SELLICKS HILL QUARRY (EML 5440, PM 163 & PM 237)

Annual Compliance Report

Prepared for: Adbri Concrete and Quarries SA Pty Ltd trading as Adbri Quarries SA
Date: October 2024
Report period: 31/08/2023 – 30/08/2024
File Reference: 1741.670.007

DOCUMENT CONTROL

PROJECT / DETAILS REPORT

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Principal Author:	Rachel Hall
Client:	Adbri Concrete and Quarries SA Pty Ltd
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0	Sellicks Hill Quarry (EML 5440, EML 6552, PM 163 & PM 237) Annual Compliance Report (31/08/2023 – 30/08/2024)	October 2024	Rachel Hall	Carly Monaghan

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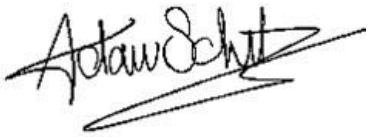
Declaration of Accuracy

This report is prepared for the Department for Energy and Mining (DEM) to fulfil the annual mining compliance reporting requirements for the tenements listed herein. I, **Adam Schutz**, the applicant, have taken reasonable steps to review the information to ensure its accuracy.



Name: Adam Schutz
Position: Manager – Quarry Operations
Company: Adelaide Brighton Cement Limited
Dated: October 2024

Summary of steps undertaken to review the compliance report to ensure its accuracy: Adbri Concrete and Quarries Pty Ltd trading as Adbri Quarries SA (Adbri) have engaged Groundwork, part of SLR (Groundwork) to undertake a review of the compliance and monitoring data for the quarry against the required objectives and outcomes defined by the Mine Operations Plan and Program for Environment Protection Rehabilitation (MOP PEPR) for the quarry. The review included undertaking a site inspection and collection of field data along with internal reviews undertaken by Adbri.

1 Executive Summary

Sellicks Hill Quarry is a South Australian limestone, dolomite, marble and shale quarry which is located on Main South Road at Sellicks Hill, approximately three (3) kilometres (km) south of Aldinga Beach. Sellicks Hill Quarry is comprised of Extractive Minerals Lease (EML) 5440, Private Mine (PM) 163 and PM 237 (the Site), which is owned and operated by Adbri. The Site, which has been in operation since the early 1970s, produces a range of products including aggregate, road base, sand and agricultural lime for the manufacturing of construction and industrial materials. The Site has been identified as a Strategic Resource Area (SRA) to the state, as it is of key economic value due to the quality and quantity of limestone and shale resources available to support private and government mandated projects.

This Compliance Report is for Sellicks Hill Quarry for the period 31/08/2023 to 30/08/2024 in accordance with the requirements of Regulation 77 of the *Mining Regulations 2020*, *Terms of Reference 009 Mining compliance reports* (TOR 009) and *Minerals Regulatory Guidelines (MG3) - Preparing a mining compliance report*.

The approval of EML 6552 has occurred during the reporting period; as a Program for Environment Protection and Rehabilitation (PEPR) has not yet been submitted (due in the next reporting period) and approved, operations have not commenced. Therefore, EML 6552 has not been factored into the Annual Compliance Report for the Site.

The Site is subject to the conditions outlined within the Mining Lease (ML) and EML documents, and a MOP PEPR which was approved on 24 May 2018 as Program No. MPEPR2015 / 005. The Site is licenced by the Environment Protection Authority (EPA) for activities of environmental significance under EPA Licence Number 2052.

2 Site Details

2.1 Tenement Details

An overview of the Tenement details is summarised in **Table 1 – Tenement Detail Summary**.

Table 1 – Tenement Details Summary

Tenement Number	**EML 5440**	**PM 163**	**PM 237**
Registration Grant Date	13/05/1987	30/08/1973	01/08/1974
Expiry Date	12/05/2036	Not applicable.	Not applicable.
Status of Currency	Active	Active	Active
Tenement Holder / Operator	Adbri Concrete and Quarries SA Pty Ltd trading as Adbri Quarries SA		
Commodities	Dolomite; Limestone	Marble; Limestone	Limestone
Legal Area – hectares (ha)	38	114.99	71.37
Commodity Categories	Construction Materials; Industrial Materials	Construction Materials; Industrial Materials	Construction Materials; Industrial Materials

(Source: SARIG, 2024)

2.2 Site Contact

Table 2 – Site Contact Details summarises the Site contact details.

Table 2 – Site Contact Details

Operations Manager Contact Details	
Contact Name / Position	Adam Schutz, Manager – Quarry Operations
Phone Number	0447 466 817
Postal Address	Level 1, 157 Grenfell Street, Adelaide SA 5000
Quarry Manager Contact Details	
Contact Name / Position	Trevor Smith, Manager – Quarry Sellicks Hill
Phone Number	0414 332 413
Postal Address	3981 Main South Road, Sellicks Beach SA 5174

2.3 Identification

Table 3 – Site Identification Details

Mine Name(s)	Sellicks Hill Quarry
Tenement Holder(s)	Adbri Concrete and Quarries SA trading as Adbri Quarries SA
Operating Company(s)	Adbri Concrete and Quarries SA trading as Adbri Quarries SA

Tenement Number(s)	EML 5440, PM 163 & PM 237		
MOP PEPR Document	1741_400_002_Approved _Mine Operation Plan (MOP)_Program for Environment Protection and Rehabilitation (PEPR)	**MOP PEPR No. (s)**	MPEPR 2015 / 005
		MOP PEPR Approval Date:	24 May 2018
Location Details	Located at Sellicks Hill, approximately 3 km south of Aldinga Beach.		
Reporting Period	31/08/2023	30/08/2024	
Compliance Report Submission Date	October 2024		

2.4 Public Liability Insurance

Public liability insurance is current for the Site. A certificate demonstrating this is provided upon request.

2.5 Other Approvals

The below **Table 4 – Other Approvals Summary**, provides a summary of the status of currency of any other approvals obtained to authorise the operation. The list includes authorisations that are relevant to the achievement of environmental outcomes within the approved MOP PEPR and Tenement conditions.

Table 4 – Other Approvals Summary

Approval Document	Regulatory Authority	Relevant Approval or Tenement Condition	Status of Currency
EPA Licence Number 2052	EPA	Refer to **Section 3.2 Compliance with Non-Outcome Based Conditions**.	Current, expiry 30 November 2024.
EML 5440	DEM	Refer to **Section 3.2 Compliance with Non-Outcome Based Conditions**.	Current.

2.6 Ore Reserves and Mineral Resources

An estimate of the remaining quarry life is shown in **Table 5 – Estimated Quarry Life**.

Table 5 – Estimated Quarry Life

Estimated Mine Life	Approximately 152 years of quarry life remain.
Notes	Quarry life is subject to market demand. The estimated quarry life is based on the estimated Site reserves as outlined within **Table 6 – Reserve Estimate (extracted from the MOP PEPR)**, which projected 158 years of quarry life at

	the time of MOP PEPR approval, with an extraction rate of approximately 1.4 million tonnes (t) per annum. The approval of EML 6552 during the reporting period would increase the estimated reserves at the Site. As a PEPR (containing Site reserves) has not yet been submitted for EML 6552, the estimated mine life is based on the reserves within EML 5440, PM 163 and PM 237 as per **Table 6 – Reserve Estimate (extracted from the MOP PEPR)**.

Table 6 – Reserve Estimate (extracted from the MOP PEPR)

Stage of Extraction	Volume – cubic metres (m^3)	Reserves (t)
Stage 1	546,600	1,476,090
Stage 2	1,100,300	2,970,810
Stage 3	2,097,500	5,663,250
Stage 4	2,606,800	7,035,660
Stage 5	3,124,900	8,437,230
Stage 15	8,609,900	23,246,730
Long-term	**81,993,900**	**221,383,530**

2.7 Mining, Processing, and Waste Storage Activities

Table 7 – Ore Mining / Resource Extraction

Ore Mined – Mine Life (t)	Ore Mined – Reporting Period	Expected quantity to be mined during next Reporting Period (MT)	Quantity of ore stockpiled on the Tenement at the end of Reporting Period (t)
Not applicable.	1.7 million tonnes (MT)	1.5	553,000
Production Notes Production is subject to market demand. Production was higher during the current reporting period than the previous reporting period. The estimated production for this reporting period was slightly lower than the estimated 1.9 MT. The stockpiled material is based upon a crushed rock density of 1.7 t/ m^3 and an Unmanned Aerial Vehicle (UAV) survey on 2 October 2024.			

Table 8 – Ore Processing

Ore Processed – Mine Life (t)	Ore Processed – Reporting Period (t)	Expected quantity of ore to be processed next Reporting Period (t)
Not applicable.	Not applicable.	Not applicable.

Production Notes
Not applicable.

Table 9 – Concentrate or Other Product Exported

Concentrate or Other Product Exported – Mine Life (t)	**Amount of Concentrate or Other Product Exported – Reporting Period (t)**	**Expected amount of concentrate or other product to be exported next Reporting Period (t)**
Not applicable.	Not applicable.	Not applicable.
Production Notes Not applicable.		

Table 10 – Overburden or Waste Mined

Overburden or Waste Mined – Mine Life (t)	**Overburden or Waste Mined – Reporting Period (t)**	**Expected amount of overburden or waste to be mined next Reporting Period (KT)**
Not applicable.	15,000	7,500
Production Notes Amount of overburden mined during the reporting period is an estimated figure.		
Volume of Potential Acid Forming (PAF) and Non-acid Forming (NAF) material mined during reporting period		
Not applicable.		
Remaining capacity of current waste facilities or planned future waste facilities as per approved MOP PEPR		
Not applicable.		
Is there sufficient capacity in the current or planned future waste facilities as per approved MOP PEPR? If not, include what future work is required		
Not applicable.		

3 Summary of Compliance

3.1 Compliance with Environmental Outcomes and Objectives and Leading Indicator Criteria

The below environmental outcomes and objectives are extracted from the approved MOP PEPR, as Program No. MPEPR 2015 / 005. The MOP PEPR details environmental outcomes and objectives for both operational and closure stages of the quarry. Due to the early life of the quarry, the environmental outcomes and objectives related to mine closure are not relevant at this operational stage, therefore are not considered in this report.

As EML 6552 was approved during the current reporting period (30 October 2023), operations on EML 6552 cannot commence until a PEPR is approved, hence, environmental outcomes for EML 6552 cannot be assessed for the current reporting period.

Table 11 – Public Safety

Aspect Public Safety (PS1)	**Tenement(s)** EML 5440, PM 163 & PM 237	**Compliance Status** Compliant
Environmental Outcome / Objective No public injuries and / or deaths resulting from unauthorised entry to the quarry Site that could have been reasonably prevented.		
Tenement Condition Not applicable.		
Outcome / Objective Measurement Criteria All incidents involving public injury and / or deaths resulting from unauthorised access to the quarry Site are to be recorded in a Quarry Management Logbook and investigated by a suitably qualified third party within one (1) calendar month (or other time as agreed with the Mining Regulator) and the results of the investigation show that the incident could not have been reasonably prevented by the Tenement Holder. Quarry Management Logbook demonstrates records of daily inspections of Site security and details of subsequent repairs where required.		
Outcome / Objective Measurement Criteria Summary During the reporting period, no public safety related incidents occurred at the Site.		
Leading Indicator Criteria Inspections undertaken by Site management to confirm that Site perimeter fencing is secure.		
Leading Indicator Summary Inspections of Site perimeter fencing are undertaken on a quarterly basis, and confirm the Site is secure.		
Effectiveness of Existing Controls Existing control strategies at the Site consist of maintaining an adequate level of fencing and signage, which is subject to regular inspection to prohibit unauthorised access. A general Site inspection conducted on 24 October 2024 demonstrated perimeter fencing is in place and adequate, and public safety signage is present throughout the Site, refer to **Attachment 1 –**		

General Site Inspection Report. Additionally, the Site has one (1) main access gate, of which is locked when not in use, and the topography and surrounding land use prevents access from other boundaries of the Site, as demonstrated within **Drawing No. 1741.DRG.144R1 – Site Layout Map**. No public safety related incidents have occurred at the Site as a result of unauthorised access. As no public safety incidents have occurred during the reporting period, the existing control measures are effective.
Supporting Report Reference **Drawing No. 1741.DRG.144R1 – Site Layout Map** **Attachment 1 – General Site Inspection Report**.

Table 12 – Damage to Third-Party Property

Aspect	**Tenement(s)**	**Compliance Status**
Damage to Third-Party Property (TPP1)	EML 5440, PM 163 & PM 237	Non-compliant

Environmental Outcome / Objective

No damage as a result of quarrying operations to adjacent public or private property and infrastructure (Main South Road as a result of overburden slip).

Tenement Condition

Not applicable.

Outcome / Objective Measurement Criteria

An annual inspection by a suitably qualified person will demonstrate that slopes:

- are battered to less than 25 degrees;
- internal batters do not exceed 36 degrees;
- are vegetated;
- have been constructed as designed; and
- are geotechnically stable as per the recommendations within Attachment 6 – Bund Stability Sellicks Hill Quarry.

Outcome / Objective Measurement Criteria Summary

Annual geotechnical inspection was undertaken at the Site in October 2024, which demonstrated the quarry pit walls were overall geotechnically stable with manageable risks. However, the Western Screening Mound (WSM) shows some potential instability vectors and certain areas will require corrective measures to ensure the structure conforms to design specifications, refer to **Attachment 2 – Annual Geotechnical Audit October 2024**.

A small area was identified to exceed the Total Slope Angle (TSA) of 25 degrees, with corrective actions outlined within the **Attachment 2 – Annual Geotechnical Audit October 2024**, and **Table 34 – Instance of Non-Compliance**. Implementing ongoing monitoring and proactive management measures will ensure safe operation of the Site.

Leading Indicator Criteria

After any large rainfall event and prior to tipping or access to the area, the bund should be visually inspected for stability.

*Key to note will be tension cracks forming at the crest and in recent tipping areas, or rotational failures which have developed in the batters. If significant structures are recognised, they should not be trafficked upon and materials brought to Site should be dumped short of the crest and pushed over with a Front End Loader (FEL).

Leading Indicator Summary

Inspections of the WSM are undertaken regularly (monthly and after large rainfall events) as part of general operations, as well as annual geotechnical inspections.

Effectiveness of Existing Controls

Existing control strategies at the Site include adherence to the Quarry Development Plans (QDPs) and recommendations regarding slope angles as per Attachment 6 – Bund Stability Sellicks Hill Quarry, and regular annual inspections of the WSM by a certified engineer to ensure geotechnical stability of the final landform, basins and the progress of rehabilitation. Additionally, regular monthly inspections of the WSM are to be undertaken to ensure effective and appropriate drainage.

During the reporting period, no incidents of damage to third-party property caused by quarrying operations occurred.

Annual geotechnical inspection was undertaken at the Site in October 2024, which demonstrated the quarry pit walls were geotechnically stable with manageable risks. However, the Western Screening Mound (WSM) shows some potential instability vectors and certain areas will require corrective measures to ensure the structure conforms to design specifications, refer to **Attachment 2 – Annual Geotechnical Audit October 2024**. Additionally, regular inspections of the WSM to ensure stability after heavy rainfall events are undertaken. As no incidents of third-party property damage occurred during the reporting period, the existing control measures are effective. However, due to a small amount of the WSM exceeding the TSA requirement of 25 degrees, this has resulted in a non-compliance, refer to **Table 34 – Instance of Non-Compliance**.
Supporting Report Reference **Attachment 2 – Annual Geotechnical Audit October 2024**.

Table 13 – Damage to Third-Party Property

Aspect	**Tenement(s)**	**Compliance Status**
Damage to Third-Party Property (TPP2)	EML 5440, PM 163 & PM 237	Compliant
Environmental Outcome / Objective No damage to third-party infrastructure, including adjacent grazing lands and stock as a result of fire caused by quarry operations.		
Tenement Condition Not applicable.		
Outcome / Objective Measurement Criteria Quarry Management Logbook demonstrates that Country Fire Service (CFS) access points (CFS locks on gates) are visually inspected monthly throughout the fire danger season and that availability of access is maintained. Records show that hot works are undertaken within designated areas in accordance with hot works permit (hot works were not undertaken during total fire ban days).		
Outcome / Objective Measurement Criteria Summary During the reporting period, no damage to third-party property occurred. CFS access points have not been formally established, and there has been no correspondence with the CFS during the reporting period. The CFS are aware of the Site's capacity to assist with nearby incidents through the use of the Site's water tanker, which has occurred in the past.		
Leading Indicator Criteria Not applicable.		
Leading Indicator Summary Not applicable.		
Effectiveness of Existing Controls Existing control strategies at the Site include ensuring firefighting equipment is available and relevant exercises are undertaken, undertaking hot works in accordance with the hot works permit and not during total fire ban conditions, maintaining appropriate firebreaks where possible and ensuring the Site is accessible to the CFS. During the reporting period, no third-party property incidents regarding fire occurred at the Site. A general Site inspection undertaken on 24 October 2024 demonstrated firebreaks within the Site are maintained, refer to **Attachment 1 – General Site Inspection Report**. As no damage to third-party property has occurred as a result of fire, the existing control strategies are effective.		
Supporting Report Reference **Attachment 1 – General Site Inspection Report**.		

Table 14 – Visual Amenity

Aspect	**Tenement(s)**	**Compliance Status**
Visual Amenity (VA1)	EML 5440, PM 163 & PM 237	Compliant
Environmental Outcome / Objective Quarrying activities are progressively screened from sensitive receptors (residents west of Site).		
Tenement Condition EML 5440 – Schedule 2, Condition 2 (Special Conditions): mounding and screening planting shall be carried out along the northern perimeter of the workings in a manner approved by the Chief Inspector of Mines.		
Outcome / Objective Measurement Criteria Annual visual photo monitoring from photo location points (refer to **Drawing No. 1741.DRG.050R1 – Visual Assessment Map**) along Main South Road (Cactus Canyon and toward Sellicks Hill), from Sellicks and Aldinga suburban areas demonstrate that quarrying activities are progressively screened from sensitive receptors.		
Outcome / Objective Measurement Criteria Summary A visual amenity inspection was undertaken by Groundwork on 24 October 2024. The visual assessment demonstrated no significant changes to the visual impact of the Site compared to the previous inspection, and no views of quarry operations were present from the visual amenity photo locations outlined in **Drawing No. 1741.DRG.050R1 – Visual Assessment Map**, refer to **Attachment 3 – Visual Amenity Inspection Report**.		
Leading Indicator Criteria Not applicable.		
Leading Indicator Summary Not applicable.		
Effectiveness of Existing Controls The existing control strategies include establishing and maintaining visual screens along the northern perimeter of the Tenement (bunding and screen planting) to minimise visual impacts to sensitive receptors, undertaking progressive rehabilitation in accordance with the QDPs and minimising the disturbance footprint where practicable. Additionally, a visual impact assessment is to be undertaken annually in accordance with **Drawing No. 1741.DRG.050R1 – Visual Assessment Map**. A general Site inspection conducted on 24 October 2024 confirmed visual amenity measures including the WSM are in place to screen the Site's operations, with progressive rehabilitation continued during the reporting period, refer to **Attachment 1 – General Site Inspection Report**. As per the MOP PEPR, an annual visual amenity inspection was undertaken on 24 October 2024, which demonstrated no significant changes to visual impacts of the Site compared to the previous reporting period, and no views of operations were present from the photo locations outlined within **Drawing No. 1741.DRG.050R1 – Visual Assessment Map**, refer to **Attachment 3 – Visual Amenity Inspection Report**. No visual amenity-related complaints have been received by the Site during the reporting period which deems the existing control strategies (including visual screening measures) effective at minimising the visual impact of the Site.		
Supporting Report Reference **Drawing No. 1741.DRG.050R1 – Visual Assessment Map**		

Attachment 1 – General Site Inspection Report
Attachment 3 – Visual Amenity Inspection Report.

Table 15 – Visual Amenity

Aspect	**Tenement(s)**	**Compliance Status**
Visual Amenity (VA2)	EML 5440, PM 163 & PM 237	Compliant
Environmental Outcome / Objective The overburden dump / screening mound is constructed and revegetated as designed to integrate with the surrounding landscape.		
Tenement Condition EML 5440 – Schedule 2, Condition 2 (Special Conditions): mounding and screening planting shall be carried out along the northern perimeter of the workings in a manner approved by the Chief Inspector of Mines.		
Outcome / Objective Measurement Criteria Annual visual photo monitoring from photo location points (refer to **Drawing No. 1741.DRG.050R1 – Visual Assessment Map**) along Main South Road (Cactus Canyon and toward Sellicks Hill), from Sellicks and Aldinga suburban areas demonstrate that the overburden dump / screening mound is being constructed and revegetated as designed (refer Drawing No.1741.DRG.041R2 – Quarry Development Plan - Stage 1, Drawing No. 1741.DRG.042R2 – Quarry Development Plan - Stage 2, Drawing No. 1741.DRG.043R2 – Quarry Development Plan - Stage 3, Drawing No. 1741.DRG.044R2 – Quarry Development Plan - Stage 4, Drawing No. 1741.DRG.045R2 – Quarry Development Plan - Stage 5, Drawing No. 1741.DRG.046R2 – Quarry Development Plan - Stage 15 and Drawing No. 1741.DRG.047R2 – Quarry Development Plan - Long Term) to integrate with the surrounding landscape.		
Outcome / Objective Measurement Criteria Summary A visual amenity inspection was undertaken by Groundwork on 24 October 2024. The visual inspection demonstrated the screening mound is in place and effectively screening views of quarry operations, refer to **Attachment 3 – Visual Amenity Inspection Report**. A general Site inspection undertaken on 24 October 2024 demonstrated progressive rehabilitation is occurring to revegetate the screening mound, refer to **Attachment 1 – General Site Inspection Report**.		
Leading Indicator Criteria Not applicable.		
Leading Indicator Summary Not applicable.		
Effectiveness of Existing Controls Existing control strategies at the Site include rounding of crest edges once construction of the bench has been established, and revegetation (rye grass followed by tubestock planting) once soil has been sufficiently stabilised. A general Site inspection was conducted on 24 October 2024 which demonstrated visual amenity screening measures and revegetation efforts have occurred at the Site, as demonstrated within **Attachment 1 – General Site Inspection Report**. A visual amenity inspection undertaken on 24 October 2024 demonstrated visual amenity screening measures are effectively minimising the visual impacts of the Site, refer to **Attachment 3 – Visual Amenity Inspection Report**. As no visual amenity related complaints have been received during the reporting period, the existing control strategies are effective at ensuring visual impacts are softened to integrate with the surrounding landscape.		

Supporting Report Reference
Drawing No. 1741.DRG.050R1 – Visual Assessment Map
Attachment 1 – General Site Inspection Report
Attachment 3 – Visual Amenity Inspection Report.

Table 16 – Noise

Aspect	**Tenement(s)**	**Compliance Status**
Noise (N1)	EML 5440, PM 163 & PM 237	Compliant
Environmental Outcome / Objective No public nuisance impacts from noise generated by extractive operations.		
Tenement Condition Not applicable.		
Outcome / Objective Measurement Criteria Quarry records shall demonstrate that all noise related complaints are acknowledged within 48 hours and closed out within seven (7) days to the satisfaction of the complainant or as agreed with the Regulator. In the event the additional control measures do not resolve the complaint to the satisfaction of regulators, noise measurements will be undertaken in accordance with Part 3 of the *Environment Protection (Noise) Policy 2007* at locations agreed upon by the operator and regulator to verify compliance with *Part 1 Section 5 — Indicative noise levels*. Indicative noise levels: Noise criteria 55 decibels (dB) (A) during day period of 7.00 am **–** 10.00 pm, 48 dB(A) night period 10.00 pm **–** 7.00 am.		
Outcome / Objective Measurement Criteria Summary During the reporting period no noise-related complaints were received by the Site.		
Leading Indicator Criteria Not applicable.		
Leading Indicator Summary Not applicable.		
Effectiveness of Existing Controls Existing control strategies at the Site include ensuring operations adhere to the approved hours, scheduling particularly noisy activities after 7.00 am, and establishing and maintaining the earthen bund on the Site perimeter to assist with noise abatement. Additional control strategies include managing vehicle speed to 40 km per hour on internal access roads, maintaining equipment, shutting down when not in use, and fitting with broadband reversing alarms, and investigating and responding to complaints within a timely manner. A general Site inspection conducted on 24 October 2024 demonstrated all Site roads and speed signage are in good condition, refer to **Attachment 1 – General Site Inspection Report**. During the reporting period, no noise complaints were received by the Site. As no noise complaints were received by the Site during the reporting period, the existing control strategies are effective at ensuring no nuisance impacts are caused to the public by extractive operations.		
Supporting Report Reference **Attachment 1 – General Site Inspection Report**.		

Table 17 – Dust

Aspect	**Tenement(s)**	**Compliance Status**
Dust (D1)	EML 5440, PM 163 & PM 237	Non-compliant
Environmental Outcome / Objective No public health and / or nuisance impacts from dust generated by quarrying operations.		
Tenement Condition Not applicable.		
Outcome / Objective Measurement Criteria Quarry Management Logbook demonstrates records of visual inspections and monitoring of wind and weather forecasts and response employed as per Trigger Action Response Plan (TARP) Table 4-4: Meteorological and visual trigger action responses and Table 4-5: Dust trigger action responses (Level 1, Level 2, Level 3). Dust related complaints acknowledged within 48 hours and closed out within seven (7) days to the satisfaction of the complainant or as agreed with the Regulator. In the event the additional control measures do not resolve the complaint to the satisfaction of regulator, air quality monitoring is to occur at locations, and using methods, as agreed with the Regulator, to demonstrate that PM_{10}* levels are less than 50 micrograms (µg) per cubic metre (m^3), when measured over a 24-hour period (midnight to midnight) as specified in the *Environment Protection (Air Quality) Policy 2016*. *Particulate matter with an aerodynamic diameter of 10 micrometres (µm) or less.		
Outcome / Objective Measurement Criteria Summary The Site adheres with the Dust Management Plan (DMP), which entails the TARP for unfavourable weather conditions, refer to **Attachment 4 – Dust Management Plan**. The DMP has been implemented to comply with the licence conditions of the EPA Licence (Licence Number 2052), as outlined within **Section 3.2 Compliance with Non-Outcome Based Conditions**. Quarterly monitoring is undertaken by the EPA to demonstrate compliance with the DMP. During the reporting period, no instances of cease of operations occurred with adherence to the TARP. During the reporting period, a full DMP revision commenced and is currently underway. Continuous air quality monitoring (real-time PM_{10}) is conducted via the Area Dust Monitor (ADR) units located within three (3) locations across the Site. In addition, monthly dust deposition monitoring is undertaken by Groundwork at four (4) locations, as outlined within **Drawing No. 1741.DRG.128 – Dust Deposition Plan (2021-10-07)**. Dust monitoring results are available upon request. During the reporting period, eight (8) dust complaints were received by the Site directly and five (5) were received by / via DEM. Correspondence regarding dust complaints occurred with DEM on two (2) occasions; one (1) of which identified four (4) dust complaints made directly to DEM on 21 March 2024. **Section 4 Complaints** outlines the summary of complaints received by the Site during the reporting period, and demonstrates all dust complaints received directly by the Site were acknowledged and closed out within a timely manner. Correspondence with DEM resulted in a non-conformance for dust on 13 March 2024, due to evidence of public nuisance caused by dust following a blasting event. An incident report was submitted to DEM on 19 March 2024. This is outlined within **Table 32 – Instance of Non-Compliance**.		

Leading Indicator Criteria

- Undertake weekly maintenance program to ensure dust suppression systems and water sprays are operated and maintained in an efficient manner.
- Undertake ongoing visual inspections of Site operations and monitoring of wind and weather forecasts (Bureau of Meteorology).
- Respond to automatic email / SMS alerts and implement controls according to the approved Table 4-5: Dust monitoring trigger action responses for the following trigger levels;
  - One (1) hour average of: 60 µg / m^3 PM_{10}
  - Two (2) consecutive hourly averages of: > 60 µg / m^3 PM_{10}
  - Three (3) consecutive hourly averages of: > 60 µg / m^3 PM_{10}

Leading Indicator Summary

A general Site inspection conducted on 24 October 2024 demonstrated dust suppression systems including the water cart are operational, and implemented onsite when necessary, refer to **Attachment 1 – General Site Inspection Report**.

As per **Attachment 4 – Dust Management Plan**, the DMP is adhered to, which includes monitoring wind and weather forecasts for any necessary TARP events, which are recorded and responded to within the EPA quarterly reports. A revision of the DMP commenced during the reporting period and is currently underway.

Effectiveness of Existing Controls

Existing control strategies at the Site include adherence with the DMP as per **Attachment 4 – Dust Management Plan**, undertaking ongoing visual inspections of the Site and monitoring wind and weather forecasts to determine days of unfavourable weather conditions and when to avoid potential dust generating activities. Additionally, daily inspections of the entrance road are undertaken, and street sweeping and wheel wash is implemented to minimise drag out.

A general Site inspection conducted on 24 October 2024 demonstrated dust-suppression measures including the water cart, wheel wash and street sweeper are implemented when necessary, refer to **Attachment 1 – General Site Inspection Report**. Additionally, re-seeding of disturbed areas and progressive rehabilitation is evident to increase vegetative cover and prevent sediment loss to erosion, refer to **Attachment 1 – General Site Inspection Report**.

During the reporting period, eight (8) dust complaints were received by the Site directly and five (5) were received by / via DEM. Correspondence regarding dust complaints occurred with DEM on two (2) occasions; one (1) of which identified four (4) dust complaints made directly to DEM on 21 March 2024. Correspondence with DEM resulted in a non-conformance for dust on 13 March 2024, due to evidence of public nuisance caused by dust following a blasting event. An incident report was submitted to DEM on 19 March 2024.

Dust monitoring, including real-time PM_{10} through ADR units, and dust deposition monitoring, is actively implemented at the Site. Dust deposition monitoring results are available upon request.

All dust complaints received by the Site directly were responded to within a timely manner as outlined within **Section 4 Complaints**. As an incident report was required by DEM and submitted due to public nuisance impacts caused by dust, the Site was non-compliant with the dust outcome, refer to **Table 32 – Instance of Non-Compliance**.

Supporting Report Reference
Drawing No. 1741.DRG.128 – Dust Deposition Plan (2021-10-07)
Attachment 1 – General Site Inspection Report
Attachment 4 – Dust Management Plan
Dust deposition monitoring results available upon request.

Table 18 – Blasting, Vibration and Overpressure

Aspect	**Tenement(s)**	**Compliance Status**
Blasting, Vibration and Overpressure (B1)	EML 5440, PM 163 & PM 237	Compliant

Environmental Outcome / Objective

No public nuisance impacts from air blast, fly rock and vibration, overpressure caused by blasting.

Tenement Condition

Not applicable.

Outcome / Objective Measurement Criteria

Quarry records demonstrate that all blast related complaints are acknowledged within 48 hours and closed out within seven (7) days to the satisfaction of the Regulator.

All blasts are monitored to comply with the following;

- Ground Vibration – Five (5) millimetres (mm) / second (sec) with up to five (5) percent allowable to 10 mm / sec or less in a 12-month period.
- Overpressure – 115 dB (Lin Peak) with up to five (5) percent allowable to 120 dB (Lin Peak) or less in a 12-month period.
- No fly rock to leave Tenement boundaries.

Outcome / Objective Measurement Criteria Summary

During the reporting period, blasting has occurred 34 times, with no exceedances (blasting results available upon request). All blasts have occurred in accordance with the Blast Management Plan (BMP), which is available upon request.

During the reporting period, two (2) complaints regarding blasting were received by the Site. **Section 4 Complaints** demonstrates that one (1) blasting-related complaint was responded to within a timely manner, while the other resulted in a non-conformance with the dust outcome (refer to **Table 17 – Dust**). An incident report was submitted to DEM on 19 March 2024 regarding the non-conformance.

Leading Indicator Criteria

- Ongoing review of blast monitoring results confirm ground vibration and overpressure results trend within compliance with criteria for 12-month monitoring period.
- Events producing monitoring results exceeding this criteria will be reported to the Department of the Premier and Cabinet (now DEM) and investigated.

Leading Indicator Summary

All blasts are monitored according to the DMP. No blasting exceedances were recorded during the reporting period. Blasting records are available upon request.

Effectiveness of Existing Controls

Existing control strategies at the Site include adherence to the BMP, which includes considering the impact upon neighbouring properties, considering the Maximum Instantaneous Charge and drill hole diameter to ensure no vibration or overpressure exceedances. Additionally, blast procedures are to signed off by the Quarry Manager to demonstrate appropriate design, including monitoring of vibration and air pressure.

The Site adheres to the BMP and all blasts are designed by a suitable contractor. During the reporting period, 34 blasts were undertaken by the Site, of which no exceedances occurred.

During the reporting period, two (2) complaints regarding blasting were received by the Site. **Section 4 Complaints** demonstrates that one (1) blasting-related complaint was responded to

within a timely manner, while the other resulted in a non-conformance with the dust outcome (refer to **Table 17 – Dust**). An incident report was submitted to DEM on 19 March 2024 regarding the non-conformance. As no public nuisance impacts from air blast, fly rock and vibration, overpressure caused by blasting have occurred during the reporting period, the existing control strategies are effective.
Supporting Report Reference Blasting records and BMP available upon request.

Table 19 – Erosion, Sediment and Stormwater Control

Aspect	**Tenement(s)**	**Compliance Status**
Erosion, Sediment and Stormwater Control (ESS1)	EML 5440, PM 163 & PM 237	Compliant
Environmental Outcome / Objective No contamination of potential receiving waterways (first order, second order watercourses tributary of unnamed creek, Sellicks Beach south-east from Sellicks Hill) as a result of quarrying operations.		
Tenement Condition Not applicable.		
Outcome / Objective Measurement Criteria Quarry records demonstrate that sediment detention ponds / silt dams are regularly maintained and free from excessive build up and functioning effectively. Overflow discharge points are regularly inspected following heavy rainfall events, visibly free of contamination, sediment, erosion and rubbish. If water must be discharged offsite, water will be monitored to demonstrate compliance with the *Environment Protection Policy (Water Quality) 2015* default trigger values for lowland river ecosystems applicable to South Australia for turbidity (50 nephelometric turbidity units [NTU]).		
Outcome / Objective Measurement Criteria Summary During the reporting period, the sediment detention ponds / silt dams were cleaned out once (13 January 2024) due to traffic risk. Generally, sediment dams are cleaned out annually. Water was discharged offsite during the reporting period, which was monitored for turbidity, with readings approximately 35 NTU. The creek was monitored following heavy rainfall events. A general Site inspection was undertaken on 24 October 2024 which demonstrated surface water is effectively retained within the sediment detention ponds / silt dams, and are free from excessive build up, refer to **Attachment 1 – General Site Inspection Report**.		
Leading Indicator Criteria Inspections following rainfall events of greater than 40 mm per day observe 50 percent of water storage capacity available. In the event 50 percent capacity is not available the sediment basin will be cleaned out (if safe to do so).		
Leading Indicator Summary During the reporting period, sediment detention ponds / silt dams were monitored after heavy rainfall events. The sediment dams were cleaned out once during the reporting period (13 January 2024) due to potential traffic risk, and were monitored after heavy rainfall events.		
Effectiveness of Existing Controls Existing control strategies include inducting staff on erosion control, diverting clean surface water using appropriate drainage measures, capturing all sedimented runoff within the sediment detention ponds / silt dams and appropriately managing stormwater. Additional control measures include minimising land disturbance and undertaking progressive rehabilitation to the extent practicable, regularly maintaining sediment detention ponds / silt dams, and recycling water collected within the quarry sump where practicable. Any spillage of contaminants are to be cleaned up as soon as possible, and any discharge of water offsite is to be monitored for turbidity. A general Site inspection conducted on 24 October 2024 and UAV conducted on 2 October 2024 demonstrated all surface water is retained within the quarry sump and sediment detention ponds / silt dams, refer to **Attachment 1 – General Site Inspection Report** and **Drawing No. 1741.DRG.168A – Orthophoto and Topography (2024-10-02)**. Sediment detention ponds / silt		

dams are generally inspected annually and after heavy rainfall events, and have been cleaned out on one occasion (13 January 2024) during the reporting period, due to a potential traffic risk. During the reporting period, surface water was discharged offsite, which was monitored for turbidity and returned a result of approximately 35 NTU. Additionally, the creek was inspected after heavy rainfall events. As no sedimented surface water has discharged from the Tenement during the reporting period, the existing control measures are effective at ensuring no contamination of waterways.
Supporting Report Reference **Drawing No. 1741.DRG.168A – Orthophoto and Topography (2024-10-02)** **Attachment 1 – General Site Inspection Report**.

Table 20 – Groundwater

Aspect	**Tenement(s)**	**Compliance Status**
Groundwater (GW1)	EML 5440, PM 163 & PM 237	Compliant
Environmental Outcome / Objective No adverse impact on the quality and quantity to existing groundwater users.		
Tenement Condition Not applicable.		
Outcome / Objective Measurement Criteria Annual review records kept in the Quarry Management Logbook demonstrate that bench and pit levels are developed in accordance with the staged development plans (refer to Drawing No.1741.DRG.041R2 – Quarry Development Plan - Stage 1, Drawing No. 1741.DRG.042R2 – Quarry Development Plan - Stage 2, Drawing No. 1741.DRG.043R2 – Quarry Development Plan - Stage 3, Drawing No. 1741.DRG.044R2 – Quarry Development Plan - Stage 4, Drawing No. 1741.DRG.045R2 – Quarry Development Plan - Stage 5, Drawing No. 1741.DRG.046R2 – Quarry Development Plan - Stage 15 and Drawing No. 1741.DRG.047R2 – Quarry Development Plan - Long Term).		
Outcome / Objective Measurement Criteria Summary The Site is currently adhering to the QDPs as per the MOP PEPR, by undertaking regular UAV surveys to inform Site conditions through the use of Propeller. According to a UAV survey conducted on 3 October 2024, the lowest pit floor level is currently 120.1 metres Australian Height Datum (mAHD) (Propeller, 2024). A groundwater assessment undertaken during the development of the MOP PEPR estimated the groundwater level at the Site to be between 27.69 mAHD and 31.11 mAHD, which is over 90 m below the quarry floor levels (refer to **Drawing No. 1741.DRG.168A – Orthophoto and Topography (2024-10-02)**).		
Leading Indicator Criteria In the event that quarrying operations are proposed at a depth greater than RL 122 (refer Drawing No. 1741.DRG.044R2 Quarry Development Plan - Stage 4) further groundwater investigations will be undertaken to ensure the pit floor will remain at least five (5) m above groundwater.		
Leading Indicator Summary Propeller data obtained from a UAV survey conducted on 3 July 2024 demonstrates the lowest pit floor level is 120.1 mAHD (Propeller, 2024). Propeller data demonstrates that only a small portion of the pit floor is below 122 mAHD, but does not exceed 120.1 mAHD (Propeller, 2024), refer to **Drawing No. 1741.DRG.168A – Orthophoto and Topography (2024-10-02)**. As groundwater levels have been predicted to be between 27.69 mAHD and 31.11 mAHD (over 90 m below the pit floor level), it is extremely unlikely impacts are being caused to groundwater. The response to this leading indicator criteria will be reviewed during the next reporting period. As per the groundwater assessment undertaken at the time of MOP PEPR approval, Australian Groundwater Technologies have advised the quarry depth may be deepened from 120 mAHD to 90 mAHD without intercepting groundwater, refer to **Attachment 5 – Groundwater Assessment**.		
Effectiveness of Existing Controls Existing control strategies include adhering to the QDPs to ensure the pit floor is designed at least five (5) m above the standing groundwater level. Propeller data obtained from a UAV survey which was undertaken on 3 July 2024 demonstrated the lowest pit floor level is 120.1 mAHD (Propeller, 2024), refer to **Drawing No. 1741.DRG.168A – Orthophoto and Topography (2024-10-02)**. As groundwater levels have been predicted to be		

between 27.69 mAHD and 31.11 mAHD (over 90 m below the pit floor level), it is unlikely impacts are being caused to groundwater. Additionally, water use at the Site is limited to mains water and recycled surface water which is collected within onsite dams and water tanks, refer to **Attachment 1 – General Site Inspection Report**. As the pit floor levels have not exceeded five (5) m from the standing groundwater level and groundwater is not utilised at the Site, the existing control strategies are effective at ensuring no adverse impact on the quantity and quality of groundwater to existing users.
Supporting Report Reference **Drawing No. 1741.DRG.168A – Orthophoto and Topography (2024-10-02)** **Attachment 1 – General Site Inspection Report** **Attachment 5 – Groundwater Assessment**.

Table 21 – Native Vegetation (Habitat Clearance or Disturbance)

Aspect	**Tenement(s)**	**Compliance Status**
Native Vegetation (Habitat Clearance or Disturbance) (NV1)	EML 5440, PM 163 & PM 237	Compliant

Environmental Outcome / Objective

No loss of abundance or diversity of native vegetation on or off the Land through;

- Clearance,
- Fire, or
- Other damage,

Unless prior approval under the relevant legislation is obtained.

Tenement Condition

Not applicable.

Outcome / Objective Measurement Criteria

Records demonstrate that:

- All vegetation clearance occurring in accordance with approved QDPs and no clearance has occurred outside of the approved areas,
- A five (5) m buffer is to be maintained from the dripline in the Root Protection Zone (RPZ) is maintained on trees that are to remain post quarry completion.

Outcome / Objective Measurement Criteria Summary

Vegetation clearance has occurred during the reporting period within PM 163 and EML 5440, as demonstrated within **Attachment 6 – Measurement Report**. As per Section 2.11.1 Vegetation within the approved MOP PEPR, vegetation clearance is permitted by exemption of the *Native Vegetation Act 1991* under the *Native Vegetation Regulations 2003*, within PM 163, PM 237 and EML 5440.

Minimal vegetation clearance occurred within PM 163 during the reporting period, as demonstrated within **Attachment 6 – Measurement Report**. Vegetation clearance occurred within this area to facilitate stormwater capture within the rain water tanks, as well as deal with water supply issues associated with Main South Road upgrades.

Although there were not any trees identified to be retained post quarry completion within the approved MOP PEPR, a five (5) m buffer is maintained around established vegetation that is to be retained long term.

Leading Indicator Criteria

Not applicable.

Leading Indicator Summary

Not applicable.

Effectiveness of Existing Controls

The existing control strategies include undertaking stripping and vegetation clearance in accordance with the approved QDPs, and training of mobile plant operators to ensure no unauthorised clearance.

During the reporting period, vegetation clearance occurred within EML 5440 and PM 163, as outlined within **Section 3.4 Disturbance and Rehabilitation Activities**. As per Section 2.11.1 Vegetation within the approved MOP PEPR, vegetation clearance is permitted by exemption of the *Native Vegetation Act 1991* under the *Native Vegetation Regulations 2003*, within PM 163, PM 237 and EML 5440.

Although there were not any trees identified to be retained post quarry completion within the approved MOP PEPR, a five (5) m buffer is maintained around established vegetation that is to be retained long term.

Vegetation clearance occurred outside of the QDPs within PM 163 to facilitate stormwater management at the Site, and mitigate water supply issues associated with upgrades to Main South Road, refer to **Attachment 6 – Measurement Report**. Though clearance occurred outside of the areas outlined within the QDPs, vegetation clearance is permitted by exemption of the *Native Vegetation Act 1991* under the *Native Vegetation Regulations 2003* within PM 163, as per the approved MOP PEPR. Therefore, vegetation clearance has occurred in accordance with the relevant legislation.

As native vegetation clearance has occurred in accordance with the relevant legislation, the existing control strategies are effective at ensuring no unauthorised loss of abundance or diversity of native vegetation.

Supporting Report Reference

Attachment 6 – Measurement Report.

Table 22 – Weeds, Pests and Plant Pathogen Management

Aspect Weeds, Pests and Pathogen Management (WP1)	**Tenement(s)** EML 5440, PM 163 & PM 237	**Compliance Status** Compliant
Environmental Outcome / Objective No introduction of new species of weeds, plant pathogens or pests (including feral animals), nor sustained increase in abundance of existing weed or pest species in the land compared to previous assessments.		
Tenement Condition Not applicable.		
Outcome / Objective Measurement Criteria Records of annual photographic monitoring undertaken in Spring, are held by the operator to demonstrate no introduction of new weeds, pests or plant pathogens and no increased abundance of weeds, pests or plant pathogens in the land when compared to previous assessments.		
Outcome / Objective Measurement Criteria Summary A weeds and pests inspection conducted on 24 October 2024 demonstrated no new introduction, or significant increases in the abundance of weeds during the reporting period, refer to **Attachment 7 – Weeds and Pests Inspection Report**. No evidence of pests were noted during the weeds and pests inspection.		
Leading Indicator Criteria Not applicable.		
Leading Indicator Summary Not applicable.		
Effectiveness of Existing Controls The existing control strategies include controlling weed infestations (by annual weed spraying campaigns if necessary), appropriate use of registered herbicides onsite (especially with respect to waterways), regular inspections for pests, and pest control if necessary. Additionally, haul roads are to be maintained and adhered to, to prevent the spread of weeds and weed management is to occur based on the status of the weed. During the reporting period, weed management including weed spraying and removal was undertaken as necessary. A weeds and pests inspection was undertaken on 24 October 2024 which demonstrated no new introductions, or significant increases in the abundance of weeds compared to previous assessments, refer to **Attachment 7 – Weeds and Pests Inspection Report**. Additionally, a general Site inspection conducted on 24 October 2024 identified a wheel wash onsite, which would aid in preventing the transport of introduced species' seeds, refer to **Attachment 1 – General Site Inspection Report**. As no new introductions or increases in abundance of weeds, pests and plant pathogens have been identified onsite, the existing control measures are effective.		
Supporting Report Reference **Attachment 1 – General Site Inspection Report** **Attachment 7 – Weeds and Pests Inspection Report**.		

Table 23 – Heritage

Aspect	**Tenement(s)**	**Compliance Status**
Heritage (H1)	EML 5440, PM 163 & PM 237	Compliant
Environmental Outcome / Objective No disturbance to European and / or Aboriginal heritage sites, objects or remains unless prior approval under the relevant legislation is obtained.		
Tenement Condition Not applicable.		
Outcome / Objective Measurement Criteria Quarry Management Logbook demonstrate that, upon discovery within the Tenements of any possible European and / or Aboriginal heritage sites; and / or objects or remains; • Work ceased until the relevant authorities were notified and work recommenced only once authorisation was received. • Documented evidence of potential or actual finds of European and / or Aboriginal heritage objects and evidence of consultation with the relevant authority.		
Outcome / Objective Measurement Criteria Summary During the reporting period, no European and / or Aboriginal heritage sites, remains or objects have been discovered at the Site.		
Leading Indicator Criteria Ongoing surveillance of work areas (particularly during vegetation and soil stripping) is to be conducted to ensure that heritage items and places are not damaged and / or disturbed by the quarrying activity. Records available onsite to confirm that all personnel are inducted on heritage requirements and responsibilities.		
Leading Indicator Summary All operators are aware of their responsibility with respect to the discovery of Aboriginal or European heritage sites. Ongoing surveillance of work areas is undertaken during operations, and all operators are trained on the process following the discovery of a heritage site.		
Effectiveness of Existing Controls The existing control strategies at the Site include inducting and training all personnel at the Site regarding the discovery of listed features. In the event that any cultural heritage sites or objects are identified, the following is to occur: • Immediately stop work in the vicinity of find. • Notify the relevant authority and the local Aboriginal Heritage group / SA Heritage Council of the find / potential find at the Site. • No activities are to recommence in the vicinity of the find until such time that liaison with the relevant authority and authority to proceed has been granted. During the reporting period, no discovery of European and / or Aboriginal heritage sites, objects and / or remains occurred. The existing control strategies are considered effective, should any heritage items be discovered.		
Supporting Report Reference Not applicable.		

Table 24 – Caves

Aspect	**Tenement(s)**	**Compliance Status**
Caves (C1)	EML 5440, PM 163 & PM 237	Compliant
Environmental Outcome / Objective No disturbance to cave sites unless prior approval under the relevant legislation is obtained.		
Tenement Condition Not applicable.		
Outcome / Objective Measurement Criteria Quarry Management Logbook demonstrate that, upon discovery within the Tenements of any possible cave sites; • Work ceased until the relevant authorities were notified and work recommenced only once authorisation was received. • Documentation evidence or potential or actual finds of caves and evidence of consultation with the relevant authority. Note: the term "cave" includes any underground opening or cavity with a cross-sectional area greater than 0.25 square metres, and a minor axis measurement greater than 0.4 m.		
Outcome / Objective Measurement Criteria Summary During the reporting period, no caves have been discovered at the Site.		
Leading Indicator Criteria Ongoing surveillance of work areas (particularly during vegetation and soil stripping) is to be conducted to ensure that caves not damaged and / or disturbed by the quarrying activity. Records available onsite to confirm that all personnel are inducted on heritage requirements and responsibilities.		
Leading Indicator Summary All operators are aware of their responsibility with respect to the discovery of cave sites. Ongoing surveillance of work areas is undertaken during operations, and all operators are trained on the process following the discovery of a cave site.		
Effectiveness of Existing Controls The existing control strategies at the Site include inducting and training all personnel at the Site regarding the discovery of listed features. In the event that any cave sites are identified, the following is to occur: • Immediately stop work in the vicinity of find. • Notify the relevant authority (DPC) of the find / potential find at the Site. • No activities are to recommence in the vicinity of the find until such time that liaison with the relevant authority and authority to proceed has been granted. During the reporting period, no discovery of cave sites occurred. The existing control strategies are considered effective, should any cave sites be discovered.		
Supporting Report Reference Not applicable.		

Table 25 – Topsoil Management

Aspect	**Tenement(s)**	**Compliance Status**
Topsoil Management (TS1)	EML 5440, PM 163 & PM 237	Compliant
Environmental Outcome / Objective Ensure existing quality and quantity of soil is maintained and applied to rehabilitation areas for successful rehabilitation.		
Tenement Condition Not applicable.		
Outcome / Objective Measurement Criteria Annual inspection and recording of soil stockpiles at Site to confirm that: • Topsoil stockpiles do not exceed three (3) m in height • Vegetative cover is established. • Minimal erosion (e.g. rills, gullies) or other evidence of soil loss.		
Outcome / Objective Measurement Criteria Summary A topsoilinspection undertaken on 24 October 2024 demonstrated topsoil stockpiles are stored appropriately, free from significant weeds and erosion, and do not exceed three (3) m in height, refer to **Attachment 8 – Topsoil Stockpile Inspection Report**.		
Leading Indicator Criteria Not applicable.		
Leading Indicator Summary Not applicable.		
Effectiveness of Existing Controls The existing control strategies include soil to be stripped ahead of quarrying and stored upgradient of quarry development areas, separately to overburden and subsoil, vegetated and not exceeding two (2) to three (3) m high. Additionally, topsoil stripping should be limited to the minimum area necessary and not undertaken when too dry or wet, and erosion and drainage control are to be implemented where necessary. During the reporting period, topsoil stripping occurred in the area to the east of the current works within PM 237 (hay paddock), by which topsoil is being utilised for progressive rehabilitation purposes as demonstrated within **Attachment 6 – Measurement Report**. A topsoil stockpile inspection undertaken on 24 October 2024 demonstrated topsoil stockpiles are stored appropriately; free from significant erosion and weeds, below three (3) m in height and vegetated, refer to **Attachment 8 – Topsoil Stockpile Inspection Report**. As topsoil is stored onsite and appropriately, the existing control strategies are effective at maintaining the existing quality and quantity of soil.		
Supporting Report Reference **Attachment 6 – Measurement Report** **Attachment 8 – Topsoil Stockpile Inspection Report**.		

Table 26 – Waste Management

Aspect	**Tenement(s)**	**Compliance Status**
Waste Management (WM1)	EML 5440, PM 163 & PM 237	Compliant
Environmental Outcome / Objective All imported fill used in progressive rehabilitation satisfies Waste Derived Fill (WDF) criteria.		
Tenement Condition Not applicable.		
Outcome / Objective Measurement Criteria All certificates of accepted WDF material are stored at the Site and will demonstrate that only WDF material is accepted for use in progressive rehabilitation. WDF receipt record details: • Source • Parties involved • Volume received • Observations of the physical nature of the soil/material • Final location of material onsite • Analysis results for >100 t loads.		
Outcome / Objective Measurement Criteria Summary During the reporting period, the Site has not received any WDF material. The Site accepts concrete washout returns which are filtered back through road base production.		
Leading Indicator Criteria Not applicable.		
Leading Indicator Summary Not applicable.		
Effectiveness of Existing Controls The existing control strategies include adhering to the *EPA Standards for the Production and Use of Waste Derived Fill, October 2013*, keeping adequate records of the receipt of WDF material and refusal of material which does not meet WDF material. During the reporting period, no WDF material was received by the Site, excluding concrete washout returns. The existing control strategies are considered effective, should WDF material be received by the Site.		
Supporting Report Reference Not applicable.		

Table 27 – Waste Management

Aspect	**Tenement(s)**	**Compliance Status**
Waste Management (WM2)	EML 5440, PM 163 & PM 237	Compliant
Environmental Outcome / Objective No land contamination, or release of contaminants to the environment from waste on quarry Site.		
Tenement Condition Not applicable.		
Outcome / Objective Measurement Criteria All waste tracking receipts are stored at the Site and will demonstrate that waste materials have been disposed of at an EPA licenced facility. Records show all chemicals and hydrocarbons are to be stored and handled in a bunded area, designed and installed in accordance with *Australian Standard AS 1940 - The storage and handling of flammable and combustible liquids* and *EPA Guideline: EPA080/12 Liquid storage Bunding and spill management*.		
Outcome / Objective Measurement Criteria Summary During the reporting period, all waste materials were disposed of at an EPA licenced facility. Receipts are stored onsite and are available upon request. A general Site inspection undertaken on 24 October 2024 demonstrated all hydrocarbons and chemicals are stored and handled in accordance with *Australian Standard AS 1940 - The storage and handling of flammable and combustible liquids* and *EPA Guideline: EPA080/12 Liquid storage Bunding and spill management*, refer to **Attachment 1 – General Site Inspection Report**.		
Leading Indicator Criteria Not applicable.		
Leading Indicator Summary Not applicable.		
Effectiveness of Existing Controls The existing control strategies include disposing of all wastes at an approved facility, all hydrocarbons and are contained within a bunded area, which is designed and installed in accordance with the Australian Standards, spill kits are available at all times and any spills of potential contaminants are cleaned up immediately. A general Site inspection conducted on 24 October 2024 demonstrated all hydrocarbons and chemicals are stored appropriately, and spill kits are available onsite, refer to **Attachment 1 – General Site Inspection Report**. During the reporting period, all trackable wastes were disposed of at an EPA licenced facility, and no spills of potential contaminants has occurred. As all wastes have been stored and disposed of appropriately, and no spills of contaminants has occurred, the existing control strategies are effective.		
Supporting Report Reference **Attachment 1 – General Site Inspection Report**.		

Table 28 – Traffic

Aspect	**Tenement(s)**	**Compliance Status**
Traffic (T1)	EML 5440, PM 163 & PM 237	Compliant
Environmental Outcome / Objective No traffic accidents involving the public at quarry access points that could have been reasonably prevented by the Tenement Holder.		
Tenement Condition Not applicable.		
Outcome / Objective Measurement Criteria All traffic accidents resulting in public injury and / or death at quarry access points will be investigated by a suitably qualified independent third party within one (1) calendar month (or other time as agreed with DPC Mining Regulation) and the results of the investigation show that the incident could not have been reasonably prevented by the Tenement Holder.		
Outcome / Objective Measurement Criteria Summary During the reporting period, no traffic accidents involving the public have occurred at mine access points.		
Leading Indicator Criteria Not applicable.		
Leading Indicator Summary Not applicable.		
Effectiveness of Existing Controls The existing control strategies include ensuring all personnel comply with Site traffic management policies by undertaking inductions and issuing directives, ensuring all vehicle-operating employees are appropriately licenced, and road signage is designed and installed in accordance with AS 1744:1975 and AS/NZS 1906.1:2007. Additionally, all personnel must report to the Site office upon arrival, two-way radios must be available in all vehicles, and road trucks are to be fitted with tarping systems and flashing lights. During the reporting period, no traffic accidents occurred involving the public at mine access points. A general Site inspection conducted on 24 October 2024 demonstrated traffic signage is in place and effective, and roads are in good condition, refer to **Attachment 1 – General Site Inspection Report**. As no traffic accidents involving the public have occurred at mine access points, the existing control strategies are effective.		
Supporting Report Reference **Attachment 1 – General Site Inspection Report**.		

Table 29 – Traffic

Aspect	**Tenement(s)**	**Compliance Status**
Traffic (T2)	EML 5440, PM 163 & PM 237	Compliant

Environmental Outcome / Objective

No public impacts caused by quarry related surface water discharges on Main South Road that could have been reasonably prevented by the Tenement Holder.

Tenement Condition

Not applicable.

Outcome / Objective Measurement Criteria

Regular inspections (monthly and / or following heavy rainfall event [> 40 mm over 24 hours]) of drainage infrastructure, diversions and sediment detention basins to ensure structures are;

- Free from excessive build up (sediment)
- Sediment accumulation on the roadway diverting water flow from its normal course.

If inspection shows exceedance of the above, records will demonstrate clean-up occurred within 24 hours of the operator becoming aware.

Outcome / Objective Measurement Criteria Summary

During the reporting period, inspections of drainage infrastructure, diversions and sediment detention basins were undertaken regularly, and following heavy rainfall events, to ensure they are free from excessive sediment build up.

Leading Indicator Criteria

Visual inspections of drainage infrastructure, diversions and sediment detention basins following heavy rainfall event (over 40 mm in a 24 hour period).

Leading Indicator Summary

During the reporting period, regular visual inspection were undertaken of drainage infrastructure, sediment detention basins and the Site discharge point. No complaints regarding surface water discharge from the Site were received during the reporting period.

Effectiveness of Existing Controls

The existing control strategies include regular inspection and maintenance of surface water diversions to ensure surface water flows are effectively diverted to the sediment detention basin, as well as regularly inspecting and maintaining sediment detention basins to ensure they are free of excessive build up and have sufficient capacity to capture, store and treat surface water prior to stormwater discharge.

During the reporting period, sediment detention basins were monitored and cleaned out on one occasion (13 January 2024), and are generally cleaned out on an annual basis. A general Site inspection conducted on 24 October 2024 demonstrated sediment detention basins are in good condition, free from excessive build up and have capacity to be effective, refer to **Attachment 1 – General Site Inspection Report**.

No incidents or complaints regarding surface water discharge onto Main South Road have occurred during the reporting period. Therefore, the existing control strategies are effective.

Supporting Report Reference

Attachment 1 – General Site Inspection Report.

Table 30 – Traffic

Aspect	**Tenement(s)**	**Compliance Status**
Traffic (T3)	EML 5440, PM 163 & PM 237	Non-compliant
Environmental Outcome / Objective No public impacts from drag out are caused by quarry related traffic on Main South Road that could have been reasonably prevented by the Tenement Holder.		
Tenement Condition Not applicable.		
Outcome / Objective Measurement Criteria Daily inspection at the Site entry and exit point will show that roadway and gutters a free of excessive build-up of sediment and / or aggregate material from quarry i.e., roadway visibly clear of drag-out / sediment accumulation on the roadway and sediment does not divert water flow from its normal course. If inspection shows exceedance of the above, records will demonstrate clean-up occurred within 24 hours of the operator becoming aware.		
Outcome / Objective Measurement Criteria Summary During the reporting period, one (1) complaint regarding drag out on Main South Road was received by the Site via the EPA, resulting in a letter of non-compliance by DEM (issued 22 April 2024). A response letter was issued to DEM from the Site on 24 April 2024, which outlined corrective actions to be taken to minimise drag out, refer to **Section 4 Complaints**. The Site entry and exit point is monitored daily by Site management, and a street sweeper and whee wash is operational. Additionally, FOD mats were installed on the exit of the wheel wash during the reporting period.		
Leading Indicator Criteria Not applicable.		
Leading Indicator Summary Not applicable.		
Effectiveness of Existing Controls The existing control strategies include covering loads prior to exiting the Site, and maintenance of the entrance road when necessary, including the implementation of a street sweeper. A general Site inspection conducted on 24 October 2024 outlined the Site entrance to be in good condition and free from excessive drag out, with the rumble grid and wheel wash noted for mitigation measures, refer to **Attachment 1 – General Site Inspection Report**. Additionally, FOD mats were installed on the exit of the wheel wash during the reporting period. During the reporting period, one (1) complaint regarding drag out on Main South Road was received by the Site via the EPA, resulting in a letter of non-compliance by DEM (issued 22 April 2024). A response letter was issued to DEM from the Site on 24 April 2024, which outlined corrective actions to be taken to minimise drag out, refer to **Section 4 Complaints**. As public nuisance impacts caused by drag out on Main South Road at the Site entrance were noted to be caused by Site operations, the Site is non-compliant with the traffic environmental outcome / objective. Corrective actions for this non-compliance are outlined within **Table 33 – Instance of Non-Compliance**.		

Supporting Report Reference
Attachment 1 – General Site Inspection Report.

3.2 Compliance with Non-Outcome Based Conditions

Table 31 – Compliance with Non-Outcome Based Conditions demonstrates the Non-Outcome Based Conditions described within the EML 5440 document and EPA Licence (Licence Number 2052).

Table 31 – Compliance with Non-Outcome Based Conditions

Tenement Condition and Number	Compliance Status	Evidence
EML 5440		
Second Schedule (Special Conditions), Condition No. 1 Rehabilitation shall be progressive and to the satisfaction of an Inspector of Mines.	Compliant.	The Site has developed a Quarry Development and Rehabilitation Plan which defines the staged and progressive rehabilitation., which was approved as part of the MPEPR No. 2015 / 005. **Table 36 – Rehabilitation Activity Summary** outlines rehabilitation activities which have occurred during the reporting period.
Second Schedule (Special Conditions), Condition No. 2 Mounding and screen planting shall be carried out along the northern perimeter of the workings in a manner approved by the Chief Inspector of Mines.	Compliant.	A general Site inspection conducted on 24 October 2024 demonstrated mounding and screen planting as part of the historic rehabilitation of the Site, refer to **Attachment 1 – General Site Inspection Report**. A visual amenity bund has been constructed along the northern boundary, as demonstrated within **Drawing No. 1741.DRG.144R1 – Site Layout Plan**.
Second Schedule (Special Conditions), Condition No. 3 Without limiting the generality of or derogating from Clause 6 (12) of this agreement, the lessee shall comply with the provisions of: • The Mines and Works Inspection Act, the Regulations made thereunder, or any lawful direction given by an Inspector pursuant to the provisions of that Act, and • The Water Resources Act, or any legislation amending, repealing, or replacing those Acts. Note: any variation to the specifications set out above must have the prior written approval of the Minister.	Compliant.	A MOP PEPR was approved on 24 May 2018 as MPEPR No. 2015 / 005. Operations have occurred in accordance with the approved program (which operates in accordance with the *Mining Act 1971*) during the reporting period.
EPA Licence Number 2052		

Tenement Condition and Number	Compliance Status	Evidence
1 Control of Emissions 1.1 Dust Management Plan (U-390) The Licensee must: 1.1.1 Submit to the EPA by 30 June 2016, an appropriate Dust Management Plan (DMP) to the satisfaction of the EPA. The DMP must include, but not limited to the following: a) Identification of all sources of dust emissions that may be generated by the activities at the Premises and their risk assessment; b) Details of appropriate measures identified in the risk assessment to minimise the dust emissions by applying reasonable and practicable and precautionary principles; c) Details of dust and meteorological monitoring to be undertaken to measure the dust leaving the Premises including appropriateness of the monitors and their locations within the context of the Premises, methodology of data collection and frequency of measurement; d) Details of criteria by which the monitoring results will be assessed and interpreted; e) Details of remedial measures to be implemented to immediately respond to dust level exceedances adopted in sub-clause 1.1.1.d, otherwise known as a TARP. f) Details of the feedback mechanism and interpretation of monitoring information to the risk assessment; and g) Strategy for community engagement with the affected community members.	Compliant.	A DMP has been developed, implemented and submitted to the EPA. The DMP (Revision 13) was last updated on 5 October 2022, and is publicly available on the SA EPA website, refer to **Attachment 4 – Dust Management Plan**. A review of the DMP commenced during the reporting period, and is currently underway.
1.2 Stormwater (S – 15) The Licensee must: 1.2.1 take all reasonable and practicable measures to prevent contamination of stormwater at the Premises; and 1.2.2 implement appropriate contingency measures to contain any contaminated stormwater at the	Compliant.	Refer to **Table 19 – Erosion, Sediment and Stormwater Control**. Water tanks to capture stormwater and mitigate water supply issues associated with Main South Road upgrades have been implemented during the reporting period.

Tenement Condition and Number	Compliance Status	Evidence
Premises unless and until the contaminated stormwater is treated to remove the contamination or is disposed of at an appropriately licenced facility.		
2 Waste Management 2.1 Waste Management Criteria (67 – 21) The Licensee must only receive, process and re-use concrete, bitumen and waste fill at the Premises in accordance with EPA Standard for the production and use of WDF.	Compliant.	Refer to **Table 26 – Waste Management**. The Site has accepted return concrete in accordance with the EPA Licence.
3 Operational Management 3.1 Bunding (S – 5) The Licensee must ensure that all chemicals or chemical products are stored, loaded, or unloaded in an appropriately bunded area. Notes: The EPA will assess the appropriateness of any bund against the EPA's Bunding and Spill Management Guidelines.	Compliant.	Refer to **Table 27 – Waste Management**.
3.2 Complaints Register (S – 1) The Licensee must: 3.2.1 Prepare and maintain a register of all complaints concerning environmental issues 3.5.3 Maintain certification records received to demonstrate that Waste Fill complies with Table 1 and 2 are maintained for a period of not less than 12 months from the date of receipt.	Compliant.	A register of all complaints and investigations is maintained onsite. Refer to **Section 4 Complaints** for a record of the complaints received during the reporting period. Refer to **Table 26 – Waste Management** for details on the receipt of WDF at the Site.
3.3 Emergency Spill Kits (S – 22) The Licensee must ensure that an appropriate emergency spill kit is kept on the Premises at all times in locations where listed wastes are stored, loaded or unloaded and is appropriately used in the event of a spill.	Compliant.	A general Site inspection conducted on 24 October 2024 demonstrated spill kits present at all hazardous storage areas onsite, refer to **Attachment 1 – General Site Inspection Report**.
3.4 Pollution Control Equipment Register (S – 2) The Licensee must: 3.4.1 maintain all Pollution Control Equipment to ensure that pollution is minimised; and	Compliant.	A pollution control equipment register is maintained onsite.

Tenement Condition and Number	Compliance Status	Evidence
3.4.2 keep a written record of all inspections of Pollution Control Equipment, which includes: a) the name of the recording officer; b) the date of each inspection of the equipment; c) details of the equipment that was inspected; d) an assessment of whether the equipment was working effectively; and e. the action taken (if required) to rectify any faults or failures.		
3.5 Receipt of Waste Soil (67 – 1409) The Licensee must ensure that Waste Fill received at the Premises: 3.5.1 is accompanied by written, signed and dated certification from a suitably qualified consultant or site contamination consultant stating that the waste constitutes Waste Fill when it exceeds 100 t from a single source site unless otherwise approved by the EPA in writing; 3.5.2 complies with the relevant definitions and chemical criteria as defined in Tables 1 and 2 attached to this licence; and 3.5.3 maintain certification records received to demonstrate the Waste Fill complies with Tables 1 and 2 are maintained for a period of not less than 12 months from the date of receipt.	Compliant.	Refer to **Table 26 – Waste Management**.
3.6 Washing of Vehicles (S – 106) The Licensee must: 3.6.1 only wash vehicles at the Premises within a wash bay that is bunded. 3.6.2 dispose of any wastewater collected within that bund to: a) a sewer; or b) a waste depot licensed to receive that waste; or c) a Sewerage Treatment Effluent Disposal Scheme (STEDS); or d) leachate ponds; or e) a wastewater management system.	Compliant.	The Site's wash bay is bunded and is on the southern portion of the Site, and vehicles are only washed within the wash bay. A general Site inspection conducted on 24 October 2024 identified a wheel wash and rumble grid are present onsite, refer to **Attachment 1 – General Site Inspection Report**. Water is reused where possible and a waste depot collects oil from the oil separation system.

Tenement Condition and Number	Compliance Status	Evidence
4.2 Approval of Operating Processes (A – 6) The Licensee must not undertake changes to operating processes conducted pursuant to the Licence at the Premises without written approval from the EPA, where such changes: 4.2.1 have the potential to increase emissions or alter the nature of pollutants or waste currently generated by, or from the licensed activity; or 4.2.2 have the potential to increase the risk of environmental harm; or 4.2.3 would relocate the point of discharge of pollution or waste at the Premises.	Compliant.	A MOP PEPR was approved on 24 May 2018 as MPEPR No. 2015 / 005. Operations have occurred in accordance with the approved program during the reporting period. All current operations at the Site are authorised under EPA Licence No. 2052. During the reporting period, EML 6552 was approved at the Site. Operations have not begun on EML 6552, and a PEPR is not required to be submitted until the next reporting period. Refer to **Section 7.1 Changes to Authorised Operations** for further information.
4.3 Approval of Works (A – 5) The Licensee must not construct or alter a building or structure, or install or alter any plant or equipment, for use of an activity undertaken pursuant to the Licence at the Premises without written approval from the EPA, where such changes: 4.3.1 have the potential to increase the emissions or alter the nature of pollutants or waste currently generated by, or from the licensed activity; or 4.3.2 have the potential to increase the risk of environmental harm; or 4.3.3 would relocate the point of discharge of pollution or waste at the Premises.	Compliant.	A MOP PEPR was approved on 24 May 2018 as MPEPR No. 2015 / 005. Operations have occurred in accordance with the approved program during the reporting period. All current operations at the Site are authorised under EPA Licence No. 2052.

3.3 Rectification of Non-Compliances

Table 32 – Instance of Non-Compliance demonstrates non-compliances which have occurred at the Site during the reporting period, and the strategies for rectification.

Table 32 – Instance of Non-Compliance

Date of the incident 13 March 2024	**Date the incident was reported** 19 March 2024
What environmental outcome / objective or Tenement condition was breached? Dust (D1) - no public health and / or nuisance impacts from dust generated by quarrying operations.	

State the cause of the non-compliance A dust complaint was made on 13 March 2024 by a member of the community via phone call regarding dust associated with blasting activities. The same community member contacted DEM with regards to the same instance of dust generation, which was supported by a video demonstrating evidence of dust causing public nuisance impacts. DEM stated this was a reportable incident due to non-compliance with the dust environmental objective / outcome.
Detail any actions taken or yet to be taken to rectify the non-compliance and to prevent the recurrence of any such non-compliance. The complainant was contacted by the Site regarding the circumstances of the blast, and was added to the blast notification list. An incident report was submitted to DEM on 19 March 2024. Dust suppression measures including the water truck, progressive rehabilitation, DMP (including the TARP) and dust monitoring are actively occurring at the Site. A review of the DMP commenced during the reporting period, and is currently underway to rectify this non-compliance and prevent future non-compliance events. No further correspondence was received and this non compliance has been resolved with no further action required at this stage, with the exception of ongoing correspondence regarding the Site's DMP.

Table 33 – Instance of Non-Compliance

Date of the incident 22 April 2024	**Date the incident was reported** 24 April 2024
What environmental outcome / objective or Tenement condition was breached? Traffic (T3) - no public impacts from drag out are caused by quarry related traffic on Main South Road that could have been reasonably prevented by the Tenement Holder.	
State the cause of the non-compliance A letter of non-compliance regarding drag out impacts was received by the Site on 22 April 2024, which stated three (3) occasions of potential public impacts caused by drag out: 1. 11 April 2024 – DEM and EPA onsite for Site tour mentioned drag out needed to be addressed; 2. 18 April 2024 – DEM drove past Site and observed significant drag out impacts caused by the Site; and 3. 19 April 2024 – EPA received complaint regarding drag out.	
Detail any actions taken or yet to be taken to rectify the non-compliance and to prevent the recurrence of any such non-compliance. A response letter was sent to DEM on 24 April 2024, as required outlining the corrective actions taken and other actions to minimise drag out. Mitigation measures including the wheel wash, installation of FOB mats on the exit of the wheel wash during the reporting period, and the operation of a street sweeper are currently implemented at the Site to rectify this non-compliance and prevent future non-compliance events. No further correspondence was received and this non compliance has been resolved with no further action required at this stage.	

Table 34 – Instance of Non-Compliance

Date of the incident October 2024	**Date the incident was reported** October 2024
What environmental outcome / objective or Tenement condition was breached? Damage to Third-Party Property (TPP1) - no damage as a result of quarrying operations to adjacent public or private property and infrastructure (Main South Road) as a result of overburden slip.	

State the cause of the non-compliance Annual geotechnical audit identified a small area which exceeds the TSA of 25 degrees. As specified within the outcome / objective measurement criteria, annual inspection must demonstrate that slopes are battered to less than 25 degrees. According to **Attachment 2 – Annual Geotechnical Audit October 2024**, the TSA from the toe to the crest exceeds the 25 degree limit, reaching 30 degrees.
Detail any actions taken or yet to be taken to rectify the non-compliance and to prevent the recurrence of any such non-compliance. Corrective actions have been outlined within **Attachment 2 – Annual Geotechnical Audit October 2024**. It is expected that the TSA of Section D will decrease once the crest is rolled over and dozed to bring it to compliance. Adbri are aware of this non-compliance, and aim to undertake the recommended strategies within **Attachment 2 – Annual Geotechnical Audit October 2024** to rectify this non-compliance, and prevent further non-compliance during the next reporting period.

3.4 Disturbance and Rehabilitation Activities

During the reporting period, approximately 4.23 ha of disturbance occurred within EML 5440, PM 163 and PM 237 for quarry development, as outlined within **Table 35 – Disturbance Activity Summary**. Approximately 135.37 ha of disturbance in total has occurred at the Site, as demonstrated within **Attachment 6 – Measurement Report**.

Approximately 2.93 ha of ongoing progressive rehabilitation has occurred during the reporting period, at the east pit, south pit and WSM, which comprised of re-seeding disturbed areas with rye grass, as outlined within **Attachment 6 – Measurement Report**. As per **Table 36 – Rehabilitation Activity Summary**, 44.17 ha of rehabilitation has occurred historically, including the construction and planting of the WSM (overburden bund) and annual tree planting within PM 237. Approximately 1,300 trees have been planted for rehabilitation and revegetation areas within PM 163 (areas have not been marked in measurement report).

Other progressive rehabilitation activities include temporary stabilisation techniques, such as the application of hand sown rye corn, which eventually outcompetes weed species and provides organic material and a stable surface for the successful growth of native tubestock. In addition, a trial of sealing agent has been used to hold seeds in place which is showing early signs of success, noted during the general Site inspection, refer to **Attachment 1 – General Site Inspection Report**.

Proposed rehabilitation for the next reporting period is the continuation of the rehabilitation activities which occurred during this reporting period.

Table 35 – Disturbance Activity Summary

Area	Disturbance Activity	Amount of land disturbed during the reporting period (ha)	Total area disturbed (ha)
The Site	General quarry development.	4.23	135.37

Table 36 – Rehabilitation Activity Summary

Area	Rehabilitation Activity	Amount of land rehabilitated during the reporting period (ha)	Estimated amount of land to be rehabilitated next reporting period (ha)	Total amount of land where rehabilitation works are completed (ha)
The Site	Progressive rehabilitation.	2.93	Not applicable.	47.101

3.5 Reconciliation of Native Vegetation

Minimal vegetation clearance has occurred within EML 5440 and PM 163 for quarry development and stormwater management purposes.

Minimal vegetation clearance occurred outside of the areas outlined within the QDPs (refer to **Attachment 6 – Measurement Report**) to facilitate stormwater management, and mitigate water supply issues associated with upgrades to Main South Road. Vegetation clearance is permitted by exemption within these areas (as per the MOP PEPR). All vegetation clearance occurred in accordance with the relevant legislation.

No Native Vegetation Management Plan (NVMP) exists for the Site and the Site is exempt form the requirements of the *Native Vegetation Act 1991*, refer to **Table 21 – Native Vegetation (Habitat Clearance or Disturbance)**.

3.6 Environment Protection and Biodiversity Conservation Act Reporting

Due to the absence of *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed species within or adjacent to the Site, a referral under the EPBC Act has not been required.

3.7 Exempt Land

Table 37 – Exempt Land Statement provides a statement on the status of exempt land on the Site. A drawing demonstrating exempt land is outlined within **Drawing No. 1741.DRG.130 – Exempt Land Map August 2021**.

Table 37 – Exempt Land Statement

All waivers for land relevant to the mining operation are in place, and compliant with exempt land provisions, in accordance with Section 9 of the *Mining Act 1971*	Yes
Notice has been given to the Mining Registrar that an exempt land agreement has been entered into	Yes

The status of exempt land is shown in **Table 38 – Exempt Land Status**.

Table 38 – Exempt Land Status

Name of Person Entitled to Exemption	Certificate of Title or Crown Land Details	Reason for Exemption	Area of Exemption	Date Waiver Registered / Obtained	Any Relevant Conditions
Vasilios Liapis and Maria Liapis	1 – CT 5987/105 2 – CT 5781/771 3 – CT 5775/613 4 – CT 6083/148 5 – CT 6083/149	As per Section 9 of the *Mining Act 1971*, land is within 400 m of the Site.	Residence located on CT 5946/150 D64276 A21 – 38 Country Road, Sellicks Beach, Hundred of Willunga.	09/04/2018	Not applicable.

4 Complaints

Community complaints are managed as per the MOP PEPR. A summary of the community complaints during the reporting period if shown in **Table 39 – Complaints Summary**.

Table 39 – Complaints Summary

Complaint Date / Time	Nature of complaint	Related to non-compliance (yes / no)	Action taken (or to be taken) to address the complaint	Date complaint resolved	Notes / comments
12/01/2024	Dust	Yes	Emailed regarding how we minimise dust leaving site with use of the TARP Plan, also mentioned the three (3) ADR dust monitors around monitoring dust leaving Site.	13/01/2024 and 15/01/2024	
12/01/2024	Dust (complaint received via DEM)	Yes	Quarry Manager replied to DEM's email with relevant data.	15/01/2024	
22/01/2024	Dust (complaint received via DEM)	Yes	Acting SA Operations Manager replied to DEM's email with relevant data.	22/01/2024	
29/01/2024	Dust	Yes	Spoke in detail with DEM regarding the complaint, providing relevant details.	29/01/2024	
29/01/2024	Dust	Yes	Spoke in detail with DEM regarding the complaint, providing relevant details.	29/01/2024	
06/03/2024	Dust (email received from Electorate Officer Joanne Flesfadar on behalf of Hon Leon Bignell MP regarding community complaints)	Yes	Email response to complainant for her to contact General Manager for discussion.	06/03/2024	

Complaint Date / Time	Nature of complaint	Related to non-compliance (yes / no)	Action taken (or to be taken) to address the complaint	Date complaint resolved	Notes / comments
06/03/2024	Dust / Blasting	Yes	Emailed replied to regarding how we minimise dust leaving Site with the TARP plan. Also mentioned that we are in the process of reinstating blasting notifications online.	08/03/2024	
13/03/2024	Dust / Blasting	Yes	Site delayed blasting for as long as possible for more favourable conditions. Unfortunately, any further delay may have led to safety concerns including misfires. Contacted the community member regarding the circumstances surrounding the blast. Need to continue to communicate freely with the community and attempt to alleviate concerns where we can. Added the community members email to the blast notification list.	13/03/2024	Complainant also complained to DEM and provided video evidence of dust emanating from the Site. Resulted in an incident report.
14/03/2024	Dust (complaint received via DEM)	Yes	SA Operations Manager replied to DEM's email with relevant data.	15/03/2024	
19/03/2024	Dust (DEM)	Yes	Email received from DEM regarding a dust complaint from the blast conducted on 13 March 2024. DEM stated that this is a reportable incident. As stated by DEM, the video shows a post blast dust cloud moving down toward the Sellicks community. The blast was conducted in line with our DMP however the dust would still have had an impact against the community which breaches the dust outcomes specified in the program (MOP / PEPR). Initial incident report submitted to DEM on 19 March 2024 at 4:00 pm. Comprehensive incident report submitted as per the request of DEM on 17/03/2024.	19/03/2024	Reportable incident.

Complaint Date / Time	Nature of complaint	Related to non-compliance (yes / no)	Action taken (or to be taken) to address the complaint	Date complaint resolved	Notes / comments
21/03/2024	General aspects – mass increase in complaints regarding the Quarry. Four (4) dust complaints received by DEM on 21/03/2024 (DEM)	Yes	General Manager replied to DEM's email with relevant data regarding the dust complaints. Also spoke to allocating internal resources to update the Sellicks Hill Quarry website with blast notifications and community updates regarding the Site.	21/03/2024	
22/03/2024	Dust	Yes	General Manager emailed DEM in regards to photos which were not attached to the email, and stated the secondary crushing plant was shutdown at 8:00 am due to poor weather conditions.	22/03/2024	
05/04/2024	Dust (email received via DEM)	Yes	General Manager emailed DEM back with the required relevant data requested.	08/04/2024	
22/04/2024	Traffic (drag out) (DEM)	Yes	Response Letter was sent to DEM on the 24 April 2024 as required which stated the corrective actions taken and other actions taken to minimise drag out: 1. Second street sweeping to be undertaken. 2. Quarry Manager has also engaged a second Street Sweeping company on a trial basis, which will commence at 10:00 am the 24 April 2024. The justification behind engaging an additional vendor is to determine if the quality of work conducted by the engaged parties is a contributing factor. 3. New wheel wash was back in operation after concrete repair work. 4. FOD mats installed on the exit of the wheel wash.	24/04/2024	

Complaint Date / Time	Nature of complaint	Related to non-compliance (yes / no)	Action taken (or to be taken) to address the complaint	Date complaint resolved	Notes / comments
26/07/2024	Dust	Yes	BoM weather checked for Sellicks Hill and the wind direction for the day was NNW at an average speed of 20 km / hr. Quarry Operations Manager called the complainant regarding and explained that the Site monitors the weather on a regular basis. The Sellicks Hill BoM weather station stated that the wind was from a NNW direction all day and that the quarry operations shouldn't be having any effect.		The complainant still believes that quarry was the cause of the dust. We also offered to take the complainant on a tour of the quarry but that was declined.

Other general enquiries / comments which have been made by the community during the reporting period are listed within **Attachment 9 – General Enquiries Summary**.

5 Management System Reviews

No management system reviews have been undertaken by the Site during the reporting period.

6 Verification of Uncertainty

There have been no uncertainties surrounding Site operations during the reporting period.

7 Changes to Authorised Operations and Emerging Environmental Hazards

7.1 Changes to Authorised Operations

Table 40 – Changes to Authorised Operations outlines the changes to authorised operations which have occurred in the reporting period. During the reporting period, EML 6552 was approved; no operations have commenced, or will commence until a PEPR is submitted and approved. A Miscellaneous Purpose Licence (MPL) application was also submitted to the DEM during the reporting period, and is currently under assessment.

Table 40 – Changes to Authorised Operations

Description of change to existing mining operation	Date submitted to the department	Approved or not approved?	Department response	Date accepted by the department	Current status at the end of the reporting period
EML 6552 approval.	Not applicable.	Approved.	Not applicable.	30 October 2023	EML 6552 has been approved. No operations have occurred on the Tenement, as a PEPR must be approved prior to operations commencing. A PEPR is not required to be submitted until the following reporting period (30 October 2024).

7.2 Emerging Environmental Hazards

During the reporting period, the Site submitted an incident report upon request from DEM regarding a reportable incident associated with the public nuisance of dust emanating from the Site, triggered by a blasting event. The reportable incident occurred on 13 March 2024 following a dust complaint, which is outlined in **Section 4 Complaints**. The initial incident report was submitted to DEM on March 2024, and a comprehensive incident report was submitted on 17 April 2024.

A letter of non-compliance was issued to the Site 22 April 2024, following three (3) separate instances of drag out observed by DEM and the EPA caused by Site operations on Main South Road. A response letter was submitted to DEM on 24 April 2024. Details of the non-compliance are within **Section 3.3 Rectification of Non-Compliances** and **Section 4 Complaints**.

8 Technical Reports

Table 41 – Technical Reports provides a summary list of all technical data, studies and reports generated during the reporting period that support the achievement of tenement conditions and environmental outcomes / objectives in the approved MOP PEPR.

Table 41 – Technical Reports

Report Title	Author(s)
Deformation Scan Report – Sellicks Hill Quarry	T. Throup (Groundwork)
Annual Geotechnical Audit October 2024	Joe Vivash (Groundwork)

9 Voluntary Information

9.1 Community Engagement

The Site participates in community engagement initiatives such as sending out blasting notifications to the local community, and contributions to the Sellicks Community Consultation Group. Additionally, the Site sponsors the Myponga / Sellicks Football Club, Aldinga Bay Bowling Club and the Aldinga Bay Surf Lifesaving Club.

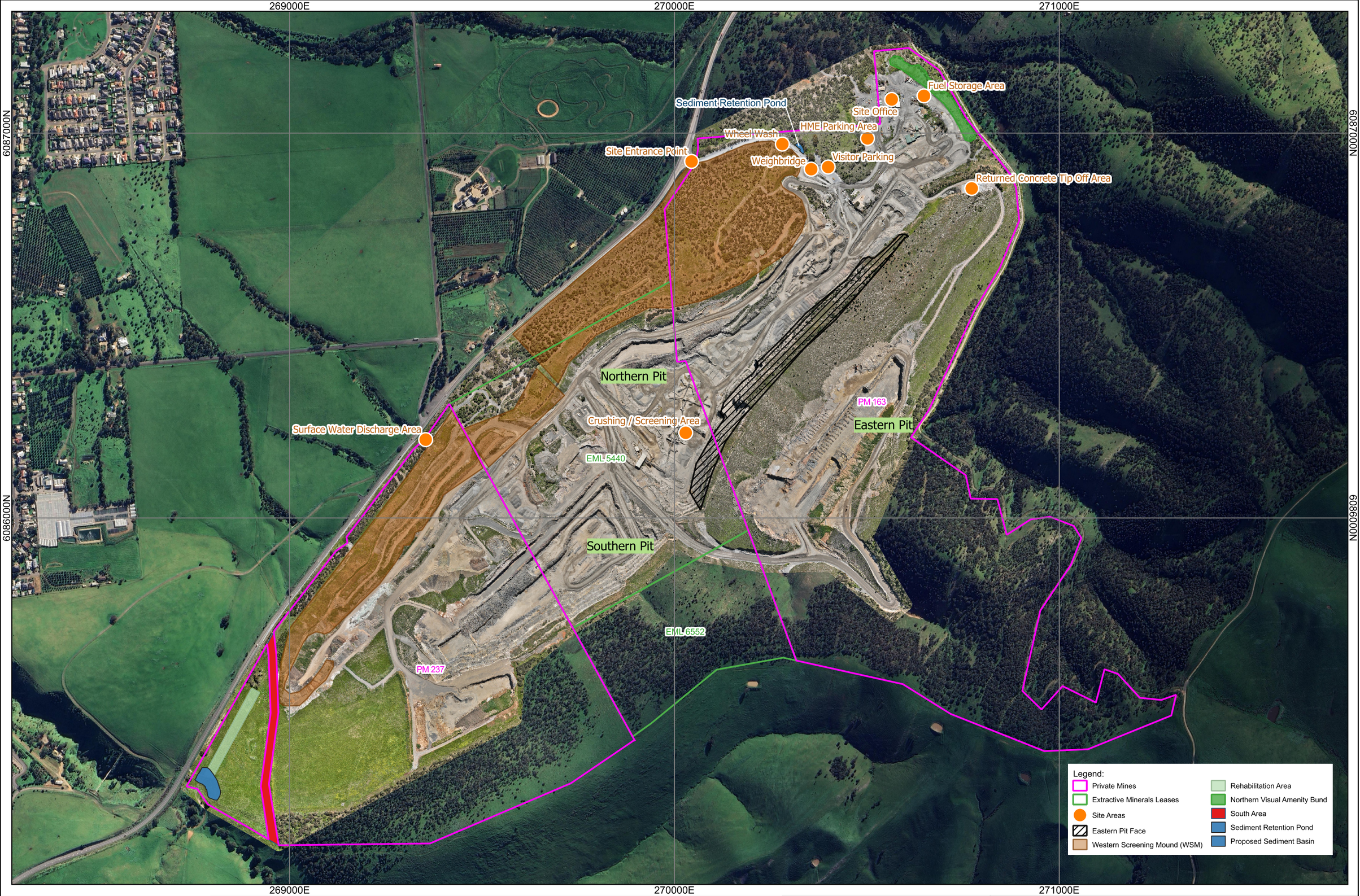
9.2 Sustainability

Sustainability initiatives undertaken by the Site include the continued use of recycled water for dust suppression. Additionally, approximately 1,300 trees were planted during the reporting period as a rehabilitation and revegetation effort of the Site

DRAWINGS

269000E 270000E 271000E

6087000N 6086000N



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REV	DESCRIPTION	DATE	BY

Data
Photography:
Topography:
Cadastre: Data.sa.gov.au,Boundaries are Indicative only, not all
Ecosystem:
Other: SARIG, 2022

N

PROJECT: Sellicks Hill Quarry

CLIENT: Adbri Quarries SA

TITLE: Site Layout Plan

GROUNDWORK PART OF SLR
PH +61 3871 0411
WWW.GROUNDWORKPLUS.COM.AU

SCALE: 1:9,000 When Printed On A3 (0 40 80 120 160 m)

DRAWING NUMBER: 1741.DRG.144

REVISION:

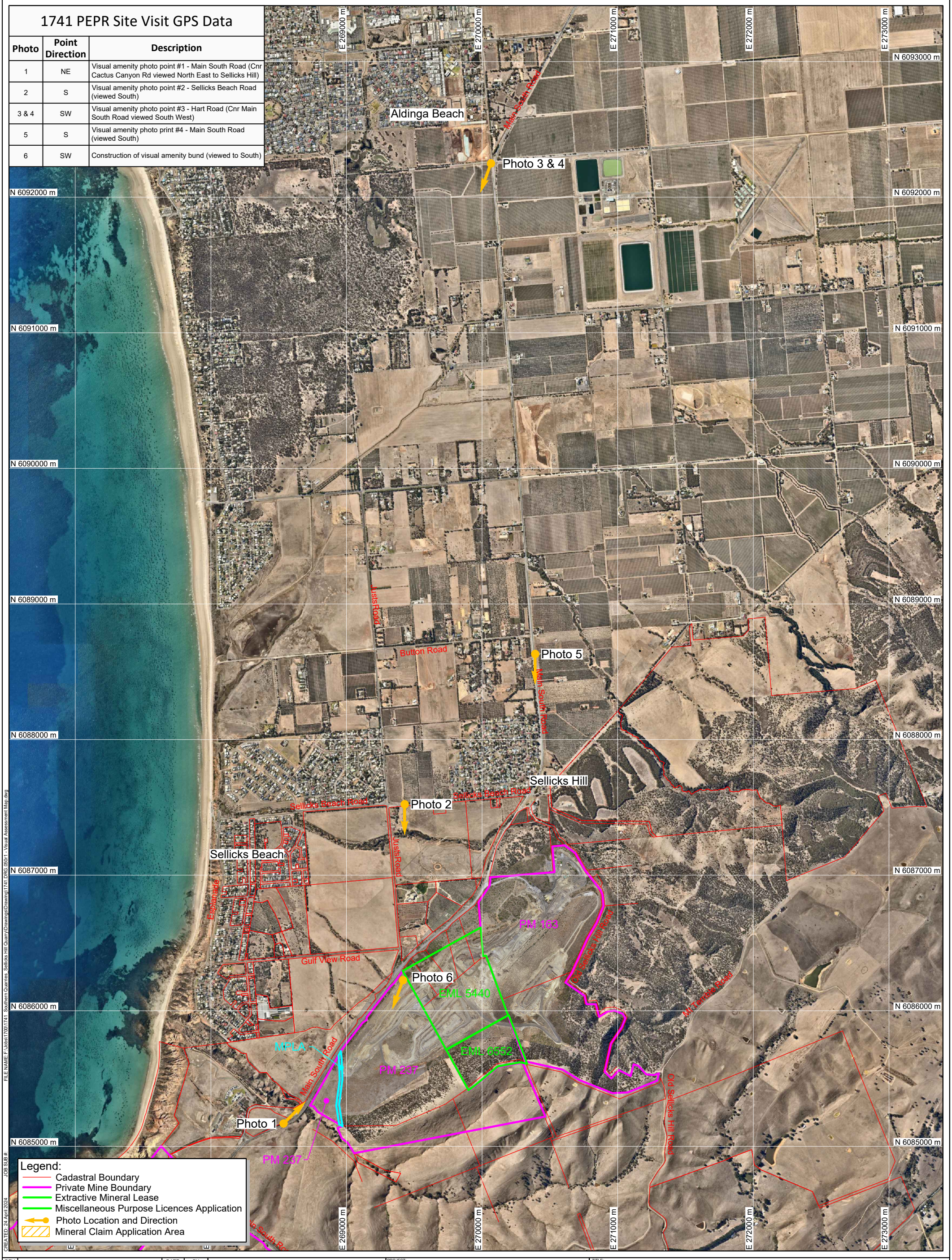
DATE: 14-October-2024 DRAWN: RH

PRINTED: 14-October-2024 CHECKED:

DATUM: HORIZONTAL / VERTICAL / EPSG:7854
MGA / AHD / 54

1741 PEPR Site Visit GPS Data

Photo	Point Direction	Description
1	NE	Visual amenity photo point #1 - Main South Road (Cnr Cactus Canyon Rd viewed North East to Sellicks Hill)
2	S	Visual amenity photo point #2 - Sellicks Beach Road (viewed South)
3 & 4	SW	Visual amenity photo point #3 - Hart Road (Cnr Main South Road viewed South West)
5	S	Visual amenity photo print #4 - Main South Road (viewed South)
6	SW	Construction of visual amenity bund (viewed to South)



REV	DESCRIPTION	DATE	BY
1	Added EML 6552, Added MPLA	24/04/2024	CP

Data Sources:
Photography: Groundwork Plus Pty Ltd RPA Survey, Captured 2022-04-22
Topography:
Cadastre:
Ecosystem:
Other: © 2022 Nearmap, Captured 2022-03-22

PROJECT: Sellicks Hill Quarry

CLIENT: Southern Quarries Pty Ltd

TITLE: Visual Assessment Map

GROUNDWORK plus
PH: +61 7 3871 0411
WWW.GROUNDWORK.COM.AU

SCALE: 1:20,000 When Printed On A3 (0 — 400m)
DATE: 24 April 2024
PRINTED: 24 April 2024
DRAWN: JHV
CHECKED: RH
DRAWING NUMBER: 1741.DRG.050
REVISION: 1
DATUM: HORIZONTAL / VERTICAL / ZONE MGA / AHD / 54

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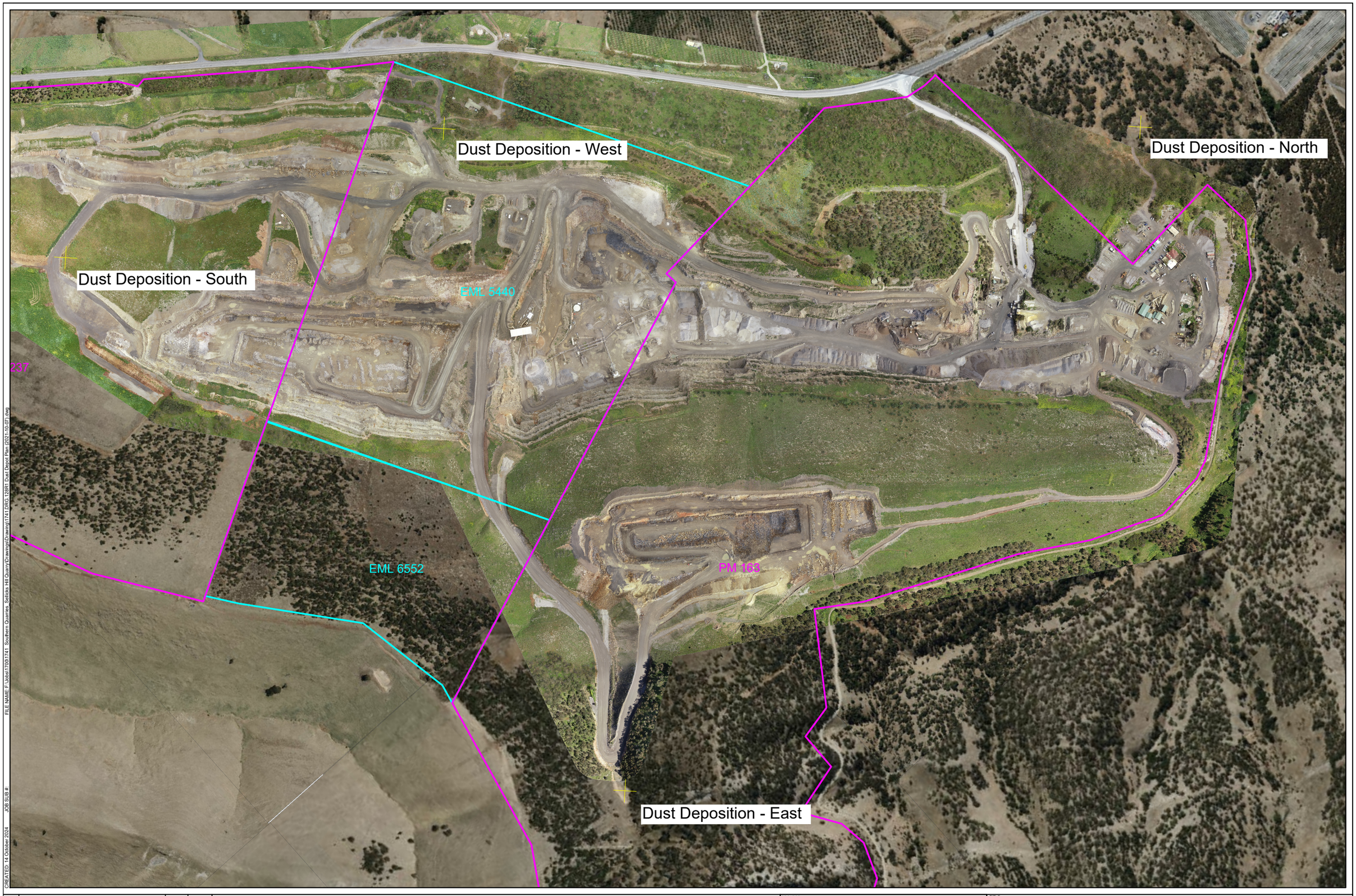

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REV	DESCRIPTION	DATE	BY

Data Sources:
Photography: Groundwork Plus RPA Survey 2021-10-07
Topography: Groundwork Plus RPA Survey 2021-10-07
Cadastre: © The Government of South Australia (SARIG) 2020
Ecosystem:
Other: © 2021 Microsoft Corporation; © 2021 Maxar; © CNES (2021) Distribution Airbus DS

Legend:
- Cadastral Boundary
- Private Mine Boundary
- Extractive Mineral Lease
- Stockpile Boundary

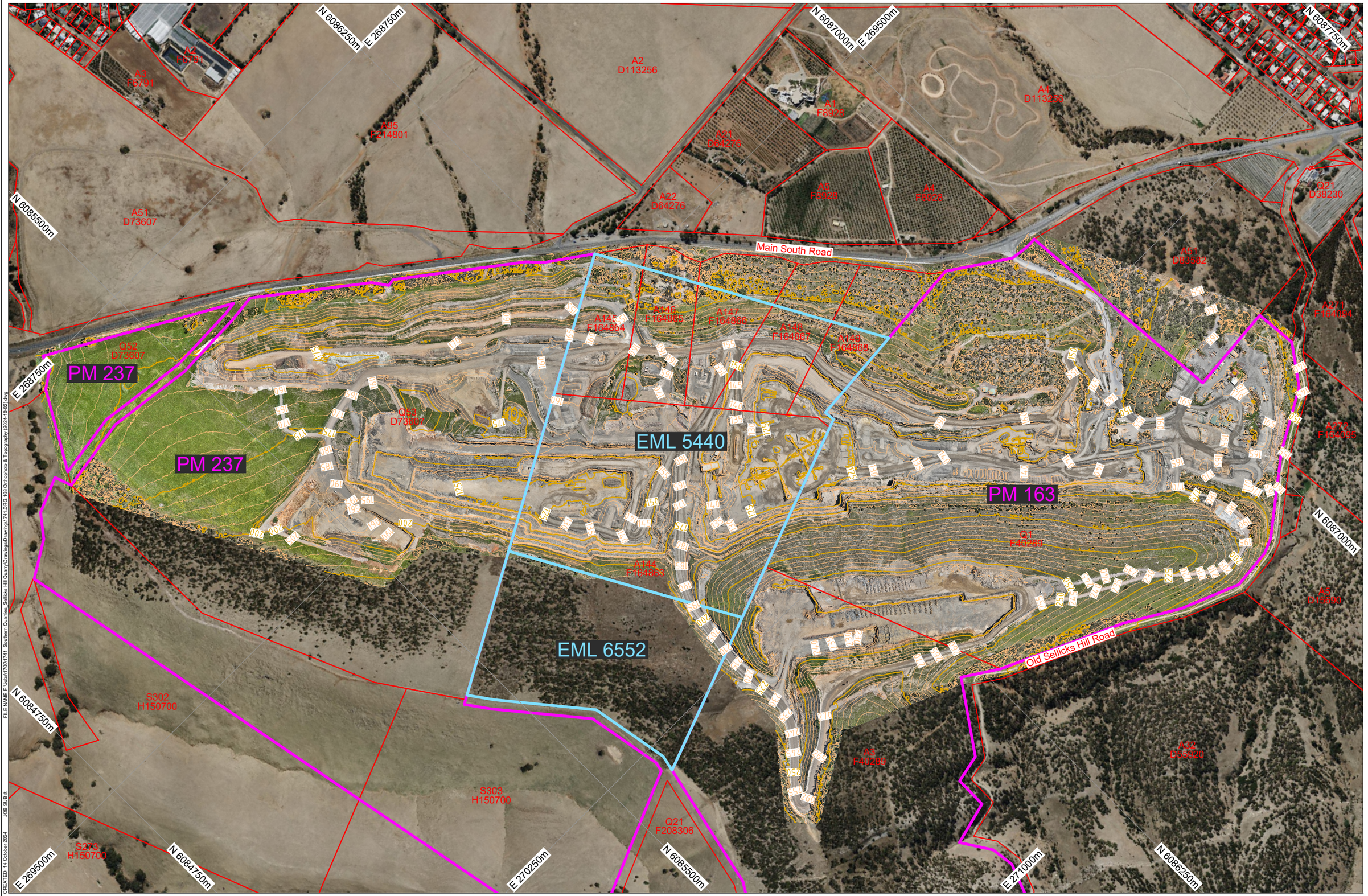
PROJECT: Sellicks Hill Quarry

CLIENT: Southern Quarries Pty Ltd

TITLE: Dust Deposition Plan (2021-10-07)

GROUNDWORK plus
PH: +61 7 3871 0411
WWW.GROUNDWORK.COM.AU

SCALE: 1:6,000 When Printed On A3 — 0 — 120m
DRAWING NUMBER: 1741.DRG.128
REVISION: 1
DATE: 14 October 2024 DRAWN: AD
PRINTED: 14 October 2024 CHECKED: JR
DATUM: HORIZONTAL / VERTICAL / ZONE: MGA / AHD / 54



CREATED: 14 October 2024 JOB SUB #: FILE NAME: F:\Jobs\17\0\1741 Southern Quarries Sellicks Hill Quarry\Drawings\Drawing\1741.DRG.168 Orthophoto & Topography (2024-10-02).dwg

REV	DESCRIPTION	DATE	BY

Data Sources:
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Topography: Groundwork Plus Pty Ltd RPA Photogrammetry Survey, Captured 2024-10-02
Cadastre: © The Government of South Australia (DIT) 2022
Ecosystem:
Other: © 2022 Microsoft Corporation, © 2022 Maxar, © CNES (2022) Distribution Airbus DS

Legend:
- Cadastral Boundary
- Private Mine
- Extractive Minerals Lease

PROJECT: Sellicks Hill Quarry

CLIENT: Adbri Quarries

TITLE: Orthophoto and Topography (2024-10-02)

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ATTACHMENTS

Attachment 1

General Site Inspection Report

Job No.:	1741	**Category:**	General Site Inspection
Site Name:	Sellicks Hill Quarry	**Client:**	Adbri Limited
Site Address:	3981 Main South Road Sellicks Beach SA 5174	**Approvals:**	EPA Licence No. 2052
Monitoring Date:	24 October 2024	**Monitored by:**	Carly Monaghan
Report Requested by:	Rachel Hall		

Purpose: General Site Inspection to provide photographic evidence of compliance with the control and management strategies in the PEPR

Event Discussion

A Site inspection was undertaken on 24 October 2024. The Site was found to be in good condition with Site fencing and entry gates in place and no damage observed, haul roads in good condition, and Site safety signage in place. There were no non-compliances noted during the Site inspection.

Photographs Points

24/10/2024

General Observations / Other: Site sign-in office.

24/10/2024

General Observations / Other: Rumble grid at Site exit point and sediment dam to prevent surface water discharge onto Main South Road.

24/10/2024

General Observations / Other: Wheel wash.

24/10/2024

General Observations / Other: General Site views of product stockpiling area.

24/10/2024

Public Safety: View of signage onsite and weighbridge.

24/10/2024

Dust: Water truck present onsite.

24/10/2024

Dust: Internal haul roads maintained in good condition.

24/10/2024

Dust: Re-seeding of disturbed areas to minimise dust and erosion.

24/10/2024

Dust: Re-seeding (progressive rehabilitation) of disturbed areas to prevent dust and erosion.

24/10/2024

Waste & Hydrocarbon Management: General waste bin.

24/10/2024

Waste & Hydrocarbon Management: View of oil storage shed.

24/10/2024

Waste & Hydrocarbon Management: Self-bunded fuel tank located onsite.

24/10/2024

Erosion, Sediment and Stormwater Management: Western sediment dam.

24/10/2024

Erosion, Sediment and Stormwater Management: Surface water bund.

24/10/2024

Erosion, Sediment and Stormwater Management: Western sediment catchment.

24/10/2024

Erosion, Sediment and Stormwater Management: Haul road sloping / bunding well-vegetated to prevent erosion.

24/10/2024

Erosion, Sediment and Stormwater Management: Water tanks installed during the reporting period to manage water supply issues as a result of Mina South Road upgrades and boost water reliability.

24/10/2024

Traffic: Main intersection / Site entrance showing minimal drag out and no obstructions.

24/10/2024

Traffic: Site personnel light vehicle carpark and main Site office.

24/10/2024

Traffic: Return concrete area and access road, well maintained and in good condition. Established vegetation acting as visual screening measure from the public..

24/10/2024

Traffic: Road signage clear and well maintained.

24/10/2024

Traffic: Internal haul roads maintained - in good condition and free from erosion.

24/10/2024

Native Vegetation: Evidence of rehabilitation and established vegetation.

24/10/2024

Native Vegetation: Evidence of rehabilitation in PM237.

Attachment 2

Annual Geotechnical Audit October 2024

Sellicks Hill Quarry

Annual Geotechnical Audit October 2024

Prepared for: Adbri Quarries

Date: 29 October 2024

File Reference: 1741.260.028V1

DOCUMENT CONTROL

PROJECT / DETAILS REPORT

Document Title:	Sellicks Hill Quarry Annual Geotechnical Audit October 2024
Principal Author:	Joe Vivash
Client:	Adbri Quarries
Reference Number:	1741.260.028V1

DOCUMENT STATUS

Issue	Description	Date	Author	Reviewer
0	DRAFT - FOR REVIEW	28 October 2024	Joe Vivash	Rod Huntley
1	FOR ISSUE	29 October 2024	Joe Vivash	Rod Huntley

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Western Dump - Section D-D	Drawing: 1741.DRG.060E R8

ATTACHMENTS

Attachment 1	Deformation Scan Report Sellicks Hill Quarry September 2024

Executive Summary

This report outlines the findings from the October 2024 Annual Geotechnical Audit for Sellicks Hill Quarry, conducted by Groundwork part of SLR, on behalf of Adbri Quarries. The audit, carried out on 17 October 2024, primarily focused on assessing the structural performance of the Western Screening Mound and the pit walls and benches. A key aspect of this audit was the review of 3D laser scan geotechnical monitoring data, comparing one year's worth of highwall performance, which is crucial for identifying potential stability issues.

Key Findings:

- **Western Screening Mound Cross-Sections and Design Compliance:**
    - **Section C:** The uppermost lift of the WSM exceeded the 36-degree allowable slope angle, reaching 37 degrees. This minor deviation requires monitoring to ensure future lifts comply with design criteria.
    - **Section D:** The Total Slope Angle (TSA) exceeded the 25-degree limit outlined in the MOP PEPR, reaching 30 degrees. Additionally, the upper lift reached 26 meters without adequate benching, increasing instability risks. Corrective actions are required to comply with the approved design, as far as it is practical and pragmatic to do so.
- **Western Screening Mound**: Minor cracking was identified in recent lift material placements. These cracks may be indicative of significant instability development. The steep outer slope of the WSM, with heights reaching 26 metres in some areas, poses a future risk if not corrected.
- **Geotechnical Monitoring**: 3D laser scanning performed on 12 September 2024 showed no significant multi-bench deformation, indicating stable wall conditions. Minor rockfall and material dislodgement were observed, but these are confined to small areas and are manageable.
- **Pit Walls**: Rockfall and erosion were noted, particularly at weaker geological zones. Though not currently a major concern, these areas require ongoing monitoring due to their potential to trigger localised instability.

Positive Audit Results:

- The 3D laser scanning did not detect major multi-bench slope stability issues, demonstrating that current geotechnical management practices are effective in maintaining stable conditions.
- The WSM and pit walls are performing within acceptable safety margins, with no immediate need for corrective actions beyond continued monitoring of cracked and high areas.

Recommendations:

- Maintain the periodic 3D scanning geotechnical monitoring.
- Inspect the WSM daily for signs of settlement or cracking.
- Continue suitable practices to manage rockfall.

Overall, the quarry pit walls demonstrate a stable geotechnical profile with manageable risks. However, the Western Screening Mound shows some potential instability vectors, and certain areas will require corrective measures to ensure the structure conforms to design specifications outlined in the MOP PEPR, specifically the TSA and lift height. Implementing ongoing monitoring and proactive management measures will ensure the safe operation of Sellicks Hill Quarry.

1 Introduction

Groundwork Plus Pty Ltd (GWP) has been commissioned by Adbri Quarries (Adbri) to conduct a Geotechnical Audit for Sellicks Hill Quarry, located at Sellicks Beach, South Australia. The audit aims to assess the stability and performance of the Western Screening Mound (WSM) and ensure compliance with safety regulations and best practice guidelines. Additionally, the performance of the quarry's slopes and benches will be evaluated. This assessment will help identify any geotechnical risks and provide recommendations for maintaining safe and efficient operations.

1.1 Objective and Scope

This geotechnical audit aims to evaluate the current ground conditions concerning the stability and performance of the pit slopes and the Western Screening Mound (WSM) over the past year, as required by the approved Mine Operations Plan / Program for Environment Protection and Rehabilitation (MOP PEPR) Environmental Outcome related to Damage to Third Party Property. The audit involves reviewing monitoring data, conducting a site inspection, and assessing the geotechnical design of the WSM as outlined in the MOP PEPR, comparing it to current conditions. It aims to identify potential risks or instabilities and evaluate the effectiveness of risk mitigation measures.

The audit scope includes the WSM structure and all active and inactive pit walls. It involves collecting and analysing qualitative observations from the site visit conducted on 17 October 2024. Recommendations will be made to address identified risks, improve geotechnical practices, and optimise slope performance to ensure safe and sustainable operations.

The audit covers the following key areas:

- **WSM Structure Performance:** Assessment of the WSM structure and slopes and whether it meets current site conditions, performance and design expectations.
- **WSM Structure Design:** Assessment of whether the WSM structure aligns with the design outlined in the MOP PEPR.
- **Geotechnical Monitoring Systems:** Evaluation of the monitoring data (e.g., 3D laser scanning) for detecting movements or deformations of the pit walls.
- **Pit Slopes and Benches:** Review the current conditions and stability of all active pit walls.
- **Risk Identification:** Identifying and evaluating any geotechnical hazards or instabilities that could impact operations relating to the pit walls and WSM structure.

1.2 Regulatory Requirements

The approved regulatory document, MOP PEPR, includes specific Control and Management Strategies within the Impact Assessment that must be addressed to ensure conformance with the criteria. These include:

- Regular annual inspections of the screening mound by a certified engineer to ensure the geotechnical stability of the landform, basins, and the progress of rehabilitation.
- Adherence to the approved Quarry Development and Rehabilitation Plans.
- Compliance with the Total Slope Angles (TSA) and Internal Angles as provided in Attachment 6 – Bund Stability, Sellicks Hill Quarry (within the approved MOP PEPR): a. The maximum batter of any face should be no more than 36 degrees. b. The TSA of the WSM should be no more than 25 degrees.

1.3 Site Description

Sellicks Hill is located at 3981 Main S Rd, Sellicks Beach, South Australia 5174. It is situated approximately 7.25 kilometres south of Aldinga Beach and accessible via Mains Road; refer to **Figure 1**. The nearest city is Adelaide, about 48 kilometres to the north.

Figure 1: Sellicks Hill Quarry location (red dot).

Figure 2: Sellicks Hill Quarry site layout. The WSM is outlined in red.

2 Geotechnical Monitoring

Sellicks Hill Quarry has implemented a geotechnical monitoring system for the pit walls, utilising 3D LiDAR (Light Detection and Ranging) scanning to measure and track material mobilisation and deformation. These scans capture 3D displacement data, providing a robust assessment of wall stability and performance. Monitoring data is collected from seven station locations opposite the walls being scanned, ensuring optimal coverage of the pit highwall. This system is crucial for offering early warning signs of displacement and enhancing site safety.

2.1 Geotechnical Monitoring

3D laser scanning was conducted on 12 September 2024 and compared to the previous survey taken on 11 September 2023. Over the one-year monitoring period, low rockfall volume and material loss from the crestlines have occurred. The amount of rockfall is viewed positively, as it does not appear to occur in large volumes or over large areas. However, the wall in the southernmost areas of the site shows a noticeable increase in crest material loss and rockfall, with debris accumulating on the benches. This is primarily attributed to the increased blasting activity being undertaken behind these benches in the upper-level pit; refer to **Figure 9**.

Material loss occurs at structural or weak zones in the highwall, which appear to be washout areas where water is funnelling down the slope, eroding material and depositing it on the benches; refer to Figures 4, 5, and 6. These areas should be closely monitored, particularly after rainfall and blasting, as they are key locations for localised material dislodgements.

In summary, the 3D laser scanning results over the past year show no signs of significant multi-bench deformation and indicate that the walls are currently performing suitably. That said, rockfall, crest material loss, and localised material mobilisation or dislodgement are expected to continue over the coming year. Sellicks Hill Quarry is aware of these challenges and can manage them by maintaining adequately wide benches with safety bunds along the crests and safety bunds at the slope toe and ensuring suitable offset distances for operations near the slopes.

The monitoring program at Sellicks Hill Quarry is invaluable for managing risk, as the data collected allows for informed decision-making, thereby reducing the risk profile of ongoing work. The scanning is considered a critical component of future monitoring and safety efforts and should be continued.

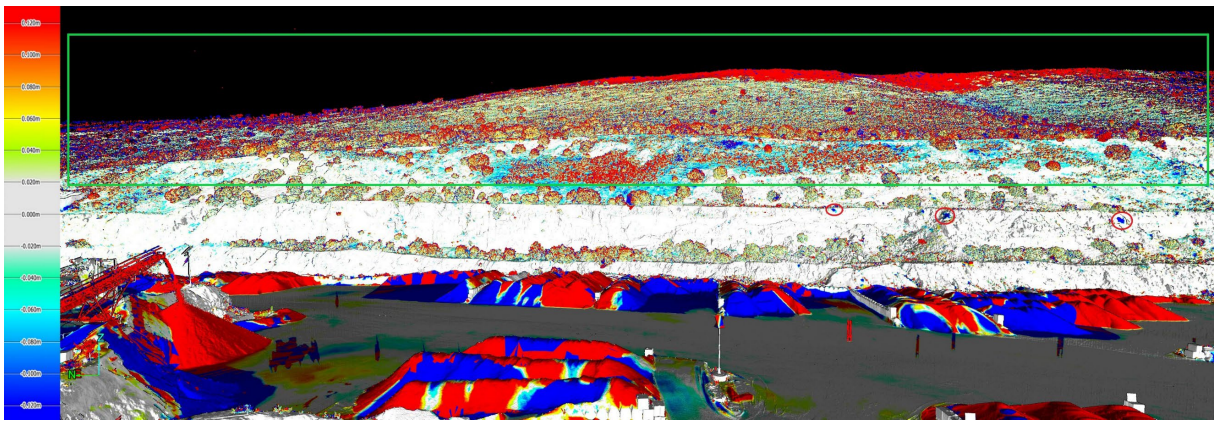

Figure 3: Station 1 3D laser scanning results.

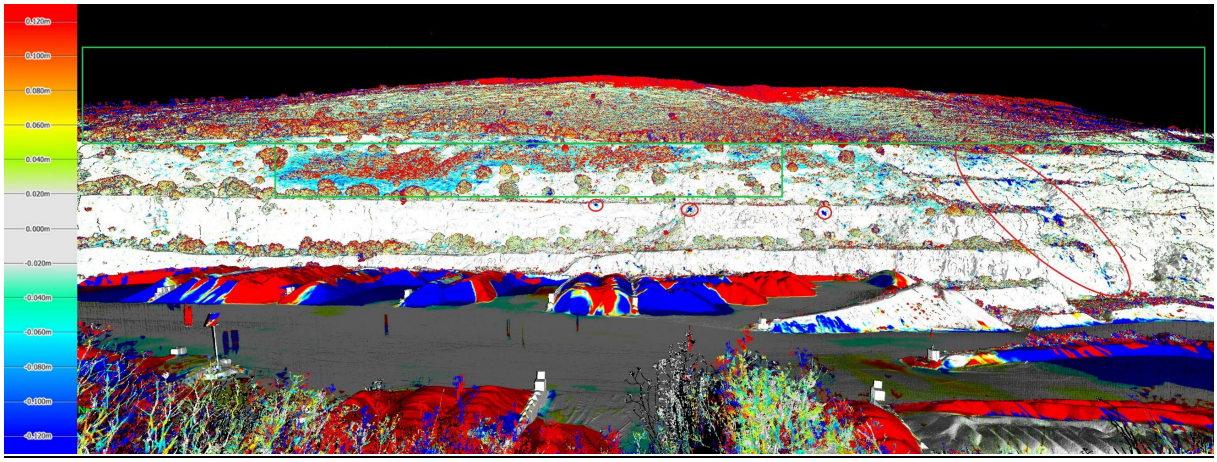

Figure 4: Station 2 3D laser scanning results. Minor rockfall is circled, and the washout/increased erosion areas on the right of the image.

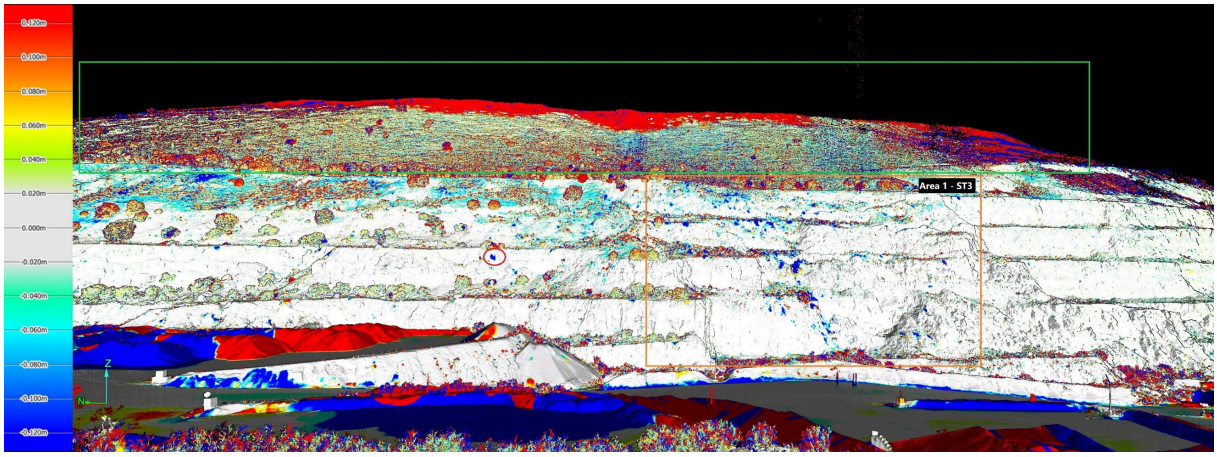

Figure 5: Station 3 3D laser scanning results.

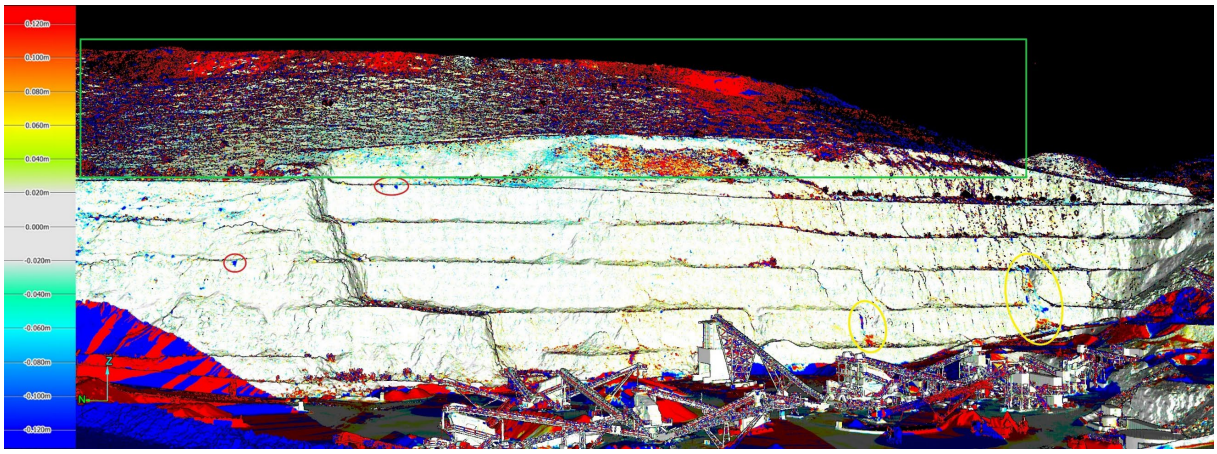

Figure 6: Station 4 3D laser scanning results.

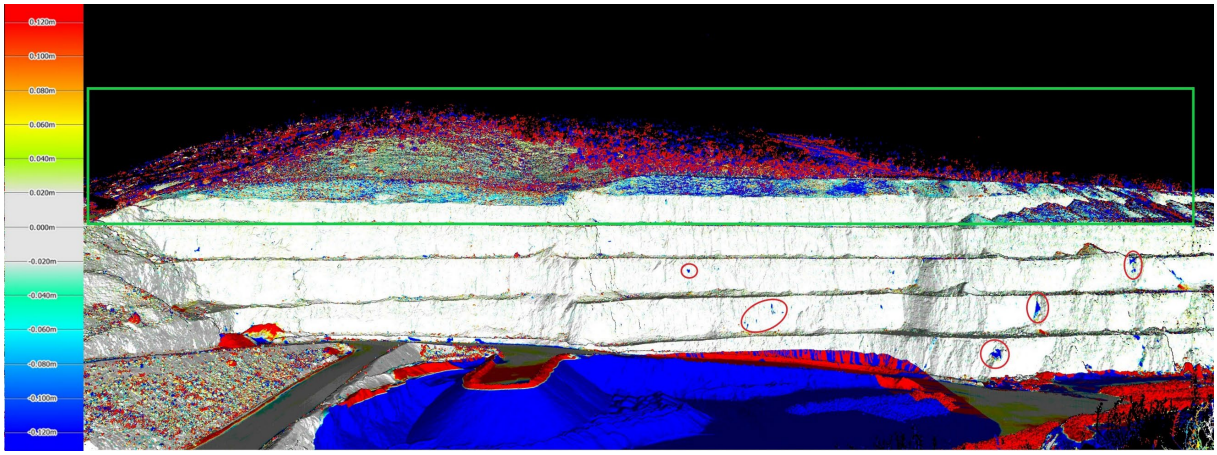

Figure 7: Station 5 3D laser scanning results showing minimal rockfall and no wall displacement.

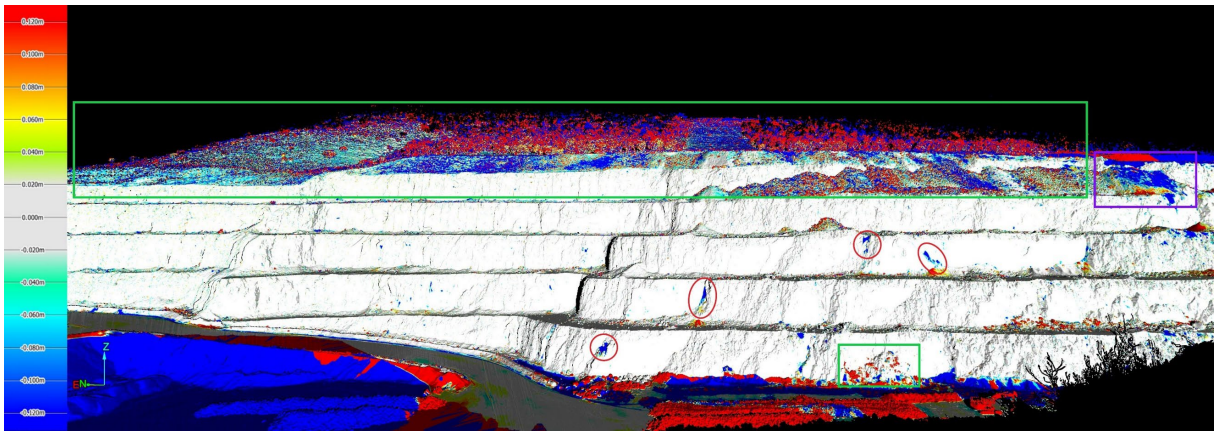

Figure 8: Station 6 3D laser scanning results showing minimal rockfall and no wall displacement.

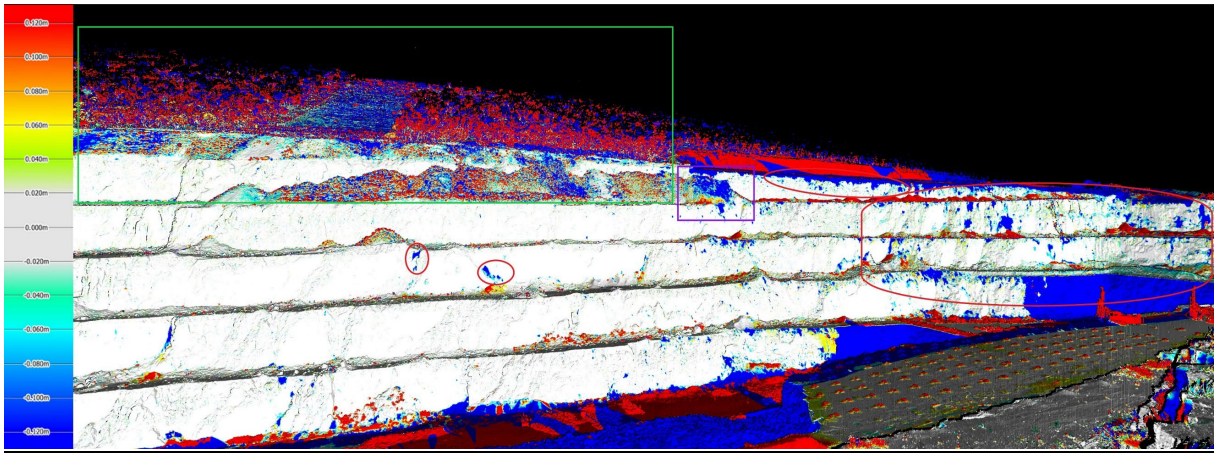

Figure 9: Station 7 3D laser scanning results showing minimal rockfall and no wall displacement.

3 Geotechnical Audit

A geotechnical audit was conducted on 17 October 2024 to evaluate the stability, conditions, and overall performance of the pit highwalls and the WSM structure. This audit aimed to assess potential geotechnical risks, ensure operational safety, and maintain the structural integrity of these critical areas. The audit focused on identifying any issues that could impact ongoing and future mining activities, including the stability of the pit walls, the effectiveness of the WSM management, and any slope instability or failure indicators. This audit is a proactive measure to address concerns before they escalate into safety hazards or operational inefficiencies. The findings will inform necessary corrective measures and improvements, ensuring compliance with industry standards and regulatory requirements.

3.1 Names and Qualifications of the Investigation Team

Joe Vivash, serving as the Associate Geotechnical Engineer (Geotechnics and Mine Waste Engineering Department) at Groundwork part of SLR, led the site investigation and audit.

Joe has a Bachelor of Science in Geology from the Queensland University of Technology (QUT) and a Master of Engineering Science in Mining from Curtin University Western Australia School of Mines: Minerals, Energy and Chemical Engineering (WASM).

Luke Mcgowan, Quarry Supervisor at Adbri Sellicks Hill Quarry, facilitated the site investigation and audit.

3.2 Details of Investigation

The geotechnical audit conducted on 17 October 2024 involved inspecting various areas within the site. This included traversing the pit crestline and floor area, which provided a vantage point for observing the geological structures and features of the highwalls. Particular attention was paid to any signs of instability, such as tension cracks, slumping or recent rockfall, which could indicate potential risks.

Further inspections were conducted on the WSM structure to assess its condition and performance in terms of geotechnical best practices, stability and safety, focusing on signs of poor compaction or deformation that might impact future operations. This work involved driving and walking along the western face's crestline and the various benches.

3.3 Observations

The following section outlines all geotechnical observations and provides recommendations where necessary. These observations include geotechnical issues and general commentary on various aspects of the site and operations.

All observations were documented with photographs and are focused on two primary areas:

- Western Screening Mound
- Pit Highwalls

3.3.1 Western Screening Mound

Minor cracking was observed in the southwesternmost apex of the WSM within recent material placement. The material in this area appears to be reasonably compacted. This may result from settlement within the upper few metres of the material or indicative of a more significant structural integrity issue affecting the entire lift or waste dump. Such signs must not be overlooked. The waste dump should be inspected daily, focusing on signs of settlement, slumping, and cracking. These are often early warning indicators of more severe stability issues that may lie deeper within the structure, and timely detection is critical to preventing more significant failures.

Figure 10: Cracks observed in recent lift material placement.

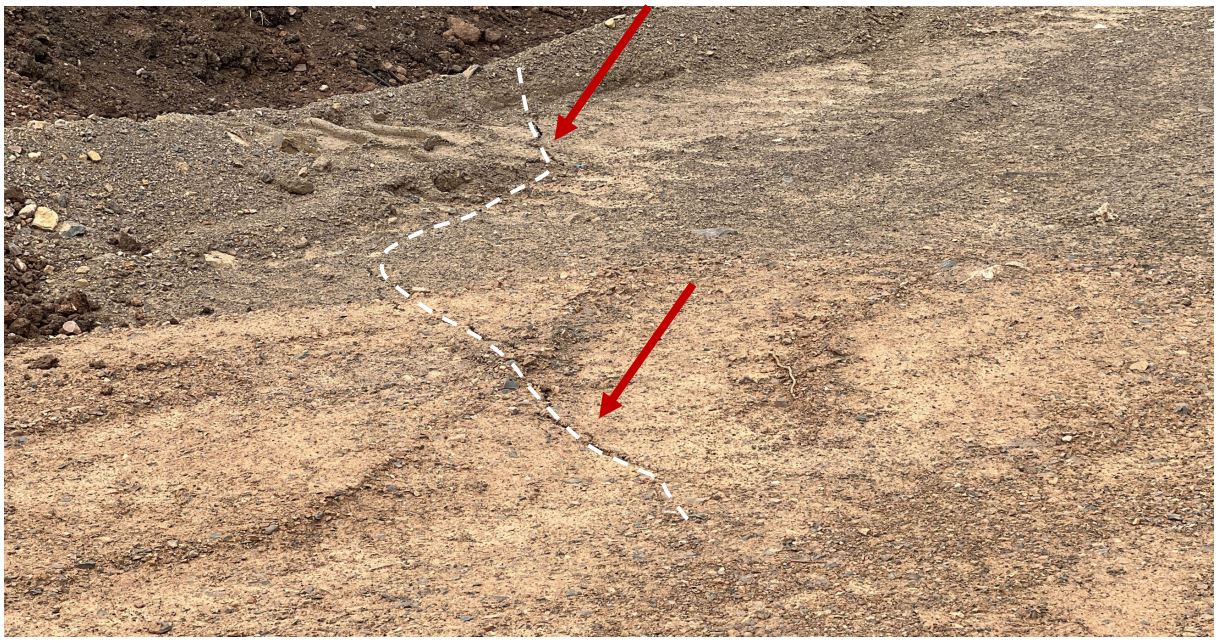

Figure 11: Cracks observed in recent lift material placement.

The southernmost end of the WSM structure is quite high, at approximately 26 metres, with minimal benching, which may contribute to potential stability issues if not closely monitored and effectively managed. Regular monitoring should prioritise the identification of any slumping or cracking along the crest, as these could be early indicators of material movement or settling. Furthermore, signs of bulging, ramping, or seepage at the toe of the dump should be carefully observed, as they may suggest deeper instability or water pressure build-up within the structure. Consistent inspections are essential to ensure that potential problems are detected early and addressed before they escalate into more severe stability or safety concerns.

The WSM should maintain a maximum lift height of 10 metres, with benches at least 10 metres wide, in alignment with the approved design. The slope faces should not exceed an angle of 36 degrees to ensure stability and reduce the risk of slumping or structural failure. These design parameters help preserve the overall integrity of the dump, providing better support and reducing the potential for erosion or material movement. Additionally, the structure should be adequately drained, with channels to prevent water from pooling on the crest and flat areas. All terminal faces should be hydro-seeded and rehabilitated to aid in slope stability.

Groundwork acknowledges that, in discussions with Luke, the Quarry Supervisor, it was understood that benching is planned for future implementation in areas with steep slopes.

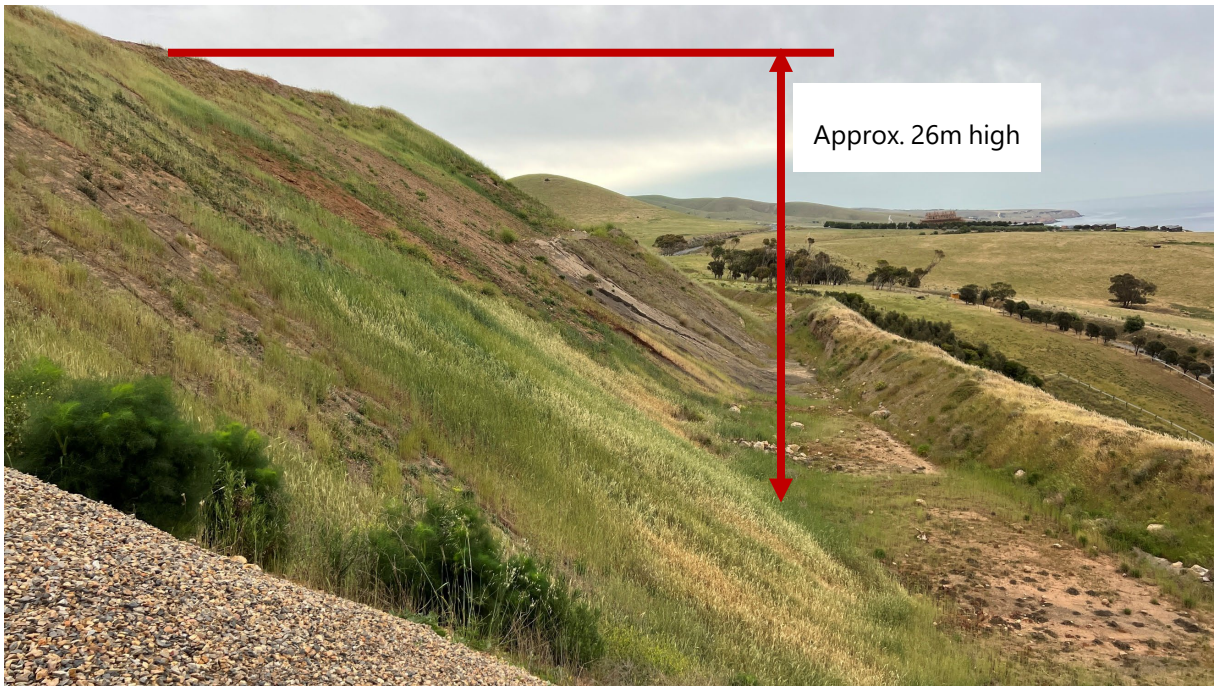

Figure 12: The outer face of the Western Screening Mound has steep slopes and lacks benching.

3.3.2 Pit Walls

The pit wall displays a moderate likelihood of rockfall in the short term, with broken rock primarily located along the crestline and is clearly highlighted in the 3D laser scanning. The primary joint set or rock mass fabric orientation dips into the dip in certain areas, indicating that, over the long term, blocks of rock may loosen and slide out; refer to **Figure 13**. Sellicks Hill Quarry is aware of this risk and actively manages it by implementing safety bunds along the benches to capture falling rocks. Aside from scaling out loose rock and maintaining dry benches, the only practical solution is to ensure that suitable exclusion zones are implemented on the pit floor, along with a high safety bund.

In several areas, surface water has eroded channels in the highwall faces along structures of weaker geology; refer to **Figure 14**. Although these issues are not currently causing significant concern, they should not be overlooked and must be respected and monitored. These locations are prime candidates for future rockfall and localised low-volume material mobilisation due to increased erosion and rock dislodgement.

Figure 13: Highwall of the southernmost end of the pit displaying crest damage sliding potential.

Figure 14: Highwall adjacent to the main haul ramp to the upper level and immediately behind the plant.

3.4 Western Screening Mound Cross Sections and TSA

Cross-sections have been taken through the Western Screening Mound to assess compliance with the approved structural design as outlined in the MOP PEPR; refer to **Figure 15**.

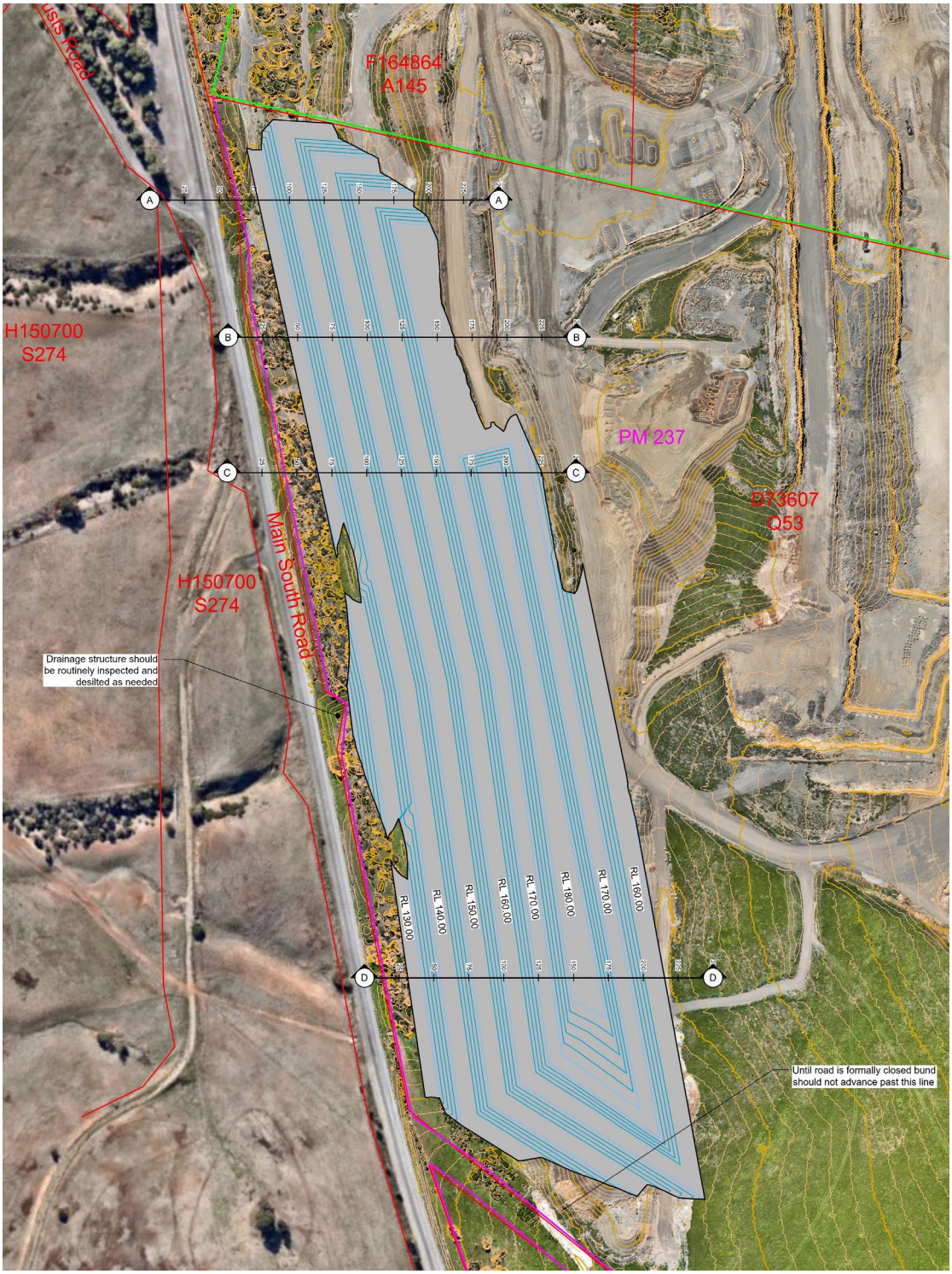

Figure 15: Western Screening Mound cross sections location plan.

Section A and Section B indicate that the WSM tier/lift slope face angles are below the maximum of 36 degrees. The TSA from the toe of the structure to the crest of the top bench is 22 degrees, which is below the permitted maximum of 25 degrees; refer to **Figure 16**.

Section C shows that the WSM tier/lift slope face angles are generally below the allowed maximum of 36 degrees; however, the uppermost lift exceeds this limit and is currently at approximately 37 degrees. The TSA from the toe of the structure to the crest of the top bench is 24 degrees, which remains below the maximum allowed limit of 25 degrees; refer to **Figure 17**.

Section D highlights that the WSM tier/lift slope face angles are at or below the permitted maximum of 36 degrees. However, the TSA from the toe of the structure to the crest of the top bench is 30 degrees, exceeding the allowed maximum of 25 degrees; refer to **Figure 17**. The upper lift is also significantly high, with no benching, reaching a total height of approximately 26 metres.

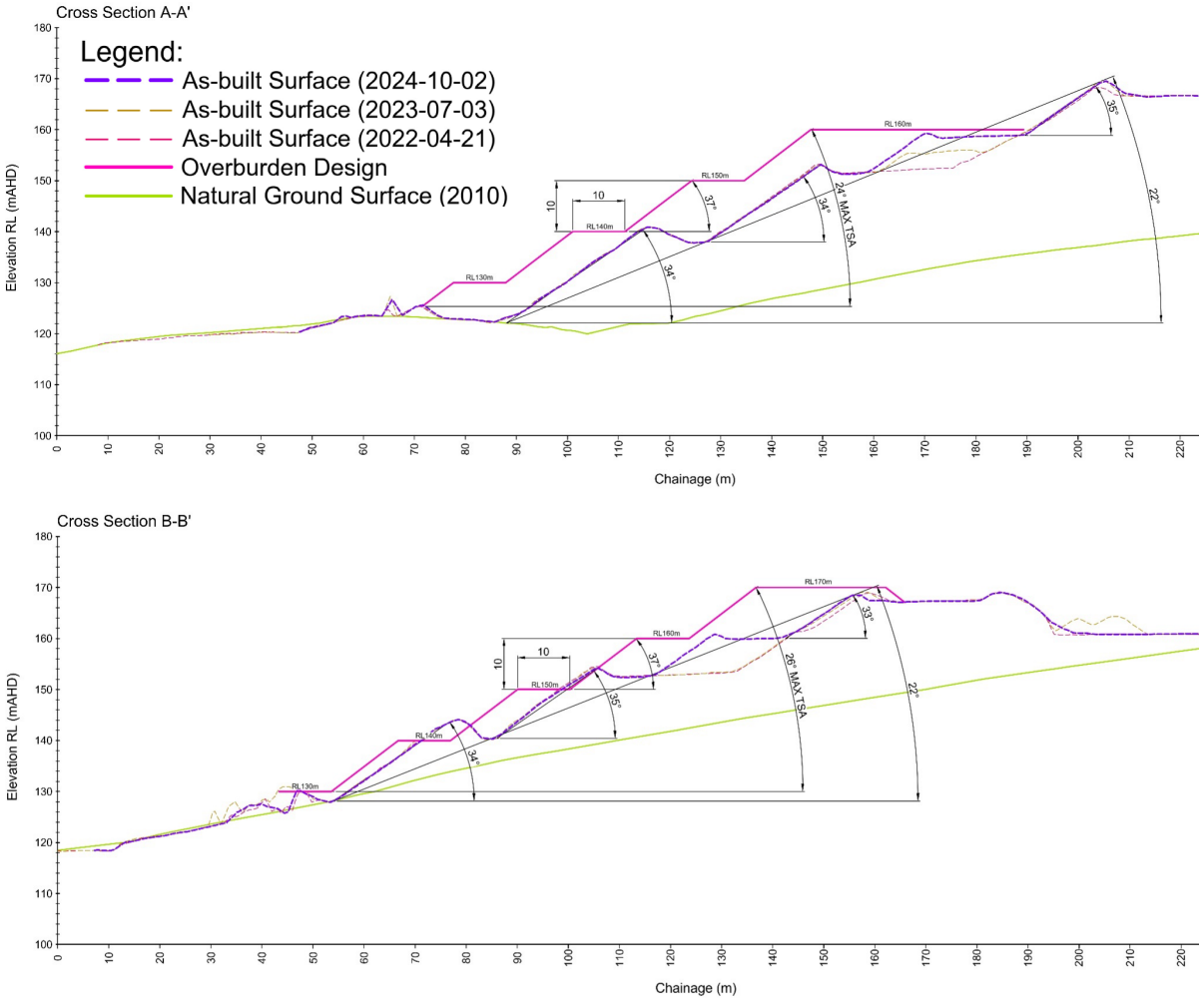

Figure 16: Western Screening Mound cross sections A and B.

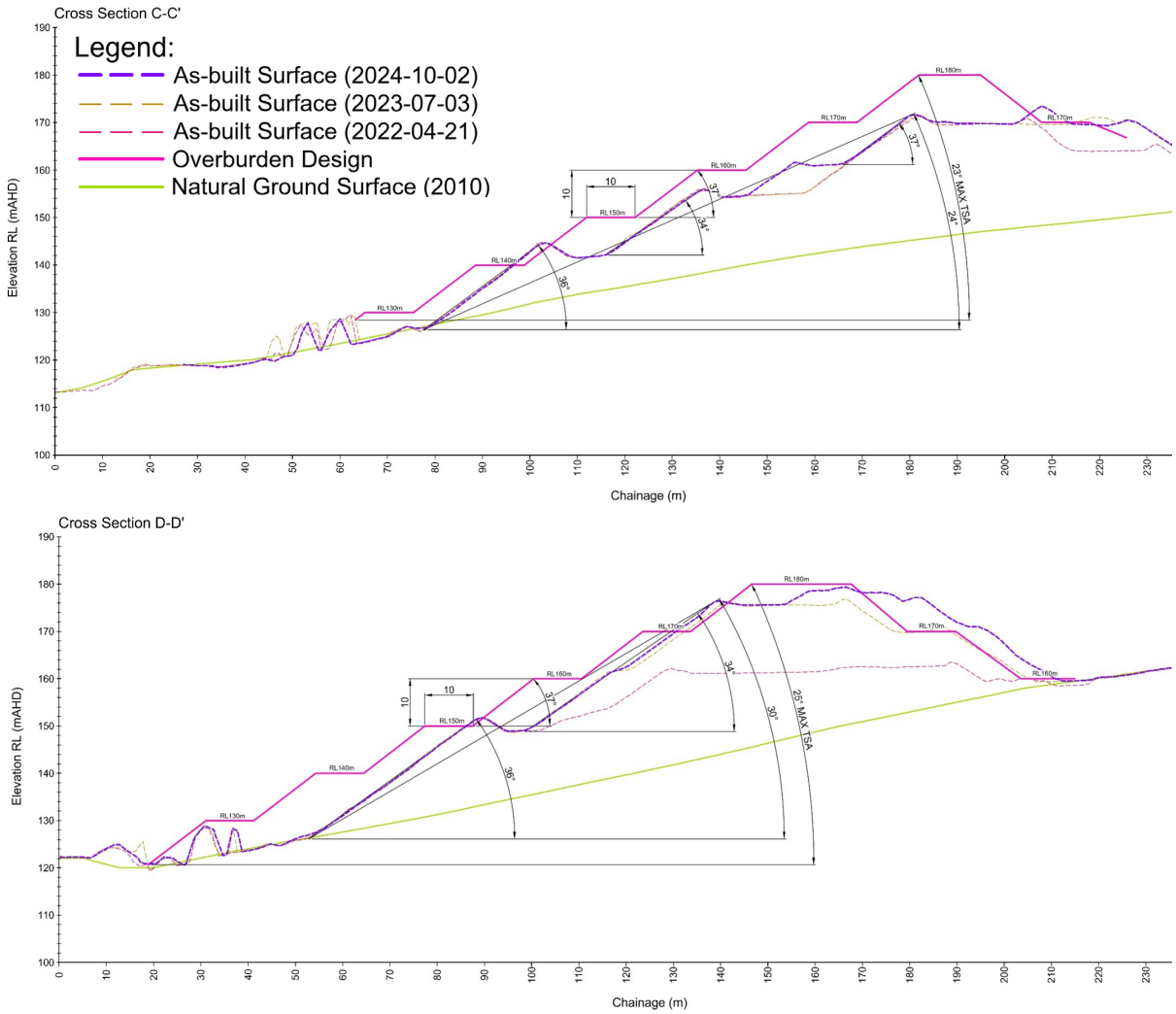

Figure 17: Western Screening Mound cross sections C and D.

3.4.1 Cross Sections Summary

In Sections A and B, the slope face angles of the WSM tier/lift are below the maximum allowed 36 degrees, and the TSA is under the permitted 25 degrees. In Section C, the uppermost lift exceeds the 36-degree limit, reaching 37 degrees, but the TSA is still within the 25-degree limit. In Section D, while the slope face angles meet the 36-degree limit, the TSA exceeds the allowed 25 degrees, reaching 30 degrees.

The primary issues involve a few instances where slope face angles and TSAs exceed the permitted limits. In Section C, the uppermost lift surpasses the 36-degree maximum by one degree, which is not a significant concern; however, extra care will need to be taken to ensure that all future faces meet the slope face angle acceptance criteria.

Section D presents a more significant issue, as the TSA from the toe to the crest exceeds the 25-degree limit, reaching 30 degrees. However, it is expected that the TSA will decrease once the crest is rolled over and dozed to bring it into compliance. Additionally, the upper lift, standing at approximately 26 metres in height without any benching, increases the potential for displacement vectors to develop.

4 Key Findings

The October 2024 Annual Geotechnical Audit for Sellicks Hill Quarry identified several critical areas regarding the stability and performance of the WSM and pit walls, including compliance issues with design parameters.

The following are the primary findings from the audit:

- **Overall Pit Stability**: No significant multi-bench deformation was observed across the quarry. The 3D laser scanning, conducted in September 2024, did not detect any significant large-scale structural concerns in the pit slopes or benches. Minor rockfall and crest material loss were confined to localised areas and are considered manageable.
- **Cross-Section Compliance Issues**:
    - **Section C**: The uppermost lift of the WSM exceeds the allowable slope face angle of 36 degrees, reaching approximately 37 degrees. While this deviation is minor, monitoring is required to ensure future lifts comply with the design limits.
    - **Section D**: The Total Slope Angle (TSA) from the toe to the crest exceeds the permitted maximum of 25 degrees, reaching approximately 30 degrees. Additionally, the upper lift of the WSM in this section is around 26 metres in height without adequate benching, which presents a potential risk of displacement and instability. This area may require corrective action to bring the TSA and lift height into compliance with the approved design.
- **Western Screening Mound**: Cracking was observed in recent material placement, particularly at the southernmost apex of the WSM. Daily inspections are recommended to monitor for any signs of deeper instability or further crack development.
- **Geotechnical Monitoring**: 3D laser scanning continues to be a highly effective tool for assessing wall stability. No major multi-bench deformation has been detected, and the observed rockfall volumes are low. The monitoring system provides valuable early warning signals for potential slope displacement.
- **Minor Rockfall and Erosion**: Minor rockfall and material loss were observed in specific areas, particularly around blast-affected zones. Additionally, water erosion channels were identified along some highwall faces, contributing to localised material washout, which could lead to further instability if not managed over the medium to long term.

Risk Summary:

- Cross-section compliance issues in Section C and Section D of the WSM need to be addressed, with particular attention to reducing the slope face angles and Total Slope Angle to within design limits.
- Localised rockfall, erosion, and minor cracking in the WSM should be managed through ongoing monitoring and maintenance to prevent future risks.

The audit confirms that while the quarry's overall geotechnical performance is stable, specific areas, particularly the WSM, require compliance with approved design parameters to ensure long-term stability.

Important Note Regarding this Report

All information in this report relating to the Geotechnical Audit is based on and accurately reflects the information provided by Adbri and compiled by Groundwork, part of SLR. However, Groundwork part of SLR, provides no warranty regarding the accuracy of the information supplied by Adbri. Groundwork part of SLR, disclaims any responsibility for loss or damage arising from reliance on inaccurate or outdated information provided by Adbri or other third parties, whether wholly or in part.

The Geological and Geotechnical information was compiled by Joe Vivash, Associate Geotechnical Engineer at Groundwork part of SLR.

Name: Joe Vivash

Signature: _____

DRAWINGS

REV	DESCRIPTION	DATE	BY
6	Update Aerial Image and Topography	06-10-2022	JHV
7	Removed 2019 Topography, Added 2023 Topography	21-09-2023	CP
8	Update Aerial Image and Topography	26-10-2024	JHV

Data Sources:
Photography: Groundwork Plus Pty Ltd RPA Survey, 2024-10-02
Topography: Groundwork Plus Pty Ltd RPA Survey, 2024-10-02, DSM 1.5m
Cadastre: © The Government of South Australia (DIT) 2021
Ecosystem:
Other: © 2022 Nearmap

Legend:
- Cadastral Boundary
- Private Mine
- Extractive Mineral Lease

PROJECT: Sellicks Hill Quarry

CLIENT: Adbri Quarries

TITLE: Western Dump - Cross Section Location Plan

GROUNDWORK plus
PH: +61 7 3871 0411
WWW.GROUNDWORK.COM.AU

SCALE: 1:2,500 When Printed On A3 (0 — 50m)
DRAWING NUMBER: 1741.DRG.060A
REVISION: 8
DATE: 26 October 2024
DRAWN: JHV
PRINTED: 26 October 2024
CHECKED: RH
DATUM: HORIZONTAL / VERTICAL / ZONE
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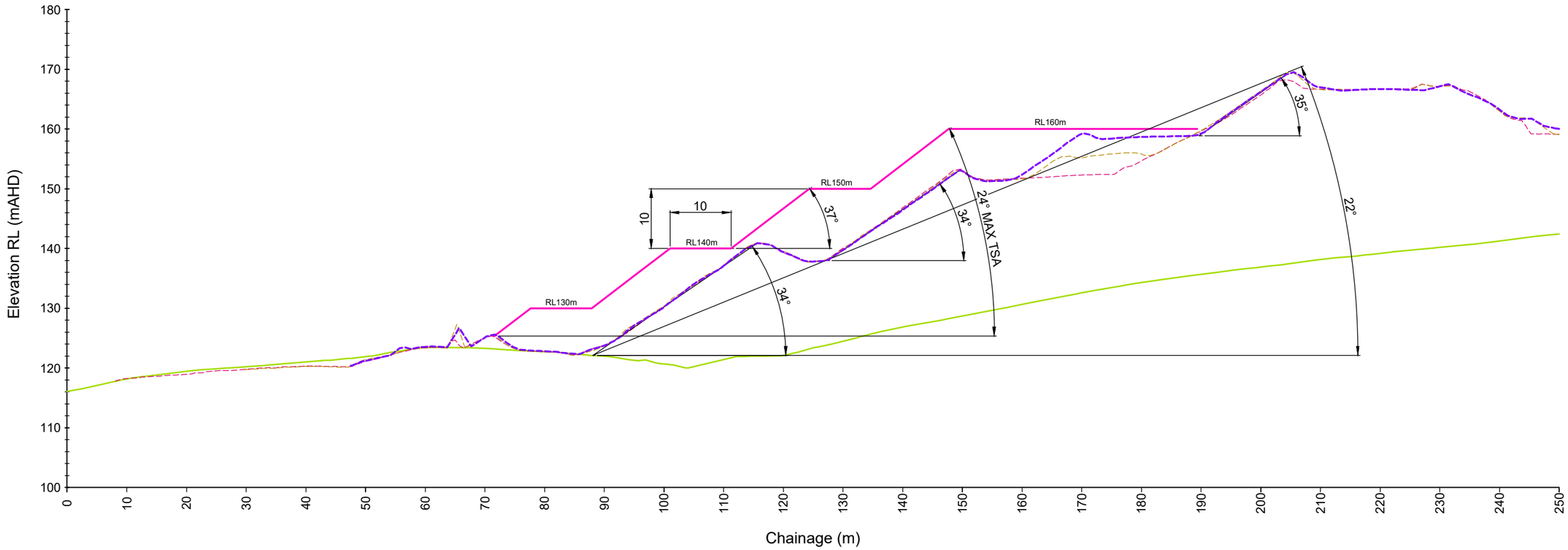
CREATED: 26 October 2024 JOB SUB #: FILE NAME: Z:\Shared\Data\Jobs\1700\1741 Southern Quarries Sellicks Hill Quarry\Drawings\Drawing\1741.DRG.060R8 - Western Dump - As-Built Sections.dwg

Cross Section A-A'



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7	Removed 2019 Topography, Added 2023 Topography	21-09-2023	CP
8	Update Aerial Image and Topography	26-10-2024	JHV

Data Sources:
Photography:
Topography: Groundwork Plus Pty Ltd RPA Survey, 2024-10-02, DSM 1.5m
Cadastre:
Ecosystem:
Other: St Vincents Ground Survey, 2010

Legend:
- As-built Surface (2024-10-02)
- As-built Surface (2023-07-03)
- As-built Surface (2022-04-21)
- Overburden Design
- Natural Ground Surface (2010)

PROJECT: Sellicks Hill Quarry

CLIENT: Adbri Quarries

TITLE: Cross Section A-A

GROUNDWORK plus
PH: +61 7 3871 0411
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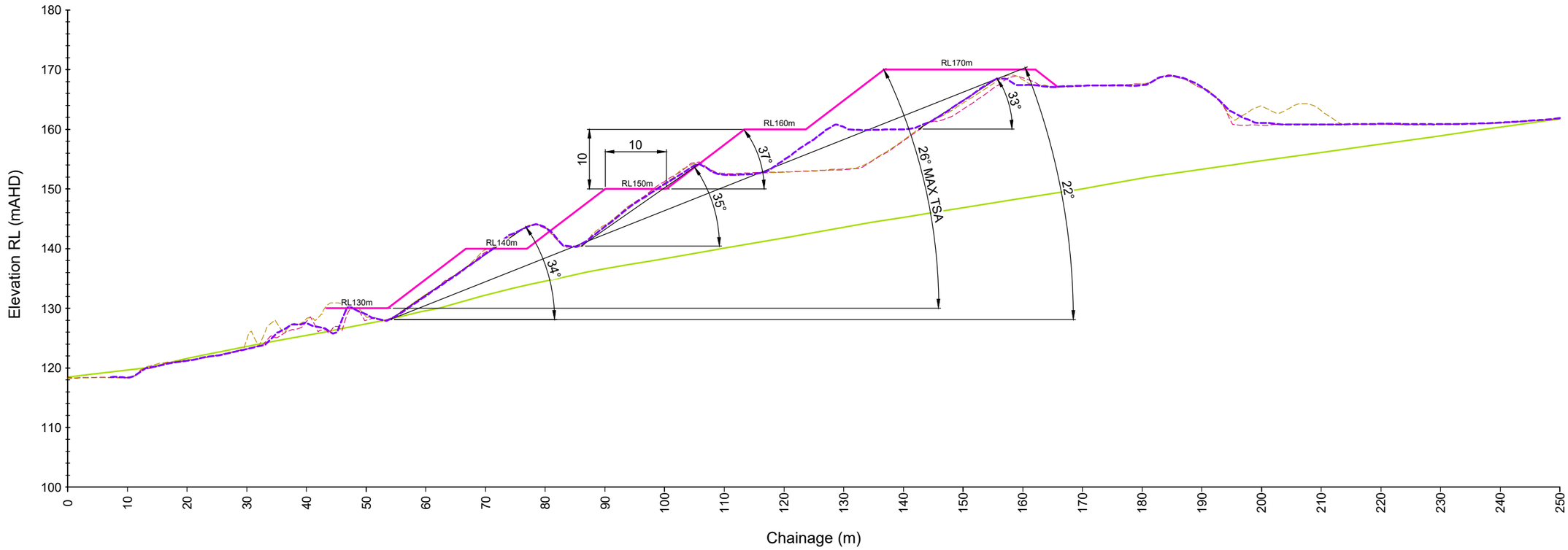
DATUM: HORIZONTAL / VERTICAL / ZONE
MGA / AHD / 54

Cross Section B-B'



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7	Removed 2019 Topography, Added 2023 Topography	21-09-2023	CP
8	Update Aerial Image and Topography	26-10-2024	JHV

Data Sources:
Photography:
Topography: Groundwork Plus Pty Ltd RPA Survey, 2024-10-02, DSM 1.5m
Cadastre:
Ecosystem:
Other: St Vincents Ground Survey, 2010

Legend:
- As-built Surface (2024-10-02)
- As-built Surface (2023-07-03)
- As-built Surface (2022-04-21)
- Overburden Design
- Natural Ground Surface (2010)

PROJECT: Sellicks Hill Quarry

CLIENT: Adbri Quarries

TITLE: Cross Section B-B

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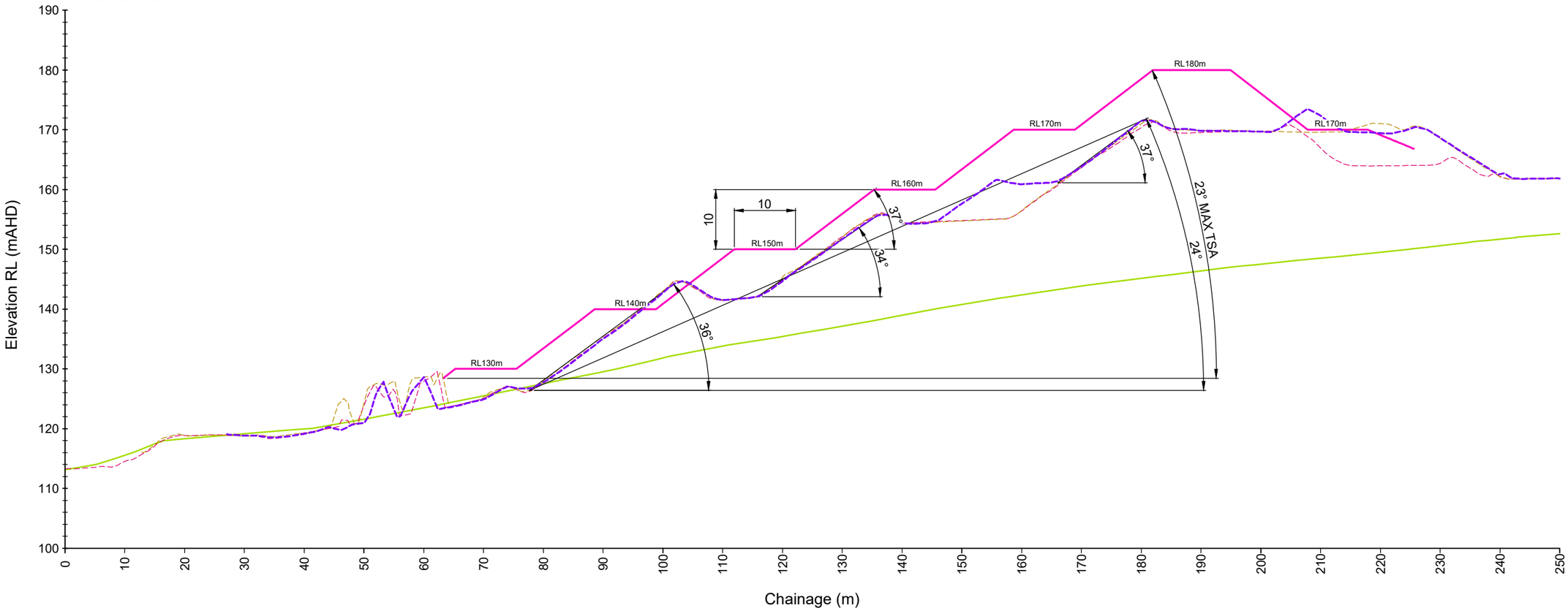
REVISION: 8
DATE: 26 October 2024 DRAWN: JHV
PRINTED: 26 October 2024 CHECKED: RH
DATUM: HORIZONTAL / VERTICAL / ZONE
MGA / AHD / 54

Cross Section C-C'



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8	Update Aerial Image and Topography	26-10-2024	JHV

Data Sources:
Photography:
Topography: Groundwork Plus Pty Ltd RPA Survey, 2024-10-02, DSM 1.5m
Cadastre:
Ecosystem:
Other: St Vincents Ground Survey, 2010

Legend:
- As-built Surface (2024-10-02)
- As-built Surface (2023-07-03)
- As-built Surface (2022-04-21)
- Overburden Design
- Natural Ground Surface (2010)

PROJECT: Sellicks Hill Quarry

CLIENT: Adbri Quarries

TITLE: Cross Section C-C

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REVISION: 8
DATE: 26 October 2024
DRAWN: JHV
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DATUM: HORIZONTAL / VERTICAL / ZONE
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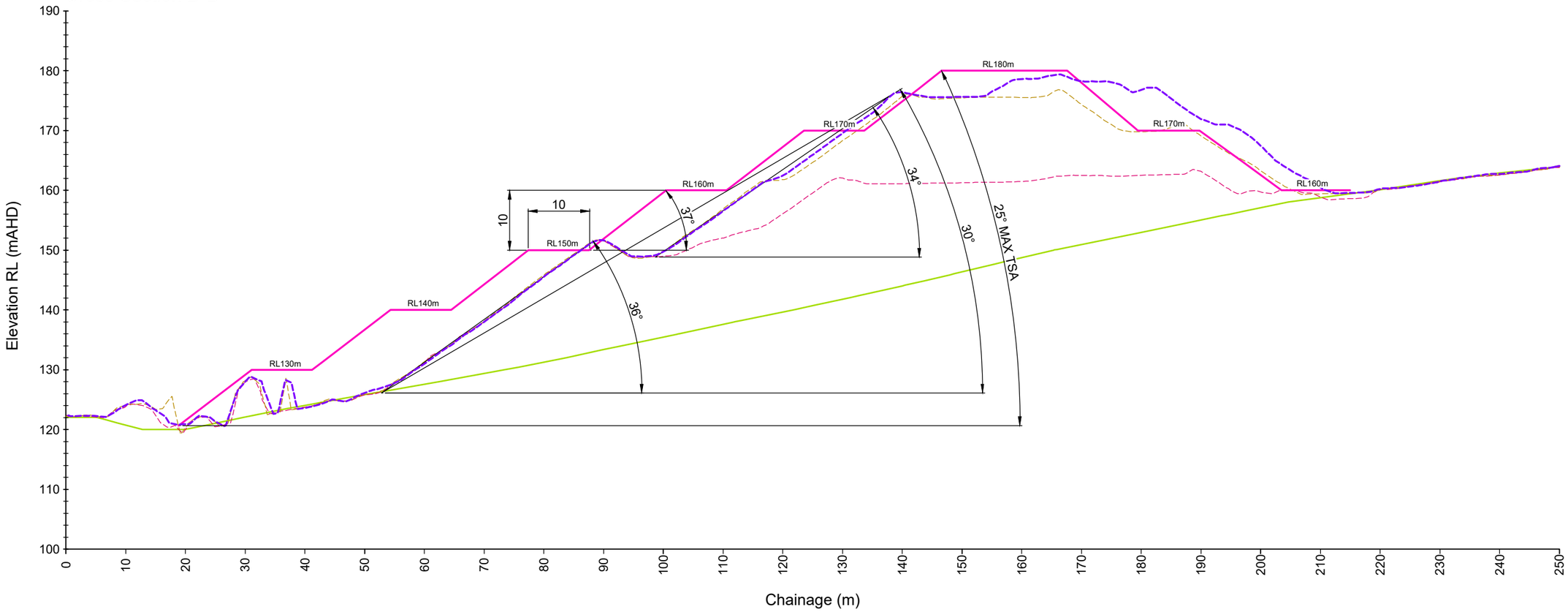
CREATED: 26 October 2024 JOB SUB # FILE NAME: Z:\Shared\Data\Jobs\1700\1741 Southern Quarries Sellicks Hill Quarry\Drawings\Drawings\1741.DRG.060RB - Western Dump - As-Built Sections.dwg

Cross Section D-D'



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8	Update Aerial Image and Topography	26-10-2024	JHV

Data Sources:
Photography:
Topography: Groundwork Plus Pty Ltd RPA Survey, 2024-10-02, DSM 1.5m
Cadastre:
Ecosystem:
Other: St Vincents Ground Survey, 2010

Legend:
- As-built Surface (2024-10-02)
- As-built Surface (2023-07-03)
- As-built Surface (2022-04-21)
- Overburden Design
- Natural Ground Surface (2010)

PROJECT: Sellicks Hill Quarry

CLIENT: Adbri Quarries

TITLE: Cross Section D-D

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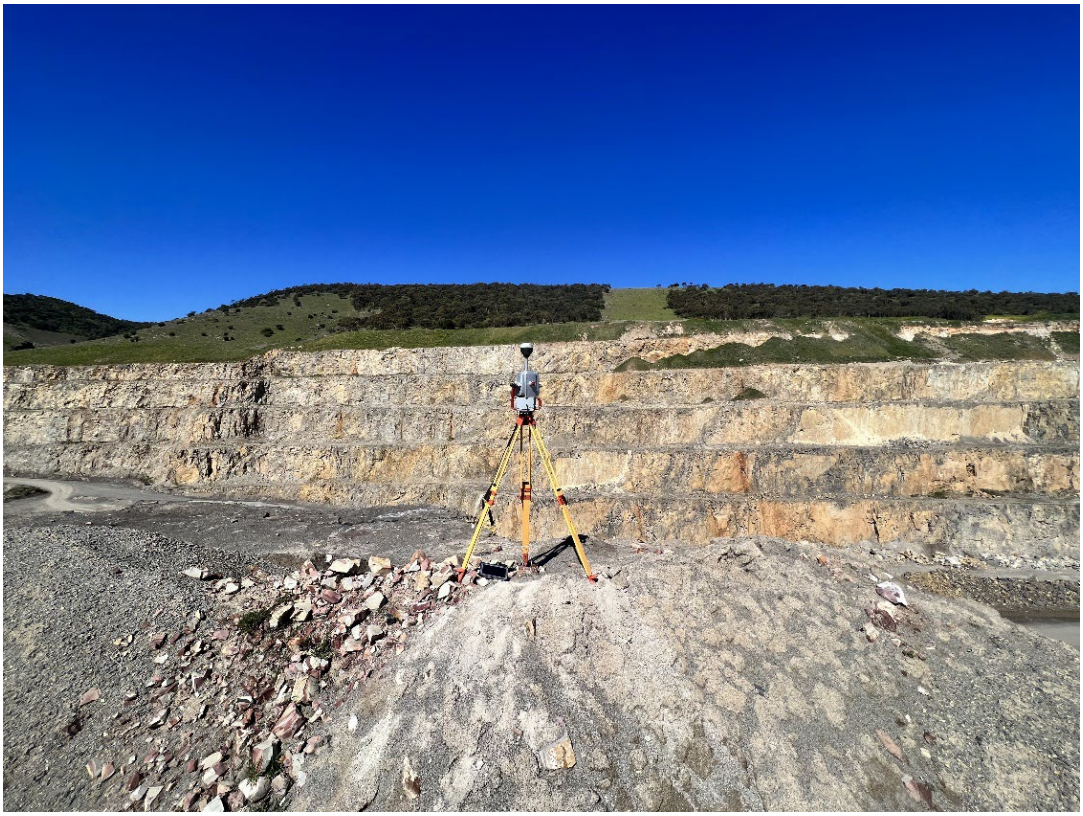
REVISION: 8
DATE: 26 October 2024 DRAWN: JHV
PRINTED: 26 October 2024 CHECKED: RH
DATUM: HORIZONTAL / VERTICAL / ZONE
MGA / AHD / 54

ATTACHMENTS

Attachment 1

Deformation Scan Report Sellicks Hill Quarry September 2024

GROUNDWORK PART OF SLR



Laser Survey and Deformation Scan

Sellicks Hill Quarry

Prepared for: ADBRI Quarries

Date: 14th October 2024

File Reference: 1741_260_027

DOCUMENT CONTROL

PROJECT / DETAILS REPORT

Document Title:	Deformation Scan Report – Sellicks Hill Quarry
Principal Authors :	T. Throup
Client:	ADBRI Quarries
Reference Number:	1741_260_027

DOCUMENT STATUS

Issue	Description	Date	Author	Reviewer
0	Deformation Scan Report –Sellicks Hill Quarry	14/10/2024	T. Throup	J. Vivash

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Unit 78/109 Leitchs Road, Brendale Qld 4500
Phone: 0417 615 217

TABLE OF CONTENTS

DRAWINGS

Sellicks Hill Quarry Scanner Locations	Drawing No. 174.DRG.161

1 Introduction

A deformation scan was undertaken onsite on the 12th of September 2024 at Sellicks Hill Quarry (The Site). The laser scan was completed to assess wall movement rates, if any, across the active pit area, since the proceeding survey conducted on the 11th of September 2023.

A legend on the various maps provided within the report provides information on movement, both from a cut and fill perspective. Please note, items of deep red may represent areas of fill that have been placed in the survey areas since the last survey while conversely areas of blue may represent areas of extraction.

1.1 Methodology

To monitor and inspect for deformation in surfaces such as Pit walls LiDAR (Light Detection and Ranging) technology is used. This technology is an excellent way to build 3D models of the real world with great accuracy. LiDAR technology sends light in the form of a pulsed laser to measure distances to a target. The reflected laser rays return back to the scanner, and the distance is recorded, capturing the spatial geometry of the structure or site. Millions of measurement points are collected, each containing an x, y, and z coordinate. Together, the points create a point cloud. The intricate detail of these data points allows an exact measurement from any one point to any other point in the point cloud be measured. When subsequent point clouds collected over different time periods are compared to each other, the distance between these point clouds can be measured, which allows for analyses to determine if there is movement occurring in a particular area of interest.

The scanner used in this survey, is a Maptek I-Site LR3 scanner. This is a terrestrial tripod mounted LiDAR scanner, that has a maximum range of 1200m and collects point cloud data with relative accuracy of 4mm and repeatability accuracy of +/- 3mm. Specifications and Certificate of conformance of the scanner can be provided upon request.

The scanner is positioned around site at optimally determined Station locations, which ensures uniform coverage of the scan area from all angles, appropriate distance, and minimizing obstructions in the field of view. Data is captured in accordance with Maptek I-Site LR3 operator manual recommendations. From each station location, a Global Navigation Satellite System (GNSS) rover is used to collect a precise measurement of the station Location. This location is used to place the point cloud data accurately in an appropriate coordinate system. The GNSS rover uses Real-time kinematic (RTK) positioning to correct common errors in current satellite navigation (GNSS) systems, which ensures that the data is referenced in the coordinate system giving an absolute accuracy of +/-3cm of Horizontal, +/- 7cm vertical accuracy.

1.2 Data Processing

Once data is collected in the field, the data needs to be processed. Groundwork Plus use Maptek point Studio Software, which is an intuitive point cloud processing and modelling package for mining, civil, geological and survey applications. The software is designed to work directly with point cloud data collected from Maptek Scanners.

To enable accurate and precise deformation analyses, the point cloud data needs to be bought into Point Studio and data processed and checked. This process involves Data registration, where the individual scans are aligned and fitted together, removing noise (Such as any dust, insects, or water reflection) and setting the coordinate system to provide the most precise measurements. Maptek Point studio provides specific tools, such as Global registration, which ensures scans are registered accurately to each other. This is an important step in deformation analyses, as each scan from different time periods needs to be registered together and verified that a degree of accuracy has been met. The Point Studio software provides a registration report, which shows a summary of the registration or alignment error between the scans. The errors are reported as RMS (Root Mean Square) value differences between corresponding points on objects where they overlap. **Figure 1: Registration Report Example** shows an example of a report that is produced. From the report the metrics and success of the registration can be verified.

Once scans are registered, the point clouds can be analysed and an appropriate heatmap applied to indicate areas of movement from both a cut or fill perspective. Depending on the scale of movement different visual overlays and heatmaps can be applied, allowing a visual understanding of the scale of movement. During the scanning process, the scanner also captures a high-quality image, which can be overlaid with the corresponding dataset. This allows analysis of the areas of interest more thoroughly and confidently by being able to compare against an image of the scene as it was at the time of data capture.

Registration Report

180424 362 Oxenford_ST 2_compass_2xC8L-B_02

Summary Table

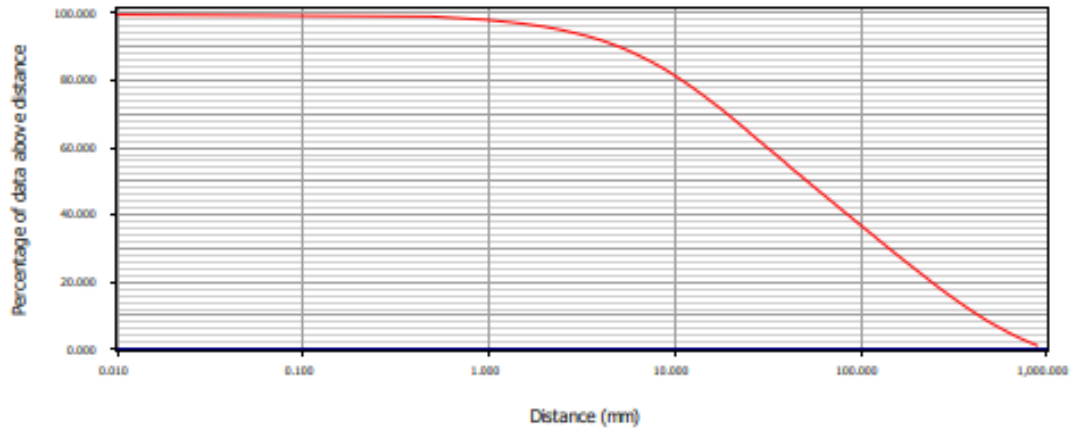
Name	No. of samples	Percentage Overlapping	Quality
20240729 362 Oxenford_ST2_c...	77,280	86.69%	70.83%

RMS Breakdown

Name	RMS (scalar*)	RMS (geometric*)	Normalised** RMS (scalar*)	Normalised** RMS (geometric*)
20240729 362 Oxenford_ST2_c...	67.56mm	0.19mm	83.40mm	0.76mm

* Scalar RMS is calculated using numeric distance values. Geometric RMS is the resulting distance of averaging point pair vectors spatially.
** Normalised RMS values are normalised against point density

Distance Plot



MAPTEK

Generated on 13/9/2024 11:35:15 Page 1/2

Figure 1 – Registration Report Example

GROUNDWORK PART OF SLR

2 Scanner Station Locations

Scanner stations with field of view shown below in **Figure 2 – Scanner Station Locations**.

Scanner locations and coordinates can also be seen in **Drawing No. 174.DRG.161**

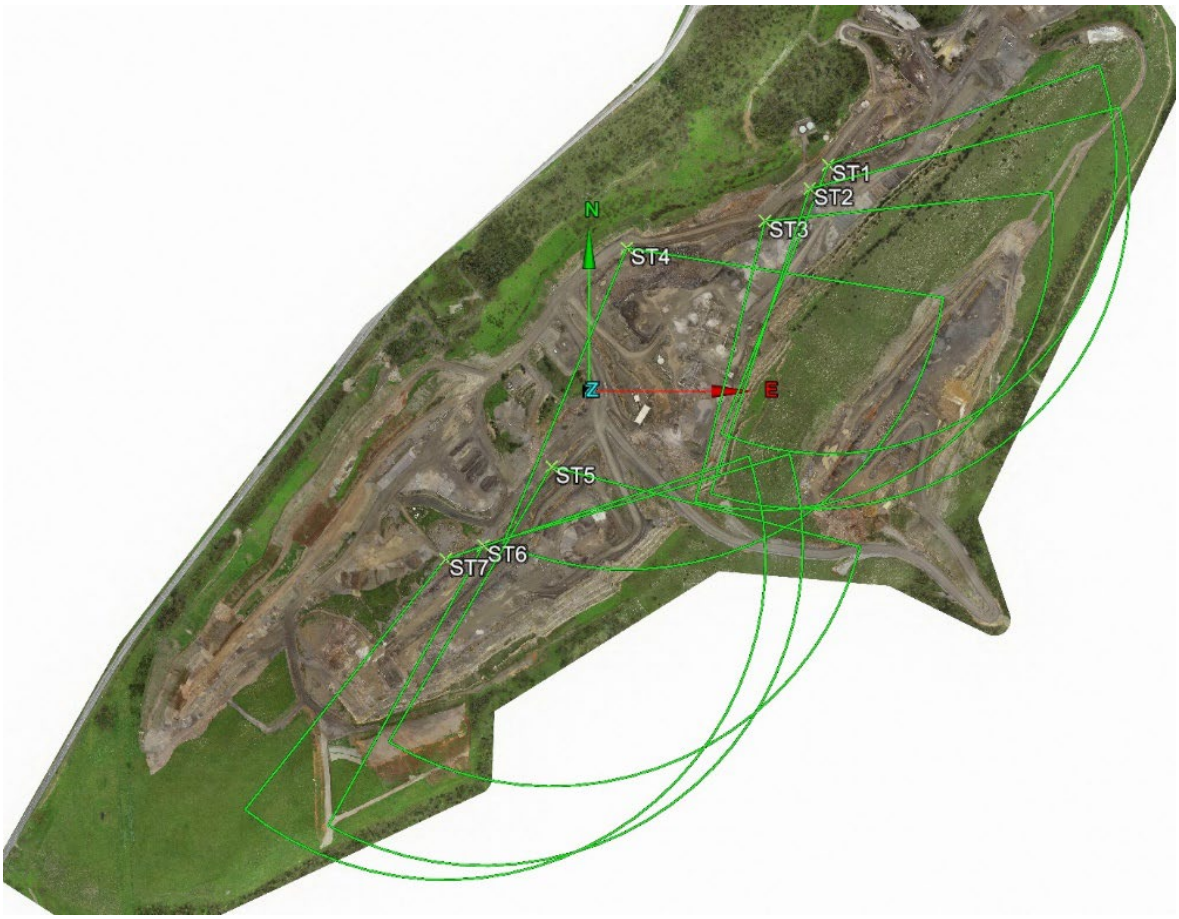


Figure 2 - Scanner Station Locations

3 Survey Findings

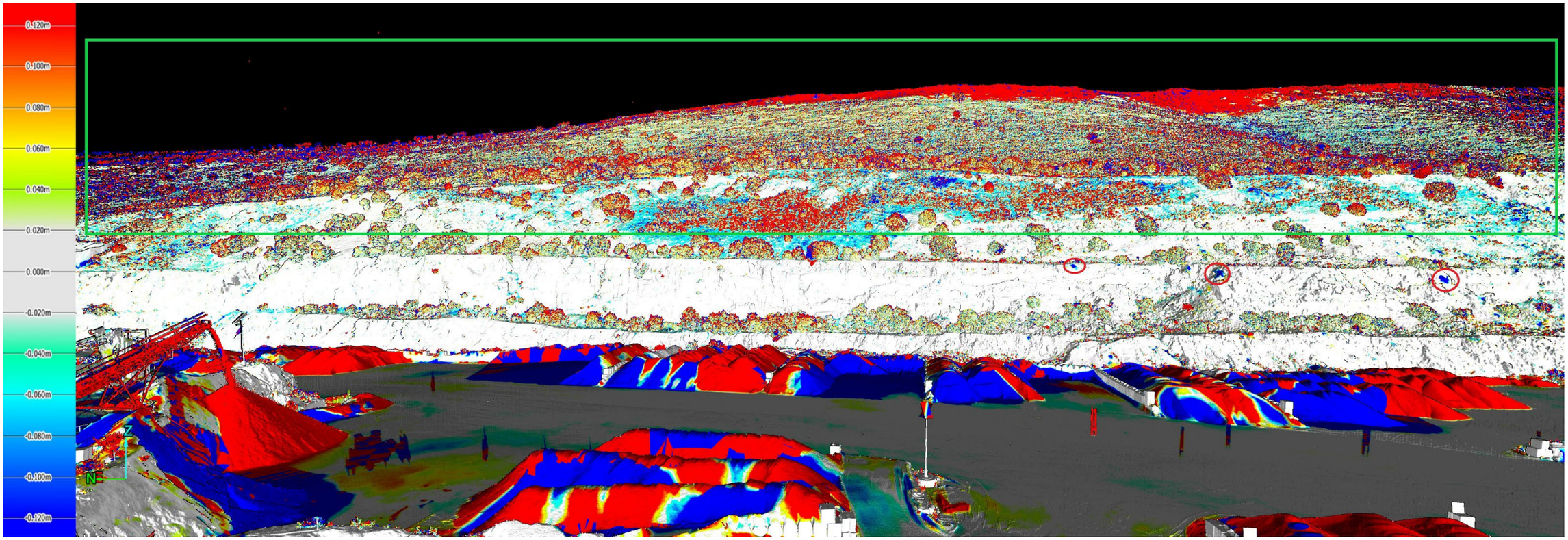
3.1 Station 1

View From Station 1

11th September 2023 Wall Photo

12th September 2024 Wall Photo

11th September 2023 to 12th September 2024 Deformation



Rock Fall / Dislodgement Vegetation

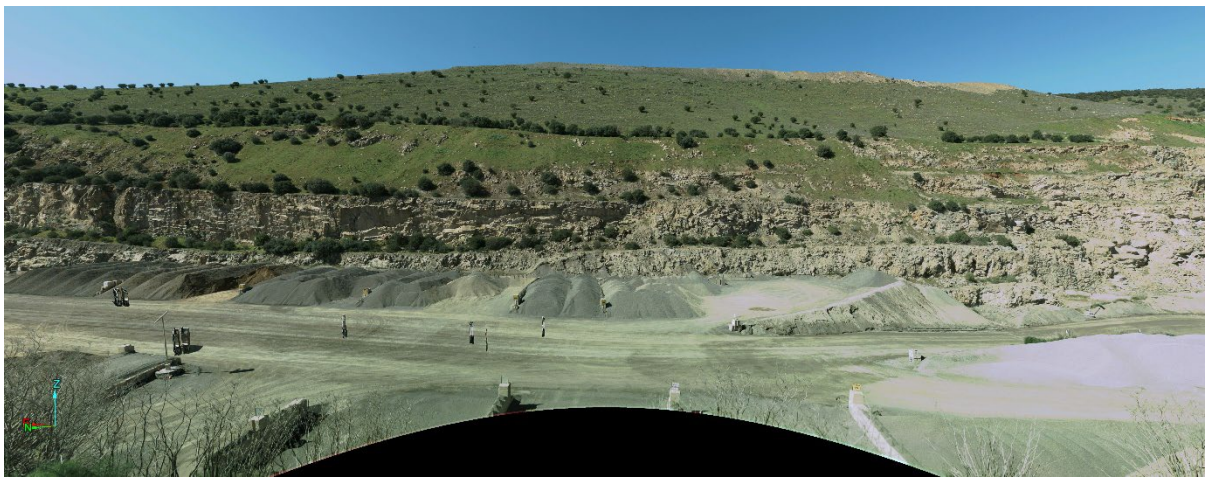
Comments / Observations for Station 1

A few minor rock falls were observed as identified by the red circle polygons. The upper bench and Hillside have large, vegetated areas which show deformation (Cut/Fill) in the heatmap as identified within the green polygon. This is due to vegetation growth over the period and may not be attributable to movement.

3.2 Station 2

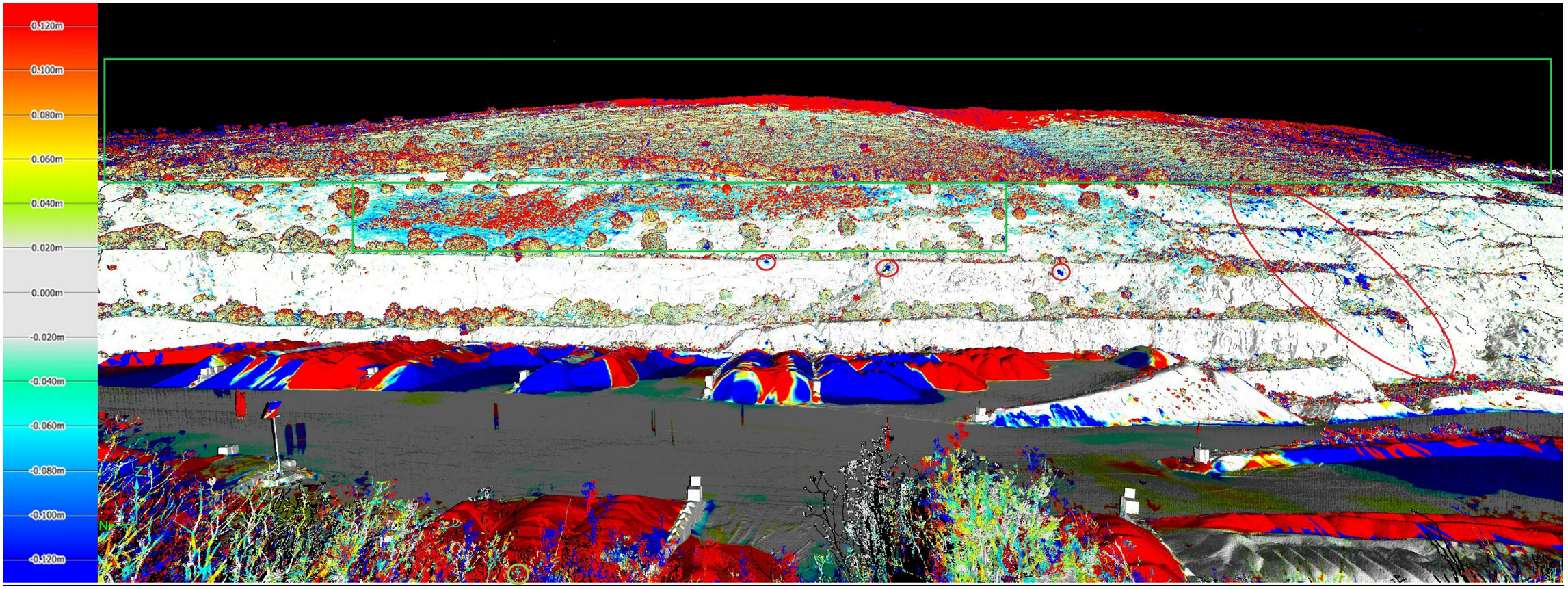
View from Station 2

11th September 2023 Wall Photo



12th September 2024 Wall Photo

11th September 2023 to 12th September 2024 Deformation



Rock Fall / Dislodgement Vegetation

Comments / Observations for Station 2

A few minor rock falls were observed as identified by the red circle polygons. Some larger and cluster of rock falls can be observed in the larger red Polygon on the right hand side, which is discussed further in Station 3 observations. The upper bench and Hillside have large, vegetated areas which show deformation (Cut/Fill) in the heatmap as identified within the green polygon. This is due to vegetation growth over the period and may not be attributable to movement.

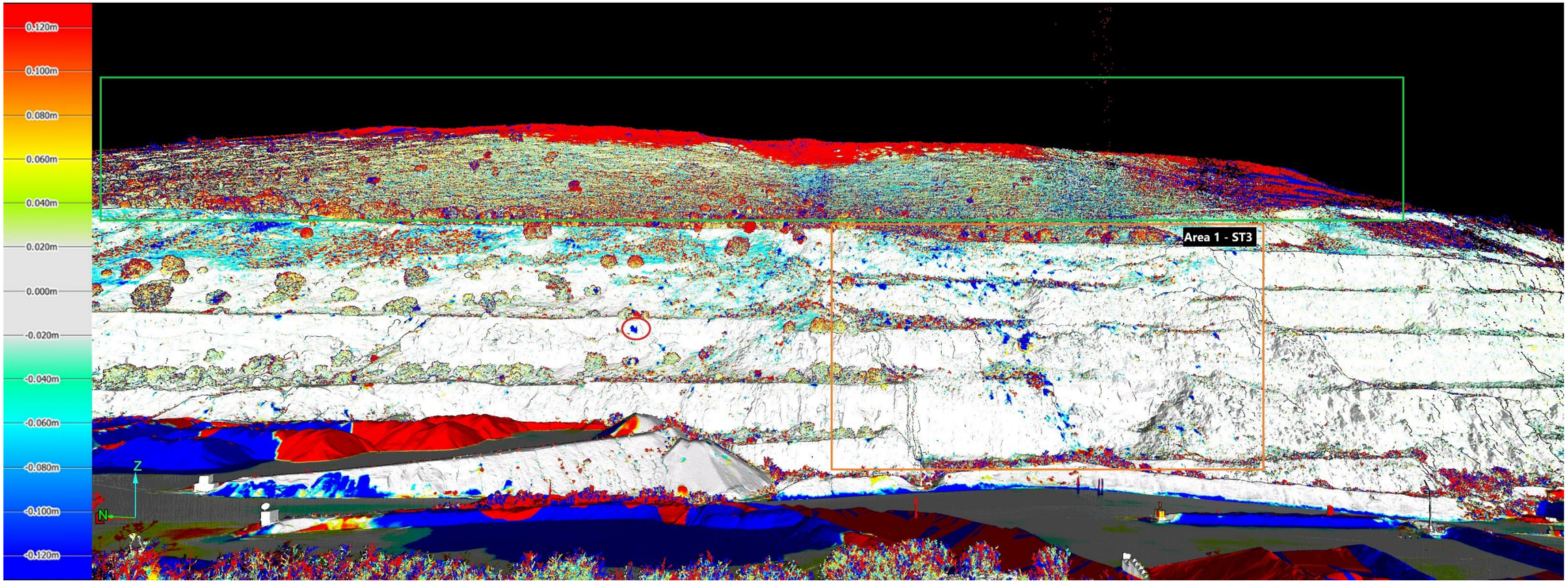
3.3 Station 3

View from Station 3

11th September 2023 Wall Photo

12th September 2024 Wall Photo

11th September 2023 to 12th September 2024 Deformation



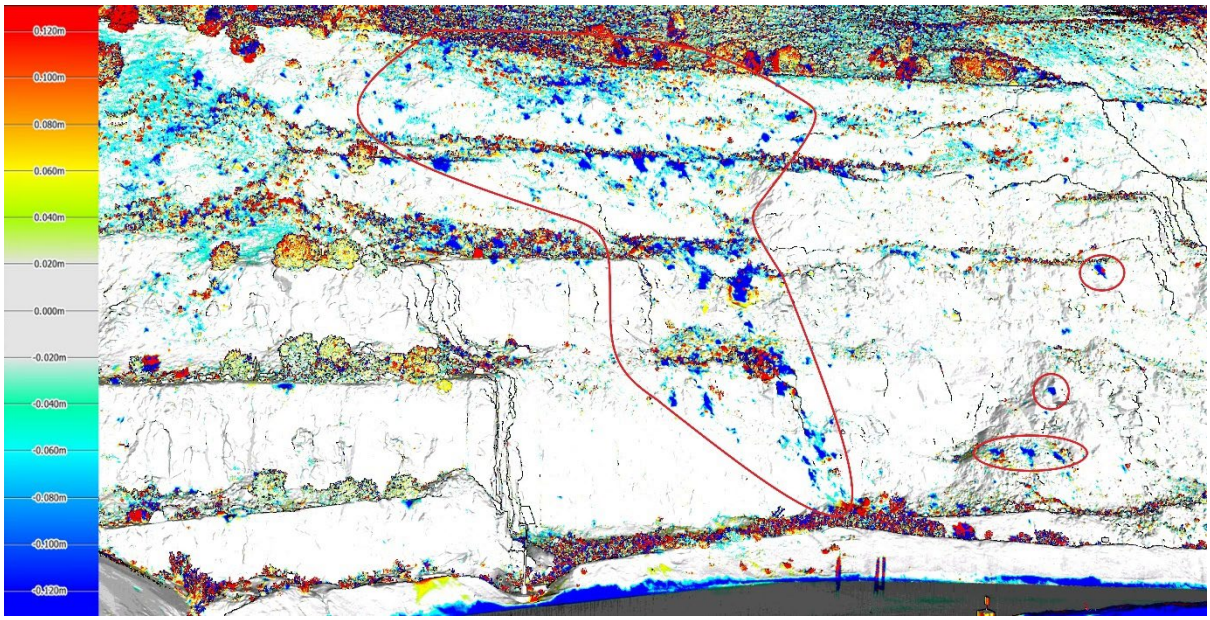
Rock Fall / Dislodgement Vegetation

Comments / Observations for Station 3

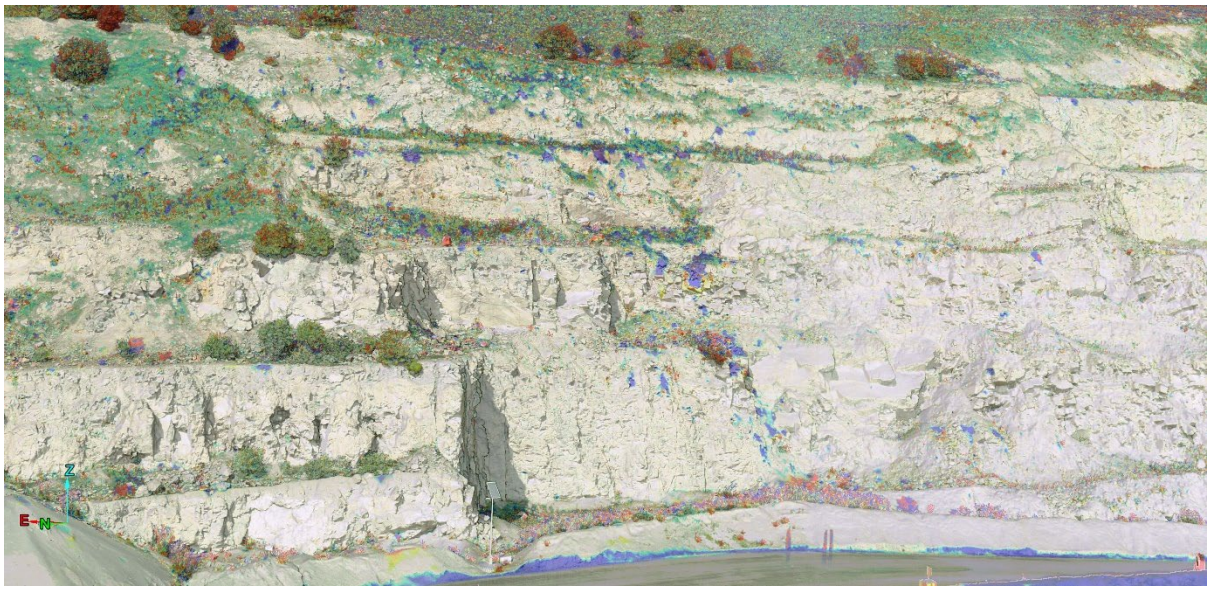
A few minor rock falls were observed as identified by the red circle polygons. Within area 1 – ST3, there were a number of rock falls observed across multiple benches. These rock falls are occurring in an area where walls exhibit loose and disjointed masses of rock. This area is shown in more detail below. The upper bench and Hillside have large, vegetated areas which show deformation (Cut/Fill) in the heatmap as identified within the green polygon. This is due to vegetation growth over the period and may not be attributable to movement.

Area 1 – ST3

11th September 2023 to 12th September 2024 Deformation



12th September 2024 Wall Photo with transparent Heatmap



Small localized/wedge and toppling failures can be seen within this area. The previous period deformation scan also showed a number of rock falls occurring in this same area. As the haul road below is frequented by Mobile equipment (Including HME, HV, and LV) this area needs to be closely monitored and ensure that appropriate toe bunding and standoff distances are adhered too. It does appear that all rock fall is being contained behind the current toe bunding.

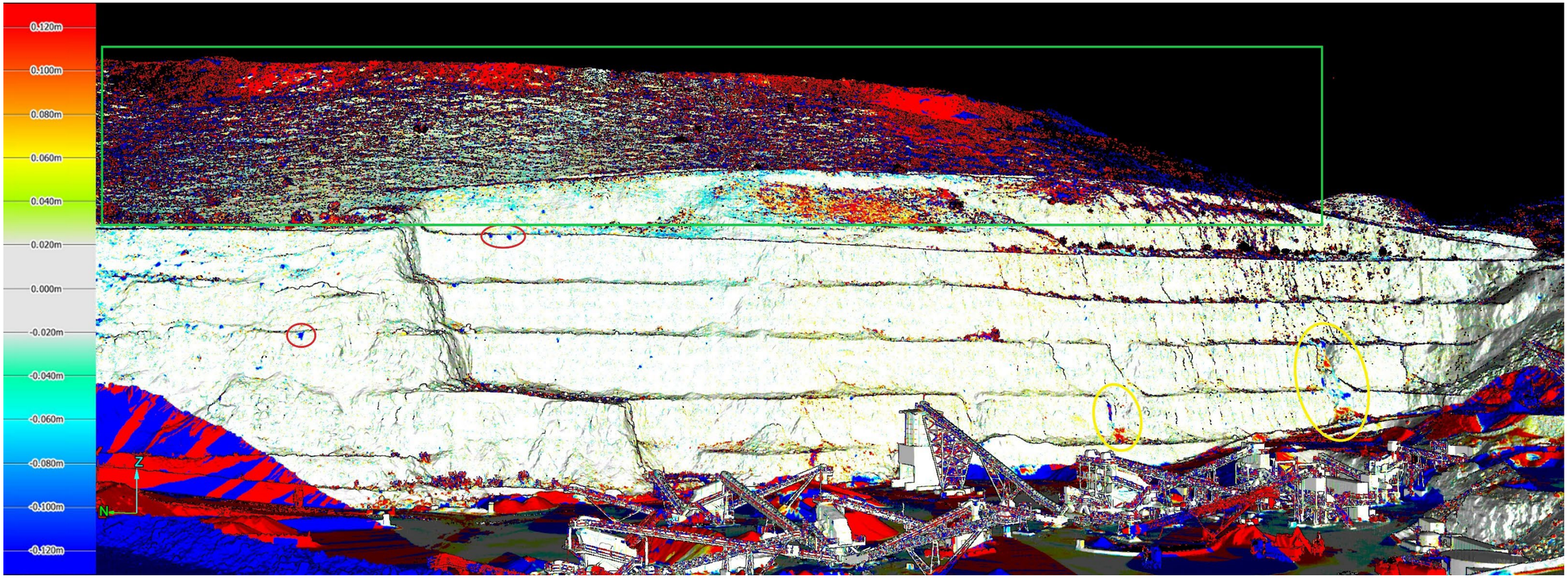
3.4 Station 4

View From Station 4

11th September 2023 Wall Photo

12th September 2024 Wall Photo

11th September 2023 to 12th September 2024 Deformation



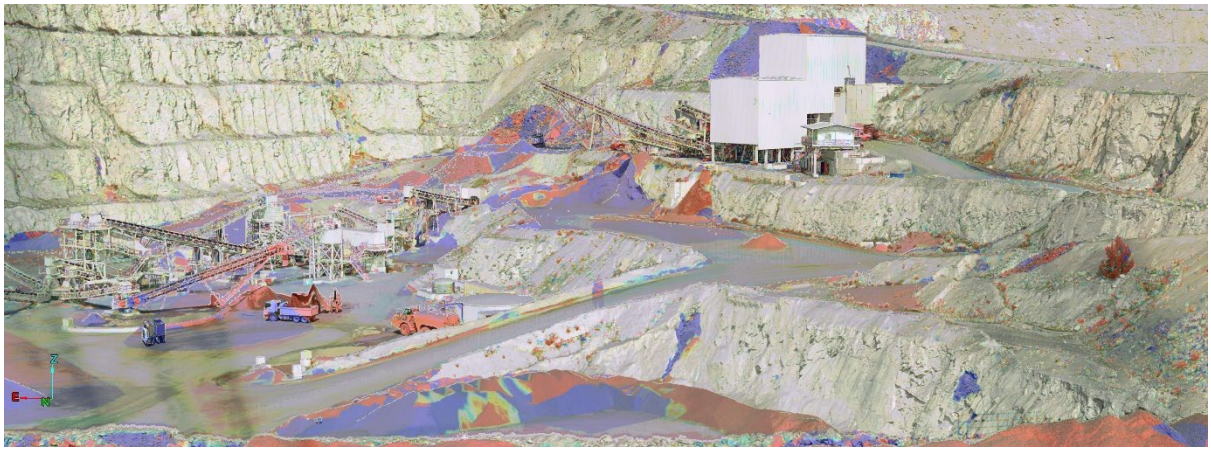
Scour Rock Fall / Dislodgement Vegetation

Comments / Observations for Station 4

A few minor rock falls were observed as identified by the red circle polygons. Some scouring is occurring within the yellow Polygons, likely from water erosion. This was also observed in the last deformation scan report. The upper bench and Hillside have large, vegetated areas which show deformation (Cut/Fill) in the heatmap as identified within the green polygon. This is due to vegetation growth over the period and may not be attributable to movement.

View From Station 4 – Southern end

12th September 2024 Wall Photo with transparent heatmap



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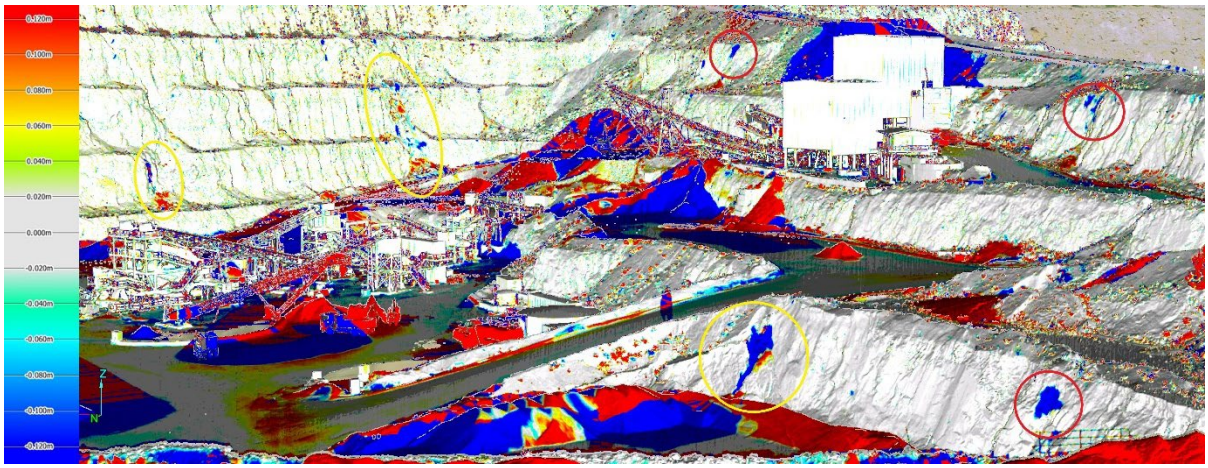


Scour Rock Fall / Dislodgement

Looking further south from station 4, you can see three (3) other areas where rockfall has occurred identified by the red polygons. Scouring is also seen to be occurring from possibly stormwater erosion by the yellow polygons.

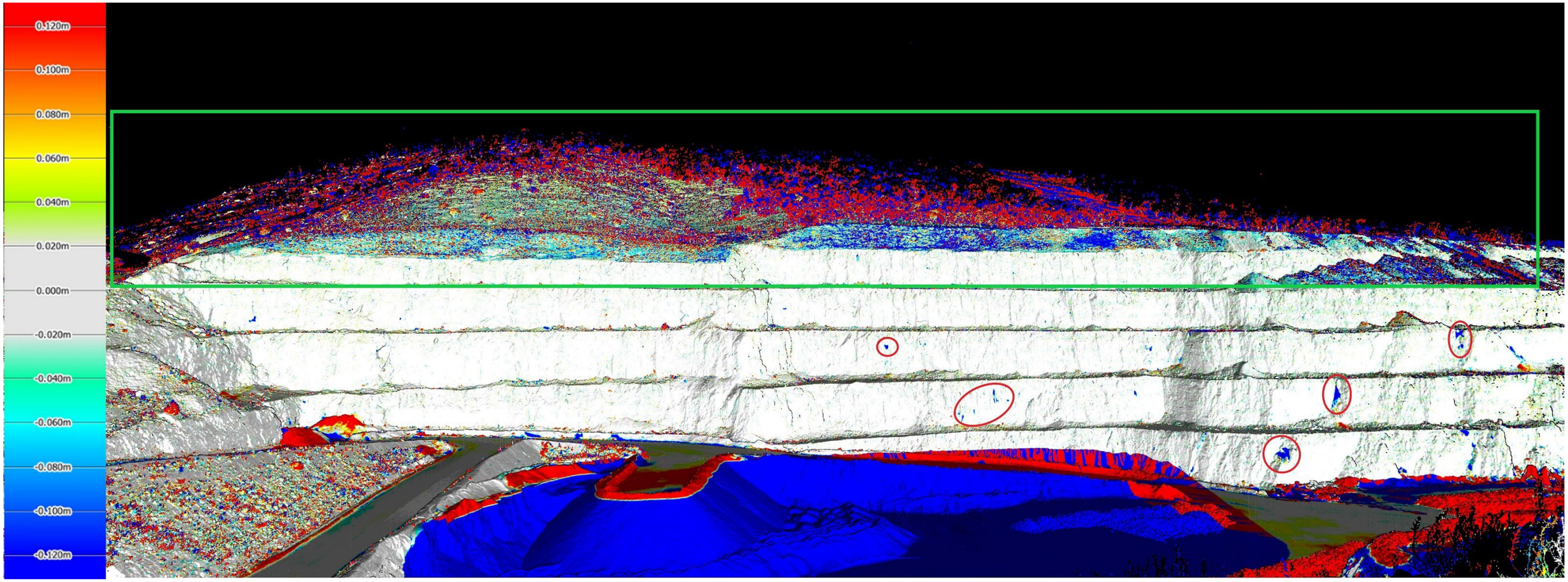
3.5 Station 5

View from Station 5

11th September 2023 Wall Photo

12th September 2024 Wall Photo

11th September 2023 to 12th September 2024 Deformation



Rock Fall / Dislodgement Vegetation

Comments / Observations for Station 5

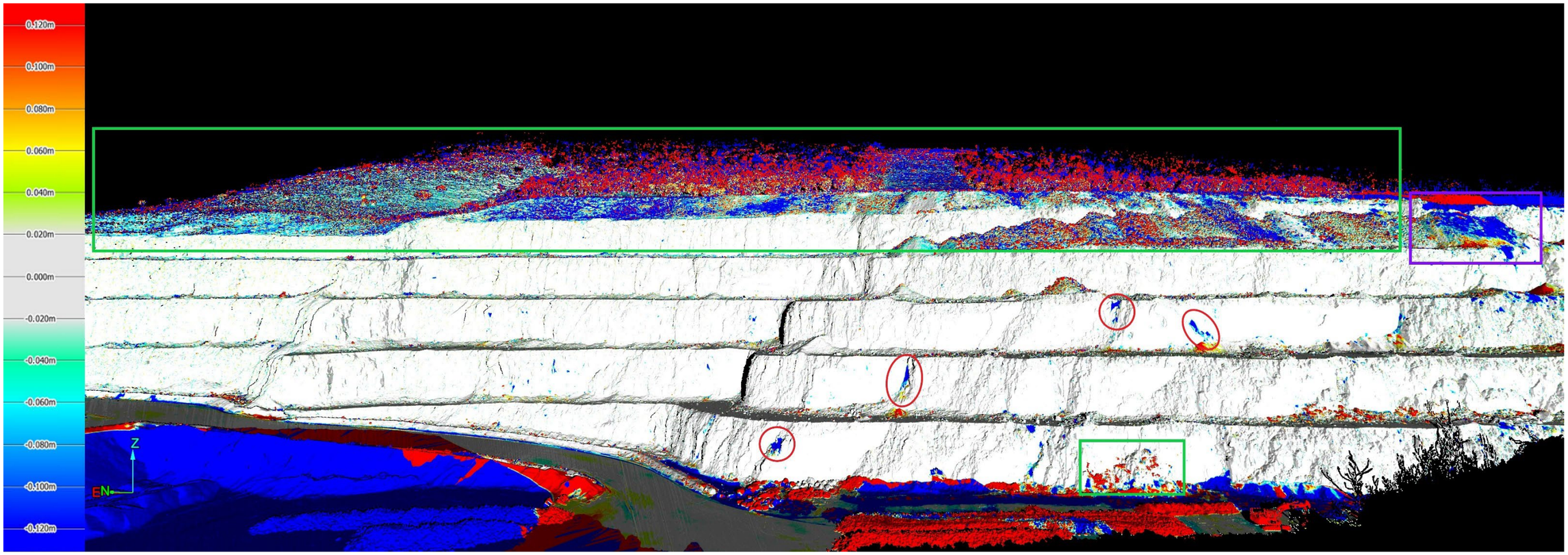
A few minor rock falls were observed as identified by the red circle polygons. The upper bench and Hillside have large, vegetated areas which show deformation (Cut/Fill) in the heatmap as identified within the green polygon. This is due to vegetation growth over the period and may not be attributable to movement.

View from Station 6

11th September 2023 Wall Photo

12th September 2024 Wall Photo

11th September 2023 to 12th September 2024 Deformation



Slump Rock Fall / Dislodgement Vegetation

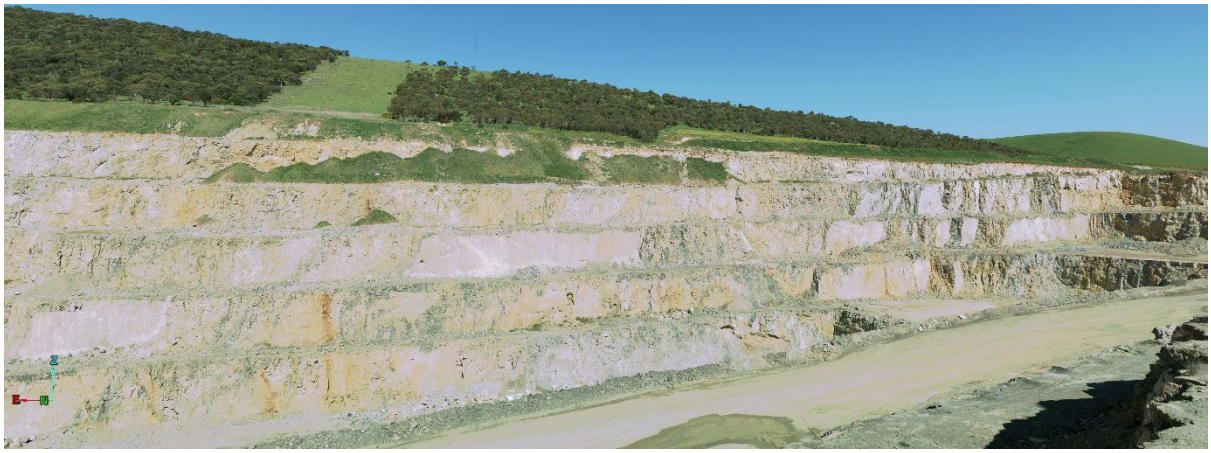
Comments / Observations for Station 6

A few minor rock falls were observed as identified by the red circle polygons. The upper bench and Hillside have large, vegetated areas which show deformation (Cut/Fill) in the heatmap as identified within the green polygon. This is due to vegetation growth over the period and may not be attributable to movement. A slump is seen to be occurring on the southern end of a fill embankment, identified by the blue polygon.

3.6 Station 7

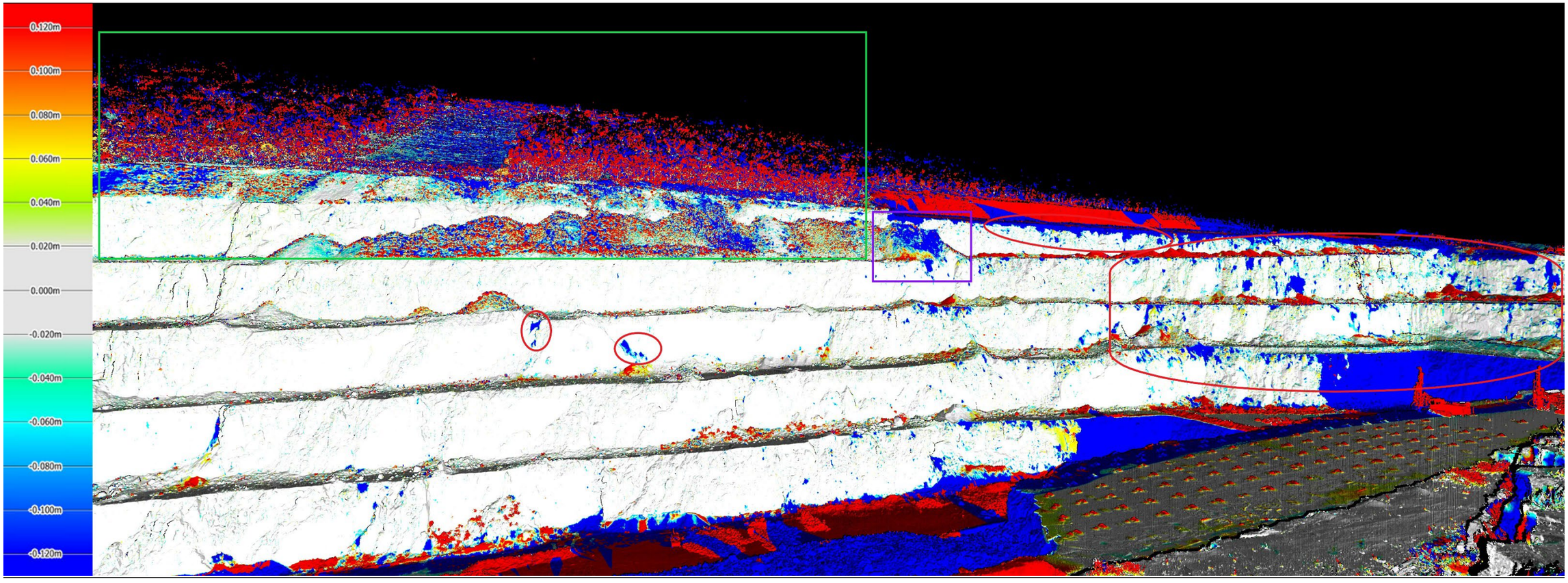
View from Station 7

11th September 2023 Wall Photo



12th September 2024 Wall Photo

11th September 2023 to 12th September 2024 Deformation



Slump Rock Fall / Dislodgement Vegetation

Comments / Observations for Station 7

A few minor rock falls were observed as identified by the red circle polygons. Rockfall appears more frequent within the southern end of the pit which is likely as a result of blasting impact. The upper bench and Hillside have large, vegetated areas which show deformation (Cut/Fill) in the heatmap as identified within the green polygon. This is due to vegetation growth over the period and may not be attributable to movement. A slump is seen to be occurring on the southern end of a fill embankment, identified by the blue polygon.

4 Survey Summary, Conclusions and Recommendations

For a survey summary, conclusion, and recommendations, please refer to the Sellicks Quarry Geotechnical Audit (Ref: 1741_260_028V1)

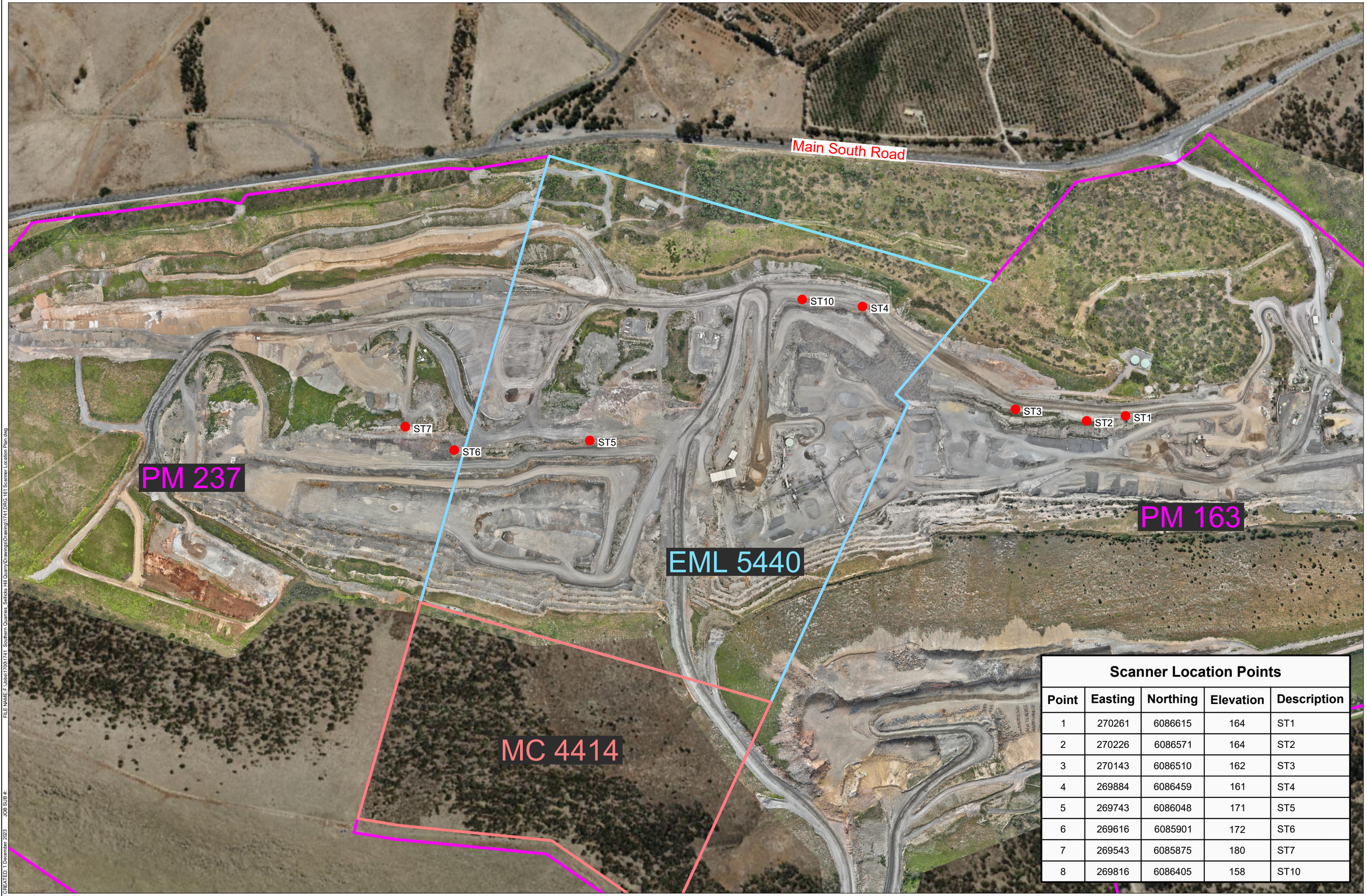
5 Scan Schedule

Annual scans are undertaken at Sellicks Hill Quarry. The next scan is due in September 2025.

6 References

Maptek I-Site LR3 operator manual

Drawings



Scanner Location Points

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2	270226	6086571	164	ST2
3	270143	6086510	162	ST3
4	269884	6086459	161	ST4
5	269743	6086048	171	ST5
6	269616	6085901	172	ST6
7	269543	6085875	180	ST7
8	269816	6086405	158	ST10

CREATED: 1 December 2023 JOB SUB #: FILE NAME: F:\Jobs\17\06\1741 Southern Quarries Sellicks Hill Quarry\Drawing\1741.DRG.161 Scanner Location Plan.dwg

REV	DESCRIPTION	DATE	BY

Data Sources:
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Topography:
Cadastre: © The Government of South Australia (DIT) 2022
Ecosystem:
Other: © 2022 Microsoft Corporation; © 2022 Maxar, © CNES (2022) Distribution Airbus DS

Legend:
- Scanner Location Points
- Private Mine
- Extractive Minerals Lease
- Mineral Claim

PROJECT: Sellicks Hill Quarry

CLIENT: Adbri Quarries

TITLE: Scanner Location Plan

GROUNDWORK plus
PH: +61 7 3871 0411
WWW.GROUNDWORK.COM.AU

SCALE: 1:7,500 When Printed On A3 — 0 — 150m
DRAWING NUMBER: 1741.DRG.161
REVISION:
DATE: 1 December 2023
DRAWN: KB
DATUM: HORIZONTAL / VERTICAL / ZONE
PRINTED: 14 December 2023
CHECKED: TT
GDA94 / MGA / AHD / 54

Attachment 3

Visual Amenity Inspection Report

Job No.:	1741	**Category:**	Visual Amenity
Site Name:	Sellicks Hill Quarry	**Client:**	Adbri Limited
Site Address:	3981 Main South Road Sellicks Beach SA 5174	**Approvals:**	EPA Licence No. 2052
Monitoring Date:	24 October 2024	**Monitored by:**	Carly Monaghan
Report Requested by:	Rachel Hall		

Purpose: Annual inspection of the Visual Amenity to inform the Visual Amenity Outcome of the MOP PEPR: Quarrying activities are progressively screened from sensitive receptors (residents west of Site). The overburden dump/screening mound is constructed and revegetated as designed to integrate with the surrounding landscape.

Event Discussion

A visual amenity inspection was undertaken on 24 October 2024 and noted no significant change to visual amenity related impact when compared with previous assessments. No views of operations were seen during the visual amenity inspection.

Photographs Points

24/10/2024

Photo 1: Facing north east along Main South Road. View of visual screening bund but no views of quarry operations.

24/10/2024

Photo 1: Facing south west towards Main South Road. Minimal views of product stockpiles, but no views of operations.

24/10/2024

Photo 2: View from intersection of Country Rd and Main South Rd intersection facing South. No views of quarry operations or working faces.

24/10/2024

Photo 3: Views facing South from Main South Road. Minimal views of quarry faces / product stockpiles but no views of quarry operations.

24/10/2024

Photo 5: Views facing South on Main South Road. Road vegetation effectively screening operations.

24/10/2024

Photo 5: Views facing South on Main South Road. Minimal views of stockpiling / bunding. No views of operations noted.

24/10/2024

Photo 6: Visual amenity bunding and tree screening south-west of the residence in EML 5440. Residence is effectively screened from Site operations.

Attachment 4

Dust Management Plan

GOLDER
MEMBER OF WSP

REPORT

Southern Quarries Dust Management Compliance Plan

Dust Management Plan

SOUTHERN QUARRIES

Submitted to:

Southern Quarries

Submitted by:

Golder Associates Pty Ltd

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1529035-R-DMP-Rev13

5 October 2022

Distribution List

Environment Protection Authority

Record of Issue

Company	Client Contact	Version	Date Issued	Method of Delivery
Southern Quarries	M Close	00	17/06/16	Email
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Southern Quarries	M Close	04	26/07/18	Email
Southern Quarries	M Close	05	29/08/18	Email
Southern Quarries	M Close	06	5/03/19	Email
Southern Quarries	M Close	07	22/10/19	Email
Southern Quarries	M Close	08	05/12/19	Email
Southern Quarries	M Close	09	04/09/2020	Email
Southern Quarries	M Close	10	10/09/2020	Email
Southern Quarries	R Low	11	28/01/2022	Email
Southern Quarries	R Low	12	22/02/2022	Email
Southern Quarries	R Low	13	5/10/2022	Email

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APPENDICES

1.0 INTRODUCTION

Southern Quarries, a fully owned subsidiary of Adbri (formerly Adelaide Brighton Ltd), is an active limestone quarry located on Main South Road, Sellicks Hill, South Australia. Products generated on-site include:

- A large number of aggregate classes ranging from 3 mm in size up to 10 tonne rocks that are used in engineering projects.
- Three classes of road bases.
- Sand in a variety of sizes and gradings.
- Agricultural soil conditioner.

In recent years, Southern Quarries has invested in improving its sustainability, focusing on better water use, reducing carbon footprints in processes, operations and facilities, and trialling products to decrease the likelihood of generating dust.

With an ongoing commitment to improving sustainability on-site and for the broader community, this Dust Management Plan (DMP) highlights additional management measures and considerations that are aimed at improving air amenity in the community.

1.1 Purpose of the Plan

As holder of the South Australian Environment Protection Authority (EPA) Licence No. 2052, Southern Quarries is required to:

- Ensure environmental protection by implementing reasonable and practicable measures to reduce dust emissions.
- Manage the risks of environmental harm and supplement any measures already implemented.
- Demonstrate the use of reasonable and practicable management measures through a formal process.
- Ensure dust emissions from the premises are compliant with EPA legislation and best practice.

This Plan seeks to address the licence conditions and prevent environmental harm through formally addressing risks from the operations at Sellicks Quarry and identifying subsequent management actions to reduce these risks.

This document is owned and used on-site by Southern Quarries at the limestone quarry located at Sellicks Hill.

1.2 Legislative Context

This DMP has been prepared with reference to:

- South Australian ***Environment Protection Act 1993.***
- South Australian ***Environment Protection (Air Quality) Policy 2016.***
- South Australian *Mining Act 1971* which is enabled through an approved site-based program (Mine Operation Plan – MOP, updated in 2018).
- National Environment Protection (Ambient Air Quality) Measure (2015).
- World Health Organisation Air Quality Guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide 2005.

2.0 SELLICKS QUARRY

2.1 Local Environment

Sellicks Quarry is within the Sellicks Hill Range in the City of Onkaparinga. The area is a semi-rural suburb of Adelaide. The local environment has been described in the MOP. Accordingly, only a brief summary is provided below.

Climate information has been collated using the Noarlunga weather station for rainfall and temperature for which data have been averaged between 2000 and 2020. Warmer temperatures (^{0}C), low rainfall and high winds are experienced in summer months, whilst lower temperatures and high rainfall are experienced in winter months. Raw data for Noarlunga can be accessed via the BoM website. Wind speeds recorded in 2015 from Mount Terrible weather station are shown in Table 1 which demonstrates that it is generally windier with stronger gusts in the summer months.

Table 1: Average Winds and Gusts (in kmh-1) Recorded from Mount Terrible Weather Station (2015 data)

Month	Average Wind	Max Gust (3 sec)	Vector Average Wind Direction	Average Wind 0600 - 1800	Max Gust (3 sec) 0600 - 1800	Vector Average Wind Direction 0600 - 1800
Jan	25	86	152	24	86	151
Feb	27	84	147	24	72	149
Mar	15	98	164	14	67	180
Apr	20	66	149	20	66	150
May	14	76	286	14	63	299
Jun	13	58	103	13	58	80
Jul	13	73	308	13	73	311
Aug	15	78	192	15	78	209
Sep	14	60	154	13	60	185
Oct	18	73	137	16	67	128
Nov	17	71	156	16	71	166
Dec	18	67	142	14	66	145

* Arithmetic average of hourly values

Sellicks Hill Range dominates the topography, reaching elevations of 360 m. The range quickly drops elevation to 120 m at South Road over a distance of 1.4 km. From there, the elevation gradually decreases to 50 m over a distance of 1.4 km to coastal cliffs and sandy beaches.

The quarry and mining tenements intersect a number of ephemeral creeks that have small but deep valley catchments.

The groundwater, approximately 80 metres (m) below the current quarry floor, is considered to be variable in quality and generally suitable for stock water. Southern Quarries is unable to access groundwater from the Willunga Basin as it is prescribed under South Australia's *Landscape South Australia Act 2019* (which superseded the *Natural Resources Management Act 2004*). As a result, Southern Quarries has to rely upon mains potable water for dust suppression. Recycled water infrastructure capital expenditure, including secondary dosing for health considerations was implemented in early 2020. Recycled water is currently utilised on site for dust suppression activities and will reduce the reliance on potable water.

Topsoil varies considerably in depth from nil, where rock outcrops on the hills, to about 0.6 m depth on the creek banks.

Vegetation has been historically cleared to enable grazing, with little significant vegetation remaining on-site (as reported in the MOP). Revegetation plantings have occurred on the site, particularly on the screening 'amenity' mound that extends along the western boundary.

2.2 Site Activities

Southern Quarries operates continuously (i.e. 24 hours) under its approved MOP. However, the operating hours of the crushing plants are generally from 06:00am to midnight Monday to Friday and 06:00am to 12:00pm on Saturday and in accordance with market needs. These times do not include pre-start checks, maintenance of plant and equipment or development works which vary due to demand. Loading and distribution of materials can occur up to 24 hours a day.

Dolomite and dolomitic shale are extracted from the open cut quarry through blasting. Blasting techniques were reviewed in 2018 by an independent consultancy that specialises in blast management. The consultancy specialises in quarry, construction and mine drilling and blasting technical support and conducts Nationally Accredited training, endorsed by SafeWork SA for the unit "RIIBLA402D Monitor and control the effects of blasting on the environment".

There are currently three processing plants within the quarry, each with associated stockpiling areas. Mobile crushing plant is used within the quarry from time to time. These are identified in the facility layout (Figure 1). A concrete batching plant is on-site, as well as fuel storage and workshop facilities.

Mobile equipment at the site is detailed in Table 2. Southern Quarries mobile equipment will change from time to time in size and total number of machines. When contractors are used, they will bring their own plant and equipment to site.

Table 2: Existing Mobile Equipment at Sellicks Quarry

Mobile Equipment*	Unit Number(s)
Excavator (120t)	1
Quarry truck (65t)	4
Quarry truck (40t)	2
Front end loader (12t)	2
Front end loader (6t)	4
Grader	1
Skid Steer	1
Water spray truck	2

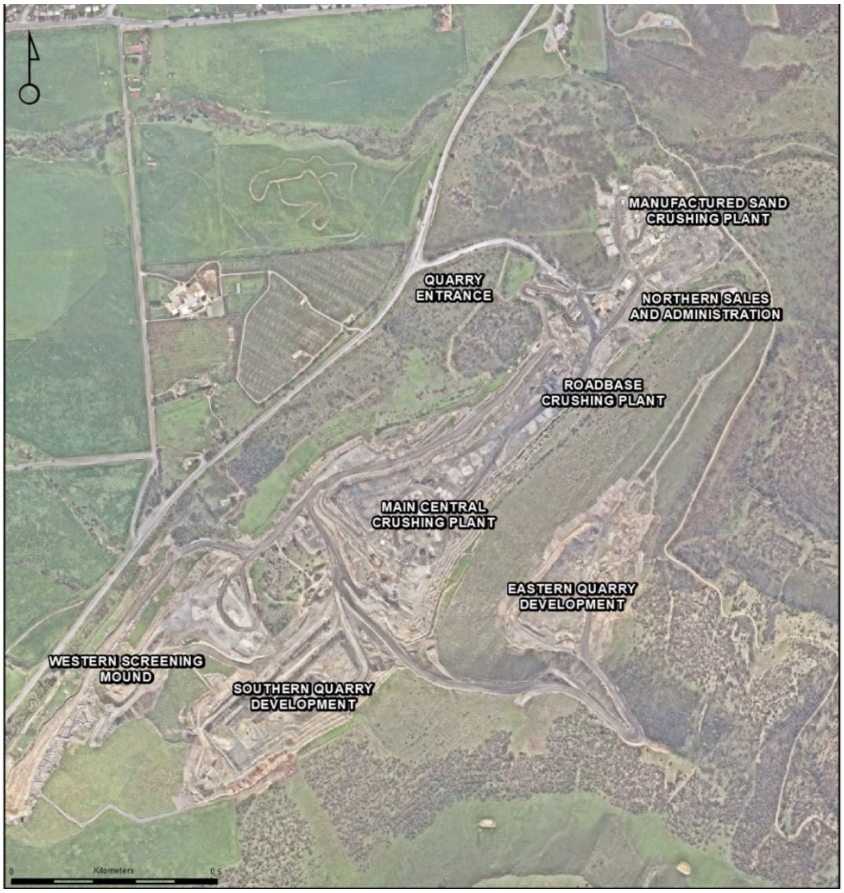


Figure 1: Existing Site Layout at Sellicks Quarry

2.3 Site Communications

Southern Quarries inducts all employees that work on-site. There are also regular tool box meetings held on-site. Information, particularly relating to weather predictions and anticipated dust control needs is transferred during daily prestart meetings. These records can be made available if required.

Southern Quarries management discuss all aspects related to the operations of the quarry including, but not limited to, ensuring hazards are checked and identified risks and prevention controls are discussed and communicated with relevant employees on the site. This includes an assessment of forecast meteorological conditions and the risks that these may present to daily operations.

2.4 Environmental Receptors

Southern Quarries has considered nearby residential and environmental receptors as potentially experiencing amenity impacts and nuisance dust.

Nearby potential receptors include:

- Residents of Sellicks Beach, approximately 1 km to the west and northwest of the site;
- Residents of Sellicks Hill, approximately 500 m north of the northernmost trafficable area of the site; and
- Two residences on Country Road, 400 m northwest of the site trafficable areas.

In addition, residential developments to the west of Main South Road are potential receptors of deposited dust.

No other environmental receptors were considered to have the potential for harm by dust. Figure 2 shows the location of receptors at 500 m intervals from the middle of the crushing plant.

LOCATION MAP

LEGEND

- Existing Urban Development
- Ongoing Urban Development
- City of Onkaparinga

COPYRIGHT

0 280 560 840 1,120
METRES

REFERENCE SCALE: 1:14,209 (at A3)

PROJECTION: GDA 1994 MGA Zone 54

CLIENT
SOUTHERN QUARRIES

PROJECT
SELLICKS HILL QUARRY DUST MANAGEMENT PLAN

TITLE
QUARRY LOCATION

CONSULTANT
Golder Associates

YYYY-MM-DD	2019-10-04
PREPARED	KB
DESIGN	-
REVIEW	LVC
APPROVED	-

PROJECT No.	CONTROL	Rev.	FIGURE
1529035	TMP	A	**2**

3.0 SELLICKS QUARRY ENVIRONMENTAL RISK ASSESSMENT

The environmental risk assessment (ERA) identifies Primary Risk Levels (PRL) of identified aspects without taking into account any design, management and mitigation measures that will be deployed by Southern Quarries.

The assessment, in accordance with leading practice, considers impacts during all stages of quarry operation (e.g. start-up, blasts, shut-down periods and traffic movements). Identification of the potential impact(s) is based on knowledge of the existing environment, activities to be undertaken at the quarry, experience with similar operations elsewhere and issues of concern to key stakeholders.

In undertaking the ERA, consideration has been given to avoidance, mitigation and/or management strategies that are technically and economically feasible and reflect Southern Quarries' commitment to minimising environmental impact and adopting an approach to the quarry operation that demonstrates best practice quarrying and environmental management.

The final component of the assessment involves describing the Residual Risk Level (RRL) associated with each of the identified aspects. This assessment assumes the effective implementation of the proposed design control and operational management measures.

The RRL is developed in the same way as the PRL by examining the potential consequences (measure of severity of environmental impact) and the likelihood that those impacts will occur.

3.1 Risk Assessment

The following definitions are provided for key risk assessment terms:

- **Likelihood**: the estimated probability or frequency of occurrence of an event over time (Table 3). Likelihood of occurrence has been largely based on experience of similar quarrying operations, but has considered additional activities associated with extractive industries.
- **Consequence:** the outcome or severity of an impact/event occurring (Table 4).
- **Risk:** a combination of the likelihood of an event occurring and the severity of outcome or consequence of the event (Table 5).

Table 3: Description of Likelihood

	Likelihood Criteria (read as either/or)
Almost Certain	The event will occur The event is of a continuous nature The likelihood is high
Likely	The event will probably occur during the life of the quarrying operation
Possible	The event could occur during quarrying operations, and is expected to occur
Unlikely	The event could occur during quarrying operations, but is not expected to occur
Rare	The event has almost never occurred in similar operations, but conceivably could occur

Table 4: Description of Consequence

Consequence Severity Rating	Element (read as either/or)		
	Social	**Environmental**	**Economic and Legal**
Insignificant	■ Not of concern to local or wider community ■ No inquiries or complaints	■ Possible impacts within the quarry boundaries and immediate environment but without noticeable consequence ■ No impacts of consequence at local, regional or State level	■ No costs or limited costs for rehabilitation or mitigation ■ No breach of regulator standards or licences
Minor	■ Not of significant concern to local or wider community ■ Isolated inquiries or complaints	■ Some reversible impact within the quarry boundaries and immediate environment with no significant long-term changes ■ May be rehabilitated or alleviated without outside assistance	■ Cost for any rehabilitation is minor ■ No breach of regulator standards or licences
Moderate	■ General local concern ■ Multiple inquiries and/or complaints	■ Significant changes within the quarry site boundaries with potential for long term change and remediation required ■ Minor changes outside quarry boundaries that may be simply rehabilitated or alleviated with outside assistance	■ Possible breach of legal obligations – inquiries and/or instruction from regulatory authorities
Major	■ Will attract significant public concern ■ Widespread complaints and/or lobbying by representative groups	■ Substantial and significant changes within and/or outside the quarry boundaries that can only be partially rehabilitated or alleviated ■ Long-term consequences	■ Major costs associated with rehabilitation / alleviation ■ Serious breach of legal obligations – regular inquiries by regulatory authorities and penalties for non-compliance
Catastrophic	■ Major public outrage ■ Deaths or widespread health and economic effects on public	■ Extreme permanent changes to social or natural environment that cannot be practically or significantly rehabilitated or alleviated	■ Major costs associated with rehabilitation / alleviation and penalties ■ Major breach of legal obligations – continual involvement of regulatory authorities and legal investigation for non-compliance

Table 5: Qualitative Risk Matrix

			Likelihood of Consequence				
			E	**D**	**C**	**B**	**A**
			Rare	**Unlikely**	**Possible**	**Likely**	**Almost Certain**
Severity of Consequence	**5**	**Insignificant**	Low 5E	Low 5D	Low 5C	Moderate 5B	Moderate 5A
	4	**Minor**	Low 4E	Low 4D	Moderate 4C	High 4B	High 4A
	3	**Moderate**	Moderate 3E	Moderate 3D	High 3C	High 3B	Extreme 3A
	2	**Major**	High 2E	High 2D	Extreme 2C	Extreme 2B	Extreme 2A
	1	**Catastrophic**	High 1E	Extreme 1D	Extreme 1C	Extreme 1B	Extreme 1A

3.1.1 Dust Types and Sources

Dust emissions are made up of a combination of different particle size fractions. The size of the particle determines the selected management measures:

- **$PM_{2.5}$**: Particulate of an aerodynamic diameter of less than 2.5 micrometers ($PM_{2.5}$) is typically associated with human health effects. These particles are small enough to deposit in the lower respiratory tract where they can then enter the bloodstream. There is sufficient evidence to suggest that acute and chronic exposure to $PM_{2.5}$ over long periods (years) can cause adverse health effects. Air Emissions from the Sellicks Quarry are dominated by mineral dust with particle sizes typically larger than $PM_{2.5.}$ Therefore, particulate matter monitoring is focused on measurements of PM_{10} and TSP.
- **PM_{10}**: Particulate of an aerodynamic diameter of less than 10 micron (PM_{10}) is typically associated with human health effects. These smaller particles are termed thoracic particles and tend to remain suspended in the air for longer periods. These particles are inhaled into the upper part of the airways and can penetrate down to the lungs. Further, if contaminated, these fine particles may pose a further health risk through absorption of the chemicals on the particles into the blood stream. Information obtained from the World Health Organisation (WHO) and United States Environmental Protection Agency (USEPA) indicates that numerous scientific studies have linked particle pollution exposure to a variety of health effects depending on chemical and physical properties.
- Particulate matter smaller than 10 micrometers in aerodynamic diameter includes $PM_{2.5}$ as well as respirable particulate that can deposit in the nose, throat and upper respiratory tract. Since air emissions from Sellicks Quarry are dominated by mineral dust, measurements of PM_{10} are used to assess potential human health effects related to particulate matter.
- **Total suspended particulates (TSP):** is defined as particulate matter with aerodynamic diameters less than 50 µm and includes $PM_{2.5}$ and $PM_{10.}$. 'Dust' is typically defined as the difference between $PM_{2.5}$ and TSP, with particles larger than PM_{10} constituting nuisance dust that contributes to reduced visibility and the soiling of exposed surfaces. Sellicks Quarry measures PM_{10} to evaluate the effectiveness of Southern Quarries dust management plan.

Sources of dust at the site include:

- Drilling and blasting.
- Crushing and screening, including at Start-up and Shut-down.
- Wind erosion, e.g. of stockpiles and the Western Mound.
- Wheel generated dust from truck and light vehicle movements.
- Loading and unloading.
- Excavators.
- Conveyors and transfer points.
- Track-out.

3.1.2 Risk Pathway and Primary Risk Assessment

The primary pathway for potential dust impacts on nearby receptors is for particulate matter from the site to be entrained into the air, either by disturbance or agitation by site plant activity (e.g. wheels, excavators etc.) or naturally by the wind, which may be transported under certain wind conditions across the site boundary to nearby receptors.

The means by which particulate matter from the site could potentially be entrained into the air are identified and discussed below together with an individual PRL assessment. In the current context, the *likelihood* of each of these sources impacting a nearby receptor(s) is greater when the prevailing winds are generally from the southeast. The *consequence* is considered to be related to the potential source strength, or the amount of dust that could be entrained into the air.

The primary risk level assessment is based on standard operational conditions of the site.

3.1.3 Controls and Residual Risk Level Assessment

A *control hierarchy* approach is followed in specifying controls to be put in place to reduce the likelihood and/or the consequence of dust from the site impacting nearby receptors. Continuous improvement will be sought across the site and across activities where practicable and economical.

Table 6: Control Hierarchy

Control	Description
Elimination	Remove the activity or equipment producing the risk.
Substitution	Substitute the activity or equipment producing the risk with another activity or equipment such that the risk is reduced or removed.
Engineering	Engineer a change in the activity or equipment producing the risk such that the risk is reduced or removed, e.g. enclose and isolate the activity or equipment.
Administration	Use procedures, training and rules to reduce the risk.
Protection	Protect the receptor(s) from the outcome of the risk, e.g. create a physical barrier between the activity or equipment and the receptor.

In considering controls for each risk, preference is given to *elimination* of the activity or equipment producing the risk, but where this is not practicable, *substitution* of that activity is considered, and so on.

Practicable controls for each of the sources are discussed within each table together with an individual RRL assessment. All staff have a responsibility to take action to manage dust sources and record the action(s) taken. Specifically, responsibilities for implementing the controls are assigned to:

- Southern Quarries Operational Management (OM);
- Quarry Manager (QM); and
- Site personnel (SP) and subcontractors (SC).

In addition to having topographic barriers to minimise the emission of dust off-site, a primary control for dust on-site during operation and shut-down periods is the use of dust suppressants / sealants and water (via automated water sprinklers). Southern Quarries use (for example) water and / or suppressants to control dust as a prevention application and as a suppression application. Prevention is the application of water and / or suppressants to prevent dust from becoming airborne. Suppression is the use of water and / or suppressants to wet dust particles which have already become airborne, increasing their mass and causing them to settle more rapidly.

3.1.3.1 Dust from Drilling and Blasting

Drilling and blasting mainly occurs in the Southern and Eastern zones of the quarry.

The drilling process is used to fragment the rock for subsequent blasting operations. Drilling and blasting activities are episodic in nature (i.e. once a week) and dust impacts are generally short term (i.e. for less than 30 minutes after a blasting event). Blasting can be considered a major source of dust and may occur every week. The emissions from drilling depend on the number of holes drilled per blast, while the emissions from blasting generally depend on the blast area.

Dust from blasting can sometimes be seen by the surrounding community. Southern Quarries engaged an independent Blast Specialist to assess the most appropriate ways to control dust from drilling and blasting. A proven method of control, which is used by some blasting operations located near residential areas, is to monitor weather conditions and only fire the blast when the prevailing winds are blowing away from sensitive receivers.

The independent review of blasting found the highest concentration of dust is due to the face-floor dust source. This source of dust can be reduced by wetting down the floor in front of the blast within 30 minutes of the firing event. This reduces/stops the dust associated with the floor from being mobilised into the air. However, the dust from the face will not be stopped. The watering down of blasts (direct application of water on top of the blast) prior to a blasting event is not recommended if using ANFO or Heavy ANFO bulk explosives, as this will alter densities of the bulk explosives and potentially cause a misfire.

Blasting at the quarry is booked in advance of the activity which causes difficulties when blasting needs to be postponed due to unfavourable prevailing winds. Preventing the dust drifting towards boundaries with a higher population of neighbours may be controlled by waiting for wind speeds and directions to be favourable, within practicable reason.

Leaving explosives in the ground overnight or for a period of days or weeks has inherent risks. The risks associated with delaying blasts to wait for improved prevailing winds include, but are not limited to, the following:

- Security of explosives;
- Animals chewing (cutting) initiation leads causing misfires;
- Moisture (rain and/or groundwater) desensitising bulk explosives causing a misfire or fume event;
- Fuel from bulk explosives ingressing into detonator downlines causing a misfire (generally applies to periods greater than a week);
- Restricted access to quarry while sleeping shots; and
- Potential productivity losses as broken rock is not available to quarry.

The primary risks and controls for drilling and blasting are identified in Table 7.

Table 7: Primary and Residual Risk Rating: Drilling and Blasting

Site Location	Impact	Primary Risk			Controls	Residual Risk		
		L	C	R		L	CC	R
Southern	Preparatory drilling causing localised dust that can be seen off-site	Likely (B)	Moderate (3)	High (3B)	Deliver training and inductions to all new employees and relevant site personnel to highlight the importance of dust control (OM); Forecast weather conditions are checked prior to drilling and deemed appropriate with respect to wind direction and speed (Meteorological and Visual TARP) (QM); Drilling undertaken by trained contractors and in accordance with Australian Standards (SC); All drills have dust collectors installed (SC); Water cart used in the drill area prior to drilling during dry and/or windy periods of drilling (SP).	Unlikely (D)	Minor (4)	Low (4D)
	Blasting causing episodic TSP and PM_{10} causing off-site nuisance	Likely (B)	Moderate (3)	High (3B)	Blasting will be performed by trained contractors and in accordance with Australian Standards AS2187.2-2006 (SC) Plan blasting activities for weekdays only (OM); Blasting will preferentially occur when weather conditions are favourable (e.g. early afternoons) and in accordance with the TARP (QM); Water cart to prewet as many surfaces as possible 30 minutes prior to firing events and as soon as possible after firing events in dry conditions (QM); Community notifications issued when blasting dust is likely to be visible (QM/OM); No visible blasting activity to occur when conditions are at TARP 3 Level (Easterly winds over 50km/hr) (QM/OM).	Likely (D)	Moderate (4)	Moderate (4D)
	Off-site health consequences from blasting	Possible (C)	Moderate (3)	High (3C)	Water cart used in the drill area prior to drilling during summer and/or dry windy periods of drilling (SP); Forecast weather conditions are checked and deemed appropriate with respect to wind direction and speed (QM).	Unlikely (D)	Minor (4)	Low (4D)
	Visible dust from blasting causing community concern	Almost certain (A)	Major (2)	Extreme (2A)	Blasting will preferentially occur when weather conditions are favourable (e.g. early afternoons) and in accordance with the TARP (QM); Blasting will be performed by trained contractors and in accordance with Australian Standards AS2187.2-2006 (SC); Water cart to prewet as many surfaces as possible 30 minutes prior to firing events and as soon as possible after firing events in dry conditions (QM); Community notifications issued for both visible and non-visible blast events (OM); Change TARP level if wind is between south (180°) to east (90°); No visible or non-visible blasting activity to occur when winds between south and east are greater than 30km/hr (QM/OM).	Almost certain (A)	Minor (4)	High (4A)

Eastern	Preparatory drilling causing localised dust that can be seen off-site	Likely (B)	Moderate (3)	High (3B)	Deliver training and inductions to highlight the importance of dust control (OM); Drilling undertaken by trained contractors and in accordance with the Australian Standard (SC); Water cart used in the drill area prior to drilling during dry and/or windy periods of drilling (SP); All drills have dust collectors installed (SC); Weather conditions are checked and deemed appropriate with respect to wind direction and speed (see Meteorological TARP) (QM).	Unlikely (D)	Minor (4)	Low (4D)
	Blasting causing episodic TSP and PM_{10} causing off-site nuisance	Possible (C)	Moderate (3)	High (3C)	Blasting will be performed by trained contractors and in accordance with Australian Standards AS2187.2-2006 (SC); Plan blasting activities for weekdays only (OM); Blasting will preferentially occur when weather conditions are favourable (e.g. early afternoons) and in accordance with the TARP) (QM); Water cart to prewet as many surfaces as possible 30 minutes prior to firing events and as soon as possible after firing events in dry conditions (QM); Community notifications issued when blasting dust is likely to be visible (QM/OM); No visible Blasting activity to occur when conditions are at TARP 3 Level (Easterly winds over 50km/hr) (QM/OM).	Unlikely (D)	Minor (4)	Low (4D)
	Off-site health consequences from blasting	Unlikely (D)	Moderate (3)	Moderate (3D)	Water cart used in the drill area prior to drilling during summer and/or dry windy periods of drilling (SP); Forecast weather conditions are checked and deemed appropriate with respect to wind direction and speed (QM).	Unlikely (D)	Insignificant (5)	Low (5D)
	Visible dust from blasting causing community concern	Almost certain (A)	Major (2)	Extreme (2A)	Blasting will preferentially occur when weather conditions are favourable (e.g. early afternoons) and in accordance with the TARP (QM); Blasting will be performed by trained contractors and in accordance with Australian Standards AS2187.2-2006 (SC); Community notifications issued when blasting dust is likely to be visible (QM/OM); Water cart to prewet as many surfaces as possible 30 minutes prior to firing events and as soon as possible after firing events in dry conditions (QM); No visible Blasting activity to occur when conditions are at TARP 3 Level (Easterly winds over 50km/hr) (QM/OM).	Almost certain (A)	Minor (4)	High (4A)

3.1.3.2 Wheel Generated Dust

Haul and access roads are used extensively in quarrying operations by mobile equipment to move material in and out of the quarry. The road network at a quarry is extensive over the entire property and the potential for dust generation is dependent upon the traffic patterns at the site.

The rate of the emission is dependent on several factors including:

- Vehicle kilometres travelled (VKT) – the amount of dust emitted is directly proportional to the distance a vehicle travels on unpaved surfaces. VKT refers to each type of vehicle.
- Vehicle weight – heavier vehicles generally have a greater potential to mechanically disturb particulate in the unpaved surface releasing it into the air. In general, they have more contact with the unpaved surface (larger and more numerous wheels).
- Vehicle speed – increased speed generally increases the potential to mechanically disturb particulate in the unpaved surface releasing it into the air.
- Surface physical properties (e.g. silt and moisture content) – the potential for dust generating is increased for greater silt content and lower moisture content.
- Meteorological conditions – the moisture content of an unpaved surface can be affected by ambient temperature, humidity, wind, incident solar radiation and rainfall.

The site is expected to be subject to multiple light and heavy vehicle movements due to its geographical location. The primary risks associated with on-site transport related to dust are identified below. Risk controls relevant to off-site dust generated by wheel movements are also discussed (Table 8).

Table 8: Primary and Residual Risk Rating: Wheel Generated Dust

Site Location	Impact	Primary Risk			Controls	Residual Risk		
		L	C	R		L	C	RR
Southern	Excavators, front end loaders and quarry truck movements creating dust that moves off-site	Likely (B)	Moderate (3)	High (3B)	Ensure speeds are safe and are minimised to suppress dust at all times (QM); Use of haul road dust suppressants (QM); Magnesium chloride used as a haul road dust suppression additive over the summer months and in response to environmental conditions, allowing for more efficient water cart utilisation and decreased water consumption (QM); Restrict traffic to roads that have a dust suppression treatment (QM); Daily visual assessment of vehicle routes. Re-route vehicles from problem areas (QM); Sprinklers and water cart/s deployed in summer and/or windy and dry conditions (SP); Water cart deployment prior to plant start-up procedures in summer and/or windy and dry conditions (SP); 30,000L capacity of both water carts to increase efficiency (OM) Use a skid steer (or grader) to remove accumulating material on roads as required (SP).	Unlikely (D)	Minor (4)	Low (4D)
	Occasional use of light vehicles in the Southern D&B generating dust that moves off-site	Possible (C)	Minor (4)	Moderate (4C)	Assessment of road surfaces to ensure they are in good working order (QM); Ensure speeds are safe and are minimised to suppress dust (QM); Restrict traffic to roads that have a dust suppression treatment (QM); Re-route vehicles from problem area (QM); Sprinklers and water cart/s deployed in summer and/or windy and dry conditions (SP). 30,000L capacity of both water carts to increase efficiency (OM)	Unlikely (D)	Minor (4)	Low (4D)
Eastern	Excavators, front end loaders and quarry truck movements creating dust that moves off-site	Likely (B)	Moderate (3)	High (3B)	Assessment of road surfaces to ensure they are in good working order (QM); Use of haul road dust suppressants (QM); Magnesium chloride used as a haul road dust suppression additive over the summer months and in response to environmental conditions, allowing for more efficient water cart utilisation and decreased water consumption (QM); Use a skid steer (or grader) to remove accumulating material on roads as required (SP). Ensure speeds are safe and are minimised to suppress dust (QM); Restrict traffic to roads that have a dust suppression treatment (QM); Re-route vehicles from problem area (QM); Sprinklers and water cart/s deployed in summer and/or windy and dry conditions (SP); Water cart deployment prior to plant start-up procedures in summer and/or windy and dry conditions (SP). 30,000L capacity of both water carts to increase efficiency (OM)	Unlikely (D)	Minor (4)	Low (4D)

Site Location	Impact	Primary Risk			Controls	Residual Risk		
		L	C	R		L	C	RR
	Occasional use of light vehicles in the Eastern D&B generating dust that moves off-site	Unlikely (D)	Minor (4)	Low (4D)	Assessment of road surfaces to ensure they are in good working order (QM); Ensure speeds are safe and are minimised to suppress dust (QM); Re-route vehicles from problem area (QM); Restrict traffic to roads that have a dust suppression treatment QM); Sprinklers and water cart/s deployed in summer and/or windy and dry conditions (SP). 30,000L capacity of both water carts to increase efficiency (OM)	Unlikely (D)	Minor (4)	Low (4D)
Central Crushing	Front end loaders and quarry truck movements creating dust that moves off-site	Possible (C)	Minor (4)	Moderate (4C)	Ensure speeds are safe and are minimised to suppress dust (QM); Use of haul road dust suppressants (QM); Restrict traffic to roads that have a dust suppression treatment (QM); Re-route vehicles from problem area (QM); Sprinklers and a water cart deployed in summer and/or windy and dry conditions (SP); Water cart deployment prior to plant start-up procedures in summer and/or windy and dry conditions (SP); Use a skid steer (or grader) to remove accumulating material on roads as required (SP).	Unlikely (D)	Minor (4)	Low (4D)
	Use of light vehicles generating dust that moves off-site	Possible (C)	Minor (4)	Moderate (4C)	Assessment of road surfaces to ensure they are in good working order (QM); Ensure speeds are safe and are minimised to suppress dust (QM); Re-route vehicles from problem (QM); Restrict traffic to roads that have a dust suppression treatment (QM); Sprinklers and water cart/s deployed in summer and/or windy and dry conditions (SP). 30,000L capacity of both water carts to increase efficiency (OM)	Unlikely (D)	Minor (4)	Low (4D)
Northern	Front end loaders and quarry truck movements creating dust that moves off-site	Likely (B)	Moderate (3)	High (3B)	Ensure speeds are safe and are minimised to suppress dust (QM); Use of haul road dust suppressants (QM); Magnesium chloride used as a haul road dust suppression additive over the summer months and in response to environmental conditions, allowing for more efficient water cart utilisation and decreased water consumption (QM); Restrict traffic to roads that have a dust suppression treatment (QM); Re-route vehicles from problem area (QM); Sprinklers and water cart/s deployed in summer and/or windy and dry conditions (SP); 30,000L capacity of both water carts to increase efficiency (OM) Water cart deployment prior to plant start-up procedures in summer and/or windy and dry conditions (SP); Use a skid steer (or grader) to remove accumulating material on roads as required (SP); Use street sweeper on quarry entrance and South Road as required (QM);	Unlikely (D)	Minor (4)	Low (4D)

Site Location	Impact	Primary Risk			Controls	Residual Risk		
		L	C	R		L	C	RR
					Additional asphalt laid around weighbridge and visitor car park to decrease unsealed surfaces (OM).			
	Use of light vehicles generating dust that moves off-site	Possible (C)	Minor (4)	Moderate (4C)	Assessment of road surfaces to ensure they are in good working order (QM); Ensure speeds are safe and are minimised to suppress dust (QM); Re-route vehicles from problem area (QM); Restrict traffic to roads that have a dust suppression treatment (QM); Sprinklers and water cart/s deployed in summer and/or windy and dry conditions (SP); 30,000L capacity of both water carts to increase efficiency (OM) Additional asphalt laid around weighbridge and visitor car park to decrease unsealed surfaces (OM).	Unlikely (D)	Minor (4)	Low (4D)
Western Mound	Front end loaders and quarry truck movements creating dust that moves off-site	Likely (B)	Moderate (3)	High (3B)	Ensure speeds are safe and are minimised to suppress dust (QM); Use of haul road dust suppressants (QM); Magnesium chloride used as a haul road dust suppression additive over the summer months and in response to environmental conditions, allowing for more efficient water cart utilisation and decreased water consumption (QM); Restrict traffic to roads that have a dust suppression treatment (QM); Re-route vehicles from problem area (QM); Sprinklers and water cart/s deployed in summer and/or windy and dry conditions (SP); 30,000L capacity of both water carts to increase efficiency (OM) Use a skid steer (or grader) to remove accumulating material on roads as required (SP).	Unlikely (D)	Minor (4)	Low (4D)
	Occasional use of light vehicles generating dust that moves off-site	Unlikely (D)	Minor (4)	Low (4D)	Assessment of road surfaces to ensure they are in good working order (QM); Ensure speeds are safe and are minimised to suppress dust (QM); Re-route vehicles from problem area (QM); Restrict traffic to roads that have a dust suppression treatment (QM); Sprinklers and water cart/s deployed in summer and/or windy and dry conditions (SP); 30,000L capacity of both water carts to increase efficiency (OM) Additional asphalt laid around weighbridge and visitor car park to decrease unsealed surfaces (OM).	Unlikely (D)	Minor (4)	Low (4D)

3.1.3.3 Dust from Loading and Unloading

Aggregate loaded and unloaded by on-site haul trucks and off-site highway trucks have the potential to release dust into the air. The rate of emission is related to:

- Aggregate physical properties – the potential for dust generation is increased for finer materials with greater silt content and lower moisture content.
- Meteorological conditions – the moisture content of the aggregate can be affected by ambient temperature, humidity, wind, incident solar radiation and rainfall.

The primary dust risks associated with loading and unloading finer aggregates are addressed below for all meteorological conditions. Risk controls relevant to off-site dust generated by loading and unloading are discussed in Table 9.

Table 9: Primary and Residual Risk Rating: Loading and Unloading

Site Location	Impact	Primary Risk			Controls	Residual Risk		
		L	C	R		L	C	R
Southern	Finer aggregates during loading and unloading causing dust that moves off-site	Unlikely (D)	Moderate (3)	Moderate (3D)	Trucks will not be overloaded (SC); Material loads are sufficiently wetted (visual assessment) to minimise dust; Sprinklers and water carts deployed in summer and/or windy and dry conditions (SP); Adhere to site speed limits (QM).	Unlikely (D)	Minor (4)	Low (4D)
Eastern	Finer aggregates during loading and unloading causing dust that moves off-site	Unlikely (D)	Moderate (3)	Moderate (3D)	Trucks will not be overloaded (SC); Material loads are sufficiently wetted (visual assessment) to minimise dust; Sprinklers and water carts deployed in summer and/or windy and dry conditions (SP); Adhere to site speed limits (QM).	Unlikely (D)	Minor (4)	Low (4D)
Central Crushing	Finer aggregates during loading and unloading causing dust that moves off-site	Likely (B)	Moderate (3)	High (3B)	Trucks will not be overloaded (SC); Large shed enclosing the primary crusher (OM, QM); Enclosure over the 500t secondary sand bin (OM, QM); Sprinklers and water carts deployed in summer and/or windy and dry conditions (SP); Use a skid steer to remove accumulating material on paved roads as required (SP); Adhere to site speed limits (QM).	Unlikely (D)	Minor (4)	Low (4D)
Northern	Finer aggregates during loading and unloading causing dust that moves off-site	Likely (B)	Moderate (3)	High (3B)	Designated tarping area with instructional load cover signage (OM); Trucks will not be overloaded (SC); Sprinklers made available to wet down loads prior to tarping (OM); Adhere to site speed limits (QM).	Unlikely (D)	Minor (4)	Low (4D)
Western Mound	Finer aggregates during loading and unloading causing dust that moves off-site	Likely (B)	Moderate (3)	High (3B)	Check weather forecast to plan works when south easterlies are in accordance with the Meteorological and Visual TARP (QM); Material loads are sufficiently wetted (visual assessment) to minimise dust; Adhere to site speed limits (QM); Tipping to occur slowly and in stages; Height of tipping activity is reduced with a loader used to spread the material; Water reticulation on western mound to provide dust suppression and irrigation of vegetation (QM).	Unlikely (D)	Minor (4)	Low (4D)
Leaving site	Aggregate from the site is expected to be transported by haul trucks that may deposit dust off-site	Likely (B)	Minor (4)	High (4B)	Trucks will not be overloaded (SC) Trucks will be covered prior to leaving site (SC) Wheel wash or rumble grid will be maintained and kept in working order (QM).	Unlikely (D)	Minor (4)	Low (4D)

3.1.3.4 Material Excavation

The mechanical disturbance of material associated with excavation is a source of dust on-site, the rate of which is dependent on:

- Rate of excavation and loading – the amount of material excavated (related to the size of the excavator and the intensity at which it is utilised).
- Material physical properties – the potential for dust generation is increased for finer materials with greater silt content and lower moisture content. Coarser materials do not present a risk.
- Meteorological conditions – the moisture content of the material especially in the surface layers, can be affected by ambient temperature, humidity, wind, incident solar radiation and rainfall.

Without controls (e.g. adjusting the rates, properties or considering meteorological conditions) the primary dust risks associated with excavation and truck loading are presented below. Risk controls relevant to off-site dust generated by excavation and truck loading are discussed in Table 10.

Table 10: Primary and Residual Risk: Material Excavation

Site Location	Impact	Primary Risk			Controls	Residual Risk		
		L	C	R		L	C	R
Southern	Finer aggregates during excavation and loading causing dust that moves off-site	Likely (B)	Minor (4)	High (4B)	Forecast weather conditions are checked and deemed appropriate with respect to wind direction and speed (see Meteorological TARP) (QM); Excavators will preferentially work shielded from prevailing winds (QM, SP); Where this is not possible, the water cannon will be used (SP); Water cart and cannon will wet down areas prior to and post excavation if required (SP); Implement the actions associated with the TARP (QM).	Unlikely (D)	Minor (4)	Low (4D)
Eastern	Finer aggregates during excavation and loading causing dust that moves off-site	Likely (B)	Minor (4)	High (4B)	Excavators will preferentially work shielded from prevailing winds (QM, SP); Water cart and cannon will wet down areas prior to and post excavation if required (SP); Implement the actions associated with the TARP (QM).	Unlikely (D)	Minor (4)	Low (4D)

3.1.3.5 Material Transfer Generating Dust

The operation of conveyors and conveyor transfer points mechanically in the central crushing plant and northern section of the site can agitate the material being transferred and release dust into the air. The rate of emission is related to:

- Rate of transfer – the amount of material transferred.
- Distance of transfer – the length of the conveyor system.
- Number of conveyor transfer points.
- Number of conveyor drop points.
- Distance from drop point to ground/stockpile – a greater drop has an increased potential for disturbance and release of dust.
- Material physical properties – the potential for dust generation is increased for finer materials.
- Meteorological conditions – the moisture content of the material, can be affected by ambient temperature, humidity, wind, incident solar radiation and rainfall.

Agitated fines can also fall to the ground and collect below conveyors and conveyor transfer points only to be entrained by the wind or wheel traffic. The site employs a substantial network of elevated conveyors. In 2021 a mechanical sock was installed to minimise the distance from the conveyor to the stockpile, thereby reducing the potential for fines to be entrained by the wind. The likelihood of dust from material transfer leaving the site boundary and impacting nearby receptors are identified below. Risk controls relevant to off-site dust generated by conveyor transfer of material are discussed in Table 11.

Table 11: Primary and Residual Risk Rating: Material Transfer

Site Location	Impact	Primary Risk			Controls	Residual Risk		
		L	C	R		L	C	R
Central Crushing	Conveyor and conveyor transfer points actively moving aggregate within the central crushing area	Likely (B)	Moderate (3)	High (3B)	Conveyers to be located in the pit for passive screening or with additional engineered screening if this is not possible (OM, QM); Large shed enclosing the primary crusher (OM, QM); Strip rubber socks installed on all 5mm or less product drop points to reduce emissions (OM, QM); Material to be conveyed is wetted if dust is visible (QM, SP); Enclosure over the tertiary crusher surge bin (OM, QM); Enclosure over the diester secondary screens (OM, QM); Enclosure over the 500t secondary sand bin (OM, QM); Conveyor belt scraped beneath the drop/transfer point (SP); A foaming agent is used in accordance with application guidelines during crushing (QM); Fines collected under conveyors will be swept regularly with a skid steer (SP); Under plant sprinklers operational to suppress accumulated fines underneath the crushing plant (QM).	Unlikely (D)	Minor (4)	Low (4D)
Northern and Central Crushing	Fines accumulating under the conveyor infrastructure	Likely (B)	Moderate (3)	High (3B)	Material to be conveyed is wetted (QM, SP); Conveyor belt scraped beneath the drop/transfer point (SP); Strip rubber socks installed on all 5mm or less product drop points to reduce emissions (OM, QM); Fines collected under conveyors will be swept regularly with a skid steer (SP).	Unlikely (D)	Minor (4)	Low (4D)
Northern	Conveyor and conveyor transfer points actively moving aggregate within the sand plant only	Unlikely (D)	Moderate (3)	Moderate (3D)	Material to be conveyed is wetted (QM, SP); Conveyor belt scraped beneath the drop/transfer point (SP); Strip rubber socks installed on all 5mm or less product drop points to reduce emissions (OM, QM); Enclose conveyors and storage of material contained within sheds (QM); Tipping point contained within a shed (QM); Fines collected under conveyors will be swept regularly with a skid steer (SP).	Unlikely (D)	Minor (4)	Low (4D)

3.1.3.6 Crushing and Screening

Crushing and screening, which occurs in the central crushing and northern area of the site, has the potential to be a major source of dust. The crushing has the potential to produce fines while the agitation of the crushing and screening tends to release fines from the surface of rock and aggregate, all of which can be entrained into the air. The rate of emission is related to:

- Feed rate of the crusher.
- Levels of crushing and screening – e.g. primary, primary and secondary, primary, secondary and tertiary.
- Material physical properties – the potential for dust generation is increased for crushing material with lower moisture content.
- Meteorological conditions – the moisture content of the material, can be affected by ambient temperature, humidity, wind, incident solar radiation and rainfall.

Agitated fines can also fall to the ground and collect around the crusher and be entrained by the wind or wheel traffic. The likelihood of dust emitted from crushing and screening leaving the site boundary and impacting nearby receptors is considered below. Targeted measures have been implemented during activities start-up and shut-down procedures involving additional passive engineering controls to suppress dust. Risk controls relevant to off-site dust generated by crushing and screening activities are discussed in Table 12.

Table 12: Primary and Residual Risk Rating: Crushing and Screening

Site Location	Impact	Primary Risk			Controls	Residual Risk		
		L	C	R		L	C	R
Central Crushing	Crushing generating dust that is airborne and/or accumulates on the ground before becoming entrained in wind and leaving the site boundary	Likely (B)	Moderate (3)	High (3B)	Enclose screens, conveyor entry and exit points as required (OM, QM); Enclosure over the tertiary crusher surge bin (OM, QM); Enclosure over the diester secondary screens (OM, QM); Enclosure over the 500t secondary sand bin (OM, QM); Foaming agent used during crushing process to inhibit dust (QM); Water sprays used at the outputs of conveyors and transfer points (SP); Water cart deployed/water sprays used prior to plant start-up procedures in summer and/or windy and dry conditions (SP). Skid steer used under the entry and exit points of conveyors (SP) as required by Quarry Manager; Adjust the rate of crushing to respond to the meteorological conditions (TARP) (QM, SP).	Unlikely (D)	Minor (4)	Low (4D)
Northern	Crushing generating dust that is airborne and/or accumulates on the ground before becoming entrained in wind and leaving the site boundary	Likely (B)	Moderate (3)	High (3B)	Enclose screens, conveyor entry and exit points and as required (OM, QM); Water sprays used at the outputs of conveyors and transfer points (SP); Skid steer used under the entry and exit points of conveyors (SP) as required by Quarry Manager; Adjust the rate of crushing to respond to the meteorological conditions (TARP) (QM, SP).	Unlikely (D)	Minor (4)	Low (4D)

3.1.3.7 Wind Erosion from Stockpiles and Exposed Areas

Dust from the surface of stockpiles and exposed areas can potentially be entrained by the air (wind) passing over it. This source of dust is notable as it can occur at any time there is wind, whether there is site activity or not (including out of operational hours and shut-down periods). Entrainment can be accentuated by dust already in suspension which can aid the dislodgement of particulates on the surface. The rate of wind erosion related emission is related to:

- Area of surface exposed.
- Wind speed and direction – erosion is increased at higher wind speeds and can also be dependent on wind direction if, for example, the site and surrounding terrain is not flat and creates natural wind breaks and or increases turbulence.
- Surface physical properties – the potential for dust generation is increased for finer materials with greater silt content and lower moisture content.
- Other meteorological conditions – the moisture content of the surface can be affected by ambient temperature, humidity, wind, incident solar radiation and rainfall.

The likelihood of dust emitted from stockpiles and exposed areas leaving the site boundary and impacting nearby receptors is considered below. Risk controls relevant to off-site dust generated by stockpiling are discussed in Table 13.

Table 13: Primary and Residual Risk Rating: Wind Erosion from Stockpiles

Site Location	Impact	Primary Risk			Controls	Residual Risk		
		L	C	R		L	C	R
Central Crushing	Dust from the surface of stockpiles and other exposed areas leaving the site boundary through wind	Likely (B)	Moderate (3)	High (3B)	Locate stockpiles in shielded areas where possible (QM); Minimise stockpile drop heights (SM, SP); Timed switched sprinklers used at regular intervals in summer, during shut-down periods and/or dry and windy conditions (QM); Use of dust suppressants / sealants; Temporary covers (e.g. encrusting agent) to be placed on stockpiles that are not in use for 90 days (QM); Large shed enclosing the primary crusher (OM, QM); Enclosure over the tertiary crusher surge bin (OM, QM); Enclosure over the diester secondary screens (OM, QM); Enclosure over the 500t secondary sand bin (OM, QM); Implement the actions associated with the TARP (QM).	Possible (C)	Minor (4)	Moderate (4C)
Northern	Dust from the surface of stockpiles and other exposed areas leaving the site boundary through wind	Likely (B)	Moderate (3)	High (3B)	Locate stockpiles in shielded areas where possible (QM); Minimise stockpile drop heights (SM, SP); Timed switched sprinklers used at regular intervals in summer, during shut-down periods and/or dry and windy conditions (QM); Use of dust suppressants / sealants; Temporary covers (e.g. encrusting agent) to be placed on stockpiles that are not in use for 90 days (QM); Implement the actions associated with the TARP (QM);	Possible (C)	Minor (4)	Moderate (4C)
Western Mound	Dust from the surface of the western mound leaving the site boundary through wind	Likely (B)	Moderate (3)	High (3B)	Short tipping to limit dust during deposition and facilitate faster rehabilitation (OM); Self-sustaining vegetation planted as soon as practicable (OM, QM); Water cart and cannon used to suppress dust (SP); Consider daily forecasts to inform construction activities to limit dust generating activities (OM, QM). Use water line to assist with revegetation and moisture for dust suppression along the exposed area of the stockpile (QM).	Possible (C)	Minor (4)	Moderate (4C)

3.1.3.8 Track-Out

Highway trucks used to take product off-site have the potential to take material onto public paved roadways. Material can drop from tailgates, vehicle surfaces where material may have collected during loading, and from wheels. Similarly, materials from third-party sites might also be deposited. Light vehicles leaving site may contribute to track-out, although to a lesser degree, by dropping and spreading material from wheels. Fines from this material have the potential to be entrained in the air from the paved surface by the wind or vehicular traffic (including public vehicular traffic).

The likelihood of dust from track-out impacting nearby receptors is considered below. Risk controls relevant to off-site dust generated by track-out are discussed in Table 14.

Table 14: Primary and Residual Risk Rating: Track-Out

Site Location	Impact	Primary Risk			Controls	Residual Risk		
		L	C	R		L	C	R
Northern	Materials dropping through tailgates or collecting on the wheels of vehicles depositing on Main South Road and causing nuisance	Likely (B)	Moderate (3)	High (3B)	Tailgates to be locked (SC); Spillage from side trails, tail gates and drawbars are cleared (SC, SP); Check that loads are covered (SC); Rumble strips and wheel washes are used appropriately (QM); Entrance road cleaned with street sweeper at regular intervals (QM); Additional asphalt surface at the quarry entrance up to and around the weighbridge (OM).	Unlikely (D)	Minor (4)	Low (4D)

3.1.3.9 Control Performance Review

All engineering, administrative and management dust control measures applied at the site will be subject to an annual performance review by the Quarry Management team to evaluate their effectiveness and reliability in preventing dust from leaving the site. Effectiveness will be demonstrated by monitoring data and visual observations.

Where a control is found to be performing less than satisfactorily, improvements will be considered and implemented, e.g. a sprinkler system not providing enough coverage will be upgraded. Southern Quarries has engaged independent air quality scientists and blast management specialists to help inform the priorities in the Action Plan (Table 15).

Table 15: Action Plan

Control	Action	Date
Admin	Refine SMS notification for dust alerts so that the Operational Manager is notified earlier of increasing dust levels at the ADR locations.	Complete
Admin	Independently review blasting controls and revise the Blasting Management Plan.	Complete
Admin	Increase the calibration frequency of the ADR dust monitoring to improve availability.	Complete
Admin	Refine the community engagement strategy.	Complete
Admin	Host a community quarry tour – attended by approximately 70 people (advertised event).	Complete
Admin	Host a Community Open Day at the Sellicks Community Hall to discuss site activities and plans.	Complete
Admin	Establish communication channels through relevant Facebook groups (e.g. Sellick & Surrounds and Friends of Sellicks groups which combined have approximately 1,600 members).	Complete
Admin	Issue community notifications for visible blasting activities, explaining the time and wind conditions.	Ongoing
Admin	Improve transparency on website by making environmental information and operational control information available.	Complete
Admin	Independent review of the operational controls and changes incorporated into the Dust Management Plan.	Complete
Elim	Seeding of the mound to commence and topsoil dressing applied where practical.	Ongoing
Elim	Progressively rehabilitate exposed surfaces across the site, which include spreading and maintenance of approximately 4-5 tonnes of grass seeds and 1,500 native trees.	Ongoing on annual basis
Eng	Increase the frequency of the street sweeper to daily use.	Complete
Eng	Inspect the efficiency of existing on-site dust controls This has resulted in: ■ Enclosure of five transfer points in the Crushing Plant. ■ Maintenance of the underplant sprinkler systems. ■ Installed an additional polo citrus dust suppression unit in the Primary Crushing Plant. ■ Installed a remote view of the Crushing Plant PLC to increase supervision and enable real time dust response by applying water. This is now being considered for installation on mobile devices. ■ Improved the efficiency of the conveyer (head chute) sprinkler system.	Complete
Eng	Provide additional water infrastructure including 20,000L tank and pump for the Western Mound to reduce dust and increase planting success using irrigation and timed sprinklers.	Complete
Eng	Install a 375,000L water tank and quickfill system for the on-site water trucks reducing the fill time to 10 mins (formerly 30 mins), enabling increased coverage and frequency of water truck use on-site.	Complete
Eng	Construct Western mound in accordance with engineering and geotechnical standards which enables shorter tipping distances.	Ongoing

Control	Action	Date
Eng	Install drainage and sediment erosion management measures on the Western Mound.	Complete
Eng	Verify the effectiveness of prewetting the quarry floor as a dust control measure during blasting events.	Complete
Eng	A supply agreement with Willunga Basin Waster Company (WBWC) has been established to use an additional 50ML of recycled water on-site. Chlorine dosing as secondary water treatment is being completed before the internal site tank is filled for use.	Complete
Eng	Installation of an enclosure over the Tertiary Crusher surge bin.	Complete
Eng	Installation of enclosures over the two Diester 20x8 Secondary Screens.	Complete
Eng	Installation of an overhead 500 tonne storage bin for the Secondary Sand Open Stockpile.	Complete
Admin	Independent review of dust controls by external consultant. Summary of key recommendations to be made and included in the October 2019 DMP update.	Complete
Eng	Installation of a self-bunded fuel tank and re-seal of the quarry entrance up to and around the weighbridge.	Complete
Eng	Installation to enclose the Primary Dump Chute to enclose trucks whilst tipping	Complete
Eng	Installation to enclose the Tertiary Sand Open stockpile (subject to internal approval).	Q4, 2023
Admin	Establishment of a camera system to monitor and record quarry activities and potential activities or conditions that may cause dust.	Complete
Admin	ADR data available in plant control rooms and available through website in real time.	Complete
Admin	Development and use of visual dust collages to be used as an internal quality control measure among quarry personnel.	Complete
Admin	Revise and optimise TARP levels to initiate prompt investigation. Hourly average trigger level revised from 60 µg/m^3 to 40 µg/m^3.	Complete
Admin	Adjust SMS notifications for trigger levels exceedances at ADR monitors.	Complete
Eng	Installation of mechanical rubber socks to the Tertiary Sand Open stockpile that move in response to the size of stockpiled material to eliminate drop height dust production.	Complete
Eng	Purchase of additional ADR monitor to help achieve minimum target availability.	Complete
Admin	Adelaide-based secondary supplier (ALS global) engaged to ensure the continuance of support and local resource for the calibration of dust monitoring equipment.	Complete
Eng/Admin	Installation of new control rooms at the primary and secondary enclosure areas. This will improve overall site safety by increasing visibility of plant operations and operator awareness of environmental conditions.	Complete
Eng	Upgrade infrastructure to support current wheel wash operation	Q4, 2022
Eng	Investigate secondary wheel wash options to aid in reduction of drag out	Q2, 2023
Eng	Conduct dust monitoring assessment and relocate ADR units accordingly	Q1, 2023
Eng	Investigate the necessity of a fourth ADR unit and possible location	Q4, 2023
Eng	Investigate enclosure options for main crushing plant VSI	Q4, 2023

4.0 MONITORING AND RESPONSE

4.1 Monitoring Stations and Data

4.1.1 Monitoring Stations

Continuous and real-time monitoring of ambient PM_{10} concentration using dust monitors is being undertaken at three locations on the site boundary. The unit is designed for continuous unattended monitoring with continuous real-time data transmission.

Dust monitoring will be conducted with instruments sited in accordance with Australian Standard AS 3580.1.1 - 2015 "*Methods for the Sampling and Analysis of Ambient Air – Guide to Siting Air Monitoring Equipment".*

Each dust monitor has a co-located meteorological monitor. Meteorological monitoring will be conducted with an instrument in accordance with Australian Standard AS 3580.14 - 2014 "*Methods for sampling and analysis of ambient air - Meteorological monitoring for ambient air quality monitoring applications".*

The locations of the three dust monitors have been independently assessed (Groundworks, July 2022) with new more applicable locations proposed for ADR1 (down-wind) and ADR2 (back-ground). Details are provided in the Groundworks report. The current (in blue) and proposed (in green) ADR locations are included in Figure 3 below.

Figure 3: Current and Proposed ADR Locations

4.1.2 Forecasting

The Mount Lofty Ranges District meteorological three-day forecasts will be obtained daily from the Bureau of Meteorology website as representative of the conditions likely to be experienced at the site in the coming days.

The forecasting information will be used to:

- Assess potential impacts and evaluate risks both ahead of time and in conjunction with the real continuous monitoring data.
- Generate alerts for predicted air quality events e.g. high winds.
- Allow site personnel to pre-plan operations and implement additional management measures.

4.1.3 Data Collection and Analysis

Parameters that will be collected are described in Table 16. Data will be continuously generated in real time, web-hosted and relayed to the Quarry Manager and Operations Manager. Formal reporting will be undertaken by Southern Quarries (along with on-site wind speed and wind direction) such that compliance monitoring and reporting requirements are met.

Table 16: Measured Parameters at Southern Quarries

Parameter	Measurement Criteria
PM_{10}	The total continuous PM_{10} dust concentration to be measured at three monitoring sites measured by a continuous unit (aiming to achieve 90% instrument and data availability) with co-located weather instruments. Trigger levels (see TARP) identified and measurement criteria are to be reviewed annually.
Meteorological	Wind speed and wind direction will also be measured at three monitoring sites measured by a continuous unit (aiming to achieve 90% instrument and data availability). It is noted that while Southern Quarries aims to achieve 90% data availability of the monitoring units, there may be technical faults that require the units to be sent interstate for repairs. Those repairs are outside the control of Southern Quarries.

To assist in managing nuisance dust, Southern Quarries continuously measures PM_{10} at three monitoring stations (ADR units) as per agreement with EPA which have co-located meteorological stations. The data recorded are compared against the regulatory limit for PM_{10} on a 24 hour average basis (midnight to midnight).

- Report PM_{10} for the quarterly and monthly 24 hour average period.
  - Data and graphs will also be made available at 10 minute, 1 hour (clock hours) and 24 hours (midnight to midnight) discrete intervals.
- Prepare scatter plots for short term intervals (e.g. 10 minutes) and triangulation to determine localised sources of nuisance dust when a TARP Triggers and/or complaint. Should the analysis be inconclusive, or not valid due to localised differences in meteorological conditions, alternative analysis will be considered.
- Investigate, report and respond to those periods where the PM_{10} 1-hr averages exceed 60µg/m^3.
- Community complaints that relate to dust will be investigated by Southern Quarries to determine the source and/or activity.

In accordance with EPA criteria for managing public health, Southern Quarries will report PM_{10} particles based on 24 hour and annual averages, for which graphs will be provided.

All data and interpretation will be made available through the quarterly reporting schedule as a condition of the EPA licence.

4.1.4 Monitoring Contingency

Southern Quarries is aiming to meet the industry performance standard with respect to the operation of instruments (i.e. 90% data availability).

In the event of monitoring interruption due to the failure of an instrument, repairs or a replacement instrument will be installed as soon as practicable. Consideration is also being given to developing a Contingency Plan, involving training staff, having spare equipment and, if required, changing equipment suppliers in order to avoid faults in monitoring equipment so that the minimum 90% data availability is achieved at the site.

Recent measures have been implemented as part of the monitoring contingency. These include the engagement of ALS Environmental as a local, secondary supplier to ensure continual support for maintenance and calibration of dust monitoring equipment. An additional ADR monitor will be available on-site in early 2022 in order to safeguard against possible equipment failure and to ensure the capture of minimum data availability at the site.

Calibrations, maintenance and/or servicing will be undertaken on a quarterly basis by an external provider.

4.2 Trigger Action Response Plan

A Trigger Action Response Plan (TARP) is designed to ensure that potential dust impacts from site activities are minimised by monitoring dust concentrations at the site boundary and implementing appropriate management measures as required. The TARP also includes consideration of meteorology forecasts and observations to enable appropriate management measures to be proactively taken, e.g. in preparation for adverse wind conditions. The TARP comprises:

- Meteorological forecasts, observations and visual inspections
- Site boundary real-time dust monitoring.

A series of *Triggers* are defined for each component (Table 17). In relation to wind speeds, the Beaufort Wind Scale has been adopted which measures wind speed according to its impact on the land and sea.

Table 17: Trigger Descriptions at Southern Quarries

Trigger	Description
Normal state	Reasonable conditions in day-to-day operations. Winds: Calm to Light (0-20 km/h).
Level 1	Change from normal indicating a potential risk; not of a serious nature, but acts as an alert and requires monitoring to detect further trends. Winds: Moderate (20-30 km/h).
Level 2	Moderate risk of dust related impacts occurring. Remedial action needs to be planned and executed. Winds: Fresh (30-40 km/h).
Level 3	High risk of dust related impacts occurring; a situation has occurred that poses an immediate risk and remedial action must be undertaken. Winds: Strong+ (40-50 km/h).

For each trigger, a corresponding response or series of responses is required, as described in Table 18.

At any time, a response is required to meet the highest trigger, be it visual, monitoring or meteorological.

Table 18 presents measures to be taken in the event that a specific site activity is identified as the source of a Level 1 Trigger and that the intensity of that activity may be temporarily reduced or altered.

Table 18: Temporary Activity Intensity Reduction and Control Measures

Activity	Temporary Intensity Reduction	Temporary Control
Drilling	■ Cease drilling until more favourable conditions return	■ Cease drilling until more favourable conditions return
Vehicle movements (wheel generated dust)	■ Reduce vehicle movements	■ Re-route vehicles from problem areas (e.g. near site boundary; route not serviced by sprinkler etc.) ■ Concentrate water cart and cannon on one route and limit vehicles to this route
Uncovered loads	■ Reduce speeds	■ Increased watering using water sprays and/or water cannon to wet-down load where it is being loaded
Truck tipping on overburden mound	■ Limit to one truck tipping at a time ■ Tip in a different area ■ Cease tipping until more favourable conditions return	■ Deploy water cannon to tipping area
Crushing and screening	■ Cease crushing and screening until more favourable conditions return	■ Increase conveyor watering rate ■ Cease crushing and stockpiling material
Material transfer	■ N/A	■ Increase conveyor watering rate
Wind erosion of unconsolidated stockpiles	■ N/A	■ Increase sprinkler rate ■ Deploy water cannon

4.3 Roles and Responsibilities

Southern Quarries have a number of site personnel responsible for all quarry operations. The roles and responsibilities are generally divided as per the general tasks listed in Table 19.

Table 19: Roles and Responsibilities of Quarry Personnel

Role	Responsibilities
Southern Quarries Operational Management (OM)	■ Provide training and inductions to all employees and site personnel to highlight the importance of dust control. ■ Plan site activities and site layout. ■ Communicate specific site activities to community when dust is likely to be visible (ie. blasting). ■ Instructional signage around quarry. ■ Engineer controls for dust suppression (storage sheds, covers, bins).
Quarry Manager (QM)	■ Check environmental and meteorological conditions prior to start-up. ■ Consider daily forecasts to inform construction activities to limit dust generation. ■ Adjust and/or refrain from activities in adverse meteorological conditions. ■ Implement actions associated with the TARP. ■ Deploy water cart and sprinklers as necessary to wet surfaces and suppress dust as part of regular operations and in increased use in response to environmental conditions. ■ Use of chemical suppressants where required (ie. foaming agents, vital bon matte encrusting agent, magnesium chloride). ■ Ensure speed of vehicles is safe and minimised to suppress dust at all times. ■ Assess road conditions and requirement for road dust suppressants. Re-route vehicles from problem areas where necessary. ■ Maintain wheel wash and rumble grid in good order. ■ Ensure water reticulation on boundary stockpiles for dust suppression and irrigation of vegetation. ■ Ensure engineering controls in daily activities are being adhered to, i.e. locating stockpiles in shielded areas where possible, temporary covers and use of storage bins. ■ Maintain entry and exit point of quarry using a street sweeper at regular intervals.
Site personnel (SP) and subcontractors (SC)	■ Site activities undertaken by trained contractors in accordance with Australian Standards. ■ Communication of site conditions and environmental and dust mitigation controls required in real time. ■ Sprinklers and water cart/s deployed prior to site start-up to pre-wet areas in summer and/or windy and dry conditions. ■ Maintain roads and area beneath material transfer equipment using skid steer or grader to remove accumulating material. ■ Ensure trucks are not overloaded and material loads sufficiently wetted. ■ Implement practical dust minimisation measures (ie. excavators will preferentially work shielded from prevailing wind).

Table 20: Trigger Action Response Plan

Trigger	Trigger Description	Response
Normal State	DAILY WEATHER FORECAST ■ Calm to light winds (less than 20 km/h). REAL TIME ACTIVITIES **Site Observation:** ■ Wind felt on face and leaves rustle; ■ No dust leaving the site. **Any ADR reading** 1 hour average less than: 40 µg /m^3 PM_{10}	■ Note forecast and observed conditions and address in prestart meetings ■ Maintain dust suppression activities
Level 1	DAILY WEATHER FORECAST ■ Moderate winds (20 to 30 km/h); ■ Less than 50% chance of rain. REAL TIME ACTIVITIES **Site Observation**: ■ Wind raises dust and loose paper; ■ No rain in past 6 hrs; ■ Dust has the potential to leave the site. **Any ADR reading** 1 hour average of: 40 µg /m^3 PM_{10}	DAILY WEATHER FORECAST Communicate change of observed conditions across site operations REAL TIME ACTIVITIES ■ SMS alert/ web-hosted data to be reviewed and correlated with weather conditions ■ Out-of-hours alerts to be investigated as soon as practicable to do so ■ Quarry Manager to identify the activity(s) and/or area(s) acting as the source of the dust and implement or delegate appropriate control strategies: ▪ Deploy the water cart to these areas and/or increase the watering rate ▪ Reduce intensity of identified activity(s) ▪ Increase intensity of available controls for identified activity(s) ▪ Quarry Manager to determine if additional longer term controls are required at source ■ Continue to implement control strategies such that conditions return to *Normal State*
Level 2	DAILY WEATHER FORECAST ■ Fresh winds (30 to 40 km/h); ■ Less than 90% chance of rain. REAL TIME ACTIVITIES **Site Observation:** ■ Wind causes small tree branches to move; ■ No rain in past 12 hrs; ■ Dust has the potential to leave site. **Any ADR reading** Two consecutive hourly averages of: >40 µg /m^3 PM_{10}	DAILY WEATHER FORECAST Review daily activities Modify dust-generating non-essential activities REAL TIME ACTIVITIES Site personnel to confirm dust is leaving site Continue to implement control strategies such that conditions return to *Normal State* Quarry Manager to determine if additional longer term controls are required at source
Level 3	DAILY WEATHER FORECAST ■ Strong+ winds (40 to 50 km/h); ■ Less than 90% chance of rain. REAL TIME ACTIVITIES **Site Observations**: ■ Wind causes large trees branches to move; ■ No rain in past 24 hrs; ■ Dust is leaving the site. . **Any ADR reading** Three consecutive hourly averages of: >40 µg /m^3 PM_{10}	DAILY WEATHER FORECAST Review daily activities Eliminate non-essential dust-generating activities (e.g. crushing may be able to cease) REAL TIME ACTIVITIES STOP identified activity(s) until such time that wind conditions change or ADR monitoring levels reduce Do not recommence identified source activity(s) until such time that wind conditions change or it is deemed that sufficient dust suppression controls have been applied to the identified source activity(s) Cintellate report filed if 24 hour average levels exceed 50 µg /m^3

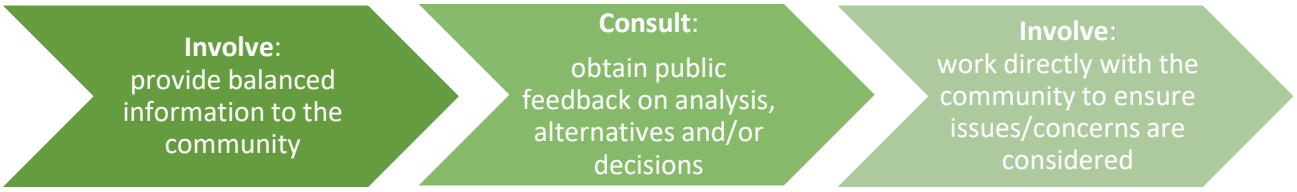
5.0 COMMUNITY ENGAGEMENT

Southern Quarries has a long history of engaging directly with members of the community, community groups, regulators, local councils, members of parliament and other community stakeholders and this is something that will continue.

The Southern Quarries Community Engagement Plan (see Appendix A), in addition to the Mine Operation Plan (MOP) has the following objectives:

- Provide relevant, timely and balanced information so people can contribute in a meaningful way.
- Provide a contact point for people to have their say and to speak honestly.
- Consider the needs and interests of all the stakeholders in decision-making processes.
- Collaborate with peak bodies and other levels of Government to achieve common goals for the future.
- Advance notice of visible blasts will be given via Facebook, and/or other preferred contact methods (specified in letter box survey).
- The EPA-accepted Quarterly Compliance report will be made publicly available via the Southern Quarries website.
- Effectively communicate strategies being used to minimise environmental impacts at the site on sensitive receptors.
- Communication and implementation of Covid-19 site safety plan for site visitors.
- Engage directly with members of the community or community groups.
- Attempt to minimise the number complaints received from the local community.

Different engagement levels may be appropriate in different situations. The following levels of engagement are relevant to Southern Quarries planned engagement activities, and these have been outlined in the Community Engagement Plan. Any community complaints will be logged in the Cintellate system and will be addressed by the Operational Management Team.

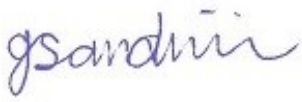


6.0 REPORTING ARRANGEMENTS

Reporting will be conducted in accordance with EPA licence conditions.

Signature Page

Golder Associates Pty Ltd



Ella Sandrini
Environmental Engineer

Naomi Cooper
Senior Environmental Toxicologist

LvC:LO/TC-JC-DF/np

A.B.N. 64 006 107 857

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APPENDIX A

Community Engagement Plan

REPORT

Community Engagement Plan

Southern Quarries

Submitted to:

Southern Quarries
16-18 Phillips Street
Thebarton SA 5031

Submitted by:

Golder Associates Pty Ltd
118 Franklin Street Adelaide, South Australia 5000 Australia

+61 8 8213 2100

1529035-007-R-Rev6

January 2022

Distribution List

1 e-copy: Southern Quarries

1 e-copy: Golder Associates

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TABLES

1.0 PURPOSE OF THE PLAN

This Community Engagement Plan (CEP) supports Southern Quarries' commitment to continue to meaningfully engage and communicate with surrounding communities and other interested parties in relation to its operations at Sellicks Beach.

The objective of this CEP is to outline a community engagement strategy to ensure effective engagement including allocation of management responsibilities and provision of an appropriate and responsive mechanism for community feedback.

The engagement strategy acknowledges the desire of Southern Quarries to share information and experiences with the community to be able to co-exist effectively and in harmony, while addressing the obligations under Section 5 of the Southern Quarries Dust Management Plan (Golder Associates, October 2019), and EPA Licence 2052, condition 1.1.2.

2.0 SOUTHERN QUARRIES- SELLICKS BEACH

Southern Quarries (the Quarry) is situated approximately 50 km south of the Adelaide CBD, on the edge of the Urban Growth boundary, as defined by the South Australian Government.

The Quarry was established in 1971 and has been quarried continuously over the past 50 years. The carbonate rock is of a very high grade and is suitable for use in high strength, low shrink concrete, as well as asphalt grade aggregates and high-quality road base material.

The three distinct rock seams that are quarried at this site are:

1) Fork Tree Hill Limestone: predominately used for concrete aggregates as well as other products such as rail ballast and armour rock.

2) Sellicks Hill Limestone: predominantly used to produce asphalt grade aggregates but can also be used to produce concrete aggregates.

3) Heatherdale Shale: used to produce a range of road base materials.

The Quarry is able to operate continuously under the Mining Act 1971. However, plant operating hours are generally from 6.00am to midnight Monday to Friday and 6.00am to 12.00pm on Saturday. These times do not include pre-start checks, maintenance of plant and equipment or development works which vary due to demand. Loading and distribution of materials occurs 24 hours per day.

The Quarry has been identified by the Department for Energy and Mines (DEM) as a strategic extractive quarry for South Australia within a Strategic Resource Area (SRA) in the Greater Adelaide region.

The SRA (Greater Adelaide region) is an area of key economic value to South Australia due to the quantity and quality of construction materials and mineral resources that are extracted or contained within that area. This SRA is also an area currently experiencing urban encroachment or incompatible development interface issues or is likely to experience such issues in the near future. The South Australian Government is working with local governments and industry members to ensure the long-term future of the resource is enhanced and protected. This will provide security for the extractives sector while supporting housing and construction affordability for urban development.

To achieve these outcomes, one of the key strategies employed by Southern Quarries in recent years is to secure a buffer zone between the Quarry and sensitive receptors located approximately 1.3 km west and south-west of the quarry site. The company has been proactive in securing large parcels of land around the quarry for this purpose.

3.0 THE ENGAGEMENT STRATEGY

3.1 Purpose and Objective

The purpose of the engagement strategy is to develop trust and confidence with the local community to engender a long-term relationship and commitment to a shared future.

The objectives of the engagement strategy are to:

- Effectively communicate strategies being used to minimise environmental impacts at the site on sensitive receptors.
- Ensure community views are understood, considered and, where possible, acted upon.
- Effectively address community concerns and establish an appropriate mechanism for responsive communication.
- Ensure the community is regularly informed and consulted regarding the quarry activities and other issues that may affect them.

3.2 Key Stakeholders

The following key stakeholders have been identified, however this list will be built upon through implementation of the engagement strategy:

- Site neighbours.
- Sellicks Beach and Sellicks Hill residents.
- Sellicks Beach businesses and community groups.
- Social media groups.
- City of Onkaparinga, District Council of Yankalilla and Alexandrina Council.
- State Government Departments.

3.3 Engagement Principles

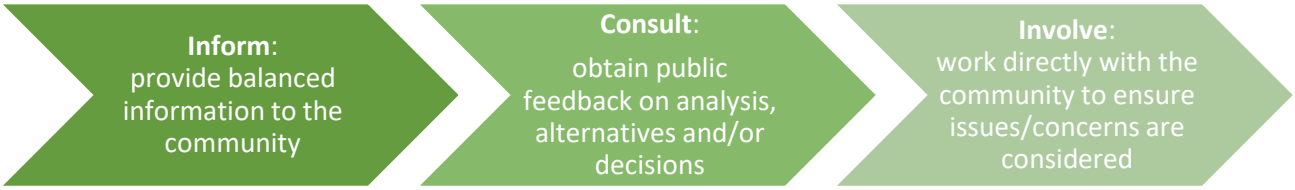
Southern Quarries has a history of engaging directly with members of the community, State and local government, members of parliament and other community stakeholders.

Southern Quarries adopts the following principles when engaging with the community:

- Provide relevant, timely and balanced information so people can contribute in a meaningful way.
- Provide a contact point for people to have their say and to speak honestly.
- Implement and communicate a Covid-safe plan to protect the health of all workers and visitors to the site.
- Consider the needs and interests of all stakeholders in decision-making processes.
- Collaborate with peak bodies and other levels of Government to achieve common goals for the future.

3.4 Engagement Activities

Different engagement levels may be appropriate in different situations. The following levels of engagement may be considered during the quarry life:



To achieve the engagement strategy objectives, the engagement activities detailed in Table 1 will be implemented.

Table 1: Stakeholder engagement strategy

Activity	Level of Engagement	Detail	Occurrence
Website updates	Inform	Southern Quarries will make environmental reports, community days and other relevant information available on a revised company website with clear links to allow interested parties to review environmental performance and provide feedback.	Ongoing
Letter box survey	Consult	A survey will be sent to local residents and businesses for response with a preferred contact method for site and operational updates. This will ensure the engagement strategy is targeted, effective and stakeholders have been adequately identified. A list of registered email addresses has been established for communication. All interactions are recorded and shared in quarterly compliance reports.	Ongoing
Provision of the Quarterly Compliance report	Inform	The EPA-accepted Quarterly Compliance report will be made publicly available via the Southern Quarries website.	Quarterly
One-on-one meetings	Consult and involve	One-on-one meetings will be held regularly with important stakeholders such as the FoS group, closest neighbours and local and State Government.	As required
“Drop in Days”	Inform, consult and involve	“Drop in Days” will be held periodically to provide site updates, news and an opportunity for the community to learn about the operations, give informal feedback and voice concerns.	As required

Activity	Level of Engagement	Detail	Occurrence
Direct communication line	Consult and involve	A dedicated email address will be maintained to allow the community to communicate directly with Southern Quarries. The email inbox will be regularly monitored, and emails will be responded to within 2 business days.	Ongoing
Site tours	Inform and consult	An annual site tour will be offered and undertaken (subject to minimum numbers being met). Residents who express an interest will be taken on a site tour of the facility. The invitation for site tours will be advertised at planned engagement activities and in other updates.	Annually, or as per community demand
Advance notice of visible blasts	Inform	Advance notice of planned blasts with a high likelihood of visual dust will be provided via Facebook, and/or other preferred contact methods (specified in letter box survey).	Ongoing
Local community groups	Inform	Updates will be provided to local community groups to include on their webpages and/or Facebook pages.	Ongoing

3.5 Community Sponsorships

In addition to the engagement activities listed above, sponsorships will be provided to community groups/causes. Community sponsorships are to be determined and arranged in accordance with Adbri Limited (Southern Quarries) Corporate Guidelines.

4.0 RESPONSIBILITIES

Southern Quarries management has responsibility for ensuring engagement strategies outlined in this document are implemented, as summarised in Table 2. Management will delegate activities appropriately and will remain accountable for the quality of their delivery.

Table 2: Management responsibilities

Role	Responsibility
General Manager / Group Corporate Affairs Adviser	▪ Providing overall direction to management ▪ Overall responsibility for the engagement strategy and ensuring activities are properly undertaken ▪ Contact face with the media ▪ Meet with community representatives as required.
Operations Manager	▪ Overall environmental management for the site ▪ Communication with the community ▪ Identifying and addressing site improvements ▪ Taking appropriate action in response to any complaints ▪ Ensuring all complaints are closed off in a timely manner ▪ Maintenance of the Complaints and Incident Register.
Quarry Manager / Assistant Quarry Manager	▪ Daily management duties at the site ▪ Ensure approved environmental strategies are implemented ▪ Communication with the community ▪ Maintenance of the Complaints and Incident Register ▪ Ensure site personnel receive appropriate environmental training ▪ Report environmental incidents and corrective action to management.

5.0 FEEDBACK MANAGEMENT

Feedback/complaints should be directed to the Quarry Operations Manager and/or the Quarry Manager via the community feedback email address (communityfeedback@southernquarries.com.au) as follows:

Ryan Low
Quarry Operations Manager
Telephone: 08 8334 4704
Mobile: 0448 952 752
Email:

Trevor Smith
Quarry Manager
Telephone: 08 8556 3007
Mobile: 0414 332 413
Email: tsmith@southernquarries.com.au

The following procedure will be followed on receipt of any feedback/complaint:

- *Register* – The feedback/complaint will be entered onto the Complaints and Incident register by either the Operations Manager or the Quarry Manager. It will also be registered on the company's internal online management system.
- *Preliminary investigation* – Once the details are entered into the Complaints and Incident Register a decision is reached to determine if the complaint is bona-fide. The complainant will be contacted directly to clarify their concerns as soon as possible and no longer than 1-2 working days.
- *Assigned actions* – Actions will be assigned in the Complaints and Incidents Register in order to respond to the specific complaint.
- *Proposed action* – Communication with the complainant to discuss the proposed action will be organised. Once the actions are completed satisfactorily the complaint will be closed off and recorded in the Register.
- *Failure to resolve a complaint* – There may be circumstances where the complaint is unable to be resolved. The complainant will then be notified, and the case will remain open and be reviewed at regular intervals (management meetings).

6.0 CLOSURE

The CEP will be reviewed regularly in response to the success of engagement activities, changing operational activities and changing stakeholder interests to ensure the strategy remains current and effective in meeting Southern Quarries engagement objectives.

Signature Page

Golder Associates Pty Ltd

Ella Sandrini
Environmental Engineer

Naomi Cooper
Senior Environmental Toxicologist

LO/DF/np

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golder.com

Attachment 5

Groundwater Assessment

Australian Groundwater Technologies AGT

'making water work'

30 May 2016

James Rowe
SA Manager
GROUNDWORK Plus
PO Box 854,
Nuriootpa SA 5355

our ref: 1507-16-GAT

Dear James,

RE: Sellicks Quarry Groundwater Assessment

AGT have reviewed the hydrogeology in proximity to Sellicks Quarry and conclude that from current information, the quarry depth may be deepened from 120 mAHD to 90 mAHD without intercepting groundwater. Additional quarrying to ~35 mAHD may be possible, but this may require the installation of a groundwater monitoring well to confirm near site groundwater levels.

1. OVERVIEW

Australian Groundwater Technologies (AGT) have been engaged by Groundwork Plus to conduct a groundwater assessment for the Sellicks Beach Quarry. The quarry is located 50 km south of Adelaide and is within the McLaren Vale Prescribed Wells Area (PWA) and the Western Mount Lofty Prescribed Water Resources Area (PWRA). The quarry is operated by Southern Quarries.

The site consists of extractive leases PM 237, EML 5440 and PM163, from which sand and limestone is extracted from Cambrian bedrock. To support quarry expansion, this groundwater assessment has been conducted to ensure groundwater inflows are avoided during quarrying advancement.

The following figures referred to in this letter report have been prepared to assess groundwater conditions within 3 km of the site:

- Figure 1: Site location map, regional geology, and water wells within 3 km of quarry tenements
- Figure 2: Detailed geology across quarry tenements
- Figure 3: Nearby wells categorised by target aquifer
- Figure 4: Latest recorded groundwater elevation (mAHD)
- Figure 5: Spatial distribution of groundwater salinity

2. GEOLOGY

The quarry is located within an area of complex geology directly southeast of the Willunga Fault (Figures 1 and 2). The surface elevation decreases rapidly across the quarry tenements in a northwest direction, where steeply dipping Cambrian bedrock is overlain by sediments of the Willunga Basin. The geological units across the quarry tenement are presented in Table 1.

Figure 1 presents the surface geology map of the broader region. Sediments to the north of the Willunga Fault include alluvial clays (Holocene age), ironstone cap-rock (Pleistocene) and iron-cemented sand

(possibly north Maslin Sand of Eocene age), while to the south east there is an unconformity between the Neoproterozoic and Cambrian sediments (Figure 2).

Cambrian and Neoproterozoic sediments were folded during the Delamerian Orogeny around 500 million years ago, resulting in steep bedding and development of cleavage. Due to the steeply dipping beds, the stratigraphy exhibits strong lateral variation (Figure 2). The formations likely to be encountered during quarrying are shown in Table 1. Collectively these units constitute the regional *fractured rock aquifer* to the east of Willunga Fault.

Table 1: Summary of the geology around the Sellick's Quarry (Source: Surface geology 100K map; Geology of South Australia (1993); Geoscience Australia Stratigraphic database (2016)

Map Symbol	Geological Unit	Age	Description
Enh	Heatherdale Shale	Cambrian c. 520 million years	Dark grey, slaty siltstone with black phosphate nodules
Enf	Fork Tree Limestone		Pale grey limestone
Ens	Sellick Hill Formation		Dark grey, ribboned, silty limestone
Enw	Wankonda Formation		Massive, dark grey limestone
Ent	Mount Terrible Formation		Arkosic grit, overlain by siltstone and sandstone
Nwb	Bunyeroo Formation	Neoproterozoic c. 600 million years	Maroon, fine-grained siltstone
Nsa	ABC Range Quartzite		White, cross bedded quartzite
Nsb	Brachina formation		Red and green siltstone and fine grained sandstone
Nss	Seacliff Sandstone		Pale grey and red sandstone, quartzite and red siltstone
Niw	Wilmington Formation		Massive, green-grey, fine-grained sandstone
N/A	Reynella Siltstone member		Mostly massive siltstone with small rock fragments

3. HYDROGEOLOGY

To investigate local groundwater conditions, the Department for Environment, Water and Natural Resources drill hole database (*WaterConnect*) was reviewed to identify water wells within 3 km of the Sellicks Quarry tenements. 30 water wells were identified that comprise useful information on groundwater conditions. The locations of these wells is presented in Figure 1, with well data presented as Table 2.

Table 2: Available well data within three kilometres of Sellicks Beach Quarry (Source: *WaterConnect*)

Unit No	Drill Date	Max Depth (m)	Aquifer	Casing to (m)	Casing diameter (mm)	Depth to water (m bgl)	Water level date	RSWL (mAHD)	Salinity (mg/L)	Salinity date	Yield (L/s)
6527-358	13/06/1950	91.44	CP-j	83.82	152	76.2	7/06/1950	147.53	971	22/08/1950	1.26
6527-359									1,620	18/04/1966	
6527-377		73.15	Nl	0	0	6.4	25/08/1975	281.29	854	26/08/1975	8.84
6527-378	4/03/1964	68.58	Nnt				10/04/2003	267.32	1,468	26/08/1975	3.41
6527-379		71.63	Nu	0	152	28.19	26/08/1975	284.02	1552	26/08/1975	3.41
6527-531	18/07/1950	66.14		0	0	48.77	16/01/2003	14.98	6,655	18/07/1950	
6527-532	26/05/1947	53.34		0	0	30.48	17/06/2005	7.49	2,780	16/04/1953	1.26
6527-533	13/03/1936	41.45		0	0	0	1/12/1965	0	1,421	13/03/1936	
6527-534	11/05/1950	79.25		0	152	39.62	1/12/1965	24.04	2,223	19/05/1950	
6527-535									18,205	7/02/1974	
6527-536									1,088	2/06/1975	
6527-537	1/03/1941	94.18	Tomw	0	0	0	1/12/1965	0	2,781	1/04/1941	2.52
6527-538	20/12/1934	71.02	Tomw	53.89	152	0	25/02/1972	0	2,800	7/06/1939	1.26
6527-539	18/07/1950	91.44	Tomw	0	0	82.3	1/12/1965	-12.2	3,831	18/07/1950	0.13
6527-540	3/06/1952	60.66	Enh	0	0	49.99	5/04/2001	93.51	2,410	3/06/1952	0.03
6527-992	15/08/1980	158.6					5/11/1980				
6527-1027	3/10/1983	109	Tomw	78	127		5/04/2001	0	3,637	31/03/2013	1.26
6527-1224	17/05/1995	100	N	100	155		2/07/2003	0	1,049	17/05/1995	1.5
6527-1232	16/05/1995	188	N	128	155	83.5	2/07/2003	27.69	5766	16/05/1996	7
6527-1349	15/02/2001	42		32	155	20	15/02/2001	-6.26	1,367	15/02/2001	12
6527-1357	28/03/2001	54		48	155	15	28/03/2001	7.49	1,177	28/03/2001	5
6527-1360	30/03/2001	42		36	155	8	30/03/2001	3.87	1,105	30/03/2001	4
6527-1361	1/06/2001	175	Enh	126	152	100	1/06/2001	31.11	1,116	1/06/2001	6.25
6527-1373	4/01/2002	49		41	155	20	4/01/2002	-8.53	2,397	4/01/2002	4
6527-1375	3/11/2001	49	Tomw	39.5	155	10	3/11/2001	2.22	1,250	1/03/2010	10
6527-1384	23/11/2000	36		36	94	29	23/11/2000	13.53	8667	23/11/2001	0.5
6527-1599	5/10/2003	54		48	155	18	5/10/2003	-1.55	1,261	5/10/2003	3
6527-1779	10/12/2008	73	Tomw	60	157	28	10/12/2008	-0.27	2,132	10/12/2008	4
6527-2083	10/06/2014	6		1.5	48	0.8	10/06/2014				
6527-2084	10/06/2014	6									

Cp-J = Cape Jervois Formation; Nl = Belair Sub-group; Nnt = Tapley Hill Formation; Tomw = Port Willunga Formation; N = undifferentiated Neoproterozoic; Enh = Heatherdale Shale; Nu = Umberatana Group.

Figures 3-5 present well data for aquifers targeted in the area, groundwater elevations (mAHD) and groundwater salinity. Information interpreted from these figures is summarised in the following sub-sections.

3.1 Aquifer monitored

Figure 3 demonstrates that wells to the south of the Willunga Fault predominantly target Neoproterozoic and Cambrian bedrock. The notable exception is well 6527-358 approximately 3 km to the south, which targets *Permian* Cape Jervis Formation (Cp-J). Wells to the north of the Willunga Fault target Port Willunga Formation limestone (map symbol *Tomw*). These wells are unrepresentative of site conditions as they access much younger sediments of the Willunga Basin. They generally report groundwater elevations in the range of - 12.2 to 13.53 mAHD with some wells being influenced by pumping (i.e. groundwater elevations below 0 mAHD – see section 3.2). The differences in aquifer types are tabled in Attachment A.

3.2 Surface elevation and groundwater flowpaths

Groundwater elevations with respect to metres Australian Height Datum (mAHD) are presented in Figure 4, and are derived from latest standing water levels reported on *WaterConnect*. Figure 4 demonstrates that groundwater elevations to the south of the Willunga Fault range from 284.02 mAHD (well 6527-379) to 27.69 mAHD (well 6527-1232). These elevations are generally higher than wells positioned to the north of the fault near the McLaren Vale wine region, which reports groundwater elevations in the range of -12.2 to 13.53 mAHD.

Groundwater flow paths east of Willunga Fault are interpreted to mimic topography, and broadly flow from regions of high elevation to regions of low elevation (e.g. Willunga and Sellicks Hills towards lower lying regions). However Cambrian bedrock is steeply dipping (Figure 2) and bedding near vertical. It is possible that preferential flow paths are aligned along the strike of steeply dipping bedding planes of the outcropping bedrock, with flow in a north-east to south-west direction. It is difficult to be definite in this regard, and for this reason a degree of conservatism should be adopted when recommended maximum pit depths (see Section 4).

3.3 Groundwater salinity

Groundwater salinity (Figure 5) is fresh to brackish (1– 3000 mg/L), with the exception of wells 6527-1232, 6527-539 and 6527-1027 which are reported as saline (salinity > 5000 mg/L). Generally, the groundwater salinity is suitable for a broad range of uses including potable, irrigation, stock and domestic purposes.

There is no apparent relationship in salinity distribution. Wells on either side of the Willunga Fault report salinities from fresh to saline, however the notable exception is a cluster of fresher wells between Sellicks and Aldinga Beach. These wells most likely target the Port Willunga Formation and source water from the upper reaches of the Willunga Basin.

3.4 DEWNR Observation wells

The nearest DEWNR observation well (MYP-060) is located approximately 5 km to the south of site. This well targets the Port Willunga Formation of the Hindmarsh Tiers, and is completed to 101 m below ground level. Monitoring wells within 10 km target aquifers that are not representative of the fractured rock aquifer which is present at the site, and for this reason no observation well data is presented for this review.

4. NEAR SITE GROUNDWATER CONDITIONS

As discussed in Section 2, geology is highly variable at the site and this will affect groundwater movement. A description of the lithology is available from cuttings recovered from a bore across-strike 50 m to the north (6527-1224) and 500 m along strike to the south west (6527-1361). These logs are provided in Attachment B and confirm that the aquifer present at the site is fractured rock aquifer.

The nearest wells to site (6527-1232 and 6527-1361) target fractured bedrock, and report groundwater elevations of 27.69 and 31.11 mAHD. These wells are located along strike and down slope to quarry tenements and are relatively near the Willunga Fault. Water cut data – the zone in which groundwater is first reported - is available at well 6527-1361, and is recorded between 107 and 155 m below ground. Depth to water for 6527-1361 was recorded at 100 m below ground suggesting marginally confined conditions.

For quarry development planning, it will be important to design quarry pits to avoid interception of regional aquifers. Based on the limited data available (Figure 4), local groundwater elevations are estimated between 27.69 and 31.11 mAHD.

Well 6527-540, however, reports a groundwater elevation of 93.51 mAHD. While further from site (approximately 2 km north east), this well is along strike of quarry pits and may represent the upper limit to groundwater elevations. Based on this assumption, it may be necessary to build a level of conservatism into quarry pit design. A preliminary expansion depth to **90 m AHD is recommended,** subject to the installation of an on-site monitoring well. From the current pit elevation of 120 mAHD (Propeller, 2016), this allows for an additional 30 m of quarrying. If this level is unacceptable, drilling of an observation well to 150 m would provide more precise information. The location for drilling should consider of on-ground conditions to ensure the well is not compromised during future quarry workings.

5. GROUNDWATER LICENSING

The Sellicks Beach quarry falls predominantly within the McLaren Vale Prescribed Wells Area (PWA), but the southern extremity of PM 237 falls within the Western Mt Lofty Ranges PWA. It is assumed that if a groundwater license was required, it would fall within the McLaren Vale PWA, and would need to satisfy the conditions with the McLaren Vale Water Allocation Plan (WAP).

The McLaren Vale (WAP) was adopted in 2007 and stipulates a maximum allocation of 6,600 ML/annum from all available aquifers, whether it be fractured rock in the foothills or sedimentary aquifers of the Willunga Basin. Obtaining a new allocation requires aquifers to have spare capacity and for the application to adhere to Principles 1–8 from Section 5.1 of the McLaren Vale WAP.

AGT contacted the licensing regulator (DEWNR) to determine whether new groundwater licenses are available. DEWNR confirmed that new licenses are not available as all aquifers are fully allocated (Button pers. comm., 2016). For this reason, the only way to secure a groundwater license is via license transfer from an existing groundwater user. Note that transfer criterion 10 of the Water Allocation Plan (Adelaide and Mount Lofty Ranges NRM Board, 2007) prohibits transfer of groundwater across the Willunga Fault from the fractured rock aquifer to a well completed in the Maslin Sands or Port Willunga Formations. However, it will be possible to transfer water **from** the Port Willunga Formation or Maslin Sands Aquifer to the site. If required, AGT can provide further information.

6. CONCLUSION

Based on available information, the nearest water wells report groundwater elevations between 27.69 and 31.11 m AHD, however, it is possible that groundwater elevations could be as high as 93 mAHD taking water levels from well 6527-540 (2 km to the north-east). For this reason, a provisional quarry depth to ~90 mAHD is recommended.

For future quarry expansion, Southern Quarries could consider the drilling of a dedicated observation well. This should target competent bedrock to a depth of 150 m below ground and be cited in proximity to future extraction areas. Monitoring from this well would support future quarry plans and accurately quantify near site groundwater levels.

Yours sincerely,

Craig Flavel
Senior Groundwater Engineer
Australian Groundwater Technologies

Paul Magarey
Senior Hydrogeologist
Australian Groundwater Technologies

REFERENCES

Adelaide and Mount Lofty Ranges NRM Board. (2007). Water Allocation Plan for the McLaren Vale Prescribed Wells Area. Adelaide: Government of South Australia.

Adelaide and Mount Lofty Ranges NRM Board. (2011). Review of the McLaren Vale Prescribed Wells Area Water Allocation Plan. Adelaide: Department of Environment, Water and Natural Resources

Button, K., (2016). Senior Water Licensing Officer, DEWNR. Personal communications 2016.

Geoscience Australia (2016). Electronic database accessed Feb 2016. http://dbforms.ga.gov.au/www/geodx.strat_units.int

Geological Society of Australia (2014) Electronic paper accessed May 2016 http://www.sa.gsa.org.au/Brochures/Sellicks_web.pdf

WaterConnect (2016) Electronic database accessed May 2016 https://www.waterconnect.sa.gov.au/

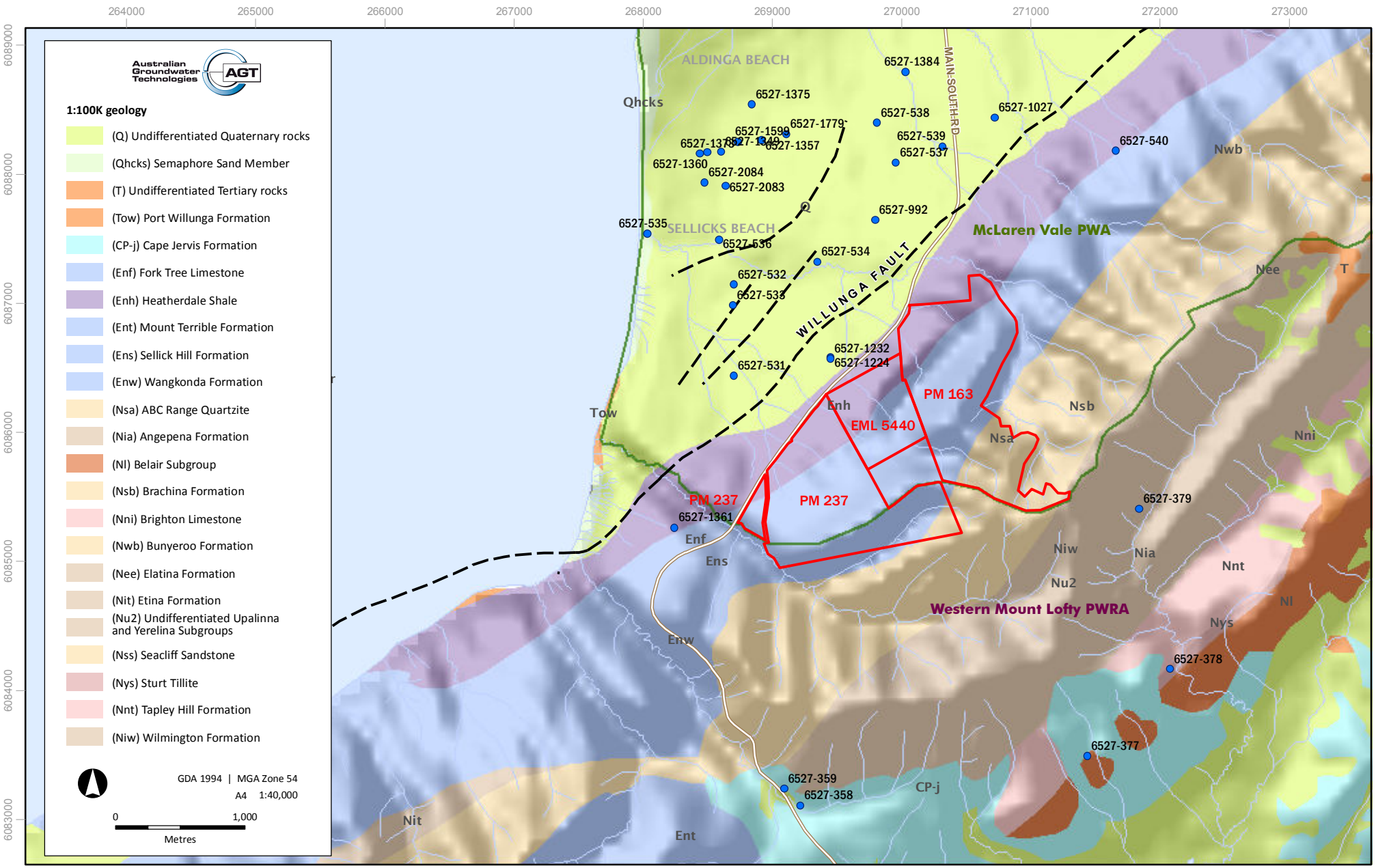

Figure 1: Site location map, surface geology, and water wells within 3 km of Sellicks Quarry

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1507-Sellicks Beach Groundwater Desktop Study\GIS\maps\sellicks beach quarry-geology.mxd

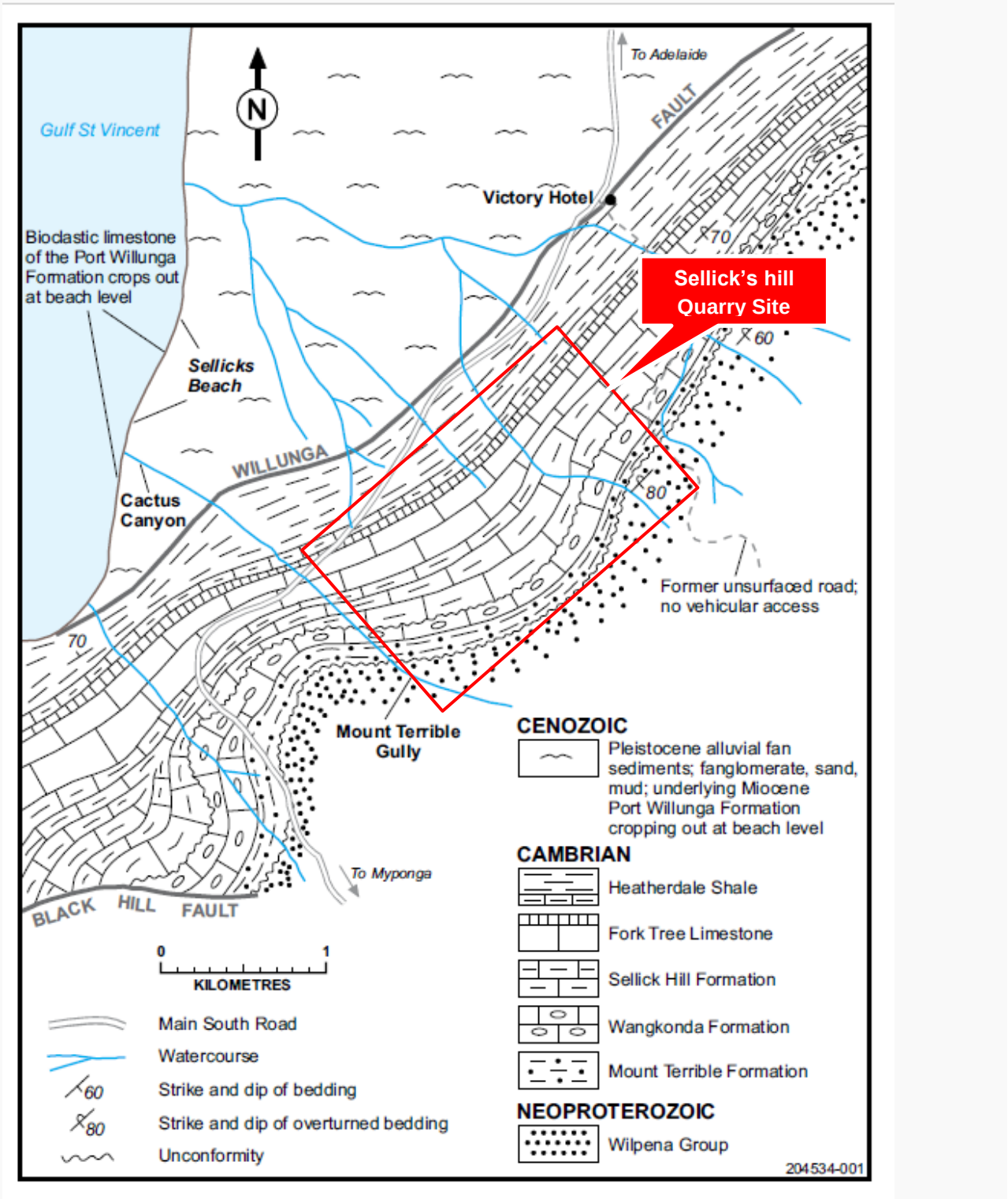

Figure 2: Structural geology in proximity to Sellicks Quarry, showing Cambrian formations dipping steeply to the northwest (Source: Geological Society of Australia, 2014).

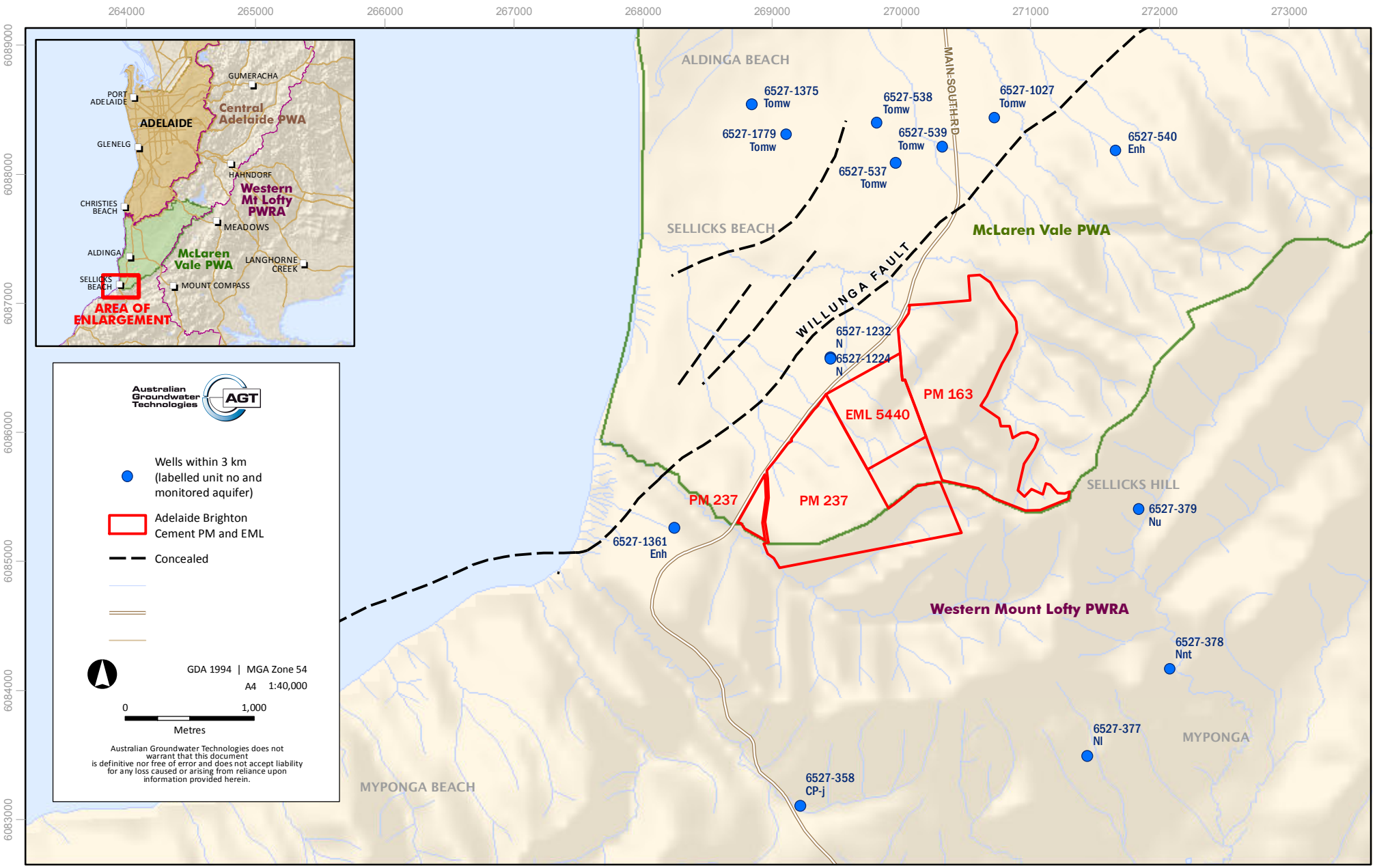

Figure 3: Sellicks Quarry – Aquifers targeted by water wells.

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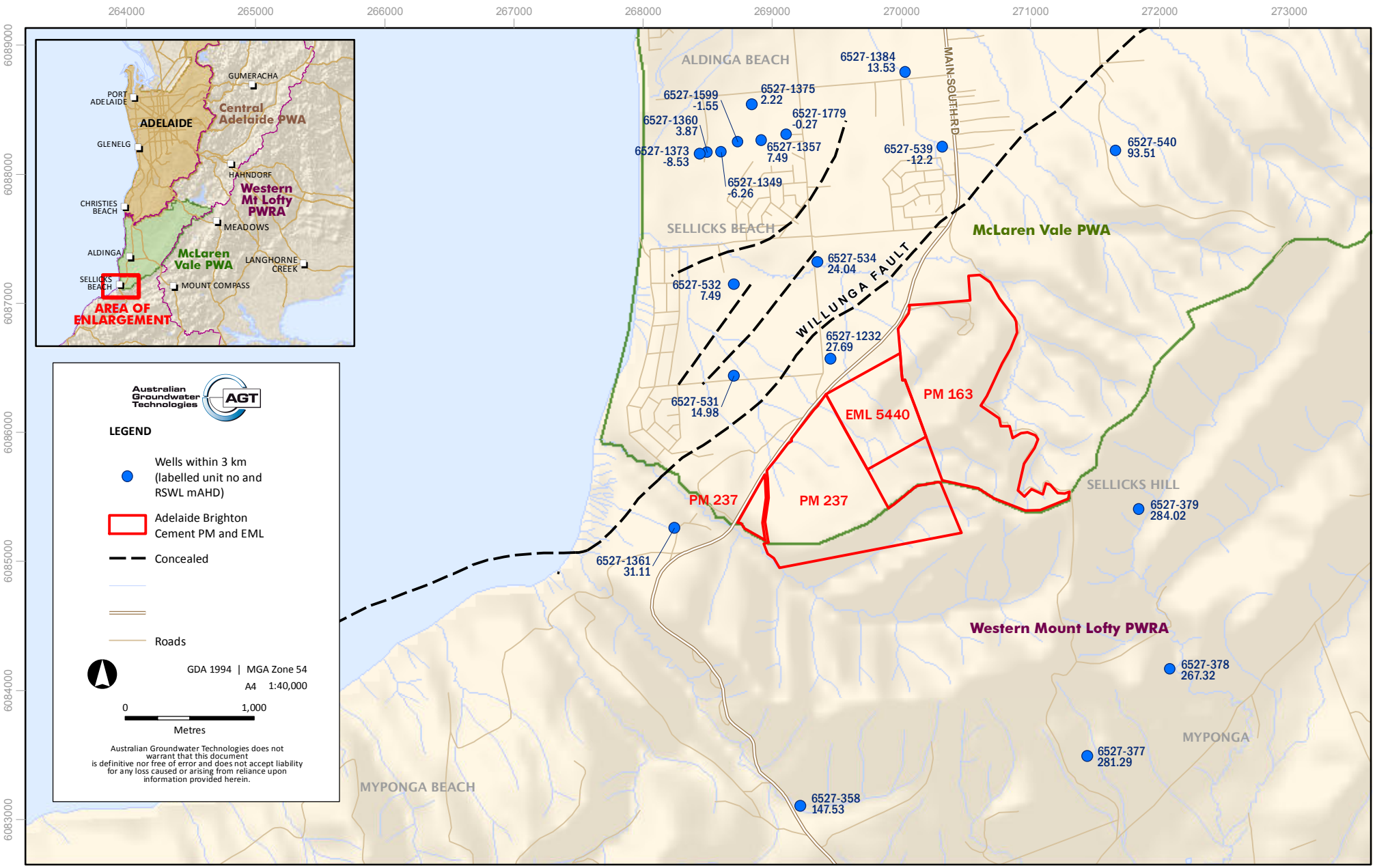

Figure 4: Groundwater elevations (mAHD) within 3 km of Sellicks Quarry.

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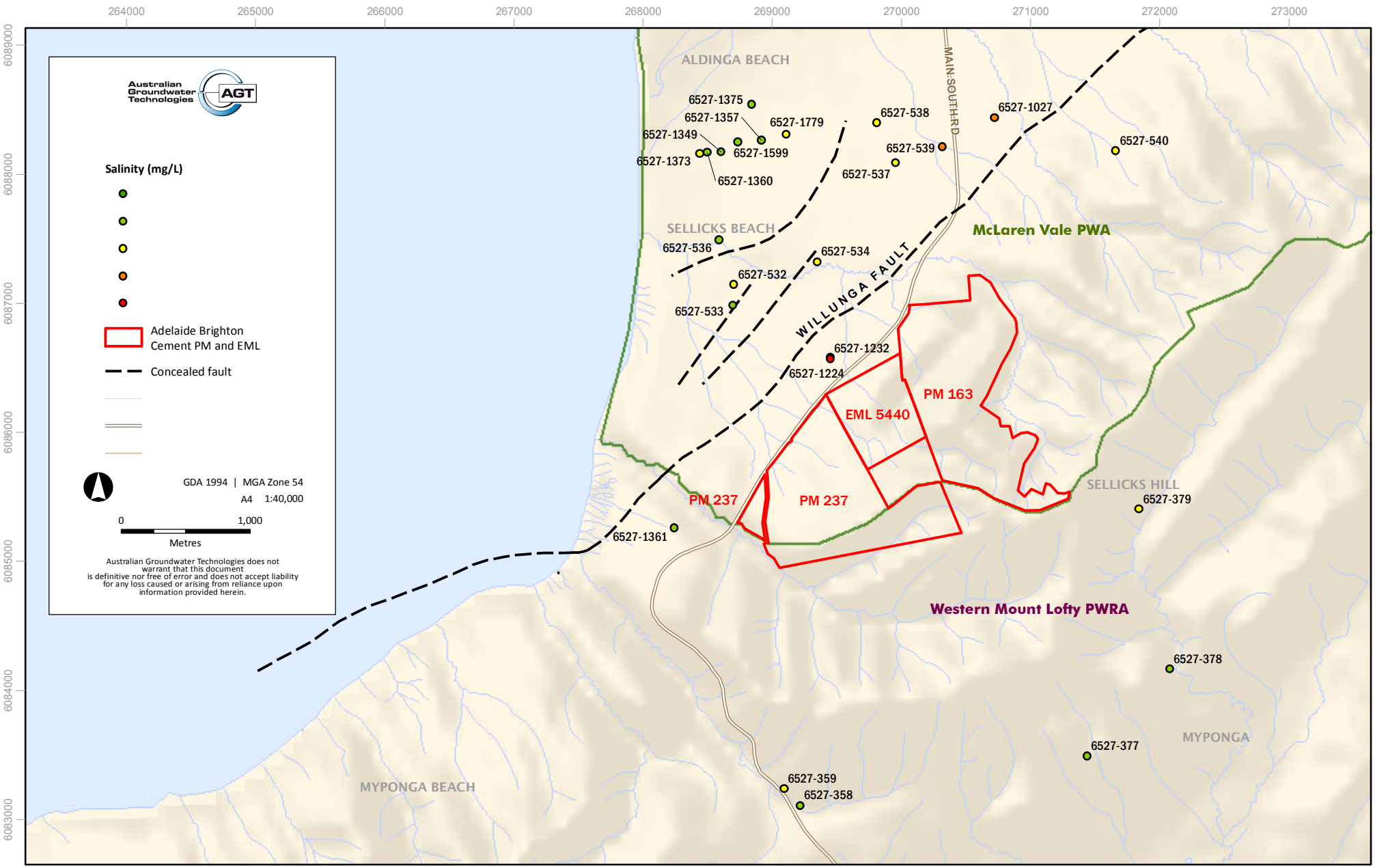

Figure 5: Groundawter salinity within 3 km of Sellicks Quarry.

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ATTACHMENT A: AQUIFERS TARGETED BY WELLS WITHIN THREE KILOMETRES OF THE SITE

Map Symbol	Geological Unit	Age	Description
Nu	Maslin Sands	Tertiary: Eocene Epoch c. 56-34 million years	Friable quartz sands with minor lignites clays and coarse grits. Glauconite is an important constituent in the topmost beds.
Tomw	Port Willunga Formation	Cenozoic: Oligocene Epoch 34-23 million years	Calcarenite, bryozoal,calcrudite, glauconitic, silt and sand, Spicular mudstone, bryozoal marl.
CP-j	Cape Jervis Formation	Carboniferous-Permian c. 300 million years	Glacio-marine and fluvioglacial sediments and residual erratics.
Enh	Heatherdale Shale	Cambrian c. 520 million years	Dark grey, slaty siltstone with black phosphate nodules
Nnt	Tapley Hill Formation	Neoproterozoic c. 600 million years	Siltstone, grey to black, dolomitic and pyritic grading upwards to calcareous, thinly laminated, locally cross-bedded; dolomite, grey, flaggy to massive; limestone conglomerate, intraformational; greywacke.
Nl	Belair subgroup	Neoproterozoic c. 750 million years	Siltstone, dark grey, laminated with minor sandstone, dolomite interbeds; quartzite, fine to coarse, feldspathic, cross bedded, minor siltstone interbeds; slate
N	Unnamed GIS Unit	Unnamed GIS Unit	Unnamed GIS Unit

ATTACHMENT B: DRILLERS LOGS AT NEARBY WELLS

Driller's log of bore 6527-1224, 50 m to the north east - across strike

Depth from (mbgl)	Depth to (mbgl)	6527-1224 Lithology (driller)	Fm
0	7	Gravelly clay	
7	10	Stiff clay	
10	13	Gravel	
13	14	Clay	
14	16	Gravel	
16	22	Clay & gravel	
22	36	Green clay	
36	48	Shaly rock	Enh?
48	63.5	Hard shaly rock	
63.5	91	Hard rock	Nsa?
91	96	Fractured rock	
96	100	Hard rock	

Drillers log of bore 6527-1361, 500 m along strike to the south-west

Depth from (mbgl)	Depth to (mbgl)	6527-1361 Lithology (driller)	Formation
0	7	Top soil, limestone, clay shale	
7	28	Shale	Enh?
28	35	Shale, softer, damp	
35	42	Shaly rock, broken	
42	56	Shale into slate	Enf?
56	63	Slate firmer	
63	70	Slate	
70	77	Slate, softer at 72m	
77	98	Slate	
98	105	Rocky shale	
105	112	Shale, slate, damper at 107m	
112	119	Slate	
119	126	Slate, soft, bit camp	
126	133	Slate, water	
133	134	Slate, firm	
134	161	Slate, quartz, more water at 155m, slight break at 160m	Nsa?
161	168	Softer at 162m, more water	
168	175	Firm slate, quartz/slate break at 173m	

Attachment 6

Measurement Report

GROUNDWORK PART OF SLR

1741 - AdBri: Sellicks

Surveyed Oct 2, 2024

Coordinate reference system: GDA94 / MGA zone 54

MEASUREMENT REPORT

Prepared by Rachel Hall Oct 28, 2024

View in Propeller

propeller

1741 - AdBri: Sellicks

GROUNDWORK PART OF SLR

Surveyed Oct 2, 2024

SURFACE AREA

Map reference / legend	Measurement name	DESCRIPTION	Surface Area (ha)	Horizontal Area (ha)
1	Disturbance - Reporting Period		0.009	0.008
2	Disturbance - Reporting Period		0.909	0.802
3	Disturbance - Reporting Period (Haul Road)		0.242	0.228
4	Disturbance Area - Reporting Period		0.124	0.108
5	Disturbance Area - Reporting Period		0.043	0.043
6	Disturbance Area - Reporting Period		0.164	0.14
7	Disturbance - Reporting Period		1.996	1.711
8	Disturbance - Reporting Period		0.022	0.017
9	Disturbance - Reporting Period		0.202	0.184
10	Disturbance - Reporting Period		0.019	0.014
11	Previous Disturbance - Other		0.072	0.054
12	Previous Disturbance - Other 2		0.032	0.027
13	Previous Disturbance - Other		0.168	0.122
14	Previous Disturbance - South Pit		28.616	22.276
15	Previous Disturbance - Gully Road		6.544	4.176
16	Previous Disturbance - Eastern Pit		15.011	11.353
17	Previous Disturbance - Haul roads, Site office, Weighbridge		21.776	17.406
18	Historic Disturbance		0.046	0.041
19	Previous Disturbance - South Pit 4		0.156	0.137
20	Previous Disturbance - South Pit 3		0.945	0.874
21	Previous Disturbance - South Pit 2		2.616	2.169
22	Previous Disturbance - WSM (south)		0.097	0.094

1741 - AdBri: Sellicks

GROUNDWORK PART OF SLR

Map reference / legend	Measurement name	DESCRIPTION	Surface Area (ha)	Horizontal Area (ha)
23	Previous Disturbance - Eastern Pit 2		0.143	0.107
24	Previous Disturbance - WSM (South)		1.486	1.316
25	Previous Disturbance - South Pit 2		1.439	1.3
26	Previous Disturbance - Eastern Pit 2		0.879	0.699
27	Previous Disturbance - Eastern Pit 1		0.867	0.742
28	Previous Disturbance - WSM (South) - to be rehabilitated		11.194	9.794
29	Previous Disturbance - North Pit		32.972	25.097
30	Previous Disturbance - South Pit 4		1.147	1.021
31	Previous Disturbance - South Pit 2		0.233	0.187
32	Previous Disturbance - South Pit 3		0.061	0.05
33	Previous Disturbance - Southern Haul Road		0.785	0.704
34	Previous Disturbance - South Pit		0.87	0.795
35	Previous Disturbance - Southern Haul Roads		2.834	2.555
36	Previous Rehabilitation - WSM (North) 1		4.523	2.423
37	Previous Rehabilitation - Tree Planting		0.205	0.2
38	Previous Rehabilitation - WSM (South) 1		9.73	6.325
39	Previous Rehabilitation - Tree Planting		0.475	0.459
40	Previous rehabilitation - WSM (South)		6.553	5.641
41	Previous Rehabilitation - WSM (north) - 2		16.996	11.502
42	Previous Rehabilitation - Tree Planting		2.152	1.515

1741 - AdBri: Sellicks

GROUNDWORK PART OF SLR

Map reference / legend	Measurement name	DESCRIPTION	Surface Area (ha)	Horizontal Area (ha)
43	Previous Rehabilitation - Seeding		0.724	0.659
44	Previous Rehabilitation - Seeding		2.388	1.875
45	Previous Rehabilitation		0.389	0.232
46	Previous Rehabilitation		0.036	0.024
47	Disturbance - Reporting Period	Clearance / increase in disturbed areas for Quarry Development	0.276	0.22
48	Disturbance - Reporting Period	Clearance / increase in disturbed land for Quarry Development	0.04	0.039
49	Progressive Rehabilitation - Reporting Period	Re-seeding of disturbed areas (eastern pit area)	2.153	1.705
50	Progressive Rehabilitation - Reporting Period	Re-seeding of disturbed areas (south-eastern pit area)	0.777	0.62
51	Disturbance - Reporting Period		0.166	0.144
52	Disturbance - Reporting Period		0.018	0.015
53	Disturbance - Historic		0.148	0.14

Attachment 7

Weeds and Pests Inspection Report

Job No.:	1741	**Category:**	Weeds and Pest
Site Name:	Sellicks Hill Quarry	**Client:**	Adbri Limited
Site Address:	3981 Main South Road Sellicks Beach SA 5174	**Approvals:**	EPA Licence No. 2052
Monitoring Date:	24 October 2024	**Monitored by:**	Carly Monaghan
Report Requested by:	Chelsea Linke		

Purpose: Reduce and monitor for the introduction of declared weed species, or plant pathogens as a result of the quarrying activity. Spray drift and chemical trespass. Control of pest fauna species.

Event Discussion

A weed and pest inspection was undertaken on 24 October 2024 at Sellicks Hill Quarry. The weeds noted onsite were consistent with those in previous years and were mostly limited to juvenile weeds. The majority of battered faces and the western screening mound have previously been vegetated with Rye Grass. The Site inspection did not note any significant increase or change in abundance of weeds and pests on the Site when compared with previous assessments, and there was no evidence of weeds spreading to adjacent properties. There were no non-compliances noted during the Site inspection.

Photographs Points

24/10/2024

Weeds and Pests Photo Location 1: Minor weed presence.

24/10/2024

Weeds and Pests Photo Location 2: Evidence of Rye Grass seeding.

24/10/2024

Weeds and Pests Photo Location 3: Minor weed presence.

24/10/2024

Weeds and Pests Photo Location 4: Minor weed presence.

24/10/2024

Weeds and Pests Photo Location 5: Minor weed presence.

24/10/2024

Weeds and Pests Photo Location 6: Minor weed presence.

Attachment 8

Topsoil Inspection Report

Job No.:	1741	**Category:**	Topsoil Stockpile Inspection
Site Name:	Sellicks Hill Quarry	**Client:**	Adbri Limited
Site Address:	3981 Main South Road Sellicks Beach SA 5174	**Approvals:**	EPA Licence No. 2052
Monitoring Date:	24 October 2024	**Monitored by:**	Carly Monaghan
Report Requested by:	Chelsea Linke		

Event Discussion

A topsoil inspection was undertaken on 24 October 2024 at Sellicks Hill Quarry. Topsoil was found to be stored in rows out of immediate operational areas, free from significant volumes of declared or noxious weeds, free from erosion and 2 - 3 metres in height. There were non non-compliances noted during the Site inspection.

Photographs Points

24/10/2024
Topsoil Stockpile Inspection: Topsoil stockpile. Free from weeds.

24/10/2024
Topsoil Stockpile Inspection: Topsoil stockpile. Free from weeds.

Attachment 9

General Enquiries Summary

Date	Type	Name	Description / Detail	Investigation	Corrective Actions	Responsible	Completed
2/02/2024	Observation	Community member	Commented on watercart activity	email through community feedback address	Documented and discussed internally	Ryan Low	2nd of Feb 2024
2/05/2024	General Enquiry	Community member	Email received from a community member responding to our blast notification on the 2nd of May 2024	Letter Stated Seems to us residence that the conditions were perfect on Monday and catastrophic today. If you are really concerned for Sellicks with any decent weather app on your phone you could have planned blasting to suit the conditions. This notification of blasting is no more than a PR exercise...and timed to suit the quarry. A blast is over in seconds and the appearance of how it looks to us is neither here nor there.	No response		
6/05/2024	General Enquiry	Community member	Email received by Sellicks Quarry Supervisor. The community member responded to a blast notification, What about your uncontrolled dust this morning? No warning about that? Stop this bs of notifications about blasting and start to control your fugitive dust. How's all the watering going? What a joke, are your own employees all wearing Effective PPE to stop them breathing this silica filled dust every day?	Blast was conducted with less than ideal conditions due to safety concerns onsite. The Blast had been rescheduled for 3 days due to poor weather.	DEM and EPA informed that the site would conduct a blast with less than ideal conditions	Adam Schutz	06th of May 24
7/05/2024	General Enquiry	Community member	Email received via DEM regarding photos showing "fugitive dust" leaving the site at 07:45am on the 07th of May 24. Also attached was a Mineralogy Analysis that had been complete by the community member. DEM requested the time frame on when Adbri will be able to supply the Petrographic reports for the Sellicks Hill Quarry.	Looking at the photo's we could not see any visible dust. Contact was made with external contractor to provide time frame on when Petrographic reports would be available	Petrographic reports provided to DEM	Adam Schutz	08th of May 24
9/05/2024	General Enquiry	Community member	Email received by Sellicks Quarry Supervisor from the Community Member responding to our Blast Notification from the 9th of May as per below.... What about the safety concerns of the Sellicks Beach community breathing in the quarry dust ?	Blast notification was sent out... Good morning Notification of a blast today, 09/05/2024 that may be visible to the wider community. The location of the blast will be in the top quarry. Understanding weather conditions are not favourable. blast was scheduled for Monday 06/04/2024 and conditions have not improved since. Due to safety concerns and to eliminate any extreme level of risk we are unable to leave any longer, the blast will take place midday today.	Unable to responded to the question as Adbri Is not health expert		
24/05/2024	General Enquiry	Community Group	Email received by Sellicks Quarry Supervisor from the Community Group - Sellicks Beach Dust Action Group after a Blast notification went out. Email stated I have attached some comments from Sellicks residence who are starting to see through the BS that is the blast notification. I have included two recent responses that were sent to me, but there are others that are similar. they are anonymous to respect privacy.	Unsure if this email was intended for the Quarry Supervisor or just for the Community Group. Blast was conducted in the "Top Pit"	No response		
5/06/2024	General Enquiry	Community member	Email received via the Sellicks Community Feedback Email. It is important that the EPA, DEM, CITY OF ONKAPARINGA. LEON BIGNELL all understand that to allow an expansion of this quarry will be a health disaster for the Sellicks community	Unsure if this email was intended for the Sellicks Community Feedback Email.	No response		