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CARRARA MARBLE QUARRY (ML 6556, PM 111)
MINE OPERATIONS PLAN (MOP) AND PROGRAM FOR ENVIRONMENTAL PROTECTION AND REHABILITATION (PEPR)

Prepared for:
Amulet Holdings Pty Ltd

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Declaration of Accuracy

I, **Stephen Falland** the applicant, have taken reasonable steps to review the information and to ensure its accuracy.

Name: Stephen Falland
Position: Director
Dated: 31 July 2025

1. Introduction

1.1 Background

Amulet Holdings Pty Ltd (Amulet Holdings) are a subsidiary business of Barossa Quarries Pty Ltd. Amulet Holdings are the Holder and Operator of Private Mine (PM) 111 and Mining Lease (Extractives) (ML 6556) (the Site). The Site is located approximately 90 kilometres (km) north east of Adelaide and accessed via Marble Quarry Road, Koonunga, South Australia.

PM 111 has been operational since 1973 and provides a much sought-after marble used in building stone, decorative aggregates and terrazzo surfaces. The white marble has been used in the construction of prominent buildings in South Australia such as Parliament House. The PM is currently operating under Approved Development Plan (ADP) / Mine Operation Plan 1999/059. The Site was approved (02/02/2024) a Mining Lease (ML) for Extractives 6556 for a period of 20 years, after approval of the Mining Lease Proposal dated October 2021.

The Mine Operations Plan (MOP) and Program for Environmental Protection and Rehabilitation (PEPR) is intending to align both of the operations into one (1) single pit where common boundaries and pit floor levels will be formed to ensure a planned, sequenced and viable operation into the future. The purpose of the quarry extension is to address current compliance concerns within PM 111, in particular the offset distance to the northern boundary. This issue is not new and is a legacy item from many decades ago. The extension of the Site into the ML area will also provide additional marble reserves, in particular blue marble extracted and manufactured at the adjacent quarry.

The MOP PEPR will focus on the potential key issues which relate to the activities of the quarrying, environmental protection and rehabilitation. The focus of this review is to update the current ADP/MOP 1999/059 to the present legislation and update a long-term Quarry Development and Rehabilitation Plan (QDP) that extracts the resources in line with quarry completion objectives and environmental sustainability and rehabilitation in mind to ensure a landform that can be utilised post-extraction.

1.2 Site Overview

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

Table 1 – Tenement Detail Summary

Tenement Number	**ML 6556**	**PM 111**
Tenement Holder / Operator	Amulet Holdings Pty Ltd	Amulet Holdings Pty Ltd
Registration Grant Date	02/02/2024	03/05/1973
Expiry Date	01/02/2044	N/A
Commodities	Marble	Marble
Legal Area (ha)	4.56	3.95
Commodity Categories	Construction Materials	Construction Materials

1.3 Site Contact

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

Table 2 – Site Contact Details

Contact Name / Position	Stephen Falland
Phone Number	0418 839 366
Postal Address	202 Radford Road, Angaston SA 5353
Email Address	steve@barossaquarries.com

2. Description of the Existing Environment

2.1 Topography and Landscape

The Site is located within a large agricultural area of predominately cropping and viticulture, with the gentle slopes in the landform ranging from 296 metres Australian Height Datum (mAHD) within the north western areas of the EML sloping easterly with the lowest point at the south eastern corner of the PM of 285 mAHD.

The current pit floor within PM 111 is currently measuring at 278 m AHD with crest heights along the northern side ranging from 292 – 290 m AHD.

Refer to **Drawing No. 2492.DRG.016R1 – Topographic Map** for detailed topography and landform features.

An unnamed highly disturbed ephemeral third order watercourse is located approximately 280 m south of the Site at lower topography of 280 m AHD.

2.2 Climate

Site climate data has been sourced from the Nuriootpa PIRSA Bureau of Meteorology (BoM) (Site No. 023373) located approximately nine (9) kms south east of the Site.

Climate is characterised as semi-arid, with warm to hot dry summers and cold winters with majority of rainfall between the months of May and September. Average annual rainfall is 481.2 millimetres (mm). **Table 3 – Climate Data Nuriootpa PIRSA Station (Site No. 023373)** shows expected mean maximum temperature for the hottest month January, at 30.2 degrees Celsius and mean minimum temperature is 4.6 degrees Celsius for the coldest month of July.

Table 3 – Climate Data Nuriootpa PIRSA Station (Site No. 023373)

Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Years		Plot	Map
Temperature																	
Mean maximum temperature (°C)	30.2	29.3	26.0	22.0	17.3	14.1	13.6	14.7	17.9	21.4	25.0	27.6	21.6	27	1996 2023		
Mean minimum temperature (°C)	14.6	14.4	12.0	9.2	6.9	5.2	4.6	5.0	6.6	8.3	10.8	12.4	9.2	27	1996 2023		
Rainfall																	
Mean rainfall (mm)	16.1	23.7	24.8	34.1	49.3	55.7	57.0	57.7	56.9	38.5	35.7	29.9	481.2	27	1996 2023		
Decile 5 (median) rainfall (mm)	11.6	15.2	16.6	27.2	47.2	54.8	55.1	64.8	47.0	33.2	31.4	21.8	456.2	27	1996 2023		
Mean number of days of rain ≥ 1 mm	2.9	2.4	3.3	4.3	8.0	9.8	10.4	10.3	8.1	6.2	5.1	4.3	75.1	27	1996 2023		
Other daily elements																	
Mean daily sunshine (hours)	10.6	10.0	8.7	7.5	5.7	4.9	5.1	6.5	7.2	8.7	9.6	9.9	7.9	18	1999 2020		
Mean number of clear days	9.1	7.9	9.9	5.6	4.1	2.1	2.8	4.3	3.6	4.7	4.8	7.0	65.9	14	1996 2010		
Mean number of cloudy days	6.4	6.4	8.1	10.8	14.7	16.9	16.9	13.9	13.7	14.1	9.9	10.4	144.2	14	1996 2010		
9 am conditions																	
Mean 9am temperature (°C)	20.6	20.0	16.8	15.7	11.9	9.0	8.3	9.7	13.1	14.7	17.3	18.9	14.7	14	1996 2013		
Mean 9am relative humidity (%)	51	54	62	61	75	83	83	78	67	58	55	52	65	14	1996 2013		
Mean 9am wind speed (km/h)	16.3	14.5	12.7	13.7	11.8	12.2	12.6	15.2	18.4	18.5	16.5	17.0	15.0	14	1996 2013		
9am wind speed vs direction plot																	
3 pm conditions																	
Mean 3pm temperature (°C)	28.2	27.9	24.5	20.7	16.4	13.1	12.4	13.8	16.3	19.3	23.5	25.4	20.1	14	1996 2010		
Mean 3pm relative humidity (%)	28	30	34	41	54	63	63	58	53	41	34	32	44	14	1996 2010		
Mean 3pm wind speed (km/h)	18.3	17.6	16.7	16.9	16.2	17.4	18.6	20.4	21.7	20.5	18.6	19.3	18.5	14	1996 2010		
3pm wind speed vs direction plot																	

red = highest value blue = lowest value

Product IDCJCM0025 Prepared at Thu 05 Oct 2023 05:06:05 AM AEDT

Source (BoM, 2023)

Wind direction can vary dependant on the season and on time of day. **Attachment 1 – Wind Rose Data Nuriootpa PIRSA Station (Site No. 023373)** shows that morning wind direction is predominately north easterly, and afternoon wind direction is predominately westerly.

2.3 Topsoil and Subsoil

Searches of the Department for Environment and Water (DEW) application '*NatureMaps*' (2021) identified the Site is located with the Kapunda Land System. It describes the main soil types of the area as 'loam over red clay on calcareous rock'. These soils are moderately deep and fertile, and generally arable (except on some short steep rises). Most soils have hard setting and sealing surfaces which shed water, are difficult to work and restrict early crop growth.

A Site inspection by Groundwork Plus (SA) Pty Ltd (Groundwork Plus) (September 2020) noted the ML has shallow topsoil (100 – 200 mm) with a rocky outcrop. The western portion of the ML is predominantly rock on the surface while the eastern side is mostly soil and supports cropped land which will remain undisturbed by quarrying. **Photo 1 – Topsoil Profile** demonstrates the depth of topsoil within the ML, integrated between heavy outcropping of Limestone.

Photo 1 – Topsoil Profile

PM 111 has been continuously operated since 1973 and operational areas have been stripped of topsoil stored in a vegetated stockpile as per **Drawing No. 2492.DRG.025 – Site Layout Plan**. The topsoil will be utilised to rehabilitate the Site as extraction encroaches towards the west of PM 111. The remaining undisturbed areas within the PM demonstrates a similar topsoil profile as ML 6556 with shallow topsoil (100 – 200 mm) with a rocky outcrop.

2.4 Geological Environment

A search of the Department for Energy and Mining's (DEM) portal South Australian Resources Information Gateway (SARIG) (2021) lists the regional geology of the area as Kapunda Marble, Cambrian in age and a stratigraphic description of Marble, white, blue, pink and amphibolitic. Refer **Drawing No. 2492.DRG.008R1 – Regional Geology Map** for an overview of the Site's geology and surrounding area.

Samples taken from the ML and PM were analysed by Groundwork Plus Petrographic Testing Laboratory and describes the same consistency of rocks as medium-grained marble, crystalline with tightly interlocking calcite crystals. A regionally to locally metamorphosed rock of carbonate sedimentary origin with high strength and durability. **Attachment 2 – Petrographic Inspection Reports** is provided for reference. Table 2 within **Attachment 2 – Petrographic Inspection Reports** demonstrates that the source rock at the surface of ML 6556 and from within the pit of PM 111 are high suitability for most applications. A sealing aggregate would require further testing and analysis to understand the Polished Aggregate Friction Value (PAFV) requirements. The resource has historically been metamorphosed and as demonstrated within **Attachment 2 – Petrographic Inspection Reports**, the source rocks are hard and durable from the samples taken at the surface of the outcropping with ML 6556 and the pit within PM 111.

The PM hosts a pit floor of 278 m AHD, the upper topography of ML 6556 is 296 m AHD. An estimated depth of 200 mm has been provided for topsoil over the ML and undisturbed areas of the PM whilst overburden will vary, however for the purposes of this document is estimated conservatively at 100 mm depth. Please note that in some areas the visible rocky outcrop denotes competent material at the surface of the Site. Refer to **Drawing No. 2492.DRG.018R1 – Geological Cross Section Plan** outlines the likely geological profile within the Site.

An estimate of topsoil and overburden to be stripped over the life quarry is provided below in **Table 4 – Overburden and Topsoil Removal**.

Table 4 – Overburden and Topsoil Removal

Stage	Overburden (1.8t/m^3)		Topsoil (1.8t/m^3)	
	Volume (m/^{3})	Tonnes (t)	Volume (m/^{3})	Tonnes (t)
1	20,033.4	36,060.10	1,046.10	1,883.0
2	23,892.70	42,482.2	1,248.7	2247.7
3	13,490.6	24,283.10	4,652.5	8,374.50
4	5,423.40	9,762.0	444.0	79.20
Total	**62,548,60**	**112,587.40**	**7,391.30**	**13,304.30**

Photo 2 – PM 111 Marble highlights a sample of the marble along the northern wall face of PM 111.

Photo 2 –PM 111 Marble

2.5 Geohazards

Drawing No. 2492.DRG.010R1 – Geohazards Map indicates several seismic activities within proximity to the Site ranging between 1.5 and 2.1 in magnitude (*SARIG, 2023*) with the most recent event occurring 25 June 2003 (1.9 magnitude) approximately three (3) kms north east of the Site.

There are no known radioactive or asbestiform minerals to be quarried at the Site.

The source rock contains two (2) percent free silica as rare fine quartz grain inclusions and does not display rhomboid crystal habits diagnostic of dolomitic rock. Therefore, regarded as innocuous in relation to Alkali-Silica Reaction (ASR) and Alkali-Carbonate Reaction (ACR) in concrete provided chemical variety as magnesium diversity is not displayed within the source rock. There are no known slips, faults, karsts features or geological unit boundaries located within the Site.

The northern boundary has been historically extracted at an angle of 65 degrees. Extraction into the ML area will address current compliance concerns within PM 111, in particular the offset distance to the northern boundary. This issue is not new and is a legacy item from many decades ago.

2.6 Groundwater

A Groundwater Desktop Study was undertaken by Groundwater Science (November, 2020) to gain information on the groundwater levels to inform QDPs, and final pit floor levels for the Site and is provided as **Attachment 3 – Groundwater Desktop Study - Carrara Quarry**.

The report concluded "*Nearby wells report groundwater elevations between 250 to 288 m AHD. Based on topographic position, it is estimated that the water table is below 280 metres (m) across the entirety of the Site. The basis for this estimate is that:*

- *Groundwater elevations at the nearest wells report water levels less than 275 m AHD.*
- *The adjacent quarry on Private Mine (PM) 111 has a minimum floor level of 278.04 m AHD which corresponds to an excavation depth up to 15 m below ground. No seepages were identified during fieldwork conducted in September 2020 (by Groundwork Plus) and the pit floor remained dry. This indicates that groundwater elevations are below 278 m AHD at this location.*
- *Water wells constructed near streams in the area report water levels between 5.8 and 13.5 m below ground. The stream to the south has a groundwater elevation between 282 and 278 m AHD (Propeller, 2020). Based on above it is expected that groundwater elevations beneath the stream would be less than 276 m AHD immediately south of the Site, falling to the south-east."*

Recommendations for pit design are for depths no greater than 280 m AHD allowing for uncertainty given limited water wells close to the Site.

It should be noted that the Site is considered low risk to groundwater receptors as:

- There are no confirmed groundwater users within one (1) km of the Site.
- A pit floor elevation of 280 m AHD is two (2) m above the existing lowest floor level of the adjacent quarry (PM 111) and is six (6) to 11 m above the water table at the nearest water wells." (*Groundwater Science, November 2020*).

Additionally in April 2024, one (1) hole was drilled within the current pit floor of PM 111 to determine the depth of groundwater presence (groundwater investigation purposes only). The hole was drilled within the pit floor at the location as shown below in **Diagram 1 – Groundwater Investigation Hole** at the pit floor level of 278 m AHD to a depth of 18 metres to a depth of 260 m AHD of which groundwater was not intersected, drilling remained consistently dry and in the marble resource for the full depth of 18 m. Whilst it is recognised the drill hole was undertaken in Autumn, groundwater variations due to seasonal fluctuations are not anticipated to rise more than 20 m, confirming that the proposed pit floor of 280 m AHD provides a significant buffer above groundwater.

Diagram 1 – Groundwater Investigation Hole

A search of the BoM Groundwater Dependent Ecosystems Atlas (GDE Atlas) (2020) identified one (1) Low Potential Aquatic GDE (watercourse) approximately 900 m east of the Site and two (2) Terrestrial GDEs approximately 560 m and 1.2 km north east of the Site comprising of *Eucalyptus leucoxylon ssp. Woodland*. The vegetation is described as having a low potential for groundwater interaction and is likely reliant on surface water generated by periodic rainfall (*Groundwater Science, November 2020*).

The Site is not located within a water resource area prescribed under the *Landscape South Australia Act 2019*.

2.7 Surface Water

A search of the DEW '*NatureMaps*' application (2020) confirmed the Site is not located within a Prescribed Water Resources Area (PWRA), Prescribed Wells Area (PWA) or the Murray Darling Basin and associated Murray River Water Protection Area.

The Site lies within the Light River Surface Water Catchment area and an unnamed highly disturbed ephemeral third order watercourse is located approximately 15 m south of the PM 111 south eastern boundary (40 m from pit edge). A first order watercourse is located approximately 540 m north of the Site and second order watercourse located 563 m approximately to the west of the Site. Catchment areas associated with these water courses are not associated with surface waters from the Site, refer to **Drawing No. 2492.DRG.016R1 – Topographic Map**.

Surface water currently drains towards the east and then south east of the ML following natural topography and fall of the land within the ML area. **Drawing No. 2492.DRG.013R1 – Quarry Stormwater Management Plan** shows surface water within the operational area of the Site will continue to drain in an east to south easterly direction towards operational areas of PM 111 and be retained within operational areas. Surface waters from areas outside of the operational footprint of the proposed operations flows away from the future disturbance areas along existing overland flow paths.

Private dams are located within the surrounding areas to support agricultural purposes and are shown on **Drawing No. 2492.DRG.016R1 – Topographic Map**.

2.8 Vegetation, Weeds and Plant Pathogens

An *Environment Protection Biodiversity Conservation Act 1999* (EPBC) Protected Matters Search (2024) of the Site and immediate surrounds summarises the Matters of National Environmental Significance (MNES) flora that may occur within three (3) km of the Site, refer **Attachment 4 – *EPBC Act 1999* Protected Matters Report**.

The *EPBC Act 1999* Protected Matters Search Report identified two (2) Listed Threatened Ecological Communities. The report identified five (5) Endangered Species and six (6) Vulnerable Species of native flora. One (1) Heritage Agreement area HA 604 was identified (approximately 2.5 km south west of the Site).

A search of the DEW native vegetation database '*NatureMaps*' (2023) for the presence of native vegetation reported that there were no identified State or Nationally Rated Flora Sites within the Site.

A Site visit by Groundwork Plus (23 March 2021) confirmed that the Site has no native vegetation onsite due to historical vegetation clearing undertaken to support the land use of grazing and cropping of which cropping is planned to continue within an eastern section of the ML and remain undisturbed by quarry development. Clearance has occurred within PM 111 due to quarrying activities. Planted vegetation in the form of a row of trees is located north and north east of the Site boundary as shown on **Drawing No. 2492.DRG.016R1 – Topographic Map** and assists to act as a natural screen of the operations from receptors to the north of the Site. There were no observations of any rare and endangered flora species within or adjacent to the Site.

2.8.1 Weed and Plant Pathogens

A search of the DEW (2024), application '*NatureMaps'* reported 20 declared Weeds of National Significance (WoNS) that may occur within a three (3) km area however no WoNS were identified within the PM and ML Site.

A search of the DEW (2023), application '*NatureMaps'* confirmed Phytophthora is not present within the search area of the tenement and immediate surrounds. No vegetation onsite is known to be affected or potentially affected by economically significant pathogens.

A Site visit by Groundwork Plus (23 March 2021) confirmed the Site contains weed disturbance comprised of *Phalaris sp.* (Canary Grass) +/- *Avena barbata* (Bearded Oat) +/- *Salvia verbenaca* (Wild Sage) +/- *Plantago sp.* (Plaintain) +/- *Marrubium vulgare* (Horehound) +/- *Asphodelus fistulosus* (Onion Weed) +/- *Scabiosa atropurpurea* (Pincushion) +/- *Plantago coronopus sp.* (Bucks-horn Plaintain) +/- *Sonchus oleraceus* (Common Sow-Thistle) +/- *Trifolium angustifolium* (Narrow-leaf Clover) +/- *Trifolium sp.* (Clover) +/- *Rosa rubiginosa* (Sweet Briar) +/- *Rosa canina* (Dog Rose) and *Rumex sp.* (Dock).

2.9 Fauna

A search of the EPBC Protected Matters Search Tool of the Site and immediate surrounds summarises the MNES (fauna) that may occur within three (3) km of the Site, as detailed in **Attachment 4 – *EPBC Act 1999* Protected Matters Report**.

The EPBC Protected Matters Search Report identified one (1) Listed Threatened Species (Mammals), 14 Listed Threatened Species (Birds), two (2) Listed Threatened (Reptiles), one (1) Listed Migratory Marine Birds (Birds), two (2) Listed Migratory Terrestrial Species (Birds), six (6) Listed Migratory Wetlands Species (Birds) and 16 Listed Marine Species (Birds).

Due to the type and degraded nature of the vegetation onsite, the operational areas of the Site are not expected to contain significant habitat or support rare or endangered species therefore a referral under the *EPBC Act 1999* is not required.

A search of the DEW (2020) application '*NatureMaps'* did not identify the presence of any State Rated Fauna Sites within a one (1) km of the Site.

The *EPBC Act 1999* Protected Matters Search Report identified eight (8) Invasive Species (Birds) and nine (9) Invasive Species (Mammals) potentially present in the area including; Domestic Cattle (Bos Taurus), Domestic Dog (Canis lupus familiaris), Goat (*Capra hircus*), Cat (Felis catus), Brown Hare (Lepus capensis), House Mice (Mus musculus), Rabbit (Oryctolagus cuniculus), Black Rat (Rattus rattus) and the Red Fox (Vulpes vulpes).

2.10 Caves

There are no known cave systems within or nearby the application area.

2.11 Land Use

Historical land use for the Site within and immediate surrounding areas has been for the purposes of cropping and agricultural activities with the exception of PM 111 an operational quarry since 1973. Remaining sections of un-quarried land east within the ML will continue to be cropped.

The Site is located within the Light Regional Council (Council) area and adheres to the Planning and Design Code zone of Rural. The surrounding areas are also consistently zoned Rural. Planning and Design Code overlays of the Site include Character Preservation, Hazards (Bushfire – General Risk), Local Heritage Places, Native Vegetation and Water Resources.

There are no public utility easements within the Site.

There are no known plans for changes to the adjacent land use at the time of preparing the MOP PEPR.

Exploration Licence (EL) 6198 was identified as present over ML 6556. A Section 80 agreement to allow simultaneous tenure was negotiated to allow for Amulet Holdings to mine extractive minerals and undertake associated activities.

2.12 Proximity to Infrastructure and Housing

Rural residences are located to the north east and south west of the Site, with the nearest residences located approximately 820 m north east and 780 m south west of the Site. Access to the Site is limited to the public road network via Marble Quarry Road and Kapunda Road with traffic movements not expected to increase above current levels.

There is an SA Water mains pipe located along Marble Quarry Road approximately 15 m to the west of the Site. Water wells and dams located within proximity to the area and are identified on **Drawing No. 2492.DRG.006R1 – Land Access Map**.

2.13 Exempt Land

A summary of land parcels, landowners, owners of infrastructure and reasons for exemption of the land under *Section 9* of the *Mining Act 1971* is provided in **Table 5 – Exempt Land**. The exempt land within the Site is also outlined within **Drawing No. 2492.DRG.002R1 – Exempt Land Map**. Note, exempt land only applies to the ML portion of the operations as exempt land is not applicable to Private Mines.

Table 5 – Exempt Land

Name of person entitled to exemption	Land parcel details	Reason for exemption	Waiver obtained	Conditions
Royce Milton Kleinig	CT 6241/411 A301 DP 142321 (previously CT 5933/462)	• Land that is situated within 150 m of a building or structure, with a value of $200* or more, used for a commercial purpose (Watermains) • Land that is lawfully and genuinely used as a yard, garden, cultivated field,	Yes	NIL

		plantation, orchard or vineyard (Cropping).		
SA Water	Located on road reserve	• Land that is situated within 150 m of a building or structure, with a value of $200* or more, used for a commercial purpose (Watermains)	Yes	NIL

***** Note waiver of exemptions were executed September 2020 as per the requirements of the *Mining Act 1971* as of that period.

The above Waiver of Exemptions have been provided to DEM and there is a reasonable prospect of entering the land to undertake the proposed quarry operations.

2.14 Amenity

Attachment 5 – Visual Assessment shows the extent of the Site visible from photo locations depicted in **Drawing No. 2492.DRG.014R1 – Visual Assessment Map** as assessed on 20 September 2020 and 18 August 2021.

Photo Location 2 from the corner of Schrapel Road and Marble Quarry Road shows views of the quarry's vegetated topsoil mounds are visible to road users, however views are softened by some vegetation present along the creek line south of the Site. As it is a low trafficked road / track visual amenity concerns are not expected to be an issue.

Photo Location 3 shows the views of the northern side of the Site visible from the corner of a private access track and Marble Quarry Road which leads to the residence located north east of the Site. The access track is not the primary entrance point to the residence. As it is a low trafficked road / track visual amenity concerns are not expected to be an issue.

Photo Location 4 provides views of the Site looking south from Marble Quarry Road with some views of the vegetated topsoil mound shown but as it is a low trafficked road, visual amenity concerns are not expected to be an issue.

Photo Location 7 shows limited views of the ML portion of the Site are experienced due to topography and vegetation screening, and views are predominately of the PM area. Tree screening has been planned to be planted along the boundary of the PM to reduce visual impacts.

Views from the other photo location points show no visibility of the Site due to screening by vegetation and / or topography screening views of the Site.

2.15 Dust and Air Quality

The Site is located within a large grazing, cropping and agricultural area of which emissions of dust is expected to be typical of rural, livestock and agricultural setting with some influence from the existing operations within the PM which is operated on a campaign basis, as well as unsealed roads in the area.

Potential dust generating activities that may occur onsite on a campaign basis include material extraction and blasting. Crushing, transport and transfer of material within open areas will occur within the PM on the pit floor.

A water cart will be available onsite to undertake dust suppression of haul roads and working areas while the Site is being operated during campaigns. The mobile crushing and screening plant is fitted with water sprayers to assist dust suppression as required.

2.16 Noise

Noise levels at the Site are generally typical of rural settings. Potential noise generating activities that may occur onsite include blasting, material extraction, crushing and transporting. The quarry is proposed to operate on a campaign basis

with quarrying activities undertaken during daytime hours as outlined within **Section 3.3.6 Modes and Hours of Operation**.

2.17 Heritage (Aboriginal, European, Geological)

Under the *Aboriginal Heritage Act 1988*, the South Australian Government is responsible for the protection and preservation of sites, objects and remains of significance to Aboriginal people. A search undertaken by the Department of the Premier and Cabinet Aboriginal Affairs and Reconciliation (DPC AAR) of the Central Archive including the Register of Aboriginal Heritage Sites and Objects has no entries for Aboriginal sites in relation to the Site, refer to **Attachment 6 – Confidential – DPC AAR Search Results** - provided separately.

Native Title on the Site has been extinguished as the land was held in fee simple prior to 1994.

A search of Local, State and Commonwealth register identified there is one (1) State Heritage place identified within the Site known as the Koounga Marble Quarry with the next closest heritage point located 1.6 km south east, refer to **Drawing No. 2492.DRG.016R1 –Topographic Map**. **Table 6 – Heritage Places Listing** provides information on the State and Local Heritage Sites.

Table 6 – Heritage Places Listing

Heritage No	Address	LGA	Details	Class	Direction from Site	Approximate Distance from Site
17707	Marble Quarry Road corner Vale Road, Koonunga	Light Regional Council	Koonunga Marble Quarry	Local	0.00	Within the Site
17708	Nietschke's Road, Koonunga	Light Regional Council	Farm Complex	Local	2.8 km	North east
17709	Kapunda Road corner Vale Road, Koonunga	Light Regional Council	Former Koonunga Post Office	Local	2.2 km	North
17716	Neukirch Road, Ebenezer	Light Regional Council	Neukirch Cemetery	Local	1.4 km	East
17715	Belvidere Road (Corner Diagonal Road), Ebenezer	Light Regional Council	Pilgrim's Lutheran Church	Local	2.6 km	East

(Source: *Nature Maps, 2023)*

No geological monuments are known to be present onsite or within the surrounding areas.

2.18 Proximity to Conservation Areas

A list of conservation areas and their proximity to the Site is provided in **Table 7 – Proximity to Conservation Areas** below.

Table 7 – Proximity to Conservation Areas

Conservation feature	Direction from Site	Approximate Distance from Site Boundary (km)
Kaiserstuhl Conservation Park	South east	18.5
Sandy Creek Conservation Park	South west	25.3

(Source: *Nature Maps, 2023)*

One (1) Heritage Agreement area has been identified within three (3) km of the Site - HA 604 is located 2.5 km south west.

2.19 Pre-existing Site Contamination and Previous Disturbance

There is no known pre-existing Site contamination or disturbance identified on the Environment Protection Authority (EPA) contamination site index for the Site.

Previous disturbance of areas onsite are related to agricultural and extraction activities historical and ongoing.

3. Description of the Proposed Mining Operations

Staged QDP and Staged Rehabilitation Plans provided in **Section 3 Description of the Mining Operations** highlight how the Site is to be extracted and rehabilitated in a staged manner to reduce the potential impacts on the surrounding receptors.

3.1 General Description and Maps of Operation

To support the MOP PEPR, a series of maps and plans have been provided including:

Topographic Map	***(Drawing No. 2492.DRG.016R1)***
Site Layout Plan	***(Drawing No. 2492.DRG.025)***
Regional Geology Map	***(Drawing No. 2492.DRG.008R1)***
Geological Cross Section	***(Drawing No. 2492.DRG.018R1)***
Geohazards Map	***(Drawing No. 2492.DRG.010R1)***
Visual Assessment Map	***(Drawing No. 2492.DRG.014R1)***
Land Access Map	***(Drawing No. 2492.DRG.006R1)***
Exempt Land Map	***(Drawing No. 2492.DRG.002R1)***
Quarry Development Plan – Stage 1	***(Drawing No. 2492.DRG.020AR1)***
Quarry Development Plan – Stage 1 Sections A-A' to D-D'	***(Drawing No. 2492.DRG.020B)***
Quarry Development Plan – Stage 2	***(Drawing No. 2492.DRG.021AR1)***
Quarry Development Plan – Stage 2 Sections A-A' to C-C'	***(Drawing No. 2492.DRG.021B)***
Quarry Development Plan – Stage 3	***(Drawing No. 2492.DRG.022AR1)***
Quarry Development Plan – Stage 3 Sections A-A' to D-D'	***(Drawing No. 2492.DRG.022B)***
Quarry Development Plan – Stage 4	***(Drawing No. 2492.DRG.023AR1)***
Quarry Development Plan – Stage 4 Sections A-A' to C-C'	***(Drawing No. 2492.DRG.023B)***
Conceptual Final Landform Plan	***(Drawing No. 2492.DRG.024AR1)***
Conceptual Final Landform Plan Sections A-A' to C-C'	***(Drawing No. 2492.DRG.024B)***
Access Route Map	***(Drawing No. 2492.DRG.005R1)***
Quarry Stormwater Management Plan	***(Drawing No. 2492.DRG.013R1)***

3.2 Resource and Products

3.2.1 Resources

The extractive mineral proposed to be extracted from the Site is Marble Limestone.

The quantities of the resource are based upon the calculation of material that was surveyed via an Unmanned Aerial Vehicle (UAV) versus a design that was implemented by a mining engineer with the use of Surpac and AutoCAD mining software and observations of the marble resource from within the active faces located within PM 111.

The attributed density is estimated at the following:

Marble Limestone 2.7 tonne per cubic metre (t/m3)

The overall reserves calculated for the Site include approximately 675.52 kilo tonnes (kt) (675,524.9 tonnes (t)).

The Marble generates both aggregate and road base products for use in the construction sector.

3.2.2 Production Rate and Products

The Marble generates both aggregate and road base products for use in the construction sector.

Rate of extraction is estimated to be approximately 10-000 - 30,000 tonnes per annum (t p/a) dependent on market demand. A breakdown of the estimated resources for each Stage at 30,000 t/pa is provided below in **Table 8 – Resource Estimates**. For reference, density of rock is calculated at 2.7 t/m3.

Table 8 – Resource Estimates

Stage	Volume (m3)	Tonnes	Approx. Years	Overburden (tonnes)
Stage 1	80,133	216,361	7	36,060
Stage 2	94,404	254,829	8	42,482
Stage 3	53,962	145,698	5	24,283
Stage 4	21,693	58,572	2	9,762
TOTAL	**250,194**	**675,524**	**22**	**112,587**

Topsoil onsite is limited due to outcropping of limestone at the ground level, however, has been estimated as 100 mm depth as shown within **Photo 1 – Topsoil Profile**. This equates to a total topsoil figure of approximately 7,391.3 m3 and when attributed a density of 1.8 t/m3 insitu, an estimated tonnage of 13,304.3 tonnes (t) estimated.

For the purposes of the MOP PEPR document, overburden has been estimated at 20 percent of extracted material. This equates to a total overburden figure of approximately 62,548.6 m3 and when attributed a density of 1.8 t/m3 insitu, an estimated tonnage of 112,587.4 tonnes (t) estimated.

During Stage 1, overburden will be utilised to rectify wall faces along the northern boundary of PM 111 and will also be utilised for battering of terminal faces and placed back onto the pit floor for final rehabilitation and return to grazing purposes.

A minimum volume of 52,644.6 t of overburden is required to achieve the conceptual final landform as provided in **Drawing No. 2492.DRG.024AR1 – Conceptual Final Landform Plan**, therefore sufficient overburden will be available with remaining overburden to be applied to the pit floor prior to application of topsoil.

3.3 Quarrying Activities

3.3.1 Type or types of quarry operation to be carried out

The proposed operation will use standard extraction methodologies that involve topsoil and overburden stripping, drilling and blasting, processing and stockpiling by mechanical means, and dispatch for use in the construction industry, refer to **Diagram 1 – Conceptual Extraction Operations**. Operations at the Site are to occur on a campaign basis in line with market demands. Overburden and topsoil are utilised in the staged rehabilitation of the Site.

Blasting occurs on an ‘as needs’ basis and will be dependent upon the market demand and production requirements up to four (4) times per annum at the highest market demand. When demand is stabilised blasting will be one (1) – two (2) times per annum. Blasting will be undertaken by a licenced contractor and explosives are to be bought in when needed, there is no storage of explosives onsite proposed as part of the operations.

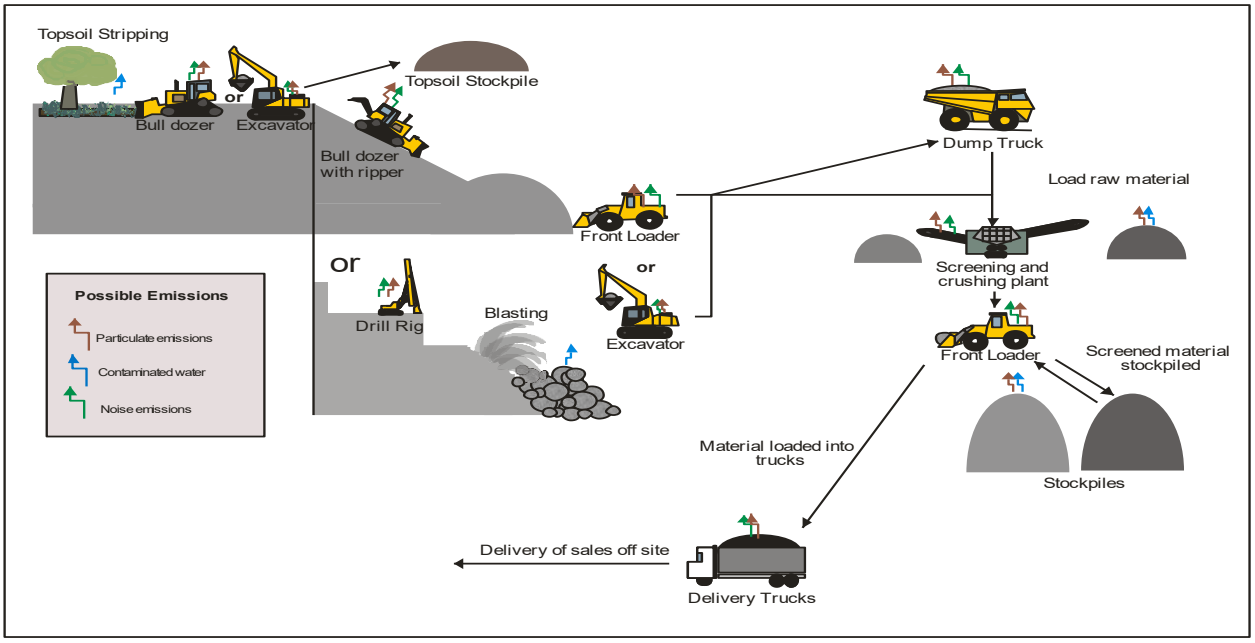


Diagram 1 – Conceptual Extraction Operations

The Pit is approximately 100 m (west to east) and 155 m in length (north to south) to a depth of 278 m AHD at the lowest pit floor level within the ML. PM 111 is approximately 243 m wide (west to east) and 145 m long (north to south) and 278 m AHD at the lowest pit floor level within the PM, with plans for new extraction areas to be lowered to 280 m AHD consistent with the ML area.

3.3.2 Type of Equipment

Equipment and plant to be typically utilised onsite includes:

- Five (5) piece mobile crushing plant consisting of Jaw, scalper, impactor, cone and three (3) deck screen
- 30t excavator and
- Two (2) x wheel loaders.

All equipment equipped with silencers to Australian standards.

3.3.3 Sequence of quarrying and progressive rehabilitation

Approximately half of ML 6556 will be disturbed by quarrying operations (the western portion), the remaining eastern half of ML 6556 will remain unextracted and cropped as per the landowner's request and agreement by Amulet Holdings. It has been left under tenement in the event the operator has to traverse the Site in order to rehabilitate the northern aspect of the adjacent PM 111. Grazing of the unextracted eastern portion of ML 6556 is also planned to occur with liaison of quarrying activities between landowner and operator with fencing to be constructed at agreed locations to ensure safe traverse of the Site.

As part of Stage 1 rehabilitation activities, overburden and topsoil from areas stripped within ML 6556 will be placed where current rocky outcropping prevents viable farming of arable areas as per **Drawing No. 2492.DRG.020AR1 – Quarry Development Plan – Stage 1**.

Pursuant to the requirements of Public Safety Strategy Lease Condition 10 for ML 6556 the construction of the pit edge batters will be undertaken as cut batters preventing the requirement for placement and compaction of fill to create the final landform, with the exception of a small portion of the northern boundary of PM 111 (as outlined within **Drawing No. 2492.DRG.020AR1 – Quarry Development Plan Stage 1**), where cut and fill of insitu material will be required for the establishment of the 1V:2H batter via the placement of overburden in two (2) m benches and compacted by HME. The material will consist of the Site's overburden material. The batters will be covered with available overburden and topsoil prior to being seeded with pasture grasses for stabilisation topsoil.

All other pit edge rehabilitation batters are intended to be established as cut batters into natural ground which will be covered with available overburden and topsoil from within the Site to support the ongoing land use as described within **Section 3.9 Description of Quarry Site at Completion**. Application of remaining overburden and topsoil will be placed on the pit floor. Surface water within the Site will be directed into the pit via gentle gradients along the quarry floor and graded surface water drainage lines to ensure that surface water does not leave the Site.

Importation of Waste Derived Fill (WDF) may be incorporated into the rehabilitated landform, however the area and extent of the WDF placement will be dependent upon market demand and proximity to local infrastructure projects within the Region. Where WDF is available, the incorporation into the rehabilitated landform will provide an enhancement of the rehabilitation activities that have been designed with the available material onsite outlined within the QDP.

Stage 1 – Quarry Development and Progressive Rehabilitation

Stage 1 of **Drawing No. 2492.DRG.020AR1 – Quarry Development Plan – Stage 1** shows development of the northern face of PM 111 easterly and then northerly into the Stage 1 portion of ML 6556. A final floor level of 280 mAHD will be realised with wall faces to be constructed at 1V:2H as per **Drawing No. 2492.DRG.020B – Quarry Development Plan – Stage 1 Sections A-A' to D-D'**.

Mobile crushing and screening plant and product stockpiles will be located within the pit floor of PM 111 Stage 4 area.

Progressive rehabilitation activities include the battering of pit edges to a 1V:2H batter and the rectification of the northern wall face within PM 111 via battering of wall face where possible and application of overburden refer to Section D-D' of **Drawing No. 2492.DRG.020B – Quarry Development Plan – Stage 1 Sections A-A' to D-D'**. Application of the overburden will be via use of Front End Loader (FEL) creating 0.5 m benching and compaction via machinery. The final batter will be applied with topsoil and scarified for promotion of natural regrowth.

As per the QDP a stock fence will be constructed within ML 6556 in agreeance with the landowner prior to extraction commencing with ML 6556.

All topsoil stripped from PM 111 will be stored to the west of the Site in topsoil bunds. Topsoil stripped from ML 6556 will be stored west of the extraction area within ML 6556 to ensure topsoil originally removed form ML 6556 is the only topsoil to be used in rehabilitation activities for that section. This includes the application of topsoil to the areas highlighted on Stage 1 plan as an outcome from consultation with the landowner.

Stage 1 extraction area will be approximately 1.43 ha and rehabilitation area approximately 0.43 ha.

Stage 2 – Quarry Development and Progressive Rehabilitation

Stage 2 of **Drawing No. 2492.DRG.021AR1 – Quarry Development Plan – Stage 2** shows development continuing in a northerly direction until reaching the end of Stage 2 within ML 6556. A final floor level of 280m AHD will be realised with wall faces constructed to 1V:2H batter as per **Drawing No. 2492.DRG.021B – Quarry Development Plan - Stage 2 Sections A-A' to C-C'**.

Mobile crushing and screening plant and product stockpiles will continue to be located within the pit floor of PM 111 Stage 4 area.

As per the QDP the stock fence will be relocated (when required) as Stage 2 progresses north to provide safe egress for the landowners accessing the eastern portion of ML 6556.

Topsoil stripped from ML 6556 will continue to be stored west of the extraction area within ML 6556 to ensure topsoil originally removed form ML 6556 is the only topsoil to be used in rehabilitation activities for that section.

The approximate extraction area will increase to 2.68 ha. Rehabilitation opportunities are limited as the quarry floor remains with extraction continuing to the northern extent of ML 6555, therefore progressive rehabilitation includes the battering of wall faces of to a 1V:2H and finalisation of Stage 1 activities.

Stage 3 – Quarry Development and Progressive Rehabilitation

Stage 3 of **Drawing No. 2492.DRG.022AR1 – Quarry Development Plan – Stage 3** shows development continuing towards the southern boundary of PM 111 and then turning to extract in an easterly direction until reaching the end of Stage 3 within PM 111.

A final floor level of 280m AHD will be realised with wall faces battered to 1V:2H as per **Drawing No. 2492.DRG.022BR1 – Quarry Development Plan – Stage 3 Sections A-A' to D-D'**.

Stage 3 includes the development of a new internal access haul road battered to 1V:8H with PM 111.

Mobile crushing and screening plant and product stockpiles will be located within the pit floor of PM 111 Stage 4.

The approximate extraction area will increase to 3.01 ha.

Progressive rehabilitation will be undertaken within the Stage 2 area as the extraction area reaches the terminal extents in conjunction with the extraction of Stage 3 with the placement of overburden generated from extraction within the pit or existing overburden already stored onsite, onto the pit floor of Stage 2 area as shown in **Drawing No. 2492.DRG.022AR1 – Quarry Development Plan – Stage 3** and application of topsoil. The approximate area progressive rehabilitated area will be 1.22 ha.

Stage 4 – Quarry Development and Progressive Rehabilitation

Stage 4 of **Drawing No. 2492.DRG.023AR1 – Quarry Development Plan – Stage 4** shows development continuing towards the eastern boundary of the Stage 4 extraction area.

A final floor level of 280 m AHD will be realised with wall faces battered to 1V:2H as per **Drawing No. 2492.DRG.023B – Quarry Development Plan – Stage 4 Sections A-A' to C-C'**.

Mobile crushing and screening plant and product stockpiles will be located within the pit floor of PM 111 Stage 4.

Progressive rehabilitation activities will commence within Stage 1 area and occur in conjunction with the extraction of Stage 4 with the placement of overburden generated from extraction within those pits or existing overburden already stored onsite, onto the pit floor of Stage 1 as shown in **Drawing No. 2492.DRG.023AR1 – Quarry Development Plan – Stage 4**.

The approximate area of extraction is 2.71 ha and approximately 2.27 ha rehabilitated of under active rehabilitation.

Upon complete extraction of Stage 4 final Site rehabilitation will commence as outlined within **Section 3.9 Description of Site at Completion** to return the land to the agreed end of life purpose of grazing within the rehabilitated areas of the Site and cropping within the undisturbed eastern portion of ML 6556.

3.3.4 Stockpiles

3.3.4.1 Topsoil and Subsoil Stockpiles

By landowner request, some overburden and topsoil will be spread along rocky outcrop areas within the southern portion of the ML 6556 and north east portion of Stage 1 as indicated on **Drawing No. 2492.DRG.020AR1 – Quarry Development Plan – Stage 1**. This will form part of the progressive rehabilitation of the Site in Stage 1 and assist develop the final landform use of a safe and stable landform for grazing purposes. It will also assist in the transition of some non-arable areas back to arable areas to increase farming yields.

Additional topsoil will be stored in two (2) m high stockpiles along the western side of PM 111 and ML 6556. Topsoil from each tenement is to be stockpiled separately and used for rehabilitation in the areas it was removed from.

Overburden will be generally contained with unused areas of PM 111 or placed in various areas on the Site near current extraction areas to be placed into progressive rehabilitation areas as soon as possible.

3.3.4.2 Product Stockpile

Product stockpiles will be located within the pit floor of the PM 111 and on the ML 6556 floor if necessary. The heights may be up to 10 m and will be stacked with the use of a FEL or via the use of a mechanical conveying stacker that is utilised throughout the mobile crushing and screening process.

3.3.5 Use of Explosives

There is no intent to store explosives onsite. All explosives are transported to the Site via a licenced contractor on the day of blasting.

Blasting is likely to occur up to four times per annum (market dependent) by a licenced and experienced contractor, however this is more likely to occur one (1) to two (2) times per annum.

All blasting events will be monitored and compliance with AS2187.2 and will be reported upon in the compliance reporting requirements. Additionally SA Water's technical standard, TS 0136 Pipework Access and Protection Section 12.4.2 4 (d) states the following criteria for blasting which is aligned to the Australia Standard and the Site's Outcome / Objective achievement:

d) Adhere to safe vibrations limits (peak particle velocities (PPV)) which SA Water may specify for a particular asset – in general, the maximum vibrations at the asset shall not exceed the limits provided in Table 8: Safe Vibration Limits (PPV) below.

Table 8: Safe Vibration Limits (PPV)

Vibration Type	Safe PPV Limit for Rigid Pipelines (AC, RC, VC, CI)	Safe PPV Limit for Flexible Pipelines	Safe PPV Limit for Masonry/Mass Concrete Oviforms
Continuous vibration	5 mm/s maximum	10 mm/s maximum	2 mm/s maximum
Intermittent or transient	10 mm/s maximum	20 mm/s maximum	

Blast vibration monitors will be set up at the two (2) nearest residents south west and north east of the Site as a result of consultation undertaken during the Mining Lease Proposal (MLP) for ML 6556 and one will be placed at the SA Water pipeline.

A notification protocol for adjacent landowners already exists for PM 111 and will apply to blasting within the whole Site, advising adjacent landowners of planned blasts 24 hours in advance.

3.3.6 Modes and hours of operation

Barossa Quarries propose to undertake operations between the hours outlined below, on a campaign basis:

- 7.00 am to 5.00 pm – Monday to Friday
- 7.00 am to 12.00 pm – Saturday
- Sundays and public holidays – No operations

3.4 Exploration Activities

The resource of Marble within the Site is well understood from historical extraction activities, therefore no further exploration activities are planned.

3.5 Crushing, Processing and Product Transport

3.5.1 Fixed Plant

No fixed plant will be located onsite.

Mobile plant will be transported to Site and located within PM 111 and ML 6556 when and where needed.

3.5.2 Hours of Operation

Refer to **Section 3.3.6 Modes and Hours of Operation**.

3.5.3 Processing Wastes

There are no processing wastes proposed to be generated onsite with all overburden to be utilised in rehabilitation within the Site.

Refer to **Section 3.3.4 Stockpiles** for information regarding overburden storage.

3.5.4 Industrial and Domestic Wastes

Industrial and domestic wastes will not be stored onsite. Any waste that is generated from minor servicing of plant and equipment will not be stored onsite and will be removed by the maintenance contractors at the time of undertaking the work.

3.6 Supporting Surface Infrastructure

3.6.1 Access and Roads

Access to Site will continue to be via the existing entry / exit point of PM 111 located on Marble Quarry Road. Trucks will approach from an easterly or westerly direction from Truro Road and turn onto Marble Quarry Road and travel south to the Site. Trucks leaving the Site will travel north along Marble Quarry Road and turn either easterly or westerly onto Truro Road dependent on delivery locations. **Drawing No. 2492.DRG.005R1 – Access Route Map** highlights the Site's entry and exit point and travel route. No new roads will need to be constructed.

Traffic volumes will vary dependent on extraction campaigns and market demand at any given time approximately up to ten (10) loads per day at the height of campaigns.

3.6.2 Accommodation and Offices

No accommodation or office facilities are to be located onsite.

3.6.3 Public Services and Utilities used by the Operation

No power is required as there will be no fixed plant or equipment located onsite.

Water is to be carted onsite and used for dust suppression as required.

3.6.4 Visual Screening

The Site is screened by a row of planted vegetation to the north and native vegetation located to the north east of the Site. Refer to **Drawing No. 2492.DRG.016R1 – Topographic Map** showing vegetation surrounding the area. Given

the proximity of sensitive receptors to the north and outcomes of engagement, it is unlikely that additional screening will be required to the north.

There is no plan to disturb the land within the eastern half of the ML area as per request from the landowner for cropping usage.

Trees screening is proposed along the PM to the south of the Site to alleviate views of the quarry the residence to the south west of the Site currently experiences of PM 111. This was agreed to during consultation undertaken throughout the ML 6556 MLP process. Refer to **Drawing No. 2492.DRG.020AR1 – Quarry Development Plan – Stage 1**.

3.6.5 Fuel and Chemical Storage

No fuel or chemicals are proposed to be stored onsite. All fuel is transported to Site via mobile fuel truck as required with refuelling of mobile equipment to occur within PM 111. Spill kits will be available onsite.

Blasting will be undertaken by a licenced contractor that will supply all materials required and remove upon completion of activities.

3.6.6 Site Security

The Site is fully fenced with rural barbed wire style fencing. Gates are located along the western side of the fence and at the entrance to PM 111, both of which are closed and locked outside of operations. The entrance gate to the Site is located at PM 111 where signage regarding Site's safety requirements are located. Signage will be placed along fencing warning of quarry faces. Due to the farming access of the adjacent land, clear delineation and fencing will be required to prevent unauthorised access to the Site. Additional post and wire stock fencing will be installed around the ML 6556 northern and eastern perimeter as extraction continues north into the ML operational area in agreement with the landowner.

3.6.7 Erosion, Sediment and Silt Control

Drawing No. 2492.DRG.013R1– Quarry Stormwater Management Plan highlights the delineation between disturbed and undisturbed areas of the Site and surrounds. **Drawing No. 2492.DRG.013R1 – Quarry Stormwater Management Plan** identifies surface water flows and drainage catchment areas within the Site. All surface waters from the disturbance areas within the Site will be directed into PM 111 floor which is approximately eight (8) m lower than the surrounding landform. Clean surface water derived from catchment areas outside of the quarry footprint will flow away from the future disturbance areas along existing overland flow paths.

3.7 Vegetation Clearance

As outlined in **Section 2.8 Vegetation, Weeds and Plant Pathogens** and as confirmed by Groundwork Plus Site visit on 23 March 2021, ML 6555 has been historically cleared for grazing, cropping and extraction purposes and there is no native vegetation present or required to be cleared. There are a few scattered trees located within PM 111 due to historical extraction activities. It is not planned to remove any vegetation within PM 111.

3.8 Site Water Management

Water will not be required for onsite processing and there will be no wastewater generated onsite.

Water will be used for dust suppression purposes as required within the Site during campaigns. Water will be carted onsite and it is estimated 4,000 litres (l) will be used annually and sourced from the Angaston Quarry (Bald Hill) as per current practices.

3.9 Description of Quarry Site at Completion

Liaison with the landowner has indicated that the final land use is to return to agricultural / grazing area and cropping to remain within the undisturbed areas of ML 6556. Final fencing is to be constructed along the southern property boundary of ML 6556.

Upon completion of Stage 4, rehabilitation of Stage 3 and Stage 4 will form part of the Site's final rehabilitation activities with the application of remaining overburden applied evenly to the pit floor.

The total final landform is to be contoured utilising the Site's remaining overburden and topsoil. Refer to **Drawing No. 2492.DRG.024AR1 – Conceptual Final Landform Plan** and **Drawing No. 2492.DRG.024B – Conceptual Final Landform Plan - Cross Sections A-A' to C-C'** for conceptual final landform incorporating placement of overburden, topsoil onto the pit floor. The pit edges will remain battered at a 1V:2H batter. A minimum of 0.5 m of overburden will be applied to the pit floor, but is expected to be greater than this with additional overburden estimated to be available for final rehabilitation. The haul road access to the pit floor will be maintained to allow access to pit floor by landowners if required.

The soil will be trafficked by Heavy Mobile Equipment (HME) and naturally compacted. Due to the proposed final use of grazing this is considered an acceptable strategy to further enhance the final land use. The final pit floor will then be scarified and seeded with grass seed suitable for grazing purposes.

For this reason, **Drawing No. 2492.DRG.024AR1 – Conceptual Final Landform Plan** and **Drawing No. 2492.DRG.024B – Conceptual Final Landform Plan - Cross Sections A-A' to C-C'** have been designed to outline a conceptual final landform that will ensure that the intended land use can successfully be achieved. The Conceptual Final Landform will be reviewed throughout each Stage of quarry development to ensure that it is consistent with the ongoing land use of the surrounding areas.

As a general guide, the following measures may be used to prepare the final landform:

- Using earthmoving equipment to progressively shape and trim the workings to the desired design profiles and flattening the gradients of batters to a stable angle of repose 1V:2H on reaching the terminal limits of extraction.
- Rounding or marrying the contours into the natural ground surface to soften the visual impacts and reflect the surrounding landscape.
- Application of overburden to pit floor and compacted by HME.
- Topsoiling of contours.
- Providing access to the terminal workings to allow maintenance of rehabilitation works.
- Designing landform and drainage to control erosion for the particular hydrological regime.
- Establishment of a gentle final floor gradient within ML 6556 and PM 111 that directs surface water towards surface water drains and eventually to the floor of the quarry preventing surface water flows from the final landform leaving the Site.
- Creating a final landform that is structurally safe and stable and facilitates the proposed post-extraction land use.

The following measures are to be implemented for topsoil spreading:

- Areas to be spread are to be re-profiled prior to placing of overlying materials.
- Equipment used to spread materials should be scheduled to avoid compaction.
- Before spreading, subsoils are to be loosened to break up any compacted or surface sealing and to enable keying of soils.
- Topsoil is to be removed from stockpiles in a manner that avoids vehicles travelling over the stockpiles.
- Topsoil is to be respread in the reverse sequence to its removal where possible so that the original upper soil layer is returned to the surface to re-establish the entrapped seed content of the soil where possible.
- Ensure all exposed subsoils are covered.
- After spreading topsoil, ensure the surface is left in a roughened state to assist moisture infiltration and inhibit soil erosion.

- Prior to any planting, cultivate any compacted or crusted topsoil surfaces.
- Soil spreading will be seeded with pasture grass as agreed with the landowner suitable for grazing.
- If erosion occurs on treated surfaces, the area is to be profiled and re-spread as necessary (note: traversing tracked machinery parallel to the slope gradient may assist in reducing the erosion potential of the re-profiled surface).

At the cessation of quarrying, all plant, equipment and structures will be removed, and the tenement will be surrendered. At this time the land will be entirely handed back to the landowner to continue grazing activities.

A formal landowner agreement will be established prior to the closure of the Site to document the requirements for ongoing management of the Site along with any potential residual liabilities that may remain within the agreed final landform. A copy of the Landowner Agreement will be provided to the administering authority prior to the final rehabilitation and decommissioning of the Site.

4. Consultation

As operations have remained continuous with PM 111 since the submission and approval of the MLP for ML 6556, the Site has continued to consult with the adjacent landowners as requested in advance of planned blasts within the Site.

The landowners have been consulted with during the development of the MOP PEPR to confirm final plans and rehabilitation activities with two (2) considerations incorporated into the plans and operations of the Site as follows:

1. **Fencing within ML 6556**
   As the landowners will continue to utilise the undisturbed eastern portion of ML 6556 for grazing activities where possible and the western portion for cropping activities, a stock fence was requested to be constructed to allow safe traverse of the Site and management of sheep. The stock fence will be relocated as extraction occurs northerly and a final fence constructed on the southern property boundary of ML 6556 prior to Tenement relinquishment as outlined with the QDPs.

   The construction of fencing for multiple stages and final landform has been reflected in quarry development plans and the confidential land deed. Fencing has been included as a control and management strategy for **Section 6.7 Public Safety**.

2. **Topsoil Management ML 6556**
   The Landowners requested all topsoil stripped from ML 6556 be stored independently from topsoil stripped within PM 111 and that this is the only topsoil replaced on the rehabilitated areas within ML 6556.

   The placement of topsoil from each extraction area has been reflected on quarry development plans, **Section 3.3.4 Stockpiles** and as control and management strategy within **Section 6.4 Soil Quality and Quantity**.

5. Management of Environmental Impacts

5.1 Introduction to Environmental Impact Assessment

As operations have been ongoing within PM 111 and the Site is regulated by a program that did not include objectives and criteria, the impact assessment is the mechanism that will update the MOP to align with the contemporary regulatory framework and utilise the outcome and measurement criteria for ML 6556 to align operational measures and reporting requirements.

To facilitate the management of potential environmental impacts at the Site in an efficient and effective manner, **Section 6 – Environmental Impacts** has been developed in accordance with the requirements of Section 73 G(1) of the *Mining Act 1971* and Ministerial Regulatory Guidelines – MG12 – *Guidelines for miners: preparation of a mine operations plan (MOP).*

This MOP PEPR seeks to address potential environmental impacts and mitigation measures for environmental aspects that are reasonably expected to be affected by the proposed operation. These are identified as the following:

- Surface water (Erosion, Silt and Stormwater Management)
- Noise
- Dust
- Visual effects
- Native vegetation and habitat (native fauna)
- Topsoil management
- Waste management
- Weeds, pests and plant pathogens
- Public safety
- Traffic
- Heritage
- Protection of third-party property
- Groundwater.

Environmental Impact Assessment, Control and Management Strategies and Objectives / Outcomes presented in the following section identifies:

- The environmental components, context and interests of any affected parties
- The potential environmental impacts that may be associated with the quarry activity
- The potential source, pathway and receptor associated with the impact
- Confirmation that the source, pathway and receptor are present for the associated impact
- A description of the uncertainties and assumptions associated with the impact assessment
- An evaluation of the sensitivity to change of the impact assessment.

Where the environmental impact source, pathway and receptor are confirmed to be present for a specific environmental impact the following information will also be provided:

- A description of the impact control and management strategies
- A description of the uncertainties and assumptions associated with the control and management strategies
- An evaluation of the sensitivity to change of the control strategies
- Objective and measurement criteria for each impact.

Where an environmental impact has been assessed and it consistent with an environmental impact within ML 6556, the ML outcome has been adopted for consistency across the Site.

Applicable Legislation and Standards for each environmental aspect is provided in **Attachment 7 – Legislation and Standards**.

The proposed outcomes and Objective / Outcome measurement criteria presented at the end of each impact assessment are limited to those associated with environmental aspects that are reasonably expected to be affected.

6. Environmental Outcomes, Strategies, Criteria and Monitoring

6.1 Noise

6.1.1 Context

The Site is located within an agricultural area with cropping and viticultural activities as the main land use surrounding the Site. As outlined within **Section 2.12 Proximity to Infrastructure and Housing** the nearest residences are located approximately 820 m north east and 780 m south west of the Site, refer to **Drawing No. 2492.DRG.006R1 – Land Access Map**.

The Site is to be operated on a campaign basis with operational hours as per:

- 7.00 am to 5.00 pm – Monday to Friday
- 7.00 am to 12.00 pm – Saturday
- Sundays and public holidays – No operations.

Plant and equipment and product stockpiles are all to be located within the Pit floor utilising the pit walls to assist minimise noise impacts.

6.1.2 Impact Assessment

Quarry Phase	**Potential impact event**			
Operational	Potential for noise generated from quarry operations to negatively impact on sensitive receptors (residents).			
Impact (ID)	**Source**	**Pathway**	**Receptor**	**Confirmation of the source pathway and receptor (Y/N)**
N1	Noise generated from HME, truck movements, operations and blasting.	Air	Nearest sensitive receptors as per **Drawing No. 2492.DRG.006R1 – Land Access Map**.	Yes
Uncertainty and assumptions				
The continuing low frequency of operations (campaign based), minimal frequency of blasting (up to four (4) times per annum, market demand based) within the Site and the distance to the nearest sensitive receiver is such that noise emissions are unlikely to significantly impact the receivers identified on **Drawing No. 2492.DRG.006R1 – Land Access Map**.				
Sensitivity to change				
Changes to the operational activities, duration, equipment could result in changes to noise emissions generated onsite.				
Justification for the confirmation / non-confirmation of Source, Pathway and Receptor				
Due to the proximity to the adjacent sensitive receptors, it is reasonable to expect that there could be the potential for noise to be generated from the quarry that could be audible.				

6.1.3 Control and Management Strategies

Control and Management Strategies
- Operations shall adhere to approved operating hours. - Equipment is to be maintained in accordance with the original equipment manufacturer's specifications. - Avoid unnecessary operation of plant and / or revving of engines, pumps, compressors (and shut down when not in use). - Noise complaints from neighbouring residents are recorded, investigated and responded to in a timely manner. - If crushing and screening is to be undertaken at the Site, crushing and screening mobile plant is to be situated on the pit floor, utilising the surrounding natural topography and lowered extraction area to shield the equipment from the direction of the sensitive receptors. - Notification of blasts to required stakeholders 24 hours prior to blasts occurring.
Uncertainty and Assumptions of Control Strategies
Potential impacts associated with noise nuisance are further reduced through the implementation of the control and management strategies which are considered reasonable and industry standard practice to protect sensitive receptors from noise nuisance.
Sensitivity to change of assumptions
Noise nuisance impacts may vary if there are significant changes to the operations of the Site and the sources and location on noise generating activities are changed. The sensitivity to change of assumptions is low based on the local topography, campaign-based nature of the operation and separation distance to the closest sensitive receptors.

6.1.4 Environmental Objective / Outcome and Measurement Criteria

The Outcome and outcome measurement criteria have been reviewed for ML 6556 and is deemed to be appropriate to be applied to the whole Site.

Noise		
Quarry Phase	**Impact ID**	**Objective / Outcome**
Operation	N1	The Tenement Holder must during construction and operation, ensure no public nuisance impacts from noise as result of mining operations.
Objective / Outcome Measurement Criteria		
1. Objective / Outcome Achievement 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 Mining Regulator. **2. What will be measured and the form of measurement** Acknowledgement and complaint resolution measured through review of quarry management records. **3. Location of measurement** At the sensitive receptor/s or alternative location as agreed with the Mining Regulator. **4. Frequency** Annually or as required following a complaint. **5. Control / Baseline Data** Not applicable. **6. Leading Indicator Criteria** Not applicable.		

6.2 Air Quality

6.2.1 Context

The Site is located within an agricultural area with cropping and viticultural activities as the main land use surrounding the Site. As outlined within **Section 2.12 Proximity to Infrastructure and Housing** the nearest residences are located approximately 820 m north east and 780 m south west of the Site, refer to **Drawing No. 2492.DRG.006R1 – Land Access Map**.

Plant and equipment and product stockpiles are all to be located within the Pit floor utilising the pit walls to assist minimise dust impacts. Water will be carted to Site and utilised to supress dust during operations on stockpiles, haul roads and sprayers on the crushing and screening plant.

6.2.2 Impact Assessment

Quarry Phase	**Potential impact event**			
Operational	Potential for nuisance dust emissions generated by operational activities to negatively impact on sensitive receptors (residents).			
Impact (ID)	**Source**	**Pathway**	**Receptor**	**Confirmation of the source pathway and receptor (Y/N)**
AQ1	Dust generated from onsite activities such as vehicle movements, product handling and dry weather conditions.	Air	Nearest sensitive receptors as per **Drawing No. 2492.DRG.006R1 – Land Access Map**.	Yes
Uncertainty and assumptions				
Operating hours for the Site will be as per **Section 3.3.7 Modes and hours of operation**. The Site operates under a campaign base where at times activities are limited within the Site. Crushing, transport and transfer of material within open areas will occur within the PM on the pit floor utilising the pit walls to reduce dust impacts. Overburden and topsoil bunds will be grassed by natural revegetation. Progressive rehabilitation to be undertaken as areas of the Site become terminal. The level of dust within the ambient environment is influenced by climatic conditions. It is common for drier seasons to contain higher levels of dust due to the extent of exposed soils, unsealed roads, cropped land and vineyards.				
Sensitivity to change				
Dust emissions from the Site may be influenced by changes to operational and climatic conditions.				
Justification for the confirmation / non-confirmation of Source, Pathway and Receptor				
It is reasonable to expect that a source, pathway and receptor may exist.				

6.2.3 Control and Management Strategies

Control and Management Strategies
Operational: - Use of water truck to ensure emissions from Site are minimised during campaigns (when required). - Dampen down cleared areas, extraction working areas, haul roads, stockpiles and other hardstand areas by water spraying. - Undertake ongoing visual inspections of Site operations and monitoring of wind and weather forecasts (BoM) to determine days when particular activities likely to generate dust are to be avoided due to unfavourable weather conditions (e.g. blasting, topsoil and overburden stripping). Increase dust suppression (watering) regime as required. - Undertake progressive rehabilitation of disturbed areas to the extent practicable. - Seeding of rehabilitated areas with local grass suitable for grazing purposes. - Establishment of the final landform and stabilisation with pastoral grasses in accordance with **Drawing No. 2492.DRG.024B – Conceptual Final Landform Plan**.
Uncertainty and Assumptions of Control Strategies
Potential impacts associated with air quality are reduced through the implementation of the control and management strategies, which are considered reasonable and industry standard practice to mitigate potential impacts.
Sensitivity to change of assumptions
The sensitivity to change of assumptions is low based upon current separation distances to sensitive receptors.

6.2.4 Environmental Objective / Outcome and Measurement Criteria

The Outcome and outcome measurement criteria have been reviewed for ML 6556 and is deemed to be appropriate to be applied to the whole Site.

Air Quality		
Quarry Phase	**Impact ID**	**Objective / Outcome**
Operational	AQ1	The Tenement Holder must during construction and operation, ensure that there are no public health and / or nuisance impacts from dust generated by mining operations.
Objective / Outcome Achievement		
1. Objective / Outcome Achievement Dust related complaints acknowledged within 48 hours and actioned appropriately within seven (7) days to the satisfaction of the Mining Regulator. If complaints are not resolved to the satisfaction of Mining Regulation, air quality monitoring is to occur at locations, and using methods, as agreed with the Mining Regulator, to demonstrate: • dust deposition leaving the tenement does not exceed 4g/m2/month in accordance with Australian Standard AS 3580.10.1 *Methods for sampling and analysis of ambient air – Determination of particulates – Deposited matter – Gravimetric method.* **2. What will be measured and the form of measurement** Records of dust complaints acknowledged and actioned with satisfactory resolution. In the event dust monitoring is undertaken, it will be undertaken in accordance with *Australian Standard AS 3580.10.1 Methods for sampling and analysis of ambient air – Determination of particulates – Deposited matter – Gravimetric method.* **3. Location of measurement** Between the receptor and the operations as agreed with the Mining Regulator.		

4. **Frequency**
   As required following a complaint.
5. **Control / Baseline Data**
   Not applicable.
6. **Leading Indicator Criteria**
   Not applicable.

6.3 Weeds, Pests and Plant Pathogens

6.3.1 Context

Section 2.8.1 Weed and Plant Pathogens discuss weeds, pests and plant pathogens that are present onsite with the PM and ML area. **Section 2.9 Fauna** outlines pests and fauna are likely to occur in the area.

Due to the current land use of cropping within ML 6556, the Site actively undertakes regular weed and pest management. Weed management practices within PM 111 are regularly undertaken to control weeds with a large portion of the Site operational.

Consultation with the landowner raised no concerns with weed management.

6.3.2 Impact Assessment

Quarry Phase	**Potential impact event**			
Operational	Introduction of declared weed or pest species, or plant pathogens as a result of the quarrying activity.			
Impact (ID)	**Source**	**Pathway**	**Receptor**	**Confirmation of the source pathway and receptor (Y/N)**
W1	HME and light vehicles	Movement of vehicles on roads, spreading weeds	Operational area and onsite vegetation	Yes
Uncertainty and assumptions				
The source, pathway and receptor are well understood.				
Sensitivity to change				
Heavy vehicle movements from offsite could result in weed propagules being brought onto Site. Portions of ML 6556 are actively cultivated, will remain so and subject to ongoing weed management, with the weeds noted as present onsite within the uncropped area of ML 6556 (grazed area) and the majority of PM 111 area cleared from historic operations. The presence of weed species within the Site may change depending upon seasonal variations and climatic conditions as the quarry development footprint progresses. The Site may contain weed seed and propagules within the soil that were not observed at the time of the Site inspection but could emerge naturally if the Site is not cultivated.				
Justification for the confirmation / non-confirmation of Source, Pathway and Receptor				
Quarry sites by their nature contain a lot of exposed soil that is often prone to weed infestation.				

Quarry Phase	Potential impact event			
Site Closure	Introduction of declared weed or pest species, or plant pathogens as a result of the quarry closure activities.			
Impact (ID)	**Source**	**Pathway**	**Receptor**	**Confirmation of the source pathway and receptor (Y/N)**
W2	HME and light vehicles	Rehabilitation activities	Rehabilitated Landform	Yes
Uncertainty and assumptions				
The source, pathway and receptor are well understood.				
Sensitivity to change				
Heavy vehicle movements from offsite to rehabilitate the Site could result in weed propagules being brought onto Site. The Site may contain weed seed and propagules within the soil that were not observed at the time of the Site inspection but could emerge naturally when the Site is rehabilitated.				
Justification for the confirmation / non-confirmation of Source, Pathway and Receptor				
It is reasonable to expect that a source, pathway and receptor may exist.				

6.3.3 Control and Management Strategies

Control and Management Strategies
- All earthmoving equipment will be clean and weed free prior to being transported to the Site. - Controlling weed infestations to prevent further spread of weeds. - Annual weed spraying campaigns throughout the Site and rehabilitated areas, with additional spraying campaigns (e.g. spot spray, bi-annual sprays) undertaken as necessary in consultation with the landowner. - Restrict movement of vehicles and machinery to project area and established access tracks where vehicle movements can be concentrated. - Storage of topsoil stripped from ML 6556 to be stored separately from PM 111 topsoil, with both stockpiles to be managed within weed management programs.
Uncertainty and Assumptions of Control Strategies
Declared weed and pest species will be controlled through regular inspections and implementation of controls. The strategies are considered to be industry standard practice.
Sensitivity to change of assumptions
The presence of weed species within the Site may change depending upon seasonal variations, climatic conditions as the quarry development footprint progresses.

6.3.4 Environmental Objective / Outcome and Measurement Criteria

The Outcome and outcome measurement criteria have been reviewed for ML 6556 and is deemed to be appropriate to be applied to the whole Site.

Weeds, Pests and Plant Pathogens		
Quarry Phase	**Impact ID**	**Objective / Outcome**

Operational	W1	The Tenement Holder must during construction, operation and post-completion, ensure no introduction of new species of environmental weed, plant pathogens or pests (including feral animals), not sustained increase in the abundance of existing weed or pest species on the Land.

Objective / Outcome Achievement

1. **Objective / Outcome Achievement**
   Records of annual inspections undertaken in Spring, are held by the operator to demonstrate no introduction of new weeds, pests or plant pathogens nor an increase in abundance of existing weeds and pests onsite.

   Records demonstrate following the first inspection, creation of baseline data report occurs listing identified weeds and average density for the PM and ML operating areas.

2. **What will be measured and the form of measurement**
   Records of inspections.

   Record of baseline data weed assessment.

3. **Location of measurement**
   Within PM 111 and ML 6556.

4. **Frequency**
   Annually in Spring.

5. **Control / Baseline Data**
   Not Applicable.

6. **Leading Indicator Criteria**
   Not Applicable.

Weeds, Pests and Plant Pathogens		
Quarry Phase	**Impact ID**	**Objective / Outcome**
Closure	WP2	The Tenement Holder must during construction, operation and post-completion, ensure no introduction of new species of environmental weed, plant pathogens or pests (including feral animals), not sustained increase in the abundance of existing weed or pest species on the Land.

Objective / Outcome Achievement

1. **Objective / Outcome Achievement**
   Records of inspection undertaken prior to tenement relinquishment, demonstrate no introduction of new weeds, pests or plant pathogens nor an increase in abundance of existing weeds and pests onsite.

2. **What will be measured and the form of measurement**
   Record of final inspection demonstrates no increase in abundance of weeds or introduction of new weeds species greater than the Baseline Weed Assessment Report.

3. **Location of measurement**
   Within PM 111 and ML 6556.

4. **Frequency**
   Once prior to EML and PM relinquishment.

5. **Control / Baseline Data**
   Baseline Weed Assessment Report.

6. Leading Indicator Criteria
Not Applicable.

6.4 Soil Quality and Quantity

6.4.1 Context

A Site inspection by Groundwork Plus (September 2020) noted the Site has shallow topsoil (100 – 200 mm) within a rocky outcrop with the majority of the PM 111 already disturbed and topsoil stockpiled. A review of overburden amounts within the Site has identified sufficient overburden is available for rehabilitation of the northern wall face and application to on the terminal areas of the pit floor.

Consultation with the landowner during the MLP resulted in a request from the landowner to place some available topsoil and overburden generated from Stage 1 and 2 on the rocky outcrop areas within the undisturbed areas on ML 6556 to convert those currently rocky outcropped areas into viable cropping areas. The request has been considered and presented as indicated on **Drawing No. 2492.DRG.020A – Quarry Development Plan Stage 1**. **Section 3.3.4 Stockpiles** outlines overburden and topsoil management for the Site. Additionally, the landowner has requested all topsoil removed from ML 6556 is stored independently from PM 111 and only used in rehabilitation activities within ML 6556.

6.4.2 Impact Assessment

Quarry Phase	**Potential impact event**			
Operational	Failure to strip, stockpile and conserve topsoils and subsoils in an efficient and effective manner intended for re-use in rehabilitation.			
Impact (ID)	**Source**	**Pathway**	**Receptor**	**Confirmation of the source pathway and receptor (Y/N)**
TS1	Quarry development	Topsoil stripping	Landform	Yes
Uncertainty and assumptions				
Future development of the QDPs will require topsoil and overburden stripping. Topsoil is likely to be shallow and vary in depth (100mm – 200mm) throughout the quarry footprint and Site inspections show areas of rocky outcropping is evident within the undisturbed footprint. The area identified as cropped land in ML 6556 will remain undisturbed. The area identified for rehabilitation to grazing in ML 6556 is currently supporting this land use and is where the rocky outcropping is present. The amount of overburden required for rehabilitation purposes has been review and identified as adequate for reapplication and to support stabilisation for Site prior to respread of topsoil.				
Sensitivity to change				
Unlikely to change.				
Justification for the confirmation / non-confirmation of Source, Pathway and Receptor				
It is reasonable to expect that the source, pathway and receptor exist as topsoil stripping is likely to be required during future stages of quarry development.				

Quarry Phase	Potential impact event			
Site Closure	Insufficient application of topsoil on progressively rehabilitated landforms resulting in failed rehabilitation.			
Impact (ID)	**Source**	**Pathway**	**Receptor**	**Confirmation of the source pathway and receptor (Y/N)**
TS2	Quarry development	Topsoil stripping	Landforms	Yes
Uncertainty and assumptions				
Sufficient volumes of topsoil and overburden have been calculated as sufficient to utilise for rehabilitation activities. Topsoil required only for pit floor once pit areas have reached terminal extents. Final landform activities are to return the land to grazing activities which requires sufficient topsoil for pasture grass and natural vegetation of the area. The area identified as cropped land in ML 6556 will remain undisturbed. The area identified for rehabilitation to grazing in ML 6556 is currently supporting this land use and is where the rocky outcropping is present, it is therefore expected rehabilitation activities can be met.				
Sensitivity to change				
The availability of topsoil for incorporation within the future rehabilitation activities is dependent upon the extent of rehabilitation area to be covered and topsoil available onsite.				
Justification for the confirmation / non-confirmation of Source, Pathway and Receptor				
Development of the Site requires the establishment of topsoil stockpiles which are required to be rehabilitated.				

6.4.3 Control and Management Strategies

Control and Management Strategies
Construction and Operation: - Soils to be stripped ahead of quarrying and temporarily stockpiled. - Stockpiles of topsoil shall not exceed two (2) m in height. - Wherever possible, soils should be used directly on areas being rehabilitated. - Compaction of topsoils by vehicles tracking over stockpiles should be avoided. - All topsoil stockpiles are to be regularly inspected and managed for weed infestation. - Maintain independent topsoil stockpiles for ML 6556 and PM 111. **Closure:** - Stockpiles of topsoils are stored, maintained and monitored prior to being used for progressive rehabilitation. - Ensure soils are spread on rehabilitation areas to a sufficient depth to support vegetation growth**.** - Use of topsoil removed from ML 6556 utilised only in rehabilitation for that area.
Uncertainty and Assumptions of Control Strategies
There is a low degree of uncertainty and assumptions pertaining to the control and management strategies which are considered reasonable and industry standard practice.
Sensitivity to change of assumptions
Unlikely to change

6.4.4 Environmental Objective / Outcome and Measurement Criteria

The Outcome and outcome measurement criteria have been reviewed for ML 6556 and is deemed to be appropriate to be applied to the whole Site.

Soil Quality and Quantity		
Quarry Phase	**Impact ID**	**Objective / Outcome**
Operational	SQ1	The Tenement Holder must, during construction, operation and post-completion, ensure the existing (pre-mining) soil quality and quantity is maintained.

Objective / Outcome Achievement

1. **Objective / Outcome Achievement**
   Annual inspection and recording of soil stockpiles at the Site to confirm that:
   - Topsoil stockpiles are kept separate from subsoil stockpiles (if applicable).
   - There is no evidence of erosion (e.g. rills, gullies) or other evidence of topsoil loss.
   - Stockpiles of topsoils do not exceed two (2) m in height.

2. **What will be measured and the form of measurement**
   Records of inspections documenting evidence of topsoil stockpile heights and condition.

3. **Location of measurement**
   Within PM 111 and ML 6556.

4. **Frequency**
   Annually.

5. **Control / Baseline Data**
   Not applicable.

6. **Leading Indicator Criteria**
   Not applicable.

Soil Quality and Quantity		
Quarry Phase	**Impact ID**	**Objective / Outcome**
Closure	SQ2	The Tenement Holder must, during construction, operation and post-completion, ensure the existing (pre-mining) soil quality and quantity is maintained.

Objective / Outcome Achievement

1. **Objective / Outcome Achievement**

   A Site inspection report undertaken by a suitably qualified person following full rehabilitation work and 12 months post completion will verify that the final landform has been established and maintained in a stable state capable to support vegetation growth within rehabilitation areas.

2. **What will be measured and the form of measurement**
   Records of inspection at quarry completion documenting evidence of final landform establishment with suitable overburden and topsoil application to support vegetation growth.

   Records of inspection 12 months post quarry completion documenting evidence of soil loss i.e. scour within rehabilitation areas, and capability of soil to support plant growth.

3. **Location of measurement**

Rehabilitation areas within PM 111 and ML 6556.

4. **Frequency**
   At quarry completion and 12 months post quarry completion.
5. **Control / Baseline Data**
   Not applicable.

6. **Leading Indicator Criteria**
   Not applicable.

6.5 Waste Management

6.5.1 Context

As outlined in **Section 3.5.4 Industrial and Domestic Waste**, discusses waste management at the Site. Industrial and domestic wastes will not be stored onsite. Any waste that is generated from minor servicing of plant and equipment will be removed by the maintenance contractors at the time of undertaking the work.

No fuels or chemicals are planned to be stored onsite as outlined within **3.6.5 Fuel and Chemical Storage**. All plant and equipment will be fuel offsite or via a mobile fuel truck. Spill kits will be available onsite.

6.5.2 Impact Assessment

Quarry Phase	**Potential impact event**			
Operational	Soil and water contamination caused by inappropriate storage, handling and disposal of waste.			
Impact (ID)	**Source**	**Pathway**	**Receptor**	**Confirmation of the source pathway and receptor (Y/N)**
WM1	Commercial and industrial waste	Spill to land	Landform, post quarry land users	Yes
Uncertainty and assumptions				
The potential source, pathway and receptor is well understood. No fuel or chemicals are proposed to be stored onsite. All fuel will be transported to Site as required via fuel trucks. All waste will be removed by contractors at the completion of activities. If required, blasting will be undertaken by a licenced contractor that will supply all materials.				
Sensitivity to change				
Not likely to change.				
Justification for the confirmation / non-confirmation of Source, Pathway and Receptor				
There will be no storage of wastes onsite It is reasonable to assume to expect that the source, pathway and receptor is well understood.				

Quarry Phase	Potential impact event			
Site Closure	Soil and water contamination caused by inappropriate storage, handling and disposal of wastes remaining onsite post quarry closure.			
Impact (ID)	**Source**	**Pathway**	**Receptor**	**Confirmation of the source pathway and receptor (Y/N)**
WM2	Commercial and industrial waste (i.e. oils, tyres etc.) Plant and Equipment	Disused plant and equipment	Landform, groundwater, post quarry land users	Yes
Uncertainty and assumptions				
Industrial and domestic waste are typically associated with the maintenance of plant and machinery associated with quarrying activities. It is assumed mobile plant is transported to and from Site continues for the life of the quarry. Contractors to manage waste and remove from Site appropriately. Groundwater is not present 18 m BGL from within the lowest point of the pit floor.				
Sensitivity to change				
Not likely to change.				
Justification for the confirmation / non-confirmation of Source, Pathway and Receptor				
Due to the nature of quarry operations, it is reasonable to expect that a source, pathway and receptor may exist for waste within the Site post closure.				

6.5.3 Control and Management Strategies

Control and Management Strategies
Operational: - No storage of wastes onsite. All wastes will be removed from the Site during the period of operations. - All quarry related infrastructure (scrap metal, parts etc.) will be removed from Site unless agreed in writing by the landowner. - Any spill of potential contaminants shall be cleaned up immediately. - Any industrial waste that is generated from servicing of plant and equipment is removed by the maintenance contractors undertaking the work. - Trackable wastes disposed by licenced operator at an approved facility. **Closure** - Adherence to **Drawing No. 2492.DRG.024AR1 – Conceptual Final Landform Plan** and **Drawing No. 2492.DRG.0024B – Conceptual Final Landform Plan Cross Sections A- A' to C-C'**. - Remove any items of quarry related infrastructure at the cessation of the operation (i.e. graveyard items (e.g. scrap metal, parts, tyres, bearings etc.). - Landowner agreements will be finalised prior to Tenement(s) revocation to agree on any remaining landform features or structures on the land.
Uncertainty and Assumptions of Control Strategies

There is a low degree of uncertainty and assumptions pertaining to the control and management strategies which are considered reasonable and industry standard practice.
Sensitivity to change of assumptions
Not likely to change

6.5.4 Environmental Objective / Outcome and Measurement Criteria

The Outcome and outcome measurement criteria have been reviewed for ML 6556 and is deemed to be appropriate to be applied to the whole Site.

Waste Management		
Quarry Phase	**Impact ID**	**Objective / Outcome**
Operational	WM1	The Tenement Holder must, during construction, operation and post completion, ensure that all commercial, industrial and domestic waste produced as a result of mining operation is disposed of in accordance with relevant legislation.
Objective / Outcome Achievement		
1. Objective / Outcome Achievement Annual inspection of the Site confirms that no storage of waste has occurred onsite. All waste tracking receipts are stored at the Site and will demonstrate that listed waste materials generated by quarry operations have been disposed of by a licenced contractor at an appropriate EPA licenced facility. **2. What will be measured and the form of measurement** Quarry management records of waste removal and waste tracking receipts. **3. Location of measurement** Within PM 111 and ML 6556 **4. Frequency** Annually **5. Control / Baseline Data** Not applicable. **6. Leading Indicator Criteria** Not applicable.		

Waste Management		
Quarry Phase	**Impact ID**	**Objective / Outcome**
Completion	WM2	The Tenement Holder must, during construction, operation and post completion, ensure that all commercial, industrial and domestic waste produced as a result of mining operation is disposed of in accordance with relevant legislation.
Objective / Outcome Achievement		
1. Objective / Outcome Achievement Closure inspections to confirm no waste spill to the surface. Any items of quarry related infrastructure (scrap metals, parts, tyres, bearing, etc.) have been removed (unless agreed in writing with the landowner). **2. What will be measured and the form of measurement**		

Site inspection records, photographic evidence and or landowner agreement.

3. **Location of measurement**
   Within PM 111 and ML 6556

4. **Frequency**
   Once prior to the PM and ML revocation application.

5. **Control / Baseline Data**
   Not applicable.

6. **Leading Indicator Criteria**
   Not applicable.

6.6 Waste Derived Fill

6.6.1 Context

As outlined within **Section 3.5.4 Industrial and Domestic Waste**, WDF material (waste soil for direct re-use) is proposed to be imported at the Site for incorporation into the rehabilitation works as a beneficial re-use of material and to help improve the growing medium for vegetation within rehabilitated areas. The rehabilitation plans are not dependent on the availability of WDF material but is intended to complement and enhance rehabilitation activities should WDF material be available.

Overburden amounts have been calculated at 20% of the extraction area and found to be more than sufficient to achieve final landform. Importation of Waste Derived Fill (WDF) may be incorporated into the rehabilitated landform, however the area and extent of the WDF placement will be dependent upon market demand and proximity to local infrastructure projects within the Region. Where WDF is available, the incorporation into the rehabilitated landform will provide an enhancement of the rehabilitation activities that have been designed with the available material onsite outlined within the QDPs.

6.6.2 Impact Assessment

Quarry Phase	**Potential impact event**			
Operational	Soil and water contamination caused by inappropriate storage, handling and disposal of WDF material (waste soil for direct re-use).			
Impact (ID)	**Source**	**Pathway**	**Receptor**	**Confirmation of the source pathway and receptor (Y/N)**
WDF1	Receipt and processing of WDF (waste soil for direct reuse)	Imported soil.	Landform, groundwater, post quarry Land users	Yes
Uncertainty and assumptions				
The use of WDF is planned to be used as an enhancement for final rehabilitation of the Site given the calculations of topsoil and overburden are sufficient to support final land rehabilitation activities. Barossa Quarries will be informed of the classification of WDF through the provision of independent reports and soil classification provided by third parties seeking to supply WDF to the Site.				

WDF for re-use (meaning waste soil for direct re-use) means waste consisting of clay, concrete, rock, sand, soil or other inert mineralogical matter in pieces not exceeding 100 mm in length and containing chemical substances in concentrations less than the concentrations for those substances set out in *Part 1, Regulation 3 of the Environment Protection Regulations 2023* and the EPA *Standard for the production and use of Waste Derived Fill 2013*. The quantity of WDF will be influenced by market variations and availability from infrastructure projects.
Sensitivity to change
Not likely to change.
Justification for the confirmation / non-confirmation of Source, Pathway and Receptor
It is reasonable to expect that the source, pathway and receptor will be present where the receipt of WDF occurs onsite.

6.6.3 Control and Management Strategies

Control and Management Strategies
Operational - All WDF material accepted into site for use in rehabilitation must meet EPA *Standard for the Production and Use of Waste Derived Fill* (October 2013). - Proof of determination that the source site of WDF- Waste Soil (for direct reuse) material has not had a Potentially Contaminating Activity occur. - Maintain records and details of receipt of all WDF fill material including source site, volume and contractor / company. - Undertake visual Inspections Waste Soil loads entering the Site and refuse material which does not meet WDF criteria. - Acceptance of additional WDF "Waste Soil' must be accompanied by written, signed and dated certification from a suitably qualified person stating that the waste constitutes Waste Fill when it exceeds 100 tonne (t) from a single source site unless otherwise approved by the EPA in writing. - The receipt of WDF will be undertaken and recorded in accordance with **Attachment 8 - Waste Derived Fill Procedure and Protocol and Waste Derived Fill Acceptance Form**. - WDF will be placed directly into the areas for reuse and only in areas required to be rehabilitated. - A detailed Waste Derived Fill Management Plan will be submitted to the Department of Energy and Mining and EPA for approval prior to the acceptance and use of WDF acceptance. **Closure** - Adherence with rehabilitation plans as outlined in **Drawing No. 2492.DRG.024AR1 – Conceptual Final Landform Plan** and **Drawing No. 2492.DRG.0024B – Conceptual Final Landform Plan Cross Sections A- A' to C-C'.**
Uncertainty and Assumptions of Control Strategies
Assume adherence to quarry development and rehabilitation plans.
Sensitivity to change of assumptions
Not likely to change.

6.6.4 Environmental Objective / Outcome and Measurement Criteria

The Outcome and outcome measurement criteria have been reviewed for ML 6556 and is deemed to be appropriate to be applied to the whole Site.

Waste Derived Fill		
Quarry Phase	**Impact ID**	**Objective / Outcome**
Closure	WDF 1	The Tenement Holder must ensure no adverse impacts to the environment from waste-derived fill brought onto the land as a result of mining operations unless otherwise authorised by the relevant legislation.

Objective / Outcome Achievement

1. **Objective / Outcome Achievement**
   Quarry management records demonstrate that WDF materials imported to the Site are weighed, documented and re-used in accordance with the requirements of *EPA Standard for the production and use of WDF - Waste Soil (for direct reuse) (EPA, 2013)*.

2. **What will be measured and the form of measurement**
   Quarry management records of WDF tracking receipts.

3. **Location of measurement**
   Within ML 6556 and PM 111.

4. **Frequency**
   Annually.

5. **Control / Baseline Data**
   No applicable.

6. **Leading Indicator Criteria**
   Not applicable.

6.7 Public Safety

6.7.1 Context

The Site is located in a rural area predominately accessed only by local residents. The proximity of the nearest sensitive receptors is discussed in **Section 2.12 Proximity to Infrastructure and Housing**. Site is surrounded by agricultural lands (grazing, cropping and viticulture) and is not directly accessed by members of the public.

Currently, the Site is fenced with rural stock fencing along the boundaries of the PM and the parcel of land ML 6556 is situated within. Signage is proposed to be installed along the perimeter of the Site warning members of the public of quarry faces. Access to the Site will be via the entrance of the PM 111 gates which are locked when not in use. Additional post and wire stock fencing will be installed around ML northern and eastern perimeters and relocated as extraction continues north into the ML area, in agreement with the landowner.

The Site will return to a final land use of grazing. The marble rock source (marble) is competent and stable and will not present any geotechnical concerns at a 1H:2V final batter.

6.7.2 Impact Assessment

Quarry Phase	Potential impact event
Operational	Public injury and / or death due to members if the public entering the Site and interacting with quarry development / HME during the operational phase.

Impact (ID)	Source	Pathway	Receptor	Confirmation of the source pathway and receptor (Y/N)
PS1	Site and heavy vehicle movements	Unauthorised public access to the quarry	General Public	Yes
Uncertainty and assumptions				
The impact assessment assumes that trespassers may enter the Site however is low given the lack or sensitive receptors and location within a rural area. The condition of the fencing will remain in good order; however, it could be subject to vandalism. All access is via the Site entrance at PM 111 of which the Site is locked when not in use. The Site is fully fenced.				
Sensitivity to change				
Unlikely to change.				
Justification for the confirmation / non-confirmation of Source, Pathway and Receptor				
It is possible that the Site could be affected by trespassers although the likelihood of this is low.				

Quarry Phase	Potential impact event			
Site Closure	Public injury and / or death due to members of the public entering the Site and interacting with quarry development and final landform post closure.			
Impact (ID)	**Source**	**Pathway**	**Receptor**	**Confirmation of the source pathway and receptor (Y/N)**
PS2	Site rehabilitated landform	Unauthorised public access	General public	Yes
Uncertainty and assumptions				
The impact assessment assumes that trespassers may enter the Site however is low given the lack or sensitive receptors and location within a rural area. The condition of the fencing will remain in good order; however, it could be subject to vandalism. Rock source (Marble) is a competent rock source to maintain stability for the post completion landform.				
Sensitivity to change				
Unlikely to change.				
Justification for the confirmation / non-confirmation of Source, Pathway and Receptor				
It is possible that the Site could be affected by trespassers post closure.				

6.7.3 Control and Management Strategies

Control and Management Strategies
Operational: - Regular inspection of Site fencing, signage and gates to ensure that they are adequately maintained. - Installation of signs warning of dangers within the quarry Site. - Installation of additional fencing around the ML 6556 northern and eastern perimeter as extraction continues north into the ML 6556 area. - Rehabilitation of the northern wall face during Stage 1. - Site is constructed in accordance with the following QDPs – **Drawing No. 2492.DRG.020AR1 – Quarry Development Plan – Stage 1, Drawing No. 2492.DRG.021AR1 – Quarry Development Plan – Stage 2, Drawing No. 2492.DRG.022AR1 – Quarry Development Plan – Stage 3 and Drawing No. 2492.DRG.023AR1 – Quarry Development Plan – Stage 4.** - Batter angles are constructed to 1V:2H batter through blasting and shaping and contouring with HME to ensure slope is stabilised. **Closure:** • Ensure the post-extraction landform is safe, stable and suitable for the desired long-term land use of grazing. • The Conceptual Final Landform **Drawing No. 2492.DRG.024AR1 – Conceptual Final Landform Plan** is maintained in accordance with the following QDPs showing flattening of the batter angles to establish a safe and stable landform. • Application of remaining overburden evenly in layers across the pit floor with compaction of rehabilitated landform via HME trafficking compaction. • Application of topsoil and stabilisation through planting of grasses suitable for grazing purposes as agreed with the Landowner/s. • Final installation of fencing on southern boundary of ML 6556.
Uncertainty and Assumptions of Control Strategies
The potential impacts to public safety are reduced, provided that the operator adheres to the control and management strategies which are considered reasonable and industry standard practice.
Sensitivity to change of assumptions
Sensitivity to change may be likely based upon the rate of rehabilitation, which is subject to market demand and the generation of overburden products on-site for use in establishing the final landform.

6.7.4 Environmental Objective / Outcome and Measurement Criteria

The Outcome and outcome measurement criteria have been reviewed for ML 6556 and is deemed to be appropriate to be applied to the whole Site.

Public Safety		
Quarry Phase	**Impact ID**	**Objective / Outcome**
Operational	PS1	The Tenement Holder must, during construction and operation, ensure that there are no public injuries and / or deaths resulting from unauthorised entry to the Land that could have been reasonably prevented.
Objective / Outcome Achievement		
1. Objective / Outcome Achievement All public injuries and / or deaths resulting from unauthorised access to the mine Site are recorded in Mine Logbook and investigated by a suitably qualified third party within one (1) calendar month (or other time as agreed with Mining Regulator), and the results of the investigation show that the incident could not have been reasonably prevented by the Tenement Holder. **2. What will be measured and the form of measurement**		

Quarry records of incidents and results of investigations by a suitably qualified third-party.

3. **Location of measurement**
   Within ML 6556 and PM 111.

4. **Frequency**
   Within one (1) month (or as agreed with the Mining Regulation) after an incident.

5. **Control / Baseline Data**
   Not applicable.

6. **Leading Indicator Criteria**
   Not applicable.

Public Safety		
Quarry Phase	**Impact ID**	**Objective / Outcome**
Closure	PS2	The Tenement Holder must demonstrate that, post completion, the risks to health and safety of the public so far as they may be affected by mining operations, are as low as reasonably practicable.

Objective / Outcome Achievement

1. **Objective / Outcome Achievement**
   Final landform to be constructed in accordance with approved final designs and inspected by a certified engineer at completion to ensure geotechnical stability of final landform.

2. **What will be measured and the form of measurement**
   Inspection to confirm final batter angles and geotechnical stability of crest lines as per **Drawing No. 2492.DRG.024AR1 – Conceptual Final Landform Plan**.

3. **Location of measurement**
   Rehabilitated areas within ML 6556 and PM 111.

4. **Frequency**
   Once post quarry completion prior to tenement revocation application.

5. **Control / Baseline Data**
   Not applicable.

6. **Leading Indicator Criteria**
   Not applicable.

6.8 Heritage Outcome

6.8.1 Context

As outlined in **Section 2.17 Heritage (Aboriginal, European, Geological)** PM 111 listed as the Koonunga Marble Quarry is a listed Local Heritage Place (Heritage Number 17707).

A search undertaken by the DPC AAR of the Central Archive including the Register of Aboriginal Heritage Sites and Objects has no entries for Aboriginal sites in relation to the Site search area.

A search of the SARIG did not identify any objects and / or sites of geological significance within the Site area.

6.8.2 Impact Assessment

Quarry Phase	**Potential impact event**			
Operational	Disturbance and / or destruction of Aboriginal, European and / or Geological Heritage sites or objects through development and operation of the Site.			
Impact (ID)	**Source**	**Pathway**	**Receptor**	**Confirmation of the source pathway and receptor (Y/N)**
H1	Quarrying development activities	Quarry development i.e. earthworks	Heritage object and / or site	Yes

Uncertainty and assumptions
Whilst there is an absence of reported Aboriginal Heritage items within proximity to the Site, it is possible that artefacts, objects or remains could exist that are currently unknown. Due to the presence of shallow souls across the Site above the marble resource the likelihood is low. Local Heritage item 17707 – Koonunga Marble Quarry is recognised for the use of marble in South Australia's Parliament House. Operations are permitted to continue and with no effect to heritage listing.
Sensitivity to change
Large scale earthworks could result in unrecorded Heritage sites being uncovered. Given that the proposed extraction area has been historically grazed and cropped and topsoil and subsoils are shallow, it is considered very unlikely that the potential impact will occur due to the shallow nature of the soils within the Site.
Justification for the confirmation / non-confirmation of Source, Pathway and Receptor
It is possible that unrecorded heritage items of significance may be present within the Site.

6.8.3 Control and Management Strategies

Control and Management Strategies
Operational - In the event that any Aboriginal and / or European cultural heritage sites, objects or remains and / or Geological monuments are identified the following is to occur: • Immediately stop work in the vicinity of the find. • Notify the relevant authority (DPC AAR) and the local 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. - Development is to be undertaken in accordance with the approved QDPs - **Drawing No. 2492.DRG.020AR1 – Quarry Development Plan – Stage 1, Drawing No. 2492.DRG.021AR1 – Quarry Development Plan – Stage 2, Drawing No. 2492.DRG.022AR1 – Quarry Development Plan – Stage 3 and Drawing No. 2492.DRG.023AR1 – Quarry Development Plan – Stage 4**.
Uncertainty and Assumptions of Control Strategies
The control and management strategies are considered reasonable and commensurate with the potential risk.
Sensitivity to change of assumptions
Unlikely to change.

6.8.4 Environmental Objective / Outcome and Measurement Criteria

The Outcome and outcome measurement criteria have been reviewed for ML 6556 and is deemed to be appropriate to be applied to the whole Site.

Heritage		
Quarry Phase	**Impact ID**	**Objective / Outcome**
Operational / Closure	H1	The Tenement Holder must, during construction, operation and post completion, ensure that there is no damage, disturbance or interference to Aboriginal or non-Aboriginal heritage sites, objects or remains as a result of mining operations unless it is authorised.

Objective / Outcome Achievement

1. **Objective / Outcome Achievement**
   Quarry Management Logbook records demonstrate that, upon discovery within the Site of any possible Aboriginal, European and / or Geological Heritage sites or objects, work ceased until the relevant authorities were notified and only recommenced once authorisation was received.

2. **What will be measured and the form of measurement**
   Quarry management logbook records of discovery and evidence appropriate procedures followed upon discovery.

3. **Location of measurement**
   Within PM 111 and ML 6556.

4. **Frequency**
   Upon discovery.

   Upon surrender of PM 111 and relinquishment of ML 6556.

5. **Control / Baseline Data**
   Not applicable.

6. **Leading Indicator Criteria**
   Not applicable.

6.9 Protection of Third Party Land, Property and Infrastructure

6.9.1 Context

The proximity to infrastructure and housing is discussed in **Section 2.12 Proximity to Infrastructure and Housing** and is illustrated in **Drawing No. 2492.DRG.006R1 – Land Access Map**.

Rural residences are located to the north east and south west of the Site, with the nearest residences located approximately 820 m north east and 930 m south west of the Site. There is an underground SA Water pipeline running along Marble Quarry Road. SA Water have been consulted regarding pipeline and have signed a waiver with Nil conditions. Operations including blasting activities have been continual within PM 111 since 1973.

6.9.2 Impact Assessment

Quarry Phase	**Potential impact event**			
Operational	Damage to third party infrastructure – residential structures and adjacent land holdings as a result of quarrying activities including fire.			
Impact (ID)	**Source**	**Pathway**	**Receptor**	**Confirmation of the source pathway and receptor (Y/N)**
PTP1	Quarrying activities	Ground	Nearby dwellings and infrastructure	Yes
Uncertainty and assumptions				
The potential impacts to third-party property are well understood based on observations and monitoring from quarry operations within the adjacent Site.				
Sensitivity to change				
Unlikely to change.				
Justification for the confirmation / non-confirmation of Source, Pathway and Receptor				
It is reasonable to expect that the source, pathway and receptor could occur.				

6.9.3 Control and Management Strategies

Control and Management Strategies
- Hot works activities if required onsite will be undertaken within the cleared quarry footprint away from vegetation. - Fire-fighting equipment available. - No hot works (welding) are to be undertaken onsite during total fire ban conditions.
Uncertainty and Assumptions of Control Strategies
Control measures are considered standard practice for the quarry industry and are proven to be effective in the prevention of potential impacts.
Sensitivity to change of assumptions
The proposed control and mitigation strategies are well known and effective and are not considered to be sensitive to change.

6.9.4 Environmental Objective / Outcome and Measurement Criteria

The Outcome and outcome measurement criteria have been reviewed for ML 6556 and is deemed to be appropriate to be applied to the whole Site.

Protection of Third Party Land, Property and Infrastructure		
Quarry Phase	**Impact ID**	**Objective / Outcome**
Operational	PTP1	The Tenement Holder must, during construction and operation, ensure there are no adverse impacts to third party land, property and infrastructure on or off the Land as a result of mining operations (including as a result of uncontrolled fires).
Objective / Outcome Achievement		
1. Objective / Outcome Achievement		

All incidents involving damage to third party property resulting from the quarry Site are recorded in Quarry Management Logbook and investigated by a suitably qualified person 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 reasonably been prevented by the quarrying activity.

2. **What will be measured and the form of measurement**
   Quarry Management records for evidence of third-party incident and investigation.

3. **Location of measurement**
   At the location of incident.

4. **Frequency**
   At the time of incident.

5. **Control / Baseline Data**
   Not applicable.

6. **Leading Indicator Criteria**
   Not applicable.

6.10 Blasting

6.10.1 Context

As outlined in **Section 3.3.5 Use of Explosives**, drilling and blasting activities will continue to be undertaken by a licensed contractor. All blasts will be monitored to ensure compliance with Australian Standard (AS) 2187.2 requirements which requires the assessment of the Site conditions and adjacent structures or services that influence the blast design.

Additionally SA Water's technical standard, TS 0136 Pipework Access and Protection Section 12.4.2 4 (d) states the following criteria for blasting which is aligned to the Australia Standard and the Site's Outcome / Objective achievement:

d) Adhere to safe vibrations limits (peak particle velocities (PPV)) which SA Water may specify for a particular asset – in general, the maximum vibrations at the asset shall not exceed the limits provided in Table 8: Safe Vibration Limits (PPV) below.

Table 8: Safe Vibration Limits (PPV)

Vibration Type	Safe PPV Limit for Rigid Pipelines (AC, RC, VC, CI)	Safe PPV Limit for Flexible Pipelines	Safe PPV Limit for Masonry/Mass Concrete Oviforms
Continuous vibration	5 mm/s maximum	10 mm/s maximum	2 mm/s maximum
Intermittent or transient	10 mm/s maximum	20 mm/s maximum	

Blasting has been undertaken within PM 111 due to the rock source (marble) and it is planned to continue with blasts occurring once per annum up to a maximum of four (4) times per annum (if market demand requires additional extraction), by a licenced contractor.

A notification protocol for blasts within PM 111 already exists and this will be extended for blasts undertaken in ML 6556 to adjoining landowners as per the current notification protocols.

6.10.2 Impact Assessment

Quarry Phase	**Potential impact event**			
Operational	Potential for fly rock, vibration and air overpressure causing damage to nearby infrastructure and / or environmental nuisance to nearby sensitive receptors.			
Impact (ID)	**Source**	**Pathway**	**Receptor**	**Confirmation of the source pathway and receptor (Y/N)**
B1	Blasting of rock	Air and land	Residential structures and adjacent landowners as per **Drawing No.2492.DRG.006R1 – Land Access Map**	Yes
Uncertainty and assumptions				
Blasting activities will be required for the development of the quarry extraction area and may cause fly rock, vibration and overpressure.				
Sensitivity to change				
The degree of fly rock, vibration and overpressure that may occur is dependent upon the planning and design of each blast.				
Justification for the confirmation / non-confirmation of Source, Pathway and Receptor				
An impact could potentially occur given the proximity of nearby sensitive receptors.				

6.10.3 Control and Management Strategies

Control and Management Strategies
- Design process to consider the Maximum Instantaneous Charge (MIC) and drill hole diameter to ensure that maximum ground vibration and overpressure of each blast does not exceed the specified limits. - Quarry records demonstrate that all blast related complaints are acknowledged and actioned in a timely manner. - Blast procedure to require approval by competent person that the blast has been designed to avoid vibration and overpressure limit exceedance. - All blasts will be monitored to ensure compliance with AS2187.2 requirements. - Blasting operations will be designed and implemented by suitable qualified contractors. - Explosives will be transported and handled by the blasting contractors and will not be stored at the Site. - Notify landowner and adjacent landowners of a planned blasts 24 hours prior. - Blast monitor to be placed at the residences located to the north east and south west of the Site. - Blast monitor to be placed at the SA Water pipeline located on Marble Quarry Road. - No blasting to occur on fire ban days.
Uncertainty and Assumptions of Control Strategies
Control measures are considered standard practice for the quarry industry and are proven to be effective in the prevention of potential impacts.
Sensitivity to change of assumptions
A potential impact could occur if the standard policy and procedures are not implemented, however this is considered unlikely to occur.

6.10.4 Environmental Objective / Outcome and Measurement Criteria

The Outcome and outcome measurement criteria have been reviewed for ML 6556 and is deemed to be appropriate to be applied to the whole Site.

Insert Environmental Aspect here (i.e. Noise)		
Quarry Phase	**Impact ID**	**Objective / Outcome**
Operational	B1	The Tenement Holder must, during construction and operation, ensure that there are no adverse impacts from airblast, flyrock and vibration caused by blasting to: - public safety - human comfort - third party property (including stock) - adjacent land use, and - adjacent infrastructure and operation.
Objective / Outcome Achievement		
1. Objective / Outcome Achievement 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 Mining Regulator. All blasts are monitored to comply with the following; • Ground Vibration – 5 mm / sec with up to 5 percent allowable to 10 mm / sec or less in a 12 month period • Overpressure - 115Db (Lin Peak) with up to 5 percent allowable to 120 Db (Lin Peak) or less in a 12 month period. No incidents of fly rock leaving the Site or causing impacts to utility infrastructure within the Site. **2. What will be measured and the form of measurement** Records of blast related complaint acknowledgement and actions(s). Ground vibration and overpressure. Visual monitoring of Tenement boundary to monitor the movement of fly rock. **3. Location of measurement** Within ML 6556 & PM 111 **4. Frequency** Records maintained following a blast or as requested by Mining Regulator. **5. Control / Baseline Data** Not applicable. **6. Leading Indicator Criteria** Not applicable.		

6.11 Groundwater

6.11.1 Context

The Site is not located within a water resource area prescribed under the *Landscape South Australia Act 2019*.

Groundwater is discussed in **Section 2.6 Groundwater** and **Attachment 3 – Groundwater Desktop Study - Carrara Quarry** concluded groundwater elevations in nearby wells between 250 to 288 m AHD. Based on topographic position, it is estimated that the water table is below 280 m across the entirety of the Site. The pit floor levels have been designed at 280 mAHD, two (2) m higher than the lowest point of the PM 111 pit floor (278 m AHD) of which groundwater intersection has not occurred. Based upon the historical observations of the adjacent quarry operations groundwater is not expected to be intercepted during the quarry operations within the Site.

Additionally in April 2024, one (1) hole was drilled within the current pit floor of PM 111 to determine the depth of groundwater presence. The hole was drilled within the pit floor at the location as shown below in **Diagram 1 – Groundwater Investigation Hole** at a pit floor level of 278 m AHD to a depth of 18 metres (260 m AHD) of which groundwater was not intersected, and drilling remained consistently within the marble resource. Whilst it is recognised the drill hole was undertaken in Autumn, groundwater variations due to seasonal fluctuations are not anticipated to rise more than 20 m, ensure the proposed pit floor of 280 m AHD will not intersect groundwater and is considered a low risk and able to demonstrate a two (2) m buffer from pit floor level 280 m AHD to groundwater can be achieved.

There are no confirmed groundwater users within one (1) km of the Site.

There are no GDE's located within the Site.

6.11.2 Impact Assessment

Quarry Phase	**Potential impact event**			
Operational	Groundwater interaction resulting in adverse impacts on water quality, groundwater flows and groundwater levels.			
Impact (ID)	**Source**	**Pathway**	**Receptor**	**Confirmation of the source pathway and receptor (Y/N)**
GW1	Groundwater interception	Groundwater movement	Nearby groundwater well users / GDEs	Yes

Uncertainty and assumptions

The source, pathway and receptor are well understood based upon the outcomes of the Groundwater Desktop Study, **Attachment 3 – Groundwater Desktop Study - Carrara Quarry**:

- There are no confirmed groundwater users within one (1) km of the Site.
- A pit floor elevation of 280 m AHD is two (2) m above the existing floor level of the adjacent quarry (PM 111) and is six (6) to 11 m above the water table at the nearest water wells." (*Groundwater Science, November 2020*).

Groundwater investigation via a drill hole 18 m BGL within the current lowest point of the quarry to a depth of 260 m AHD in April 2024 did not intersect groundwater. This indicates a 20 m or greater buffer to groundwater.

BoM Groundwater Dependent Ecosystems Atlas (GDE Atlas) (2020) identified one (1) Low Potential Aquatic GDE (watercourse) approximately 900 m east of the Site and two (2) Terrestrial GDEs approximately 560 m and 1.2 km north east of the Site comprising of *Eucalyptus leucoxylon ssp. Woodland*. The vegetation is described as having a low potential for groundwater interaction and is likely reliant on surface water generated by periodic rainfall (*Groundwater Science, November 2020*).

The Site is not located within a water resource area prescribed under the *Landscape South Australia Act 2019*.

Sensitivity to change
Seasonal variation in groundwater depths may occur.
Justification for the confirmation / non-confirmation of Source, Pathway and Receptor
Based upon the groundwater desktop assessment, onsite drill hole investigation and proposed final floor level of 280.0 mAHD the likelihood of the quarry development interacting with groundwater is low.

Quarry Phase	**Potential impact event**			
Site Closure	Groundwater interaction resulting in adverse impacts on water quality, groundwater flows and groundwater levels.			
Impact (ID)	**Source**	**Pathway**	**Receptor**	**Confirmation of the source pathway and receptor (Y/N)**
GW2	Rehabilitation activities	Groundwater movements	Nearby groundwater well users / GDEs	No
Uncertainty and assumptions				
The source, pathway and receptor are well understood based upon the outcomes of the Groundwater Desktop Study, **Attachment 3 – Groundwater Desktop Study - Carrara Quarry** and drill hole investigation undertaken in April 2024 that did not intercept groundwater 18 m depth (to 260 m AHD) from the lowest pit floor level (278 m AHD): Seasonal variation in groundwater depths may occur but provided a large buffer is present it is unlikely to cause any impact and is not considered a risk.				
Sensitivity to change				
Seasonal variation in groundwater depths may occur but provided a large buffer is present it is unlikely to cause any impact and is not considered a risk.				
Justification for the confirmation / non-confirmation of Source, Pathway and Receptor				
Based upon the groundwater desktop assessment, onsite drill hole investigation and proposed final floor level of 280.0 mAHD the likelihood of the quarry development interacting with groundwater is low and a pathway is unlikely to exist.				

6.11.3 Control and Management Strategies

Control and Management Strategies
Operational • Adherence with **Drawing No. 2492.DRG.020AR1 – Quarry Development Plan – Stage 1, Drawing No. 2492.DRG.021AR1 – Quarry Development Plan – Stage 2, Drawing No. 2492.DRG.022AR1 – Quarry Development Plan – Stage 3 and Drawing No. 2492.DRG.023AR1 – Quarry Development Plan – Stage 4** and **Drawing No. 2492.DRG.020B – Quarry Development Plan – Stage 1 Sections A-A' to D-D', Drawing No. 2492.DRG.021B – Quarry Development Plan – Stage 2 Sections A-A' to D-D', Drawing No. 2492.DRG.022B – Quarry Development Plan – Stage 3 Sections A-A' to D-D'** and **Drawing No. 2492.DRG.023B – Quarry Development Plan – Stage 4 Sections A-A' to C-C'** • Regular review of quarry development pit floor levels to ensure operations correspond with QDPs. • Monitoring of pit floor for signs of seepage.

- Prior to commencing extraction with ML 6556, drilling to be undertaken to a depth of 260 mAHD in Spring to investigate the presence or absence of groundwater and maintenance of a minimum two (2) m buffer between final planned pit floor levels and seasonal high groundwater levels (if detected).
- If groundwater is located at 260 m AHD installation of monitoring well to be established.
- Monitoring of groundwater levels and quality (EC and PH) twice per annum in Summer and Spring to monitor seasonally high groundwater levels.
- Undertake a groundwater assessment and review of QDP's if groundwater is detected within two (2) m of the planned quarry floor level.

Closure

- Rehabilitation of the Site as per **Drawing No. 2492.DRG.024AR1 – Conceptual Final Landform Plan** and **Drawing No. 2492.DRG.024B – Conceptual Final Landform Plan Sections A-A' to C-C'.**

Uncertainty and Assumptions of Control Strategies
Control and management strategies are considered reasonable and commensurate with potential impacts of groundwater interception.
Sensitivity to change of assumptions
Unlikely to change.

6.11.4 Environmental Objective / Outcome and Measurement Criteria

The Outcome and outcome measurement criteria have been reviewed for ML 6556 and is proposed to be amended due to groundwater buffers being established and can be applied to the whole Site (ML and PM).

Groundwater		
Quarry Phase	**Impact ID**	**Objective / Outcome**
Operational / Closure	GW1	The Tenement Holder must, during construction and operation and closure, ensure that there is no adverse impact to the quantity of groundwater caused by mining operations.
Objective / Outcome Achievement		

1. **Objective / Outcome Achievement**
   Annual survey of the Site will ensure floor levels do not go under the limits designed within **Drawing No. 2492.DRG.020AR1 – Quarry Development Plan – Stage 1, Drawing No. 2492.DRG.021AR1 – Quarry Development Plan – Stage 2, Drawing No. 2492.DRG.022AR1 – Quarry Development Plan – Stage 3 and Drawing No. 2492.DRG.023AR1 – Quarry Development Plan – Stage 4**.

   Monthly inspection records during operations of the extraction area confirms that there are no signs of seepage during operation of the Site.

   Additional resource drilling undertaken prior to commencement of extraction within ML 6556 to a depth of 260 m AHD identifies the presence or absence of groundwater beneath the Site and maintenance of a two (2) m buffer.

   If groundwater is present at 260 m AHD, the establishment of a groundwater well and seasonal groundwater monitoring will confirm the highest seasonal groundwater elevation is lower than two (2) m below the final floor level.

   If a monitoring well is established groundwater monitoring to measure the quality (EC and pH) of groundwater

2. **What will be measured and the form of measurement**
   Records of annual survey confirming Quarry pit floor levels are within the approved designs.

Inspection records for visual assessment of seepage.
Records of drilling investigations undertaken within ML 6556.
If groundwater is detected during additional resource drilling or quarrying at 260 m AHD, records of a monitoring well established and records of monitoring seasonal groundwater levels and quality (EC and pH levels).

3. **Location of measurement**
   Within ML 6556 and PM 111.
   Drilling within ML 6556.

4. **Frequency**
   Survey Pit floor levels annually.
   Seepage inspections monthly during operations.
   Drilling investigation undertaken once prior to commencement of extraction within ML 6556.
   If groundwater monitoring bore is established, monitoring to occurring twice per annum in summer and spring.

5. **Control / Baseline Data**
   Not Applicable.

6. **Leading Indicator Criteria**
   Not Applicable.

6.12 Visual Amenity

6.12.1 Context

The Site is located within an agricultural area with cropping and viticultural activities as the main land use surrounding the Site. As outlined within **Section 2.12 Proximity to Infrastructure and Housing** the nearest residences are located approximately 820 m north east and 780 m south west of the Site, refer to **Drawing No. 2492.DRG.006R1 – Land Access Map**.

Section 2.14 Amenity identifies receptors at Photo Location 7 currently experience views of PM 111. The vegetated topsoil mound is visible from Photo Location 2 and 4 however this mostly local road users for short durations. The placement of plant and product stockpiles within the pit floor assists to mitigate views of the quarry operations.

As a result of consultation undertaken during the MLP for ML 6556, **Section 3.6.4 Visual Screening** outlines planting of tree screening along the south western boundary of the PM to minimise views of the operation from the residential receptor located 780 m south west.

6.12.2 Impact Assessment

Quarry Phase	**Potential impact event**			
Operational	Potential for negative visual impact of quarrying activities upon sensitive receptors situated within adjacent land.			
Impact (ID)	**Source**	**Pathway**	**Receptor**	**Confirmation of the source pathway and receptor (Y/N)**
VA1	Quarry development, disturbed land	External viewpoints	Residential dwelling as per	Yes

Uncertainty and assumptions
Assessment of the potential visual amenity impacts from the Site are well understood and informed by the visual impact assessment undertaken on 29/09/2020. The seven (7) visual assessment locations have been informed via desktop analysis and field assessment of topography, vegetation, and sensitive receptors and are considered to be representative sensitive receptor locations. Quarry has been operational since 1973 and the south west residence has been constructed since the quarry began operations and is the only sensitive residential receptor that has views of the operations. Views of the Site are restricted through the topography of the surrounding environment and presence of vegetation within portions of the adjacent land.
Sensitivity to change
Development occurring closer to the Site or removal of natural screening located offsite could result in additional visual aspects increasing in some locations, however the sensitivity to change is considered medium based upon the current land use for the area
Justification for the confirmation / non-confirmation of Source, Pathway and Receptor
Site inspection confirms some portions of the Site are visible to sensitive residential receptors and therefore a receptor exists.

Quarry Phase	**Potential impact event**			
Site Closure	Potential for negative visual impact of quarrying activities upon sensitive receptors post closure.			
Impact (ID)	**Source**	**Pathway**	**Receptor**	**Confirmation of the source pathway and receptor (Y/N)**
VA2	Final landform	External viewpoints	Residential dwelling as per	Yes
Uncertainty and assumptions				
Assessment of the potential visual amenity impacts from the Site are well understood and informed by the visual impact assessment undertaken on 29/09/2020. The seven (7) visual assessment locations have been informed via desktop analysis and field assessment of topography, vegetation, and sensitive receptors and are considered to be representative sensitive receptor locations. Views of the Site are restricted through the topography of the surrounding environment and presence of vegetation within portions of the adjacent land.				
Sensitivity to change				
Development occurring closer to the Site or removal of natural screening located offsite could result in additional visual aspects becoming realised, however the sensitivity to change is considered low based upon the current land use for the area.				
Justification for the confirmation / non-confirmation of Source, Pathway and Receptor				
Site inspection confirms some portions of the Site are visible to sensitive residential receptors and therefore a receptor exists.				

6.12.3 Control and Management Strategies

Control and Management Strategies
Construction and Operation: - Planting and establishment of vegetation screening in the form of trees native to the area along the southwestern boundary of PM 111 as demonstrated in **Drawing No. 2492.DRG.020AR1 – Quarry Development Plan – Stage 1**. - Mobile plant, equipment and product stockpiles within the Pit floor. • Quarry development and prompt rehabilitation of available areas as per **Drawing No. 2492.DRG.020AR1 – Quarry Development Plan – Stage 1, Drawing No. 2492.DRG.021AR1 – Quarry Development Plan – Stage 2, Drawing No. 2492.DRG.022AR1 – Quarry Development Plan – Stage 3 and Drawing No. 2492.DRG.023AR1 – Quarry Development Plan – Stage 4** and **Drawing No. 2492.DRG.020B – Quarry Development Plan – Stage 1 Sections A-A' to D-D', Drawing No. 2492.DRG.021B – Quarry Development Plan – Stage 2 Sections A-A' to D-D', Drawing No. 2492.DRG.022B – Quarry Development Plan – Stage 3 Sections A-A' to D-D'** and **Drawing No. 2492.DRG.023B – Quarry Development Plan – Stage 4 Sections A-A' to C-C'** - Topsoil stockpiles to be utilised as earthen bunds to assist screening of the operations. **Post Completion:** • Shaping of the final landform with 1V:2H batters and stabilisation with pastoral grasses to soften the final quarry landform to reflect the surrounding landscape in accordance with **Drawing No. 2492.DRG.024AR1 – Conceptual Final Landform Plan** and **Drawing No. 2492.DRG.024B – Conceptual Final Landform Plan Sections A-A' to C-C'**.
Uncertainty and Assumptions of Control Strategies
Additional vegetation will be successful in reducing the visual impact caused by the quarrying operations. No known future residential development or intensification of land use is known within the adjacent land parcels.
Sensitivity to change of assumptions
Low sensitivity to change.

6.12.4 Environmental Objective / Outcome and Measurement Criteria

The Outcome and outcome measurement criteria have been reviewed for ML 6556 and is deemed to be appropriate to be applied to the whole Site.

Visual Amenity		
Quarry Phase	**Impact ID**	**Objective / Outcome**
Construction and Operation	VA1	The Tenement Holder must, during construction, operation and post-completion, ensure that mining operations are visually softened to blend in with the surrounding landscape.

Objective / Outcome Achievement

1. **Objective / Outcome Achievement**
   Visual impact assessment of the Site and surrounds are undertaken by a suitably qualified person at the completion of each Stage of quarry development and confirms that vegetation screening and progressive rehabilitation strategies have been implemented to minimise visual amenity impacts.

2. **What will be measured and the form of measurement**
   Visual assessment and photographic records of vegetation screening and progressive rehabilitation as per Staged Quarry Development Plans.

3. **Location of measurement**
   Visual amenity location points as per **Attachment 4 – Visual Assessment**.

4. **Frequency**
   Annually and at the completion of each Stage of quarry development.

5. **Control / Baseline Data**
   Visual amenity location points as per **Attachment 4 – Visual Assessment**

6. **Leading Indicator Criteria**
   Not applicable.

Insert Environmental Aspect here (i.e. Noise)		
Quarry Phase	**Impact ID**	**Objective / Outcome**
Closure	VA2	The Tenement Holder must, during construction, operation and post-completion, ensure that mining operations are visually softened to blend in with the surrounding landscape.

Objective / Outcome Achievement

1. **Objective / Outcome Achievement**
   Visual assessment of the Site and surrounds undertaken by a suitably qualified person post quarrying confirming final landforms conform to QDPs.

2. **What will be measured and the form of measurement**
   The final landform is to be measured against **Drawing No. 2492.DRG.024AR1– Conceptual Final Landform Plan** and photographic visual assessment of the Site and surrounds is to be undertaken.

3. **Location of measurement**
   Visual amenity location points as per **Attachment 4 – Visual Assessment**

   Post quarrying landform within the Tenement.

4. **Frequency**

Once prior to the PM revocation application.

5. **Control / Baseline Data**
   Not applicable.

6. **Leading Indicator Criteria**
   Not applicable.

6.13 Surface Water

6.13.1 Context

Section 3.6.7 Erosion, Sediment and Silt Control and **Drawing No. 2492.DRG.013R1 – Quarry Stormwater Management Plan** outlines all surface waters from the disturbance areas within the Site will be directed into PM 111 floor which is approximately eight (8) m lower than the surrounding landform. Clean surface water derived from catchment areas outside of the quarry footprint will flow away from the future disturbance areas along existing overland flow paths.

6.13.2 Impact Assessment

Quarry Phase	**Potential impact event**			
Operational	Offsite discharge of silt laden waters (contaminated as defined in *Environment Protection (Water Quality) Policy 2015*) flowing onto adjacent land.			
Impact (ID)	**Source**	**Pathway**	**Receptor**	**Confirmation of the source pathway and receptor (Y/N)**
SW1	Disturbed land, surface water runoff.	Overland flow.	Adjacent land, receiving waterways.	No
Uncertainty and assumptions				
It is unlikely that silt laden surface water could leave the Site as silt laden water from the proposed quarry operations will be retained within the PM. Some silt laden water may occur from areas outside of the quarry operations due to activities associated with the cropping land that is already disturbed.				
Sensitivity to change				
The volume, frequency and intensity of flows may change depending upon seasonal variations and climatic conditions, however the sensitivity to change is considered low.				
Justification for the confirmation / non-confirmation of Source, Pathway and Receptor				
It is unlikely that silt laden surface water could leave the Site as silt laden water from the proposed quarry operations will be retained within the PM. Some silt laden water may occur from areas outside of the quarry operations due to activities associated with the cropping land that is already disturbed.				

Quarry Phase	Potential impact event			
Site Closure	Offsite discharge of silt laden waters (contaminated as defined in *Environment Protection (Water Quality) Policy 2015*) derived from the final landform flowing onto adjacent land or receiving waterways.			
Impact (ID)	**Source**	**Pathway**	**Receptor**	**Confirmation of the source pathway and receptor (Y/N)**
SW2	Disturbed land, surface water runoff.	Overland flow on rehabilitated surface areas.	Adjacent land, receiving waterways.	No
Uncertainty and assumptions				
Surface water catchments and associated flow paths have been determined based upon existing topographical features of the Site. Some silt laden water may occur from area outside of the quarry operations due to activities associated with the cropping land within the ML that is already disturbed.				
Sensitivity to change				
The volume, frequency and intensity of flows may change depending upon seasonal variations and climatic conditions, however the sensitivity to change is considered low.				
Justification for the confirmation / non-confirmation of Source, Pathway and Receptor				
It is unlikely that silt laden surface water could leave the Site as silt laden water from the proposed quarry operations will be retained within the Site.				

6.14 Native Vegetation and Habitat

6.14.1 Context

As discussed within **Section 2.8 Vegetation, Weeds and Plant Pathogens** the Site has been heavily disturbed due to historical and current quarrying operations. There are three (3) scattered trees located in the south western and south boundary of the PM, however these are not within the proposed extraction areas and therefore do not require clearance. There is no native vegetation identified or required to be cleared for quarry development.

6.14.2 Impact Assessment

Quarry Phase	Potential impact event			
Operational	Unauthorised clearance or damage of native vegetation and habitat as a result of quarrying operations.			
Impact (ID)	**Source**	**Pathway**	**Receptor**	**Confirmation of the source pathway and receptor (Y/N)**
NV1	Quarrying development activities, HME and light vehicles	Land	Native Vegetation	No

Uncertainty and assumptions				
The Site's historical and current land use is grazing, cropping and quarrying creating large clearance of the Site. Furthermore native vegetation was not noted as present during a Site inspection 18 August 2021. Abundance of exotic species indicates the low probability of native vegetation to be low.				
Sensitivity to change				
Unlikely to change due to the absence of native vegetation within the PM				
Justification for the confirmation / non-confirmation of Source, Pathway and Receptor				
No native vegetation located onsite therefore there is no receptor.				

7. Effective and Efficient Mining and Outcome Achievement Statement

☒ There is a reasonable prospect that the land in respect of which the lease is sought could be effectively and efficiently mined.

☒ Based on the control strategies provided I consider that the environmental outcomes will be able to be achieved.

☒ We / I declare that the mineral resource or ore reserve (or both) has been appropriately identified and estimated.

8. Operator Capability and Compliance History

I / We have the following technical, operational and financial capabilities and resources available for carrying out proposed mining operations:

Amulet Holdings have been a successful operator of the adjacent PM 111 since 2003. Amulet Holdings and associated company Barossa Quarries have a Safety Management System incorporating a Quality Management System to ISO9001 standard.

In the last five (5) years, a related body corporate or I have failed to comply with a provision of a corresponding Australia Law or designated Australian Act in connection with authorised operations that resulted in:

☐ Yes	☒ No	The revocation or suspension of an authority to carry out authorised operations; or
☐ Yes	☒ No	A prosecution for an offence; or
☐ Yes	☒ No	The imposition of a penalty by a court; or
☐ Yes	☒ No	The issuing of a notice, direction or order that required the suspension of discontinuance of any authorised operations; or
☐ Yes	☒ No	The rectification of any harm to the environment or the rehabilitation of any land, place or other aspect of the environment.

9. Lease / Licence Conditions

Table 9 – Lease / Licence Conditions summarises the lease / licence conditions that apply to the ML 6556 and where they have been addressed within the MOP PEPR.

Table 9 – Lease / Licence Conditions

Condition No.	Condition	Addressed in PEPR Section
Fourth Schedule		
1.	**7. Waste Derived Fill Criteria** The Tenement Holder is required, for the purpose of Regulation 63(1)(c) of the Mining Regulations 2020 in relation to Fourth Schedule Clause 6, to ensure the measurement criteria is developed in accordance with the Environment Protection Authority Standards for the production and use of Waste Derived Fill.	Refer to **Section 6.6 Waster Derived Fill**
2.	**10. Public Safety Strategies** The Tenement Holder is required to address the following matters for the purpose of Regulation 63(1)(b) of the Mining Regulations 2020 in relation to Fouth Schedule Clause 9; 10.1 All Quarry landforms at post completion (including pit and any other landforms) must be based on a detailed design that mitigates risk to public safety and addresses the following (at a minimum): 10.1.1 appropriate landform and/or batter angles; 10.1.2 appropriate construction methods; 10.1.3 appropriate slope stabilisation methods; and 10.2 in addition to clause 10.1, where backfill is used to create a final landform, the detailed design must include the following (at a minimum) to demonstrate mitigation of slumping and displacement: 10.2.1 description of the materials to be used; 10.2.2 the method of placement, compaction, contouring, shaping (as is relevant); 10.2.3 description of erosion protection measures (as is relevant) 10.2.4 revegetation plans; and 102.5 quality control measure to ensure the landform is constructed to design.	Refer to **Section 3.3.3 Sequence of quarrying and progressive rehabilitation**. Refer to **Section 3.9 Description of Quarry Site at Completion** and **Section 6.7 Public Safety**. Refer to **Section 3.9 Description of Quarry Site at Completion** and **Section 6.6 Waste Derived Fill**.
3.	**14. Blasting Strategies** The Tenement Holder is required to address the following matter for the purpose of Regulation 63(1)(b) of the Regulations is relation to Fourth Schedule Clause 13: 14.1 Ensure blast design is developed by appropriately licenced and experienced professional, and 14.2 Each blast is undertaken and monitored by appropriately licenced and experienced professional. **15. Blasting Criteria** The Tenement Holder is required to address the following matters for the purpose of Regulation 63(1) (c) of the Regulations in relation to Fourth Schedule clause 12: 15.1 Establish compliance vibration limits appropriate for protection of the third-party infrastructure (SA Water mains pipeline located along Marble Quarry Road, Kapunda); 15.2 Ensure all blasts are measured and monitored; 15.3 Locations of monitoring must include (as a minimum) a site appropriate to measure potential impact to receptors; and	Refer to **Section 6.10 Blasting**.

	The measurement parameters and values that are taken to constitute achievement of the outcome must comply with the relevant Australian Standard.	
4.	**Groundwater Criteria** 17. The Tenement Holder is required to address the following matters for the purpose of Regulation 63(1) (c) of the Regulations in relation to Fourth Schedule clause 16: 17.1 Establish the maximum local groundwater level in (mAHD) through appropriate methodology within the timeframe approved by the Director of Mines (or other authorised officer).	Refer to **Section 2.6 Groundwater** and **Section 6.11 Groundwater** outlining a drillhole within the lowest point of the pit floor within PM 111 was drilled to 18 m BGL and did not intercept groundwater, therefore able to demonstrate a buffer greater than two (2) metres will be achieved. Control and management and measurement criteria related to additional GW drilling investigations within ML 6556 have been included.

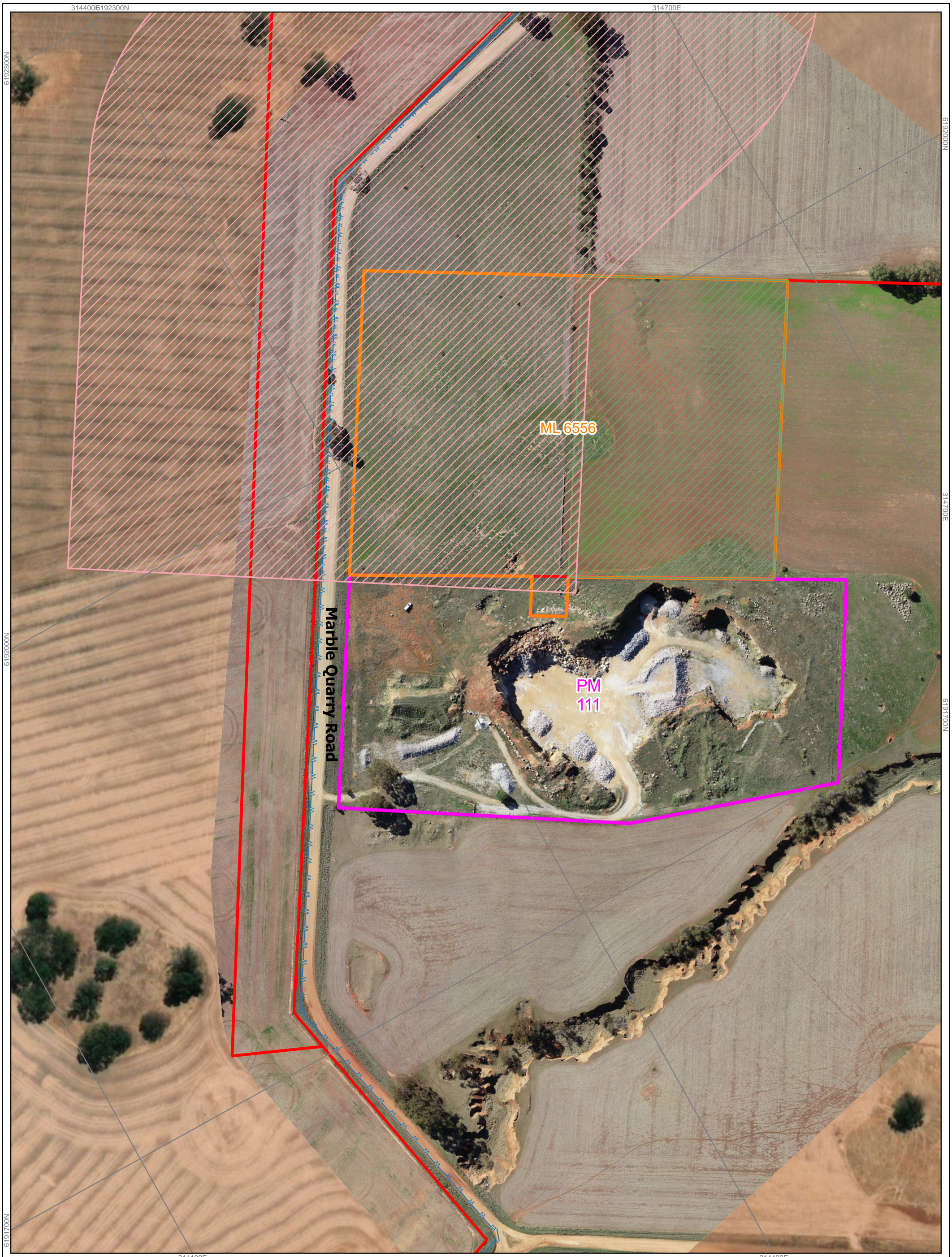
10. Reference List

Bureau of Meteorology 2020, *Monthly climate statistics, Summary statistics Nuriootpa PIRSA,* Australian Government, viewed September 2020, http://www.bom.gov.au/climate/averages/tables/cw_023373.shtml

Department for Environment and Water 2024, *NatureMaps*, viewed June 2024, Government of South Australia http://spatialwebapps.environment.sa.gov.au/naturemaps/?locale=en-us&viewer=naturemaps

South Australian Resources Information Gateway (2024), *Department for Energy and Mining,* South Australian Government, viewed June 2024, https://map.sarig.sa.gov.au/

drawings



REV	DESCRIPTION	DATE	BY
1	Updated for issue of ML 6556	13/02/2024	EP

Data Sources:
Photography: UAV Survey 2020-05-05; Google Maps accessed: 13-February-2024
Topography: UAV Survey 2020-05-05
Cadastre: SALIS - boundaries may not be accurate
Ecosystem:
Other:

Legend:
- Mining Lease
- Private Mine (PM) 111
- Cropped Land
- Watermains
- Cadastral
- Exempt Land - Infrastructure

PROJECT: Carrara Marble Quarry

CLIENT: Amulet Holdings Pty Ltd

TITLE: Exempt Land Map

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

SCALE: 1:2,000 When Printed On A3
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REVISION: 1
DATE: 13-February-2024
DRAWN: EP
PRINTED: 13-February-2024
CHECKED: MJ
DATUM: HORIZONTAL / VERTICAL / ZONE: MGA / AHD / 54
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316000E

6194000N

6192000N

ROCKBROOK

MOPPA

TRURO

BAGOT WELL

DREGKOW

TRURO

NIETSCHKE

TRURO

MARBLE QUARRY

DIAGONAL

HEINTZE

ML 6556

Site Entry / Exit Point

PM 111

SCHRAPEL

NEUKIRCH

REV	DESCRIPTION	DATE	BY
1	Updated upon issue of ML 6556	13/02/2024	EP

Data Sources:
Photography: UAV Survey 2020-05-05; Google Maps accessed: 13-February-2024
Topography: UAV Survey 2020-05-05
Cadastre: SALIS - some boundaries may not be accurate
Ecosystem:
Other: SARIG 2024

Legend:
- Private Mine 111
- Truck Route
- Mining Lease

N

PROJECT: Carrara Marble Quarry

CLIENT: Barossa Quarries

TITLE: Access Route Map

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

SCALE: 1:11,000 When Printed On A3
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DRAWING NUMBER: 2492.DRG.005

REVISION: 1

DATE: 13-February-2024 DRAWN: EP

PRINTED: 13-February-2024 CHECKED: MJ

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Legend:
- Private Mines
- Mining Lease
- Cadastral Boundaries
- Receptors
- Powerlines
- Water Mains
- Water Wells
- Waterbodies

REV	DESCRIPTION	DATE	BY
1	Updataed upon issue of ML 6556	13/02/2024	EP

Data Sources:
Photography:
Topography:
Cadastre: Data.sa.gov.au Boundaries are for indicative purposes only.
Ecosystem:
Other: Google Maps , SARIG (2021)

PROJECT: Carrara Marble Quarry

CLIENT: Amulet Holdings Pty Ltd

TITLE: Land Access Map

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

SCALE: 1:25,000 When Printed On A3 (0 100 200 300 400 m)
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REVISION: 1
DATE: 13-February-2024 DRAWN: EP
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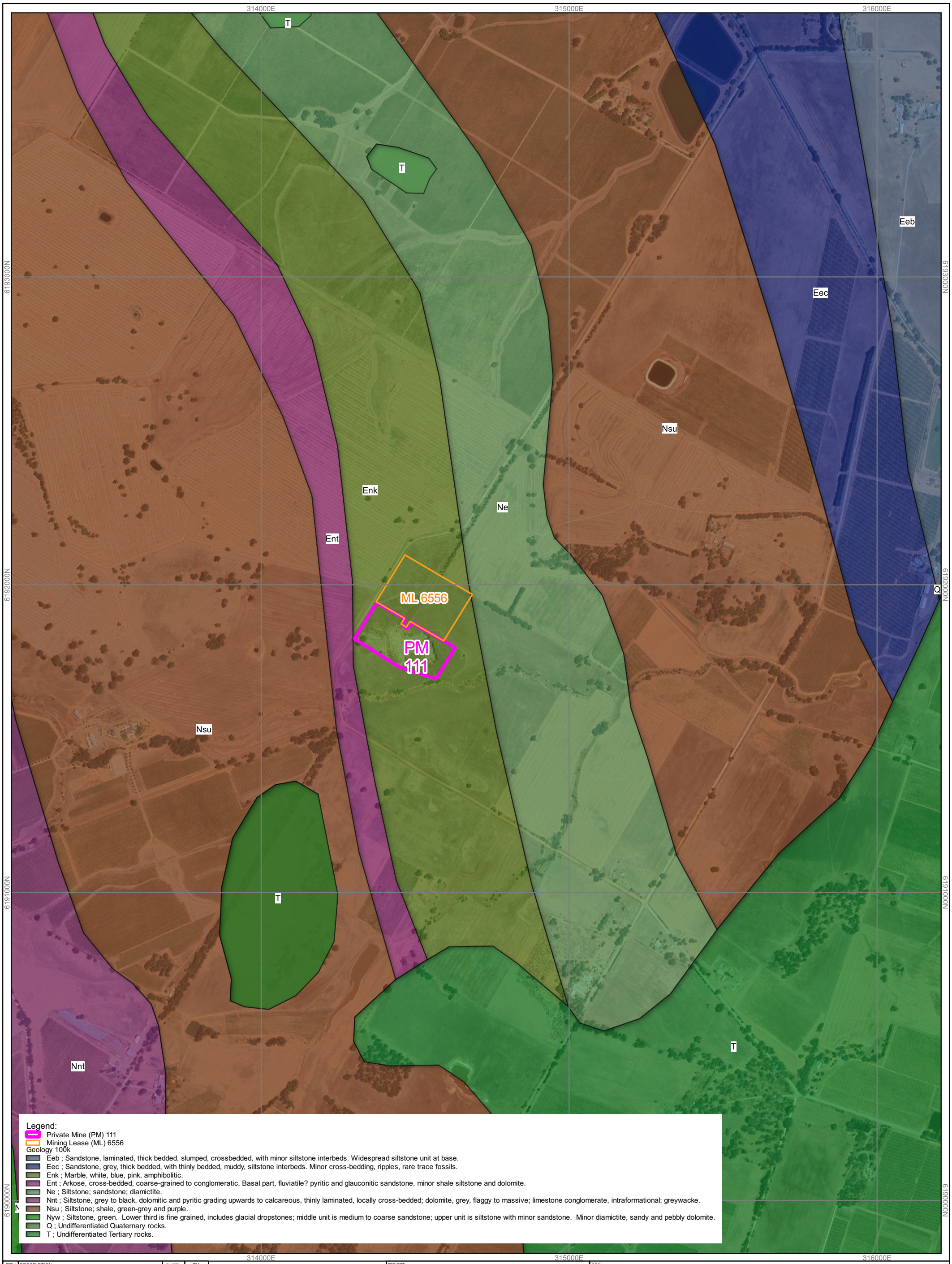

REV	DESCRIPTION	DATE	BY
1	Updated upon issue of ML 6556	13/02/2024	EP

Data Sources:
Photography: UAV Survey 2020-05-05; Google Maps accessed: 13-February-2024
Topography: UAV Survey 2020-05-05
Cadastre:
Ecosystem:
Other: SARIG, 2024

N

PROJECT: Carrara Marble Quarry

CLIENT: Amulet Holdings Pty Ltd

TITLE: Regional Geology Map

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

SCALE: 1:11,000 When Printed On A3 (0 50 100 150 200 m)
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REVISION: 1
DATE: 13-February-2024
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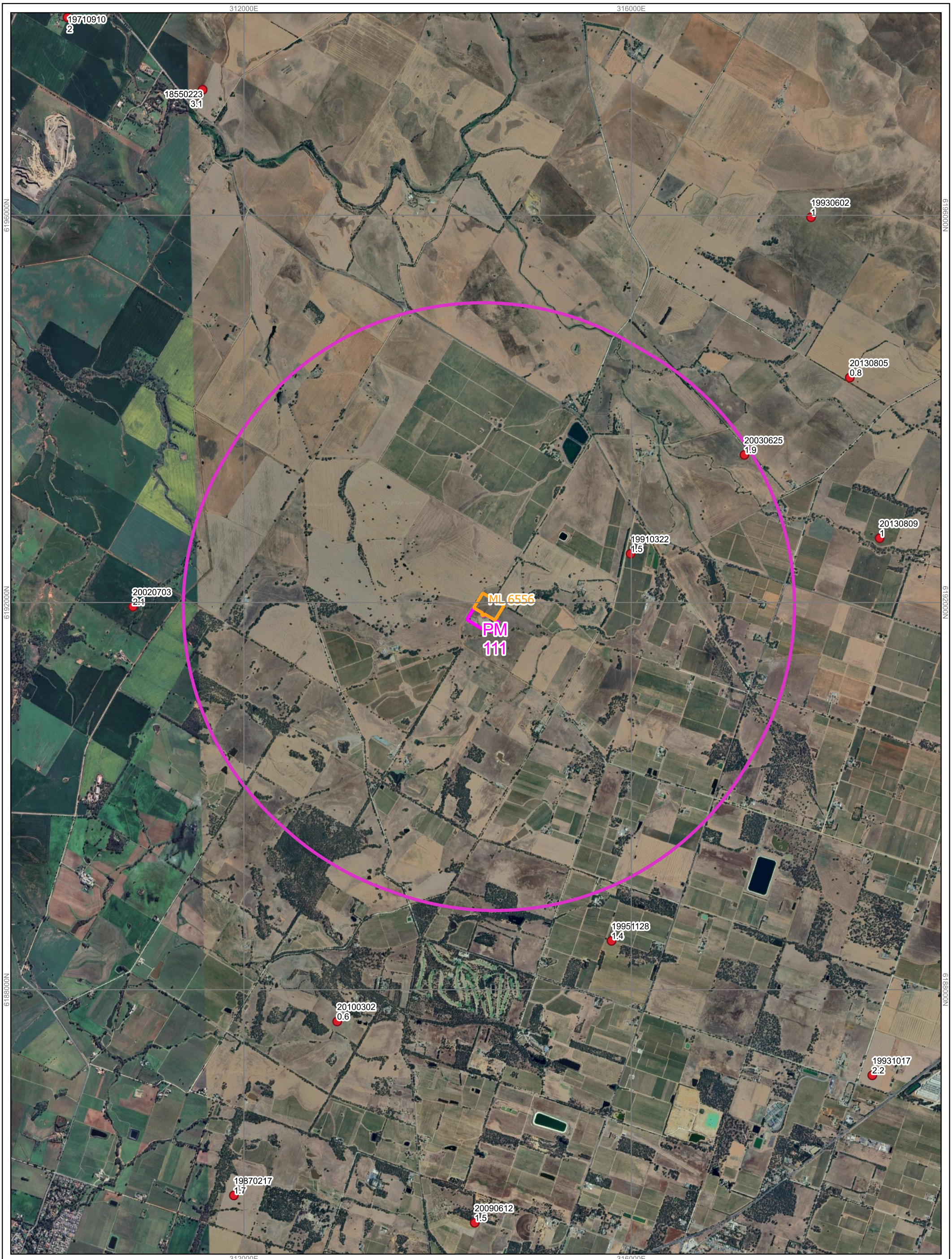

REV	DESCRIPTION	DATE	BY

Data Sources:
Photography: UAV Survey 2020-05-05; Google Maps accessed: 09-October-2024
Topography: UAV Survey 2020-05-05
Cadastre:
Ecosystem:
Other: SARIG, 2020

Legend:
- Mineral Claim
- Private Mine 111
- Earthquakes(Date & Magnitude)

N

PROJECT: Carrara Marble Quarry

CLIENT: Amulet Holdings Pty Ltd

TITLE: Geohazards Map

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

SCALE: 1:35,000 When Printed On A3
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DRAWING NUMBER: 2492.DRG.010

REVISION: 1

DATE: 09-October-2024
DRAWN: EP
PRINTED: 09-October-2024
CHECKED: MJ

DATUM: HORIZONTAL / VERTICAL / ZONE: MGA / AHD / 54

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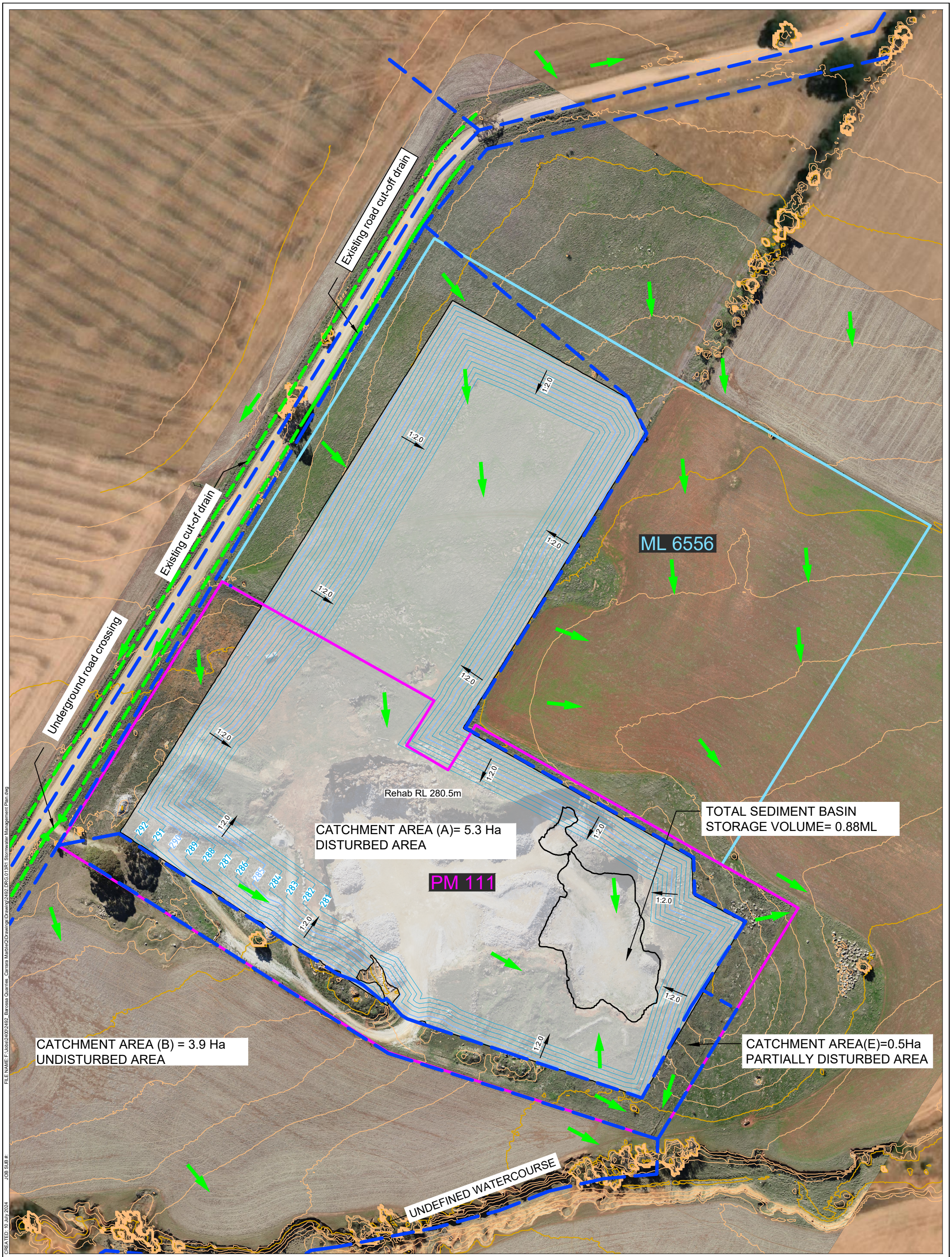

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Data Sources:
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Topography: Groundwork part of SLR Pty Ltd UAV Survey, Captured 2020/05/05, DSM 1m
Cadastre:
Ecosystem:
Other: © 2024 Microsoft Corporation; © 2024 Maxar; © CNES (2024) Distribution Airbus DS

Legend:
- Mining Lease
- Private Mine
- Drainage Catchment
- Extraction Area

PROJECT: Carrara Marble Quarry

CLIENT: Barossa Quarries

TITLE: Quarry Stormwater Management Plan

GROUNDWORK PART OF SLR
PH: +61 7 3871 0411
WWW.GROUNDWORK.COM.AU

SCALE: 1:1,500 When Printed On A3 — 0 — 30m
DRAWING NUMBER: 2492.DRG.013
REVISION: 1
DATE: 10 July 2024
DRAWN: CP
DATUM: HORIZONTAL / VERTICAL / ZONE
PRINTED: 10 July 2024
CHECKED: EM
GDA94 / MGA / AHD / 54

FILE NAME: F:\Jobs\2400\2492 Barossa Quarries_Carrara Marble\QDrawings\Drawings\2492.DRG.013R1 Stormwater Management Plan.dwg
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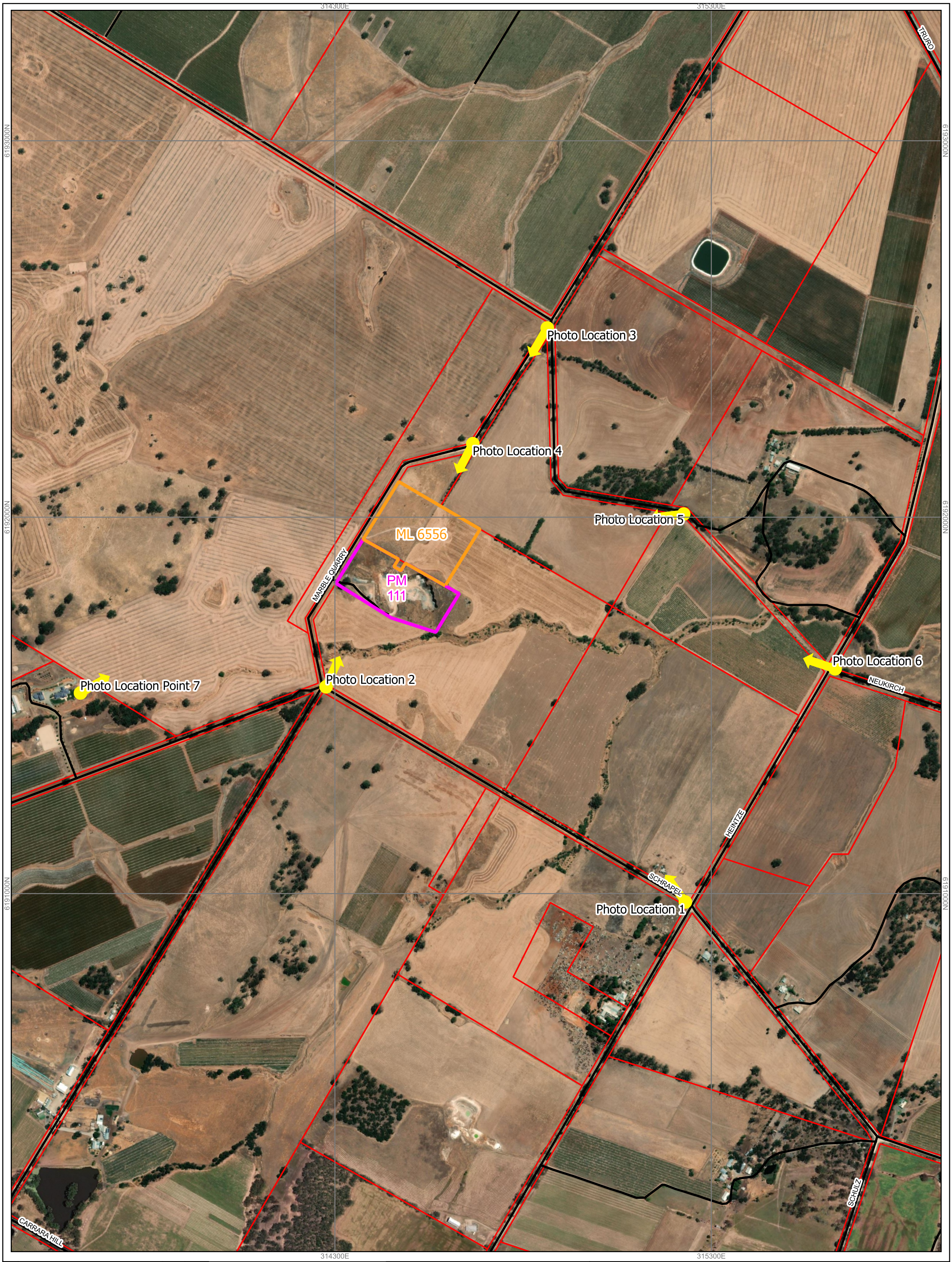
CREATED: 10 July 2024



REV	DESCRIPTION	DATE	BY

Data Sources:
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Topography: UAV Survey 2020-05-05
Cadastre: Data.sa.gov.au (2021). Note Cadastral boundaries are provided for indicative purposes only
Ecosystem:
Other: SARIG, 2024

Legend:
- Mining Lease (ML) 6556
- Private Mine (PM) 111
- Cadastral Boundary

N

PROJECT: Carrara Marble Quarry

CLIENT: Amulet Holdings Pty Ltd

TITLE: Visual Assessment Map

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

SCALE: 1:9,000 When Printed On A3
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DATE: 19-August-2024
PRINTED: 19-August-2024
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CHECKED: MJ
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EPSG:28354

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314800E

6192500N

6192000N

6191500N

ML 6556

PM 111

17707

Legend:
- Private Mine (PM) 111
- Mining Lease (ML) 6556
- Cadastral Boundary
- Offsite Vegetation
- State Heritage Places Points
- Waterbodies
- Watercourses

REV	DESCRIPTION	DATE	BY
1	Updated with Mining Lease ML 6556 number	13/02/2024	EP

Data Sources:
Photography: UAV Survey 2020-05-05; Google Maps accessed: 13-February-2024
Topography: UAV Survey 2020-05-05
Cadastre: Data.sa.gov.au (2021). Note Cadastral boundaries are provided for indicative purposes only
Ecosystem:
Other:

N

PROJECT: Carrara Marble Quarry

CLIENT: Amulet Holdings Pty Ltd

TITLE: Topographic Map

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

SCALE: 1:3,000 When Printed On A3 — 0 10 20 30 40 m

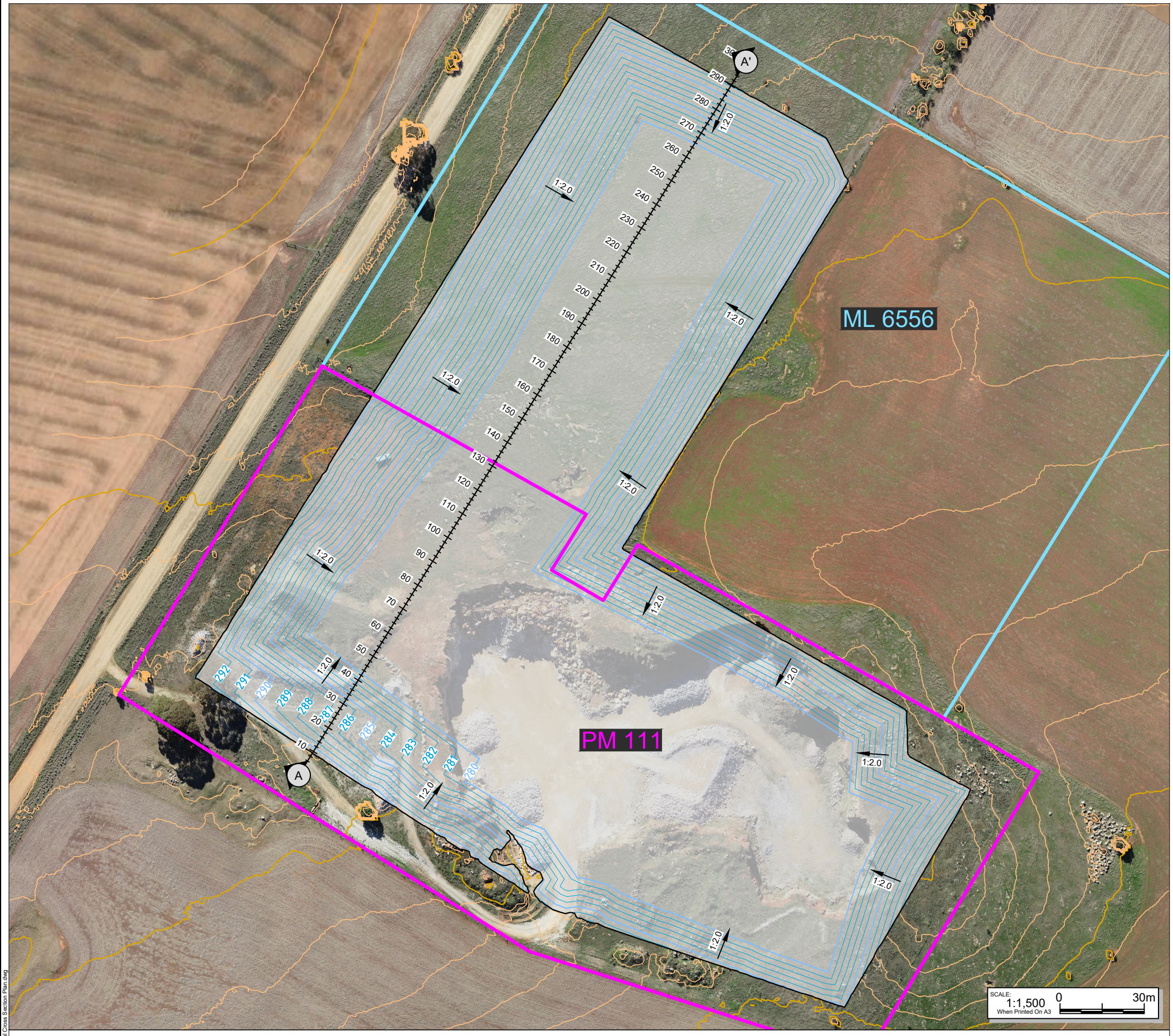
DATE: 13-February-2024 DRAWN: EP

PRINTED: 13-February-2024 CHECKED: MJ

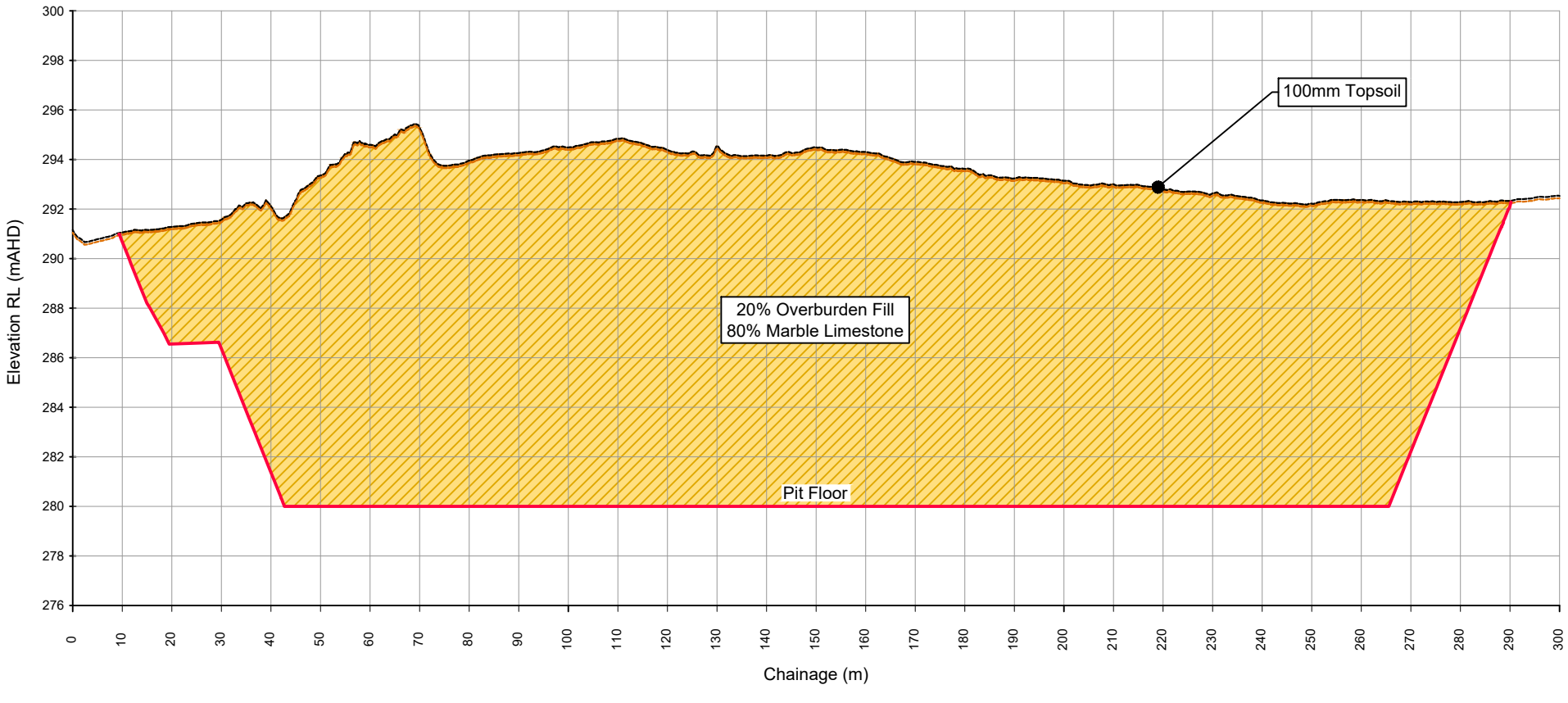
DRAWING NUMBER: 2492.DRG.016

REVISION: 1

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



Section A-A' (Horizontal - 1:1250, Vertical 1:250)



REV	DESCRIPTION	DATE	BY
1	Updated Pit Design	2024/07/10	CP

Data Sources:
Photography: Groundwork part of SLR Pty Ltd UAV Survey, Captured 2020/05/05
Topography: Groundwork part of SLR Pty Ltd UAV Survey, Captured 2020/05/05, DSM 1m
Cadastre:
Ecosystem:
Other: © 2024 Microsoft Corporation; © 2024 Maxar; © CNES (2024) Distribution Airbus DS

Legend:
- Mining Lease
- Private Mine
- Extraction Area

PROJECT: Carrara Marble Quarry

CLIENT: Barossa Quarries

TITLE: Geological Cross Section

GROUNDWORK PART OF SLR
PH: +61 7 3871 0411
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SCALE: 1:1,250 When Printed On A3 — 0 — 25m
DRAWING NUMBER: 2492.DRG.018
REVISION: 1
DATE: 10 July 2024 | DRAWN: CP
PRINTED: 10 July 2024 | CHECKED: EM
DATUM: HORIZONTAL / VERTICAL / ZONE: GDA94 / MGA / AHD / 54

CREATED: 10 July 2024 JOB SUB #: FILE NAME:F:\Jobs\2400\2492_Barossa Quarries_Carrara MarbleQ\Drawings\Drawing\2492.DRG.018R1 Geological Cross Section Plan.dwg

E 314300m
E 314400m
E 314500m
E 314600m
N 6192100m
N 6192000m
N 6191900m
N 6191800m
N 6191700m

Fence
Topsoil Storage
Topsoil Stockpile: 3977.3m³
Site Entry
Tree Line
Floor RL 280m
Backfill to 1:2 Batter to Stabilise Existing Face
Plant and Product Stockpiles to be Located on Pit Floor
Overburden Storage
ML 6556
PM 111
A
A'
B
B'
C
C'
D
D'
1:2.0

Stage	Material (2.7t/m³)		Overburden (1.8t/m³)		Topsoil (1.8t/m³)		Rehabilitation (1.8t/m³)	
	Volume (m³)	Tonnes (t)	Volume (m³)	Tonnes (t)	Volume (m³)	Tonnes (t)	Volume (m³)	Tonnes (t)
1	80,133.8	216,361.3	20,033.4	36,060.1	1,046.1	1,883.0	1,431.1	2,576.0
Total	**80,133.8**	**216,361.3**	**20,033.4**	**36,060.1**	**1,046.1**	**1,883.0**	**1,431.1**	**2,576.0**

REV	DESCRIPTION	DATE	BY
1	Topsoil storage and fence added	08/10/2024	GL

Data Sources:
Photography: Groundwork part of SLR Pty Ltd UAV Survey, Captured 2020/05/05
Topography: Groundwork part of SLR Pty Ltd UAV Survey, Captured 2020/05/05, DSM 1m
Cadastre:
Ecosystem:
Other: © 2024 Microsoft Corporation; © 2024 Maxar; © CNES (2024) Distribution Airbus DS

Legend:
- Mining Lease
- Private Mine
- Extraction Area (1.43ha)
- Rehabilitation Area (0.43ha)

PROJECT: Carrara Marble Quarry
CLIENT: Barossa Quarries
TITLE: Quarry Development Plan - Stage 1

GROUNDWORK PART OF SLR
PH: +61 7 3871 0411
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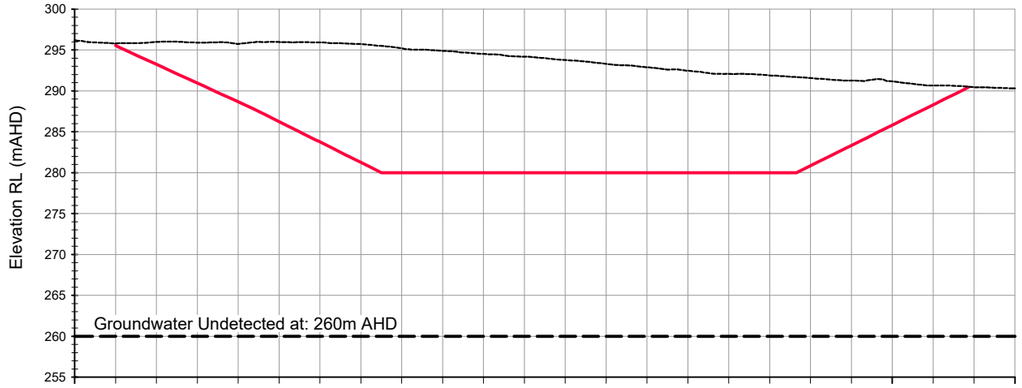
SCALE: 1:1,250 When Printed On A3 (0 – 25m)
DRAWING NUMBER: 2492.DRG.020A
REVISION: 1
DATE: 8 October 2024
DRAWN: CP
PRINTED: 8 October 2024
CHECKED: EM
DATUM: HORIZONTAL / VERTICAL / ZONE
GDA94 / MGA / AHD / 54

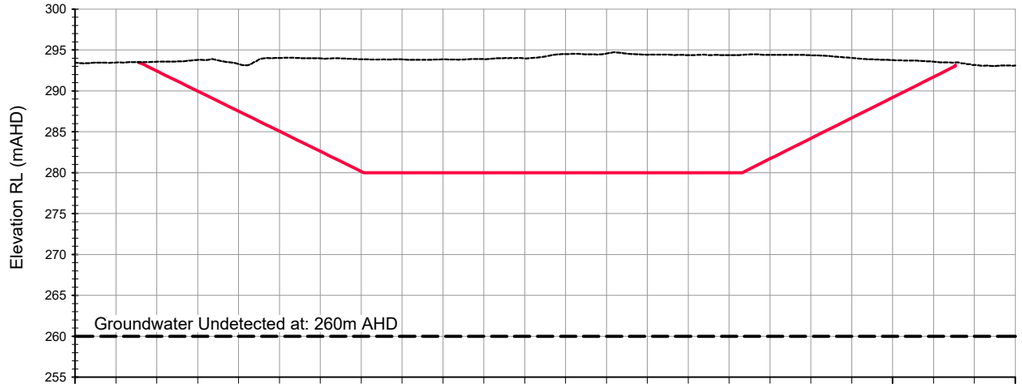
FILE NAME: Z:\Shared\Data\Jobs\2400\2492_Barossa Quarries_Carrara Marble\Q\Drawings\Drawing\2492.DRG.020R1 Quarry Development Plan - Stage 1.dwg
JOB SUB #:
CREATED: 8 October 2024

Section A-A'



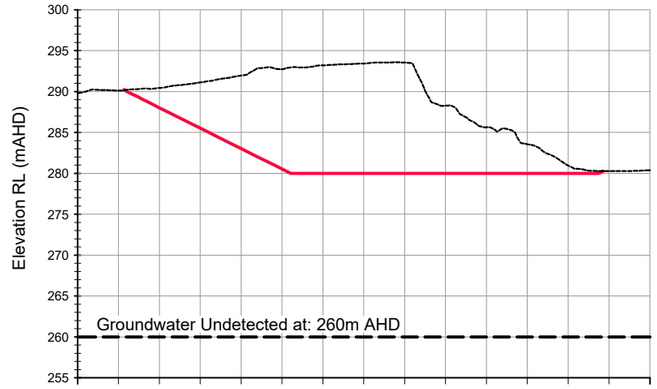
Chainage (m)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115
Existing Level (AHD)	295.8	296.0	295.9	295.8	296.0	295.9	295.7	295.2	294.9	294.5	294.2	293.8	293.3	292.9	292.5	292.1	291.9	291.6	291.3	291.2	290.7	290.5	290.3
Design Level (AHD)	295.6	293.2	290.9	288.7	286.2	283.8	281.3	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.9	283.3	285.8	288.3		
Depth (m)	0.3	2.7	5.0	7.1	9.7	12.2	14.5	15.2	14.9	14.5	14.2	13.8	13.3	12.9	12.5	12.1	11.9	10.7	7.9	5.4	2.4		

Section B-B'



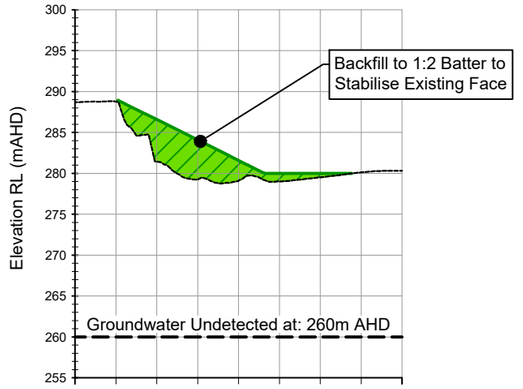
Chainage (m)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115
Existing Level (AHD)	293.5	293.6	293.8	293.3	294.0	294.0	293.9	293.9	293.9	293.9	294.0	294.5	294.6	294.4	294.4	294.4	294.4	294.4	294.0	293.8	293.6	293.2	293.1
Design Level (AHD)		292.4	290.0	287.5	285.1	282.6	280.2	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	281.7	284.2	286.7	289.2	291.7		
Depth (m)		1.1	3.8	5.8	9.0	11.4	13.7	13.9	13.9	13.9	13.9	14.0	14.5	14.6	14.4	14.4	14.4	12.7	10.2	7.3	4.6	1.9		

Section C-C'



Chainage (m)	5	10	15	20	25	30	35	40	45	50	55	60	65	70
Existing Level (AHD)	290.1	290.4	291.1	292.0	292.7	293.2	293.4	293.5	288.3	285.6	283.5	281.0	280.3	280.4
Design Level (AHD)		288.0	285.5	283.0	280.5	280.0	280.0	280.0	280.0	280.0	280.0	280.0		
Depth (m)		2.4	5.6	8.9	12.2	13.2	13.4	13.5	8.3	5.6	3.5	1.0		

Section D-D'



Chainage (m)	5	10	15	20	25	30	35	40
Existing Level (AHD)	288.8	281.4	279.2	279.1	279.0	279.5	280.1	280.3
Design Level (AHD)		286.6	284.1	281.6	280.0	280.0		

CREATED: 10 July 2024 JOB SUB #: FILE NAME: F:\Jobs\24002\492_Barossa Quarries_Carrara Marble\Drawings\Drawing\2492.DRG.020 Quarry Development Plan - Stage 1.dwg

REV	DESCRIPTION	DATE	BY

Data Sources:
Photography:
Topography: Groundwork part of SLR Pty Ltd UAV Survey, Captured 2020/05/05, DSM 1m
Cadastre:
Ecosystem:
Other:

Legend:
- Existing Ground Surface
- Pit Design Surface
- Rehabilitation Surface

PROJECT: Carrara Marble Quarry

CLIENT: Barossa Quarries

TITLE: Quarry Development Plan - Stage 1
Sections A-A' to D-D'

GROUNDWORK PART OF SLR
PH: +61 7 3871 0411
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SCALE: 1:750 When Printed On A3 (0 – 15m)
DRAWING NUMBER: 2492.DRG.020B
REVISION:
DATE: 10 July 2024 DRAWN: CP
PRINTED: 10 July 2024 CHECKED: EM
DATUM: HORIZONTAL / VERTICAL / ZONE: GDA94 / MGA / AHD / 54

E 314300m
E 314400m
E 314500m
E 314600m
N 6192100m
N 6192000m
N 6191900m
N 6191800m
N 6191700m

Fenceline
Topsoil Storage
Topsoil Stockpile: 3977.3m³
Site Entry
Tree Line
Floor RL 280m
Plant and Product Stockpiles to be Located on Pit Floor
Overburden Storage
ML 6556
PM 111
A
A'
B
B'
C
C'
1:2.0

Stage	Material (2.7t/m³)		Overburden (1.8t/m³)		Topsoil (1.8t/m³)		Rehabilitation (1.8t/m³)	
	Volume (m³)	Tonnes (t)	Volume (m³)	Tonnes (t)	Volume (m³)	Tonnes (t)	Volume (m³)	Tonnes (t)
1	80,133.8	216,361.3	20,033.4	36,060.1	1,046.1	1,883.0	1,431.1	2,576.0
2	94,404.7	254,892.7	23,601.2	42,482.2	1,248.7	2,247.7	0.0	0.0
Total	**174,538.5**	**471,254.0**	**43,634.6**	**78,542.3**	**2,294.8**	**4,130.6**	**1,431.1**	**2,576.0**

REV	DESCRIPTION	DATE	BY
1	Topsoil storage and fence added	08/10/2024	GL

Data Sources:
Photography: Groundwork part of SLR Pty Ltd UAV Survey, Captured 2020/05/05
Topography: Groundwork part of SLR Pty Ltd UAV Survey, Captured 2020/05/05, DSM 1m
Cadastre:
Ecosystem:
Other: © 2024 Microsoft Corporation; © 2024 Maxar; © CNES (2024) Distribution Airbus DS

Legend:
- Mining Lease
- Private Mine
- Extraction Area (2.68ha)
- Rehabilitation Area (0.43ha)

PROJECT: Carrara Marble Quarry
CLIENT: Barossa Quarries
TITLE: Quarry Development Plan - Stage 2

GROUNDWORK PART OF SLR
PH: +61 7 3871 0411
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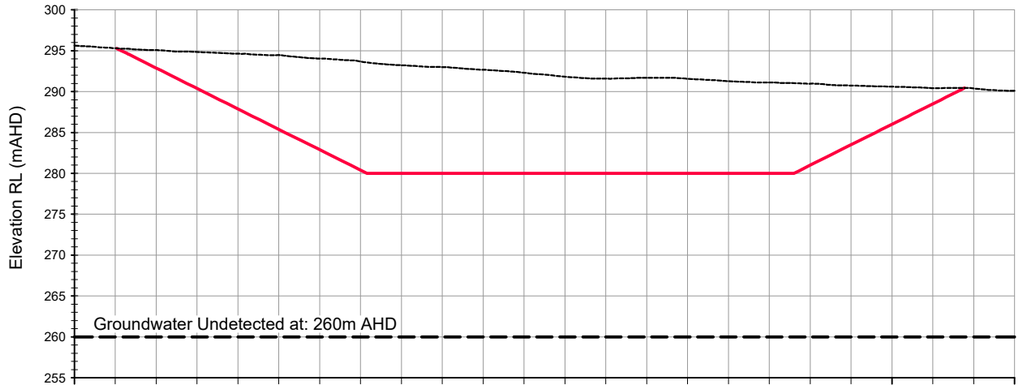
SCALE: 1:1,250 When Printed On A3 (0 – 25m)
DRAWING NUMBER: 2492.DRG.021A
REVISION: 1
DATE: 8 October 2024
DRAWN: CP
PRINTED: 8 October 2024
CHECKED: EM
DATUM: HORIZONTAL / VERTICAL / ZONE
GDA94 / MGA / AHD / 54

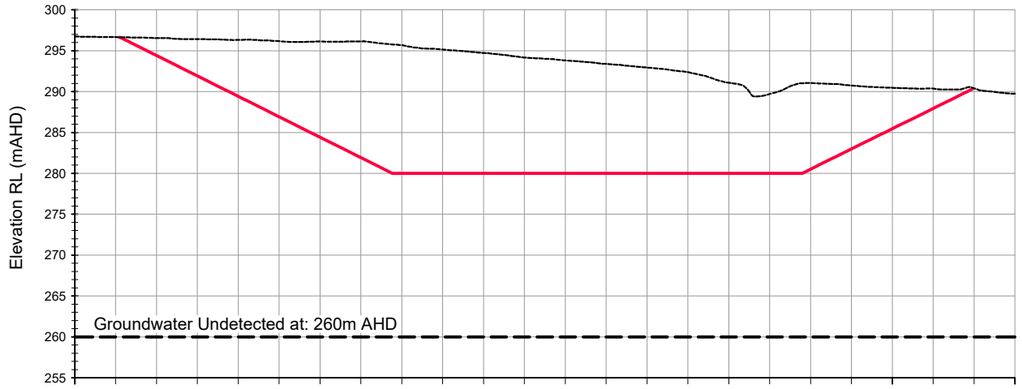
FILE NAME: Z:\Shared\Data\Jobs\2400\2492_Barossa Quarries_Carrara Marble\Q\Drawings\Drawing\2492.DRG.021R1 Quarry Development Plan - Stage 2.dwg
JOB SUB #:
CREATED: 8 October 2024

Section A-A'



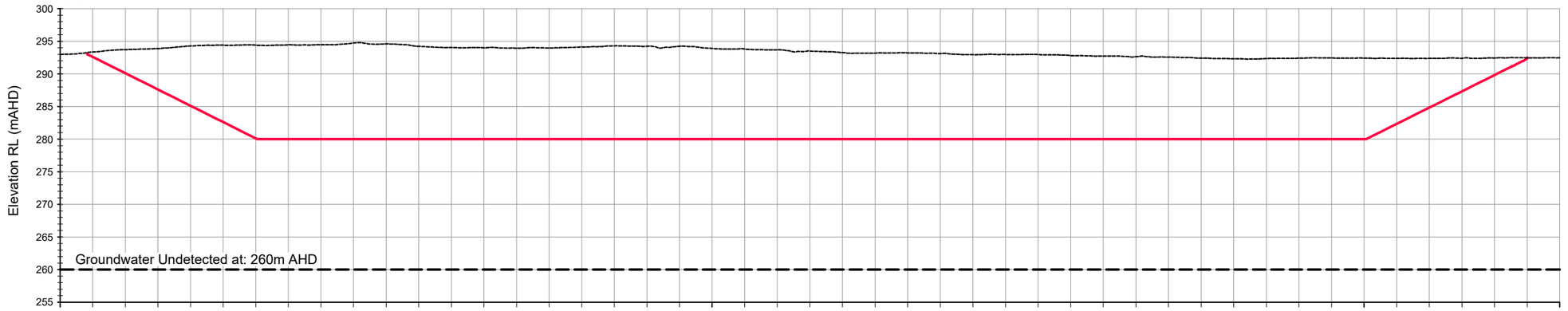
Chainage (m)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115
Existing Level (AHD)	295.3	295.1	294.8	294.6	294.5	294.0	293.7	293.2	293.0	292.7	292.3	291.8	291.6	291.7	291.6	291.3	291.1	291.0	290.7	290.6	290.4	290.4	290.1
Design Level (AHD)		292.9	290.4	287.9	285.4	282.9	280.4	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	281.0	283.5	286.0	288.5		
Depth (m)		2.2	4.5	6.7	9.1	11.1	13.3	13.2	13.0	12.7	12.3	11.8	11.6	11.7	11.6	11.3	11.1	10.0	7.2	4.6	1.9		

Section B-B'



Chainage (m)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115
Existing Level (AHD)	296.7	296.5	296.4	296.3	296.2	296.1	296.1	295.7	295.1	294.7	294.2	293.8	293.4	292.9	292.4	291.1	289.7	291.0	290.7	290.5	290.4	290.4	289.7
Design Level (AHD)		294.4	291.9	289.4	286.9	284.4	281.9	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.5	283.0	285.5	287.9		
Depth (m)		2.1	4.5	6.9	9.2	11.7	14.2	15.7	15.1	14.7	14.2	13.8	13.4	12.9	12.4	11.1	9.7	10.5	7.8	5.0	2.4		

Section C-C'



Chainage (m)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230
Existing Level (AHD)	293.4	293.7	293.9	294.3	294.4	294.4	294.5	294.5	294.7	294.6	294.2	294.1	294.0	293.9	294.0	294.1	294.3	294.2	294.2	293.9	293.8	293.7	293.5	293.3	293.2	293.2	293.1	292.9	293.0	293.0	292.8	292.7	292.6	292.6	292.4	292.3	292.3	292.4	292.4	292.4	292.4	292.4	292.4	292.4	292.5	292.5
Design Level (AHD)	292.6	290.1	287.6	285.1	282.6	280.1	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	282.3	284.8	287.3	289.8	292.4	
Depth (m)	0.8	3.6	6.3	9.2	11.8	14.3	14.5	14.5	14.7	14.6	14.2	14.1	14.0	13.9	14.0	14.1	14.3	14.2	14.2	13.9	13.8	13.7	13.5	13.3	13.2	13.2	13.1	12.9	13.0	13.0	12.8	12.7	12.6	12.6	12.4	12.3	12.3	12.4	12.4	12.4	10.0	7.5	5.1	2.6	0.1	

REV	DESCRIPTION	DATE	BY

Data Sources:
Photography:
Topography: Groundwork part of SLR Pty Ltd UAV Survey, Captured 2020/05/05, DSM 1m
Cadastre:
Ecosystem:
Other:

Legend:
Existing Ground Surface
Pit Design Surface

PROJECT: Carrara Marble Quarry

CLIENT: Barossa Quarries

TITLE: Quarry Development Plan - Stage 2
Sections A-A' to C-C'

GROUNDWORK PART OF SLR
PH: +61 7 3871 0411
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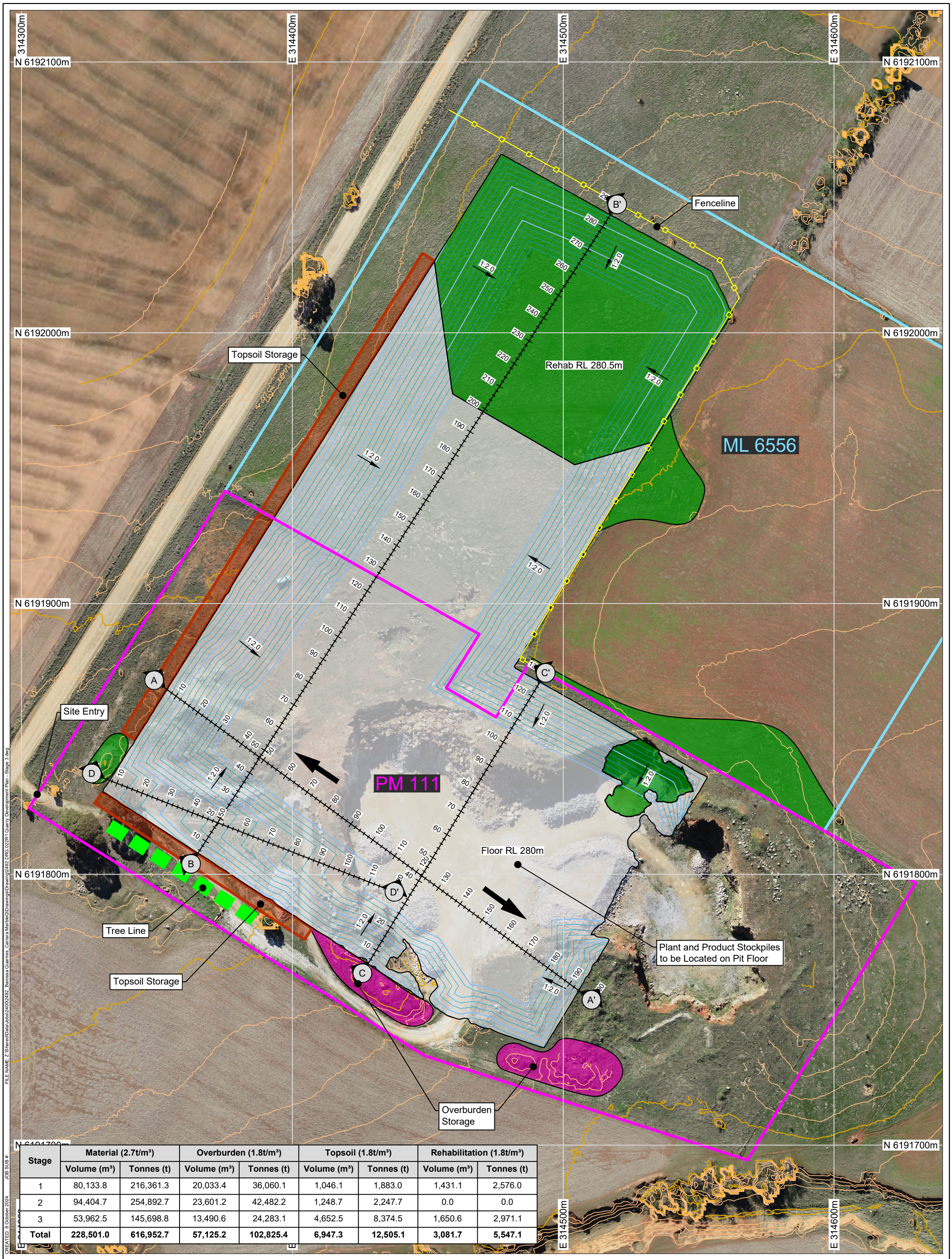
SCALE: 1:750 When Printed On A3 (0 — 15m)
DRAWING NUMBER: 2492.DRG.021B
REVISION:
DATE: 10 July 2024 DRAWN: CP
PRINTED: 10 July 2024 CHECKED: EM
DATUM: HORIZONTAL / VERTICAL / ZONE
GDA94 / MGA / AHD / 54



Stage	Material (2.7t/m³)		Overburden (1.8t/m³)		Topsoil (1.8t/m³)		Rehabilitation (1.8t/m³)	
	Volume (m³)	Tonnes (t)	Volume (m³)	Tonnes (t)	Volume (m³)	Tonnes (t)	Volume (m³)	Tonnes (t)
1	80,133.8	216,361.3	20,033.4	36,060.1	1,046.1	1,883.0	1,431.1	2,576.0
2	94,404.7	254,892.7	23,601.2	42,482.2	1,248.7	2,247.7	0.0	0.0
3	53,962.5	145,698.8	13,490.6	24,283.1	4,652.5	8,374.5	1,650.6	2,971.1
Total	**228,501.0**	**616,952.7**	**57,125.2**	**102,825.4**	**6,947.3**	**12,505.1**	**3,081.7**	**5,547.1**

REV	DESCRIPTION	DATE	BY
1	Topsoil storage and fence added	08/10/2024	GL

Data Sources:
Photography: Groundwork part of SLR Pty Ltd UAV Survey, Captured 2020/05/05
Topography: Groundwork part of SLR Pty Ltd UAV Survey, Captured 2020/05/05, DSM 1m
Cadastre:
Ecosystem:
Other: © 2024 Microsoft Corporation; © 2024 Maxar; © CNES (2024) Distribution Airbus DS

Legend:
- Mining Lease
- Private Mine
- Extraction Area (3.01ha)
- Rehabilitation Area (1.22ha)

PROJECT: Carrara Marble Quarry

CLIENT: Barossa Quarries

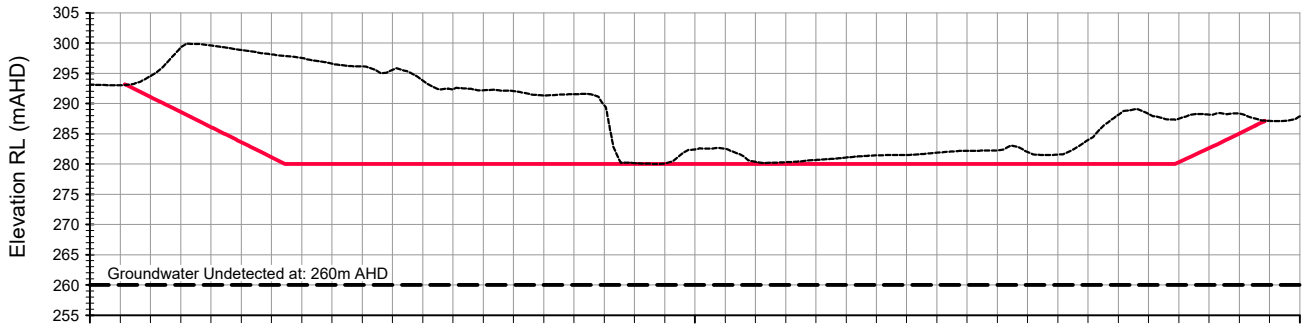
TITLE: Quarry Development Plan - Stage 3

GROUNDWORK PART OF SLR
PH: +61 7 3871 0411
WWW.GROUNDWORK.COM.AU

SCALE: 1:1,250 When Printed On A3 (0 – 25m)
DRAWING NUMBER: 2492.DRG.022A
REVISION: 1
DATE: 8 October 2024
DRAWN: CP
PRINTED: 8 October 2024
CHECKED: EM
DATUM: HORIZONTAL / VERTICAL / ZONE: GDA94 / MGA / AHD / 54

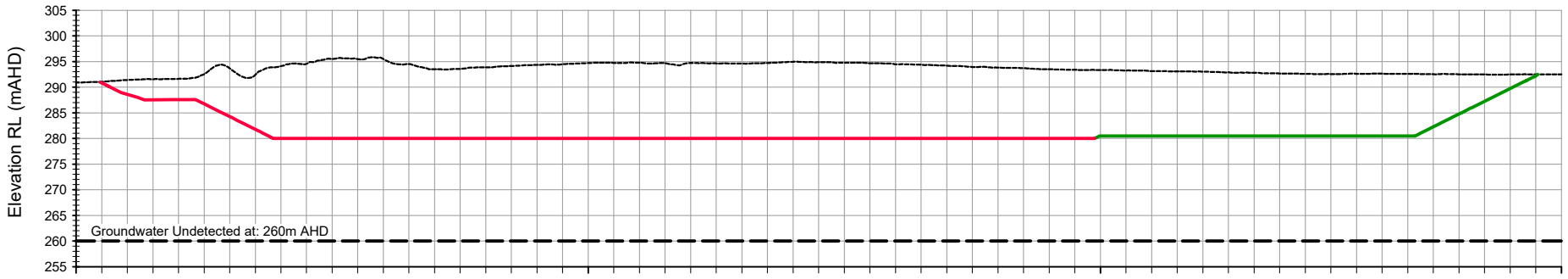
FILE NAME: Z:\Shared\Data\Jobs\240024492_Barossa Quarries_Carrara Marble\Q\Drawings\Drawing\2492.DRG.022R1 Quarry Development Plan - Stage 3.dwg
JOB SUB #:
CREATED: 8 October 2024

Section A-A'



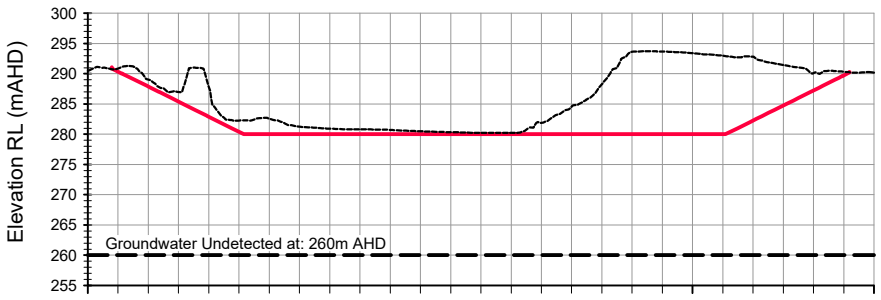
Chainage (m)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200
Existing Level (AHD)	293.0	294.5	299.2	299.6	298.9	298.1	297.5	296.6	296.1	295.5	293.8	292.3	292.2	292.0	291.3	291.5	289.7	280.1	280.1	282.4	282.5	280.4	280.3	280.7	281.1	281.4	281.5	281.9	282.2	282.3	282.0	281.6	284.0	288.1	288.3	287.5	288.2	288.3	287.1	287.9
Design Level (AHD)		291.1	288.6	286.1	283.6	281.1	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.3	282.6	285.0		
Depth (m)		3.5	10.6	13.5	15.3	17.0	17.5	16.6	16.1	15.5	13.8	12.3	12.2	12.0	11.3	11.5	9.7	0.1	0.1	2.4	2.5	0.4	0.3	0.7	1.1	1.4	1.5	1.9	2.2	2.3	2.0	1.6	4.0	8.1	8.3	7.2	5.6	3.3		

Section B-B'



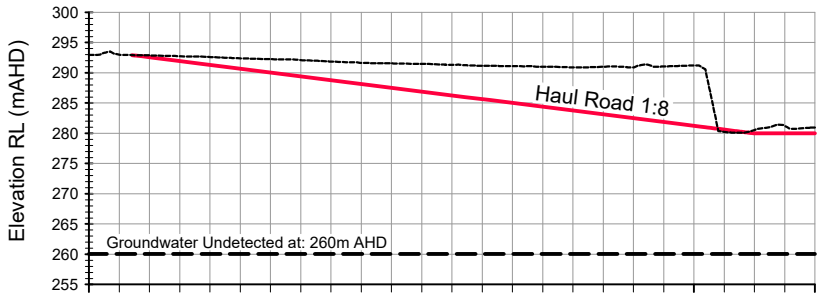
Chainage (m)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290
Existing Level (AHD)	291.0	291.4	291.6	291.6	292.5	293.7	292.4	294.1	294.6	295.5	295.5	295.5	295.5	294.5	293.5	293.6	293.9	294.1	294.3	294.3	294.5	294.7	294.7	294.8	294.7	294.7	294.6	294.6	294.7	295.0	294.9	294.7	294.7	294.5	294.4	294.2	293.9	293.8	293.7	293.5	293.4	293.3	293.2	293.1	293.1	293.0	292.9	292.8	292.7	292.6	292.6	292.6	292.6	292.6	292.6	292.5	292.5	292.5	292.5	292.5
Design Level (AHD)	290.8	288.6	287.5	287.6	286.8	284.3	281.8	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	284.7	287.2	289.7	292.2	
Depth (m)	0.2	2.8	4.0	4.1	5.8	9.4	10.7	14.1	14.6	15.5	15.5	15.5	15.5	14.5	13.5	13.6	13.9	14.1	14.3	14.5	14.7	14.7	14.7	14.8	14.7	14.7	14.6	14.6	14.7	15.0	14.9	14.7	14.7	14.5	14.4	14.2	13.9	13.8	13.7	13.5	13.4	12.8	12.7	12.6	12.6	12.5	12.4	12.3	12.2	12.1	12.1	12.1	12.1	12.1	12.1	10.3	7.7	5.3	2.8	0.3	

Section C-C'



Chainage (m)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130
Existing Level (AHD)	290.8	289.0	287.0	287.9	282.3	282.6	281.3	280.9	280.8	280.7	280.5	280.3	280.2	280.2	281.9	284.6	288.3	293.6	293.7	293.4	293.0	292.8	291.4	290.1	290.3	290.2
Design Level (AHD)	290.4	287.9	285.4	282.9	280.4	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	282.3	284.8	287.3	289.7	
Depth (m)	0.5	1.1	1.6	5.0	1.9	2.6	1.3	0.9	0.8	0.7	0.5	0.3	0.2	0.2	1.9	4.6	8.3	13.6	13.7	13.4	13.0	10.5	6.7	2.9	0.6	

Section D-D'



Chainage (m)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120
Existing Level (AHD)	293.0	292.9	292.8	292.6	292.4	292.3	292.1	291.9	291.6	291.6	291.5	291.3	291.2	291.1	291.0	290.9	291.0	290.9	291.0	291.2	280.2	280.5	281.2	281.0
Design Level (AHD)		292.6	291.9	291.3	290.7	290.0	289.4	288.8	288.2	287.5	286.9	286.3	285.6	285.0	284.4	283.8	283.1	282.5	281.9	281.2	280.6	280.0	280.0	280.0
Depth (m)		0.3	0.8	1.3	1.7	2.2	2.7	3.1	3.5	4.0	4.6	5.0	5.5	6.1	6.6	7.1	7.9	8.4	9.2	10.0	-0.4	0.5	1.2	1.0

REV	DESCRIPTION	DATE	BY

Data Sources:
Photography:
Topography: Groundwork part of SLR Pty Ltd UAV Survey, Captured 2020/05/05, DSM 1m
Cadastre:
Ecosystem:
Other:

Legend:
- Existing Ground Surface
- Pit Design Surface
- Rehabilitation Surface

PROJECT: Carrara Marble Quarry

CLIENT: Barossa Quarries

TITLE: Quarry Development Plan - Stage 3
Sections A-A' to D-D'

GROUNDWORK PART OF SLR
PH: +61 7 3871 0411
WWW.GROUNDWORK.COM.AU

SCALE: 1:1,250 When Printed On A3 — 0 — 25m
DRAWING NUMBER: 2492.DRG.022B
REVISION:
DATE: 10 July 2024 DRAWN: CP
PRINTED: 10 July 2024 CHECKED: EM
DATUM: HORIZONTAL / VERTICAL / ZONE
GDA94 / MGA / AHD / 54

E 314300m
E 314400m
E 314500m
E 314600m
N 6192100m
N 6192000m
N 6191900m
N 6191800m
N 6191700m

Fenceline
A'
280
270
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
1:2.0

ML 6556

Rehab RL 280.5m

Topsoil Storage

Site Entry

PM 111

Floor RL 280m

292
291
290
289
288
287
286
285
284
283
282
281
280

A
B
B'
C
C'

Tree Line

Topsoil Storage

Overburden Storage

Topsoil Storage

Plant and Product Stockpiles to be Located on Pit Floor

Stage	Material (2.7t/m³)		Overburden (1.8t/m³)		Topsoil (1.8t/m³)		Rehabilitation	
	Volume (m³)	Tonnes (t)	Volume (m³)	Tonnes (t)	Volume (m³)	Tonnes (t)	Volume (m³)	Tonnes (t)
1	80,133.8	216,361.3	20,033.4	36,060.1	1,046.1	1,883.0	1,431.1	2,576.0
2	94,404.7	254,892.7	23,601.2	42,482.2	1,248.7	2,247.7	0.0	0.0
3	53,962.5	145,698.8	13,490.6	24,283.1	4,652.5	8,374.5	1,650.6	2,971.1
4	21,693.4	58,572.2	5,423.4	9,762.0	444.0	799.2	1,208.6	2,175.5
Total	**250,194.4**	**675,524.9**	**62,548.6**	**112,587.4**	**7,391.3**	**13,304.3**	**4,290.3**	**7,722.5**

REV	DESCRIPTION	DATE	BY
1	Topsoil storage and fence added	08/10/2024	GL

Data Sources:
Photography: Groundwork part of SLR Pty Ltd UAV Survey, Captured 2020/05/05
Topography: Groundwork part of SLR Pty Ltd UAV Survey, Captured 2020/05/05, DSM 1m
Cadastre:
Ecosystem:
Other: © 2024 Microsoft Corporation; © 2024 Maxar; © CNES (2024) Distribution Airbus DS

Legend:
- Mining Lease
- Private Mine
- Extraction Area (2.71ha)
- Rehabilitation Area (2.27ha)

PROJECT: Carrara Marble Quarry

CLIENT: Barossa Quarries

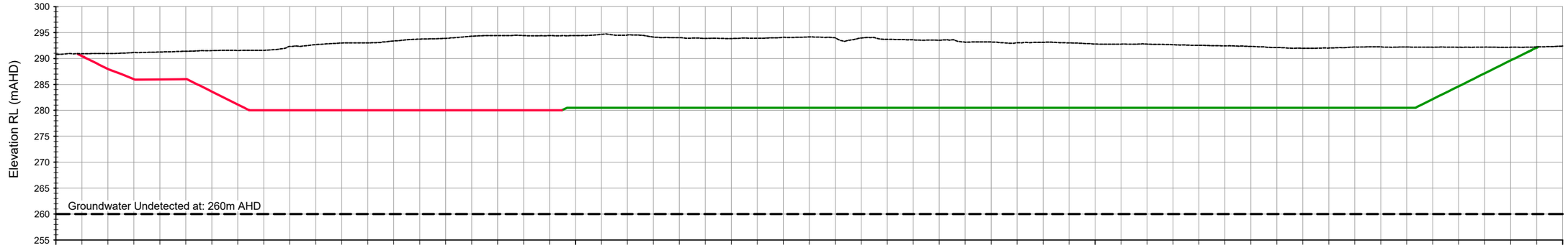
TITLE: Quarry Development Plan - Stage 4

GROUNDWORK PART OF SLR
PH: +61 7 3871 0411
WWW.GROUNDWORK.COM.AU

SCALE: 1:1,250 When Printed On A3 (0 – 25m)
DRAWING NUMBER: 2492.DRG.023A
REVISION: 1
DATE: 8 October 2024
DRAWN: CP
PRINTED: 8 October 2024
CHECKED: EM
DATUM: HORIZONTAL / VERTICAL / ZONE
GDA94 / MGA / AHD / 54

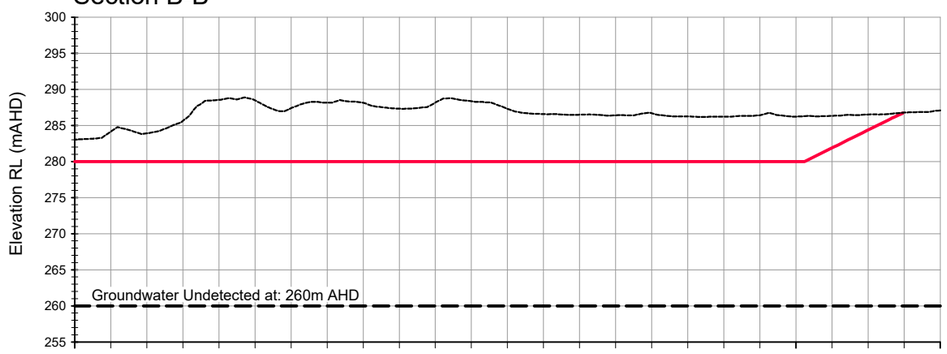
FILE NAME: Z:\SharedData\Jobs\2400\2492_Barossa Quarries_Carrara Marble\Drawings\Drawing\2492.DRG.023R1 Quarry Development Plan - Stage 4.dwg
JOB SUB #:
CREATED: 8 October 2024

Section A-A'



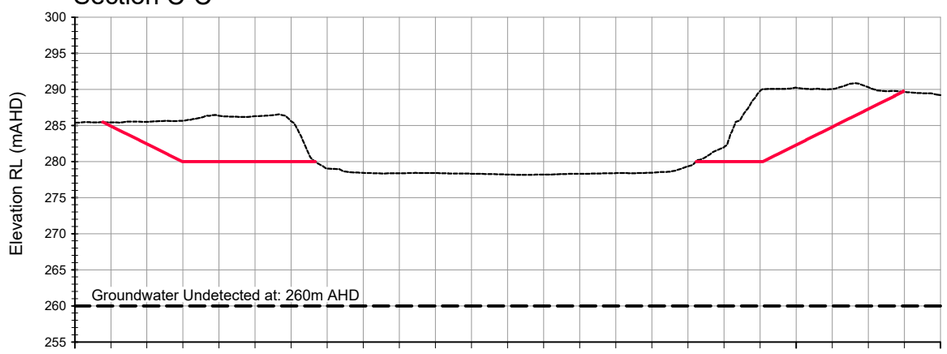
Chainage (m)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290
Existing Level (AHD)	290.9	290.9	291.2	291.2	291.4	291.5	291.5	291.6	292.3	292.7	293.0	293.0	293.4	293.7	293.9	294.3	294.4	294.4	294.4	294.4	294.6	294.5	294.1	294.0	293.9	293.8	293.9	294.1	294.1	294.0	293.9	293.7	293.6	293.5	293.1	293.2	293.0	293.1	293.0	292.8	292.8	292.8	292.6	292.5	292.4	292.3	292.1	292.0	292.0	292.2	292.2	292.2	292.2	292.2	292.2	292.4
Design Level (AHD)	290.5	288.0	286.0	286.0	286.0	283.6	281.1	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	282.2	284.6	287.1	289.6	292.0	
Depth (m)	0.4	3.0	5.1	5.3	5.4	7.9	10.4	11.6	12.3	12.7	13.0	13.0	13.4	13.7	13.9	14.3	14.4	14.4	14.4	13.9	14.1	14.0	13.6	13.5	13.4	13.3	13.4	13.6	13.6	13.5	13.4	13.2	13.1	13.0	12.6	12.7	12.5	12.6	12.5	12.3	12.3	12.3	12.1	12.0	11.9	11.8	11.6	11.5	11.5	11.7	11.7	11.7	10.0	7.5	5.1	2.5	0.2	

Section B-B'



Chainage (m)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120
Design Level (AHD)	284.1	283.9	285.6	288.5	288.5	287.4	288.1	288.1	287.3	288.2	288.3	287.3	286.6	286.5	286.4	286.7	286.3	286.2	286.4	286.2	286.3	286.5	286.8	287.1
Existing Level (AHD)	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	280.0	281.9	284.4		
Depth (m)	4.1	3.9	5.6	8.5	8.5	7.4	8.1	8.1	7.3	8.2	8.3	7.3	6.6	6.5	6.4	6.7	6.3	6.2	6.4	6.2	4.4	2.1		

Section C-C'



Chainage (m)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120
Design Level (AHD)	285.4	285.5	285.6	286.3	286.3	285.6	279.0	278.4	278.4	278.4	278.3	278.2	278.2	278.3	278.4	278.4	279.3	282.0	289.8	290.2	290.0	290.3	289.6	289.2
Existing Level (AHD)	284.9	282.4	280.0	280.0	280.0	280.0												280.0	280.0	282.3	284.8	287.3		
Depth (m)	0.5	3.1	5.6	6.3	6.3	5.6												2.0	9.8	7.9	5.3	3.0		

REV	DESCRIPTION	DATE	BY

Data Sources:
Photography:
Topography: Groundwork part of SLR Pty Ltd UAV Survey, Captured 2020/05/05, DSM 1m
Cadastre:
Ecosystem:
Other:

Legend:
- Existing Ground Surface
- Pit Design Surface
- Rehabilitation Surface

PROJECT: Carrara Marble Quarry

CLIENT: Barossa Quarries

TITLE: Quarry Development Plan - Stage 4
Sections A-A' to C-C'

GROUNDWORK PART OF SLR
PH: +61 7 3871 0411
WWW.GROUNDWORK.COM.AU

SCALE: 1:850 When Printed On A3 — 0 — 17m
DRAWING NUMBER: 2492.DRG.023B
REVISION:
DATE: 10 July 2024 DRAWN: CP
PRINTED: 10 July 2024 CHECKED: EM
DATUM: HORIZONTAL / VERTICAL / ZONE GDA94 / MGA / AHD / 54

CREATED: 10 July 2024 JOB SUB #: FILE NAME: F:\Jobs\2400\2492_Barossa Quarries_Carrara Marble\Cit\Drawings\Drawing\2492.DRG.023 Quarry Development Plan - Stage 4.dwg

Stage	Rehabilitation	
	Volume (m³)	Tonnes (t)
1	1,431.1	2,576.0
2	0.0	0.0
3	1,650.6	2,971.1
4	1,208.6	2,175.5
Final Landform	24,956.7	44,922.1
Total	**29,247.0**	**52,644.6**

REV	DESCRIPTION	DATE	BY
1	Fenceline altered	08/10/2024	GL

Data Sources:
Photography: Groundwork part of SLR Pty Ltd UAV Survey, Captured 2020/05/05
Topography: Groundwork part of SLR Pty Ltd UAV Survey, Captured 2020/05/05, DSM 1m
Cadastre:
Ecosystem:
Other: © 2024 Microsoft Corporation; © 2024 Maxar; © CNES (2024) Distribution Airbus DS

Legend:
- Mining Lease
- Private Mine
- Rehabilitation Area (4.97ha)

PROJECT: Carrara Marble Quarry

CLIENT: Barossa Quarries

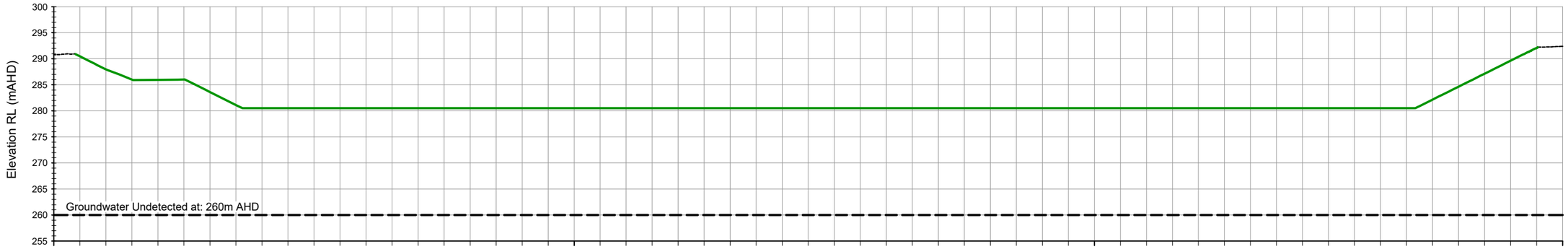
TITLE: Conceptual Final Landform Plan

GROUNDWORK PART OF SLR
PH: +61 7 3871 0411
WWW.GROUNDWORK.COM.AU

SCALE: 1:1,250 When Printed On A3 (0 — 25m)
DRAWING NUMBER: 2492.DRG.024A
REVISION: 1
DATE: 8 October 2024
DRAWN: CP
PRINTED: 8 October 2024
CHECKED: EM
DATUM: HORIZONTAL / VERTICAL / ZONE
GDA94 / MGA / AHD / 54

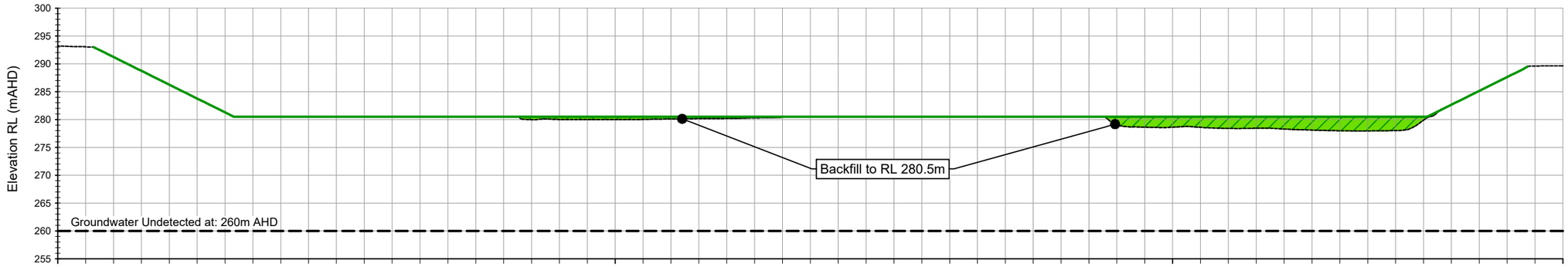
FILE NAME: Z:\SharedData\Jobs\2400\2492_Barossa Quarries_Carrara Marble\Drawings\Drawing\2492.DRG.024R1 Conceptual Final Landform Plan.dwg
JOB SUB #:
CREATED: 8 October 2024

Section A-A'



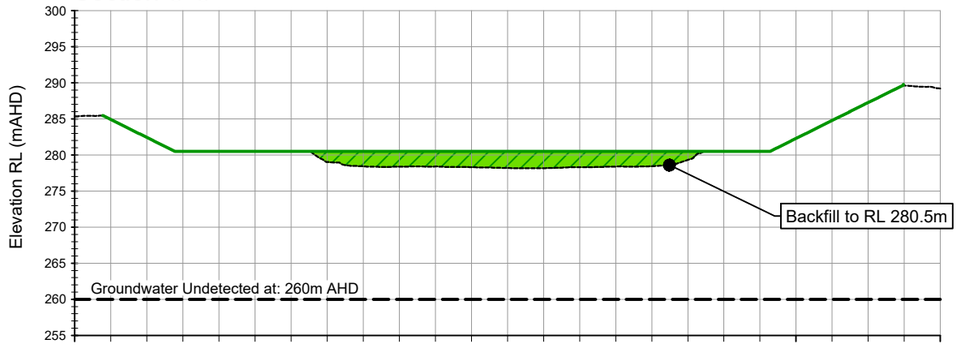
Chainage (m)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290
Final Level (AHD)	290.5	288.0	286.0	286.0	286.0	283.6	281.1	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	282.2	284.6	287.1	289.6	292.0	292.4

Section B-B'



Chainage (m)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270
Final Level (AHD)	293.0	291.2	288.7	286.3	283.8	281.3	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	282.7	285.1	287.6	289.6	289.6

Section C-C'



Chainage (m)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120
Final Level (AHD)	284.9	282.4	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	280.5	282.3	284.8	287.3	289.7	289.2

CREATED: 10 July 2024 JOB SUB # FILE NAME: F:\Jobs\24000\2492_Barossa Quarries_Carrara Marble\QI\Drawings\Drawing\2492.DRG.024 Conceptual Final Landform Plan.dwg

REV	DESCRIPTION	DATE	BY

Data Sources:
Photography:
Topography: Groundwork part of SLR Pty Ltd UAV Survey, Captured 2020/05/05, DSM 1m
Cadastre:
Ecosystem:
Other:

Legend:
- Existing Ground Surface
- Rehabilitation Surface

PROJECT: Carrara Marble Quarry

CLIENT: Barossa Quarries

TITLE: Conceptual Final Landform Plan
Sections A-A' to C-C'

GROUNDWORK PART OF SLR
PH: +61 7 3871 0411
WWW.GROUNDWORK.COM.AU

SCALE: 1:850 When Printed On A3 (0 — 17m)
DRAWING NUMBER: 2492.DRG.024B
REVISION:
DATE: 10 July 2024 DRAWN: CP
PRINTED: 10 July 2024 CHECKED: EM
DATUM: HORIZONTAL / VERTICAL / ZONE GDA94 / MGA / AHD / 54

REV	DESCRIPTION	DATE	BY

Data
Photography: UAV Survey 2020-05-05; Google Satellite Imagery accessed: 19-August-2024
Topography: UAV Survey 2020-05-05
Cadastre: Data.sa.gov.au Boundaries are Indicative only, not all boundaries shown
Ecosystem:
Other: SARIG, 2024

Legend:
- Mining Lease
- Site PM 111
- Topsoil PM 111
- Product Stockpiles current
- Site entry / exit

N

PROJECT: Site Layout Plan

CLIENT: Amulet Holdings Pty Ltd

TITLE: Site Layout Plan

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

SCALE: 1:2,000 When Printed On A3 (0 10 20 30 40 m)
DRAWING NUMBER: 2492.DRG.025
REVISION:
DATE: 19-August-2024
DRAWN: EP
PRINTED: 19-August-2024
CHECKED: MJ
DATUM: HORIZONTAL / VERTICAL / EPSG:7854
MGA / AHD / 54

attachments

Attachment 1

Wind Rose Data Nuriootpa PIRSA Station (Site No. 023373)

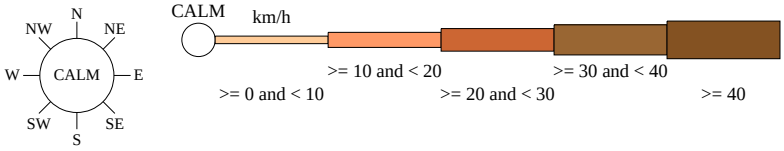
Rose of Wind direction versus Wind speed in km/h (28 Aug 1996 to 10 Aug 2024)

Custom times selected, refer to attached note for details

NURIOOTPA PIRSA

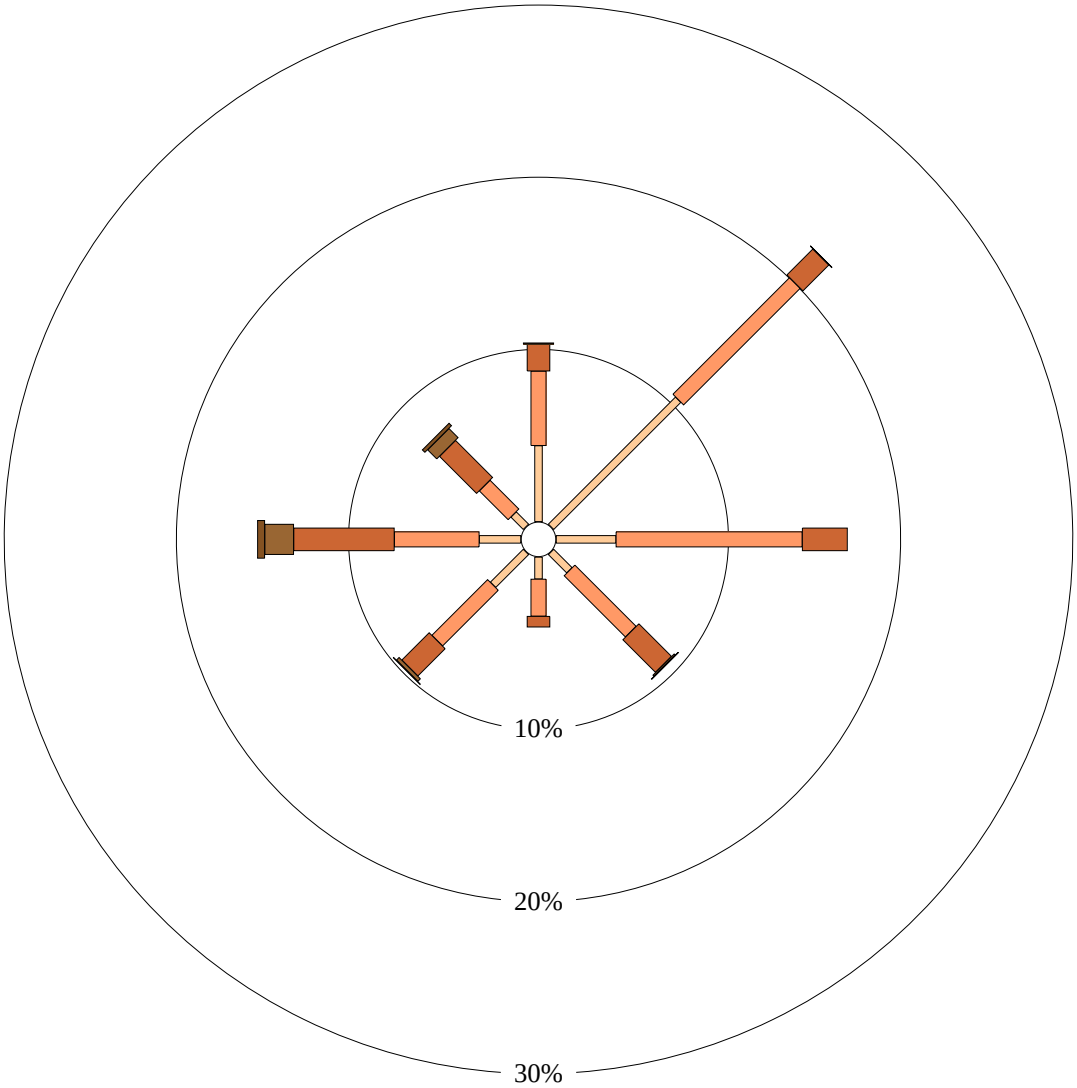
Site No: 023373 • Opened Aug 1996 • Still Open • Latitude: -34.4761° • Longitude: 139.0056° • Elevation 275m

An asterisk (*) indicates that calm is less than 0.5%.
Other important info about this analysis is available in the accompanying notes.



9 am
13911 Total Observations

Calm 5%



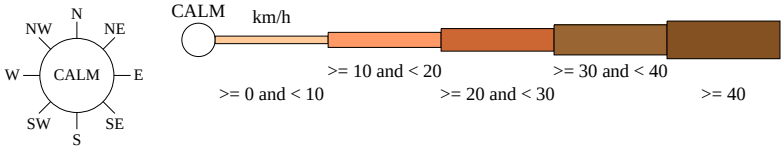
Rose of Wind direction versus Wind speed in km/h (28 Aug 1996 to 10 Aug 2024)

Custom times selected, refer to attached note for details

NURIOOTPA PIRSA

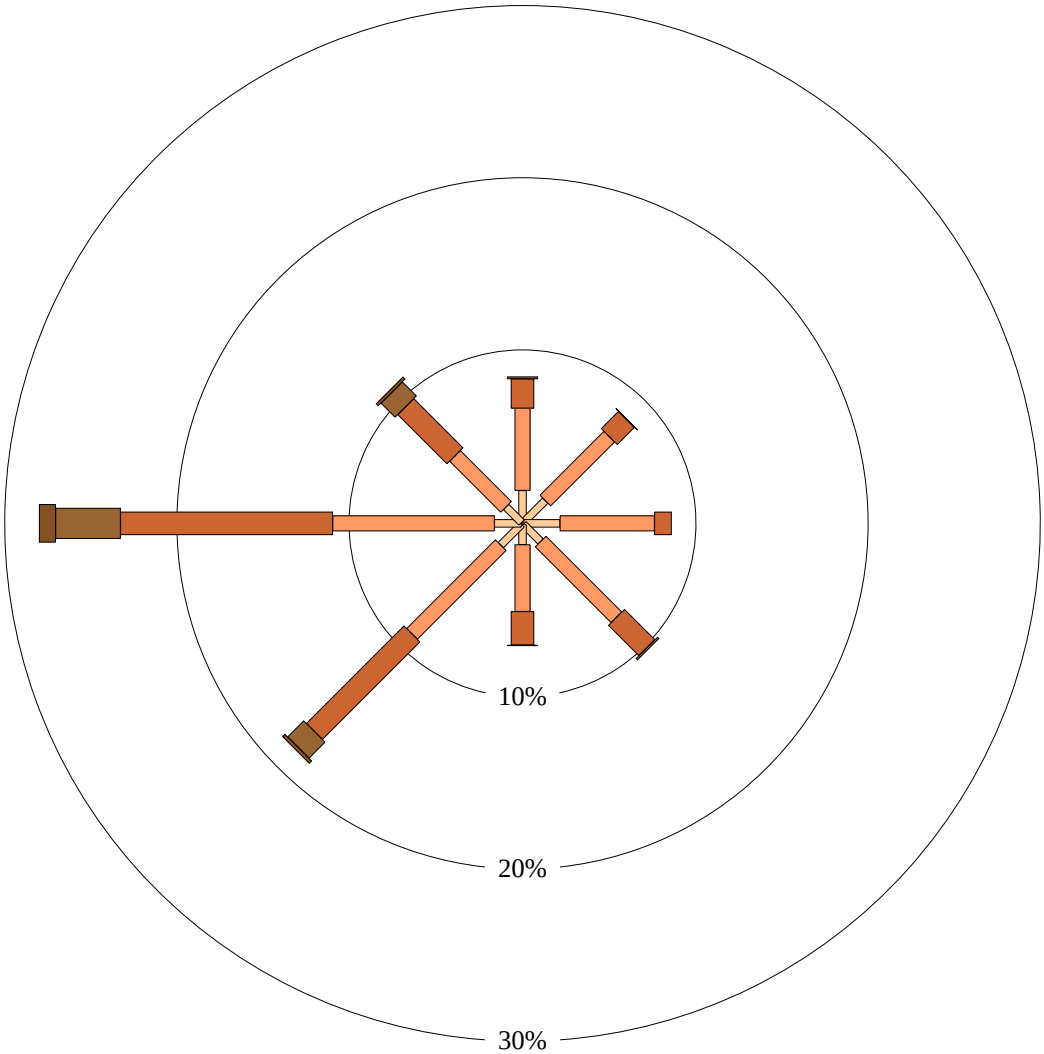
Site No: 023373 • Opened Aug 1996 • Still Open • Latitude: -34.4761° • Longitude: 139.0056° • Elevation 275m

An asterisk (*) indicates that calm is less than 0.5%.
Other important info about this analysis is available in the accompanying notes.



3 pm
13903 Total Observations

Calm *



Attachment 2

Petrographic Inspection Report

Email: info@groundwork.com.au
Website: groundwork.com.au
ABN 13 609 422 791

Petrographic Inspection Report

Prepared for:	Barossa Quarries
Date Received:	25/05/2020
Sample Type:	In Situ Spall
Source:	Carrara Marble Quarry
Date of Inspection:	08/06/2020
Report Issued:	19/06/2020
Project/ File Ref.:	P2020_107_02

Author: 

Blake Deegan (BSc, MPhil)

Petrologist
Groundwork Plus

Reviewer: 

Rod Huntley (BSc, M.App.Sc, M.Eng)
Principal Resource Consultant
Groundwork Plus

Enquiries regarding the content of this report should be directed to Groundwork Plus 07 3871 0411. Samples are disposed of after 3 months from the date of report. Thin sections will remain on site indefinitely. The analysis is based on a limited number of thin sections and sample provided by client, further investigation may be required. Interpretations are specific to the sample examined only.

Executive Summary

Classification: Medium-grained marble

For Engineering Purposes 2758.1: Marble, a carbonate metamorphic rock

Key Material Risk: Exposure to acidic conditions will result in disaggregation of the sample.

Table 1 – Summary of Sample's Compositional Characteristics

Compositional Features	%	Comments
Strong Phases	96	Occurring principally as calcite, with minor quartz and diopside
Weak/Secondary Phases	4	Minor weak phases identified as texturally isolate pyrite and muscovite, with trace clays and goethite
Shrink/swell clays	0	None observed
Micas	2	Minor mica as non-foliated muscovite laths
Sulphides	1	Occurring as disseminated pyrite
Organics	0	None observed
Textural Features	**Yes/ No**	
Fracturing/Veins	Yes	Minor calcite veining
Voids	No	None observed
Free Silica	**%**	
Unstrained quartz	2	Unstrained quartz inclusions
Optically strained Quartz	0	None observed
Microcrystalline Quartz	0	None observed
Volcanic Glass	0	None observed

Table 2 – Product Suitability for Specific Applications and Source Rock Quality

Product Suitability	Low	Mod	High	Comments
Coarse Aggregate in Concrete (MRTS70)			ü	Mechanically well-suited and ideal as aggregate in concrete used to extend the life of sewerage pipes and covers
Manufactured Sand			ü	Likely to produce high quality manufactured sand with insignificant argillic/ferruginous fines
Aggregate Unbound Pavements (MRTS05)			ü	Unlikely to produce deleterious or unmanageable fines with crushing
Cover/Sealing Aggregate (MRTS22)		ü		Suitable pending materials testing for LAA and SSS
Graded Asphalt Aggregate (MRTS101)		ü		Physically well suited pending Polished Aggregate Friction Value testing
Gabion/Revetment			ü	Suitable
Expected Performance	**Low**	**Mod**	**High**	**Comments**
Hardness			ü	Hard
Strength			ü	Strong
Durability			ü	Durable in non-acidic settings
ACR in concrete			ü	Innocuous, no dolomite detected
ASR in concrete			ü	Innocuous, minor unstrained quartz present

Introduction

This report provides the results of a general petrographic assessment of a spall sample, which was submitted to the Groundwork Plus petrographic laboratory, and describes the method and standards used to assess the sample. The supplied sample was sampled by the client and sent to the Groundwork Plus petrographic facility. The thin section was prepared and analysed by Groundwork Plus with instructions from the client to conduct petrographic testing to ASTM C295 and recommend further testing if significant deleterious characteristics are identified pursuant to Clause 16.3 of this standard. The provided modal mineral percentages relate to the supplied sample which is understood to be representative of material on site. Assessment regarding the Alkali-Silica Reactivity (ASR) potential of the aggregate has been advised by AS1141.65-2008 and is communicated pursuant to Clause 9. Communication of findings are advised by AS 1726-1993 Geotechnical Site Investigations.

Methodology

The petrographic assessment of the slide is carried out using a Nikon polarising microscope equipped with a digital camera at the Groundwork Plus petrographic laboratory. Photographs of the hand specimen and thin section photomicrographs showing grain sizes and any particular aspects of the minerals are included as part of the report (Plates 1 to 6). Modal analysis is conducted on the sample using a MA945/10 Mechanical Point Counter on 600 points (Table 3 – Modal Analysis of Minerals).

The petrology assessment is based on:

- ASTM C 295 – 2019 Standard Guide for Petrographic Examination of Aggregates for Concrete.
- AS 2758.1 – 2014 Aggregates and Rock for Engineering Purposes Part 1: Concrete Aggregates (Appendix B).
- AS 1141.26 – 2019 Standard Guide for the Method for Sampling and Testing Aggregates – Secondary Minerals Content in Igneous Rocks.
- Alkali-Aggregate Reaction - Guidelines on Minimising the Risk of Damage to Concrete Structure in Australia - Cement and Concrete Association of Australia and Standards Australia (HB 79-2015).
- The accepted definition of free silica is set out in the Queensland Department of Transport and Main Roads Test Method Q188, and tested pursuant to the AS1141.65-2008 Methods for sampling and testing aggregates – Alkali aggregates reactivity – Qualitative petrological screening for potential Alkali-Silica Reaction and AS1141.26 – 2019 Secondary Mineral Content.

Hand Specimen Description

The supplied spall is identified as a medium-grained Marble.

The supplied sample is approximately 15cm in diameter and is slightly weathered, with minor goethitic staining on the exterior of the spall. The sample consists of medium grained white crystalline and tightly interlocking calcite crystals. The cut face of the spall shows thin grey veining, which is represents primary clay-rich sedimentary layers. Minor white veining is present crosscuts the grey layering observed and is composed of micritic calcite. The sample is regarded as hard, strong, and durable. Minor pyrite is observed in hand specimen, and the sample is non-magnetic.

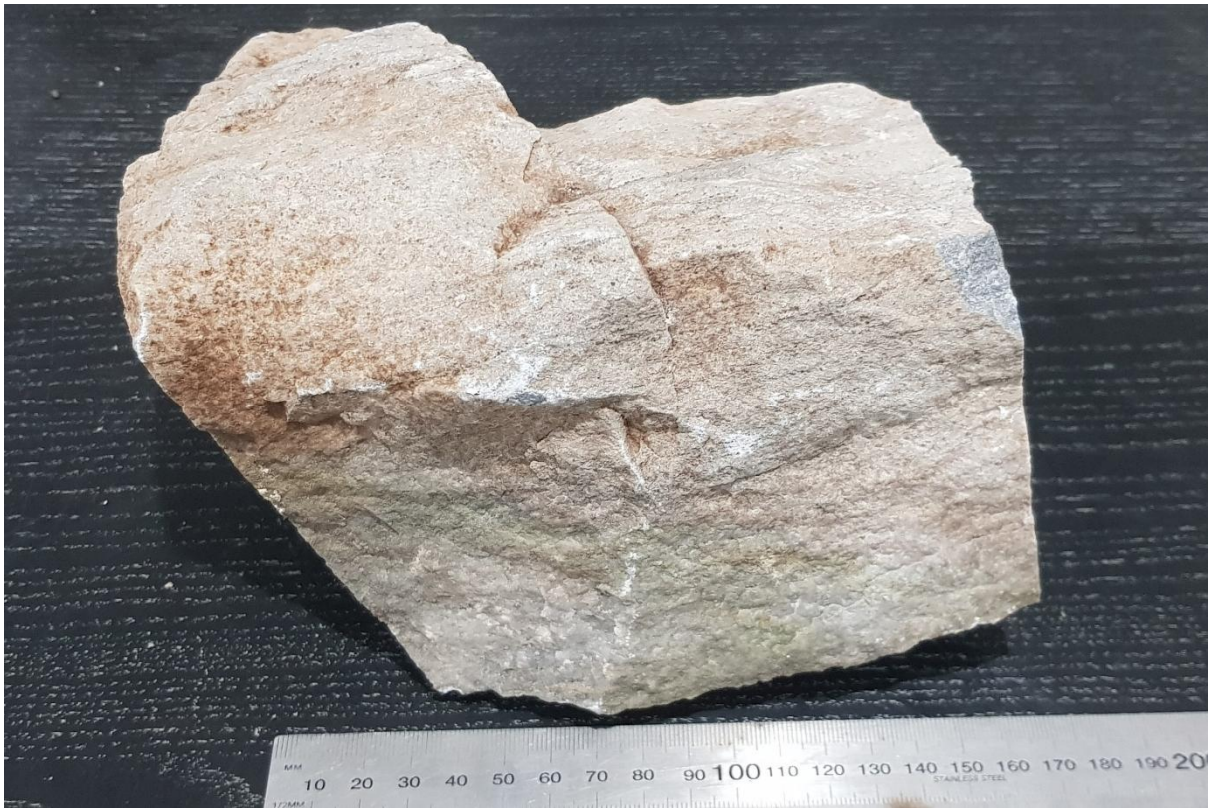


Plate 1: Photograph of the sample as provided, showing the medium grain size and weathered exterior of the spall.

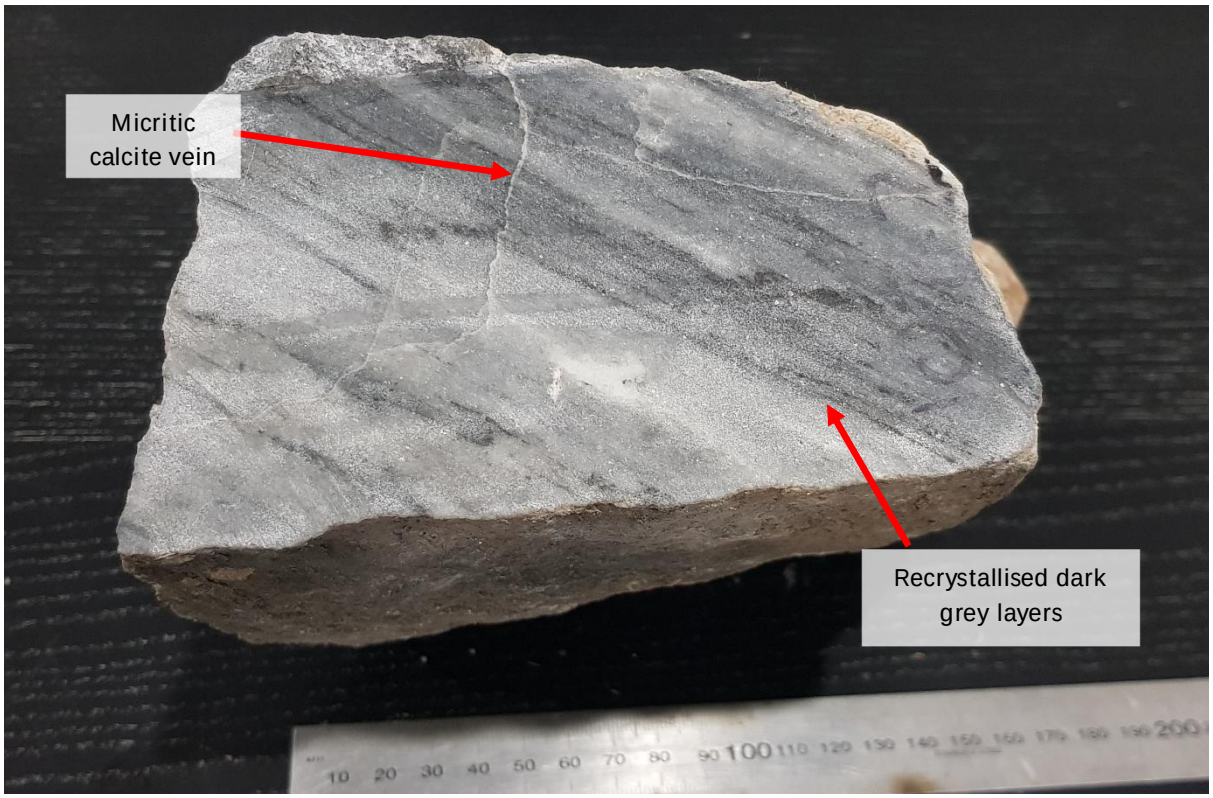


Plate 2: Photograph of the washed sample, showing the occurrence of deformed clay-rich primary layers and minor white veining.

Thin Section Description

Through petrographic examination, the supplied spall has been identified as a medium to coarse grained, comprehensively recrystallised marble. The sample is principally composed of a mosaic of recrystallised and intergrown calcite crystals, which range from 0.3 to 1.25mm in diameter. Fine quartz crystals measuring 0.1 to 0.2mm are unstrained and rounded, occurring throughout the sample. Opaque crystals as pyrite occur as fine to medium disseminations, a minor proportion of which show oxidation as red-brown semi-opaque iron oxide staining. The sample contains a moderate proportion of thin erratic dark grey layers, which represent primary clay-rich lenses which were subsequently lithified, deformed and metamorphosed. The resultant mineralogy contains a higher abundance of muscovite, quartz, and pyrite relative to the rest of the sample and is noticeably finer grained. Minor subsequent calcite veining crosscuts the clay-rich layers, composed of micritic calcite.

Due to the comprehensively recrystallised and tightly interlocking crystalline fabric the source rock is regarded being of high strength, hardness, and durability. Impurities within the marble are limited to minor quartz, muscovite diopside and pyrite, which are not interpreted to negatively impact performance. Minor veining present in the spall is not present in high enough abundance to cause overly flaky aggregate. Following from the principally carbonate composition and potentially pH reactivity of the rock, acidic settings should be avoided to prevent degradation of the aggregate. This may include acidic ground waters or run-off. A mode based on a count of 600 widely spaced points is listed in Table 3 – Modal Analysis of Minerals.

Table 3 – Modal Analysis of Minerals

Robust Minerals	Mode (%)	Comments
Calcite	94	Occurring as recrystallised sparry calcite
Quartz	2	Rounded unstrained <0.2mm quartz crystals
Diopside	Trace	Rare <0.1mm rounded inclusions in calcite
Weak Minerals		
Muscovite	2	Randomly oriented flakes, colourless in plane polarised light
Pyrite	1	Non-magnetic cubic opaques
Goethite	1	Minor ferruginous staining
Clays	Trace	Associated with ferruginous staining
Total	100	Balance accounted for by trace minerals

Free Silica Content

After conducting a modal analysis using the MA945-10 mechanical point counter on 600 points, the total free silica content was found to be 2%. The sample was found to contain 2% unstrained quartz.

According to AS1141.65-2008 and Department of Transport and Main Roads test method Q188, the provided spall is regarded as innocuous in relation to Alkali-Silica Reactivity (ASR) in concrete.

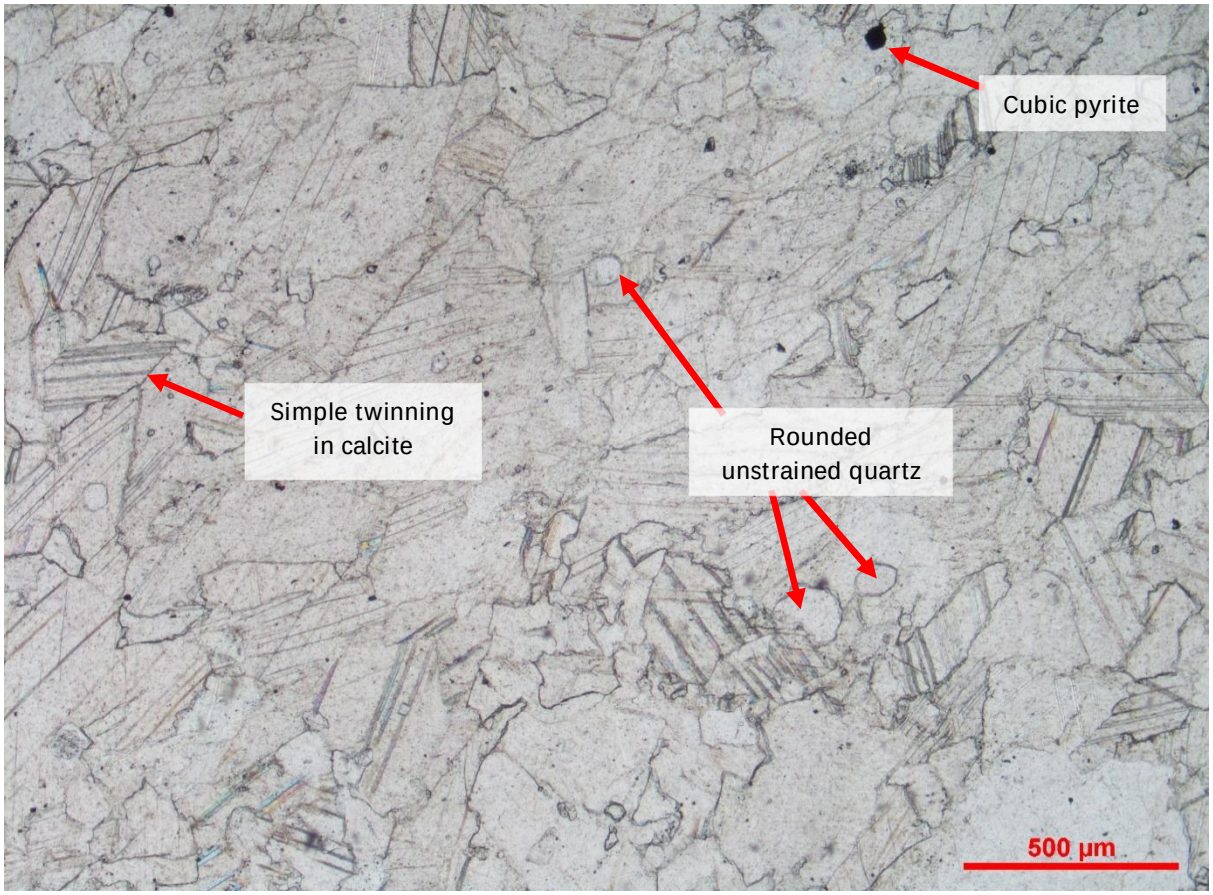


Plate 3: Microphotograph of the sample, showing the occurrence of abundant variably sized sparry calcite, with minor quartz and pyrite. Image shown in plane polarised light. Scale = 500µm x 40 magnification. F.O.V. 5.2mm.

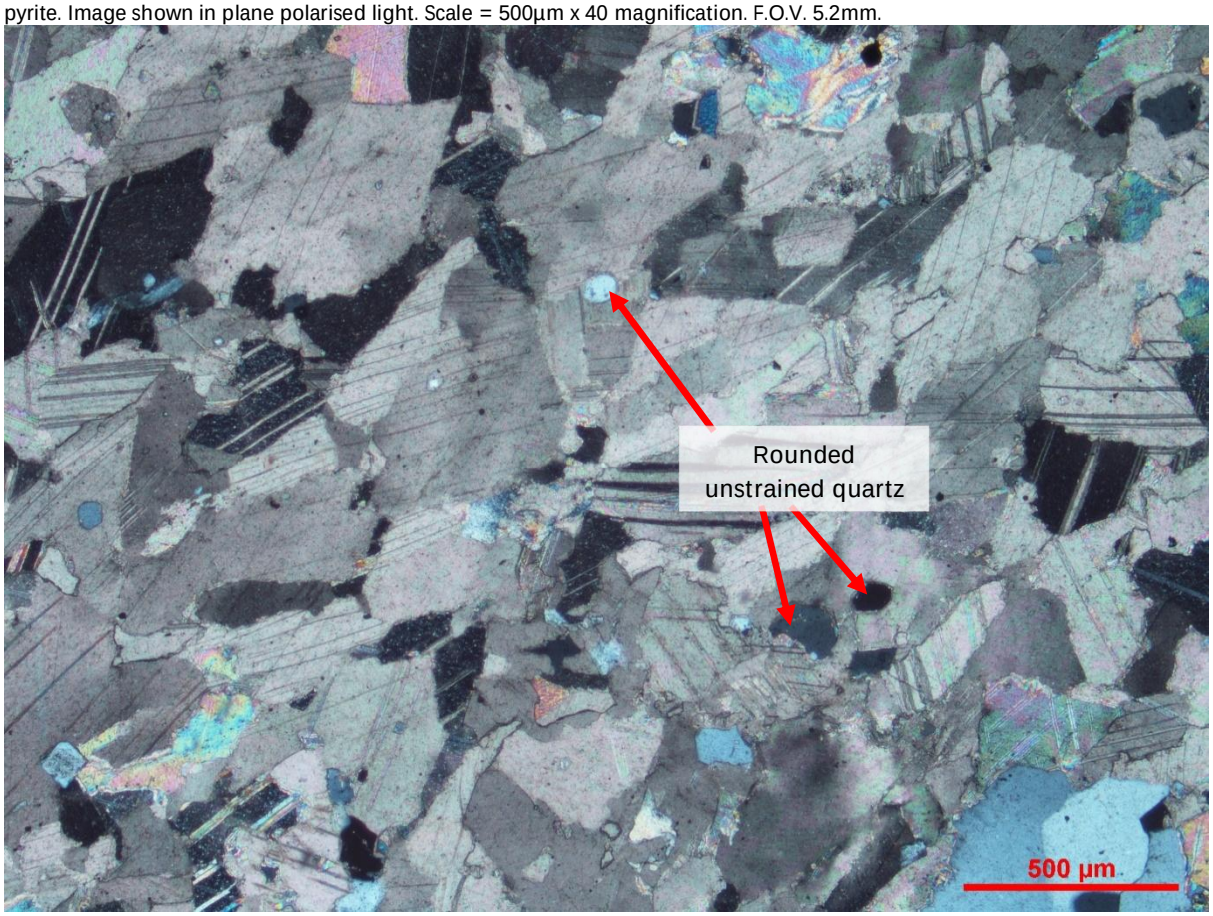


Plate 4: The same image from Plate 3 under crossed polarised light. Scale = 500µm x 40 magnification. F.O.V. 5.2mm.

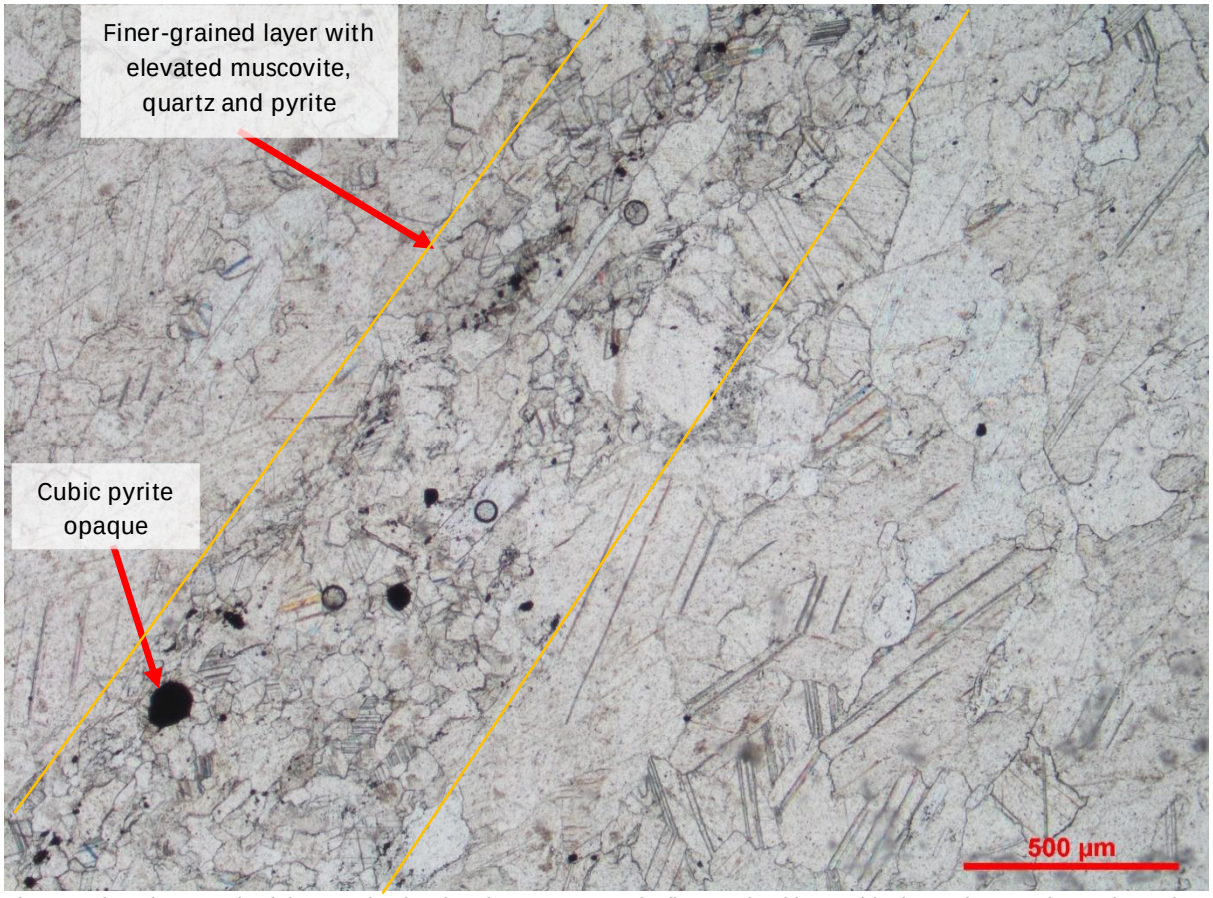


Plate 5: Microphotograph of the sample, showing the occurrence of a finer-grained layer with elevated muscovite, pyrite and quartz. Image shown in plane polarised light. Scale = 500µm x 40 magnification. F.O.V. 5.2mm.

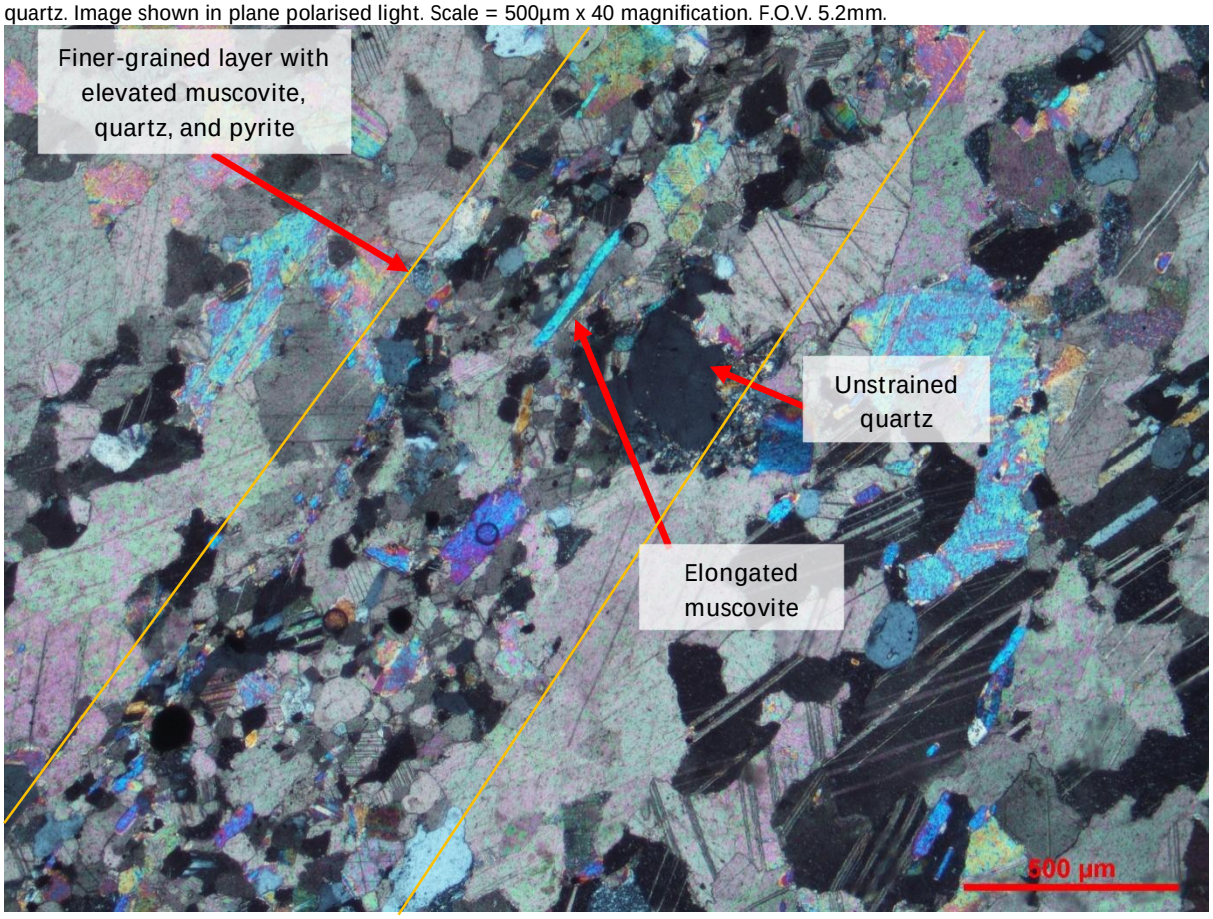


Plate 6: The same image from Plate 5 under crossed polarised light. Scale = 500µm x 40 magnification. F.O.V. 5.2mm.

Summary

Pending appropriate material testing this marble aggregate is regarded as suitable for use in Concrete and Unbound Pavements with coarser material suitable as gabion/revetment. Further crushing may produce quality manufactured sand. Exposure to acidic conditions including ground waters and run-off is not recommended due to the reactive nature of carbonate rocks and their propensity to degrade quickly in low pH settings.

For engineering purposes, the rock may be summarised as:

- Marble, a regionally to locally metamorphosed rock of carbonate sedimentary origin.
- Essentially unweathered, with trace goethitic staining on the surface of the spall.
- Hard, and regarded as being of high strength and durability.
- 4% weak secondary phases as disseminated muscovite, goethite, pyrite, and trace clays.
- Containing 2% free silica as rare fine quartz grain inclusions and does not display rhomboid crystal habits diagnostic of dolomitic rock. Therefore, regarded as innocuous in relation to ASR and ACR in concrete provided chemical variety as magnesium diversity is not displayed within the source rock.

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Website: groundwork.com.au
ABN 13 609 422 791

Petrographic Inspection Report

Prepared for:	Barossa Quarries
Date Received:	25/05/2020
Sample Type:	Pit Spall
Source:	Carrara Marble Quarry
Date of Inspection:	08/06/2020
Report Issued:	19/06/2020
Project/ File Ref.:	P2020_107_01

Author: BDeegan

Blake Deegan (BSc, MPhil)
Petrologist
Groundwork Plus

Reviewer: Rod Huntley

Rod Huntley (BSc, M.App.Sc, M.Eng)
Principal Resource Consultant
Groundwork Plus

Enquiries regarding the content of this report should be directed to Groundwork Plus 07 3871 0411. Samples are disposed of after 3 months from the date of report. Thin sections will remain on site indefinitely. The analysis is based on a limited number of thin sections and sample provided by client, further investigation may be required. Interpretations are specific to the sample examined only.

Executive Summary

Classification: Coarse-grained marble

For Engineering Purposes 2758.1: Marble, a carbonate metamorphic rock

Key Material Risk: Exposure to acidic conditions will result in disaggregation of the sample.

Table 1 – Summary of Sample's Compositional Characteristics

Compositional Features	%	Comments
Strong Phases	97	Occurring principally as calcite, with minor quartz and diopside
Weak/Secondary Phases	3	Minor weak phases identified as texturally isolate pyrite and muscovite, with trace clays and goethite
Shrink/swell clays	0	None observed
Micas	1	Minor mica as non-foliated muscovite laths
Sulphides	2	Occurring as disseminated pyrite
Organics	0	None observed
Textural Features	**Yes/ No**	
Fracturing/Veins	Yes	Minor calcite veining
Voids	No	None observed
Free Silica	**%**	
Unstrained quartz	2	Unstrained quartz inclusions
Optically strained Quartz	0	None observed
Microcrystalline Quartz	0	None observed
Volcanic Glass	0	None observed

Table 2 – Product Suitability for Specific Applications and Source Rock Quality

Product Suitability	Low	Mod	High	Comments
Coarse Aggregate in Concrete (MRTS70)			ü	Mechanically well-suited and ideal as aggregate in concrete used to extend the life of sewerage pipes and covers
Manufactured Sand			ü	Likely to produce high quality manufactured sand with insignificant argillic/ferruginous fines
Aggregate Unbound Pavements (MRTS05)			ü	Unlikely to produce deleterious or unmanageable fines with crushing
Cover/Sealing Aggregate (MRTS22)		ü		Suitable pending materials testing for LAA and SSS
Graded Asphalt Aggregate (MRTS101)		ü		Physically well suited pending Polished Aggregate Friction Value testing
Gabion and Revetment			ü	Suitable
Expected Performance	**Low**	**Mod**	**High**	**Comments**
Hardness			ü	Hard
Strength			ü	Strong
Durability			ü	Suitable in non-acidic settings
ACR in concrete			ü	Innocuous, no dolomite detected
ASR in concrete			ü	Innocuous, minor unstrained quartz

Introduction

This report provides the results of a general petrographic assessment of a spall sample, which was submitted to the Groundwork Plus petrographic laboratory, and describes the method and standards used to assess the sample. The supplied sample was sampled by the client and sent to the Groundwork Plus petrographic facility. The thin section was prepared and analysed by Groundwork Plus with instructions from the client to conduct petrographic testing to ASTM C295 and recommend further testing if significant deleterious characteristics are identified pursuant to Clause 16.3 of this standard. The provided modal mineral percentages relate to the supplied sample which is understood to be representative of material on site. Assessment regarding the Alkali-Silica Reactivity (ASR) potential of the aggregate has been advised by AS1141.65-2008 and is communicated pursuant to Clause 9. Communication of findings are advised by AS 1726-1993 Geotechnical Site Investigations.

Methodology

The petrographic assessment of the slide is carried out using a Nikon polarising microscope equipped with a digital camera at the Groundwork Plus petrographic laboratory. Photographs of the hand specimen and thin section photomicrographs showing grain sizes and any particular aspects of the minerals are included as part of the report (Plates 1 to 6). Modal analysis is conducted on the sample using a MA945/10 Mechanical Point Counter on 600 points (Table 3 – Modal Analysis of Minerals).

The petrology assessment is based on:

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Hand Specimen Description

The supplied spall is identified as a medium-grained Marble.

The hand sample consists of a dark grey spall, approximately 12cm in diameter, comprising medium-grained, crystalline, and tightly interlocking calcite crystals. The sample is essentially unweathered, with rare ferruginous staining and infill occurring along pre-existing fracture planes. Minor veining, observed in Plate 2, is composed of microcrystalline micritic calcite. The sample is regarded as hard, strong, and durable. Minor pyrite is observed in hand specimen, and the sample is non-magnetic.

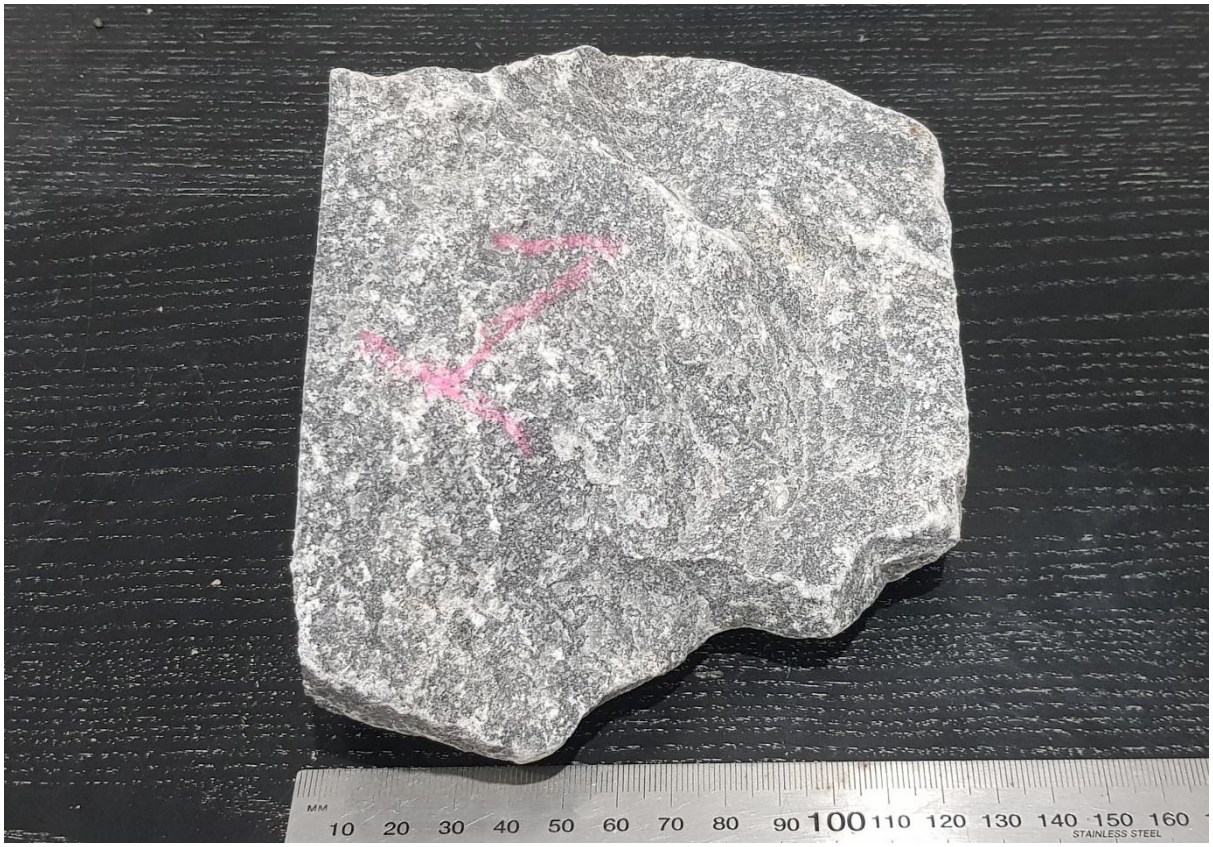

Plate 1: Photograph of the sample as provided, showing the sample's crystalline nature and uniformly grey colour.

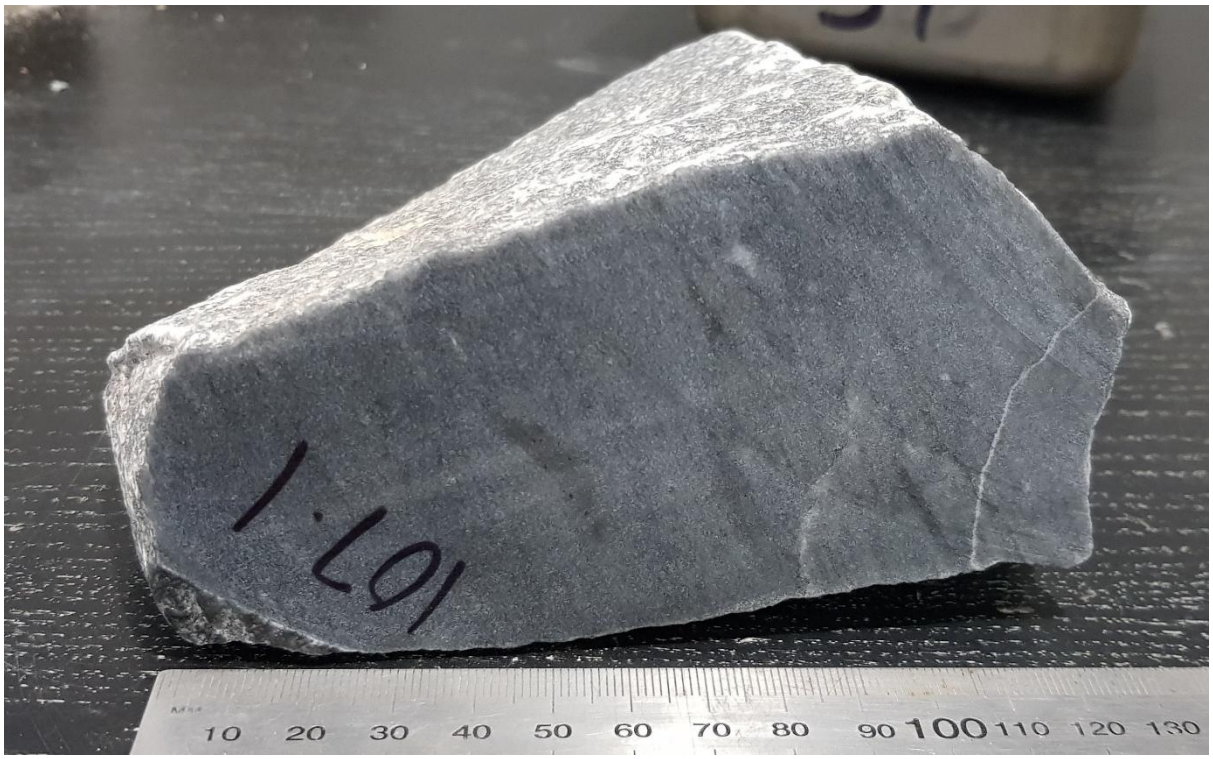

Plate 2: Photograph showing the cut face of the sample, which displays the grey colour and medium-grained nature, as well as micritic white calcite veining.

Thin Section Description

Through petrographic analysis, the supplied spall has been identified as a medium-grained, comprehensively recrystallised marble. The marble is relatively pure being composed principally of tightly intergrown and medium grained 0.4-1.0mm calcite crystals. The sample is essentially unweathered, with isolated and insipid iron oxide staining. The sample also contains a minor abundance of silicate metamorphic phases, which represent argillic impurities in the limestone protolith. Accessory silicate phases are predominantly composed of randomly oriented 0.1mm muscovite flakes, accompanied by quartz and rare diopside. The sample also contains a minor proportion of pyrite, which occurs as <0.1 – 0.2mm cubic opaques evenly disseminated throughout the spall. Pyrite offers some risk of oxidising upon exposure, releasing acid sulphate, but is considered innocuous in the current abundance.

Due to the comprehensively recrystallised and tightly interlocking crystalline fabric the source rock is regarded being of high strength, hardness, and durability. Impurities within the marble are limited to minor quartz, muscovite diopside and pyrite, which are not interpreted to negatively impact performance. Following from the principally carbonate composition and potentially pH reactivity of the rock, acidic settings should be avoided to prevent degradation of the aggregate. This may include acidic ground waters or run-off. A mode based on a count of 600 widely spaced points is listed in Table 3 – Modal Analysis of Minerals.

Table 3 – Modal Analysis of Minerals

Robust Minerals	Mode (%)	Comments
Calcite	95	Occurring as recrystallised sparry calcite
Quartz	2	Rounded unstrained <0.2mm quartz crystals
Diopside	Trace	Rare <0.1mm rounded inclusions in calcite
Weak Minerals		
Pyrite	2	Non-magnetic cubic opaques
Muscovite	1	Randomly oriented flakes, colourless in plane polarised light
Clays	Trace	Associated with ferruginous staining
Goethite	Trace	Rare ferruginous staining
Total	100	Balance accounted for by trace minerals

Free Silica Content

After conducting a modal analysis using the MA945-10 mechanical point counter on 600 points, the total free silica content was found to be 2%. The sample was found to contain 2% unstrained quartz.

According to AS1141.65-2008 and Department of Transport and Main Roads test method Q188, the provided supplied spall is innocuous in relation to Alkali-Silica Reactivity (ASR) in concrete.

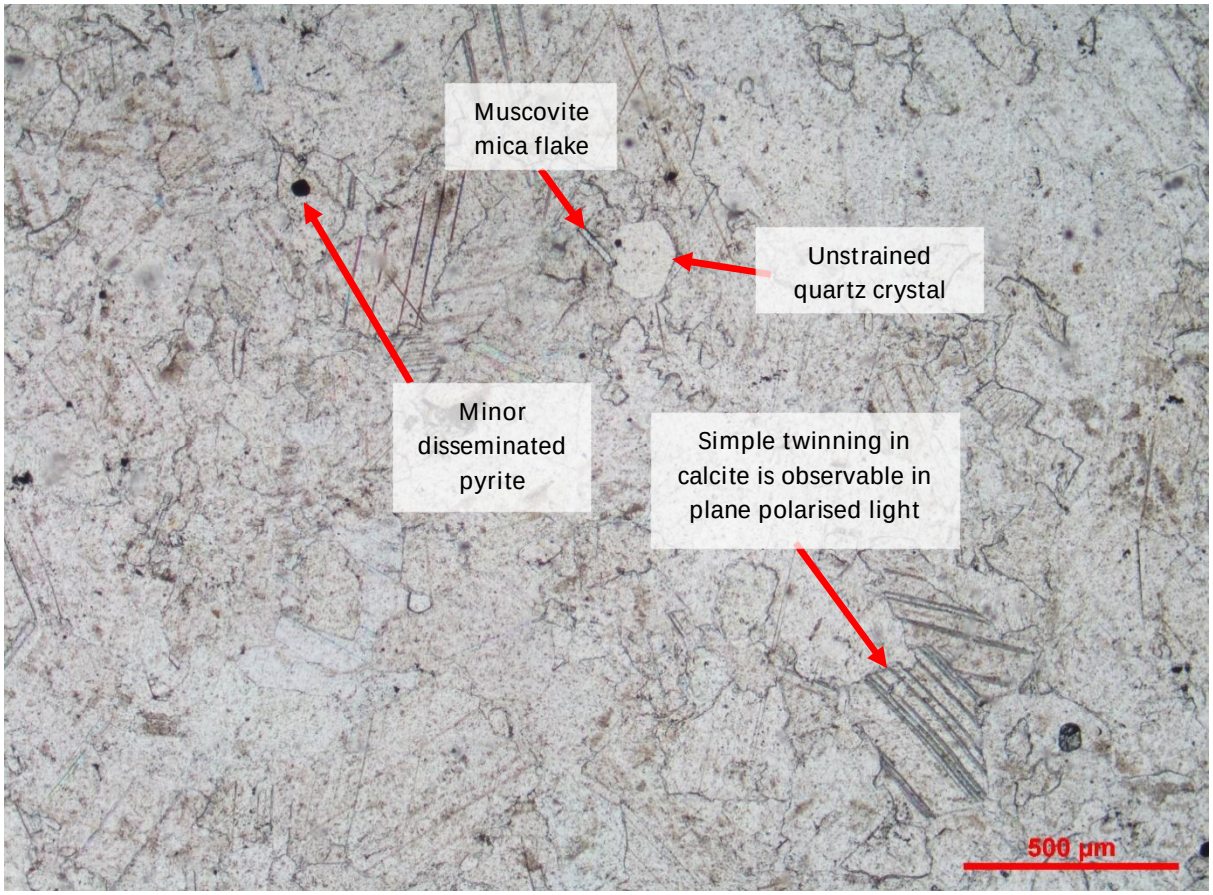

Plate 3: Microphotograph of the sample, showing the occurrence of abundant variably sized recrystallised calcite, with minor accessory phases. Image shown in plane polarised light. Scale = 500µm x 40 magnification. F.O.V. 5.2mm.

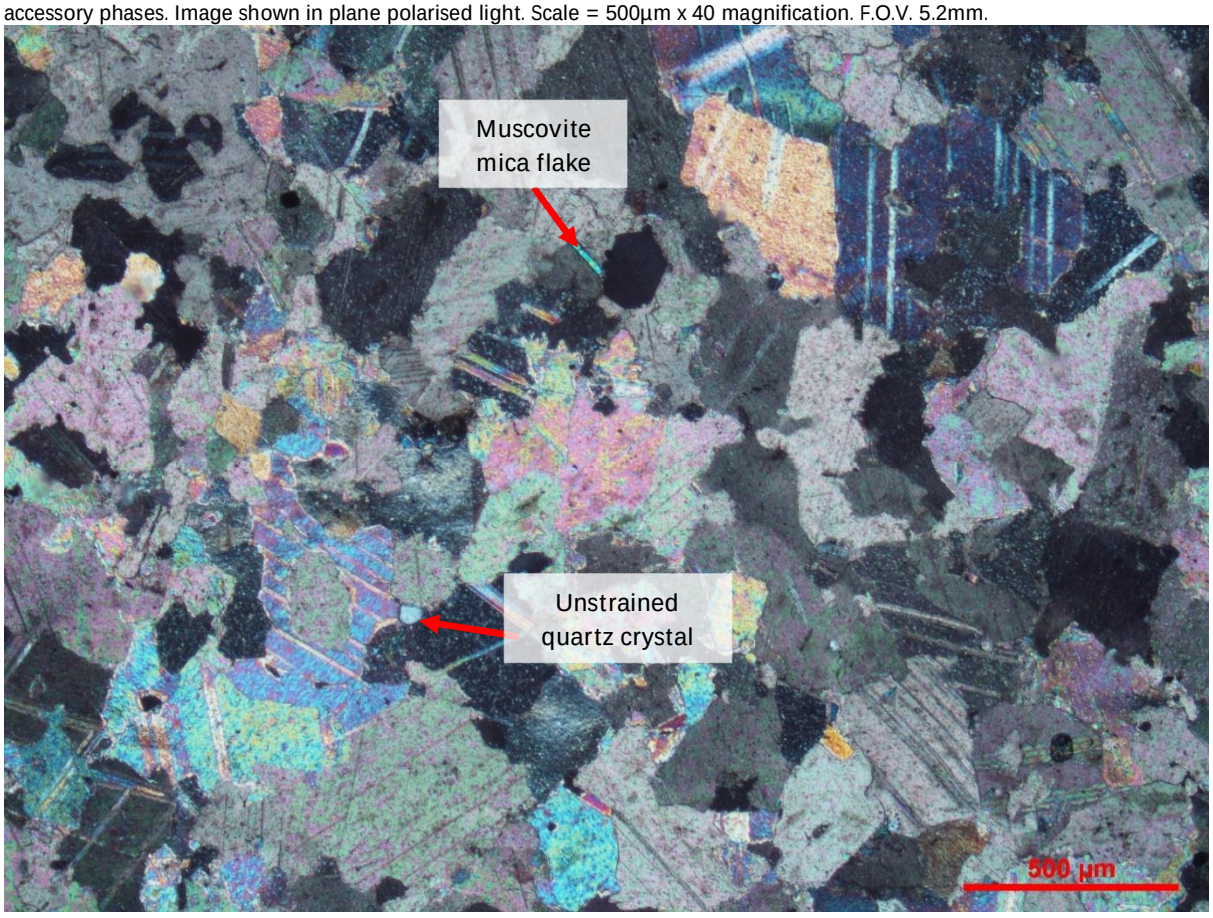

Plate 4: The same image from Plate 3 under crossed polarised light. Scale = 500µm x 40 magnification. F.O.V. 5.2mm.

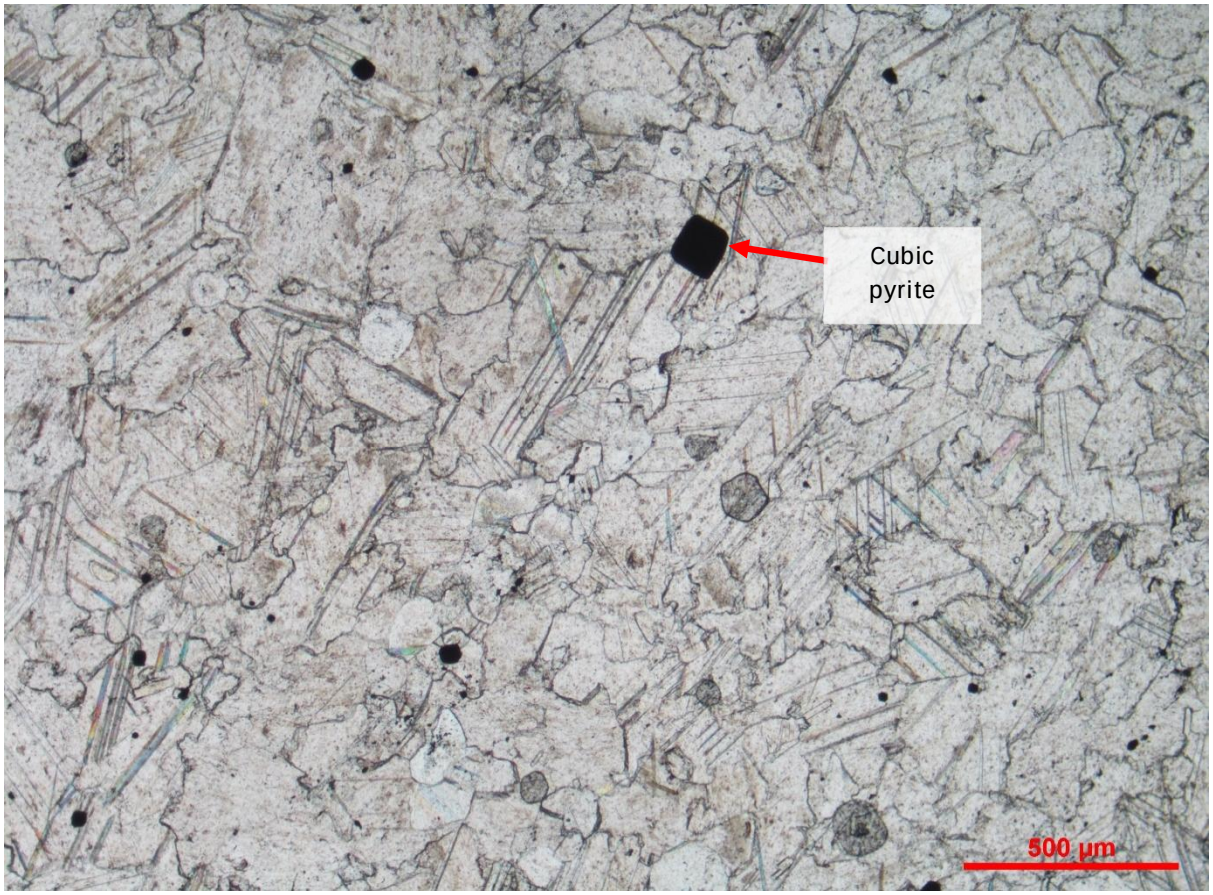

Plate 5: Microphotograph of the sample, showing disseminated pyrite, with accessory muscovite, diopside and minor quartz crystals. Image shown in plane polarised light. Scale = 500µm x 40 magnification. F.O.V. 5.2mm.

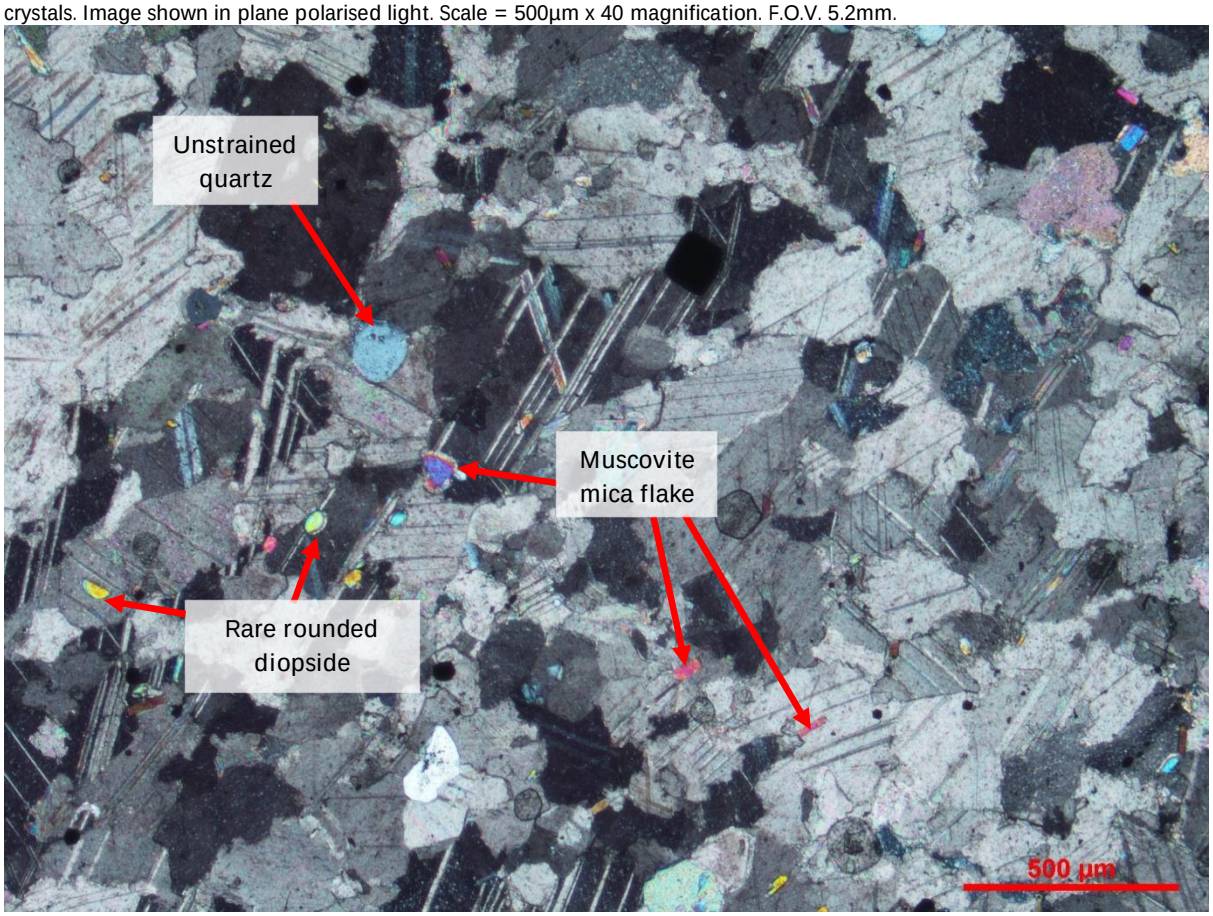

Plate 6: The same image from Plate 5 under crossed polarised light. Scale = 500µm x 40 magnification. F.O.V. 5.2mm.

Summary

Pending appropriate material testing this marble aggregate is regarded as suitable for use in Concrete and Unbound Pavements with coarser material suitable as gabion/revetment. Further crushing may produce quality manufactured sand. Exposure to acidic conditions including ground waters and run-off is not recommended due to the reactive nature of carbonate rocks and their propensity to degrade quickly in low pH settings. For engineering purposes, the rock may be summarised as:

- Marble, a regionally to locally metamorphosed rock of carbonate sedimentary origin.
- Essentially unweathered, with trace goethitic staining and clays.
- Hard, and regarded as being of high strength and durability.
- 3% weak secondary phases as disseminated pyrite and randomly oriented muscovite.
- Containing 2% free silica as rare fine quartz grain inclusions and does not display rhomboid crystal habits diagnostic of dolomitic rock. Therefore, regarded as innocuous in relation to ASR and ACR in concrete provided chemical variety as magnesium diversity is not displayed within the source rock.

Attachment 3

Groundwater Desktop Study - Carrara Quarry

GROUNDWATER SCIENCE

James Rowe
SA Manager
Groundwork Plus

12 November 2020

Dear James

RE: Groundwater Desktop Study – Carrara Quarry – Mineral Claim Application 2020 / 000624

Please find the following report that summarises groundwater conditions near Mineral Claim Application (MCA) 2020 / 000624 , Koonunga, South Australia (the "Site" – Figure 1). The work has been commissioned to support the Mining Lease Proposal (MLP) for quarrying of marble by Amulet Holdings. The Site is located approximately 11 km north of Nuriootpa in a non-prescribed water resources area.

Groundwater Science (GWS) have been engaged to undertake a groundwater desktop assessment. The purpose of the work is to:

- Collate baseline groundwater information in proximity to the Site.
- Assess near Site groundwater conditions and provide recommendations to support quarry development planning. This intent is to avoid groundwater interception to prevent risks to 3rd party groundwater receptors.

Findings from the work as summarised as follows:

- The Site falls outside of a prescribed wells or prescribed water resources area (PWA / PWRA). Use of groundwater or surface water does not require a license.
- The target for quarrying is Kapunda Marble which is Cambrian in age.
- The Bureau of Meteorology (BoM) Atlas of Groundwater Dependent Ecosystems (GDE's) does not report any GDE's within the footprint of the Site. The nearest mapped vegetation is terrestrial woodland 240 m to the east-north-east. The vegetation is described as having a low potential for groundwater interaction.
- There are a number of historical wells drilled in the area, however many have been abandoned or backfilled. Recent fieldwork indicates the nearest operational well is located more than 1 km to the south-south east[1].
- Nearby wells report groundwater elevations between 250 to 288 m metres Australian Height Datum (mAHD). Based on topographic position, it is estimated that the water table is below 280 m across the entirety of the Site. The basis for this estimate is that:
  - Groundwater elevations at the nearest wells report water levels less than 275 mAHD.
  - the adjacent quarry on Private Mine (PM) 111 has a minimum floor level of 278.04 mAHD which corresponds to an excavation depth up to 15 m below ground. No seepages were identified during fieldwork conducted in September 2020[2] and the pit floor remained dry. This indicates that groundwater elevations are below 278 mAHD at this location.
  - Water wells constructed near streams in the area report water levels between 5.8 and 13.5 m below ground. The stream bed to the south has an elevation between 282 and 278 mAHD (Propeller, 2020). Based on above it is expected that groundwater elevations beneath the stream

[1] Well not listed on WaterConnect, located 100 m south of well 6629-305. Well confirmed as operational via field inspection, September 2020.
[2] Groundwork Plus (2020).

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www.groundwaterscience.com.au

would be less than 276 mAHD immediately south of the Site, falling to the south-east (see Figure 6).

- For quarry pit designs it is recommended to design pits no deeper than 280 mAHD. This recommendation allows for uncertainty given limited water wells close to the Site. However, it should be noted that the Site is considered low risk to groundwater receptors as:
    - There are no confirmed groundwater users within 1 km of the Site.
    - A pit floor elevation of 280 mAHD is 2 m above the floor level of the adjacent quarry and is 6 to 11 m above the water table at the nearest water wells.
    - There are no GDE's in proximity to the Site that could be impacted from small volume groundwater seepages.

1 Introduction

Groundwater Science have been engaged by Groundwork Plus Pty Ltd (Groundwork Plus) to undertake a groundwater desktop study for Amulet Holdings Pty Ltd incorporating MCA 2020/000664 'the Site'. The purpose of the work is to:

- Collate baseline groundwater data in proximity to the Site.
- Assess levels to which quarrying can be conducted to avoid pit inflows and potential impacts to groundwater receptors (if present).
- Provide a description of uncertainty with respect to existing groundwater conditions and recommended floor levels.

The following report summarise findings from the work. Data has been sourced from the Department for Environment and Water (DEW) Groundwater Data Application[3], the South Australian Resources Information Gateway (SARIG), the BoM Atlas of GDE's and field information collected from Site.

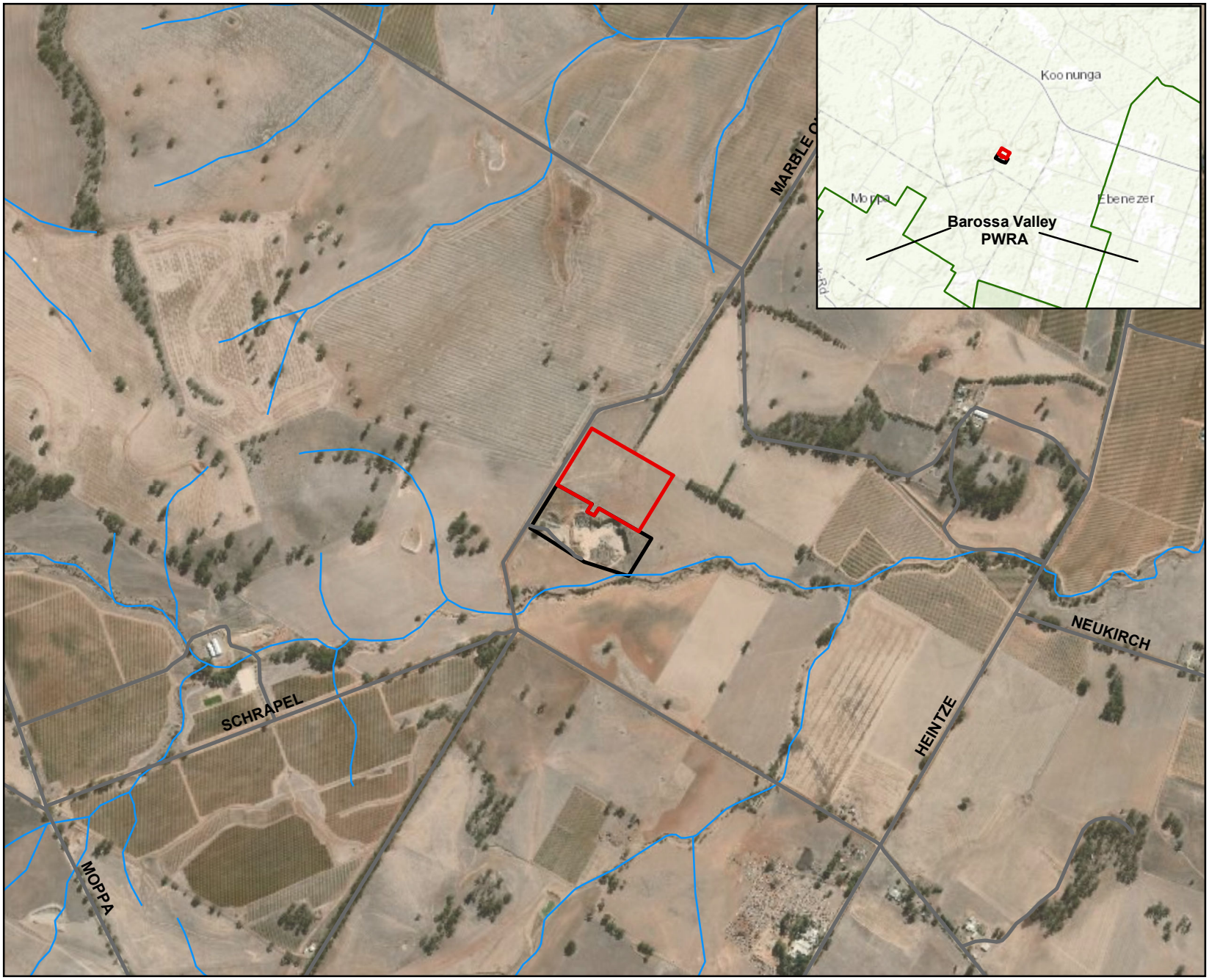
Table 1 provides a project summary of key information with respect to physiography and near Site groundwater conditions.

[3] https://www.waterconnect.sa.gov.au/Systems/GD/Pages/Default.aspx

Table 1. Summary of Desktop Review – MCA 2020 / 000664 (Amulet Holdings).

Project Attribute	Details
Tenement Details	The application incorporates MCA 2020 / 000664. The Site is adjacent to PM 111 (Figure 1).
Landscape Board Region	Northern and Yorke Landscape Board.
Groundwater Management Area	The Site falls outside of a prescribed wells or prescribed water resources area (PWA / PWRA). Extraction of groundwater or surface water does not require a license. The nearest PWRA is the Barossa Valley PWRA located 2 km south-west of the Site.
Rainfall	Mean rainfall at Nuriootpa is 513 mm while mean rainfall at Kapunda is 484 mm. The Site is expected to receive approximately 500 mm/annum.
Topography	The Site ranges in elevation from 283 mAHD on the eastern boundary, rising to 297 mAHD on the western boundary (Propeller, 2020).
Surface water	The Site is located in the Light River Catchment. Streams generally drain to the north-east and east. A major catchment divide is located 2.5 km to the south-west and separates the Light River from the Gawler River catchment.
Target rocks	The quarry targets Kapunda Marble which is Cambrian in age.
Regional aquifer systems / groundwater attributes	Groundwater in the area resides in a fractured rock aquifer. Recharge to the fractured rock aquifer is expected to occur by rainfall infiltration. Recharge may also occur at streams during runoff events. Note, the review indicates that streams are losing streams, with groundwater residing more than 5 m below stream beds. See depth to water information in Figure 5.
	Groundwater salinity is reported as fresh to saline, ranging from 912 milligrams per litre total dissolved solids (mg/L TDS) to 16,963 mg/L TDS. Higher salinities are reported to the east and north-east of the Site while lowest salinity is reported at shallow wells (< 30 m). Beneficial use of groundwater is for stock and industrial use.
	Regional groundwater elevations are reported between 250 and 288 mAHD[4]. Groundwater is expected to flow towards the north and north-east in the direction of surface water drainage.
	Groundwater elevation at the Site is expected to reside below 280 mAHD, falling to the east.
3rd party groundwater users	Most wells in the area are very old and have been marked as abandoned. The nearest registered well is located 660 m east of the Site (6629-300) and was drilled in 1957. It is not expected to be used based on age. One well was drilled in 2020 (6629-2324) however the salinity was reported greater than 16,000 mg/L. The well is unlikely to be utilised as the quality is above tolerances for stock, domestic and irrigation use. During September fieldwork a stock well was confirmed as operational 1 km to the south-south-east of the Site (Groundwork Plus, 2020). This is likely the only operational well in the area. Vineyards located in proximity to the Site are likely supplied by the Barossa Irrigation Limited water scheme. This is due to the relatively high salinity of wells and / or the absence of wells marked within the boundaries of vineyard properties.
Potential for Groundwater Dependent Ecosystems	According to the BoM GDE Atlas no GDE's are identified within the PM that are reliant on 'surface expression of groundwater' (BoM, 2020). Creek line vegetation to the south-east of the Site is described as having low potential for groundwater interaction and is likely reliant on surface water generated by periodic rainfall. No baseflow or moisture was recorded in the creek line during September fieldwork (Groundwork Plus, 2020). Woodland vegetation mapped 240 m east-north-east is likely rainfall dependent (see Figure 10).

[4] This data is sourced from WaterConnect (2020) and historical images obtained from the South Australian Resource Information Gateway (SARIG, 2020).



Legend

- Roads
- Streams
- MC Application 2020/000624
- Private Mine 111

GROUNDWATER SCIENCE

Job Number: GWP-20-2

Client: Groundwork Plus

Version: 1 Date: 4/11/2020

Drawn by: PM

N

0 150 300 600

Meters

Coordinate System: GDA 1994 MGA Zone 54

Site Location Map
MCA 2020/000624
"the Site"

Figure 1

Document Path: C:\Users\Groundwater17\Dropbox (Groundwater Science)\Groundwater Science Team Folder\Project Files\GWP\GWP-20-2-Carrara Marble Pty Ltd\GIS\Maps\Fig 1. Location map.mxd
Document Name: Fig 1. Location map

2 Data Review

2.1 Rainfall

Mean rainfall in the area is reported at 514 mm at Nuriootpa and 484 mm at Kapunda. Rainfall at the Site is expected in the order of 500 mm/annum.

2.2 Topography and Surface Water Drainage

The site is situated within the Light River catchment north of the Barossa Valley PWRA. A surface water divide exists 2.5 km to the south-west of the Site which separates the Light River catchment from the Gawler River catchment.

Topography of the Site is gently sloping and ranges from 283 mAHD at the eastern Site boundary, rising to 297 mAHD on the western boundary (Propeller, 2020)[5].

2.3 Geology

The geology of the Site and surrounding area is presented in Figure 2 whilst a summary of key geological units mapped by the South Australian Geological Survey is provided in Table 2.

The dominant rock at the Site is Kapunda Marble which is Cambrian in age. To the east rock types comprise siltstone of Neoproterozoic age while a thin band of sandstone (Mt Terrible Formation – Cambrian) is mapped to the west. No significant Tertiary Sediments are mapped in the area.

A fault is located on the eastern boundary of the Site which is oriented in a north-west to south-east orientation (Figure 2). Its influence on groundwater properties is not known.

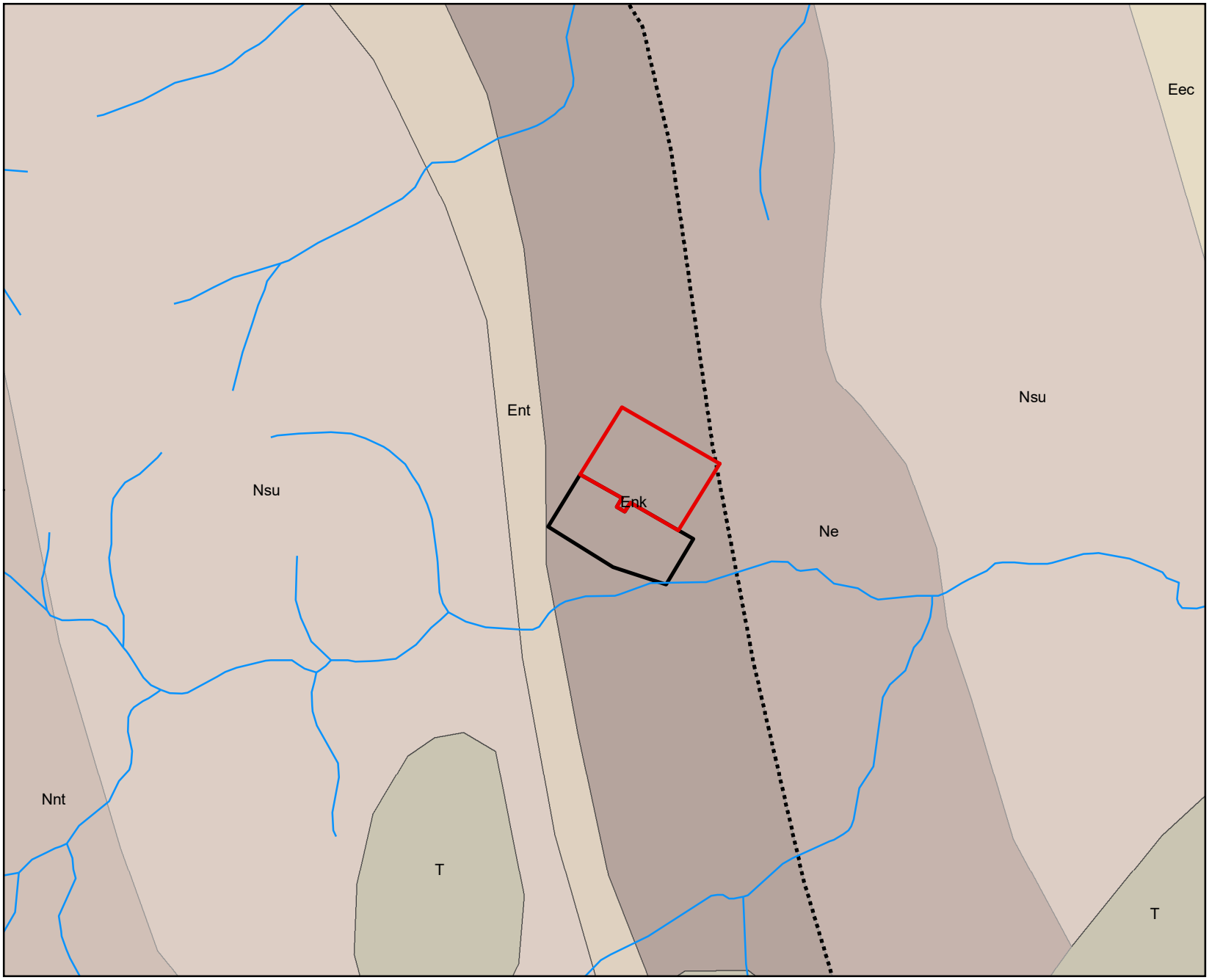
Based on geology groundwater is expected to reside in a fractured rock aquifer.

Table 2: Summary Table – Surface Geology near the Site and immediately east and west.

Map Unit	Name / Formation	Era	Description
Enk	Kapunda Marble	Cambrian	Marble, white, blue, pink; amphibolitic.
Ent	Mt Terrible Formation		Arkose (sandstone), cross bedded, coarse grained to conglomeratic.
Ne	Yerelina sub-group	Neoproterozoic (Marinoan)	Siltstone, sandstone, diamictite.
Nsu	Ulupa Siltstone		Siltstone, shale, green grey and purple.

Description sources from SARIG (2020). See Figure 2 for outcrop extents.

[5] High resolution ground elevation data was acquired via an unmanned aerial vehicle (UAV) survey, May 2020. Accessed via Propeller (2020).



Legend

- Streams
- MC Application 2020/000624
- Private Mine 111
- Faults / Structures

Surface Geology

- T - Undifferentiated Tertiarty
- Eec - Carrickalinga Head Formation
- Enk - Kapunda Marble
- Ent - Mt Terrible Formation
- Ne - Yerelina Subgroup
- Nnt - Tapley Hill Formation
- Nsu - Ulupa Siltstone

GROUNDWATER SCIENCE

Job Number: GWP-20-2

Client: Groundwork Plus

Version: 1 Date: 4/11/2020

Drawn by: PM

N

0 125 250 500

Meters

Coordinate System: GDA 1994 MGA Zone 54

1:100,000 Surface Geology (Source: SARIG, 2020)

Figure 2

Document Path: C:\Users\Groundwater17\Dropbox (Groundwater Science)\Groundwater Science Team Folder\Project Files\GWP\GWP-20-2-Carrara Marble Pty Ltd\GIS\Maps\Fig 2. Surface Geology.mxd
Document Name: Fig 2. Surface Geology

3 Water Well Data

To assess groundwater conditions of the nearby area well data was obtained from DEW's groundwater data application[6]. Data was downloaded and analysed with a summary of results presented below.

The review focussed on wells within a nominal distance of 1.5 km from Site.

3.1 Nearby Wells, Drill Date and Status

Figure 3 reports water wells labelled by unit number, drill date and status. The map indicates that no water well exists at the Site. The nearest well is located 660 m to the east (unit no 6629-300).

One well was drilled in 2020 (6629-2324) 1 km to the north-east of the Site with the well reporting a salinity of 16,963 mg/L. This is above normal tolerances for stock, domestic and irrigation use. For this reason it is unlikely to be used.

During a field inspection in September 2020 an operational well was identified 1 km to the south-south-east of the Site (Groundwork Plus, 2020). The location of the well did not correspond with any displayed on WaterConnect and was positioned approximately 100 m south of well 6629-305 (Figure 3). The well is operational and used for stock watering.

When reviewing available well data it is expected that most of the wells within 1 km are abandoned and not in use. The basis of this assumption includes the following:

- Age – many wells are more than 50 years old and were first recorded from water well surveys in the 1970's (see historical images on SARIG, 2020). Assuming their completion with steel, it is likely the wells have rusted and are no longer operational.
- Groundwater salinity – salinity of wells is generally brackish to saline and above the tolerance for domestic and irrigation use. Beneficial use is restricted to stock or industrial uses.
- Well Depths – some wells are relatively shallow at less than 30 m. Historical records reviewed on SARIG indicate that a number of wells have become dry since the time of drilling (e.g. well 6629-313).

Based on above only 1 well is confirmed as operational within 1 km of Site. This is an unregistered well located to the south-south-east (see Figure 3 for location). Remaining wells are likely to be abandoned or not in use due to their high salinity.

3.2 Total well depths

Figure 4 displays water wells labelled by their drill depth. Wells range in depth from 12 m to 104 m.

3.3 Standing water levels

Figure 5 displays standing water levels at nearby wells. Based on the figure the following is apparent:

- Wells positioned near creek lines report groundwater levels ranging from 5.82 to 13.72 m below ground.
- Wells further from creek lines report deeper water levels ranging from 15.24 to 27.40 m below ground.

The above indicates that depth to water is likely to be a function of position in the landscape, being deeper at topographically elevated positions and shallower near drainage lines. Further discussion on Site groundwater elevations is discussed in Section 3.4.

[6] Data can be obtained via https://www.waterconnect.sa.gov.au/Systems/GD/Pages/Default.aspx

Legend

- Water wells - unit no
- Streams
- MC Application 2020/000624
- Private Mine 111
- Unregistered well (operational)

GROUNDWATER SCIENCE

Job Number: GWP-20-2

Client: Groundwork Plus

Version: 1 Date: 4/11/2020

Drawn by: PM

N

0 125 250 500

Meters

Coordinate System: GDA 1994 MGA Zone 54

Nearby wells labelled by unit number, drill date and status.

Figure 3

Document Path: C:\Users\Groundwater17\Dropbox (Groundwater Science)\Groundwater Science Team Folder\Project Files\GWP\GWP-20-2-Carrara Marble Pty Ltd\GIS\Maps\Fig 3. Nearby Wells and Status.mxd
Document Name: Fig 3. Nearby Wells and Status

Legend

- Well Depths (m)
- Streams
- MC Application 2020/000624
- Private Mine 111

GROUNDWATER SCIENCE

Job Number: GWP-20-2

Client: Groundwork Plus

Version: 1 Date: 4/11/2020

Drawn by: PM

N

0 125 250 500

Meters

Coordinate System: GDA 1994 MGA Zone 54

Well Depths (m below ground)

Figure 4

Document Path: C:\Users\Groundwater17\Dropbox (Groundwater Science)\Groundwater Science Team Folder\Project Files\GWP\GWP-20-2-Carrara Marble Pty Ltd\GIS\Maps\Fig 4. well depths.mxd
Document Name: Fig 4. well depths

Legend

- Depth to water (m bgl)
- Streams
- MC Application 2020/000624
- Private Mine 111

GROUNDWATER SCIENCE

Job Number: GWP-20-2

Client: Groundwork Plus

Version: 1 Date: 4/11/2020

Drawn by: PM

N

0 125 250 500

Meters

Coordinate System: GDA 1994 MGA Zone 54

Depth to water at nearby wells (m below ground)

Figure 5

Document Path: C:\Users\Groundwater17\Dropbox (Groundwater Science)\Groundwater Science Team Folder\Project Files\GWP\GWP-20-2-Carrara Marble Pty Ltd\GIS\Maps\Fig 5. Depth to water.mxd
Document Name: Fig 5. Depth to water

3.4 Groundwater Elevations

Figure 6 displays groundwater elevations at nearby water wells. The figure indicates that groundwater resides between 270 and 275 mAHD near to the Site, rising to 288 mAHD to the west.

As there are no groundwater wells completed at the Site, a combination of topography, site observations and inference from the nearest wells have been used to estimate groundwater elevations. This is discussed as follows:

- The existing quarry on PM 111 has a minimum floor level of 278.04 mAHD (Propeller, 2020). No groundwater inflows have been reported during September 2020 fieldwork (Groundwork Plus, 2020) which indicates that groundwater elevations are below 278 mAHD at this location. Photos of the pit floor at PM 111 are presented in Attachment 1.

- The drainage line to the south of PM 111 does not display any baseflow per fieldwork in September 2020 (Groundwork Plus, 2020). Additionally, wells near creek lines report groundwater residing between 5.8 and 13.5 m below stream beds (see Figure 5). Assuming a water level 6 m below ground at the base of the stream to the south of the Site, groundwater is likely to reside at depths less than 276 mAHD, falling to the east.

The above information has been used to construct hydrogeological cross sections as displayed in Figure 7. Section lines can be viewed in Figure 6.

The cross sections indicate that groundwater falls from south-west to the north-east and from the west to the east. Based on the cross section it is estimated that groundwater resides at less than 178 mAHD below the adjacent quarry (PM) and below 180 mAHD across the Site.

Implications for quarrying on MCA 2020 / 000664 are discussed in Section 4.

3.5 Groundwater Salinity

Figure 8 displays groundwater salinity in mg/L. Groundwater salinity ranges from 912 to 16,963 mg/L.

The best quality water is at wells drilled less than 30 m deep, while salinity of deeper wells is generally higher. Higher salinity is observed to the east and north east of the site.

Based on salinity groundwater is generally only suitable for stock or industrial uses and above thresholds for irrigation. It may have limited use for domestic supplies.

3.6 Well Yields

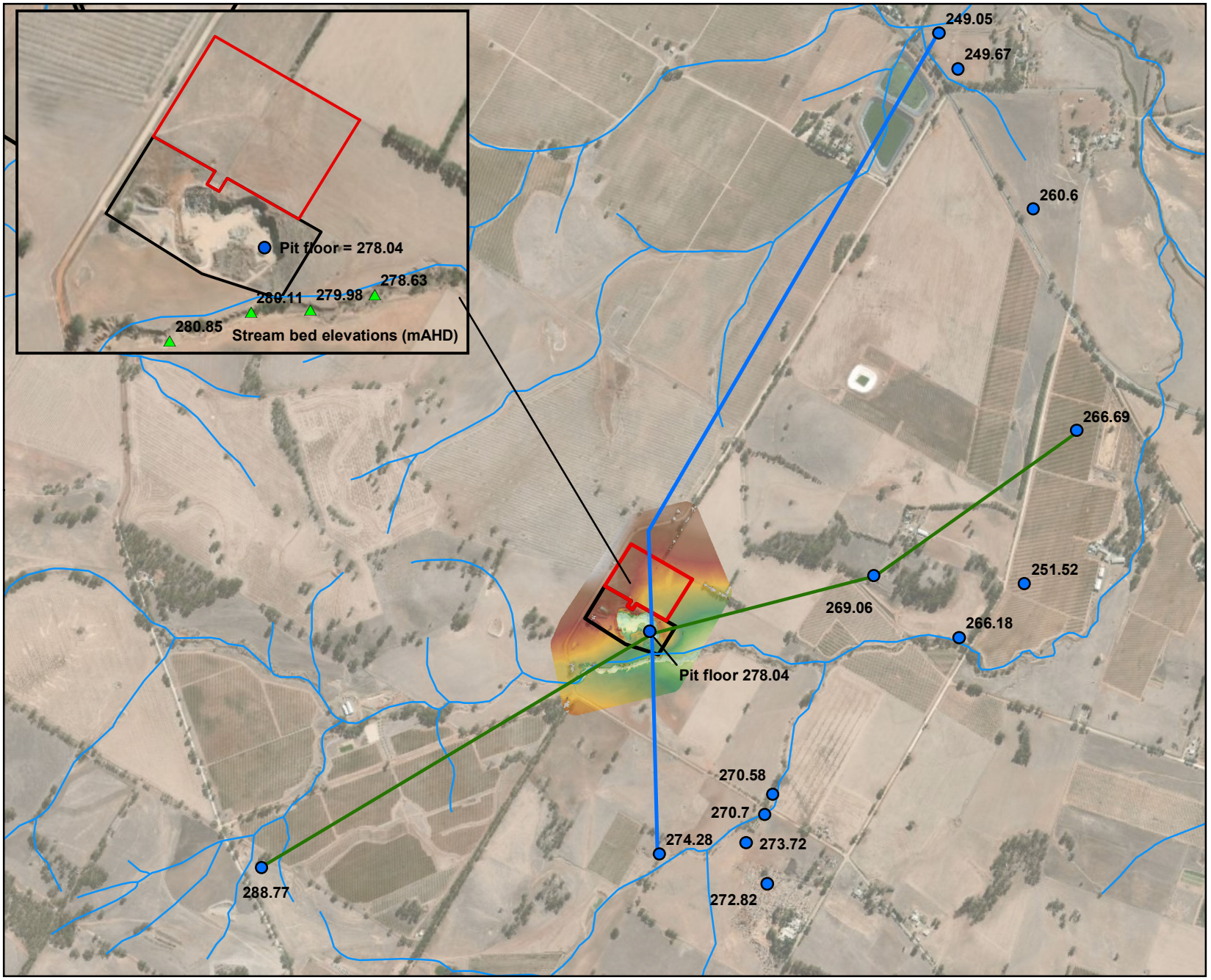
Figure 9 displays well yield in litres per second (L/s). Reported yields range from relatively low (0.4 L/s) to high at 10 L/s.

3.7 Groundwater Dependent Ecosystems

To determine the presence of any GDE's the BoM Atlas of GDE's was inspected (BoM, 2020). This webpage can be viewed electronically at http://www.bom.gov.au/water/groundwater/gde/map.shtml.

Based on the Atlas there are no confirmed GDE's at or near the Site (Figure 10). Terrestrial woodland is mapped 240 m to the east-north-east however this is described as having moderate potential for groundwater interaction. Given depth to water is more than 15 m at a nearby well (6629-300) the vegetation is likely to be rainfall dependent.

Additionally, no aquatic vegetation was identified at nearby creek lines. Stream vegetation mapped 560 m to the south-east is described as having a low potential for groundwater interaction.



Legend

- Groundwater Elevation (mAHD)
- Cross Section - SW-NE
- Cross Section S-N
- Streams
- MC Application 2020/000624
- Private Mine 111

Digital Surface Model (mAHD) - UAV survey

Value

High : 314.331

Low : 277.915

GROUNDWATER SCIENCE

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Client: Groundwork Plus

Version: 1 Date: 4/11/2020

Drawn by: PM

N

0 200 400 800

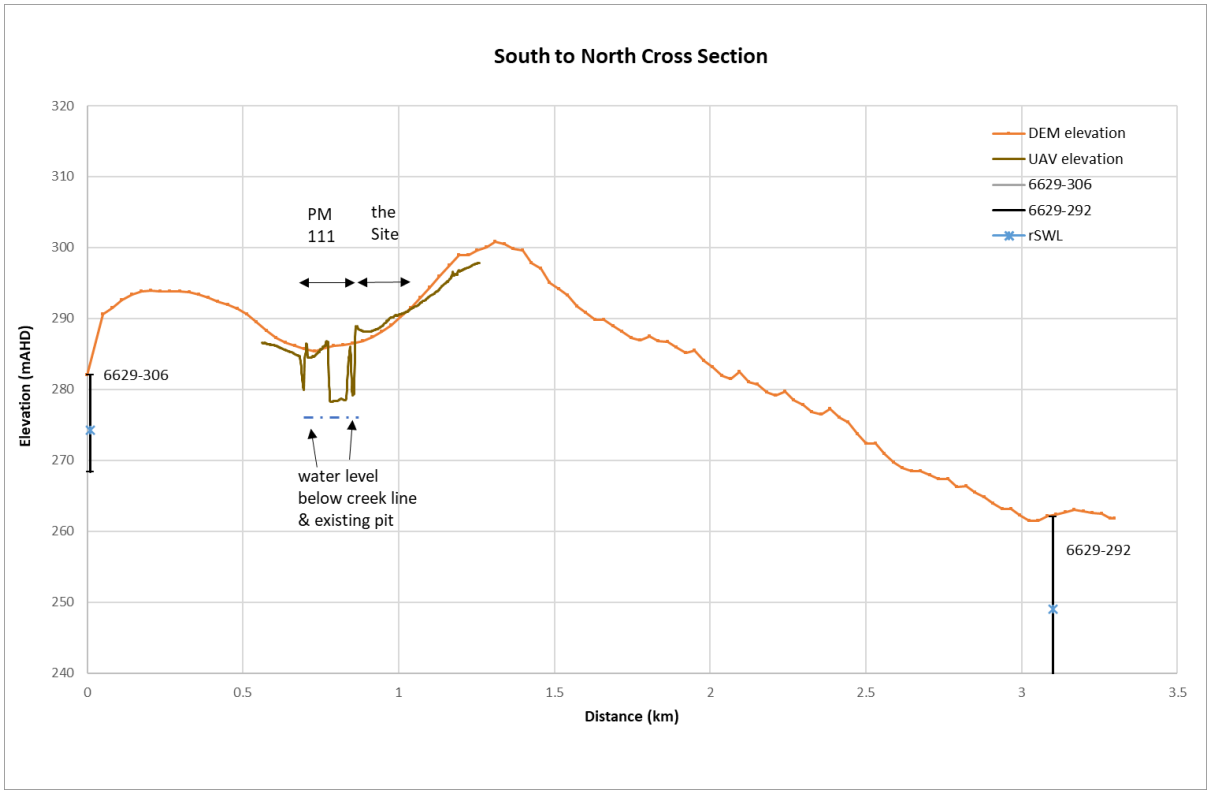
Meters

Coordinate System: GDA 1994 MGA Zone 54

Groundwater elevations (mAHD) reported at nearby wells. (Source: Waterconnect, 2020)

Figure 6

Document Path: C:\Users\Groundwater17\Dropbox (Groundwater Science)\Groundwater Science Team Folder\Project Files\GWP\GWP-20-2-Carrara Marble Pty Ltd\GIS\Maps\Fig 6. Groundwater Elevation_mAHD.mxd
Document Name: Fig 6. Groundwater Elevation_mAHD



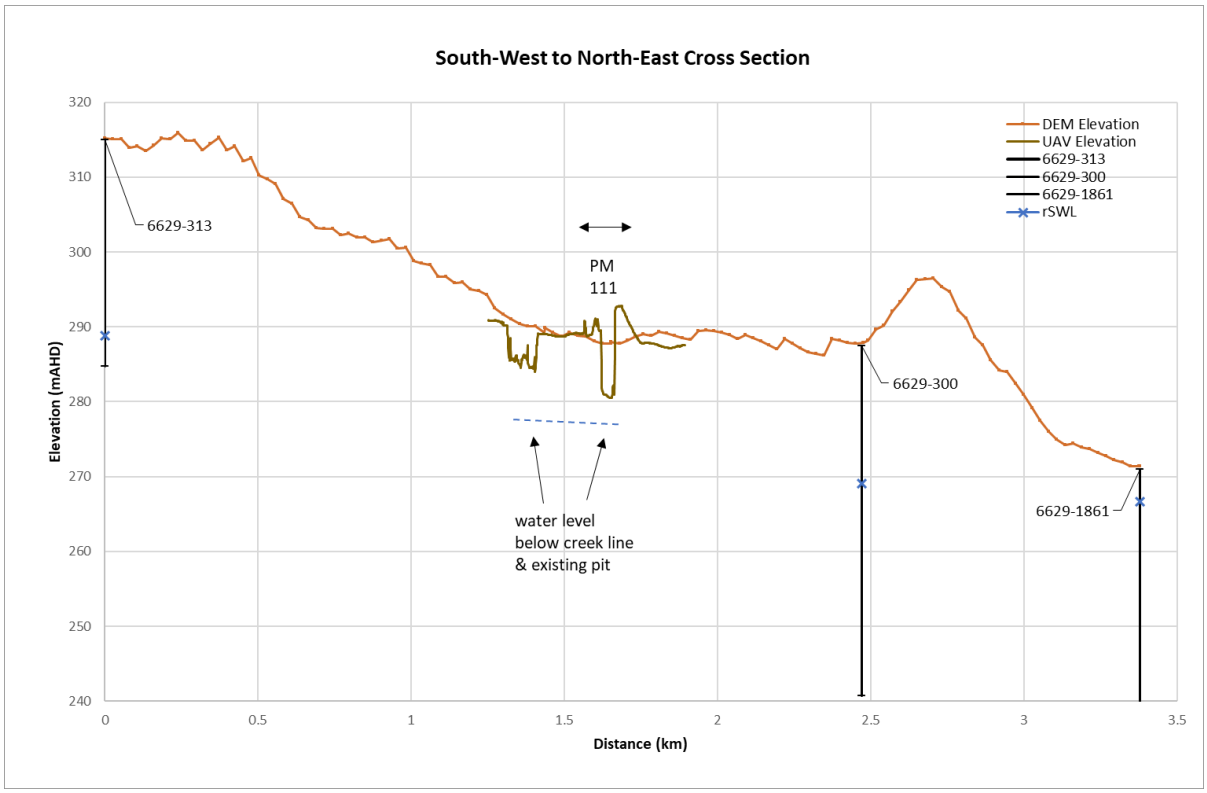
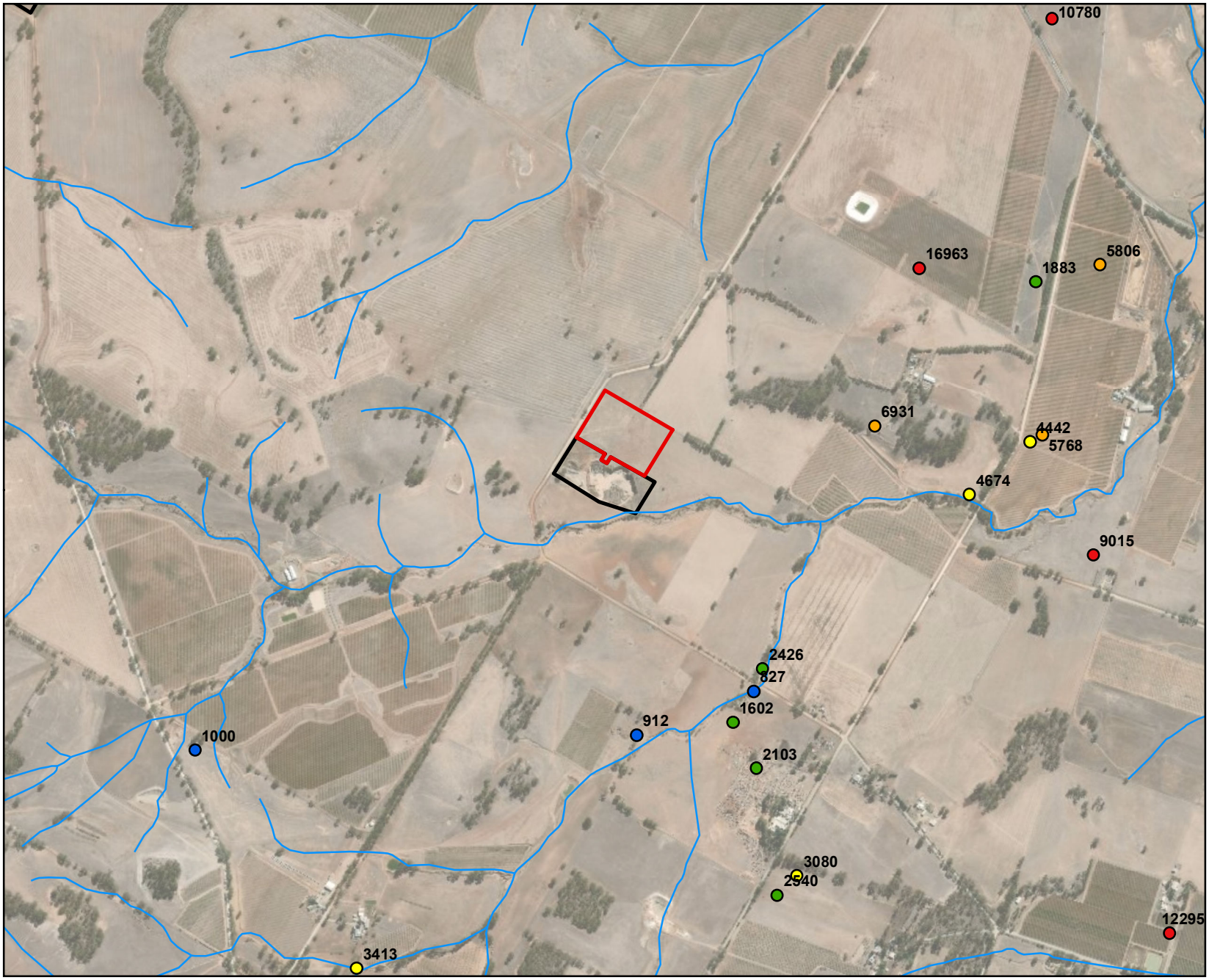


Figure 7. Hydrogeological Cross Sections (see Figure 6 for Cross Section lines).



Legend

Salinity (mg/L)

- 605 - 1200
- 1201 - 3000
- 3001 - 5000
- 5001 - 7000
- 7001 - 20000
- Streams
- MC Application 2020/000624
- Private Mine 111

GROUNDWATER SCIENCE

Job Number: GWP-20-2

Client: Groundwork Plus

Version: 1 Date: 4/11/2020

Drawn by: PM

N

0 150 300 600

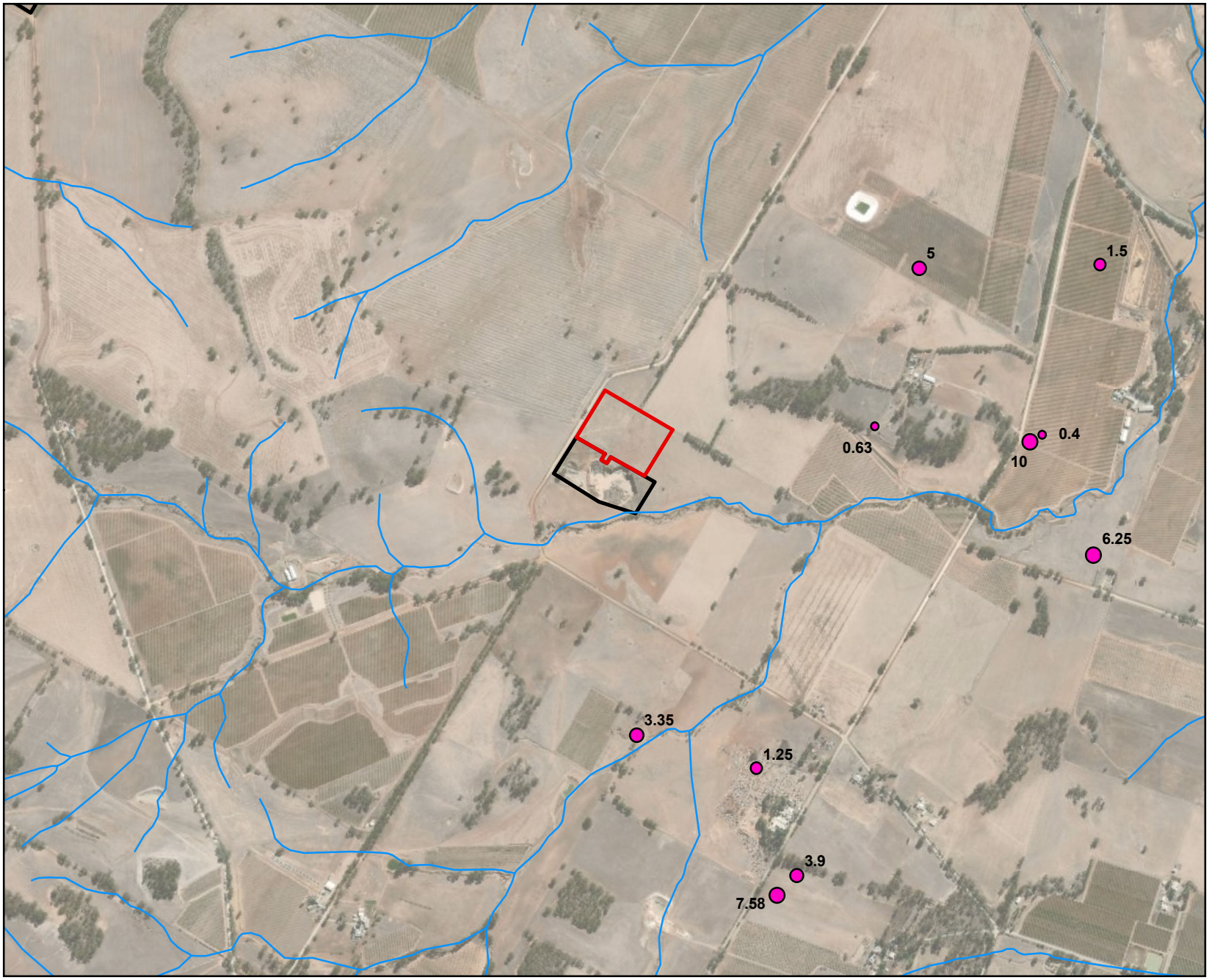
Meters

Coordinate System: GDA 1994 MGA Zone 54

Water wells labelled by salinity (mg/L)

Figure 8

Document Path: C:\Users\Groundwater17\Dropbox (Groundwater Science)\Groundwater Science Team Folder\Project Files\GWP\GWP-20-2-Carrara Marble Pty Ltd\GIS\Maps\Fig 8. Groundwater salinity.mxd
Document Name: Fig 8. Groundwater salinity



Legend

Well yield (L/s)

- 0.4-1
- 1-3
- 3-5
- 5-10
- >10
- Streams
- MC Application 2020/000624
- Private Mine 111

GROUNDWATER SCIENCE

Job Number: GWP-20-2

Client: Groundwork Plus

Version: 1 Date: 4/11/2020

Drawn by: PM

N

0 150 300 600

Meters

Coordinate System: GDA 1994 MGA Zone 54

Water wells labelled by yield (L/s)

Figure 9

Document Path: C:\Users\Groundwater17\Dropbox (Groundwater Science)\Groundwater Science Team Folder\Project Files\GWP\GWP-20-2-Carrara Marble Pty Ltd\GIS\Maps\Fig 9. Well yields.mxd
Document Name: Fig 9. Well yields

Legend

- Terrestial woodland
- Stream vegetation
- Streams
- MC Application 2020/000624
- Private Mine 111
- Prescribed_WRA

GROUNDWATER SCIENCE

Job Number: GWP-20-2

Client: Groundwork Plus

Version: 1 Date: 4/11/2020

Drawn by: PM

N

0 125 250 500

Meters

Coordinate System: GDA 1994 MGA Zone 54

Vegetation displayed on the BoM GDE database (source: BoM, 2020)

Figure 10

Document Path: C:\Users\Groundwater17\Dropbox (Groundwater Science)\Groundwater Science Team Folder\Project Files\GWP\GWP-20-2-Carrara Marble Pty Ltd\GIS\Maps\Fig 10. GDE database.mxd
Document Name: Fig 10. GDE database

4 Groundwater Management

4.1 Groundwater Licensing

The Site falls outside of a PWA or PWRA. Extraction of groundwater does not require a license.

A well construction permit would be required for the drilling of water wells.

4.2 Inferred water table position and recommended floor level

The cross sections (Figure 7) displays available water level data near to the Site. It is estimated that the groundwater elevation is below 278 mAHD at the adjacent quarry and below 280 mAHD across the entirety of the Site.

Based on above it is recommended to design pits no deeper than 280 mAHD.

4.3 Groundwater Monitoring and Management

The quarry should be monitored for groundwater seepage. If seepage occurs, then an investigation to confirm the depth to groundwater and determine management strategies (if required) should be undertaken. This should include an assessment of risk to 3rd party receptors.

4.4 Risk assessment

The risks to groundwater are quarrying below the water table which would result in the removal of groundwater and low magnitude drawdown near to the Site.

Risks to groundwater can be managed per the following:

- planning the quarry to remain above groundwater as described in this report; and
- monitoring the quarry operation for any groundwater seepage.

In the case that monitoring indicates groundwater seepage then a risk assessment and management plan should be developed and submitted as an amendment to the Program for Environmental Protection and Rehabilitation. More details on the risk assessment is provided in Table 3.

Table 3. Impact Assessment for Groundwater – PM 214.

Quarry Phase	Potential impact event			
Impact (ID)	**Source**	**Pathway**	**Receptor**	**Confirmation of the Source, Pathway and Receptor**
GWS1	Removal of groundwater by quarry dewatering	Interception of groundwater by quarrying results in lowered groundwater levels by a small amount	Nearest Existing groundwater user located 1 km to the south-south-east[7].	Source: Groundwater. Pathway: via the fractured rock aquifer Receptor: 3rd party well 1 km to the south-south-east.
Uncertainty and assumptions		It is estimated that groundwater is < 280 mAHD across the Site. Quarrying at the new application area to 280 mAHD is unlikely to intercept groundwater.		
Sensitivity to change		Not sensitive to change due to the distance to receptors and the low likelihood of impact.		
Justification for the confirmation / non-confirmation of Source, Pathway and Receptor		Based on the groundwater assessment, the proposed quarry pit floors are not expected to intercept the water table.		

5 Closing remarks

Thank you for the opportunity to conduct this assessment. If you have any queries' please contact Paul Magarey on 0438 856 442.

Regards

Paul Magarey
Senior Hydrogeologist

[7] Well not reported on WaterConnect.

6 References

Bureau of Meteorology (2020). *Groundwater Dependent Ecosystems Atlas,* accessed November 2020. Federal Government of Australia.

Geoscience Australia (2011). *1s Digital Elevation Model*.

Groundwork Plus (2020). Written communications from James Rowe to Paul Magarey, October 2020.

Propeller (2020). Ground surface elevations obtained via unmanned aerial vehicle 5th May 2020.

SARIG (2020). *South Australian Resource Information Gateway*. Electronic data accessed October 2020. Government of South Australia.

Water Connect (2020). *DEW Groundwater Data Application*. Electronic data accessed October 2020. Government of South Australia.

Attachment 1. Photos of Adjacent Quarry September 2020 – Private Mine 111.

Photos courtesy of Groundwork Plus.

Attachment 4

Visual Assessment

Photo Plate 1: Photo from corner of Schrapel Road and Heinze Road towards MC area. No view experienced due to topography, buildings and tree screening.

Photo Plate 2: View from Corner of Schrapel Road and Marble Quarry Road. Looking into PM 111 and MC area. Views of the existing quarry experienced. No views of the MC area due to overburden mound and tree screening.

Photo Plate 3: View from north of Marble Quarry Road taken at private access track entry / exit point for landowner (Saegenschnitter). No view due to topography of the area.

Photo Plate 4: View from Marble quarry Road, north of MC area. Views of MC area experienced, white peg of MC shown in distance. Views of PM 111 Overburden mound also experienced.

Carrara Marble Quarry	**Visual Assessment Photo Plates – Sheet 1**		
Barossa Quarries	GROUNDWORK p l u s	Date: 29/09/2020	Ref. 2492.610.003

Photo Plate 5: View taken along private access track south of the Saegenschnitter property. Vineyards located just of view to the left of photo. No views of MC area experienced due to topography and tree screening.

Photo Plate 6: View from corner of Heinze Road and Neukirch Road towards PM and MC area. Distant views of PM Overburden mound but no views of MC area due to topography and tree screening.

Photo Plate 7: View from the residence located south west of the Site shows limited views of the MC area are experienced due to topography and vegetation screening, and views are predominately of the adjacent PM.

Carrara Marble Quarry	**Visual Assessment Photo Plates – Sheet 2**		
Barossa Quarries	GROUNDWORK p l u s	Date: 29/09/2020	Ref. 2492.610.003

Attachment 5

EPBC Act 1999 Protected Matters Report

Australian Government

Department of Climate Change, Energy, the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 12-Dec-2024

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	28
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	16
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	1
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	4
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Iron-grass Natural Temperate Grassland of South Australia	Critically Endangered	Community may occur within area	In feature area
Peppermint Box (Eucalyptus odorata) Grassy Woodland of South Australia	Critically Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area	In feature area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat may occur within area	In feature area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat known to occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Polytelis anthopeplus monarchoides Regent Parrot (eastern) [59612]	Vulnerable	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In buffer area only
MAMMAL			
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area
PLANT			
Acacia menzelii Menzel's Wattle [9218]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Caladenia argocalla White-beauty Spider-orchid [54991]	Endangered	Species or species habitat known to occur within area	In feature area
Caladenia tensa Greencomb Spider-orchid, Rigid Spider-orchid [24390]	Endangered	Species or species habitat known to occur within area	In feature area
Dodonaea procumbens Trailing Hop-bush [12149]	Vulnerable	Species or species habitat may occur within area	In feature area
Dodonaea subglandulifera Peep Hill Hop-bush [11956]	Endangered	Species or species habitat may occur within area	In feature area
Euphrasia collina subsp. osbornii Osborn's Eyebright [3684]	Endangered	Species or species habitat known to occur within area	In feature area
Olearia pannosa subsp. pannosa Silver Daisy-bush, Silver-leaved Daisy, Velvet Daisy-bush [12348]	Vulnerable	Species or species habitat known to occur within area	In feature area
Prasophyllum pallidum Pale Leek-orchid [20351]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Prasophyllum pruinosum Plum Leek-orchid [11821]	Endangered	Species or species habitat may occur within area	In buffer area only
Senecio macrocarpus Large-fruit Fireweed, Large-fruit Groundsel [16333]	Vulnerable	Species or species habitat may occur within area	In feature area
Swainsona pyrophila Yellow Swainson-pea [56344]	Vulnerable	Species or species habitat may occur within area	In feature area
REPTILE			
Aprasia pseudopulchella Flinders Ranges Worm-lizard [1666]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Tiliqua adelaidensis](#) Pygmy Blue-tongue Lizard, Adelaide Blue-tongue Lizard [1270]	Endangered	Species or species habitat known to occur within area	In feature area

Listed Migratory Species

[Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
[Apus pacificus](#) Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
[Motacilla cinerea](#) Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Unnamed (No.HA604)	Heritage Agreement	SA	In buffer area only

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Nava-1 Cable System	2001/510	Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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Attachment 6

DPC AAR Search Results – Confidential

Attachment 7

Legislation and Standards

Environmental Aspect	Applicable Legislation	Applicable Non-Legislated Standard/s
Public Safety	*Work Health and Safety Act 2012* (SA) and Regulations *Mining Act 1971* (SA) *Local Government Act 1999* (SA)	Mine Closure and Completion: Leading Practice Sustainable Development Program for the Mining Industry (Department of Industry, Tourism and Resources, 2016).
Traffic	*Work Health and Safety Act 2012* (SA) and Regulations *Road Traffic Act 1961* (SA) *Local Government Act 1999* (SA)	N/A
Protection of Third Party Property	*Work Health and Safety Act 2012 (SA) and Regulations* *Mining Act 1971 (SA)* *Local Government Act 1999* *Electricity Act 1996* *Electricity (General) Regulations 2012*	Network Information for Customers and Contractors (NICC) 404 – Working in the Vicinity of SA Power Networks Infrastructure – Network Access Permit Process (January, 2015)
Heritage	*Aboriginal Heritage Act 1988* (SA) *Heritage Places Act 1993* (SA) *Mining Act 1971* (SA) and Regulations *Planning, Development and Infrastructure Act 2016 (SA)* *Aboriginal and Torres Strait Island Heritage Protection Act 1987* (Cth)	Cultural Heritage Guidelines, A handbook for Staff and Contractors, (Transport SA 1999) Section 20 of the *Aboriginal Heritage Act 1988*: Discovery of sites, objects or remains
Weeds, Pests and Plant pathogens	*Landscape South Australia Act 2019* *Controlled Substances Act 1984* (SA) and Regulations (SA) 2017 *Agricultural and Veterinary Products Act (Control of Use) Act 2002* (SA) and Regulations 2017	Weed control handbook for declared plants in South Australia (Government of South Australia, 2017)
Topsoil management	*Landscape South Australia Act 2019*	Mine Closure and Completion: Leading Practice Sustainable Development Program for the Mining Industry (Department of Industry, Tourism and Resources, 2006).

Environmental Aspect	Applicable Legislation	Applicable Non-Legislated Standard/s
Waste management	*Zero Waste SA Act 2004* (SA) *Environmental Protection Act 1993* (SA) *Environment Protection Regulations 2009* *Environment Protection (Waste to Resources) Policy 2010* (SA) *Environment Protection (National Pollutant Inventory) Policy 2008* (Cth)	EPA Guideline: Site contamination—what is site contamination? (EPA, 2009) EPA Guideline: EPA080/16 Bunding and spill management (EPA, 2016) EPA Standard for the production and use of Waste Derived Fill (EPA, October 2013)
Visual amenity	*Mining Act 1971* (SA) and Regulations	Planning and Design Code - 23 September 2021 – Version 2021.14
Noise	*Environment Protection Act 1993* (SA) *Environment Protection (Noise) Policy 2007* (SA)	Planning and Design Code - 23 September 2021 – Version 2021.14
Dust	*Environment Protection Act 1993* (SA) *Environment Protection (Air Quality) Policy 2016* (SA) *The South Australian Public Health Act 2011* (SA) *Local Government Act 1999* (SA)	World Health Organisation (WHO) Air Quality Guidelines, 2005 National Environment Protection (Ambient Air Quality) Measure Australian Standard AS 3580.10.1 Methods for sampling and analysis of ambient air – Determination of particulates – Deposited matter – Gravimetric method Australian Standard AS 3580.9.6 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM10 high volume sampler with size-selective inlet – Gravimetric method
Blast vibration and overpressure	*Mining Act 1971* (SA) and Regulations *Explosives Act 1936* (SA) and Regulations *Dangerous Substances Act 1979* (SA) *Environment Protection (Noise) Policy 2007* (SA) *Work Health and Safety Act 2012* (SA) and Regulations	Australian Standard AS 2187 Explosives—Storage, transport and use Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration (ANZECC, 1990)
Groundwater	*Environment Protection Act 1993* (SA) *Environment Protection (Water Quality) Policy 2015* (SA)	Australian and New Zealand Guidelines for Fresh and Marine Waters (ANZECC and ARMCANZ, 2000)

Environmental Aspect	Applicable Legislation	Applicable Non-Legislated Standard/s
	Landscape South Australia Act 2019	
Native vegetation	*Landscape South Australia Act 2019* *Native Vegetation Act 1991* (SA) *Environment Protection and Biodiversity Conservation Act 1999* (Cth)	Guide to the *Native Vegetation Regulations 2017*, Native Vegetation Council (July, 2019)
Surface water (Erosion, Sediment and Stormwater Management)	*Environment Protection Act 1993* (SA) *Environment Protection (Water Quality) Policy 2015* (SA)	Australian and New Zealand Guidelines for Fresh and Marine Waters (ANZECC and ARMCANZ, 2000) Code of practice for wastewater overflow management (EPA, 2017) Stormwater pollution prevention: Code of practice for the building and construction industry (EPA, 1999)

Attachment 8

Waste Derived Fill Procedure and Protocol and Waste Derived Fill Acceptance Form

Barossa Quarries Pty Ltd

Waste Derived Fill Procedure and Protocol

Purpose:

To control the importation of Waste Derived Fill onto Barossa Quarries sites.

Scope:

As part of its Quality Management System, Barossa Quarries recognized the need to control the importation of Waste Derived Fill onto site as part of its Rehabilitation Program. The following procedures are implemented to capture all incoming waste derived fill and ensure that it conforms to the EPA standards.

Protocols & Procedure:

- Only the Director or Quarry Manager may authorise the importation of fill onto site after the necessary legislative needs have been met.
- All fill must have a beneficial re-use on site.
- Only Customers with an active account may access the service.
- All deliveries of fill must be accompanied by a Waste Derived Fill Acceptance form with the appropriate authorisation.
- The Waste Derived Form shall be used for every site that fill is accepted from and referenced against the *EPA Standard for the Production and use for Waste Derived Fill*.
- The Waste Derived Fill Form shall also make note of the approximate location of the fill in the quarry.
- The Waste Derived Fill Form shall be authorised only by the Director or Quarry Manager.
- Each Site shall be investigated for its compliance to the EPA Standard for the Production and use for Waste Derived Fill.
- Once accepted the Customer must abide by Barossa Quarries standard terms and conditions for trade.
- The Director or Quarry Manager may choose not to accept waste derived fill even if the fill complies with the EPA Standard. The decision is final and will not be entered into.
- Each Docket shall reference the Waste Derived Fill Form number for traceability.
- The Director or Quarry Manager shall notify the Responsible Person onsite of the acceptance of the fill, the customer, the volume, the Waste Derived Fill Acceptance Form and the accompanying test results.
- The Responsible Person onsite will not accept any fill until notified of these details.
- A contract shall be generated in the system to allow traceability of the fill, the location of the fill, customer details and any other relevant information.
- Waste Derived Fill site to be inspected on a daily basis.
- Any deliveries over 100t per site to be inspected at least twice daily.

Documentation References:

EPA Act 1993
EPA Standard for the production and use of Waste Derived Fill.
Waste Derived Fill Acceptance Form

Barossa Quarries Pty Ltd

Waste Derived Fill Acceptance Form

Form Ref No: _____

STAKEHOLDER

Name of Business	
Trading Name (if different from above)	
Address & Location	

SITE & CONTACT DETAILS

Site Location		Site Supervisor	
Suburb		Telephone No	
Current Site Use		Mobile	
Previous Site Use		Email	

Description of WDF .....

Total Quantity ..... (amounts greater than 100t require a clean fill certificate)

Does the WDF meet the EPA waste fill criteria? Yes ☐ No ☐

Material supplied must meet and be in accordance with the EPA Guidelines "Standard for the Production and use of Waste Derived Fill".

Does the WDF consist of or contain any prohibited waste? Yes ☐ No ☐

Material containing prohibited waste cannot be accepted on site.

Has a sampling program and chemical analysis been undertaken according to EPA Guidelines?

Yes ☐ (please attach) No ☐

Does the Contractor have a Certified Quality and Environmental Management Systems?

Yes ☐ No ☐ Details .....

Has there been dilution of the waste? Yes ☐ No ☐

Any material that may have been diluted or substituted will be deemed unacceptable. The responsibility and cost of removal from site and appropriate disposal of this material will be borne by the customer.

Name ..... Authorised .....

Date ..... Date .....

Signature ..... Signature .....

The Customer shall be deemed to have supplied clean fill as per the EPA Specification and Hallett Resources reserves the right to reject any material delivered to site with all costs of removal of the material, from site, and appropriate disposal according to the standard, to be borne by the customer.