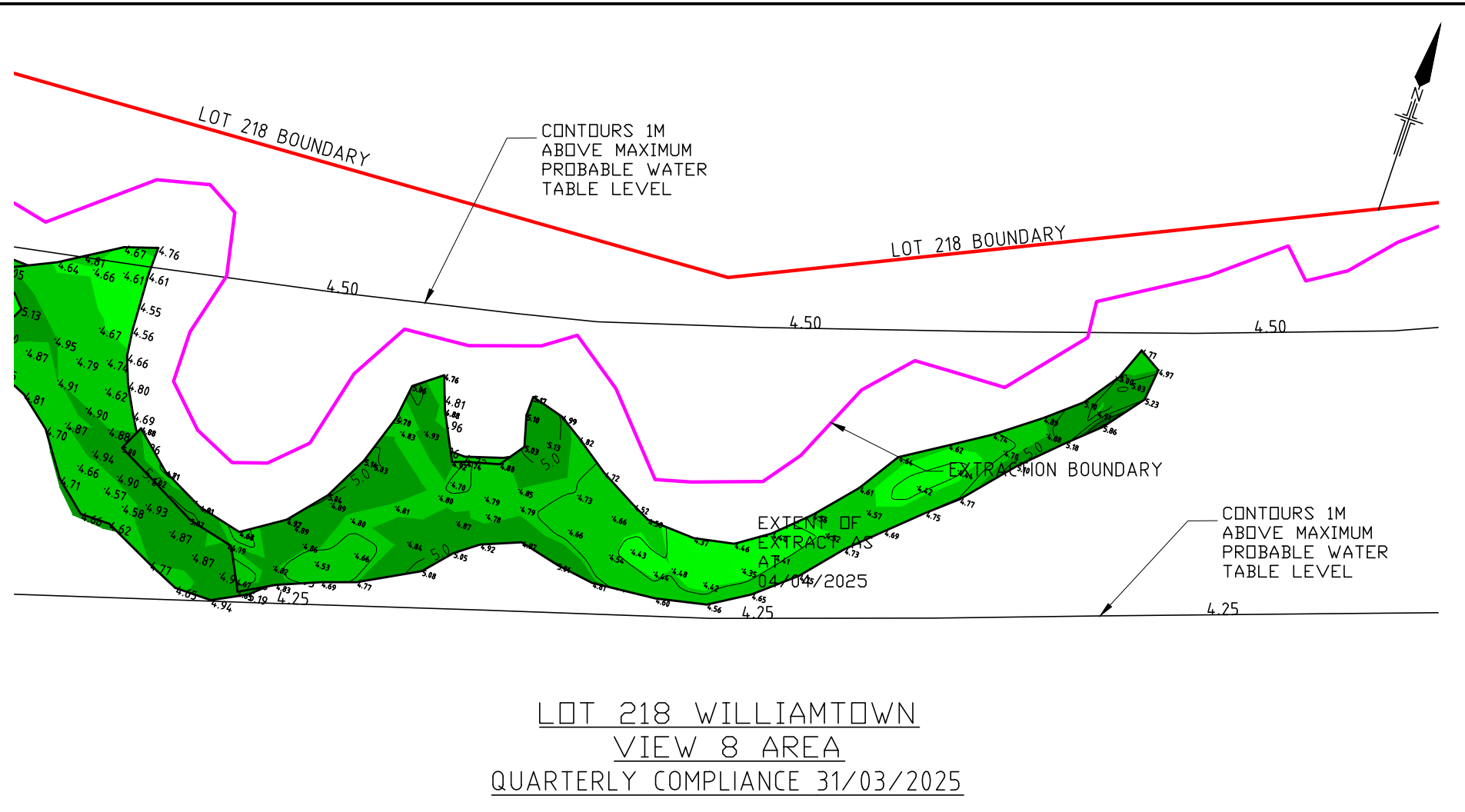
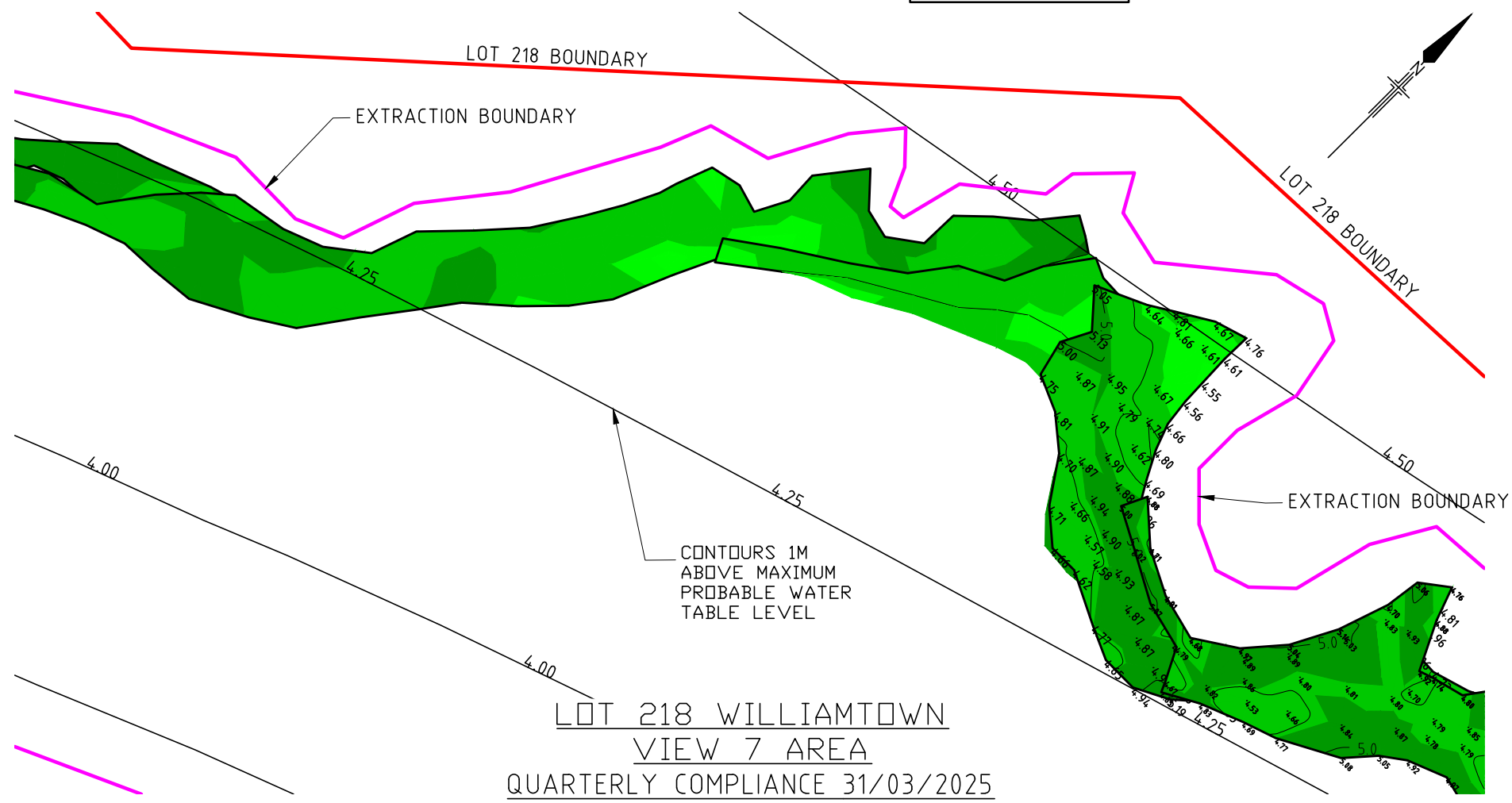
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STATUS:

MARCH 2025

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2. THE SURFACE LEVEL EITHER SIDE OF THE ACCESS ROAD IN OPERATIONAL AREAS IS COMPLIANT AS AT 31/03/2025.
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-0.35	to -0.3	m	
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CHECKED: CJ

DATUM: AHD

ISSUE DATE: 04/06/2025

REVISION: A

CLIENT & JOB:

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M: 0429 987 821  
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Mayfield NSW 2304

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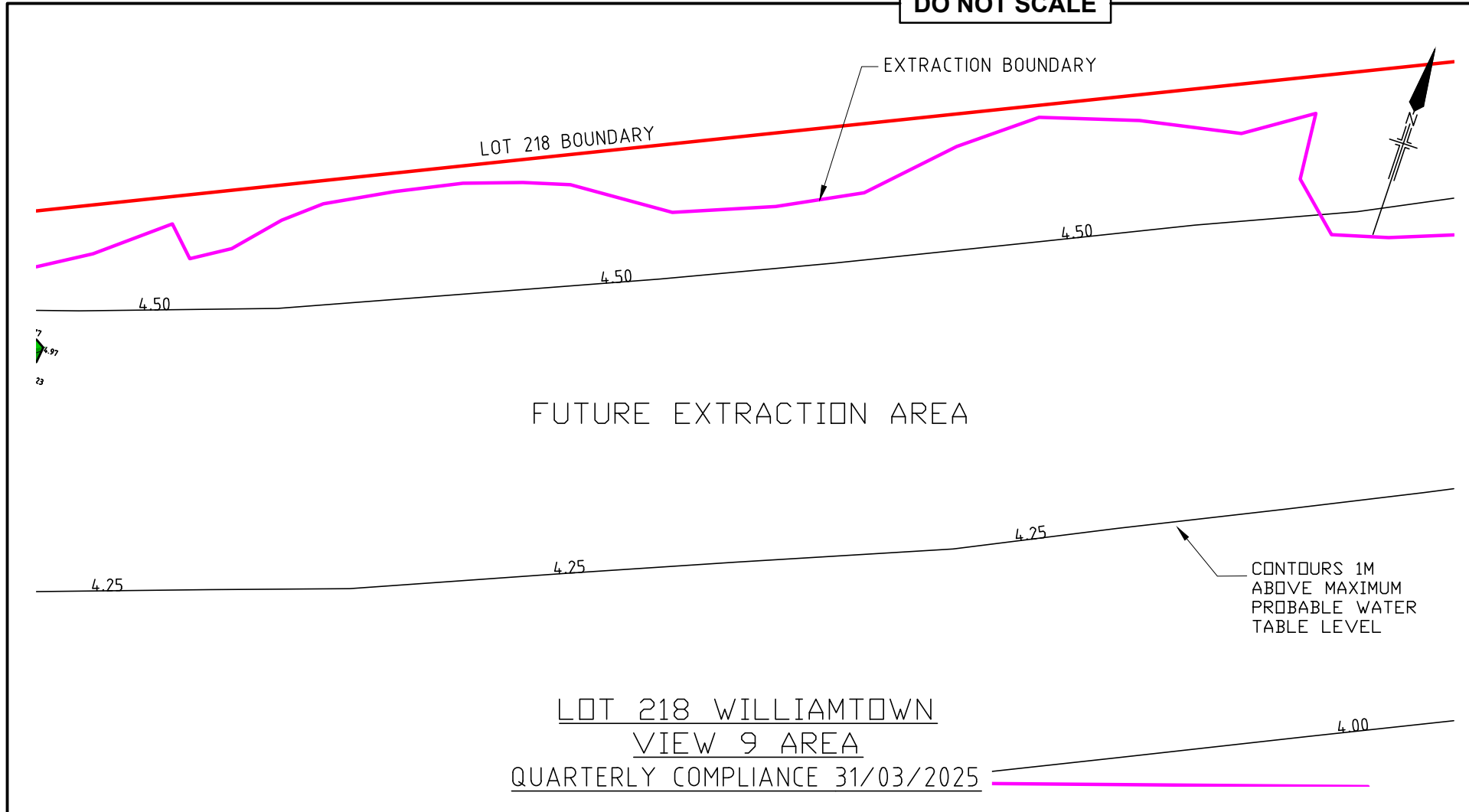
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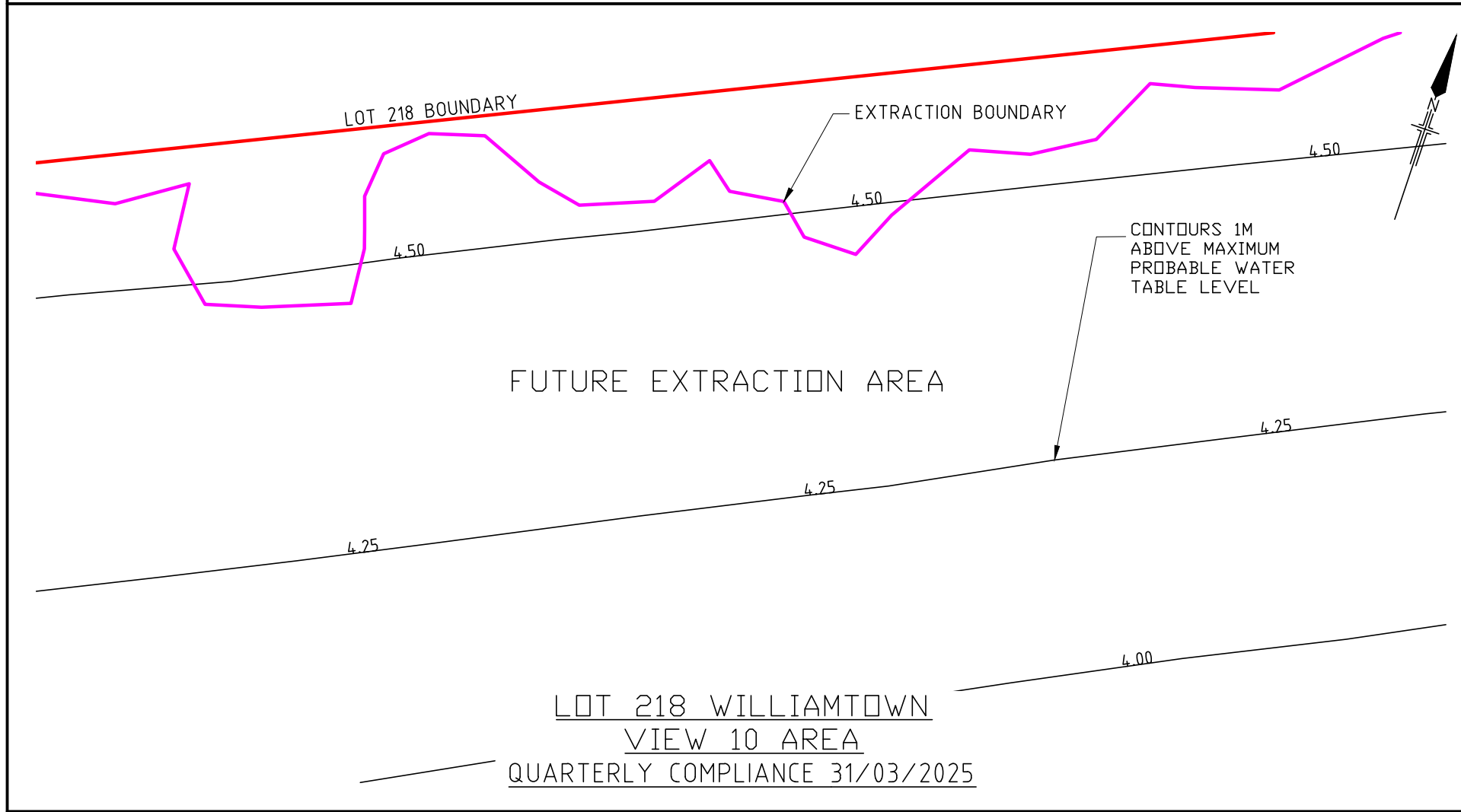
MARCH 2025

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**DO NOT SCALE**



LOT 218 WILLIAMTOWN  
VIEW 9 AREA  
QUARTERLY COMPLIANCE 31/03/2025



LOT 218 WILLIAMTOWN  
VIEW 10 AREA  
QUARTERLY COMPLIANCE 31/03/2025

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2. THE SURFACE LEVEL EITHER SIDE OF THE ACCESS ROAD IN OPERATIONAL AREAS IS COMPLIANT AS AT 31/03/2025.
3. SHOT HEIGHTS SHOWN ARE FOR THE CURRENT OPERATIONAL FOOTPRINT AND CAN BE USED TO IDENTIFY THE EXTENT OF THE SURVEY.
4. AREAS WITHOUT SPOT HEIGHT SHOWN WERE IDENTIFIED AS COMPLYING IN PREVIOUS SURVEYS. THESE AREAS DO NOT FORM PART OF THE ACTIVE EXTRACTION OPERATION AND DO NOT FORM PART OF THIS SURVEY REPORT AND ARE ONLY SHOWN TO IDENTIFY THE CURRENT EXTENT OF THE EXTRACTION FLOOR.
5. SURVEY TO CONFIRM COMPLIANCE AT WESTERN END FOR THE QUARTER ENDING 31/03/2025 WAS COMPLETED 17/10/2023.
6. DATE OF CURRENT SURVEY: 04/04/2025

DEPTH COMPLIANCE COMPARISON TO 1m ABOVE MAXIMUM PROBABLE GROUND WATER LEVEL			
LOWER VALUE	UPPER VALUE		COLOUR
-0.35	to -0.3	m	
-0.3	to -0.2	m	
-0.2	to -0.1	m	
-0.1	to 0.0	m	
0.0	to 0.1	m	
0.1	to 0.2	m	
0.2	to 0.5	m	
0.5	to 1.0	m	
1.0	to 2.0	m	

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_241231.dwg  
 SURVEYED: CJ & LC  
 DRAWN: CJ  
 CHECKED: CJ  
 DATUM: AHD  
 ISSUE DATE: 30/09/2024  
 REVISION: A

CLIENT & JOB:

MACKAS SAND & SOIL

WILLIAMTOWN COMPLIANCE REPORTING

ABN: 66 605 045 314  
 P: (02) 4967 5927  
 M: 0429 987 821  
 Unit 11 56 Industrial Dr  
 Mayfield NSW 2304

TITLE:

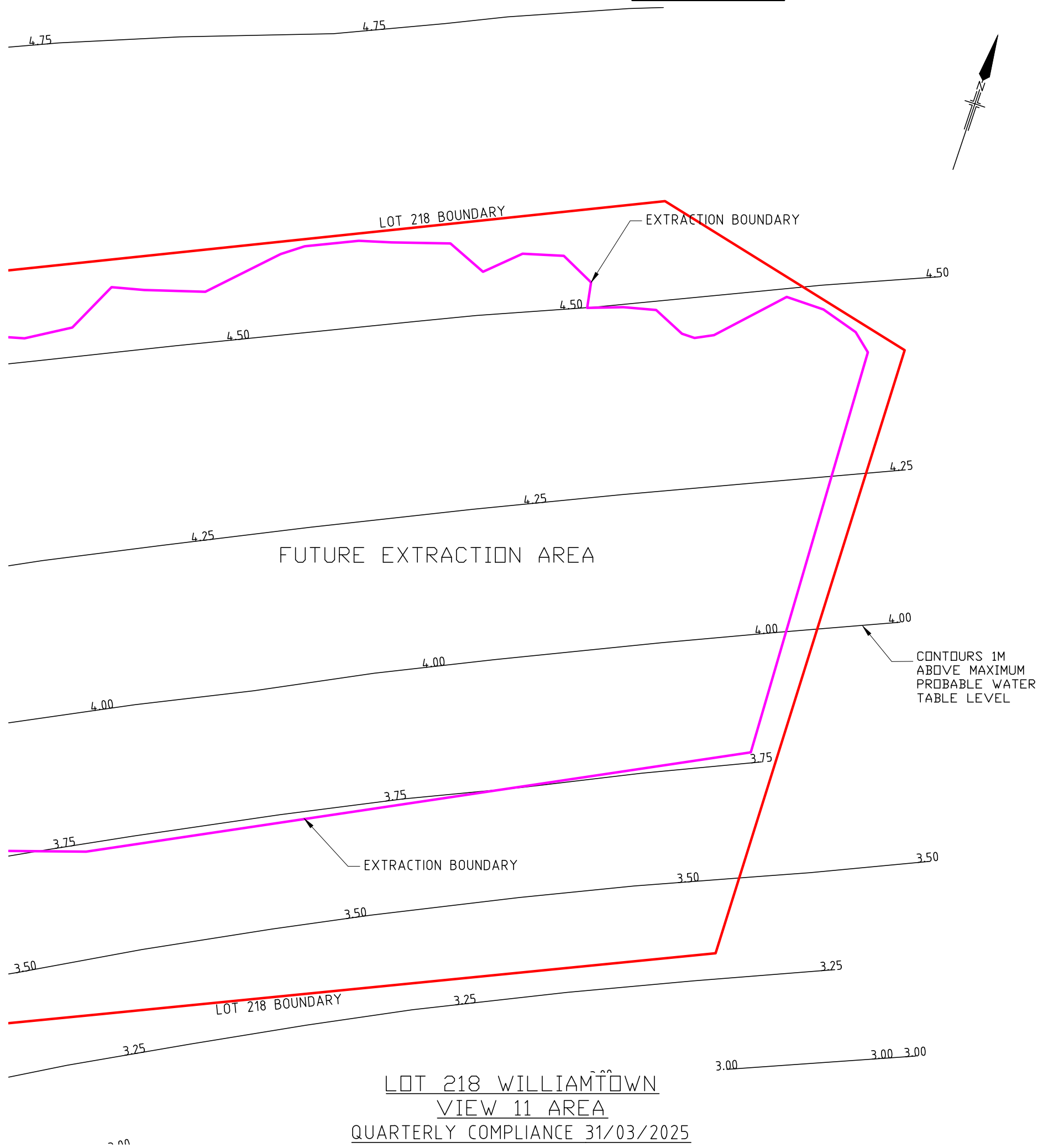
LOT 218 EXTRACTION COMPLIANCE VIEW AREA 9 & 10

STATUS:

MARCH 2025

DRAWING NUMBER:

**DO NOT SCALE**



**NOTES:**

1. THE ROAD SURFACE LEVEL HAS BEEN RAISED TO A MINIMUM OF 300mm-400mm ABOVE THE EXTRACTION SURFACE.
2. THE SURFACE LEVEL EITHER SIDE OF THE ACCESS ROAD IN OPERATIONAL AREAS IS COMPLIANT AS AT 31/03/2025.
3. SHOT HEIGHTS SHOWN ARE FOR THE CURRENT OPERATIONAL FOOTPRINT AND CAN BE USED TO IDENTIFY THE EXTENT OF THE SURVEY.
4. AREAS WITHOUT SPOT HEIGHT SHOWN WERE IDENTIFIED AS COMPLYING IN PREVIOUS SURVEYS. THESE AREAS DO NOT FORM PART OF THE ACTIVE EXTRACTION OPERATION AND DO NOT FORM PART OF THIS SURVEY REPORT AND ARE ONLY SHOWN TO IDENTIFY THE CURRENT EXTENT OF THE EXTRACTION FLOOR.
5. SURVEY TO CONFIRM COMPLIANCE AT WESTERN END FOR THE QUARTER ENDING 31/03/2025 WAS COMPLETED 17/10/2023.
6. DATE OF CURRENT SURVEY: 04/04/2025

DEPTH COMPLIANCE COMPARISON TO 1m ABOVE MAXIMUM PROBABLE GROUND WATER LEVEL			
LOWER VALUE	UPPER VALUE		COLOUR
-0.35	to -0.3	m	
-0.3	to -0.2	m	
-0.2	to -0.1	m	
-0.1	to 0.0	m	
0.0	to 0.1	m	
0.1	to 0.2	m	
0.2	to 0.5	m	
0.5	to 1.0	m	
1.0	to 2.0	m	

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_241231.dwg

SURVEYED: CJ & LC

DRAWN: CJ

CHECKED: CJ

DATUM: AHD

ISSUE DATE: 30/09/2024

REVISION: A

CLIENT & JOB:

**MACKAS SAND & SOIL**

**WILLIAMTOWN COMPLIANCE REPORTING**

ABN: 66 605 045 314  
P: (02) 4967 5927  
M: 0429 987 821  
Unit 11 56 Industrial Dr  
Mayfield NSW 2304

TITLE:

**LOT 218 EXTRACTION COMPLIANCE VIEW AREA 9 & 10**

STATUS:

**MARCH 2025**

DRAWING NUMBER:



DO NOT SCALE

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_250630.dwg  
 SURVEYED: CJ & LC  
 DRAWN: CJ  
 CHECKED: CJ  
 DATUM: AHD  
 ISSUE DATE: 31/07/2025  
 REVISION: A

CLIENT & JOB:

MACKAS SAND & SOIL

WILLIAMTOWN COMPLIANCE REPORTING



ABN: 66 605 045 314  
 P: (02) 4967 5927  
 M: 0429 987 821  
 Unit 11 56 Industrial Dr  
 Mayfield NSW 2304

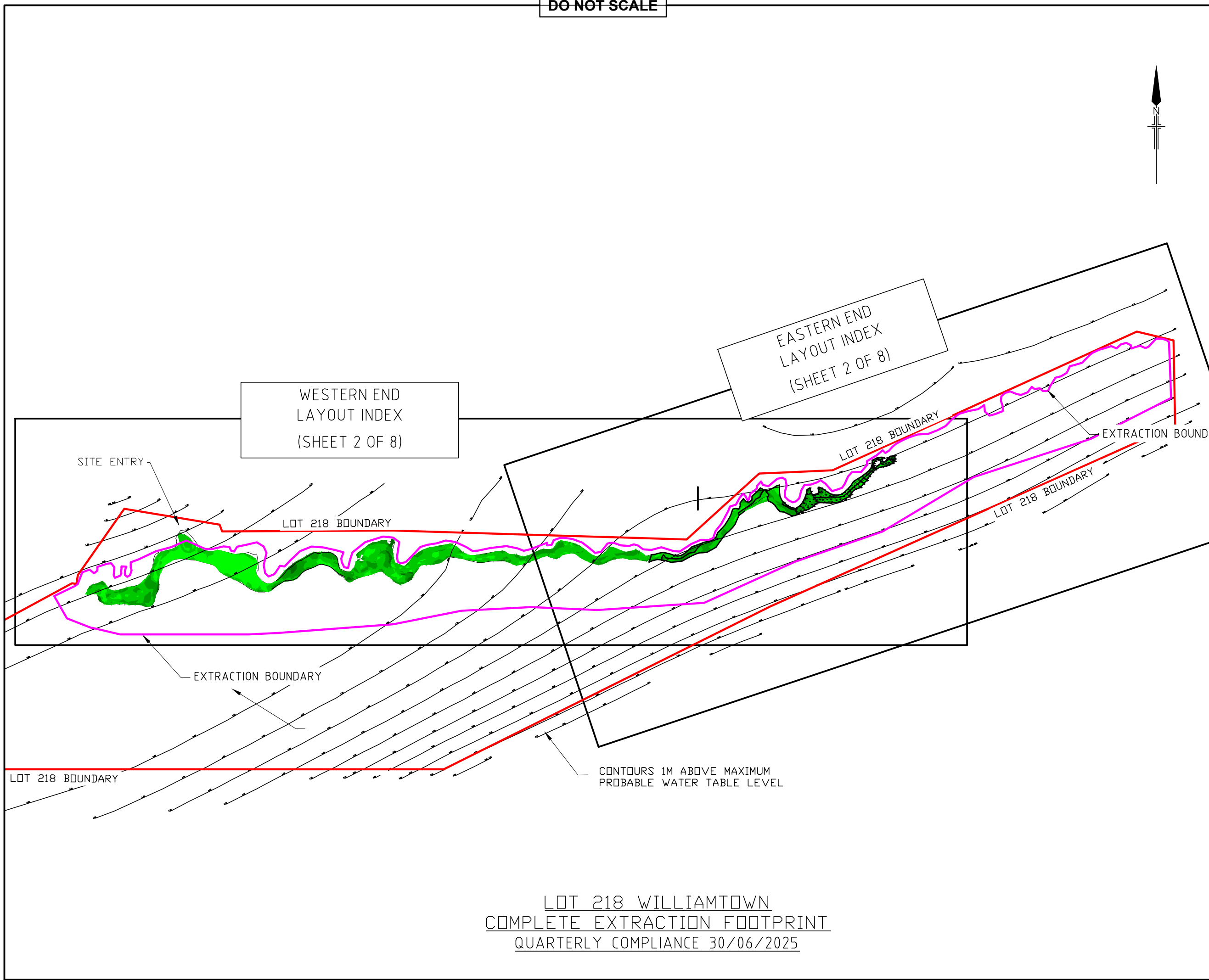
TITLE:  
 LOT 218  
 QUARTERLY COMPLIANCE  
 SHEET LAYOUT INDEX

STATUS:  
 JUNE 2025

DRAWING NUMBER:

SHEET 1 OF 8 SHEETS

A3



LOT 218 WILLIAMTOWN  
 COMPLETE EXTRACTION FOOTPRINT  
 QUARTERLY COMPLIANCE 30/06/2025

DO NOT SCALE

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_250630.dwg  
SURVEYED: LC 03/07/2025  
DRAWN: CJ  
CHECKED: CJ  
DATUM: AHD  
ISSUE DATE: 31/07/2025  
REVISION: A

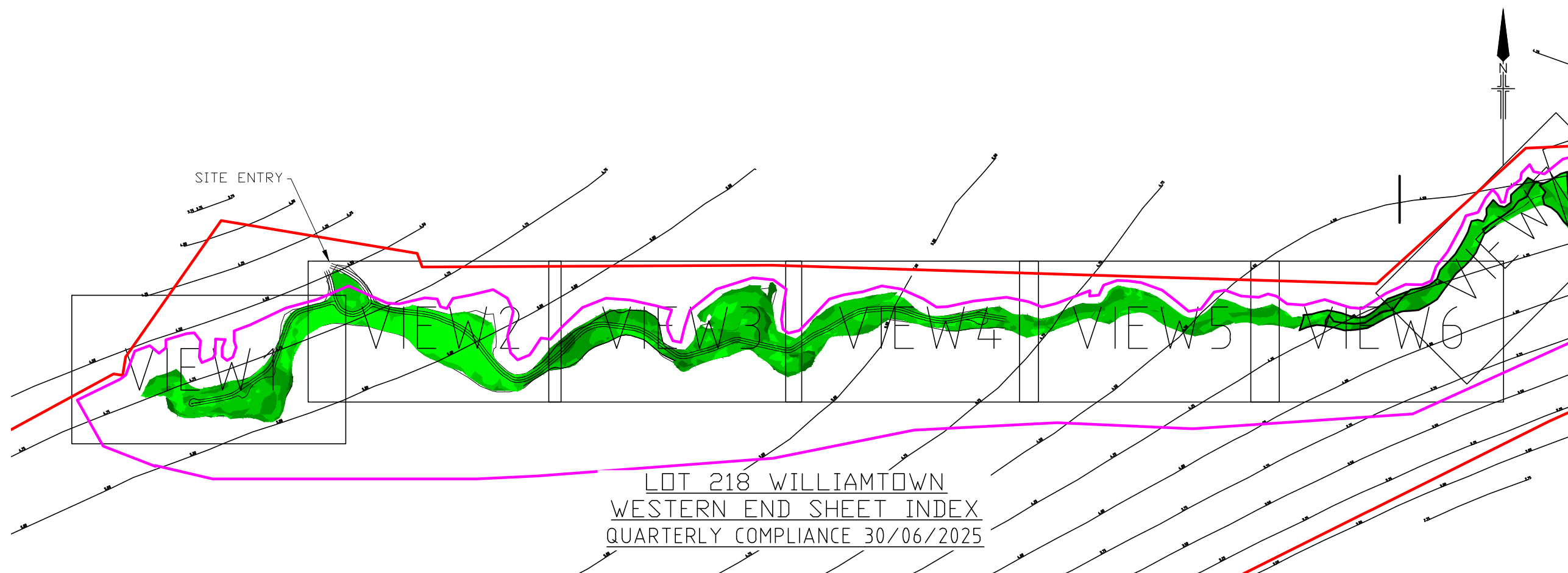
CLIENT & JOB:

MACKAS  
SAND & SOIL

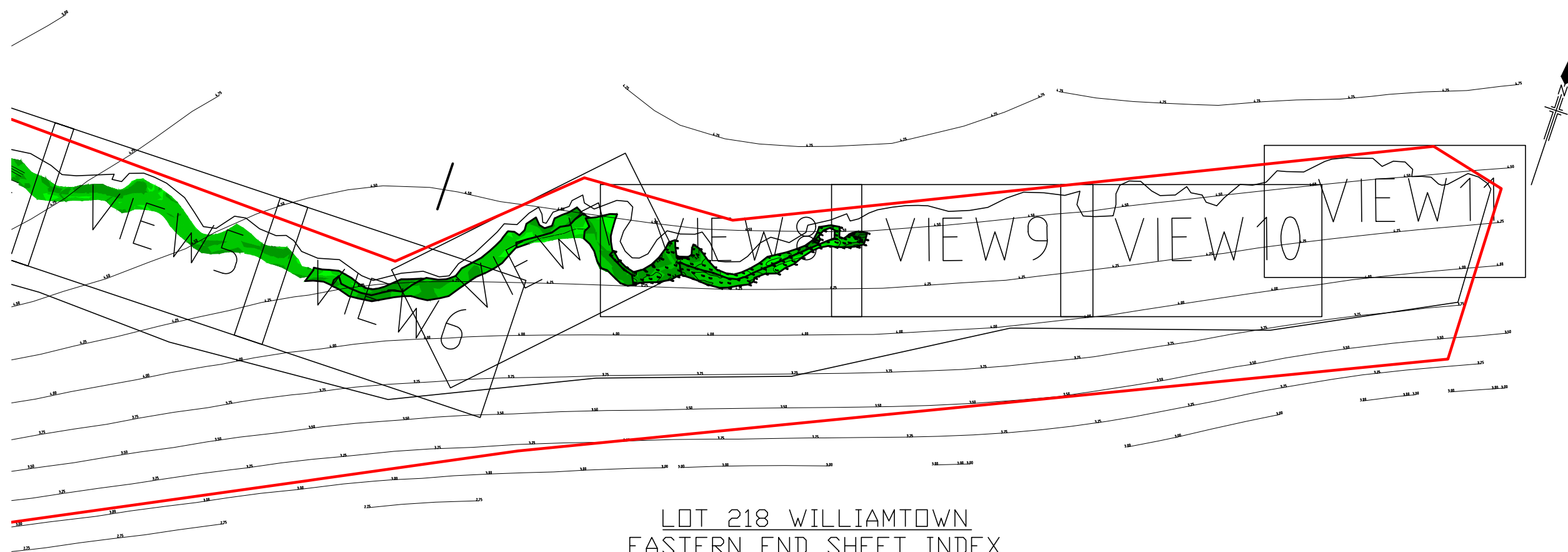
WILLIAMTOWN  
COMPLIANCE  
REPORTING



ABN: 66 605 045 314  
P: (02) 4967 5927  
M: 0429 987 821  
Unit 11 56 Industrial Dr  
Mayfield NSW 2304



LOT 218 WILLIAMTOWN  
WESTERN END SHEET INDEX  
QUARTERLY COMPLIANCE 30/06/2025



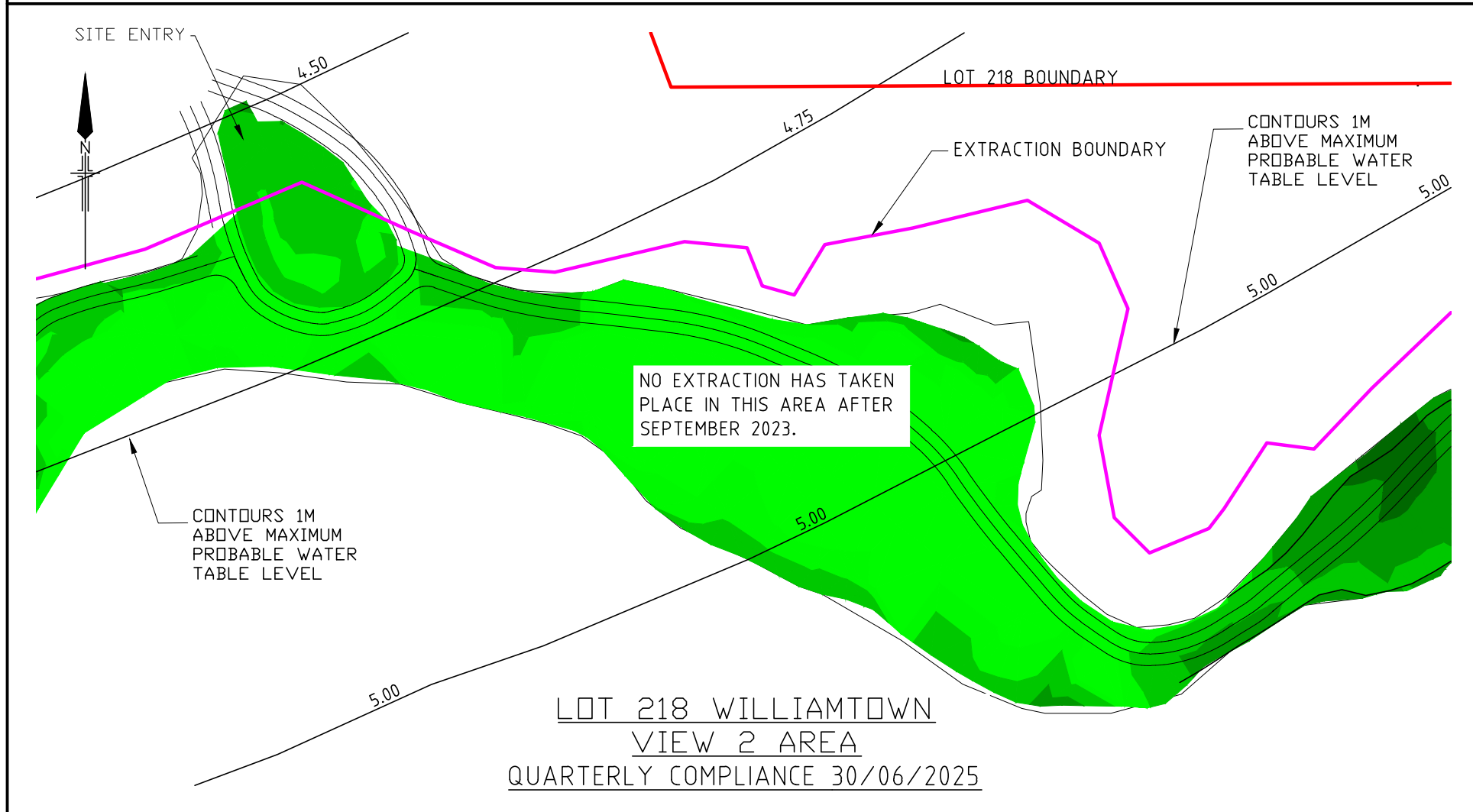
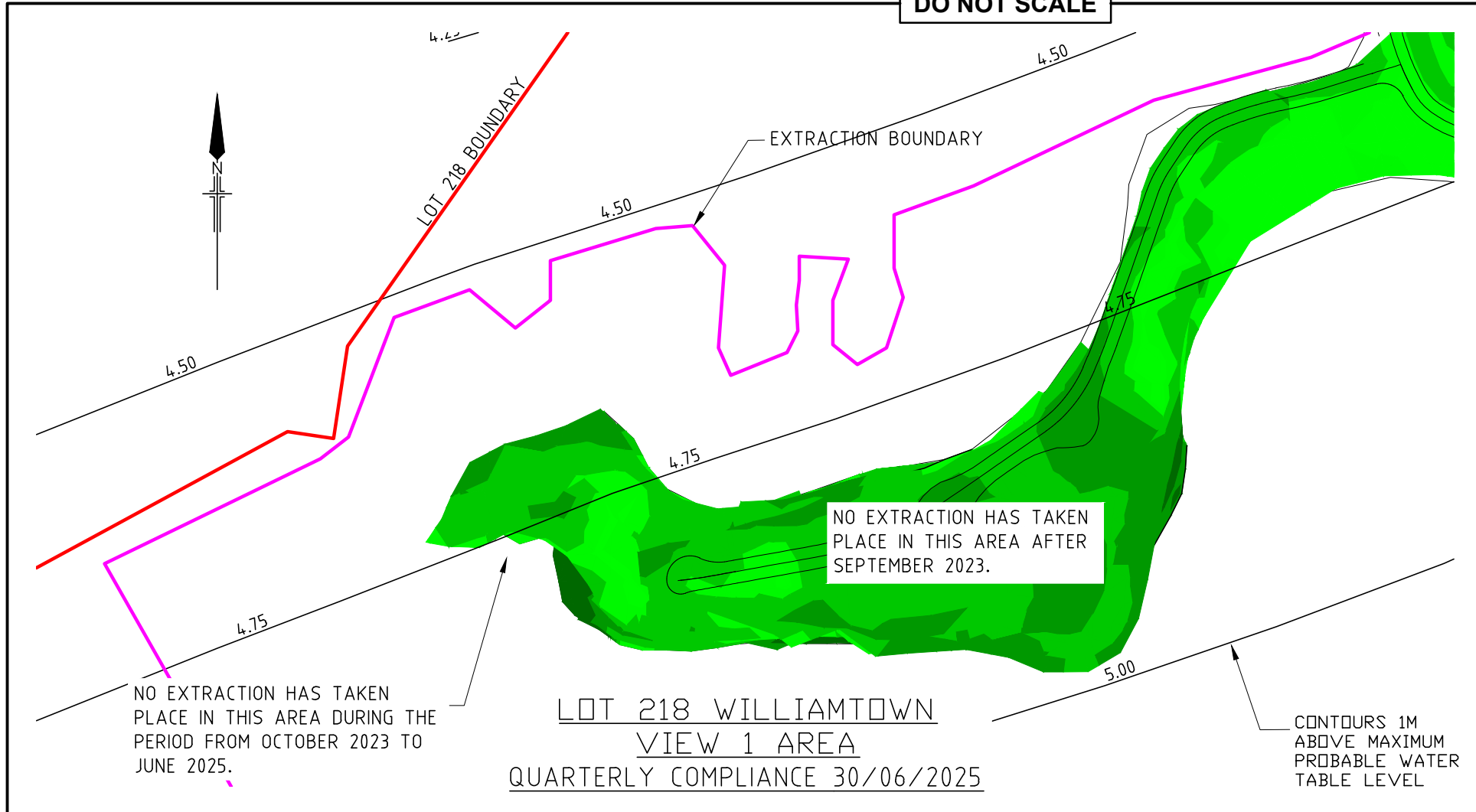
LOT 218 WILLIAMTOWN  
EASTERN END SHEET INDEX  
QUARTERLY COMPLIANCE 30/06/2025

TITLE:  
  
LOT 218  
SHEET INDEX  
PLAN

STATUS:  
  
JUNE 2025

DRAWING NUMBER:

DO NOT SCALE



NOTES:

1. THE ROAD SURFACE LEVEL HAS BEEN RAISED TO A MINIMUM OF 300mm-400mm ABOVE THE EXTRACTION SURFACE.
2. THE SURFACE LEVEL EITHER SIDE OF THE ACCESS ROAD IN OPERATIONAL AREAS IS COMPLIANT AS AT 30/06/2025.
3. SHOT HEIGHTS SHOWN ARE FOR THE CURRENT OPERATIONAL FOOTPRINT AND CAN BE USED TO IDENTIFY THE EXTENT OF THE SURVEY.
4. AREAS WITHOUT SPOT HEIGHT SHOWN WERE IDENTIFIED AS COMPLYING IN PREVIOUS SURVEYS. THESE AREAS DO NOT FORM PART OF THE ACTIVE EXTRACTION OPERATION AND DO NOT FORM PART OF THIS SURVEY REPORT AND ARE ONLY SHOWN TO IDENTIFY THE CURRENT EXTENT OF THE EXTRACTION FLOOR.
5. SURVEY TO CONFIRM COMPLIANCE AT WESTERN END FOR THE QUARTER ENDING 30/06/2025 WAS COMPLETED 17/10/2023.
6. DATE OF CURRENT SURVEY: 03/07/2025

DEPTH COMPLIANCE COMPARISON TO 1m ABOVE MAXIMUM PROBABLE GROUND WATER LEVEL			COLOUR
LOWER VALUE	UPPER VALUE		
-0.35	to -0.3	m	
-0.3	to -0.2	m	
-0.2	to -0.1	m	
-0.1	to 0.0	m	
0.0	to 0.1	m	
0.1	to 0.2	m	
0.2	to 0.5	m	
0.5	to 1.0	m	
1.0	to 2.0	m	

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_250630.dwg  
 SURVEYED: CJ & LC  
 DRAWN: CJ  
 CHECKED: CJ  
 DATUM: AHD  
 ISSUE DATE: 31/07/2025  
 REVISION: A

CLIENT & JOB:

MACKAS  
SAND & SOIL

WILLIAMTOWN  
COMPLIANCE  
REPORTING



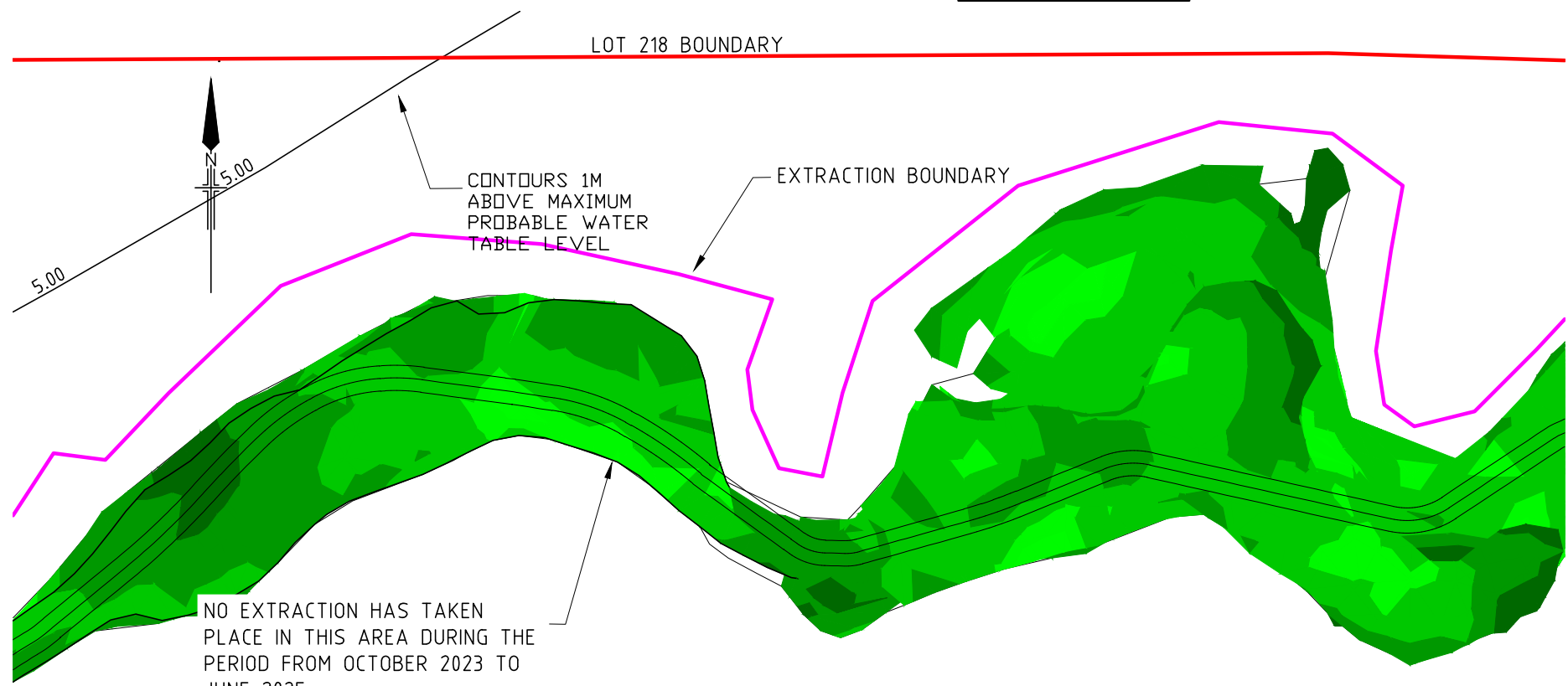
ABN: 66 605 045 314  
 P: (02) 4967 5927  
 M: 0429 987 821  
 Unit 11 56 Industrial Dr  
 Mayfield NSW 2304

TITLE:  
 LOT 218  
 EXTRACTION COMPLIANCE  
 VIEW AREA 1 & 2

STATUS:  
 JUNE 2025

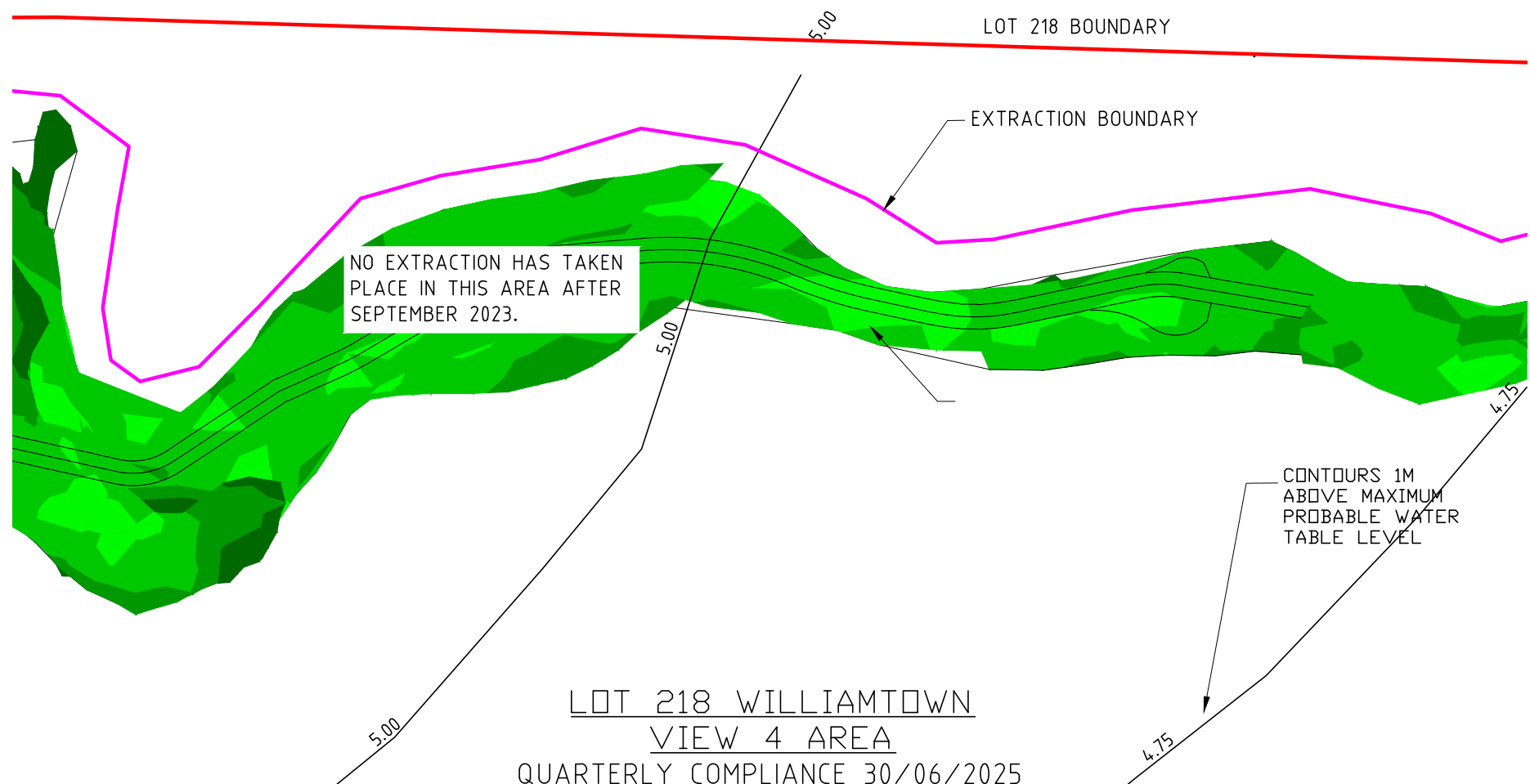
DRAWING NUMBER:

**DO NOT SCALE**



NO EXTRACTION HAS TAKEN PLACE IN THIS AREA DURING THE PERIOD FROM OCTOBER 2023 TO JUNE 2025.

LOT 218 WILLIAMTOWN  
VIEW 3 AREA  
QUARTERLY COMPLIANCE 30/06/2025



NO EXTRACTION HAS TAKEN PLACE IN THIS AREA AFTER SEPTEMBER 2023.

LOT 218 WILLIAMTOWN  
VIEW 4 AREA  
QUARTERLY COMPLIANCE 30/06/2025

**NOTES:**

1. THE ROAD SURFACE LEVEL HAS BEEN RAISED TO A MINIMUM OF 300mm-400mm ABOVE THE EXTRACTION SURFACE.
2. THE SURFACE LEVEL EITHER SIDE OF THE ACCESS ROAD IN OPERATIONAL AREAS IS COMPLIANT AS AT 30/06/2025.
3. SHOT HEIGHTS SHOWN ARE FOR THE CURRENT OPERATIONAL FOOTPRINT AND CAN BE USED TO IDENTIFY THE EXTENT OF THE SURVEY.
4. AREAS WITHOUT SPOT HEIGHT SHOWN WERE IDENTIFIED AS COMPLYING IN PREVIOUS SURVEYS. THESE AREAS DO NOT FORM PART OF THE ACTIVE EXTRACTION OPERATION AND DO NOT FORM PART OF THIS SURVEY REPORT AND ARE ONLY SHOWN TO IDENTIFY THE CURRENT EXTENT OF THE EXTRACTION FLOOR.
5. SURVEY TO CONFIRM COMPLIANCE AT WESTERN END FOR THE QUARTER ENDING 30/06/2025 WAS COMPLETED 17/10/2023.
6. DATE OF CURRENT SURVEY: 03/07/2025

DEPTH COMPLIANCE COMPARISON TO 1m ABOVE MAXIMUM PROBABLY GROUND WATER LEVEL			COLOUR
LOWER VALUE	UPPER VALUE		
-0.35	to -0.3	m	
-0.3	to -0.2	m	
-0.2	to -0.1	m	
-0.1	to 0.0	m	
0.0	to 0.1	m	
0.1	to 0.2	m	
0.2	to 0.5	m	
0.5	to 1.0	m	
1.0	to 2.0	m	

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_250630.dwg  
 SURVEYED: CJ & LC  
 DRAWN: CJ  
 CHECKED: CJ  
 DATUM: AHD  
 ISSUE DATE: 31/07/2025  
 REVISION: A

CLIENT & JOB:

**MACKAS SAND & SOIL**

**WILLIAMTOWN COMPLIANCE REPORTING**



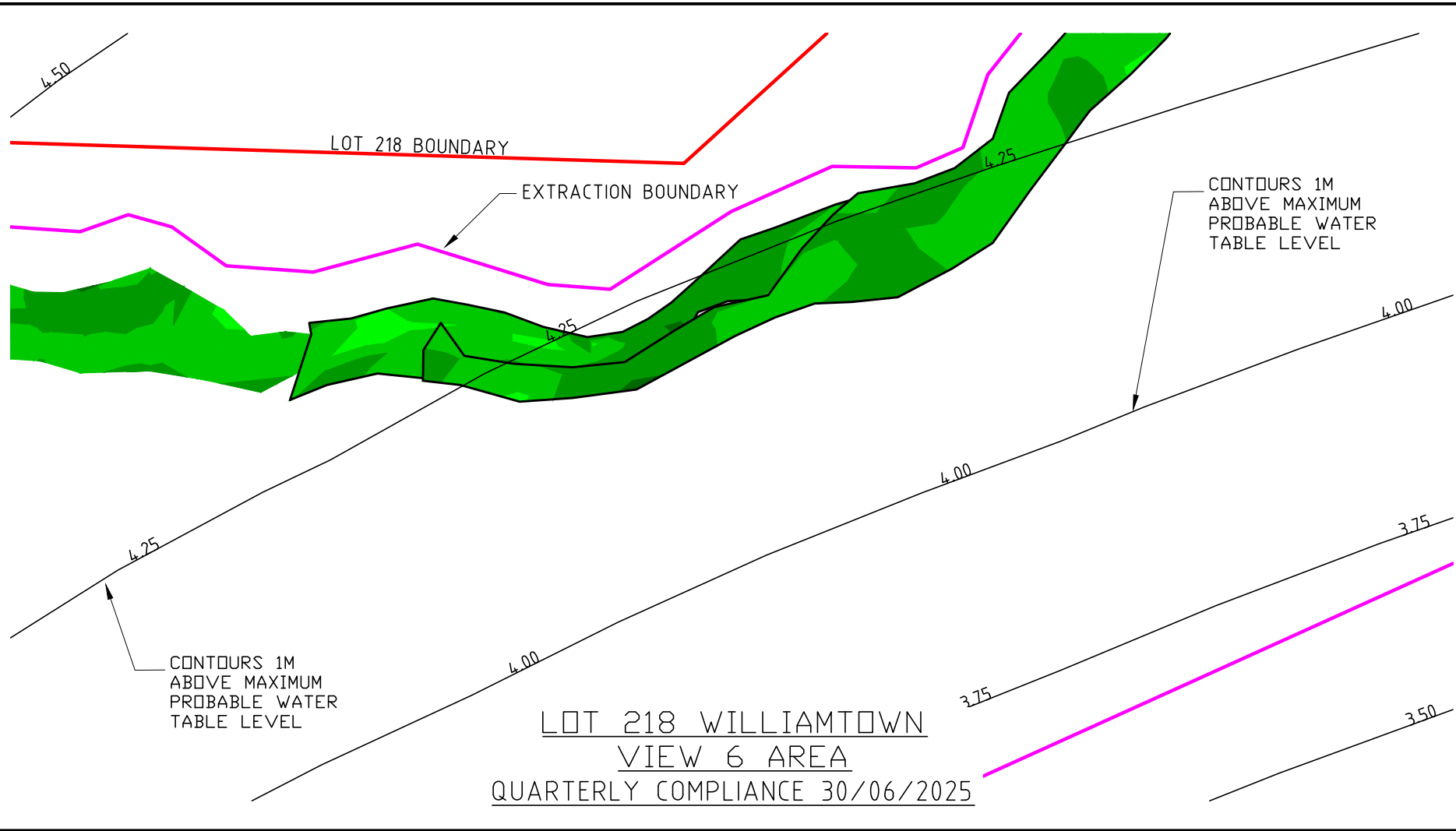
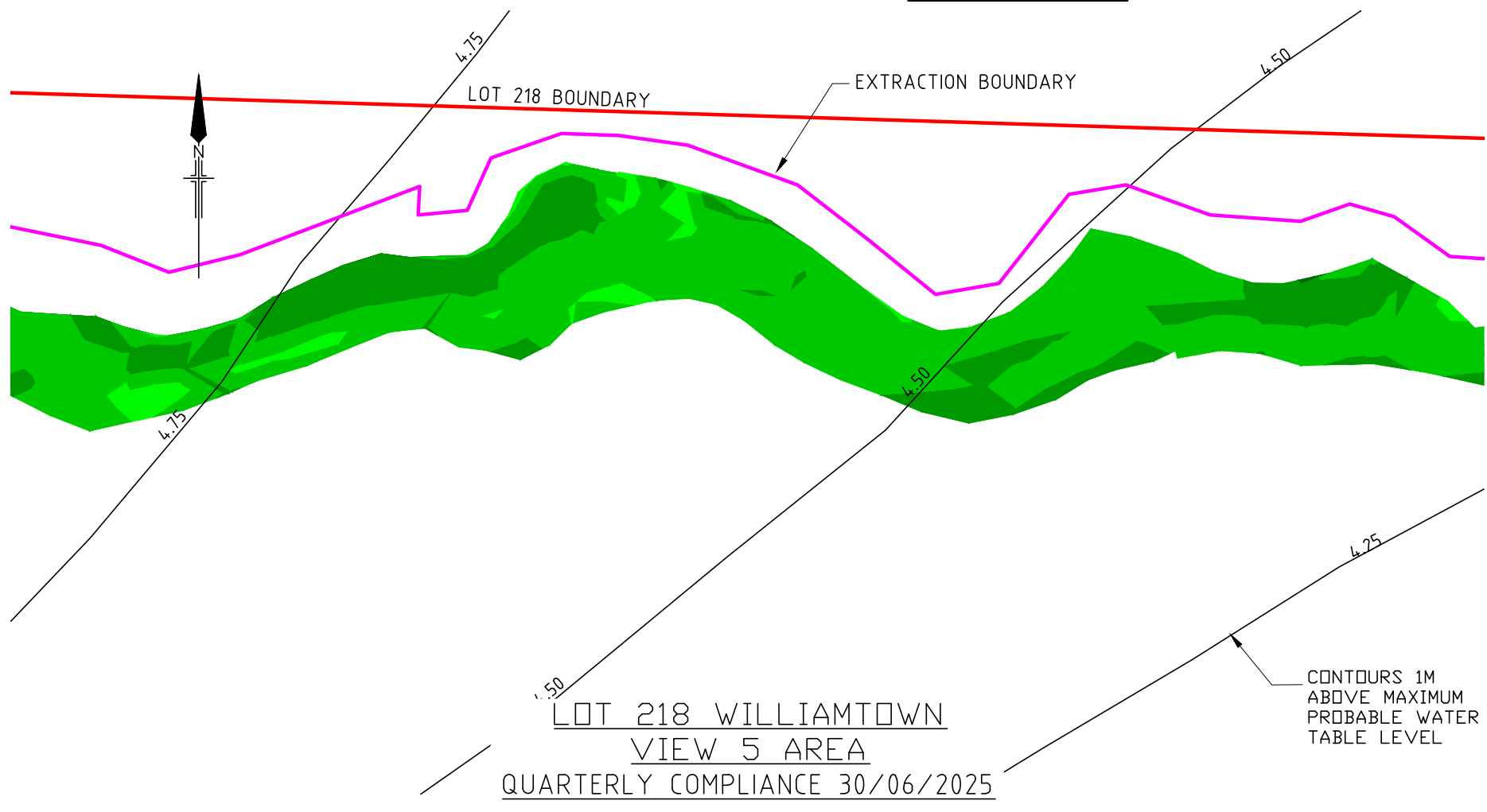
ABN: 66 605 045 314  
 P: (02) 4967 5927  
 M: 0429 987 821  
 Unit 11 56 Industrial Dr  
 Mayfield NSW 2304

TITLE:  
**LOT 218 EXTRACTION COMPLIANCE VIEW AREA 3 & 4**

STATUS:  
**JUNE 2025**

DRAWING NUMBER:

DO NOT SCALE



NOTES:

1. THE ROAD SURFACE LEVEL HAS BEEN RAISED TO A MINIMUM OF 300mm-400mm ABOVE THE EXTRACTION SURFACE.
2. THE SURFACE LEVEL EITHER SIDE OF THE ACCESS ROAD IN OPERATIONAL AREAS IS COMPLIANT AS AT 30/06/2025.
3. SHOT HEIGHTS SHOWN ARE FOR THE CURRENT OPERATIONAL FOOTPRINT AND CAN BE USED TO IDENTIFY THE EXTENT OF THE SURVEY.
4. AREAS WITHOUT SPOT HEIGHT SHOWN WERE IDENTIFIED AS COMPLYING IN PREVIOUS SURVEYS. THESE AREAS DO NOT FORM PART OF THE ACTIVE EXTRACTION OPERATION AND DO NOT FORM PART OF THIS SURVEY REPORT AND ARE ONLY SHOWN TO IDENTIFY THE CURRENT EXTENT OF THE EXTRACTION FLOOR.
5. SURVEY TO CONFIRM COMPLIANCE AT WESTERN END FOR THE QUARTER ENDING 30/06/2025 WAS COMPLETED 17/10/2023.
6. DATE OF CURRENT SURVEY: 03/07/2025

DEPTH COMPLIANCE COMPARISON TO 1m ABOVE MAXIMUM PROBABLE GROUND WATER LEVEL			COLOUR
LOWER VALUE	UPPER VALUE		
-0.35	to -0.3	m	Red
-0.3	to -0.2	m	Orange
-0.2	to -0.1	m	Yellow
-0.1	to 0.0	m	Light Green
0.0	to 0.1	m	Green
0.1	to 0.2	m	Dark Green
0.2	to 0.5	m	Very Dark Green
0.5	to 1.0	m	Black
1.0	to 2.0	m	Black

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_250630.dwg  
 SURVEYED: CJ & LC  
 DRAWN: CJ  
 CHECKED: CJ  
 DATUM: AHD  
 ISSUE DATE: 31/07/2025  
 REVISION: A

CLIENT & JOB:  
**MACKAS SAND & SOIL**  
**WILLIAMTOWN COMPLIANCE REPORTING**

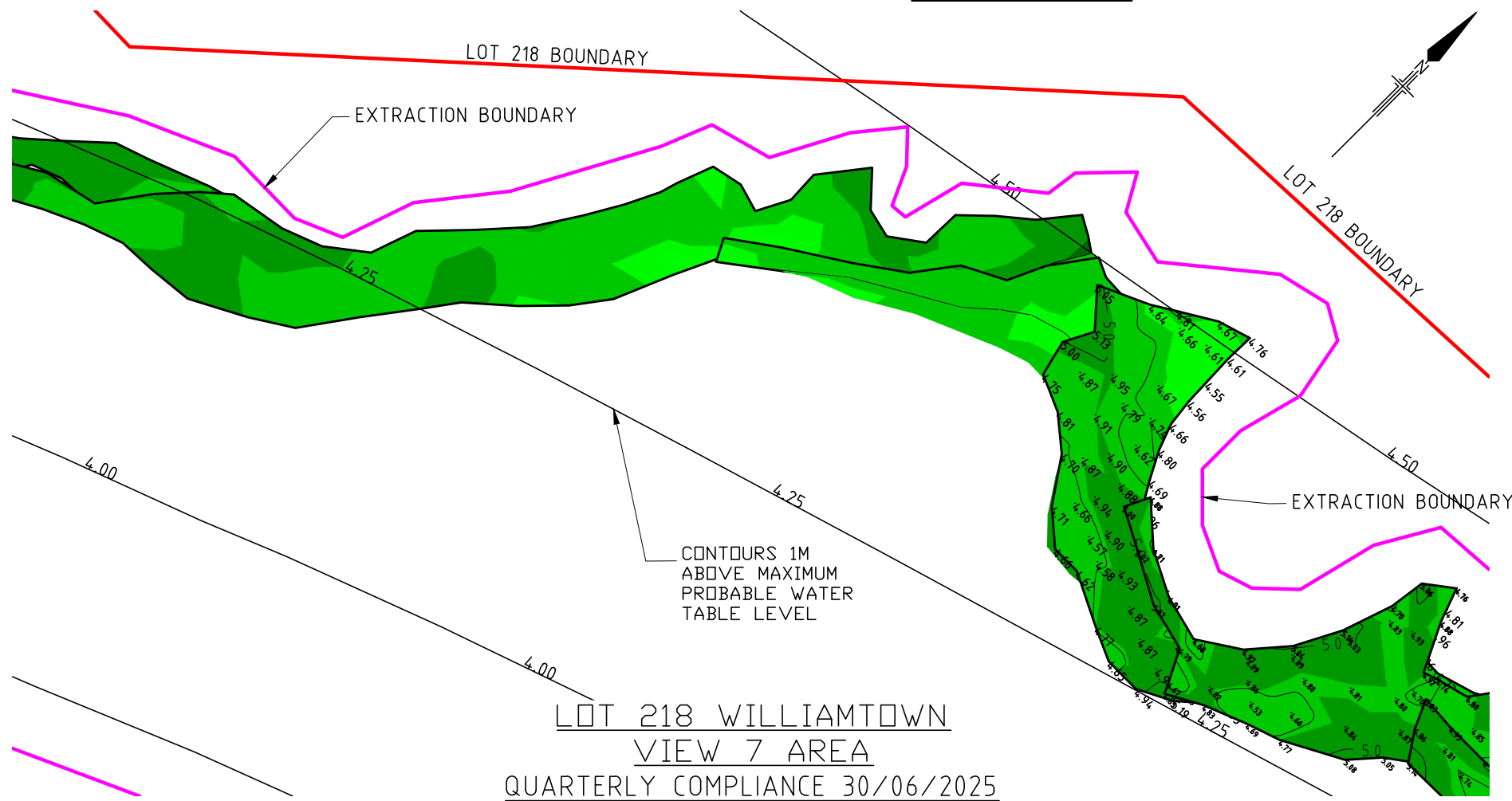
ABN: 66 605 045 314  
 P: (02) 4967 5927  
 M: 0429 987 821  
 Unit 11 56 Industrial Dr  
 Mayfield NSW 2304

TITLE:  
**LOT 218 EXTRACTION COMPLIANCE VIEW AREA 5 & 6**

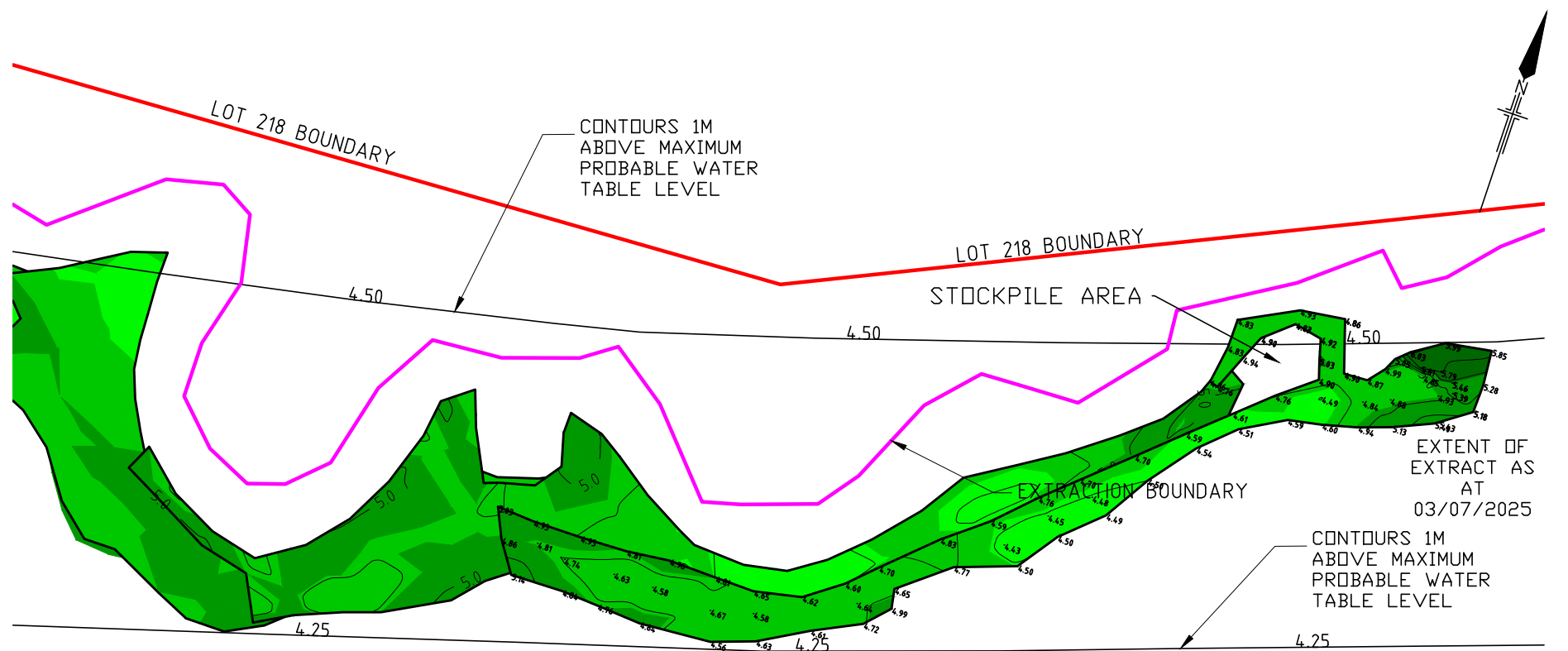
STATUS:  
**JUNE 2025**

DRAWING NUMBER:

DO NOT SCALE



LOT 218 WILLIAMTOWN  
VIEW 7 AREA  
QUARTERLY COMPLIANCE 30/06/2025



LOT 218 WILLIAMTOWN  
VIEW 8 AREA  
QUARTERLY COMPLIANCE 30/06/2025

NOTES:

1. THE ROAD SURFACE LEVEL HAS BEEN RAISED TO A MINIMUM OF 300mm-400mm ABOVE THE EXTRACTION SURFACE.
2. THE SURFACE LEVEL EITHER SIDE OF THE ACCESS ROAD IN OPERATIONAL AREAS IS COMPLIANT AS AT 30/06/2025.
3. SHOT HEIGHTS SHOWN ARE FOR THE CURRENT OPERATIONAL FOOTPRINT AND CAN BE USED TO IDENTIFY THE EXTENT OF THE SURVEY.
4. AREAS WITHOUT SPOT HEIGHT SHOWN WERE IDENTIFIED AS COMPLYING IN PREVIOUS SURVEYS. THESE AREAS DO NOT FORM PART OF THE ACTIVE EXTRACTION OPERATION AND DO NOT FORM PART OF THIS SURVEY REPORT AND ARE ONLY SHOWN TO IDENTIFY THE CURRENT EXTENT OF THE EXTRACTION FLOOR.
5. SURVEY TO CONFIRM COMPLIANCE AT WESTERN END FOR THE QUARTER ENDING 30/06/2025 WAS COMPLETED 17/10/2023.
6. DATE OF CURRENT SURVEY: 03/07/2025

DEPTH COMPLIANCE COMPARISON TO 1m ABOVE MAXIMUM PROBABLE GROUND WATER LEVEL			COLOUR
LOWER VALUE	UPPER VALUE		
-0.35	to -0.3	m	Red
-0.3	to -0.2	m	Orange
-0.2	to -0.1	m	Yellow
-0.1	to 0.0	m	Light Green
0.0	to 0.1	m	Green
0.1	to 0.2	m	Dark Green
0.2	to 0.5	m	Medium Green
0.5	to 1.0	m	Light Green
1.0	to 2.0	m	Dark Green

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_250630.dwg

SURVEYED: CJ & LC

DRAWN: CJ

CHECKED: CJ

DATUM: AHD

ISSUE DATE: 31/07/2025

REVISION: A

CLIENT & JOB:

MACKAS SAND & SOIL

WILLIAMTOWN COMPLIANCE REPORTING

ABN: 66 605 045 314  
P: (02) 4967 5927  
M: 0429 987 821  
Unit 11 56 Industrial Dr  
Mayfield NSW 2304

TITLE:

LOT 218 EXTRACTION COMPLIANCE VIEW AREA 7 & 8

STATUS:

JUNE 2025

DRAWING NUMBER:

DO NOT SCALE

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_220\_Compliance\_250630.dwg  
SURVEYED: CJ  
DRAWN: CJ  
CHECKED: CJ  
DATUM: AHD  
ISSUE DATE: 25/07/2025  
REVISION: A

CLIENT & JOB:

MACKAS  
SAND & SOIL  
SALT ASH  
  
COMPLIANCE  
REPORTING



ABN: 66 605 045 314  
P: (02) 4967 5927  
M: 0429 987 821  
Unit 11 56 Industrial Dr  
Mayfield NSW 2304

TITLE:

LOT 220  
EXTRACTION LEVEL  
COMPLIANCE

STATUS:

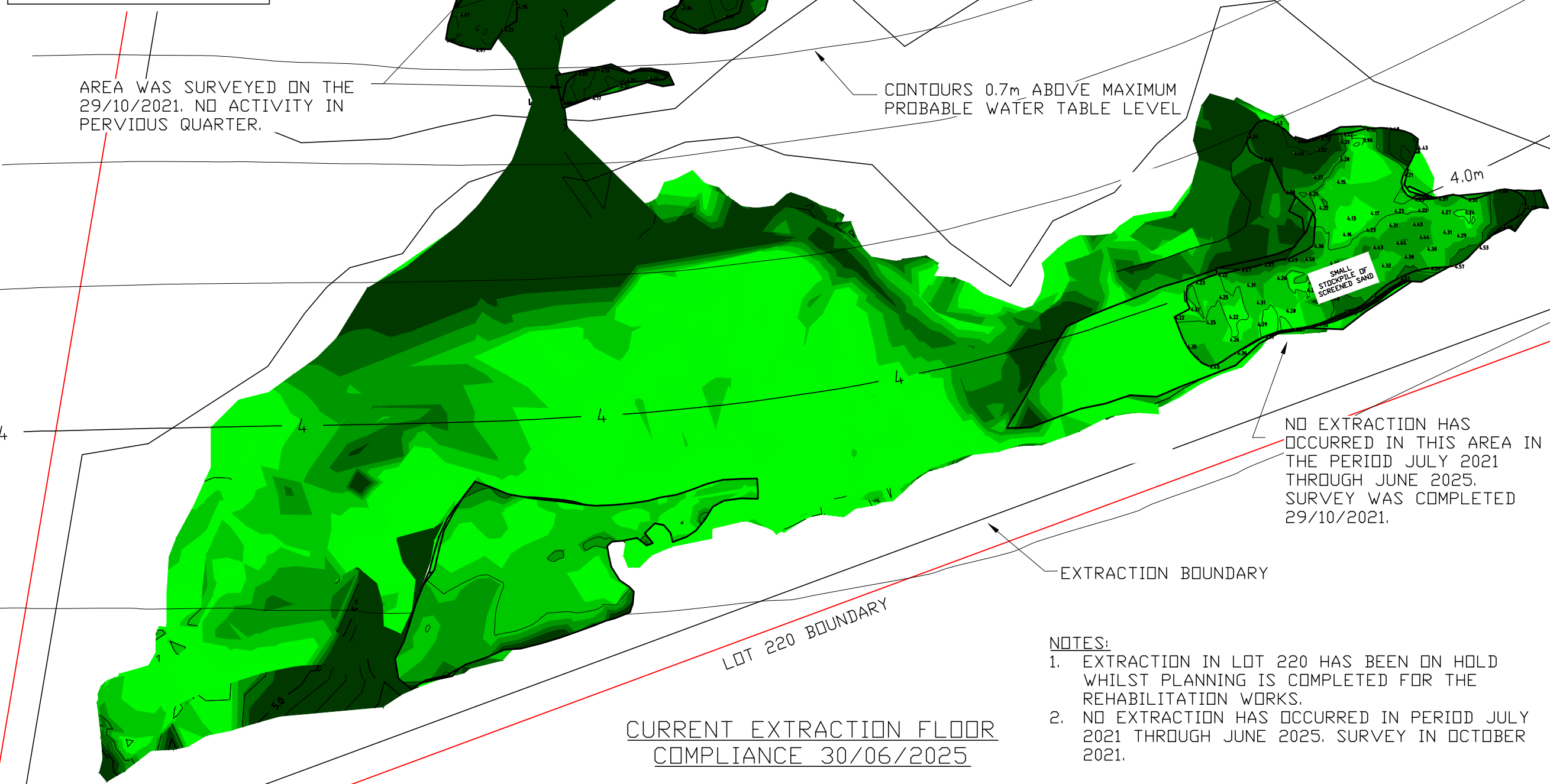
JUNE 2025

DRAWING NUMBER:

SHEET 1 OF 1 SHEETS

A3

DEPTH COMPLIANCE COMPARISON TO 0.7m ABOVE MAXIMUM PROBABLY GROUND WATER LEVEL			COLOUR
LOWER VALUE	UPPER VALUE		
-0.35	to -0.3	m	Red
-0.3	to -0.2	m	Orange
-0.2	to -0.1	m	Yellow-Orange
-0.1	to 0.0	m	Yellow
0.0	to 0.1	m	Light Green
0.1	to 0.2	m	Green
0.2	to 0.5	m	Dark Green
0.5	to 1.0	m	Very Dark Green
1.0	to 2.0	m	Black



AREA WAS SURVEYED ON THE 29/10/2021. NO ACTIVITY IN PERVIOUS QUARTER.

CONTOURS 0.7m ABOVE MAXIMUM PROBABLE WATER TABLE LEVEL

NO EXTRACTION HAS OCCURRED IN THIS AREA IN THE PERIOD JULY 2021 THROUGH JUNE 2025. SURVEY WAS COMPLETED 29/10/2021.

NOTES:

- EXTRACTION IN LOT 220 HAS BEEN ON HOLD WHILST PLANNING IS COMPLETED FOR THE REHABILITATION WORKS.
- NO EXTRACTION HAS OCCURRED IN PERIOD JULY 2021 THROUGH JUNE 2025. SURVEY IN OCTOBER 2021.

CURRENT EXTRACTION FLOOR COMPLIANCE 30/06/2025

DO NOT SCALE

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_250930.dwg  
SURVEYED: CJ & LC  
DRAWN: CJ  
CHECKED: CJ  
DATUM: AHD  
ISSUE DATE: 04/12/2025  
REVISION: A

CLIENT & JOB:

MACKAS  
SAND & SOIL

WILLIAMTOWN  
COMPLIANCE  
REPORTING



ABN: 66 605 045 314  
P: (02) 4967 5927  
M: 0429 987 821  
Unit 11 56 Industrial Dr  
Mayfield NSW 2304

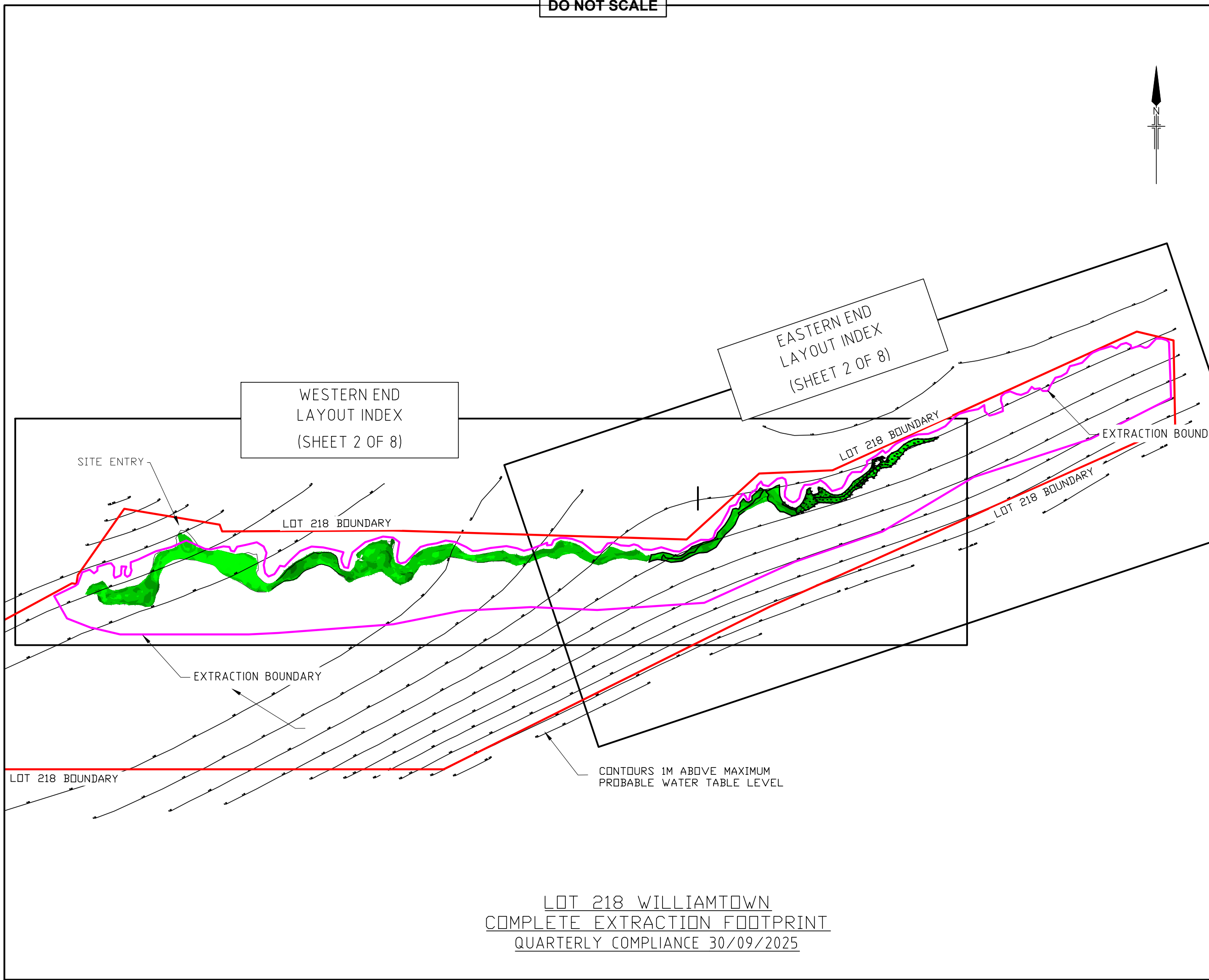
TITLE:  
LOT 218  
QUARTERLY COMPLIANCE  
SHEET LAYOUT INDEX

STATUS:  
SEPTEMBER 2025

DRAWING NUMBER:

SHEET 1 OF 8 SHEETS

A3



LOT 218 WILLIAMTOWN  
COMPLETE EXTRACTION FOOTPRINT  
QUARTERLY COMPLIANCE 30/09/2025

DO NOT SCALE

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_250930.dwg  
SURVEYED: LC 13/10/2025  
DRAWN: CJ  
CHECKED: CJ  
DATUM: AHD  
ISSUE DATE: 04/12/2025  
REVISION: A

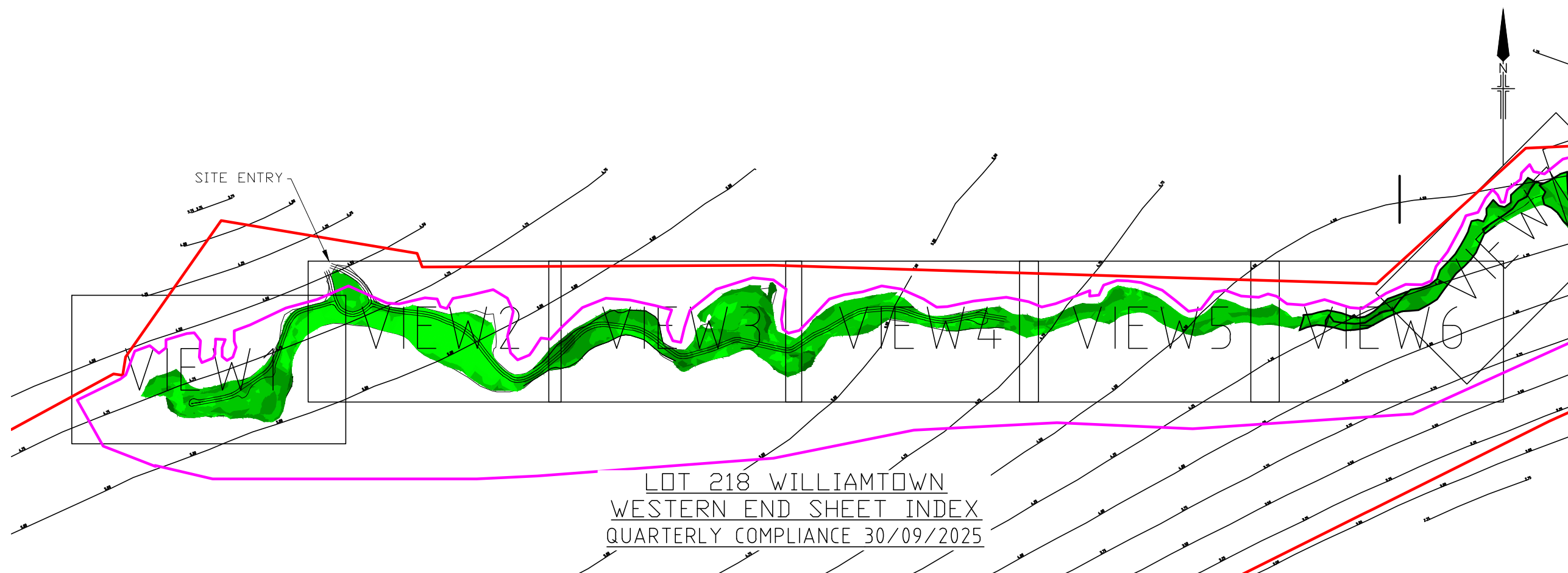
CLIENT & JOB:

MACKAS  
SAND & SOIL

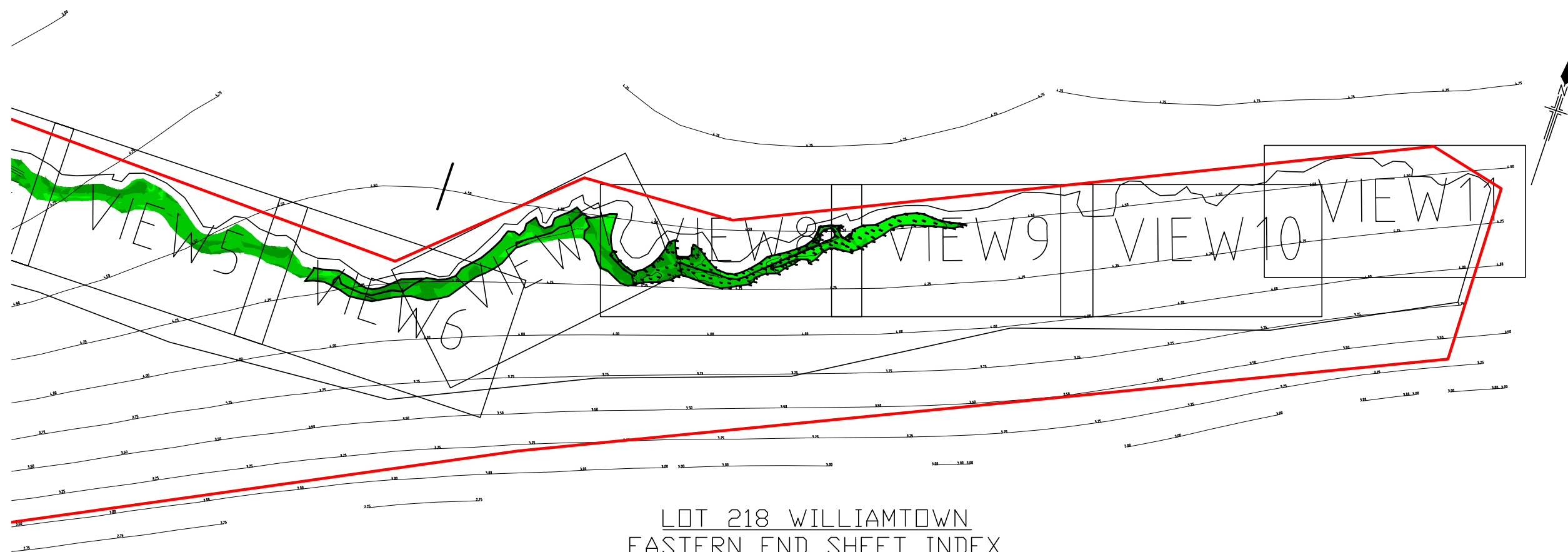
WILLIAMTOWN  
COMPLIANCE  
REPORTING



ABN: 66 605 045 314  
P: (02) 4967 5927  
M: 0429 987 821  
Unit 11 56 Industrial Dr  
Mayfield NSW 2304



LOT 218 WILLIAMTOWN  
WESTERN END SHEET INDEX  
QUARTERLY COMPLIANCE 30/09/2025



LOT 218 WILLIAMTOWN  
EASTERN END SHEET INDEX  
QUARTERLY COMPLIANCE 30/09/2025

TITLE:

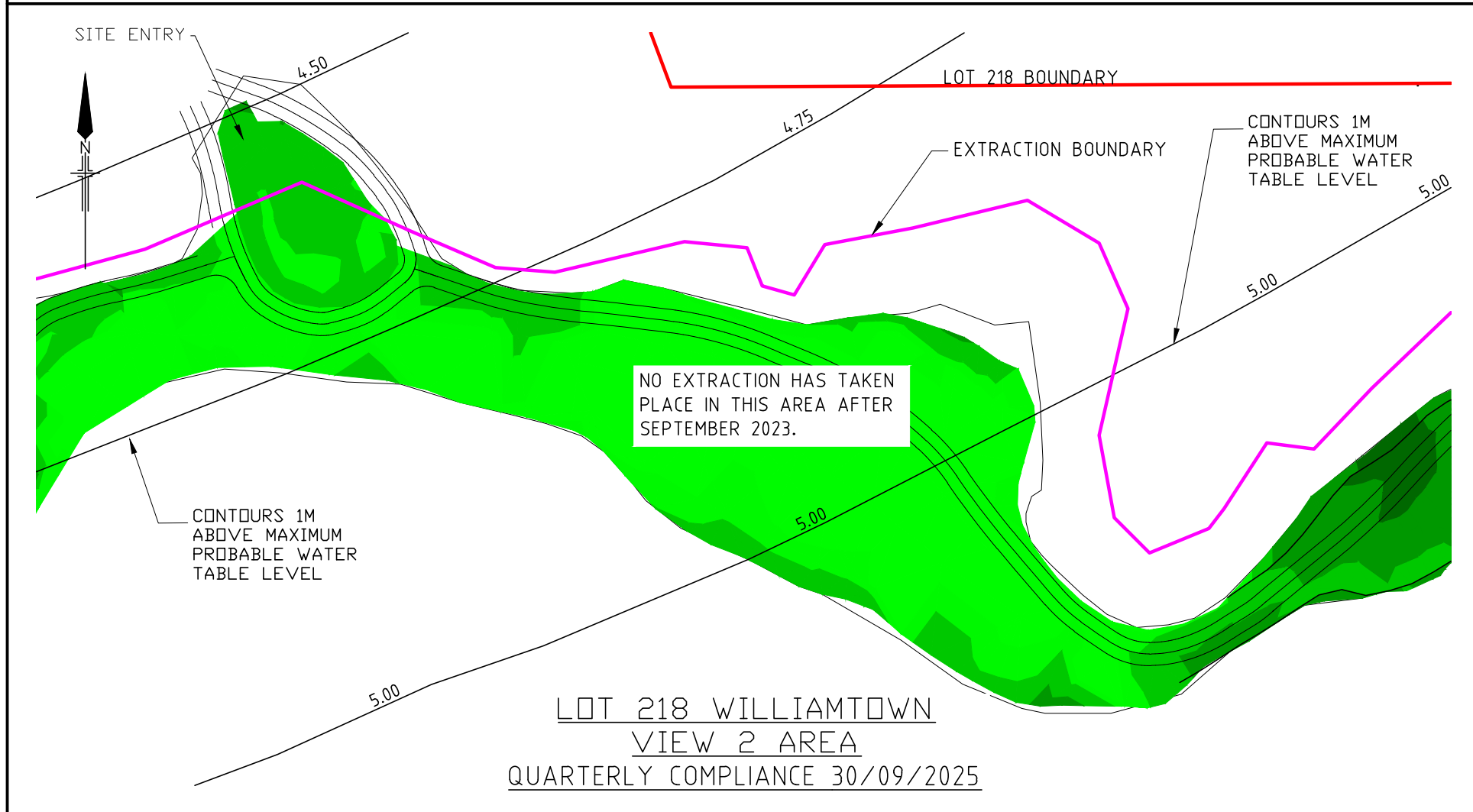
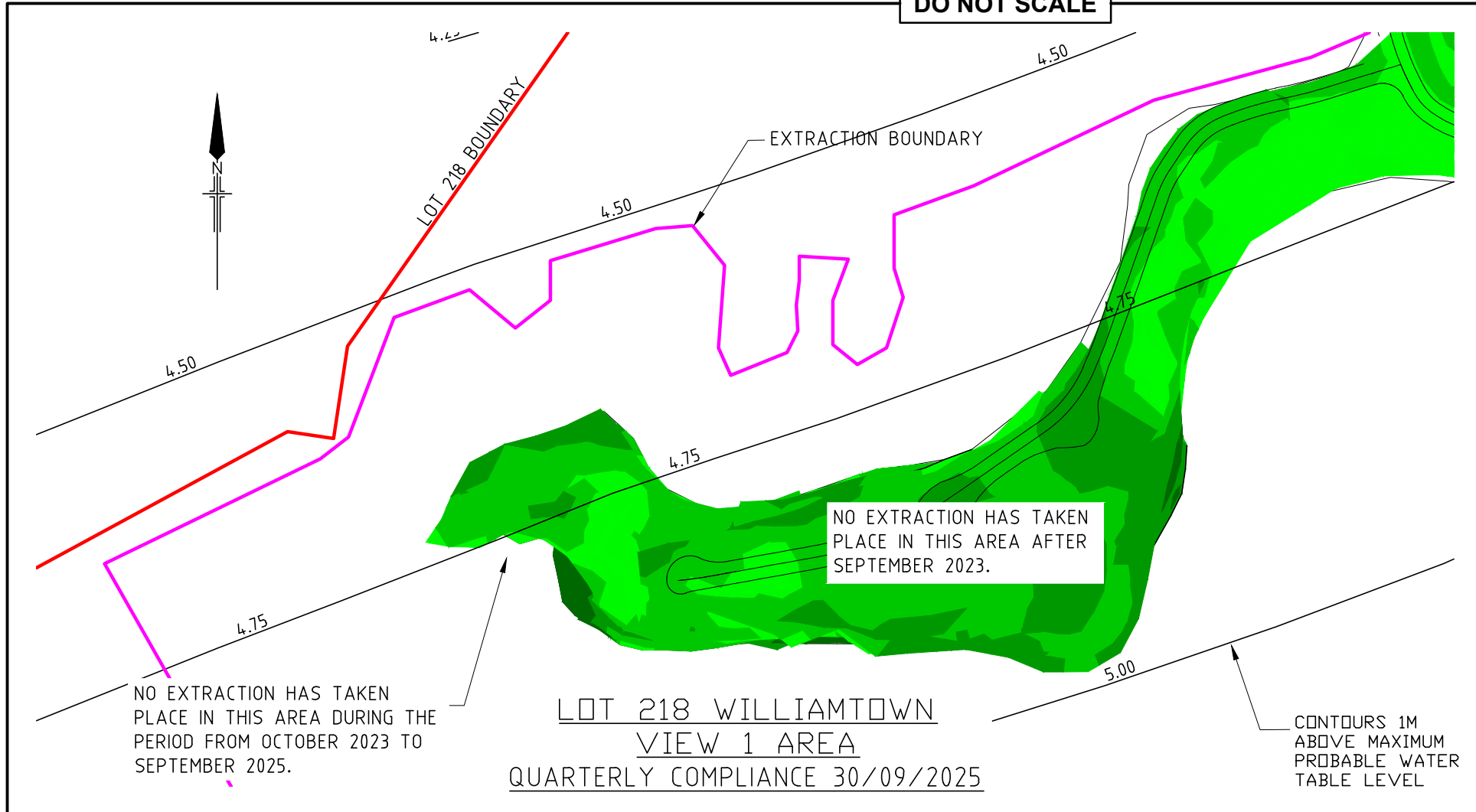
LOT 218  
SHEET INDEX  
PLAN

STATUS:

SEPTEMBER 2025

DRAWING NUMBER:

**DO NOT SCALE**



**NOTES:**

1. THE ROAD SURFACE LEVEL HAS BEEN RAISED TO A MINIMUM OF 300mm-400mm ABOVE THE EXTRACTION SURFACE.
2. THE SURFACE LEVEL EITHER SIDE OF THE ACCESS ROAD IN OPERATIONAL AREAS IS COMPLIANT AS AT 30/09/2025.
3. SHOT HEIGHTS SHOWN ARE FOR THE CURRENT OPERATIONAL FOOTPRINT AND CAN BE USED TO IDENTIFY THE EXTENT OF THE SURVEY.
4. AREAS WITHOUT SPOT HEIGHT SHOWN WERE IDENTIFIED AS COMPLYING IN PREVIOUS SURVEYS. THESE AREAS DO NOT FORM PART OF THE ACTIVE EXTRACTION OPERATION AND DO NOT FORM PART OF THIS SURVEY REPORT AND ARE ONLY SHOWN TO IDENTIFY THE CURRENT EXTENT OF THE EXTRACTION FLOOR.
5. SURVEY TO CONFIRM COMPLIANCE AT WESTERN END FOR THE QUARTER ENDING 30/09/2025 WAS COMPLETED 17/10/2023.
6. DATE OF CURRENT SURVEY: 13/10/2025

DEPTH COMPLIANCE COMPARISON TO 1m ABOVE MAXIMUM PROBABLE GROUND WATER LEVEL			COLOUR
LOWER VALUE	UPPER VALUE		
-0.35	to -0.3	m	Red
-0.3	to -0.2	m	Orange
-0.2	to -0.1	m	Yellow-Orange
-0.1	to 0.0	m	Yellow
0.0	to 0.1	m	Light Green
0.1	to 0.2	m	Green
0.2	to 0.5	m	Dark Green
0.5	to 1.0	m	Very Dark Green
1.0	to 2.0	m	Black

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_250930.dwg  
 SURVEYED: CJ & LC  
 DRAWN: CJ  
 CHECKED: CJ  
 DATUM: AHD  
 ISSUE DATE: 04/12/2025  
 REVISION: A

CLIENT & JOB:  
**MACKAS SAND & SOIL**  
**WILLIAMTOWN COMPLIANCE REPORTING**



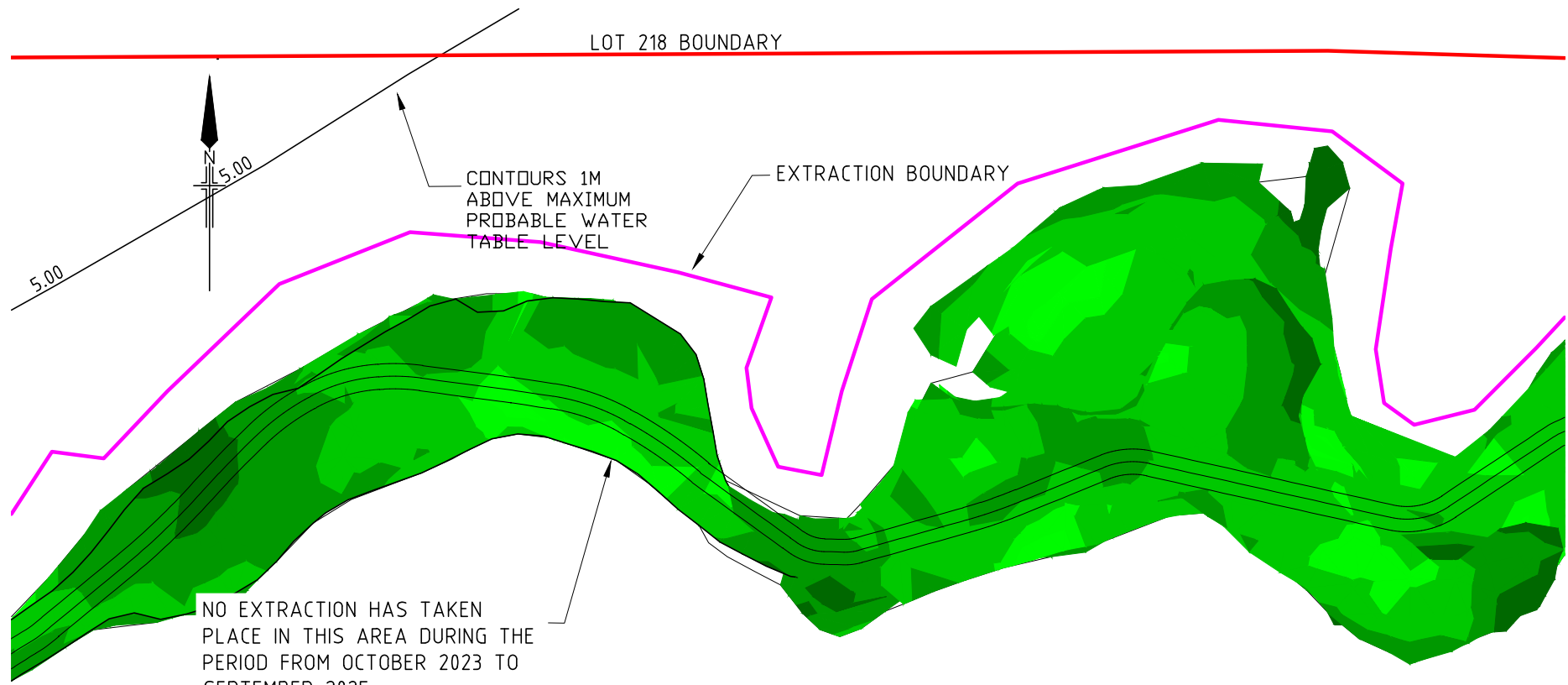
ABN: 66 605 045 314  
 P: (02) 4967 5927  
 M: 0429 987 821  
 Unit 11 56 Industrial Dr  
 Mayfield NSW 2304

TITLE:  
**LOT 218 EXTRACTION COMPLIANCE VIEW AREA 1 & 2**

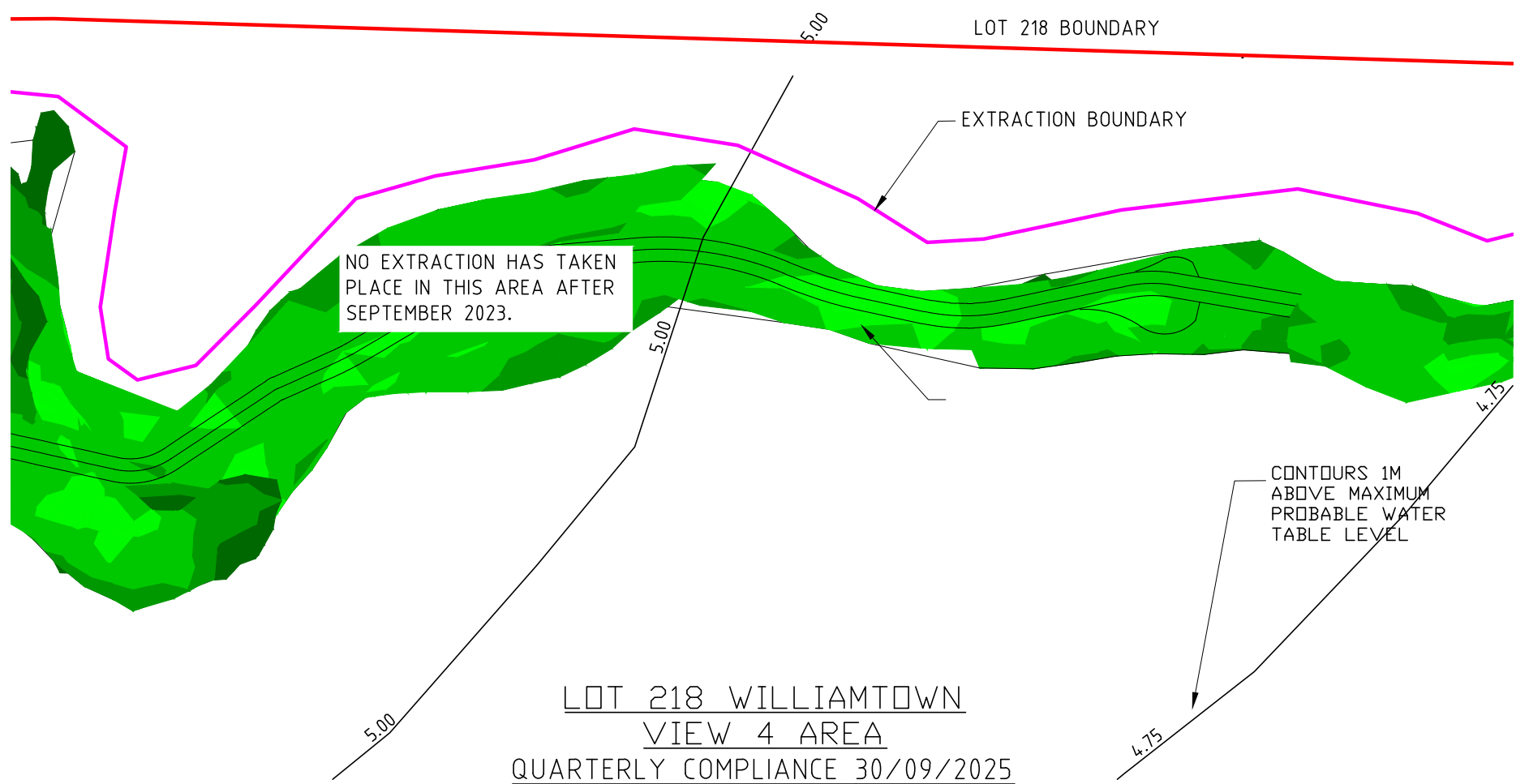
STATUS:  
**SEPTEMBER 2025**

DRAWING NUMBER:

**DO NOT SCALE**



LOT 218 WILLIAMTOWN  
VIEW 3 AREA  
QUARTERLY COMPLIANCE 30/09/2025



LOT 218 WILLIAMTOWN  
VIEW 4 AREA  
QUARTERLY COMPLIANCE 30/09/2025

**NOTES:**

1. THE ROAD SURFACE LEVEL HAS BEEN RAISED TO A MINIMUM OF 300mm-400mm ABOVE THE EXTRACTION SURFACE.
2. THE SURFACE LEVEL EITHER SIDE OF THE ACCESS ROAD IN OPERATIONAL AREAS IS COMPLIANT AS AT 30/09/2025.
3. SHOT HEIGHTS SHOWN ARE FOR THE CURRENT OPERATIONAL FOOTPRINT AND CAN BE USED TO IDENTIFY THE EXTENT OF THE SURVEY.
4. AREAS WITHOUT SPOT HEIGHT SHOWN WERE IDENTIFIED AS COMPLYING IN PREVIOUS SURVEYS. THESE AREAS DO NOT FORM PART OF THE ACTIVE EXTRACTION OPERATION AND DO NOT FORM PART OF THIS SURVEY REPORT AND ARE ONLY SHOWN TO IDENTIFY THE CURRENT EXTENT OF THE EXTRACTION FLOOR.
5. SURVEY TO CONFIRM COMPLIANCE AT WESTERN END FOR THE QUARTER ENDING 30/09/2025 WAS COMPLETED 17/10/2023.
6. DATE OF CURRENT SURVEY: 13/10/2025

DEPTH COMPLIANCE COMPARISON TO 1m ABOVE MAXIMUM PROBABLE GROUND WATER LEVEL			COLOUR
LOWER VALUE	UPPER VALUE		
-0.35	to -0.3	m	
-0.3	to -0.2	m	
-0.2	to -0.1	m	
-0.1	to 0.0	m	
0.0	to 0.1	m	
0.1	to 0.2	m	
0.2	to 0.5	m	
0.5	to 1.0	m	
1.0	to 2.0	m	

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_250930.dwg  
 SURVEYED: CJ & LC  
 DRAWN: CJ  
 CHECKED: CJ  
 DATUM: AHD  
 ISSUE DATE: 04/12/2025  
 REVISION: A

CLIENT & JOB:  
**MACKAS SAND & SOIL**  
**WILLIAMTOWN COMPLIANCE REPORTING**

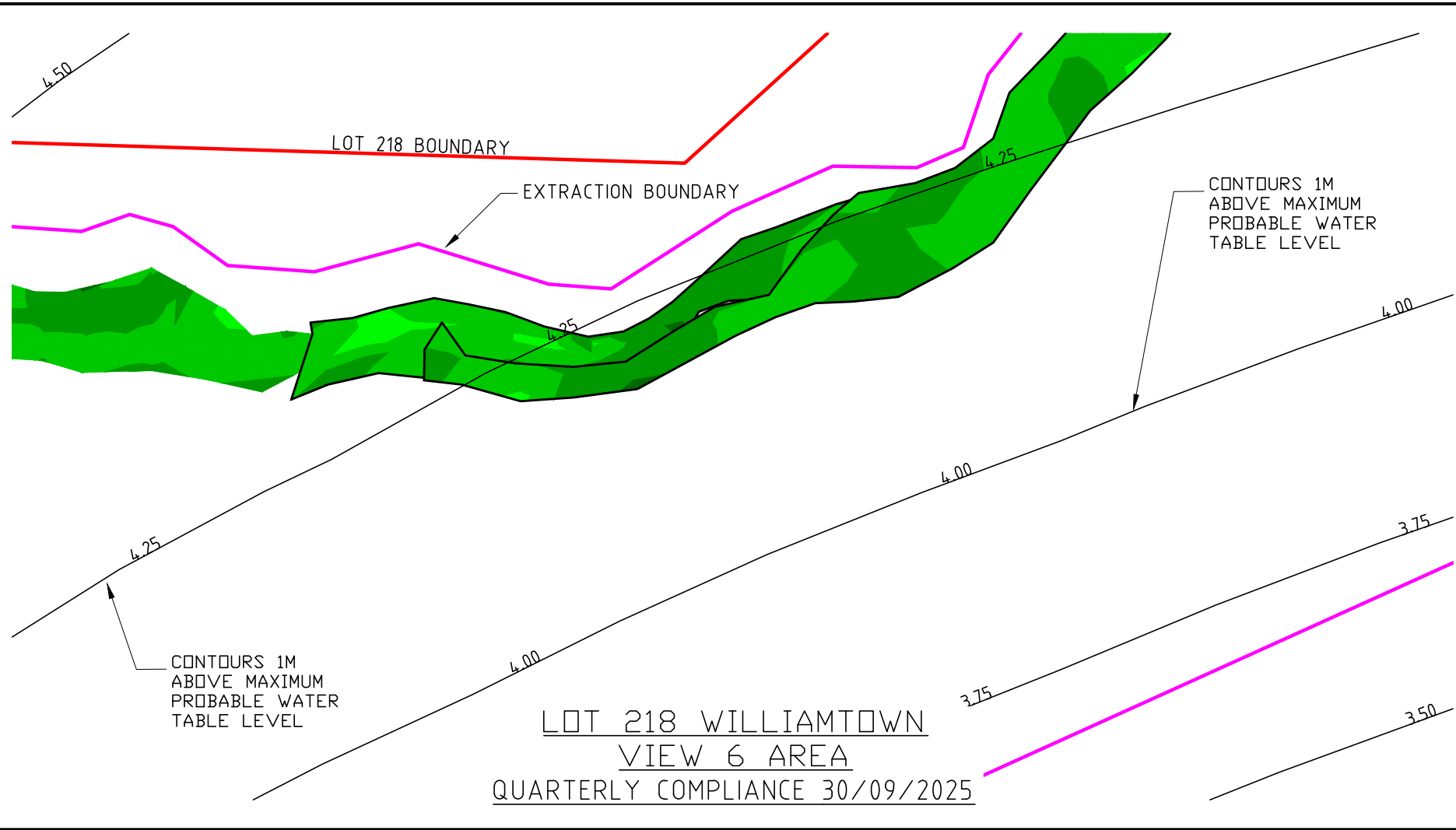
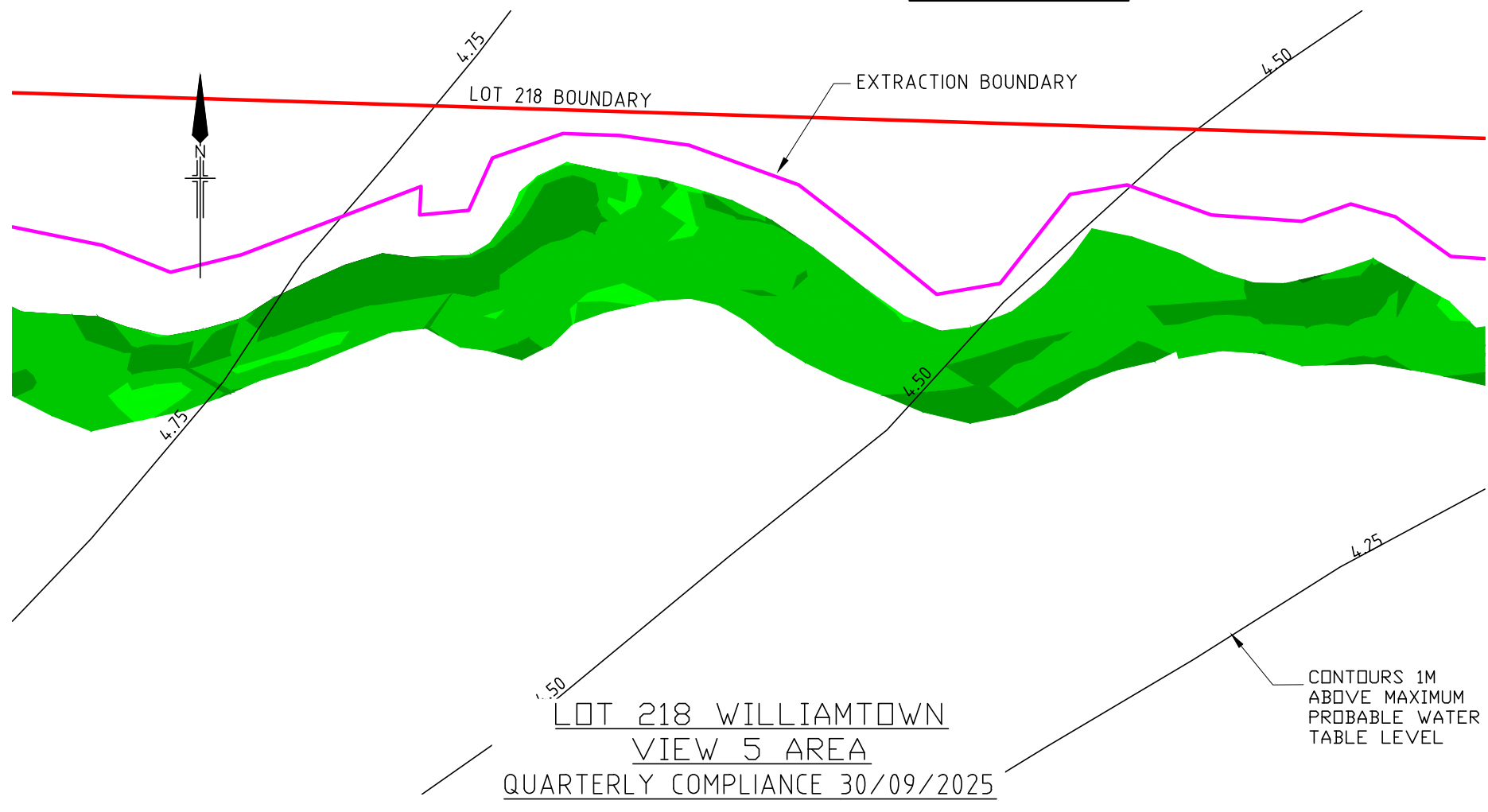
ABN: 66 605 045 314  
 P: (02) 4967 5927  
 M: 0429 987 821  
 Unit 11 56 Industrial Dr  
 Mayfield NSW 2304

TITLE:  
**LOT 218 EXTRACTION COMPLIANCE VIEW AREA 3 & 4**

STATUS:  
**SEPTEMBER 2025**

DRAWING NUMBER:

DO NOT SCALE



NOTES:

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6. DATE OF CURRENT SURVEY: 13/10/2025

DEPTH COMPLIANCE COMPARISON TO 1m ABOVE MAXIMUM PROBABLE GROUND WATER LEVEL			COLOUR
LOWER VALUE	UPPER VALUE		
-0.35	to -0.3	m	Red
-0.3	to -0.2	m	Orange
-0.2	to -0.1	m	Yellow
-0.1	to 0.0	m	Light Green
0.0	to 0.1	m	Green
0.1	to 0.2	m	Dark Green
0.2	to 0.5	m	Very Dark Green
0.5	to 1.0	m	Black
1.0	to 2.0	m	Black

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_250930.dwg

SURVEYED: CJ & LC

DRAWN: CJ

CHECKED: CJ

DATUM: AHD

ISSUE DATE: 04/12/2025

REVISION: A

CLIENT & JOB:

MACKAS SAND & SOIL

WILLIAMTOWN COMPLIANCE REPORTING

ABN: 66 605 045 314  
P: (02) 4967 5927  
M: 0429 987 821  
Unit 11 56 Industrial Dr  
Mayfield NSW 2304

TITLE:

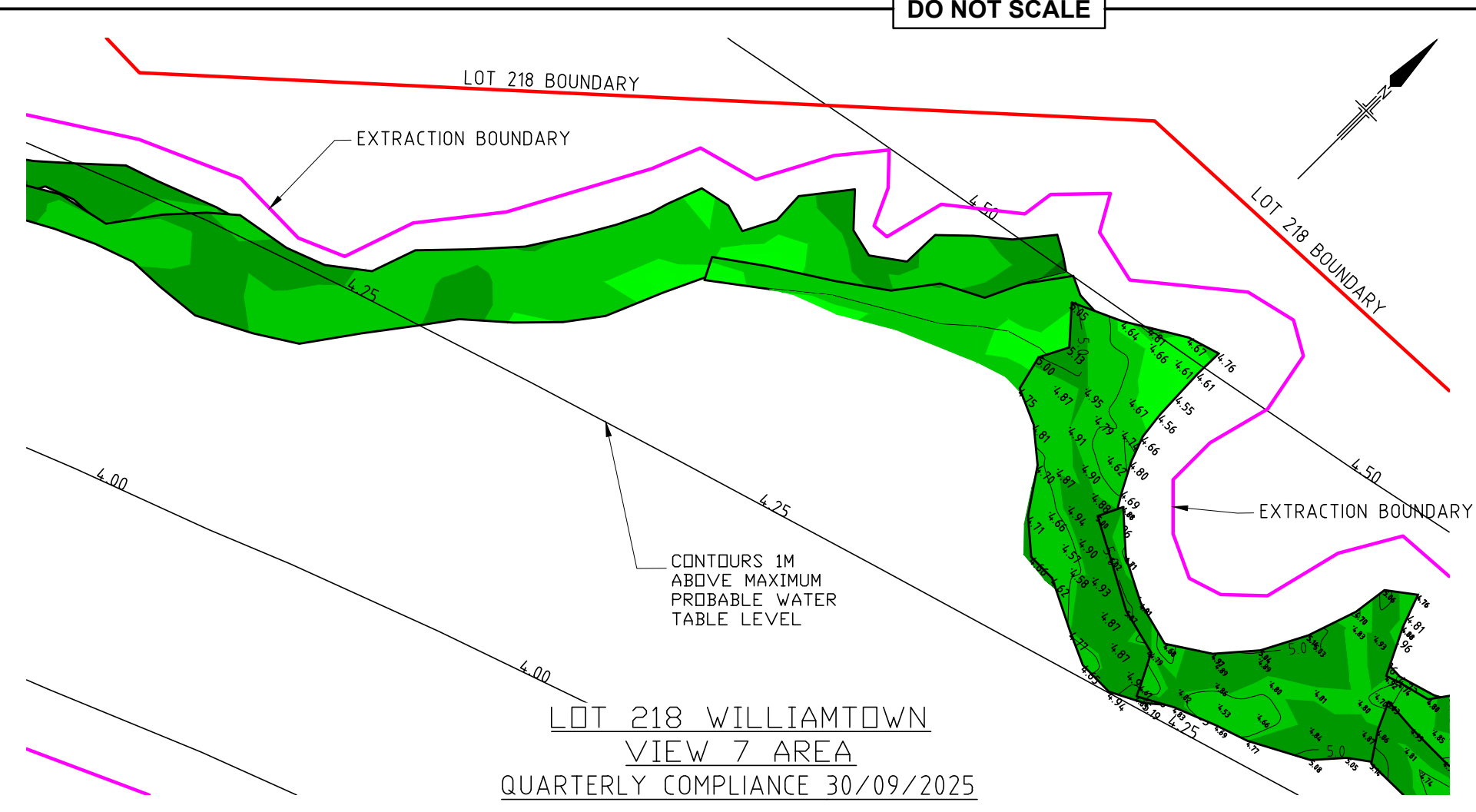
LOT 218 EXTRACTION COMPLIANCE VIEW AREA 5 & 6

STATUS:

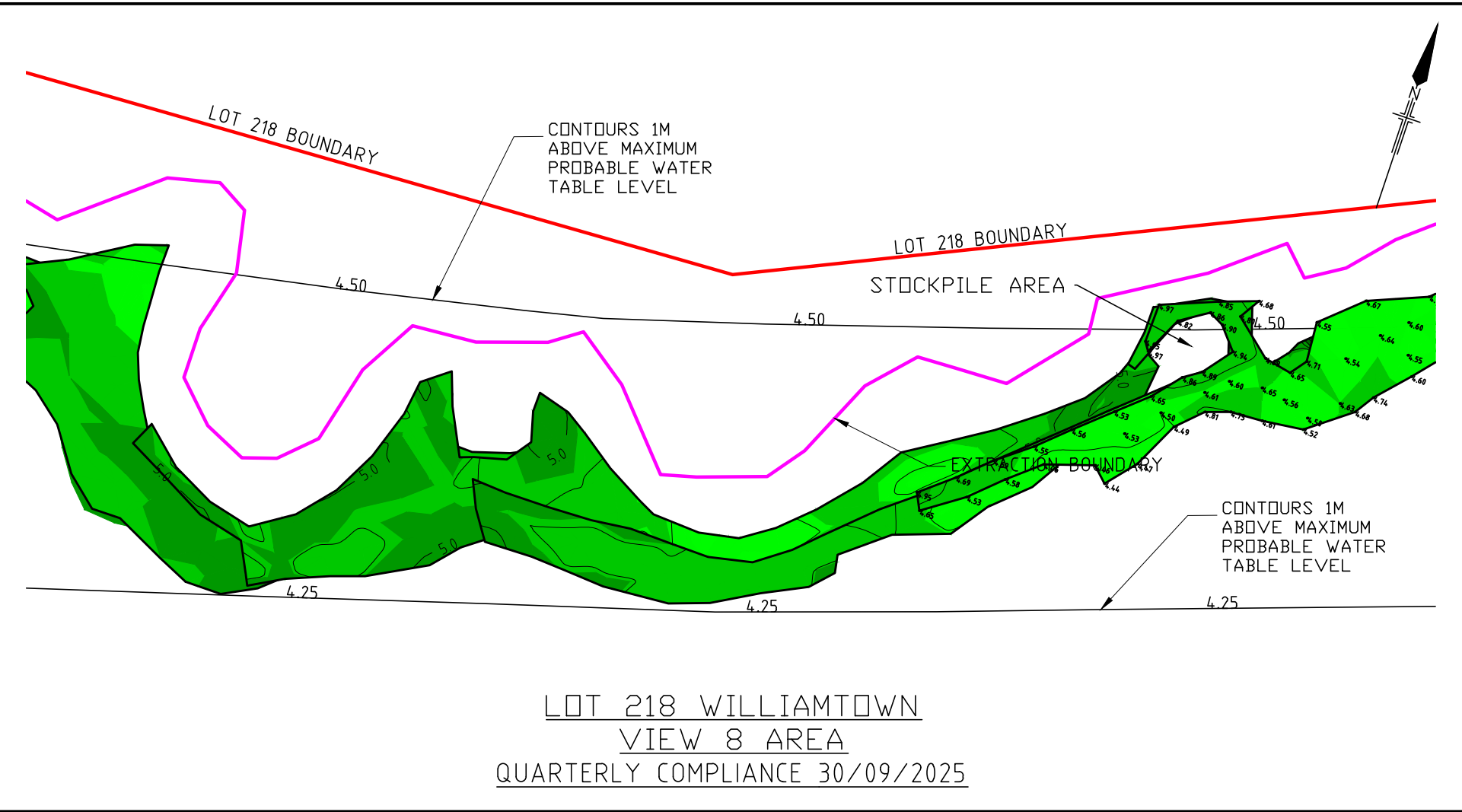
SEPTEMBER 2025

DRAWING NUMBER:

DO NOT SCALE



LOT 218 WILLIAMTOWN  
VIEW 7 AREA  
QUARTERLY COMPLIANCE 30/09/2025



LOT 218 WILLIAMTOWN  
VIEW 8 AREA  
QUARTERLY COMPLIANCE 30/09/2025

NOTES:

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DEPTH COMPLIANCE COMPARISON TO 1m ABOVE MAXIMUM PROBABLE GROUND WATER LEVEL			COLOUR
LOWER VALUE	UPPER VALUE		
-0.35	to -0.3	m	Red
-0.3	to -0.2	m	Orange
-0.2	to -0.1	m	Yellow
-0.1	to 0.0	m	Light Green
0.0	to 0.1	m	Green
0.1	to 0.2	m	Dark Green
0.2	to 0.5	m	Very Dark Green
0.5	to 1.0	m	Black
1.0	to 2.0	m	Black

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_250930.dwg

SURVEYED: CJ & LC

DRAWN: CJ

CHECKED: CJ

DATUM: AHD

ISSUE DATE: 04/12/2025

REVISION: A

CLIENT & JOB:

MACKAS SAND & SOIL

WILLIAMTOWN COMPLIANCE REPORTING

ABN: 66 605 045 314  
P: (02) 4967 5927  
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Unit 11 56 Industrial Dr  
Mayfield NSW 2304

TITLE:

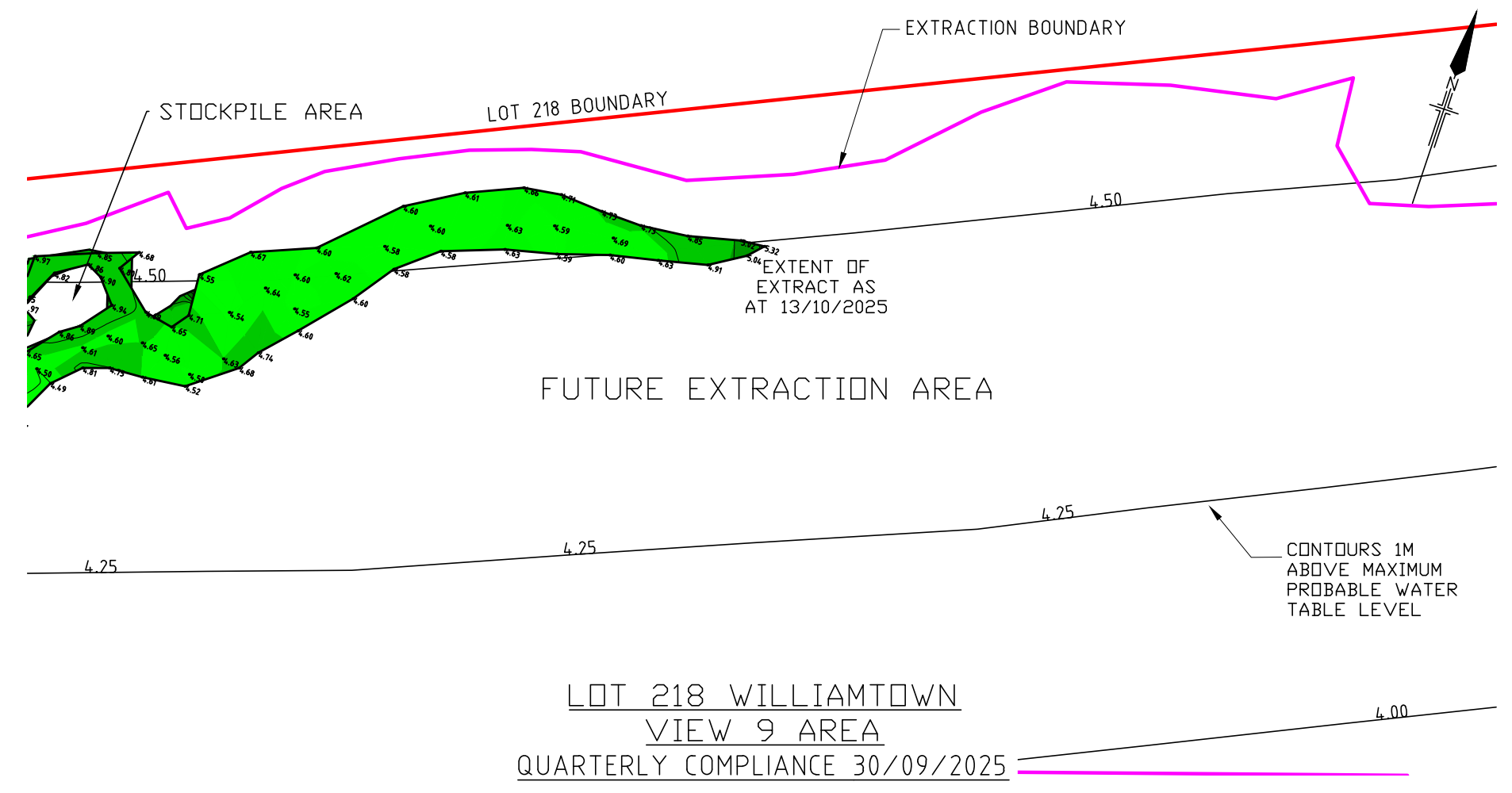
LOT 218 EXTRACTION COMPLIANCE VIEW AREA 7 & 8

STATUS:

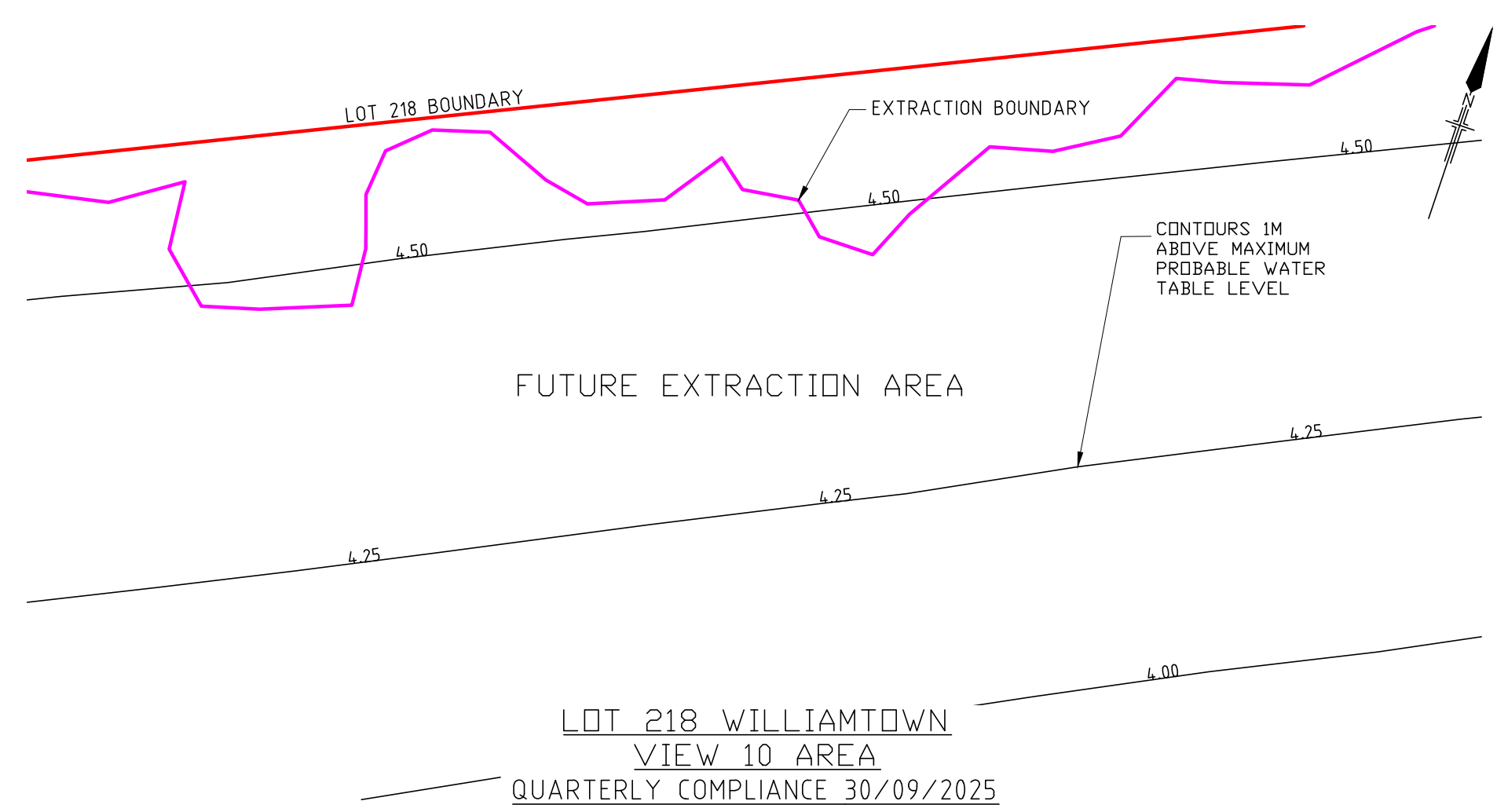
SEPTEMBER 2025

DRAWING NUMBER:

**DO NOT SCALE**



LOT 218 WILLIAMTOWN  
VIEW 9 AREA  
QUARTERLY COMPLIANCE 30/09/2025



LOT 218 WILLIAMTOWN  
VIEW 10 AREA  
QUARTERLY COMPLIANCE 30/09/2025

**NOTES:**

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6. DATE OF CURRENT SURVEY: 13/10/2025

DEPTH COMPLIANCE COMPARISON TO 1m ABOVE MAXIMUM PROBABLY GROUND WATER LEVEL			COLOUR	
LOWER VALUE	UPPER VALUE			
-0.35	to	-0.3	m	
-0.3	to	-0.2	m	
-0.2	to	-0.1	m	
-0.1	to	0.0	m	
0.0	to	0.1	m	
0.1	to	0.2	m	
0.2	to	0.5	m	
0.5	to	1.0	m	
1.0	to	2.0	m	

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_250930.dwg  
 SURVEYED: LC 13/10/2025  
 DRAWN: CJ  
 CHECKED: CJ  
 DATUM: AHD  
 ISSUE DATE: 04/12/2025  
 REVISION: A

CLIENT & JOB:  
**MACKAS SAND & SOIL**  
**WILLIAMTOWN COMPLIANCE REPORTING**

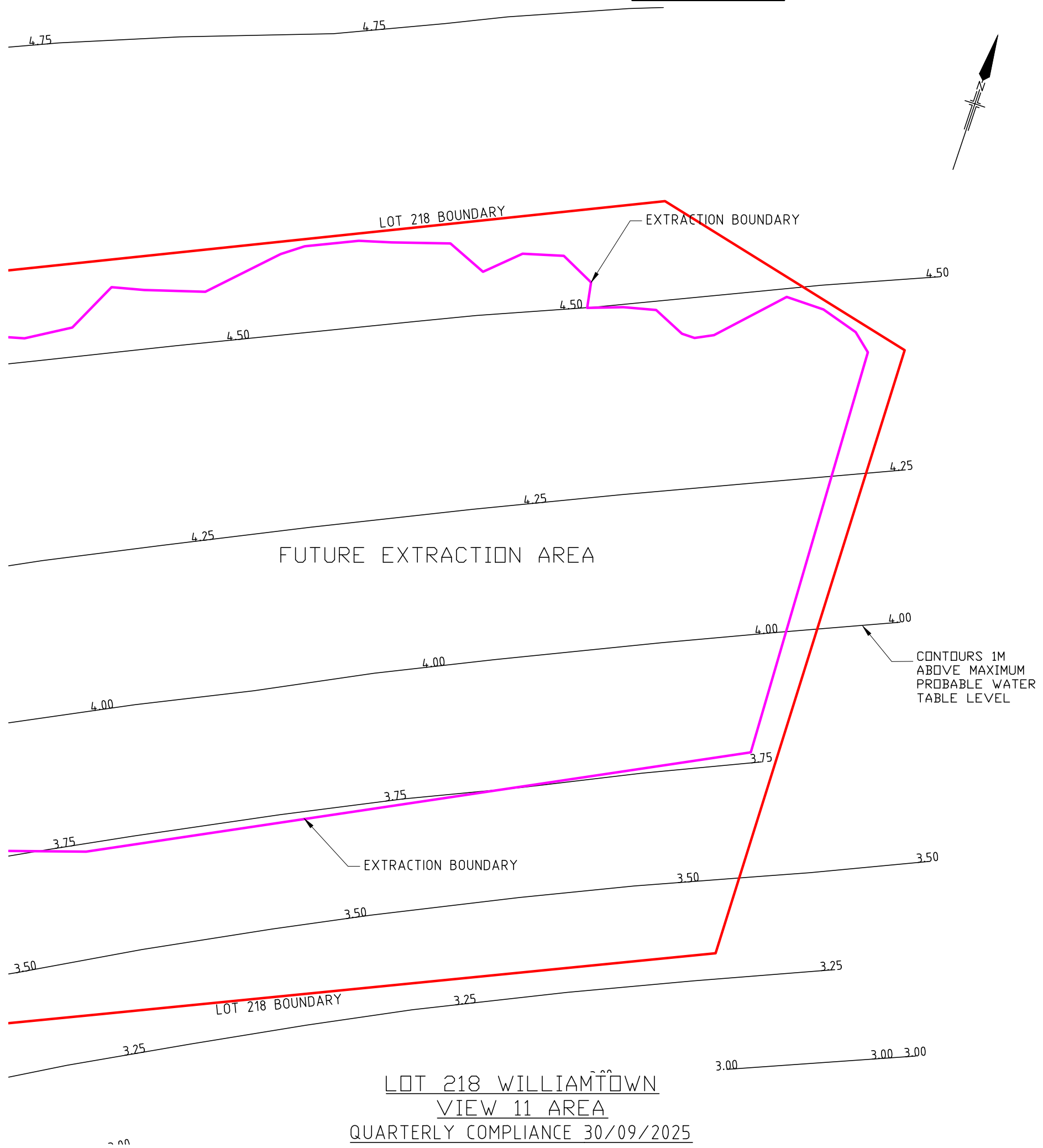
ABN: 66 605 045 314  
 P: (02) 4967 5927  
 M: 0429 987 821  
 Unit 11 56 Industrial Dr  
 Mayfield NSW 2304

TITLE:  
**LOT 218 EXTRACTION COMPLIANCE VIEW AREA 9 & 10**

STATUS:  
**SEPTEMBER 2025**

DRAWING NUMBER:

DO NOT SCALE



NOTES:

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6. DATE OF CURRENT SURVEY: 13/10/2025

DEPTH COMPLIANCE COMPARISON TO 1m ABOVE MAXIMUM PROBABLE GROUND WATER LEVEL			
LOWER VALUE	to	UPPER VALUE	COLOUR
-0.35	to	-0.3	m
-0.3	to	-0.2	m
-0.2	to	-0.1	m
-0.1	to	0.0	m
0.0	to	0.1	m
0.1	to	0.2	m
0.2	to	0.5	m
0.5	to	1.0	m
1.0	to	2.0	m

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_250930.dwg  
 SURVEYED: LC 13/10/2025  
 DRAWN: CJ  
 CHECKED: CJ  
 DATUM: AHD  
 ISSUE DATE: 04/12/2025  
 REVISION: A

CLIENT & JOB:  
**MACKAS SAND & SOIL**  
 WILLIAMTOWN COMPLIANCE REPORTING

ABN: 66 605 045 314  
 P: (02) 4967 5927  
 M: 0429 987 821  
 Unit 11 56 Industrial Dr  
 Mayfield NSW 2304

TITLE:  
**LOT 218 EXTRACTION COMPLIANCE VIEW AREA 9 & 10**

STATUS:  
**SEPTEMBER 2025**

DRAWING NUMBER:

DO NOT SCALE

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_220\_Compliance\_250930.dwg  
SURVEYED: CJ  
DRAWN: CJ  
CHECKED: CJ  
DATUM: AHD  
ISSUE DATE: 25/10/2025  
REVISION: A

CLIENT & JOB:  
**MACKAS SAND & SOIL SALT ASH**  
**COMPLIANCE REPORTING**



ABN: 66 605 045 314  
P: (02) 4967 5927  
M: 0429 987 821  
Unit 11 56 Industrial Dr  
Mayfield NSW 2304

TITLE:  
**LOT 220  
EXTRACTION LEVEL  
COMPLIANCE**

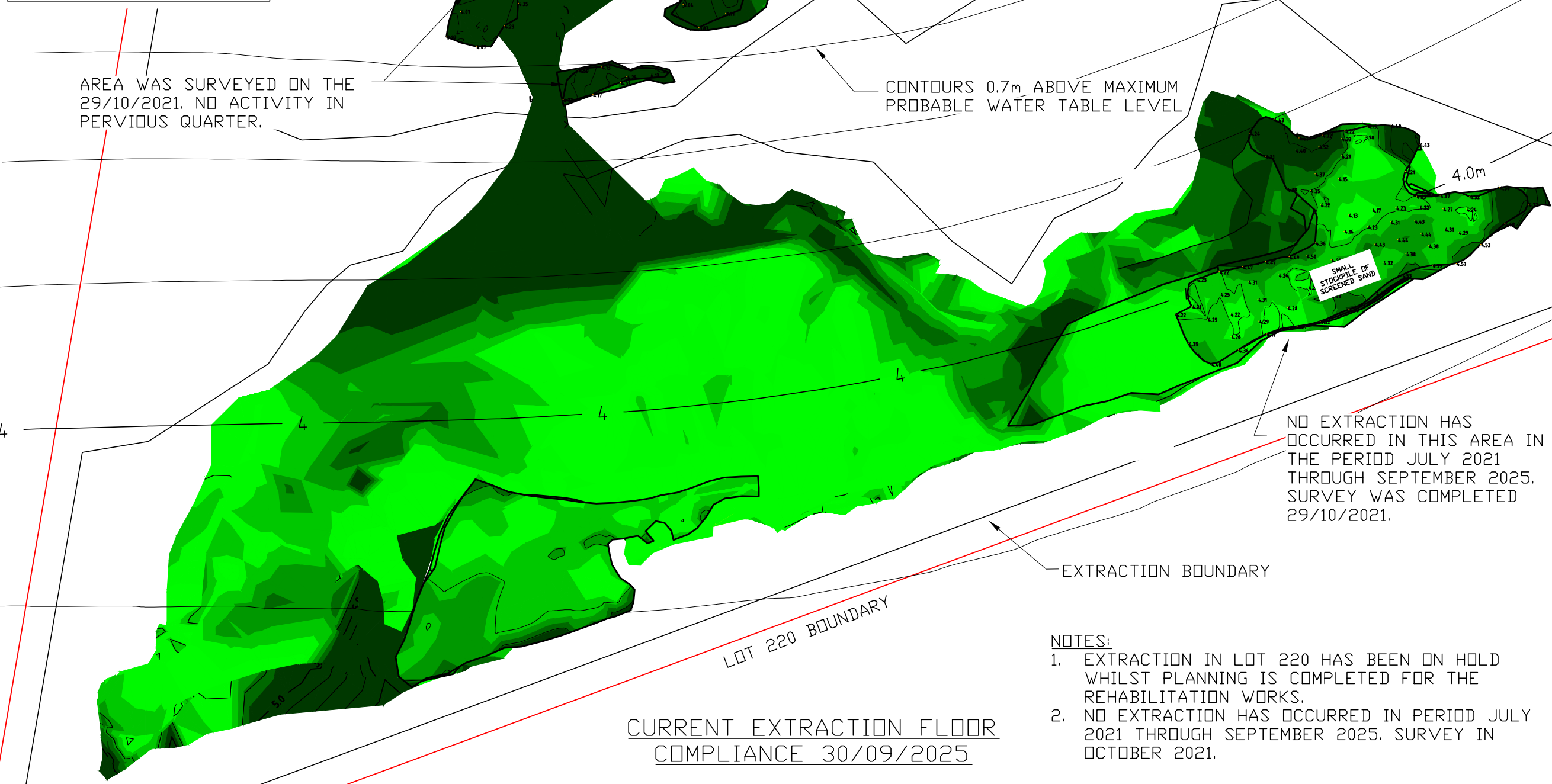
STATUS:  
**SEPTEMBER 2025**

DRAWING NUMBER:

SHEET 1 OF 1 SHEETS

A3

LOWER VALUE	UPPER VALUE	COLOUR
-0.35	to -0.3	m
-0.3	to -0.2	m
-0.2	to -0.1	m
-0.1	to 0.0	m
0.0	to 0.1	m
0.1	to 0.2	m
0.2	to 0.5	m
0.5	to 1.0	m
1.0	to 2.0	m



AREA WAS SURVEYED ON THE 29/10/2021. NO ACTIVITY IN PERVIOUS QUARTER.

CONTOURS 0.7m ABOVE MAXIMUM PROBABLE WATER TABLE LEVEL

NOTE: THIS AREA HAS NOT BEEN EXTRACTED AT THIS POINT IN TIME

NO EXTRACTION HAS OCCURRED IN THIS AREA IN THE PERIOD JULY 2021 THROUGH SEPTEMBER 2025. SURVEY WAS COMPLETED 29/10/2021.

NO EXTRACTION HAS OCCURRED IN THIS AREA IN THE PERIOD JULY 2021 THROUGH SEPTEMBER 2025. SURVEY WAS COMPLETED 29/10/2021.

**NOTES:**

- EXTRACTION IN LOT 220 HAS BEEN ON HOLD WHILST PLANNING IS COMPLETED FOR THE REHABILITATION WORKS.
- NO EXTRACTION HAS OCCURRED IN PERIOD JULY 2021 THROUGH SEPTEMBER 2025. SURVEY IN OCTOBER 2021.

CURRENT EXTRACTION FLOOR COMPLIANCE 30/09/2025

DO NOT SCALE

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_251219.dwg  
SURVEYED: CJ & LC  
DRAWN: CJ  
CHECKED: CJ  
DATUM: AHD  
ISSUE DATE: 15/01/2026  
REVISION: A

CLIENT & JOB:

MACKAS  
SAND & SOIL

WILLIAMTOWN  
COMPLIANCE  
REPORTING



ABN: 66 605 045 314  
P: (02) 4967 5927  
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Unit 11 56 Industrial Dr  
Mayfield NSW 2304

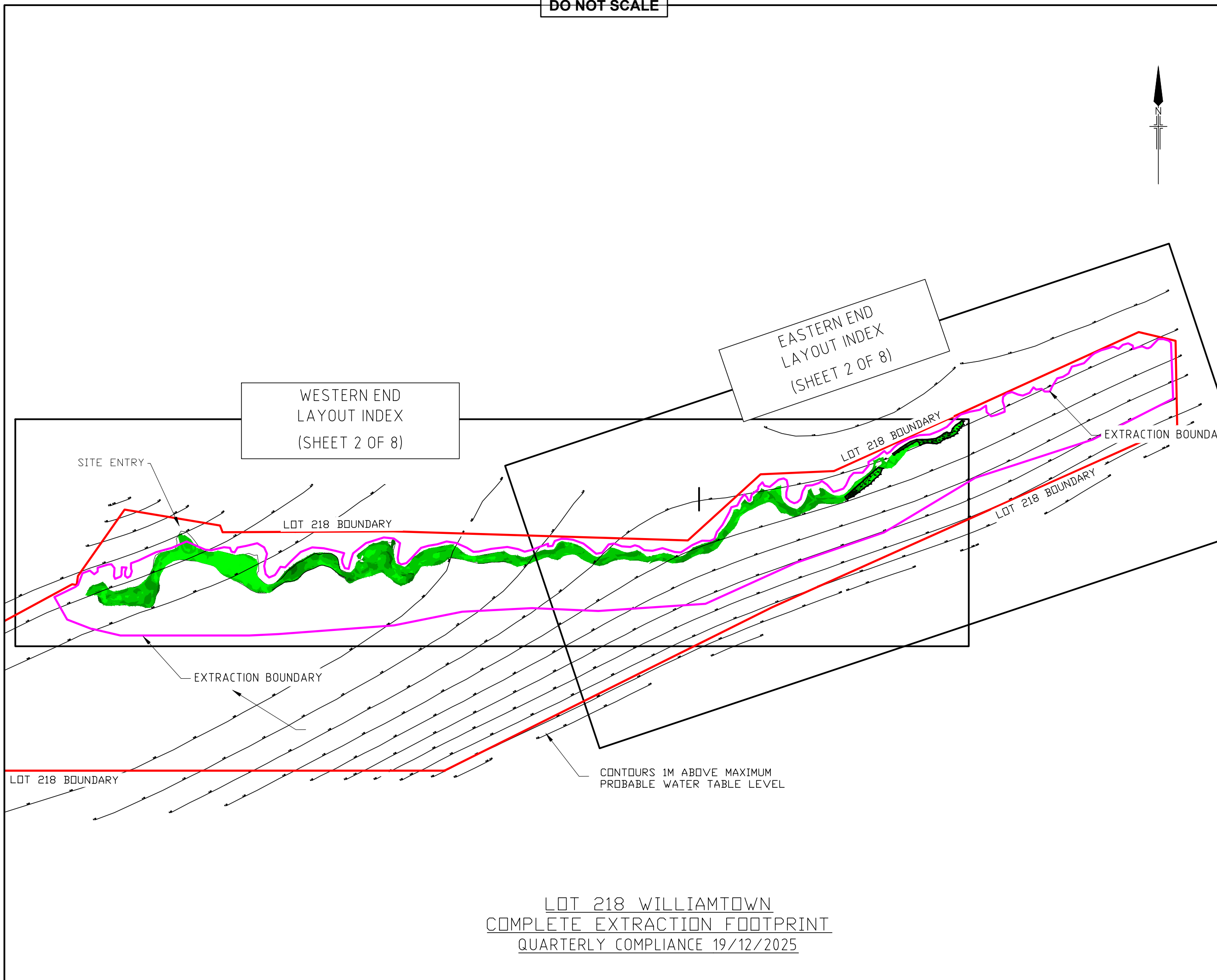
TITLE:  
  
LOT 218  
QUARTERLY COMPLIANCE  
SHEET LAYOUT INDEX

STATUS:  
  
DECEMBER 2025

DRAWING NUMBER:

SHEET 1 OF 8 SHEETS

A3



LOT 218 WILLIAMTOWN  
COMPLETE EXTRACTION FOOTPRINT  
QUARTERLY COMPLIANCE 19/12/2025

DO NOT SCALE

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_251219.dwg  
SURVEYED: LC 19/12/2025  
DRAWN: CJ  
CHECKED: CJ  
DATUM: AHD  
ISSUE DATE: 15/01/2026  
REVISION: A

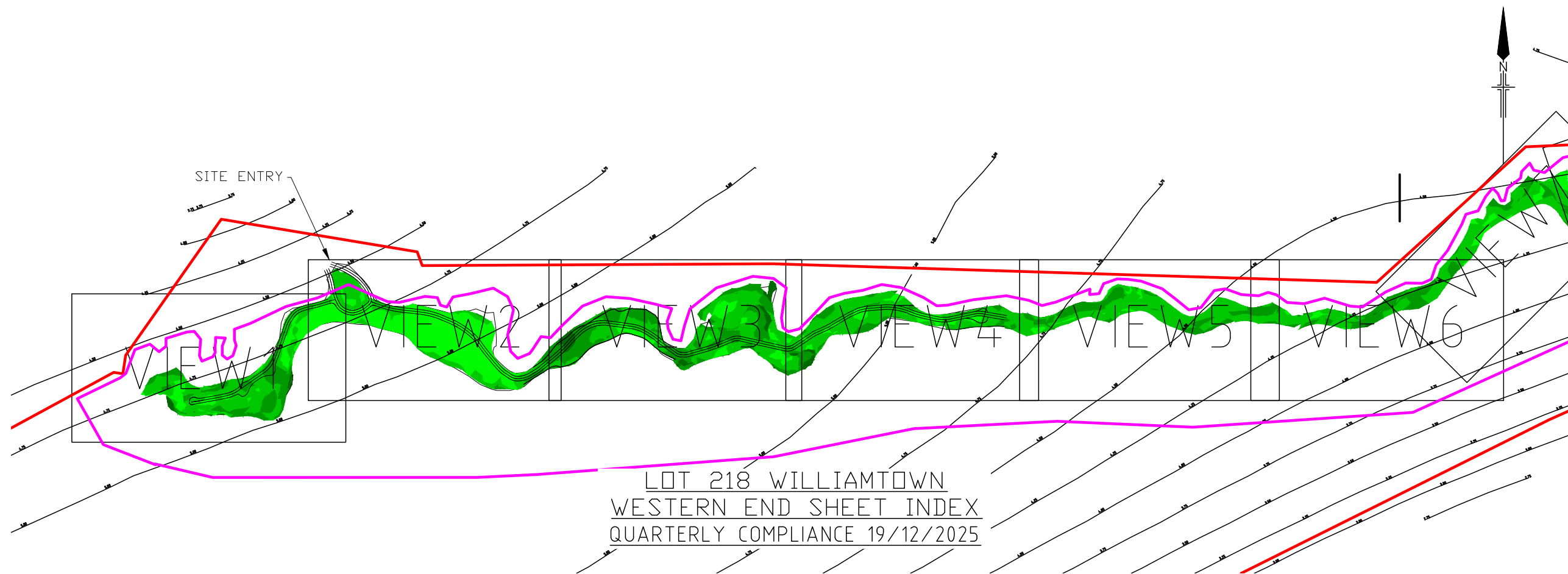
CLIENT & JOB:

MACKAS  
SAND & SOIL

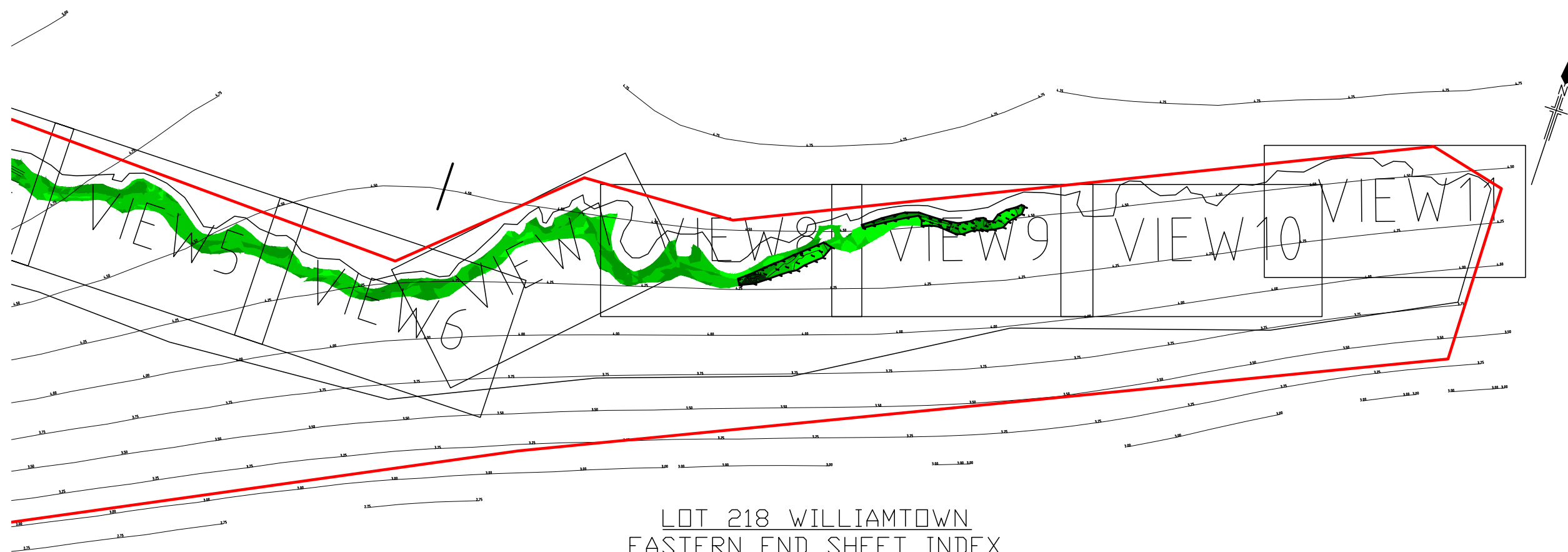
WILLIAMTOWN  
COMPLIANCE  
REPORTING



ABN: 66 605 045 314  
P: (02) 4967 5927  
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Unit 11 56 Industrial Dr  
Mayfield NSW 2304



LOT 218 WILLIAMTOWN  
WESTERN END SHEET INDEX  
QUARTERLY COMPLIANCE 19/12/2025



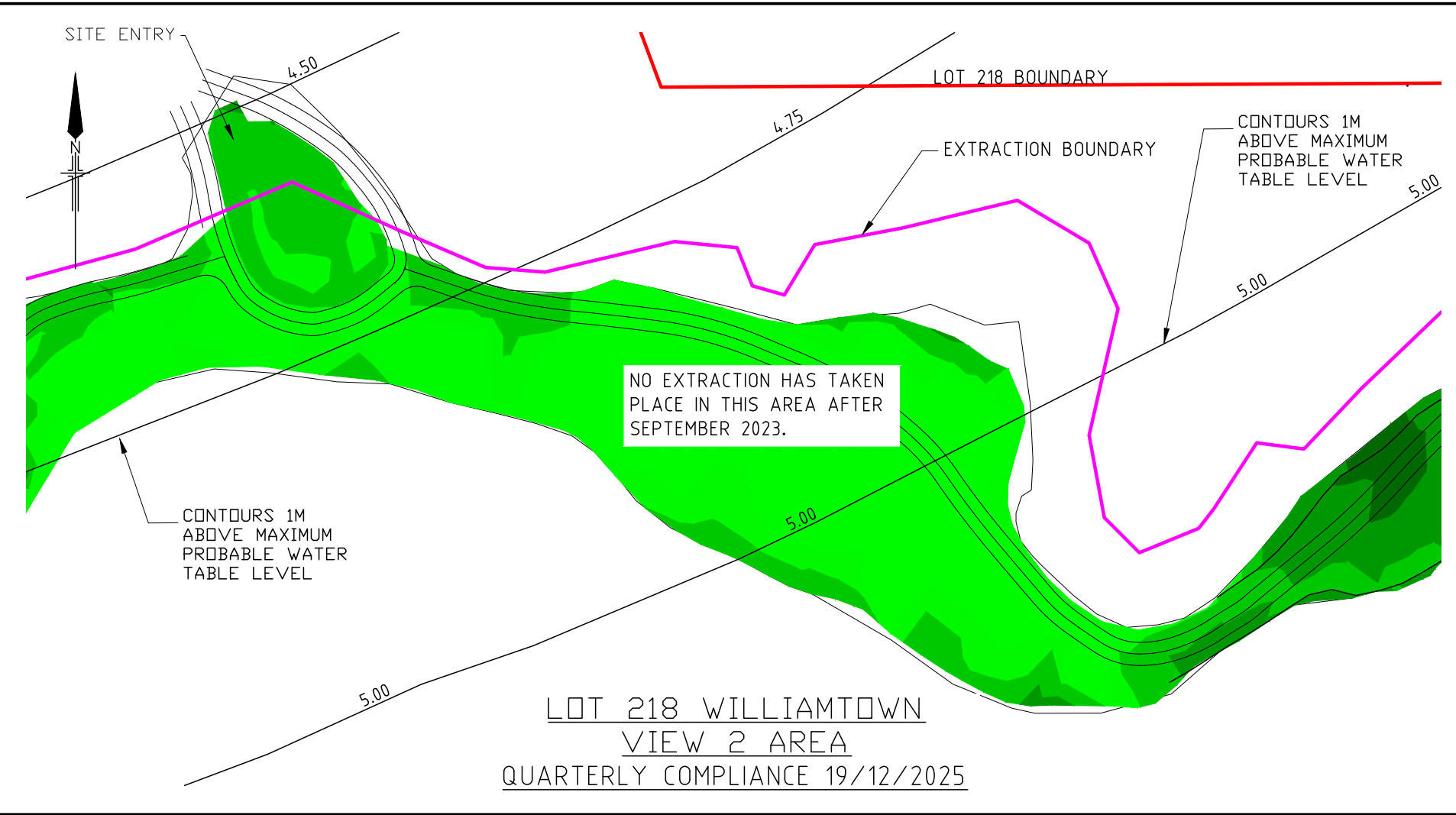
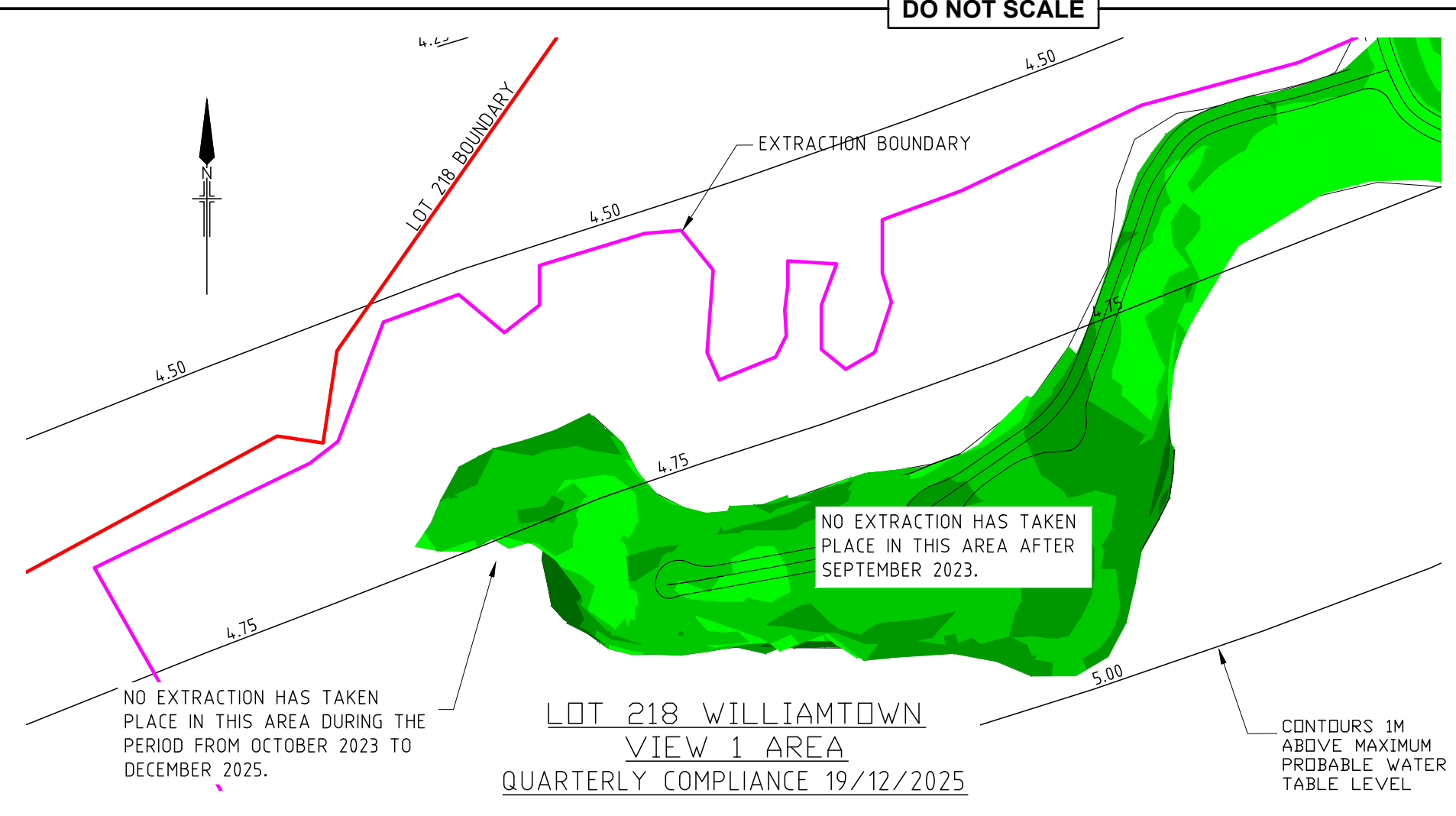
LOT 218 WILLIAMTOWN  
EASTERN END SHEET INDEX  
QUARTERLY COMPLIANCE 19/12/2025

TITLE:  
  
LOT 218  
SHEET INDEX  
PLAN

STATUS:  
DECEMBER 2025

DRAWING NUMBER:

DO NOT SCALE



NOTES:

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LOWER VALUE	UPPER VALUE		
-0.35	to -0.3	m	
-0.3	to -0.2	m	
-0.2	to -0.1	m	
-0.1	to 0.0	m	
0.0	to 0.1	m	
0.1	to 0.2	m	
0.2	to 0.5	m	
0.5	to 1.0	m	
1.0	to 2.0	m	

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_251219.dwg

SURVEYED: CJ & LC

DRAWN: CJ

CHECKED: CJ

DATUM: AHD

ISSUE DATE: 15/01/2026

REVISION: A

CLIENT & JOB:

MACKAS SAND & SOIL

WILLIAMTOWN COMPLIANCE REPORTING

ABN: 66 605 045 314  
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Mayfield NSW 2304

TITLE:

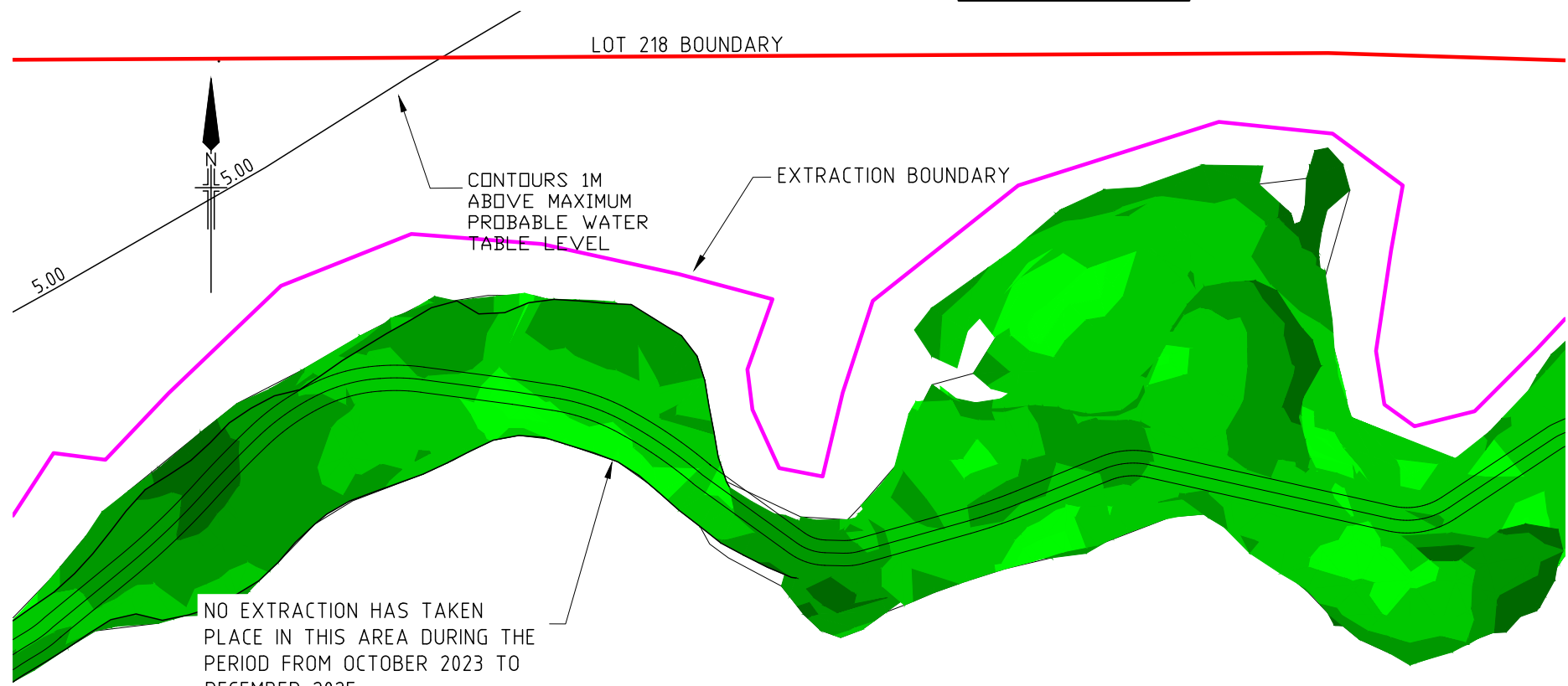
LOT 218 EXTRACTION COMPLIANCE VIEW AREA 1 & 2

STATUS:

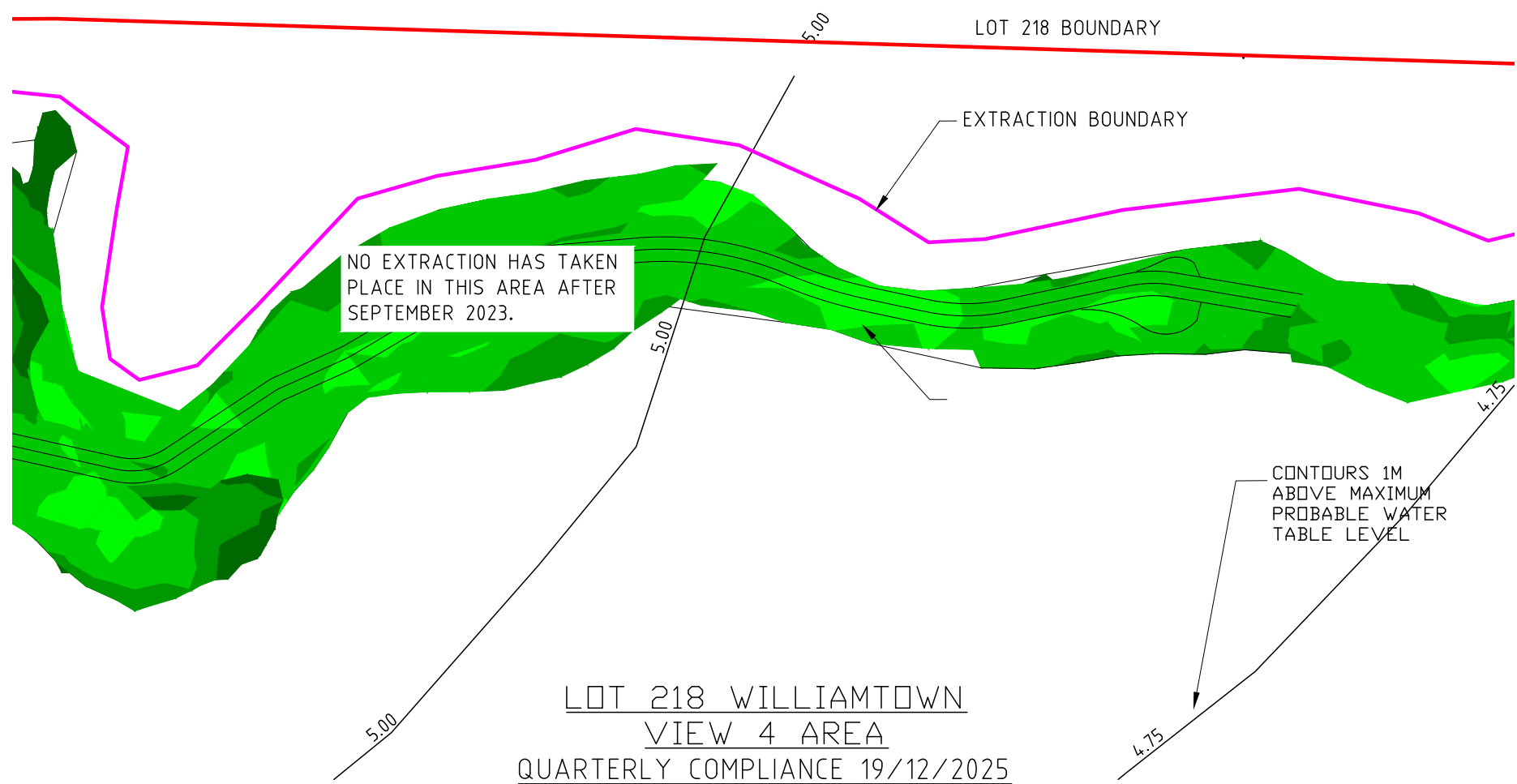
DECEMBER 2025

DRAWING NUMBER:

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LOT 218 WILLIAMTOWN  
VIEW 3 AREA  
QUARTERLY COMPLIANCE 19/12/2025



LOT 218 WILLIAMTOWN  
VIEW 4 AREA  
QUARTERLY COMPLIANCE 19/12/2025

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LOWER VALUE	UPPER VALUE		
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-0.3	to -0.2	m	
-0.2	to -0.1	m	
-0.1	to 0.0	m	
0.0	to 0.1	m	
0.1	to 0.2	m	
0.2	to 0.5	m	
0.5	to 1.0	m	
1.0	to 2.0	m	

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_251219.dwg

SURVEYED: CJ & LC

DRAWN: CJ

CHECKED: CJ

DATUM: AHD

ISSUE DATE: 15/01/2026

REVISION: A

CLIENT & JOB:

**MACKAS SAND & SOIL**

**WILLIAMTOWN COMPLIANCE REPORTING**

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Mayfield NSW 2304

TITLE:

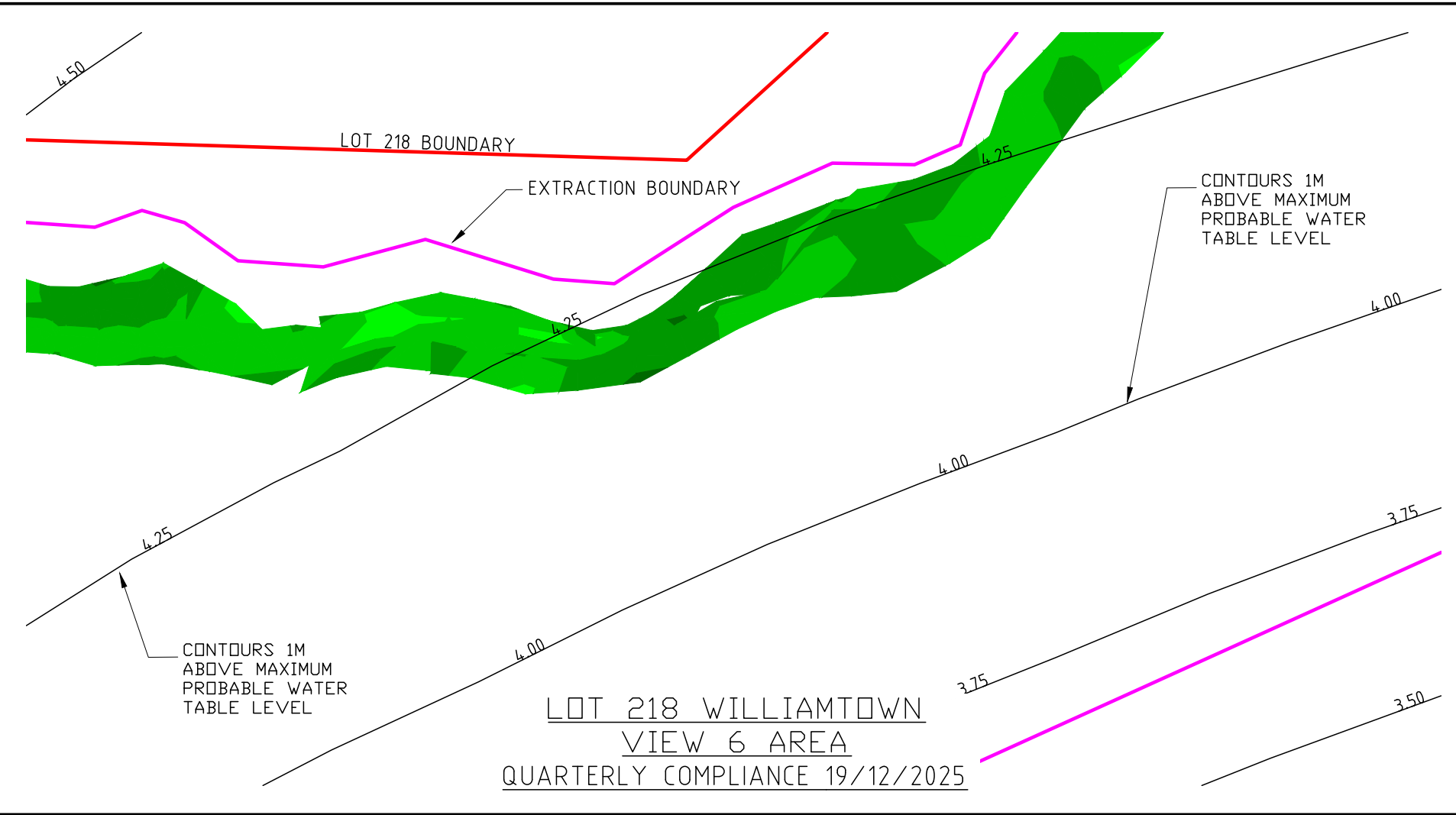
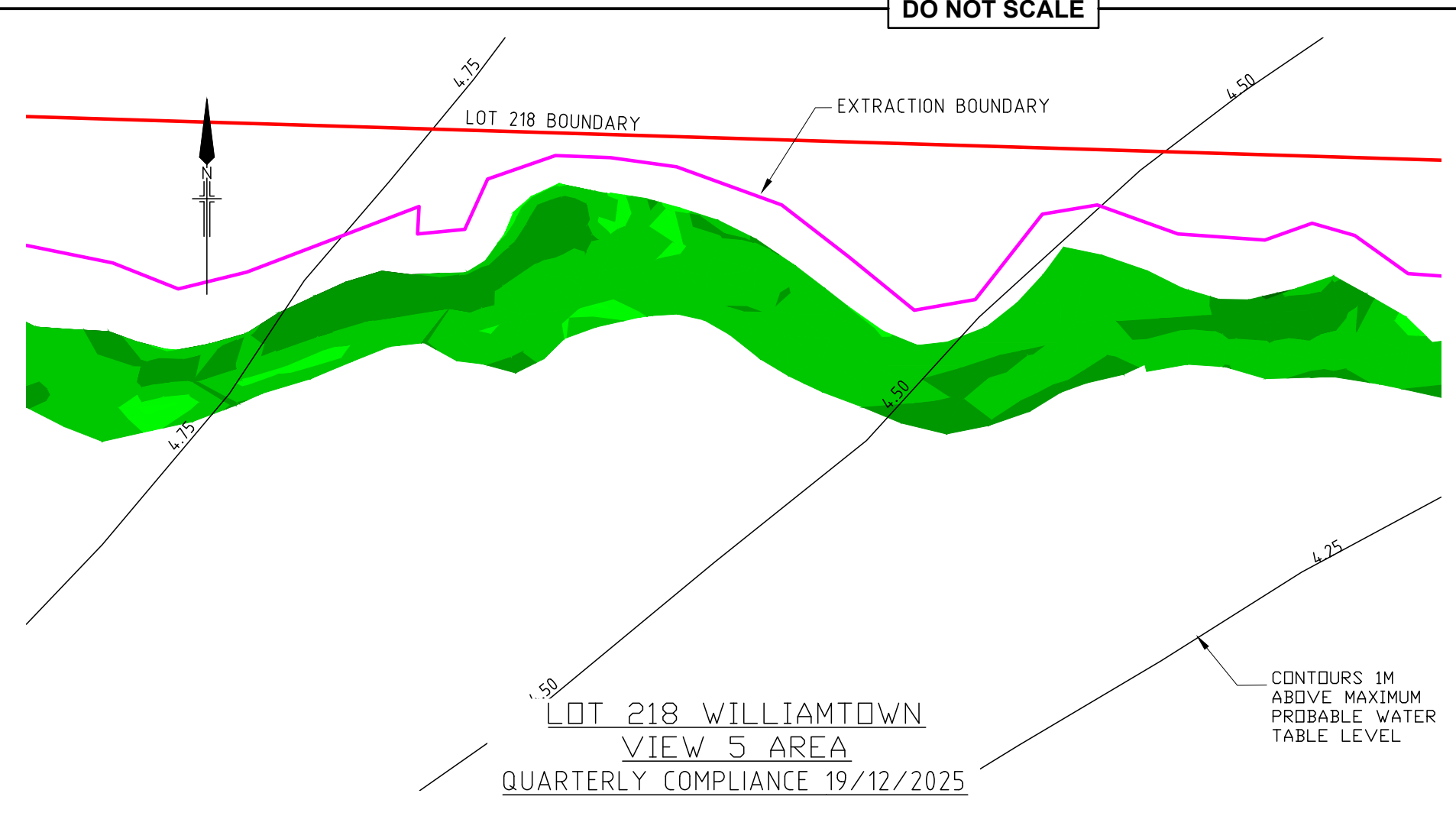
**LOT 218 EXTRACTION COMPLIANCE VIEW AREA 3 & 4**

STATUS:

**DECEMBER 2025**

DRAWING NUMBER:

DO NOT SCALE



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2. THE SURFACE LEVEL EITHER SIDE OF THE ACCESS ROAD IN OPERATIONAL AREAS IS COMPLIANT AS AT 19/12/2025.
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4. AREAS WITHOUT SPOT HEIGHT SHOWN WERE IDENTIFIED AS COMPLYING IN PREVIOUS SURVEYS. THESE AREAS DO NOT FORM PART OF THE ACTIVE EXTRACTION OPERATION AND DO NOT FORM PART OF THIS SURVEY REPORT AND ARE ONLY SHOWN TO IDENTIFY THE CURRENT EXTENT OF THE EXTRACTION FLOOR.
5. SURVEY TO CONFIRM COMPLIANCE AT WESTERN END FOR THE QUARTER ENDING 19/12/2025 WAS COMPLETED 17/10/2023.
6. DATE OF CURRENT SURVEY: 19/12/2025

DEPTH COMPLIANCE COMPARISON TO 1m ABOVE MAXIMUM PROBABLE GROUND WATER LEVEL			COLOUR
LOWER VALUE	UPPER VALUE		
-0.35	to -0.3	m	Red
-0.3	to -0.2	m	Orange
-0.2	to -0.1	m	Yellow
-0.1	to 0.0	m	Light Green
0.0	to 0.1	m	Green
0.1	to 0.2	m	Dark Green
0.2	to 0.5	m	Medium Green
0.5	to 1.0	m	Light Green
1.0	to 2.0	m	Dark Green

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_251219.dwg  
 SURVEYED: CJ & LC  
 DRAWN: CJ  
 CHECKED: CJ  
 DATUM: AHD  
 ISSUE DATE: 15/01/2026  
 REVISION: A

CLIENT & JOB:

MACKAS SAND & SOIL

WILLIAMTOWN COMPLIANCE REPORTING

ABN: 66 605 045 314  
 P: (02) 4967 5927  
 M: 0429 987 821  
 Unit 11 56 Industrial Dr  
 Mayfield NSW 2304

TITLE:

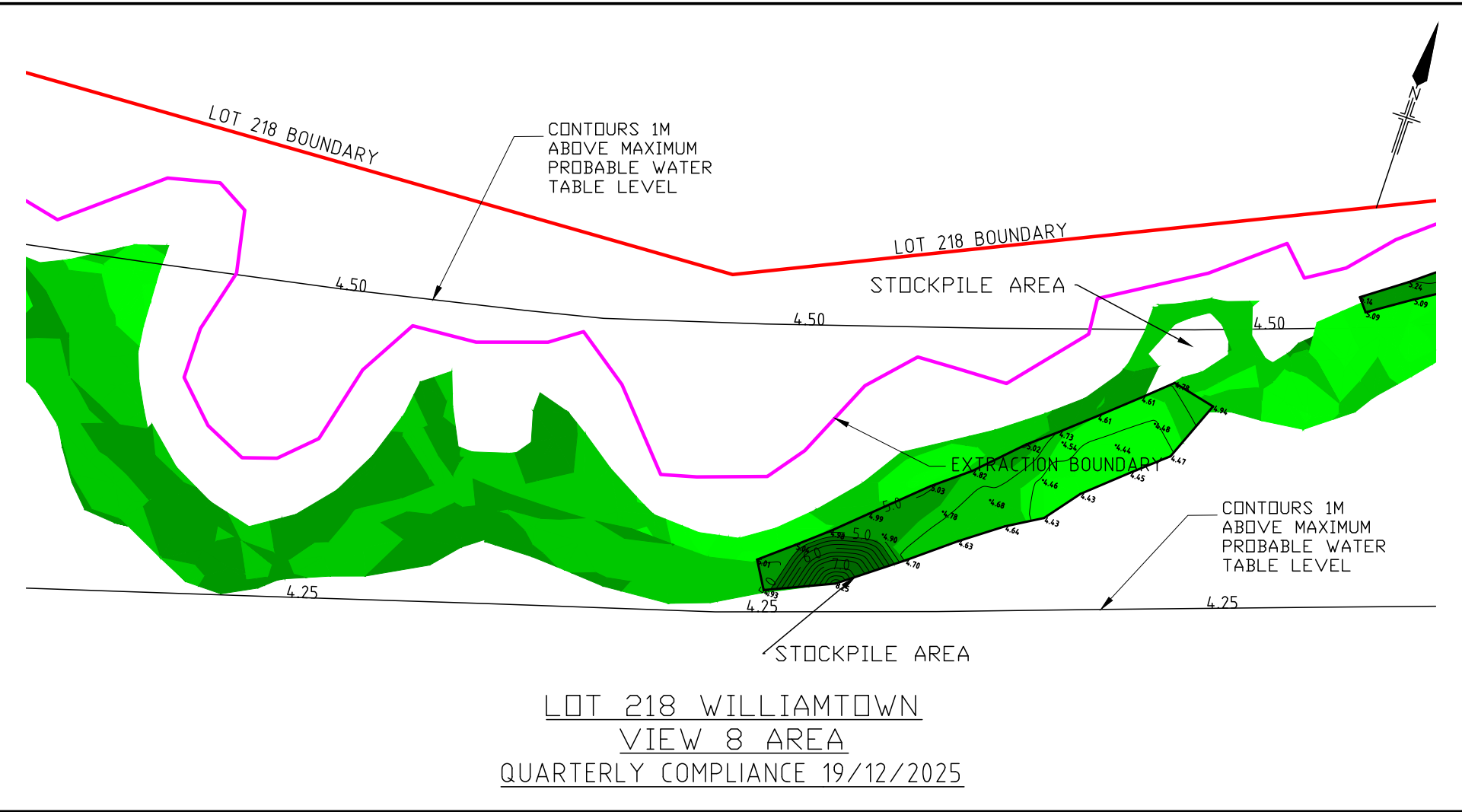
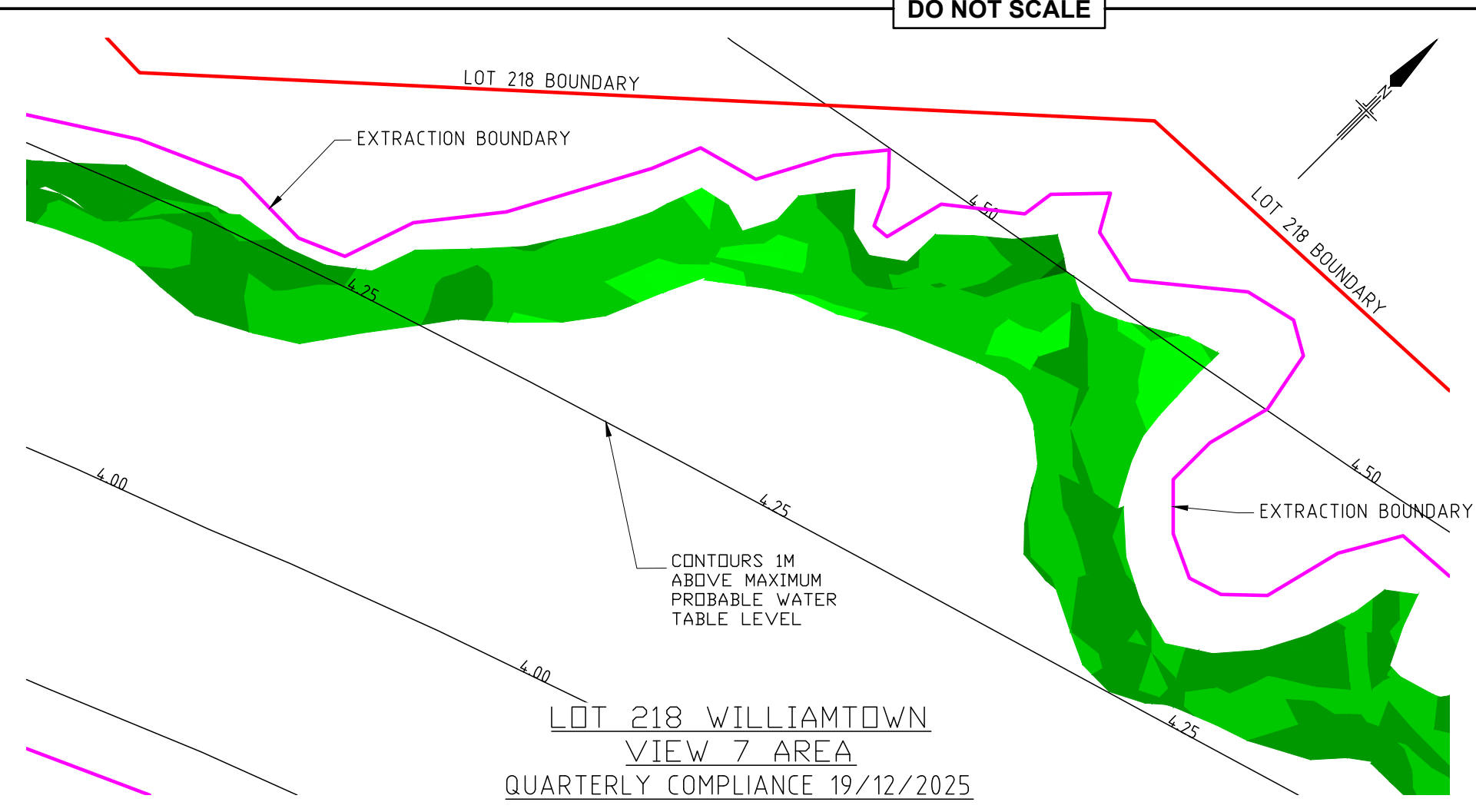
LOT 218 EXTRACTION COMPLIANCE VIEW AREA 5 & 6

STATUS:

DECEMBER 2025

DRAWING NUMBER:

**DO NOT SCALE**



**NOTES:**

1. THE ROAD SURFACE LEVEL HAS BEEN RAISED TO A MINIMUM OF 300mm-400mm ABOVE THE EXTRACTION SURFACE.
2. THE SURFACE LEVEL EITHER SIDE OF THE ACCESS ROAD IN OPERATIONAL AREAS IS COMPLIANT AS AT 19/12/2025.
3. SHOT HEIGHTS SHOWN ARE FOR THE CURRENT OPERATIONAL FOOTPRINT AND CAN BE USED TO IDENTIFY THE EXTENT OF THE SURVEY.
4. AREAS WITHOUT SPOT HEIGHT SHOWN WERE IDENTIFIED AS COMPLYING IN PREVIOUS SURVEYS. THESE AREAS DO NOT FORM PART OF THE ACTIVE EXTRACTION OPERATION AND DO NOT FORM PART OF THIS SURVEY REPORT AND ARE ONLY SHOWN TO IDENTIFY THE CURRENT EXTENT OF THE EXTRACTION FLOOR.
5. SURVEY TO CONFIRM COMPLIANCE AT WESTERN END FOR THE QUARTER ENDING 19/12/2025 WAS COMPLETED 17/10/2023.
6. DATE OF CURRENT SURVEY: 19/12/2025

DEPTH COMPLIANCE COMPARISON TO 1m ABOVE MAXIMUM PROBABLE GROUND WATER LEVEL			COLOUR
LOWER VALUE	UPPER VALUE		
-0.35	to -0.3	m	
-0.3	to -0.2	m	
-0.2	to -0.1	m	
-0.1	to 0.0	m	
0.0	to 0.1	m	
0.1	to 0.2	m	
0.2	to 0.5	m	
0.5	to 1.0	m	
1.0	to 2.0	m	

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_251219.dwg

SURVEYED: CJ & LC

DRAWN: CJ

CHECKED: CJ

DATUM: AHD

ISSUE DATE: 15/01/2026

REVISION: A

CLIENT & JOB:

**MACKAS SAND & SOIL**

**WILLIAMTOWN COMPLIANCE REPORTING**

**CENTURION SURVEY PTY LTD**

ABN: 66 605 045 314  
P: (02) 4967 5927  
M: 0429 987 821  
Unit 11 56 Industrial Dr  
Mayfield NSW 2304

TITLE:

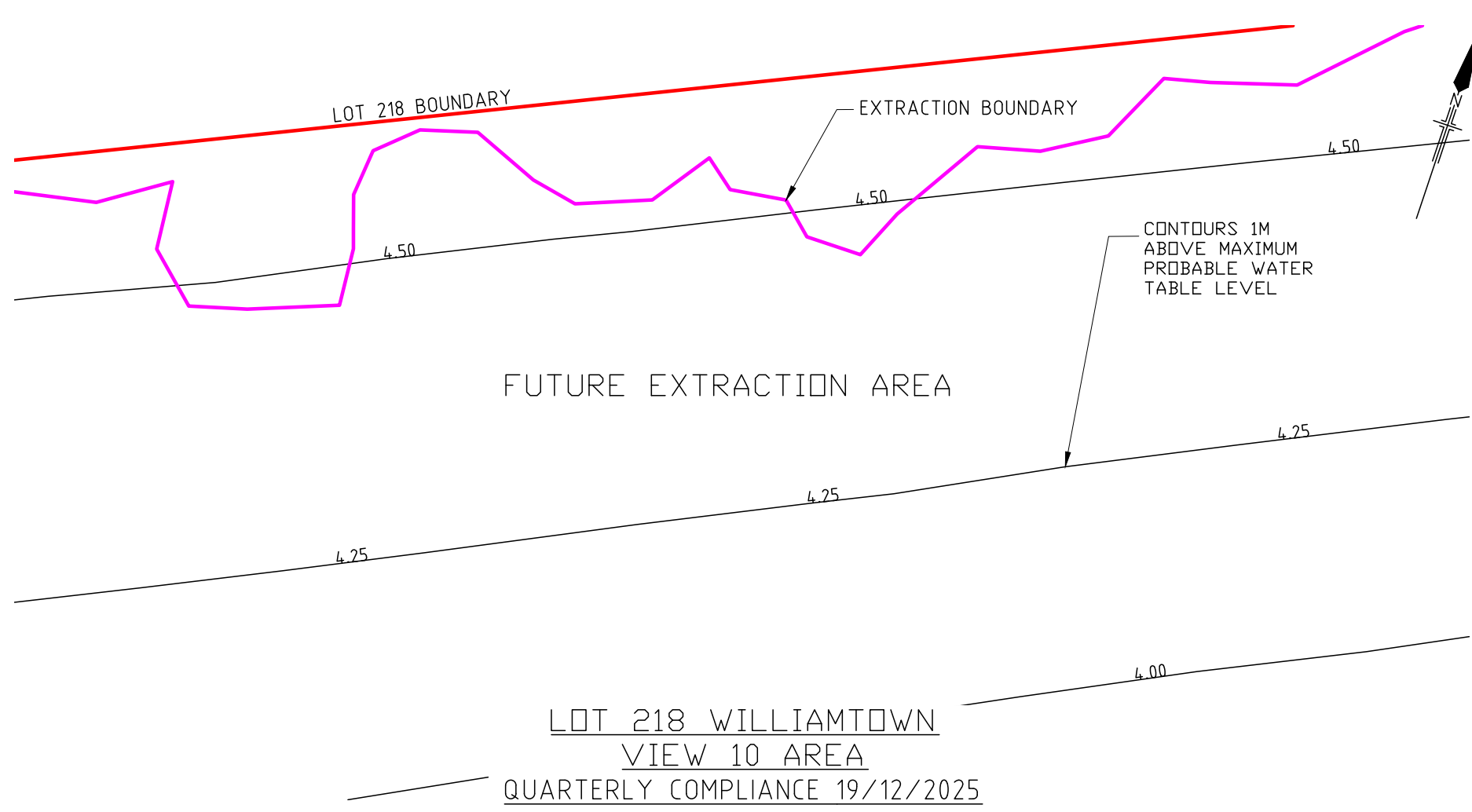
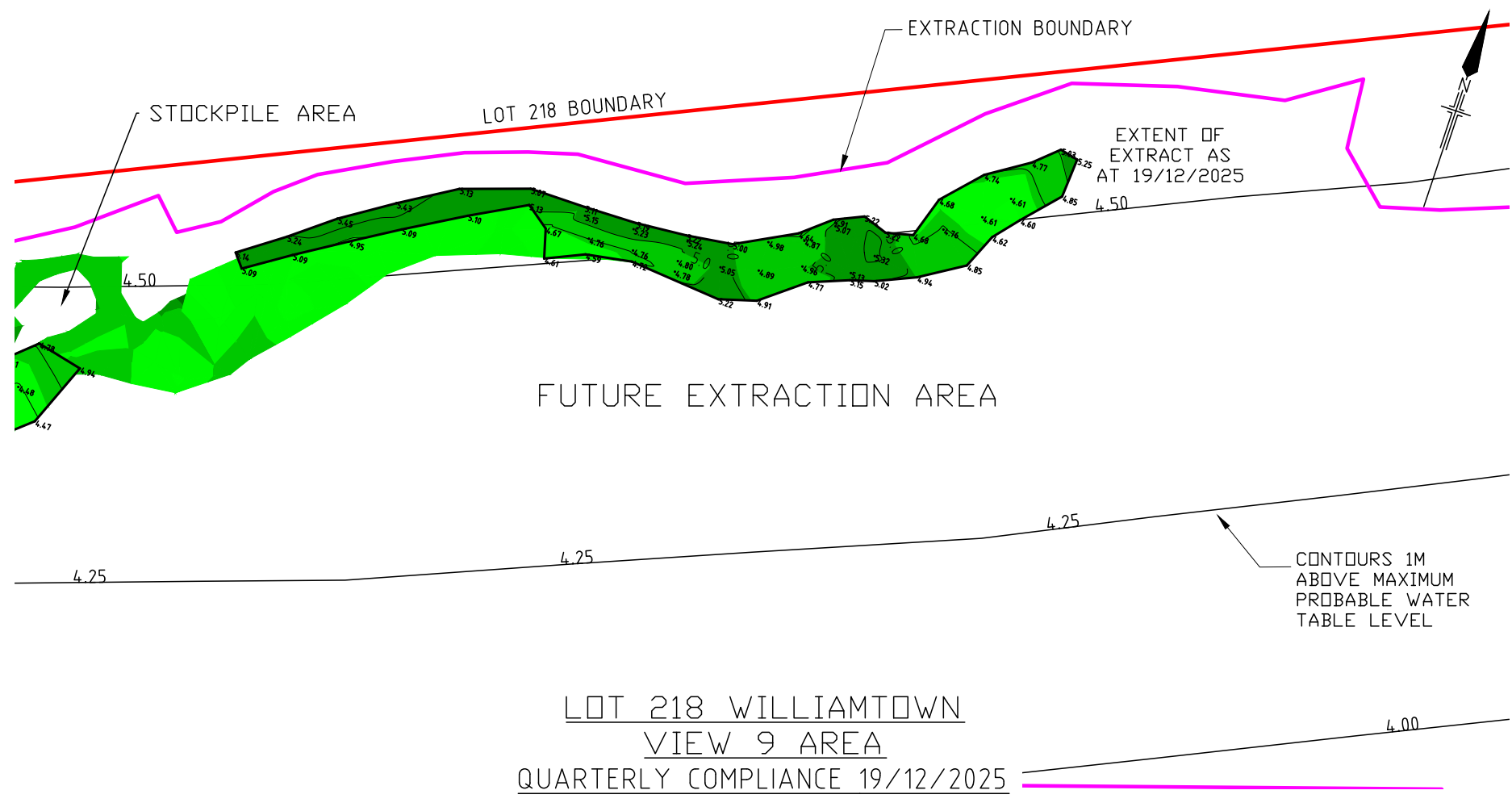
**LOT 218 EXTRACTION COMPLIANCE VIEW AREA 7 & 8**

STATUS:

**DECEMBER 2025**

DRAWING NUMBER:

**DO NOT SCALE**



**NOTES:**

1. THE ROAD SURFACE LEVEL HAS BEEN RAISED TO A MINIMUM OF 300mm-400mm ABOVE THE EXTRACTION SURFACE.
2. THE SURFACE LEVEL EITHER SIDE OF THE ACCESS ROAD IN OPERATIONAL AREAS IS COMPLIANT AS AT 19/12/2025.
3. SHOT HEIGHTS SHOWN ARE FOR THE CURRENT OPERATIONAL FOOTPRINT AND CAN BE USED TO IDENTIFY THE EXTENT OF THE SURVEY.
4. AREAS WITHOUT SPOT HEIGHT SHOWN WERE IDENTIFIED AS COMPLYING IN PREVIOUS SURVEYS. THESE AREAS DO NOT FORM PART OF THE ACTIVE EXTRACTION OPERATION AND DO NOT FORM PART OF THIS SURVEY REPORT AND ARE ONLY SHOWN TO IDENTIFY THE CURRENT EXTENT OF THE EXTRACTION FLOOR.
5. SURVEY TO CONFIRM COMPLIANCE AT WESTERN END FOR THE QUARTER ENDING 19/12/2025 WAS COMPLETED 17/10/2023.
6. DATE OF CURRENT SURVEY: 19/12/2025

DEPTH COMPLIANCE COMPARISON TO 1m ABOVE MAXIMUM PROBABLE GROUND WATER LEVEL			COLOUR
LOWER VALUE	UPPER VALUE		
-0.35	to -0.3	m	
-0.3	to -0.2	m	
-0.2	to -0.1	m	
-0.1	to 0.0	m	
0.0	to 0.1	m	
0.1	to 0.2	m	
0.2	to 0.5	m	
0.5	to 1.0	m	
1.0	to 2.0	m	

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_251219.dwg

SURVEYED: LC 19/12/2025

DRAWN: CJ

CHECKED: CJ

DATUM: AHD

ISSUE DATE: 15/01/2026

REVISION: A

CLIENT & JOB:

**MACKAS SAND & SOIL**

**WILLIAMTOWN COMPLIANCE REPORTING**

**CENTURION SURVEY PTY LTD**

ABN: 66 605 045 314  
 P: (02) 4967 5927  
 M: 0429 987 821  
 Unit 11 56 Industrial Dr  
 Mayfield NSW 2304

TITLE:

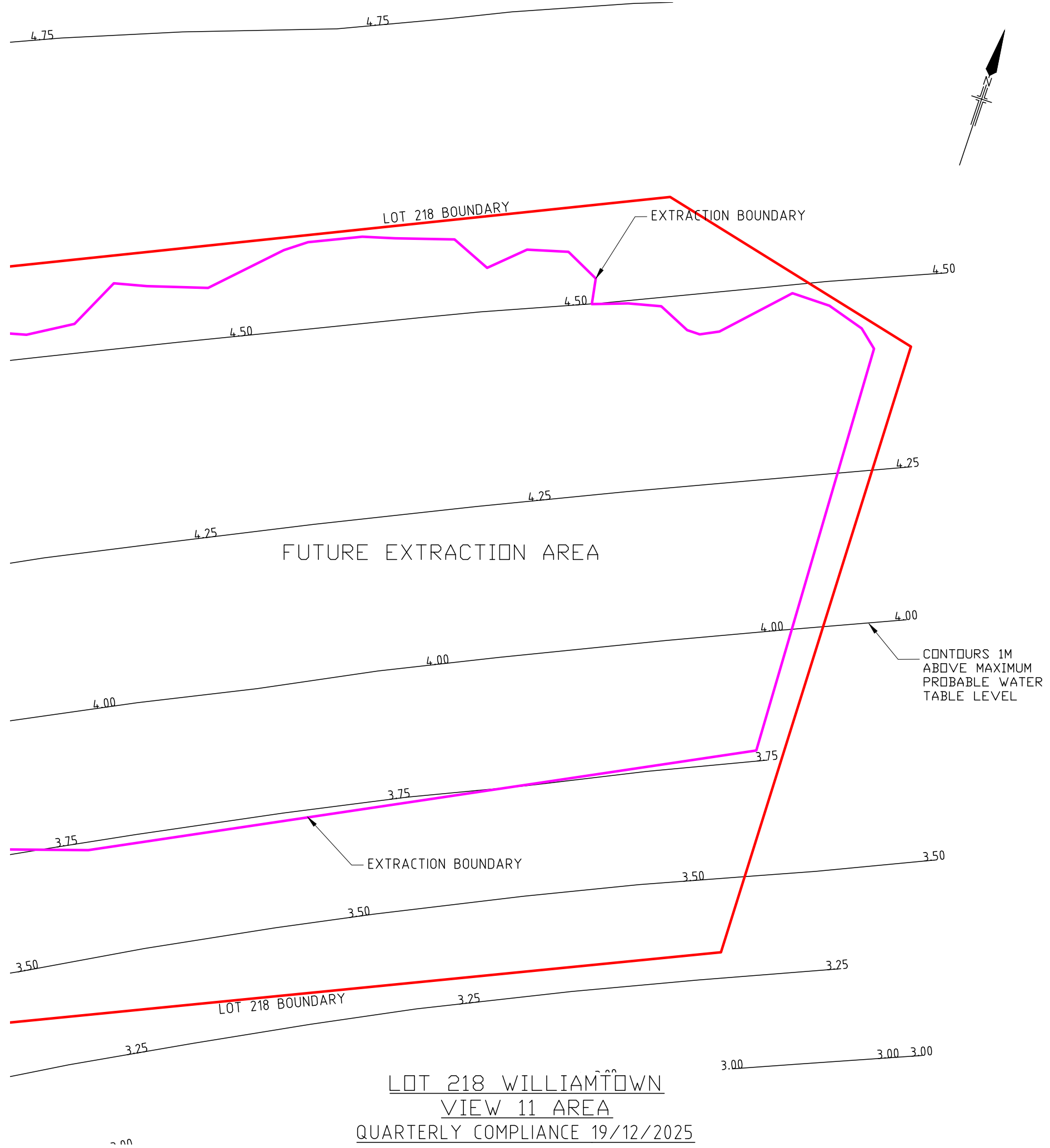
**LOT 218 EXTRACTION COMPLIANCE VIEW AREA 9 & 10**

STATUS:

**DECEMBER 2025**

DRAWING NUMBER:

DO NOT SCALE



NOTES:

1. THE ROAD SURFACE LEVEL HAS BEEN RAISED TO A MINIMUM OF 300mm-400mm ABOVE THE EXTRACTION SURFACE.
2. THE SURFACE LEVEL EITHER SIDE OF THE ACCESS ROAD IN OPERATIONAL AREAS IS COMPLIANT AS AT 19/12/2025.
3. SHOT HEIGHTS SHOWN ARE FOR THE CURRENT OPERATIONAL FOOTPRINT AND CAN BE USED TO IDENTIFY THE EXTENT OF THE SURVEY.
4. AREAS WITHOUT SPOT HEIGHT SHOWN WERE IDENTIFIED AS COMPLIANT IN PREVIOUS SURVEYS. THESE AREAS DO NOT FORM PART OF THE ACTIVE EXTRACTION OPERATION AND DO NOT FORM PART OF THIS SURVEY REPORT AND ARE ONLY SHOWN TO IDENTIFY THE CURRENT EXTENT OF THE EXTRACTION FLOOR.
5. SURVEY TO CONFIRM COMPLIANCE AT WESTERN END FOR THE QUARTER ENDING 19/12/2025 WAS COMPLETED 17/10/2023.
6. DATE OF CURRENT SURVEY: 19/12/2025

DEPTH COMPLIANCE COMPARISON TO 1m ABOVE MAXIMUM PROBABLY GROUND WATER LEVEL			
LOWER VALUE	UPPER VALUE		COLOUR
-0.35	to -0.3	m	
-0.3	to -0.2	m	
-0.2	to -0.1	m	
-0.1	to 0.0	m	
0.0	to 0.1	m	
0.1	to 0.2	m	
0.2	to 0.5	m	
0.5	to 1.0	m	
1.0	to 2.0	m	

SCALE: NOT TO SCALE

FILE: 0014\_CS\_LOT\_218\_Compliance\_251219.dwg  
 SURVEYED: LC 19/12/2025  
 DRAWN: CJ  
 CHECKED: CJ  
 DATUM: AHD  
 ISSUE DATE: 15/01/2026  
 REVISION: A

CLIENT & JOB:  
**MACKAS SAND & SOIL**  
 WILLIAMTOWN COMPLIANCE REPORTING

ABN: 66 605 045 314  
 P: (02) 4967 5927  
 M: 0429 987 821  
 Unit 11 56 Industrial Dr  
 Mayfield NSW 2304

TITLE:  
**LOT 218 EXTRACTION COMPLIANCE VIEW AREA 9 & 10**

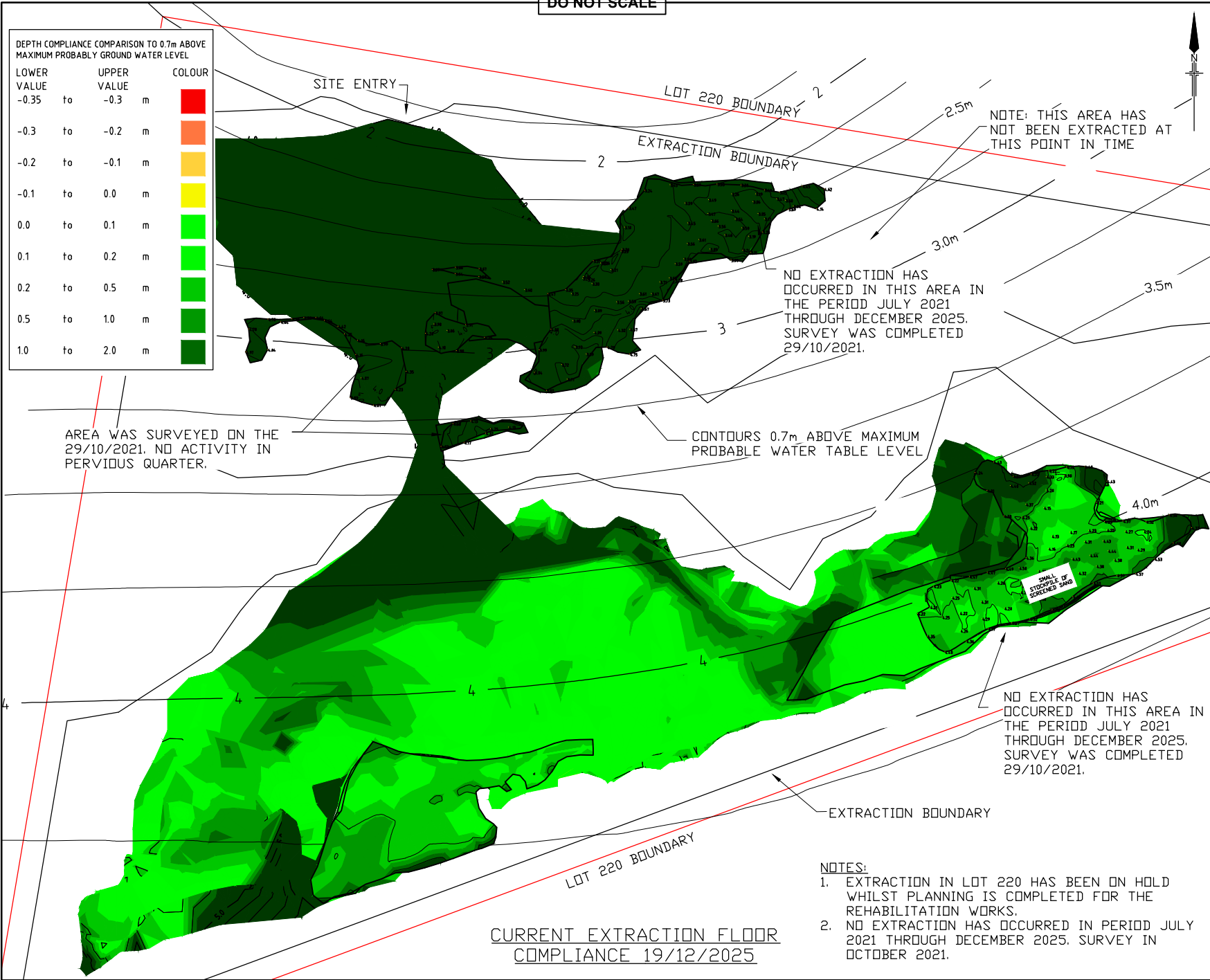
STATUS:  
**DECEMBER 2025**

DRAWING NUMBER:

DO NOT SCALE

DEPTH COMPLIANCE COMPARISON TO 0.7m ABOVE  
MAXIMUM PROBABLY GROUND WATER LEVEL

LOWER VALUE	UPPER VALUE	COLOUR
-0.35 to	-0.3 m	Red
-0.3 to	-0.2 m	Orange
-0.2 to	-0.1 m	Yellow
-0.1 to	0.0 m	Light Green
0.0 to	0.1 m	Green
0.1 to	0.2 m	Light Green
0.2 to	0.5 m	Green
0.5 to	1.0 m	Dark Green
1.0 to	2.0 m	Very Dark Green



NOTE: THIS AREA HAS NOT BEEN EXTRACTED AT THIS POINT IN TIME

NO EXTRACTION HAS OCCURRED IN THIS AREA IN THE PERIOD JULY 2021 THROUGH DECEMBER 2025. SURVEY WAS COMPLETED 29/10/2021.

AREA WAS SURVEYED ON THE 29/10/2021. NO ACTIVITY IN PERVIOUS QUARTER.

CONTOURS 0.7m ABOVE MAXIMUM PROBABLE WATER TABLE LEVEL

NO EXTRACTION HAS OCCURRED IN THIS AREA IN THE PERIOD JULY 2021 THROUGH DECEMBER 2025. SURVEY WAS COMPLETED 29/10/2021.

NOTES:

1. EXTRACTION IN LOT 220 HAS BEEN ON HOLD WHILST PLANNING IS COMPLETED FOR THE REHABILITATION WORKS.
2. NO EXTRACTION HAS OCCURRED IN PERIOD JULY 2021 THROUGH DECEMBER 2025. SURVEY IN OCTOBER 2021.

CURRENT EXTRACTION FLOOR COMPLIANCE 19/12/2025

SCALE: NOT TO SCALE

FILE: 004\_CS\_LOT\_220\_Compliance\_251219.dwg  
 SURVEYED: CJ  
 DRAWN: CJ  
 CHECKED: CJ  
 DATUM: AHD  
 ISSUE DATE: 15/01/2026  
 REVISION: A

CLIENT & JOB:  
**MACKAS SAND & SOIL SALT ASH**  
**COMPLIANCE REPORTING**

**CENTURION SURVEY PTY LTD**  
 ABN: 66 605 045 314  
 P: (02) 4967 5927  
 M: 0429 987 821  
 Unit 11 56 Industrial Dr  
 Mayfield NSW 2304

TITLE:  
**LOT 220 EXTRACTION LEVEL COMPLIANCE**

STATUS:  
**DECEMBER 2025**

DRAWING NUMBER:

SHEET 1 OF 1 SHEETS  
**A3**

# **Appendix 2**

## **Groundwater Monitoring Results**

