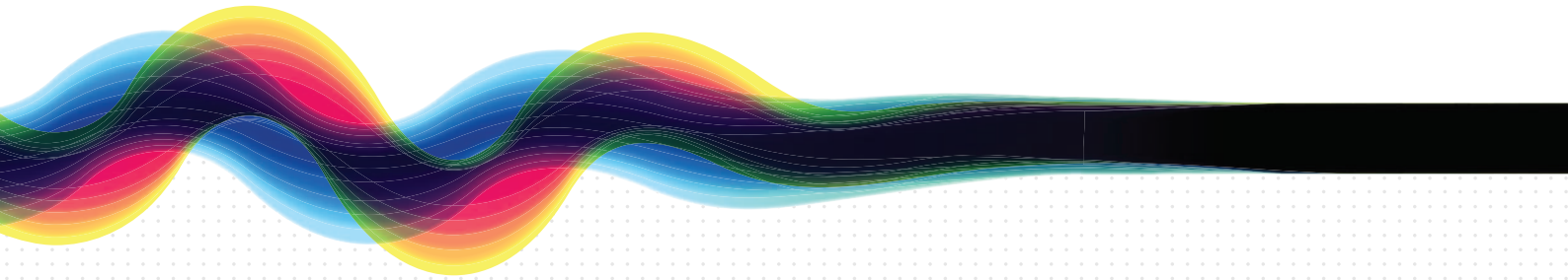
RECEIVED
By Shire of Augusta Margaret River
13 September 2024

9730 Caves Road, Hamelin Bay
Extractive Industry Development Application

August 2024 | 24-132



element.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

We acknowledge the Whadjuk people of the Noongar nation as traditional owners of the land on which we live and work.

We acknowledge and respect their enduring culture, their contribution to the life of this city, and Elders, past and present.

Document ID: /Volumes/Graphics/2024/24-132 - Hamelin Bay, Lot 22 (9730) Caves Road/01 InDesign Report/01 Draft/00 InDesign/24-132 9730 Caves Rd Hamelin Bay EIL DA Folder/24-132 9730 Caves Rd Hamelin Bay EIL DA F 240903.indd

Issue	Date	Status	Prepared by	Approved by	Graphics	File
1	30.08.24	Draft	Campbell Green	Daniel Lewis	CB	D1
2	03.09.24	Draft	Campbell Green	Daniel Lewis	MS	F

This report has been prepared for the exclusive use of the Client, in accordance with the agreement between the Client and Element Advisory Pty Ltd (**Element Advisory**) ('Agreement').
Element Advisory accepts no liability or responsibility whatsoever in respect of any use of or reliance upon this report by any person who is not a party to the Agreement or an intended recipient.
In particular, it should be noted that this report is a qualitative assessment only, based on the scope and timing of services defined by the Client and is based on information supplied by the Client and its agents.
Element Advisory cannot be held accountable for information supplied by others and relied upon by **Element Advisory**.
Copyright and any other Intellectual Property arising from the report and the provision of the services in accordance with the Agreement belongs exclusively to **Element Advisory** unless otherwise agreed and may not be reproduced or disclosed to any person other than the Client without the express written authority of **Element Advisory**.

Element Advisory Pty Ltd | Whadjuk Country, L18, 191 St Georges Tce, Perth WA 6000 | **www.elementadvisory.com.au**

© **Element** Advisory

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Contents

1. Development Application Details 1
2. Consultant List 3
3. Introduction 5
4. Subject Site 7
5. Proposed Development 9
6. Orderly and Proper Planning 17
7. Conclusion 19
Appendix A – Certificate of Title 21
Appendix B – Planning Assessment 23
Appendix C – Development Plans 41
Appendix D – Acoustic Assessment 43
Appendix E – Traffic Impact Statement 45
Appendix F – Environmental Management Plan 47
Appendix G – Groundwater Monitoring Report 49
Appendix H – Visual Impact Assessment 51
Appendix I – Soil Data Analysis 53

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

1. Development Application Details

1.1 Development Application Details

Proposed development	Industry – Extractive
Applicant	Element Advisory, on behalf of McDougall Quarries Pty Ltd
Landowner	Joe Fish Pty Ltd
Type of approval sought	Development Application to be determined by the Joint Development Assessment Panel (DAP Form 1)
Subject site	Lot 22 (No. 9730) Caves Road, Hamelin Bay
Real property address	9730 Caves Road, Hamelin Bay
Proposed Extraction Area	14 ha (subject to survey)
Estimated Development value	$3,500,000 (excl. GST)

1.2 Planning Framework Details

Local Government Area	Shire of Augusta – Margaret River
Local Planning Scheme	Shire of Augusta – Margaret River Local Planning Scheme No. 1
Land Use Permissibility	General Agriculture – (A) use
Aboriginal and/or Local Heritage Considerations	N/A
Environmental Considerations	• Scattered Native Vegetation on perimeter of site, predominantly cleared of native vegetation • Significant undulating topography
Relevant State Planning Policy(s), Development Control Policy(s), Position Statements and/or Planning Bulletins	• SPP 2.4 Basic Raw Materials • SPP 3.7 Planning in Bushfire Prone Areas • Statement of Planning Policy 6.1- Leeuwin-Naturaliste Ridge Policy • EPA Separation Distances between Industrial and Sensitive Land Uses (GS3)
Local Planning Policies	• Shire of Augusta Margaret-River Local Planning Policy 3 – Extractive Industries
Local Law	• Shire of Augusta Margaret River Extractive Industries Local Law 2014

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

2. Consultant List

This development application has been prepared by Element Advisory on behalf of McDougall Quarries Pty Ltd with input from the following specialist consultants:

Discipline	Consultant
Planning Consultant	Element Advisory
Environmental Consultant	Accendo Australia
Traffic Engineer	Ptg Consulting
Acoustic Consultant	Herring Storer Acoustics
Hydrology	WML Consulting Engineers
Soil Evaluation	Agrifood Technology

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

3. Introduction

This Development Application (DA) has been prepared by Element Advisory on behalf of McDougall Quarries for an Extractive Industry over Lot 22 (No. 9730) Caves Road, Hamelin Bay (the subject site).

The subject site is 118.837 Ha and is vacant, abutting the Hamelin Ridge rural-residential estate to the north and the National Park west and southwest. To the east, the subject site is bound by Caves Road and rural properties on the east of Caves Road. The subject site has an existing aerial powerline passing through the site on the eastern side.

The purpose of this DA is to seek approval from the Regional Development Assessment Panel (DAP) to allow lime sand and limestone extraction on the subject site to a maximum depth of 30m AHD. The proposed development is estimated to yield approximately 1,314,489m^3 of raw material for use in surrounding agricultural and land development projects which will provide the region with a locally sourced basic raw material.

This report provides an overview of the subject site and the proposed development, as well as a detailed assessment against the relevant planning requirements and an examination of the planning merits of the proposal.

This report is accompanied by the following detailed technical reports, assessments and plans:

- Appendix A – Certificate of Title
- Appendix B – Planning Assessment
- Appendix C – Development Plans
- Appendix D – Acoustic Assessment
- Appendix E – Traffic Impact Statement
- Appendix F – Environmental Management Plan
- Appendix G – Groundwater Monitoring Report
- Appendix H – Visual Impact Analysis
- Appendix I – Soil Data Analysis

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Figure 1. Aerial Image of Lot 22, 9730 Caves Road, Hamelin Bay

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

4. Subject Site

4.1 Property Description, Ownership and Locality

The subject site is located within the Shire of Augusta-Margaret River local government area (Shire), approximately 12km north-west of the Augusta Town Centre. The proposed extraction area totals 13.995ha as outlined within the development plans.

Refer to Appendix C – Development Plans.

The subject site contains a single habitable dwelling, as well as a low voltage above ground power line traversing the subject site from south the north.

The subject site directly fronts on to Caves Road to the east, and Cosy Corner Road to the south. The Hamelin Ridge estate is located north of the development proposal.

The property details are provided within **Table 1** below with a copy of the Certificate of Title attached at Appendix A.

Table 1. Certificate of Title Particulars

LOT NO.	LANDOWNER	AREA	VOL.	FOLIO	PLAN NO.
22	Joe Fish Pty Ltd	118.837 ha	2113	44	P022155

4.2 Heritage & Environmental Considerations

4.2.1 Existing Site Topography and Soils

The topography is characterised by dispersed hilltops. The subject site has a high-point in the south-eastern corner of the property exceeding 60m AHD. The eastern portion of the property is generally undulating between 45m AHD and 35m AHD with small peaks dispersed throughout. The western portion sits at the bottom of a large slope at a height of 30m AHD, lying at the low point of the valley which slopes up again on properties neighbouring to the west.

A site feature survey is provided within the development plans and laboratory soil testing conducted by Agrifood Technical is attached at Appendix I.

Refer to Appendix C – Development Plans.

Refer to Appendix I – Soil Data Analysis.

4.2.2 Groundwater

Groundwater levels identified onsite were recorded following the installation of 8 monitoring bores onsite in July 2024, by WML and the data correlated to the data used for the LWMS for Hamelin Ridge Estate to produce the predicted maximum groundwater contours outlined in the Groundwater Technical Note and Development Plans.

All proposed operations will always maintain a 2m separation to groundwater, with the highest groundwater level estimated at 28m AHD.

Refer to the Environmental Management Plan at Appendix F.

Refer to the Groundwater Monitoring Report at Appendix G.

4.2.3 Acid Sulphate Soils (ASS)

Department of Water and Environmental Regulation (DWER) Acid Sulphate Soil (ASS) risk mapping for the Swan Coastal Plain demonstrates that the subject site is at no risk of interception of ASS.

Refer to the Environmental Management Plan at Appendix F.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

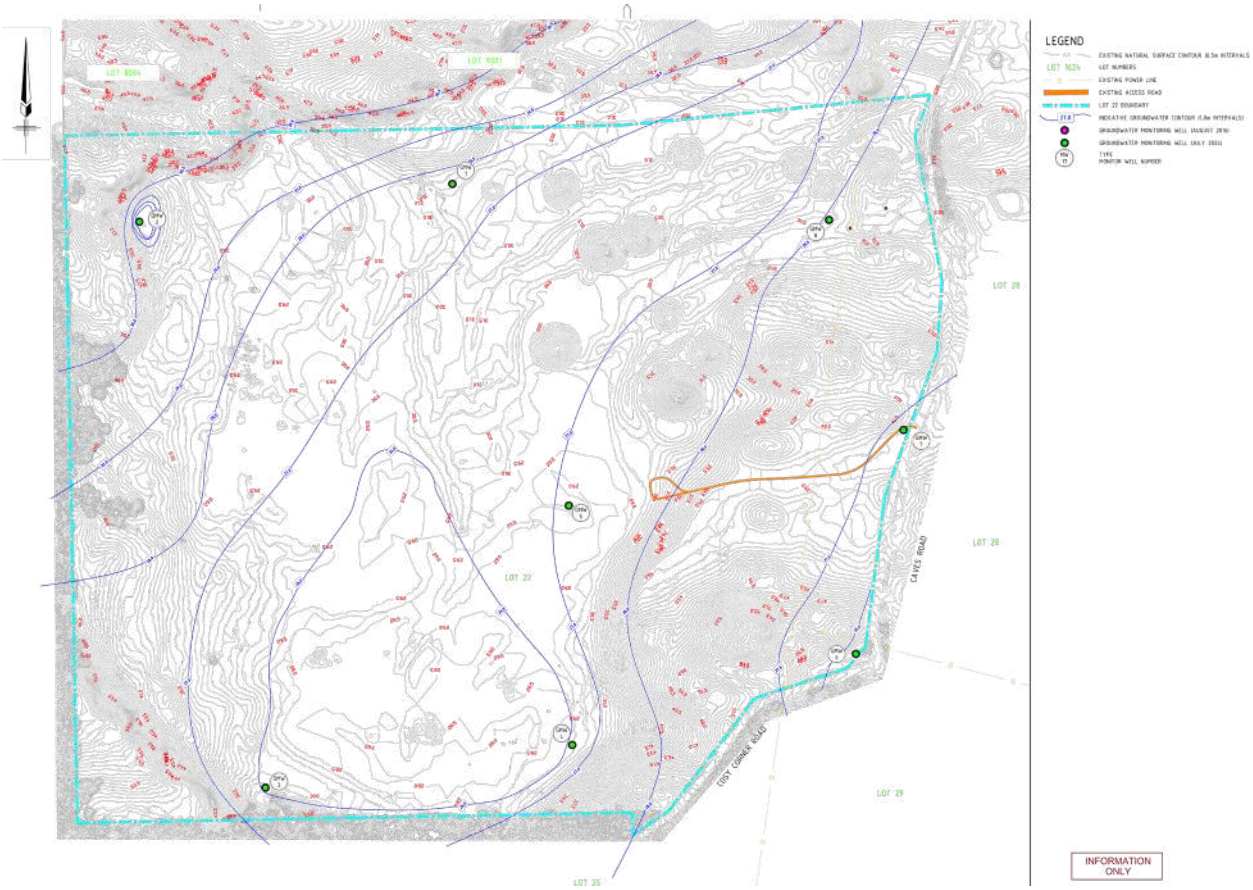


Figure 2. WML Estimated Maximum Groundwater Level (MGL) Contours

4.2.4 Wetlands

No geomorphic wetlands are present within the subject site.

4.2.5 Native Vegetation

The subject site features scattered native vegetation in the western portion of the property while the extraction area includes only a number of individual trees totalling an area less than 0.1 ha and in a completely degraded condition. We do not consider the vegetation to provide substantial environmental value to Western Ring Tail Possums due to their isolated nature and separation to surrounding vegetation.

A native vegetation clearing permit will likely be required from the Department of Water and Environmental Regulation (DWER) to assess the environmental value of the identified native vegetation. A clearing permit is to be lodged with DWER following the lodgement of this development application.

4.2.6 Heritage

A search using the Department of Planning, Lands and Heritage (DPLH) mapping system indicates that there are no places with Aboriginal Cultural Heritage significance on the subject site.

Furthermore, the Heritage Council's State Heritage Register and the City's heritage records indicate there are no sites or places of State or Local heritage significance that will be impacted by the proposed development.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

5. Proposed Development

5.1 Development Details

5.1.1 Overview

The proposal is for lime sand and limestone extraction restricted to 14Ha of the subject site. Extraction is to occur over 7 sequential stages, with each stage to comprise of an area less than 2Ha open to extraction at any given time.

Extraction is to be completed by BCP Group, with haulage proposed to use 27.5m trucks on the road network identified in the haulage route defined below. The haulage route allows for efficient regional connection with Caves Road, directly accessed via the proposed crossover.

Extraction is proposed to commence within stage 1 and progressively quarry north, with all operations concealed behind a large working extraction face. Extraction is not to go below a minimum pit floor level of 30m AHD, ensuring a 2m separation to groundwater is always maintained. The Development proposal is summarised in **Table 2** below:

Table 2. Development Summary

Development Details:	
Subject Site Area	118.837 Ha
Requested Approval Timeframe	10 years
Area of Vegetation Clearing	0.1ha Native Vegetation (Completely Degraded)
Basic Raw Material	Lime Sand & Lime Stone
Lot Boundary Setbacks	Minimum 60m (Caves Road boundary) Minimum 20m (Cosy Corner Road boundary) Minimum 415m (northern boundary)
Minimum Separation Distance to Sensitive Land Use	400m
Extractive Industry License Area (%)	13.995ha (11.77%)
Rehabilitation Area	100 % of Extraction Area
Rehabilitation Typology	Pasture
Extraction Method	Front-end loader, D9 Dozer, Excavator, Screen & Crusher
Batter Slopes (Vertical: Horizontal)	1:4
No. of Stages	7
Proposed Extraction Yield	1,314,489m3
Annual Extraction Rate (Estimate)	Approx. 131,448.9m3 per annum
Maximum Depth of Extraction	30m AHD
Proposed Haulage Vehicle Movements	Maximum of 15 trucks per day (dependent on market demand) Total of 30 movements per day.
RAV Network	RAV 4.1
Haulage Route	Caves Road to Bussell Highway
Hours of Operation	Mon-Fri: 7:00am to 5:00pm Sat: 7:00am to 1:00pm No works are to occur on Sundays or Public Holidays.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

It is anticipated that all material may be extracted within 10 years, with rehabilitation to be completed following the completion of the final 2ha stage.

Rehabilitation and ongoing monitoring and maintenance of the rehabilitation area to a self-sustaining status will require maintenance over a 1 year period following the completion of works onsite.

The following activities are expected as part of the on-going operation of the site:

- Removal and Stockpiling of Topsoil - the top 100mm of topsoil from the active extraction stage is to be removed and stockpiled. Stockpiles are to be located where convenient within each extraction stage for operations with a batter no greater than 1:3 to ensure minimal erosion of the stockpile during winter periods and a height no greater than 2m for reduced wind erosion.
- Material excavation - active excavation of the resource from the working face within each stage and loading of trucks for haulage offsite.
- Screening and crushing - Screening of excavated material may be required dependent upon the particle size of material and market demand for material permeability. Should screening be undertaken onsite, a mobile screen is to be located within centre of the stage and operated in accordance with the noise management plan attached at **Appendix D.** Larger pieces of material are to be adequately crushed prior to screening. Material is to be loaded into the screen by front-end loader and/or excavator prior to loading trucks for haulage.
- Final contouring and topsoil respread - A combination of equipment may be used to undertake spreading and earthworks including a tracked bobcat, excavator and front end loader. Final contours are to reflect the Post Extraction Contour Plan.
- Site rehabilitation – Rehabilitation is to be completed in stages, following each stage of extraction. Rehabilitation of the subject site will ensure a pasture grass cover is established for long term dust suppression purposes.

5.1.2 Stages of Excavation

Extraction is to progress gradually in approximately 7 sequential stages moving from the western boundary of stage 1 before progressing north. This sequence allows for all operations to be screened behind a large working face.

5.1.3 Depth of Extraction

The maximum depth of extraction is to be limited to 30m AHD, ensuring a 2m separation to groundwater is always maintained during excavation. Detailed post extraction contours are provided within the development plans attached at **Appendix C.**

It is the operator's responsibility to not exceed this depth of extraction to prevent any risk of exposing groundwater within the site.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

5.1.4 Site Access and Movement

Site access and haulage route is set out within Figure 3**.** Caves Road is identified as a RAV network road, capable of accommodating up to 27.5m B-Double Trucks. All proposed roads to be used for haulage are able to accommodate 27.5m RAV trucks as proposed.

The preferred haulage route will utilise a new crossover to Caves Road, where RAV trucks will travel to Bussell Highway for regional access.

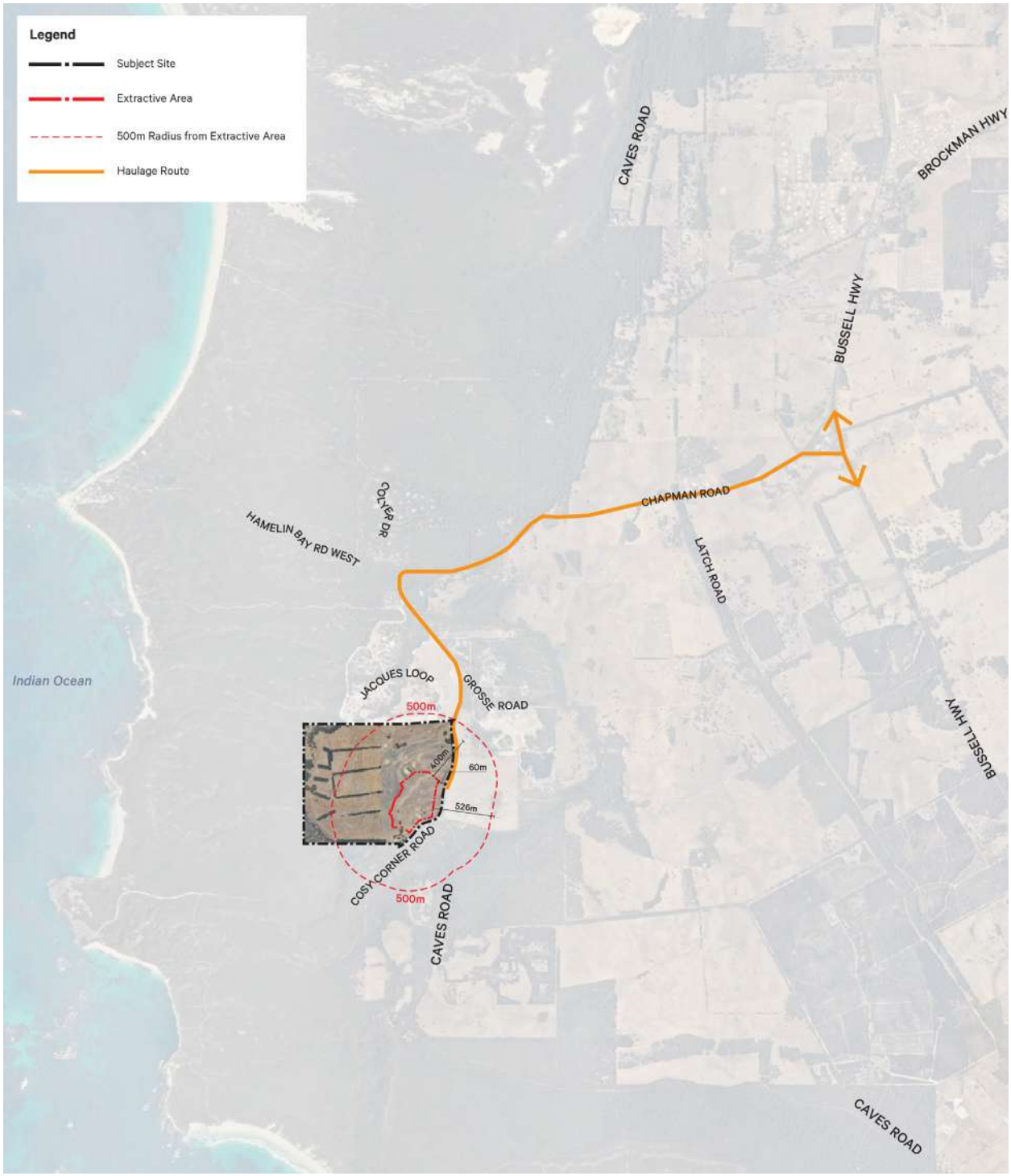


Figure 3. Site Aerial and Proposed Haulage Route

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

5.1.5 Hours of operation

The proposed hours of operation are:

- 7:00am to 5:00pm Monday to Friday.
- 7:00am to 1:00pm on Saturdays.
- No works are to occur on Sundays or Public Holidays.

5.1.6 Water Supply for Dust Suppression

It is anticipated that during the months of October to March, approximately 30KL (two full water carts) will be required for dust suppression per day during operations. The operator is required to maintain a water cart onsite, with sourcing of water from a licenced source either onsite or nearby. Should an onsite source be required, following DA approval, a water license application is required to be lodged with DWER for determination.

5.2 Noise Management

An acoustic report was prepared by Herring Storer to model the predicted noise impacts of the development with a copy of the report included at **Appendix D.**

Due to the proposed day-time operating hours, the applicable acoustic criteria for this assessment is the assigned L_{A10} day period noise level of 45 dB(A). The acoustic report concludes that, subject to the management measures specified for specific plant, the proposed operations are compliant with the *Environmental Protection (Noise) Regulations 1997* and do not adversely impact on the nearest sensitive receptors.

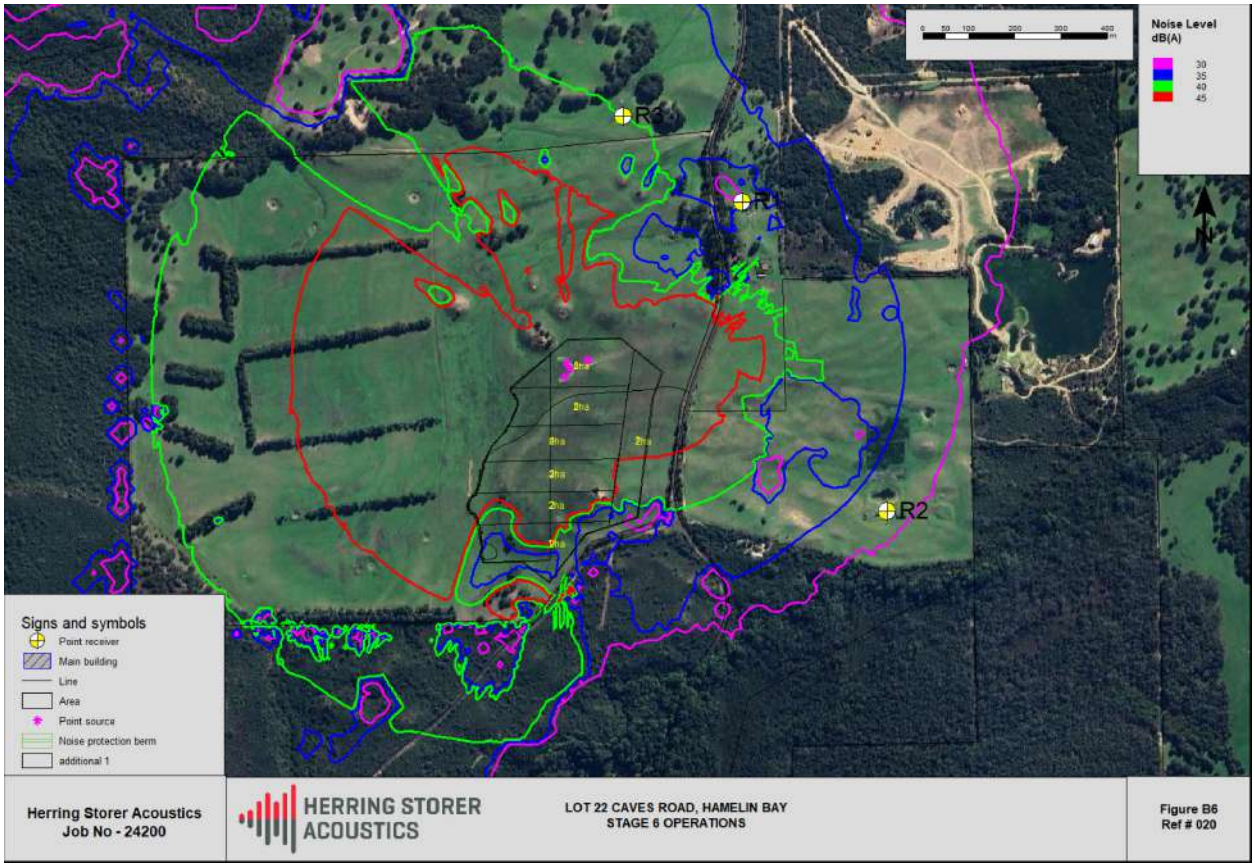


Figure 4. Modelled Acoustic Contours (worst case scenario – Stage 6)

Noise management measures required onsite include:

- The use of a 3m high temporary berm surrounding the crusher equipment if operating on the pit surface;
- The D9 dozer may only operate at surface within the western portion of stages 1-9 as shown, unless it is located behind a 5m excavation face at which stage it may operate within the extent of each stage; and
- All plant may operate without any noise management at a depth of 5m below the natural ground level as the quarry face acts as an acoustic bund.

The Noise Management Plan, prepared by Accendo, provides further details on the management of noise emissions onsite.

Refer to Appendix F – Environmental Management Plan

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

5.3 Traffic and Transport

A Traffic Impact Statement (TIS) has been prepared by PTG in support of the proposed haulage operations onsite.

The TIS concludes that proposed development is estimated to generate up to 38 daily vehicle (15 RAV trucks per day) movements which translate to approximately 1.5 trucks entering and exiting the site during peak operation. These volumes are considered only to influence the existing road network during infrequent peak haulage campaigns. The vehicles used are to be 27.5m RAV 4 vehicles.

The TIS recommends the location of the proposed crossover as shown on the Excavation Works Plan to maximise sight line distances to the Cosy Corner Road intersection and Caves Road to the north.

The potential impacts on the road network due to the proposed development are considered acceptable.

Refer to Appendix E – Traffic Impact Statement

5.4 Weed and Dieback Management

Weed management for the proposed development is addressed in Section 4.4 of the Rehabilitation Management Plan prepared by Accendo. The Weed management plan includes the following strategies to mitigate against the spread of weeds, where required:

- Assess potential for weeds within surface material prior to removal of topsoil and separate weed affected topsoil for treatment or disposal;
- Storage of weedy topsoil separately to be cleaned;
- All stockpiled topsoil is stored in the general vicinity of its origin;
- Cleaning of earthmoving machinery prior to entry and exit of the subject site;
- No soil shall be brought to the subject site apart from that used for rehabilitation;
- Plants used in rehabilitation are to be free from weeds;
- Internal access within subject site is controlled to reduce weed spread via vehicles;
- Chemical spray to kill weeds is used where deemed to be required, and;
- Monitoring of objectives and constant reporting to required to ensure above objectives are met.

Dieback management measures are detailed under Section 5.3 of the Environmental Management Plan. Given there is limited native vegetation (>0.1Ha) within the subject site, dieback indicator species are largely absent and therefore it is not possible to detect whether dieback is present or absent. On this basis, it is reasonable to classify the subject site as 'uninterpretable', denoting that a precautionary management approach should be adopted.

The following precautionary measures are applied to minimise risk of dieback entry to the subject site:

- Training provided to staff to educate on the specific requirements of dieback management;
- Fencing and lockable gates will be maintained and used to control unauthorised access to the excavation area.
- As far as reasonable and practicable haulage vehicles are to be cleaned of all loose external soil and plant material prior to entry and exit from the extraction area.
- Access to the subject site during operation will be restricted to the proposed roads. No other access points should be established. The access location and vehicle inspection point should be clearly sign posted.
- The extraction area will be managed to avoid ponding of surface water where vehicle access is required.
- Trucks will be loaded and covered to ensure there is no spillage of material during transport.

Refer to **Appendix F** *– Environmental Management Plan*

5.5 Dust Management

Dust generated onsite by operations is to be managed in accordance with the Dust Management Plan (DMP) prepared by Accendo Australia as part of the Environmental Management Plan attached at Appendix F.

As outlined within the DMP, dust emissions during the extraction process will be managed through the use of a water cart onsite to dampen material before and during extraction. This measure will reduce visible dust and minimise dust created during excavations.

The DMP also incorporates a complaints register, ensuring the DMP is considered a live management plan and may be continually updated to ensure dust is managed appropriately onsite.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

The DMP includes precautions to ensure dust generation does not cause adverse amenity impacts, this includes the termination of works at the notice of visible dust crossing the site boundary, particularly towards Caves Road or neighbouring properties.

Refer to **Appendix F** – *Environmental Management Plan*

5.6 Rehabilitation

During operations, quarrying and rehabilitation of the extraction area will be undertaken progressively. Following quarrying of each stage, rehabilitation will be undertaken. Rehabilitation of each stage is to be in the form of stabilising pasture.

Upon completion of each cell, the following broad completion criteria will be achieved:

- A self-sustaining cover of pasture;
- Weed levels that are not likely to impact on the viability of the reconstructed soils; and
- A safe and stable landform suitable for the proposed future land use which will be productive, grazing pasturelands.

Refer to **Appendix F** – *Environmental Management Plan*

5.7 Stormwater Management

Potential impacts associated with sedimentation and erosion from stormwater runoff during the operation of the quarry will be minimised by ensuring the pit floor has an area of 840m2 or less, bunded to allow for the potential capture of stormwater from within each stage.

Due to the size of the subject site, no offsite stormwater issues are anticipated to by this development with the likelihood and residual risk considered Low.

Refer to **Appendix F** – *Environmental Management Plan*

5.8 Onsite Vehicle Maintenance

All machinery onsite are to be serviced by an authorised service vehicle which is to arrive onsite as required. Each service and maintenance vehicle will to contain a hydrocarbon spill kit to prevent any potential contamination of the site.

All major servicing is to occur offsite with machinery transported offsite.

No hydrocarbons are to be stored onsite at any time, with the refuelling of machines to occur from an authorised service vehicle which is to attend site as required.

Refer to **Appendix F** – *Environmental Management Plan*

5.9 Visual Impact Analysis and Management

Element Advisory has prepared a Visual Impact Analysis to determine the potential of the development proposal to impact on the visual amenity of the locality as viewed from the surrounding road network.

Refer to **Appendix H** – *Visual Impact Assessment*

Photos were taken around the perimeter of the subject site and digitally mapped to illustrate the potential visual impact of the development proposal. Three categories were applied to each photo to provide guidance on the potential for how the extraction area may be viewed from the surrounding road network. These site photos have been graphically presented in the Visual Impact Analysis.

Due to operations proposed to commence within stage 1 and only progress north at a floor of 30m AHD, no operations are to be seen from any photo location. Stage 1 in particular is naturally screened to Cosey Corner Road (see images 26-29).

Progressively over time, various view angles will observe the progressive removal of the critical resource onsite before the stage returns to pasture. Operations will be screened, but the change in topography may be evident over time. For this reason, at locations identified as having a “partially visible” or “visible” category, a 5m wide landscape corridor is proposed to break up the view corridor with native vegetation. The 5m wide landscape corridor is anticipated to be conditioned to be planted at the commencement of operations within stage 1.

Critical to this proposal is its time limited nature and it’s progressive rehabilitation to pasture following extraction. Therefore, as the quarry face progresses north, pasture rehabilitation will progressively establish.

Notably, the undulating nature of the property north of the quarry partially screens any potential views across the landscape due to the existing smaller hills.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

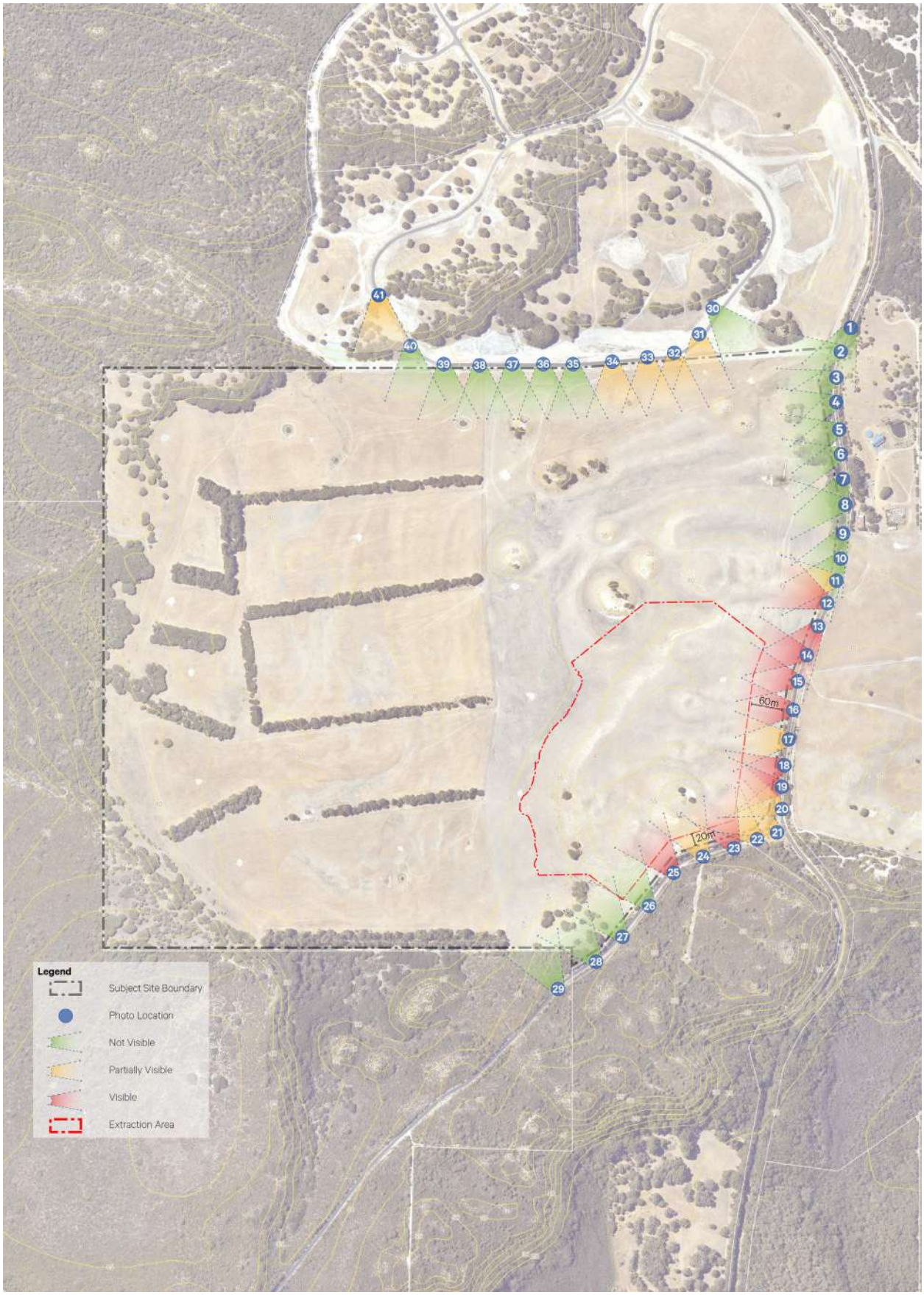


Figure 5. Viewing Diagram

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Figure 6. Vegetation Screening Plan

Through the appropriate planting of screening vegetation within the proposed 5m corridor, the potential visual amenity impacts associated with temporary operations may be screened, and the ecological connectivity of the site enhanced to support the western ring tail possum movements across the site.

Following extraction, the existing topography is to reflect the contours shown on the post extraction plan and returned to pasture for grazing.

Refer to **Appendix H** – *Visual Impact Assessment*

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

6. Orderly and Proper Planning

In addition to the assessment and justification provided in the planning assessment at **Appendix B**, the principles of orderly and proper planning require that new development is consistent with the planning vision and strategic direction for the locality.

The key matters relating to orderly and proper planning are outlined as follows:

- The application seeks approval for an Extractive Industry, a discretionary land use subject to public advertising within the General Agriculture Zone pursuant to Section 4.3 of The Shire's Local Planning Scheme No. 1. A land use, capable of approval;
- The proposed use is a temporary, time limited land use. Once the resources is extracted, operations cease and the land is rehabilitated to pasture.
- The extraction of Lime sand and Limestone will supply the region with a market competitive locally sourced basic raw material for use in the agricultural, civil and land development sectors. This development will service a significant market demand for Basic Raw Materials, particularly in the lower southwest;
- The proposed quarry represents the only limestone quarry within the Shire of Augusta-Margaret River, providing the agriculture and land development industries within the shire a local limestone supply, resulting in reduced haulage costs;
- The proposed development seeks to extract sand to a depth no lower than 30m AHD, ensuring a 2m buffer is maintained to groundwater. The batter slopes for the final post-extraction contours are to be constructed to a slope of 1:4 and may be appropriately rehabilitated to pasture.
- The proposed extraction area maintains a 60m setback to Caves Road in accordance with LPS1 to protect the visual amenity of a key tourist route;
- The proposal will not impact on the amenity of surrounding rural and residential land uses through the progressive staging of operations, and a 5m screening corridor planted with native species to support WRP connectivity onsite;
- The proposal uses a haulage route which has the capacity to accommodate all haulage vehicles and provides efficient regional access to market;
- The proposed development is capable of managing dust within the site without any offsite amenity impacts on the locality;
- The proposed development is appropriately separated from nearest sensitive land uses to ensure potential noise impacts by plant and operations may be managed in accordance with the Noise Regulations 1997; and
- Following extraction, each stage is to be progressively rehabilitated in the manner set out within the Environmental Management Plan to pasture. The rehabilitation process is to be audited and to the Shire's satisfaction to ensure the productive use of the land for agricultural purposes is not jeopardised.

In consideration of the above merits of the proposal, the proposed development is considered to be consistent with the principles of orderly and proper planning and therefore may be conditionally supported by the RJDAP on its planning merit.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

7. Conclusion

This report has been prepared by Element Advisory, on behalf of McDougall Quarries for an Extractive Industry at Lot 22 (No. 9730) Caves Road, Hamelin Bay (the "subject site"). The development proposal seeks approval to extract lime sand and limestone from the subject site within 7 stages before being rehabilitated to pasture for future agricultural use of the subject site. The development proposal will ensure a 5m native vegetation corridor is established along Caves Road and the northern boundary to enhance the environmental connectivity of the site for Western Ring Tail Possums and enhance the visual amenity of the locality.

This report sets out the development approval framework, project area description, proposed development and planning framework applicable to the proposal. The planning assessment demonstrates that the proposed development will remain compliant with the strategic intent for the area following extraction and is consistent with the requirements and standards in the applicable statutory planning framework.

This proposal provides a development proposal which is sequential in nature and which enables the supply Lime sand and Limestone, a critical basic raw material to meet current and projected demand within the Southwest for agricultural, civil and land development purposes.

The proposal is therefore consistent with the principles of orderly and proper planning and can be appropriately managed within a 10-year time limited period, as outlined within this report.

It is respectfully requested that the Shire support and recommend approval of the proposed development to the RJDAP, subject to appropriate conditions reflective of proposed extractive operations.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Appendix A – Certificate of Title

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
2113	**44**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

BGRoberts

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 22 ON PLAN 22155

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

JOE FISH PTY LTD OF 89 ANZAC ROAD MOUNT HAWTHORN WA 6016

(T N652127) REGISTERED 20/6/2017

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required. Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND:	2113-44 (22/P22155)
PREVIOUS TITLE:	2113-42
PROPERTY STREET ADDRESS:	9730 CAVES RD, HAMELIN BAY.
LOCAL GOVERNMENT AUTHORITY:	SHIRE OF AUGUSTA MARGARET RIVER

LANDGATE COPY OF ORIGINAL NOT TO SCALE 09/08/2024 11:45 AM Request number: 66985503

Landgate
www.landgate.wa.gov.au

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Appendix B – Planning Assessment

Shire of Augusta Margaret-River Local Planning Strategy 2022

The Shire's 2022 Local Planning Strategy (Strategy) provides strategic guidance towards the future development and sustainability of the Shire. The Strategy includes various themes, summarised below:

1. Population and Housing
2. Utilities and Assets
3. Environment and Resilience
4. Agriculture and Food Heritage, Character and Design
5. Commerce and Tourism
6. Transportation

Under the 'Commerce and Tourism' strategic theme, the strategy specifically mentions the extraction of Basic Raw Materials (BRM), stating:

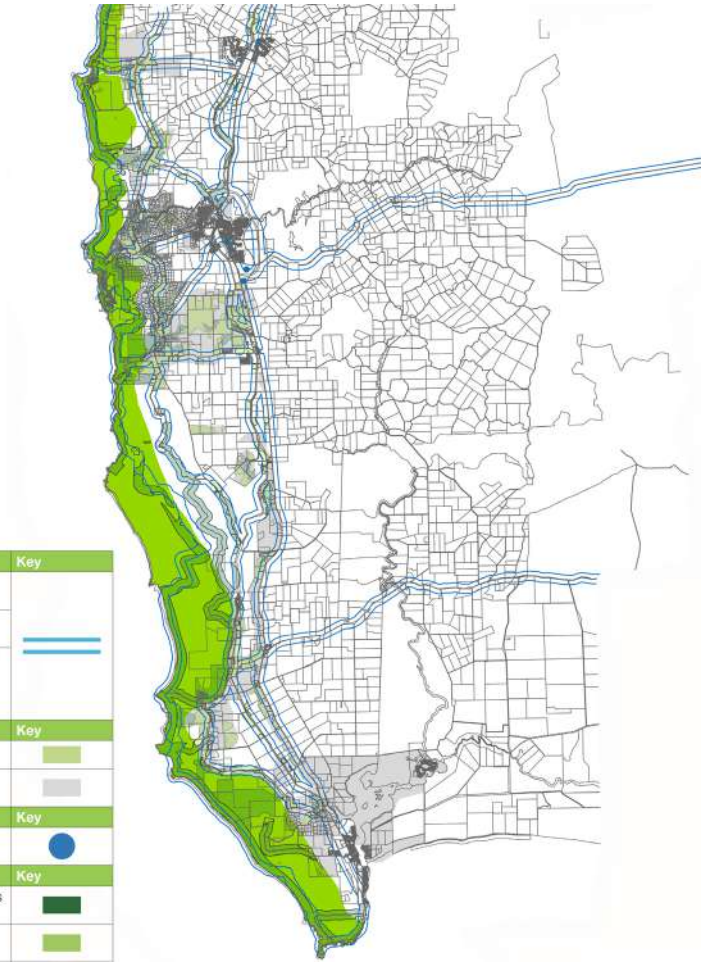
> *"Basic raw materials (BRM) include sand, limestone, gravel, clay, gypsum and other construction and road building materials. The materials are finite and as local supply becomes more constrained their cost will increase thereby putting upward pressure on the cost of housing....*
>
> *...The Shire will work cooperatively with the WAPC to ensure that where extraction opportunities are identified, appropriate controls are put in place to prioritise extraction from areas where there is a low risk of environmental degradation and social or amenity impact."*

In accordance with the intent of the strategy theme of Commerce and Tourism, this development application proposes to extract lime sand and limestone, a regionally significant resource in its size, to be used in urban development and infrastructure projects. The location of the development proposal is designed in such a was as to minimise potential social or amenity impacts on surrounding sensitive land uses and allows for the progressive development of a native vegetation screen to enhance WRP connectivity onsite.

The provision of this resource will assist in satisfying BRM demand and directly influence the current costs experienced in the agricultural and land development sectors due to the required haulage distances to the nearest resource.

The Strategy also seeks to address the visual management of sites located within 600m of Caves Road. The development proposal is located within the 300m corridor of Caves road and is identified by the Strategy at Appendix 2 as having rural landscape significance as outlined within Figure 7 below. The priority of the strategy is to maintain the Rural significance of the landscape.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Corridors	Key
Cape to Cape – Wilderness walk trail which traverses the full length of the Leeuwin Naturaliste National Park	
Wadandi Track – The now disused Busselton to Augusta railway track being progressively developed to facilitate walking and cycling.	
Travel Route Corridor (road) – Key areas which allow people opportunities to access and experience adjoining areas and consist of a 600 metre wide corridor (300m on either side) along the Primary Transport Network. These corridors may or may not include areas where rural or natural significance have been identified.	
Areas	**Key**
Leeuwin Naturaliste Ridge – the western coastal and eastern slopes of the Ridge.	
Landscape Protection – Areas identified as being within Visual Management Area A by the 1991 Rural Strategy.	
Sites	**Key**
Visually Sensitive Site – A site which is or will be subject to pressure for land use change which is visually prominent and which is traversed by a high traffic volume road.	
Landscape Qualities	**Key**
Natural Landscape Significance – Areas in this class include all the natural characteristics which contribute to significant natural landscapes.	
Rural Landscape Significance – Areas in this class include all the natural and cultural characteristics which contribute to significant rural landscapes.	

Figure 7. Local Planning Strategy Visual Management Corridors

The rural significance of the landscape is identified from the intersection of Caves Road to Cosey Corner Road with the majority of this section of caves road lined with native vegetation (refer to Visual Impact Assessment at **Appendix H**)

To promote the ecological connectivity of vegetation along caves road to be consistent, and to screen proposed development operations while temporarily operational, a 5m corridor is identified to enhance the visual character along Caves Road.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Shire of Augusta Margaret-River Local Planning Scheme No. 1

Zoning and Land Use Permissibility

The subject site is zoned "General Agriculture" under the Shire of Augusta-Margaret River Local Planning Scheme No. 1 (LPS.1).

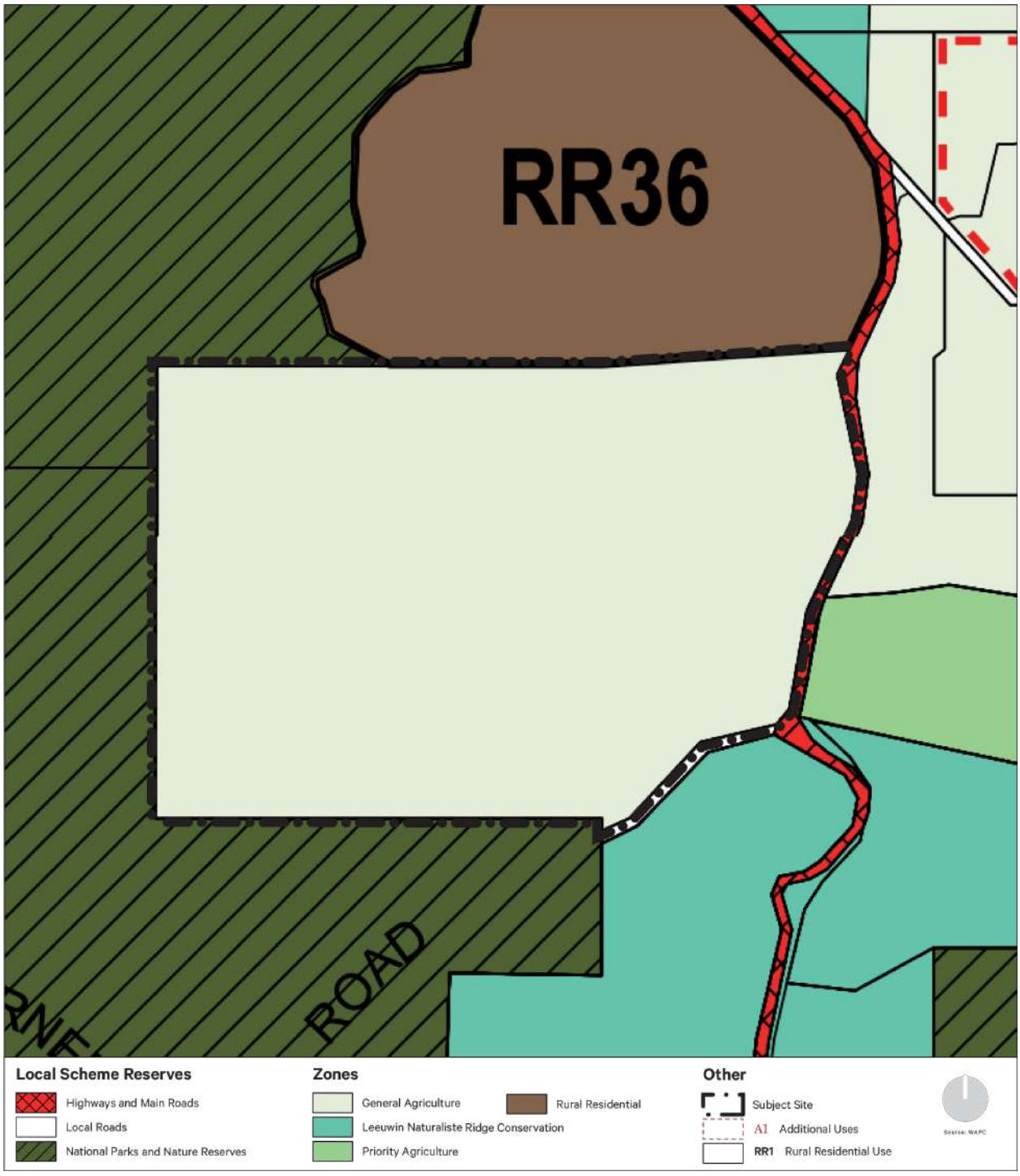


Figure 8. Local Planning Scheme No. 1 Zoning

An 'Industry – Extractive' land use is defined under LPS.1 as:

> *means an industry which involves the extraction, quarrying or removal of sand, gravel, clay, hard rock, stone or similar material from the land and includes the treatment and storage of those materials, or the manufacture of products from those materials on, or adjacent to, the land from which the materials are extracted, but does not include industry - mining;*

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

As the proposed development seeks approval for the extraction of limestone, the 'Industry-Extractive' land use definition is deemed the most appropriate land use. The application does not propose any manufacturing activities onsite.

Within the General Agriculture Zone under LPS1, Industry-Extractive is considered an 'A' use. Clause 4.3.2 of LPS1 defines the following interpretation of 'A' uses:

> *"means that the use is not permitted unless the local government has exercised its discretion by granting development approval after giving special notice in accordance with clause 64 of the Deemed Provisions"*

Therefore, the proposed development is capable of approval by the Shire, subject to a period of public advertising.

Setbacks

Schedule 9 of LPS1 stipulates setback requirements for development in each zone. For the General Agriculture Zone, development is normally required to be setback a minimum of 30m from the primary street setback. When the development abuts Highways, Main Roads or Travel Route Corridors, a greater minimum setback of 60m is required.

The proposed development proposes a minimum setback of 60m to the primary lot boundary on Caves Road, 20m to Cosy Corner Road, 733m to the western lot boundary and 415m to the northern lot boundary This is compliant with Schedule 9 of LPS1 and allows for greater protection of visual amenity.

In addition to meeting the minimum setback for development adjacent to Caves Road, the proposed development will be screened from abutting roads through the planting of screening vegetation to assist in enhancing the existing character of caves road.

Draft Shire of Augusta Margaret-River Local Planning Scheme No. 2

Zoning and Land Use Permissibility

The Shire is currently in the process of reviewing and preparing a new local planning scheme (LPS2). As the scheme was advertised in early 2024, it is considered seriously entertained.

Under the draft LPS2, the subject site is to be zoned 'Rural'.

Under the 'Rural' zone, the 'Industry-Extractive' land use is still considered an 'A' use. This has the same meaning as the land use classification in LPS1.

Therefore, it is considered that the proposed development will be capable of approval considering the future land use permissibility provisions relevant to the subject site and the proposed development is consistent with the future planning of the Shire.

Landscape Protection

Clause 55 of the draft LPS2 details the scheme requirements for the protection of landscape quality and visual amenity within the Shire. Clause 55 lists several criteria to be addressed when proposing development in areas of natural landscape significance. The table below summarises the criteria under Clause 55 of the draft LPS2 and provides responses to each criteria.

Table 3. Clause 55 Landscape Protection Criteria Assessment

Clause 55 Landscape Protection Criteria	Applicant Response
(1) Development in areas with landscape qualities of 'natural landscape significance', as identified by the Local Planning Strategy, shall maintain the existing natural aesthetic. The local government may require landscaping utilising plant species endemic to the area to screen development from viewing locations, including visual management 'corridors' identified by the Local Planning Strategy. Public recreation or safety facilities may be allowed to be seen in the foreground if necessary.	Extensive planting within a 5m corridor is proposed along Caves Road to assist in the screening of the extractive industry development as viewed by the road and to provide ecological connectivity across the site for WRP's.
(2) The removal of vegetation which contributes to the landscape qualities of natural significance is prohibited.	Removal of significant vegetation located in significant view corridors is not proposed
(3) Where development may impact upon areas having landscape qualities of 'rural landscape significance', as identified by the Local Planning Strategy, development is to be sufficiently setback from boundaries to maintain existing open landscape and views from Visual Management 'Corridors'.	The proposed extractive industry boundary is setback 60m from Caves Road in accordance with LPS1 to protect visual amenity. The proposed land use is temporary in nature and following extraction will be rehabilitated to pasture.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Clause 55 Landscape Protection Criteria	Applicant Response
(4) Development subject to visual management controls identified in the Local Planning Strategy must not use colours with a solar absorbtance rating less than or equal to 0.4. The use of colours with a solar absorbtance rating less than or equal to 0.4 may be considered for roofs where it can be demonstrated that this will have a negligible visual impact off site.	The development does not propose any permeant structures but is temporary in nature. Following rehabilitation to pasture, no disturbance of the landscape is to be visible.
(5) Within Visual Management 'Areas' as defined by the Local Planning Strategy, the local government will require that development be located on lower contours, avoid 'skylining'. Vegetated backdrops may be required to be planted where they will lessen visual impact.	The proposed development is to be temporary in nature and will progressively extract sand from stage 1 to 6. Over time, the hill within the south eastern corner will progressively change, until the end landform reflects the contours shown on the Post Extraction plan.
(6) Development upon 'Visually Sensitive Sites' as identified by the Local Planning Strategy must be designed to minimise visual impacts by employing mitigating controls such as: • Screen landscaping; • Setbacks; • Appropriate scale; • Low intensity of land uses.	The subject site is not considered a visually sensitive site as per the Local Planning Strategy
(7) The Shire may, at its discretion request a Visual Impact Assessment prepared by a suitably qualified person in accordance with the 'Visual Landscape Planning in Western Australia' manual to demonstrate to the satisfaction of the local government that a proposal will not lead to an adverse visual impact.	The proposed development is supported by a visual impact assessment. *Refer to Appendix H – Visual Impact Assessment*

Shire of Augusta Margaret-River Local Planning Policy 3 – Extractive Industries

The Shire's Local Planning Policy No.3 – Extractive Industries (LPP3) was adopted by the Council in January of 2023 and guides the appropriate location, management and function of extractive industry proposals in the Shire.

Section 8 of LPP3 provides detailed policy measures under the elements of amenity, environment, buffers, visual impact, transport and compliance. Section 8 of LPP 3 provides a list of Acceptable Development (AD) provisions for each element to be satisfied by the proposal. If the AD provisions cannot be satisfied, the proposal must demonstrate consistency with the corresponding Performance Criteria (PC) of the associated element. The table below conducts an assessment against the AD and PC provisions for each element, where relevant.

Table 4. LPP 3 Acceptable Development and Performance Criteria Assessment

LPP 3 Acceptable Development / Performance Criteria Provisions	Applicant Comments	Compliant
Element: Amenity		
AD 1.1.1 Development is located away from sensitive landuses unless appropriate measures can be taken to ameliorate adverse impacts.	The proposed extraction area is located a minimum of 300m from sensitive land uses in accordance with the EPA industrial use buffer guidelines. The nearest sensitive landuse is located 400m from the extraction boundary.	✓
AD 1.1.2 Hours of operation are limited to 7am to 5pm Monday to Friday and 8am to 1pm on Saturdays. No operations on Sundays and recognised public holidays.	Proposed hours of operation are in accordance with AD 1.1.2.	✓

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

LPP 3 Acceptable Development / Performance Criteria Provisions	Applicant Comments	Compliant
AD 1.1.3 Extraction of material occurs from only one site per property at any one time	The proposed extraction will be undertaken sequentially in 7 stages. Only one (1) stage will have extraction occurring at any time. Rehabilitation of each stage will begin immediately after commencing extraction on the following stage.	✓
AD 1.1.4 Sites are filled with clean material only.	Post extraction, the extraction area is to be completely rehabilitated to pasture to the satisfaction of the Shire.	✓
Element: Environment		
AD 1.2.1 Development does not prejudicially effect native flora and fauna; groundwater quality, quantity and use; surface drainage and surface water quality including discharge of sediment and sites of cultural and/or historic significance on the land. Where relevant an extractive industry is to incorporate a wetland buffer and be setback a minimum of 100m from all wetlands.	The proposed Extractive Industry will not result in any adverse impact on environmental aspects of the site. This Development Application is accompanied by a detailed Environmental Management Plan (EMP) which addresses all relevant environmental considerations and includes an audit of the existing environmental values. The EMP details how the proposed extractive industry will appropriately protect the natural environment, rehabilitate the site and manage onsite drainage. *Refer to Appendix F - EMP*	✓
AD 1.2.2 Acid Sulphate Soil Risks Assessment required in areas with soil with a risk of Acid Sulphate Soils as determined in the DWER's Guideline – Identification and investigation of acid sulfate soils and acidic landscapes.	No risk of Acid Sulphate Soils are mapped on the subject site.	✓
AD 1.2.3 Dieback is managed in accordance with Best Practice Guidelines – Management of Phytophthora Dieback in Extractive Industries (Dieback Working Group Inc 2021).	*Due to the limited indicator species onsite, the presence of dieback is undetermined* *Refer to Appendix F - EMP*	✓
AD 1.2.4 The site is able to be rehabilitated in a way that is compatible with the long term planning for the site and surrounding area. Rehabilitation is to be undertaken on an ongoing basis for completed cells. Where clearing of native vegetation has occurred, revegetation shall be undertaken in such a way to recreate and restore the native vegetation of the site and enhance environmental linkages within and beyond the site.	Rehabilitation is to be conducted sequentially, following the completion of each stage of extraction. Rehabilitation of the previous stage is to begin and operate concurrently with the extraction of the subsequent stage. Less than 0.1 ha of native vegetation is proposed to be cleared, and a large 5m corridor is proposed to enhance the ecological connectivity onsite for WRP. *Refer to Appendix F - EMP*	✓
AD 1.2.5 A revegetation plan prepared by a suitably qualified environmental specialist in revegetation techniques and experience specific to Western Australian conditions shall be prepared in accordance with DWER's publication 'A Guide to Preparing Revegetation Plans for Clearing Permits (2018).	The EMP prepared by Accendo includes a revegetation plan. *Refer to Appendix F - EMP*	✓
Element: Buffers		
AD 1.3.1 Quarry of hard rock (including blasting), crushing and screening - requires a buffer distance of 1000m; or	N/A	
AD 1.3.2 Quarry (not hard rock). Processing rock ore etc. by blasting, grinding and milling works – material processed by grinding, milling or separated by sieving, aeration etc. - requires a buffer distance of 1000m; or	N/A	
AD 1.3.3 Quarry (no blasting) - material processed by grinding, milling or separated by sieving, aeration etc. - requires a buffer distance of 500m; or	N/A	

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

LPP 3 Acceptable Development / Performance Criteria Provisions	Applicant Comments	Compliant
AD 1.3.4 Gravel extraction processed by grinding, milling or separated by sieving, aeration etc. – requires a buffer distance of 500m; or	N/A	
AD 1.3.5 Sand and limestone extraction no grinding or milling works - requires a buffer distance of 500m.	The proposed extraction area is separated by 400m to the nearest residence east of Caves Road. Proposed operations can commence within Stage 1 which is greater than 500m from the nearest sensitive receptor. Within the first stage of extraction, operations will cut to 30m AHD, which is a lower elevation than the nearby Hamelin Ridge residential development (40-60m AHD) and the rural residence to the east (35-40m AHD). As extraction stages progress north towards each sensitive receptor, the natural barrier caused by the pit face increases. Due to the nature of operations and the distances to the nearest sensitive receptors, all Noise and Dust emissions may be appropriately managed. *Refer to Appendix F – EMP*	✓
Element: Visual Impact		
AD 1.4.1 Development is to be visually inevident in the landscape when viewed from major tourist routes.	Extraction activities are to be appropriately setback by over 60m to Caves Road as per the requirements of LPS1. Additionally, all operations are to be visually screened by the extraction face, preventing any view of activities from Caves Road. To assist with the visual amenity along caves road, vegetation is proposed to screen the subject site and protect the natural amenity of Caves road.	✓
AD1.4.2 Outside of major tourist routes, development is to comply with the visual management guidelines of the Council's Local Planning Strategy and State Planning Policy 6.1 – Leeuwin Naturaliste Ridge (if applicable).	Refer to assessment of the Shire's Local Planning Strategy and SPP 6.1 in this report.	✓
AD1.4.3 A vegetative screen of an appropriate width depending on the size and life of the extractive industry shall be provided to assist with visual impacts and help mitigate dust impacts. Vegetation should be of substantive size to provide an appropriate screen during the operation of the industry.	A 5m native vegetation screen is proposed along Caves Road and the northern boundary. It is anticipated that a landscape plan be prepared as a condition of development approval, specifying proposed vegetation species.	✓
AD1.4.4 Noise mitigation bunds or stockpiles are not to be of size or height so as to cause unacceptable visual impact when viewed from neighbouring properties or public roads.	As previously stated, following the extraction of Stage 1, all operations are to be at 30m AHD and due to the cut at the base of the extraction face, all operations are screened from Caves Road.	✓
Element: Transport		
AD1.5.1 Development is located in proximity to heavy haulage routes.	The subject site immediately fronts Caves Road a RAV 4 network.	✓
AD1.5.2 Development which does not utilise school bus routes for haulage purposes.	The portion of Caves Road which interfaces with the subject site is not included on a School Bus Route. No disruption of School Bus Routes is anticipated as a result of this proposal.	✓

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

LPP 3 Acceptable Development / Performance Criteria Provisions	Applicant Comments	Compliant
AD1.5.3 Development where a road maintenance agreement has been entered into with the Shire prior to operation, or where financial contributions have been made to ensure the upgrading of roads where necessary to improve the standard of access.	N/A. As the site does not travel along a road which is managed by the Shire, no road deterioration cost contributions are applicable.	✓
Element: Compliance		
AD1.6.1 Where approval for extraction is granted, the maximum term shall be a period of not more than 5 years.	The proposed development is seeking an approval timeframe of 10 years due to the volume of material. It is anticipated that the Shire may impose a condition requiring an annual audit to be submitted, demonstrating the progress of operations and compliance with development conditions, including the success of rehabilitation onsite.	✓

Statement of Planning Policy 6.1- Leeuwin-Naturaliste Ridge Policy

The subject site is located within the area affected by SPP 6.1 Leeuwin Naturaliste Ridge. Under SPP 6.1, the part of the subject site on which the development is located is in the Travel Corridor Rural Landscape Significance Class and the Plateau Landscape Character Unit.

Please refer to Figure 9 on page 31 and Figure 10 on page 32

The vision for the Leeuwin Naturaliste Ridge SPP area is:

> *Creative, vital and sustainable communities living in balance with economic development and the unique landscape and environmental values of the Leeuwin-Naturaliste Ridge policy area.*

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

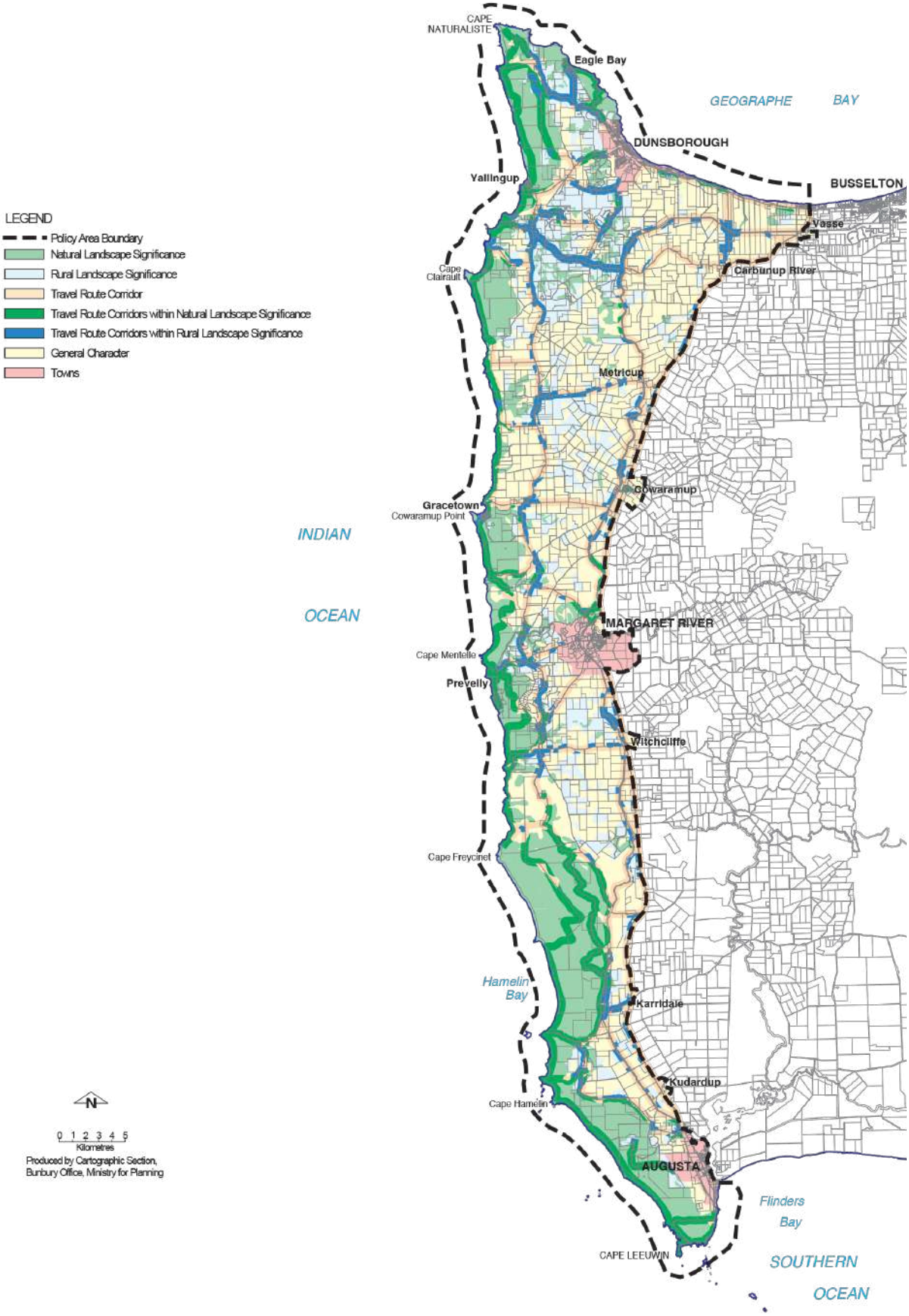


Figure 9. Landscape Class

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

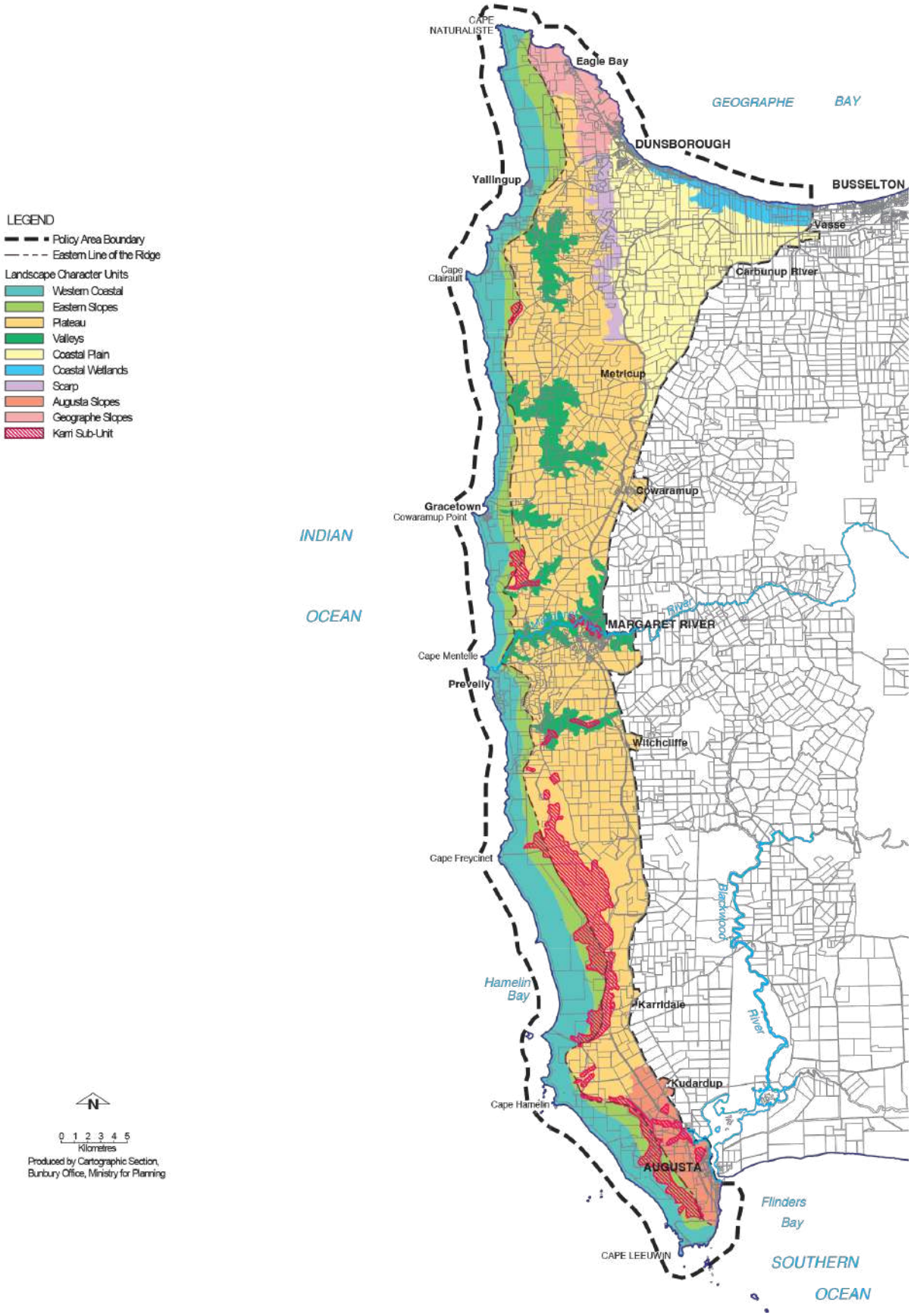


Figure 10. Landscape Character Unit

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

The general policy objectives for SPP 6.1 are listed below:

1. *Conserve and enhance the special benefits arising from landscape elements that form the fabric of the region.*
2. *Respect and conserve its outstanding natural and cultural heritage and environmental values.*
3. *Cater for population growth consistent with the objectives of the LNRSPP and provide a range of settlement options located to enhance the economic, social and environmental functions, while promoting quality and innovation in urban design and built form*
4. *Protect agricultural land for its economic, landscape, tourism and social values.*
5. *Encourage a mix of compatible land uses while separating conflicting land uses.*
6. *Facilitate a robust, diverse and sustainable economy*
7. *Foster a sense of community and creativity; for the benefit of all residents and visitors and for future generations.*

The proposed extractive industry development is consistent with the SPP 6.1 policy objectives for the following reasons:

- Post-extraction, the subject site will be appropriately rehabilitated to pasture, with additional screening vegetation planted;
- Capitalising on the presence of natural basic raw materials allows for the diversification of the economy and use of an essential reginal resource for urban development in a manner which cannot be visually seen from Caves Road; and
- The development will seek to ensure a nature positive outcome onsite, with an enhanced landscaped interface along Caves Road.

In addition to the above general policy objectives, SPP 6.1 also identifies the subject site and extraction area as being the Travel Corridor Rural Landscape Significance Class, with the relevant policy outlined below:

PS 3.6 In areas of Rural Landscape Significance, as identified in Figure 3, development or change of use should protect the rural character of the land.

The proposed extractive industry development gives regard to the above SPP 6.1 policy action through the following:

- The use of the land for agricultural purposes will be protected and sequentially developed following extraction through rehabilitation to pasture. Current agricultural use onsite will remain unchanged during operations.
- The development proposal only seeks to operate within 11% of the subject site, the balance of which will remain grazing land and unchanged.
- The development proposal seeks to enhance the landscape amenity of the locality through planting a native vegetation corridor along caves road to be established and enhance the WRP connectivity onsite.
- The predominant land use and economic contribution of the subject site in perpetuity remains agriculture and viticulture, as proposed extractive industry is a time limited use which will cease following the extraction of material.

Given the above, the proposed extractive industry development will maintain consistency with the strategic intent of SPP 6.1.

State Planning Policy 2.4 - Basic Raw Materials Resource Policy (2021)

State Planning Policy 2.4 – Basic Raw Materials seeks to enable the responsible extraction of Basic Raw Materials (BRM) while ensuring the protection of people and the environment. The application of this Policy provides the foundation for land use planning to address the sustainable management of BRM in Western Australia.

The policy objectives and applicable response are provided within **Table 5** below.

Table 5. SPP2.4 Objectives Assessment

SPP2.4 Policy Objective	Proposed Development
Ensure BRM and its regional importance is considered at the earliest stages of the planning process;	The proposal allows for the extraction of basic raw materials from a currently vacant site. Rehabilitation will maintain the potential for future development on the site.
Ensure BRM resources are used efficiently in land use planning and development;	The extraction area includes a deposit of lime sand and limestone, a regionally significant basic raw material. This resource is widely used as an essential component in urban development and civil infrastructure projects.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

SPP2.4 Policy Objective	Proposed Development
Identify BRM extraction opportunities through sequential land use without compromising the final intended land use; and	The proposed development site is to be completely rehabilitated to pasture to restore existing natural aesthetics and allow future development in accordance with the General Agricultural Zoning.
Ensure the extraction of BRM avoids, minimises or mitigates any adverse impacts on the community, water resources and biodiversity values.	The proposed extractive industry has demonstrated significant consideration of the subject sites environmental characteristics as shown in the attached EMP. The proposal includes significant consideration of community values, ensuring no water resources are affected and visual amenity is preserved.

In addition to the above policy objectives, SPP2.4 also includes associated guidelines (SPP 2.4 Guidelines). Section 4 of the SPP 2.4 Guidelines includes more specific assessment criteria for extractive industry developments. The following table includes an assessment of the proposal against this criteria:

Table 6. SPP2.4 Guidelines Assessment

SPP 2.4 Guidelines Extractive Industries Criteria	Analysis of this Extractive Industry Application
(a) the avoidance or mitigation of conflicts and detrimental effects on existing and future sensitive land uses and agricultural land in the surrounding areas (that is, noise, dust, vibration, blasting and vehicular traffic);	The proposed extractive industry is to be appropriately separated from surrounding sensitive land uses. A minimum separation distance of 400m is proposed. Operations can appropriately manage all potential impacts associated with dust and noise to prevent any offsite impacts.
(b) having an effective consultation process with appropriate stakeholder engagement, including advertising as required;	The development application is to be made available for public comment as part of the development application process with due regard given to any submissions made.
(c) prioritisation of proposals within SGS areas aligned with DMIRS geoVIEW.WA mapping in Perth and Peel;	Not applicable to this application.
(d) if the resources is identified as a SGS area and/or local basic raw material demand;	The subject site is not identified as within an SGS area.
(e) the quantity and quality of resource and scale and duration of extraction;	The proposal seeks approval to extract 1,314,489m3 of limestone and lime sand. This is a significant resource for surrounding development projects.
(f) management of finished ground levels for BRM extraction and site rehabilitation to: - Maintain appropriate horizontal separation between extraction, water supply infrastructure and any other engineering requirements; - Avoid the exposure of groundwater and maintain the required vertical separation distances to groundwater for sequential land use; - Protect ground water and surface water quality.	The proposed extractive industry will be consistent with SPP 2.4 Guidelines Part 4(f). A separation distance to groundwater of 2m from the maximum groundwater level is proposed and is considered sufficient to protect against any potential interception of groundwater. The proposed extraction depth of 30mAHD has been deemed appropriate following groundwater monitoring onsite.
(g) the site's potential for sequential land use and the ability to rehabilitate the land in a manner compatible with its long-term use identified by the Local Planning Scheme;	The subject site is to be adequately rehabilitated in accordance with the approved EMP. Rehabilitation will restore the subject site to pasture and reinstate cleared native vegetation.
(h) the ability to stage the extraction operations to avoid conflicts with any adjacent land uses;	Staging is proposed in a manner which does not impact surrounding sensitive land uses. Staging is planned to ensure the majority of works are screened by the active pit face.
(i) the effect of the proposed extractive industry on any adjacent agricultural land;	The proposed extractive industry will not impact adjacent agricultural land. The subject site is largely surrounded by conservation areas and interfaces to agricultural land are separated by roads.
(j) the availability and suitability of road access;	The subject site has direct access to Caves Road, a RAV 4 network.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

SPP 2.4 Guidelines Extractive Industries Criteria	Analysis of this Extractive Industry Application
(k) the effect of the proposed extractive industry on any native flora and fauna and general landscape values;	The proposed extraction area is within an area already largely cleared of vegetation. The natural vegetation that is cleared will be appropriately rehabilitated within the 5m vegetation corridor where required.
(l) how all water resources will be protected during BRM extraction including a separation distance to the defined groundwater level plus other management measures to protect water resources during BRM extraction;	No water resources are anticipated to be impacted by this proposal. An effective minimum groundwater vertical separation of 2m is proposed. There are no wetlands or major watercourses nearby the extraction site which require protection.
m) potential impacts on fragmentation and connectivity of remnant vegetation;	No fragmentation is anticipated as part of this application. Native vegetation patches are currently disconnected onsite and highly degraded. Native vegetation is to be rehabilitated where required and enable ecological connectivity.
n) any requirements for an environmental offset;	Not required.
o) sites of cultural and historic significance on and near the land, having regard to how they are likely to be integrated with subsequent land uses; and	Not applicable to this application.
p) location and stability of excavations, stockpiles and overburden dumps.	Refer to the development plans. No overburden is required to be removed by this development.

Concerning the above, the proposal is deemed to demonstrate compliance with the provisions of SPP 2.4 and the associated SPP 2.4 Guidelines.

Planning and Development (Local Planning Schemes) Regulations 2015

Clause 67(2) of Schedule 2 of the *Planning and Development (Local Planning Schemes) Regulations 2015* (the Deemed Provisions), specifies matters which are to be given due regard when determining applications for approval.

An assessment of the proposal against the relevant matters outlined in Clause 67(2) of the Deemed Provisions has been undertaken. A summary of the assessment is provided below in Table 7.

Table 7. Clause 67(2) of the Planning and Development (Local Planning Schemes) Regulations 2015 Assessment

Provision		Applicant Response	
a.	*the aims and provisions of this Scheme and any other local planning scheme operating within the Scheme area*	Refer to the planning justification provided under the Local Planning Scheme No. 1	✓
b.	*the requirements of orderly and proper planning including any proposed local planning scheme or amendment to this Scheme that has been advertised under the Planning and Development (Local Planning Schemes) Regulations 2015 or any other proposed planning instrument that the local government is seriously considering adopting or approving*	Refer to the planning justification provided under the Draft Local Planning Scheme No. 2	✓
c.	*any approved State planning policy*	Refer to the assessment listed under State Planning Policy 2.4, 3.7 6.1.	✓
d.	*any environmental protection policy approved under the Environmental Protection Act 1986 section 31(d)*	N/A	
e.	*any policy of the Commission*	N/A	
f.	*any policy of the State*	N/A	
g.	*any local planning strategy for this Scheme endorsed by the Commission*	Refer to the Local Planning Strategy Assessment above.	✓
h.	*any local planning policy for the Scheme area*	Refer to the above assessment of Local Planning Policy 3.	✓

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Provision	Applicant Response	
i. *any structure plan or local development plan that relates to the development*	N/A – No Local Structure Plans or Local Development Plans are applicable to the subject site.	✓
j. *any report of the review of the local planning scheme that has been published under the Planning and Development (Local Planning Schemes) Regulations 2015*	N/A	✓
k. *in the case of land reserved under this Scheme, the objectives of the reserve and the additional and permitted uses identified in this Scheme for the reserve*	N/A	✓
l. *the built heritage conservation of any place that is of cultural significance*	N/A	✓
m. *the effect of the proposal on the cultural heritage significance of the area in which the development is located*	Refer to review of indigenous and non-indigenous heritage above. The subject site is not impacted by any recognised sites of indigenous heritage.	✓
n. *the compatibility of the development with its setting, including –* i. *the compatibility of the development with the desired future character of its setting; and* ii. *the relationship of the development to development on adjoining land or on other land in the locality, but not limited to, the likely effect of the height, bulk, scale orientation and appearance of the development.*	The proposed development site is currently surrounded by largely vacant, rural land. The land to the north of the subject site is the planned Hamelin Ridge Estate, providing limited rural-residential lots. The land on the east side of Caves Road contains two Rural dwellings. Mitigation measures have been taken to ensure noise, visual amenity, dust and traffic impacts are minimised on these surrounding properties. Visual amenity is strictly managed through planting to screen the development from Caves Road. Staging of the extraction has also been planned purposefully to allow the pit face to ensure operations are not seen from Caves Road or Hamelin Ridge Estate. No buildings are proposed and therefore building bulk is not a consideration.	✓
o. *the amenity of the locality including the following –* i. *environmental impacts of the development* ii. *the character of the locality* iii. *social impacts of the development*	Refer to the Environmental Management Plan for responses to these identified considerations. The proposed operations are screened from surrounding development and will not impact upon the character or amenity of the locality. No social impacts are anticipated by the development due to the appropriate management of Dust and noise onsite. Following extraction, the site is to return to agricultural grazing.	✓
p. *the likely effect of the development on the natural environment or water resources and any means that are proposed to protect or mitigate impacts on the natural environment or the water resource*	The proposed development will maintain a separation to groundwater of 2m. The development site is appropriately distanced from any surrounding natural water resources.	✓
q. *whether adequate provision has been made for the landscaping of the land to which the application relates and whether any trees or other vegetation on the land should be preserved*	The proposed development requires minimal clearing of native vegetation, with appropriate approvals to be sought where required. The development proposal includes a 5m planting corridor to enhance ecological connectivity.	✓
r. *the suitability of the land for the development taking into account the possible risk of flooding, tidal inundation, subsidence, landslip, bush fire, soil erosion, land degradation or any other risk*	The site is suitable for limestone extraction. No soil erosion or land degradation is proposed by this development. No flooding or bush fire risk is anticipated in the proposal.	✓

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Provision	Applicant Response	
s. *the suitability of the land for the development taking into account the possible risk to human health or safety*	Refer to the EMP.	✓
t. *the adequacy of –* i. *the proposed means of access and egress from the site; and* ii. *arrangements for the loading, unloading, manoeuvring and parking of vehicles*	The site access and haulage routes for vehicles associated with the proposal is deemed appropriate. Refer to the Transport Impact Statement.	✓
u. *the amount of traffic likely to be generated by the development, particularly in relation to the capacity of the road system in the locality and the probable effect on traffic flow and safety*	Refer to the Transport Impact Statement. A maximum of 15 trucks are to enter and exit the site per day during peak haulage periods.	✓
v. *the availability and adequacy for the development of the following –* i. *public transport services* ii. *public utility services* iii. *storage, management and collection of waste* iv. *access for pedestrians and cyclists (including end of trip storage, toilet and shower facilities)* v. *access by older people and people with disability*	N/A	
w. *the potential loss of any community service or benefit resulting from the development other than potential loss that may result from economic competition between new and existing businesses*	Significant community benefit will be provided through this development by ensuring the Shire of Augusta Margaret River has a locally sourced lime sand and limestone quarry to substantially reduce haulage costs.	
x. *the history of the site where the development is to be located*	N/A	
y. *the impact of the development on the community as a whole notwithstanding the impact of the development on particular individuals*	The development will positively impact the community, by providing limestone for future construction purposes within the local area. The subject site will also allow for further local employment within the region.	✓
z. *any submissions received on the application*	Submissions received on the application are to be considered and addressed through the assessment process.	✓
aa. *the comments or submissions received from any authority consulted under clause 66*	Submissions received on the application are to be considered and addressed through the assessment process.	✓
ab. *any other planning consideration the local government considers appropriate*	N/A	✓

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

State Planning Policy 3.7 – Planning in Bushfire Prone Areas

The subject site is designated to be bushfire prone as outlined within Figure 11

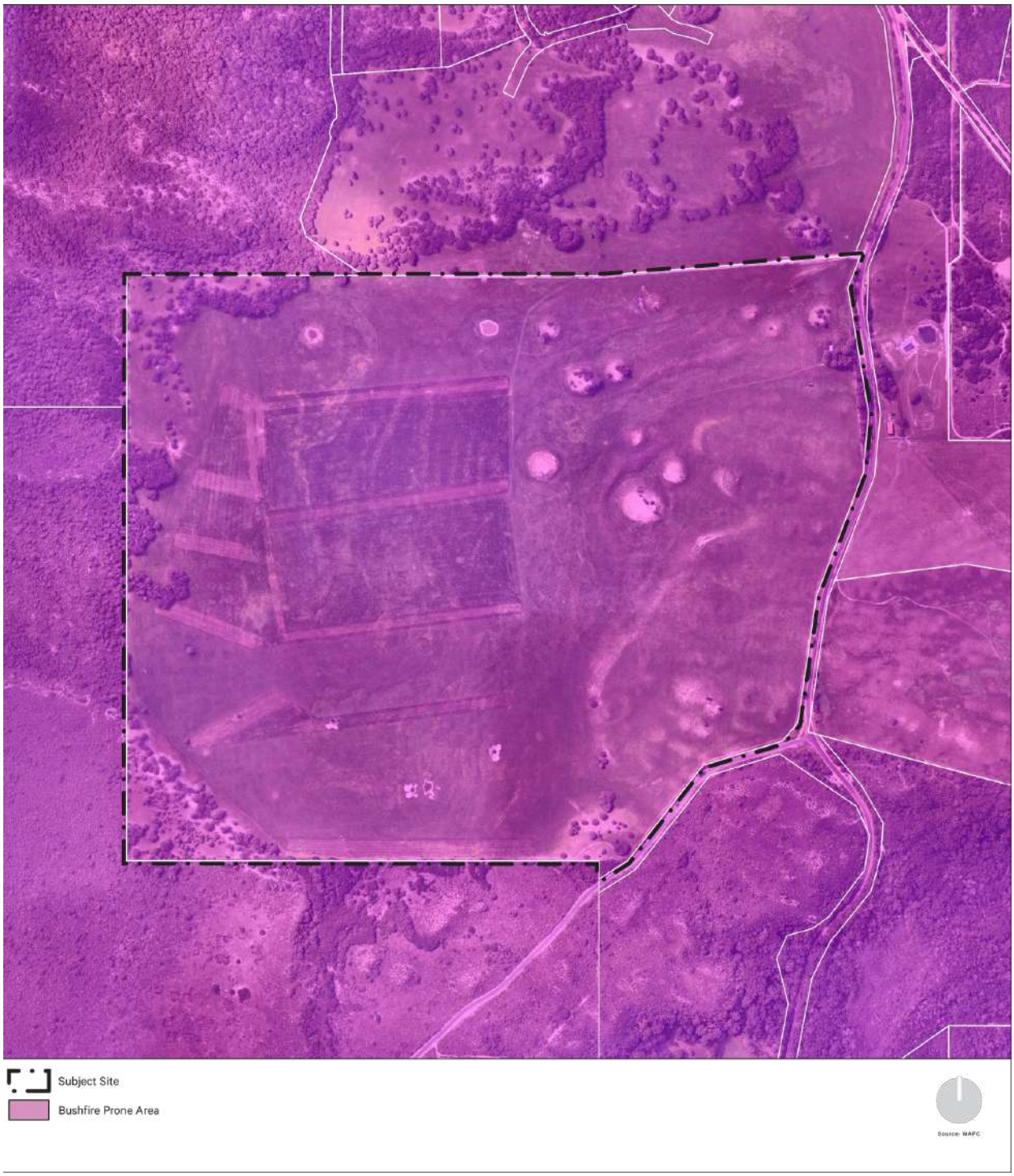


Figure 11. Bushfire Prone Mapping

The provisions of SPP 3.7 and associated guidelines for Planning in Bushfire Prone Areas (V1.4) apply to the proposed development.

Section 2.6 – Discretionary Decision-Making states the following applicable to this application:

> *Decision-makers can apply exemptions from the requirements of SPP 3.7 and these Guidelines where there is no intensification of land-use, and/or the proposal is not increasing the bushfire threat. Intensification of land use and/or development may include planning proposals that:*

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

a. *result in an increase of visitors, residents or employees; or*

b. *involve the occupation of employees on site for more than three hours at a time for multiple periods during a week.*

An Extractive Industry is listed as a land use which may be considered exempt from compliance with the guidelines where no habitable buildings are proposed and where the proposal does no propose an intensification of land use. Since the proposal does not contain any habitable buildings, and employees onsite are to be onsite for periods of haulage and loading only, the application is considered exempt from requiring a bushfire assessment at this stage.

EPA Separation Distances between Industrial and Sensitive Land Uses (GS3)

The Environmental Protection Authority (EPA) has prepared a guiding document for assessment of environmental factors associated with the separation distances between sensitive land uses and Industrial land uses.

The proposed extractive industry is of a nature which reflects the 'Extractive Industry - Sand and Limestone' industry listed within Appendix 1. The relevant separation distance is recommended to be 300-500m to sensitive land uses, depending on the size and nature of operations, with key impacts associated with operations being noise and dust.

The proposed development is located 400m from the nearest sensitive land use (closest point at stage 6),and 496m from the nearest building envelope within the Hamelin Ridge Estate. Staging of operations from south to north will ensure extraction will predominantly be located behind a large face, and ensure operations are appropriately screened to prevent any potential impacts such as dust or noise.

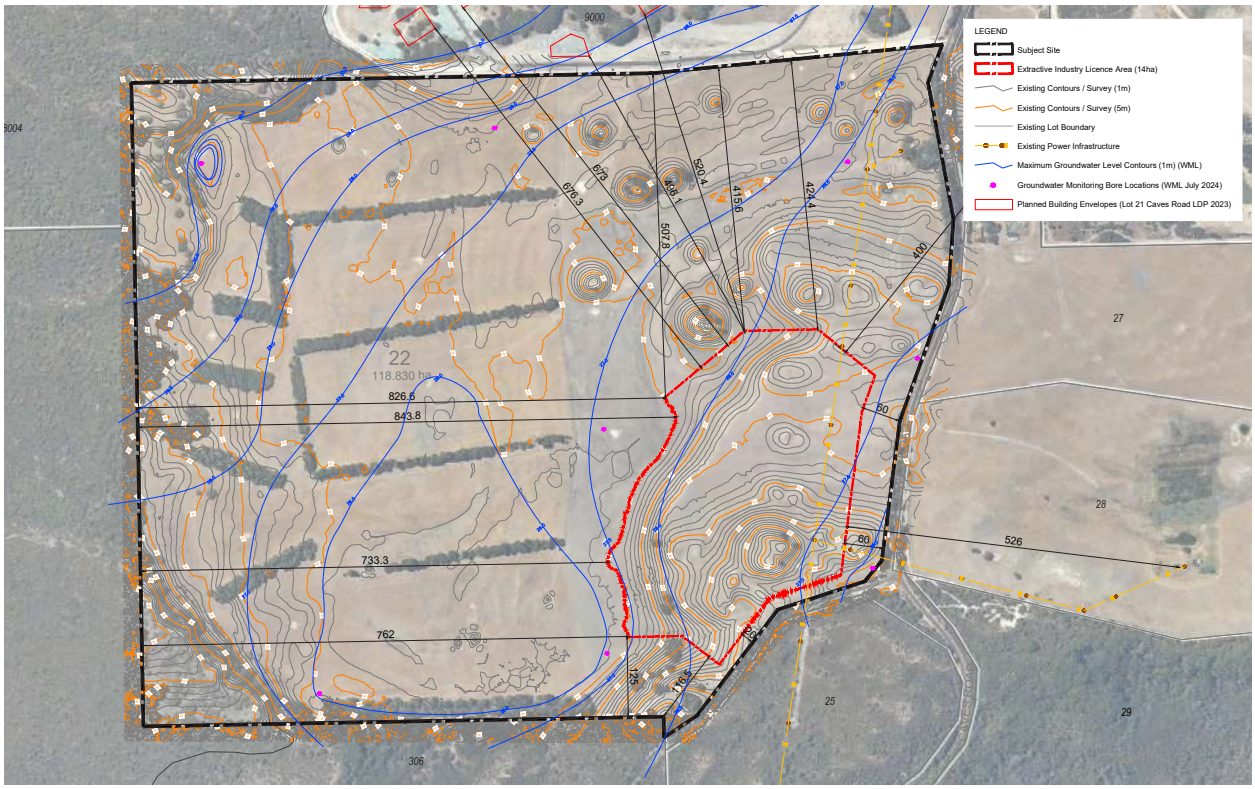


Figure 12. Separation Distances To Nearest Sensitive Land Uses

The development proposal is supported by an acoustic report and environmental management plans that demonstrate the proposal can achieve compliance with the relevant standards and therefore the proposed development will not detrimentally impact the nearby land uses.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Appendix C – Development Plans

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Context Plan

Lot 22 (9730) Caves Road, Hamelin Bay

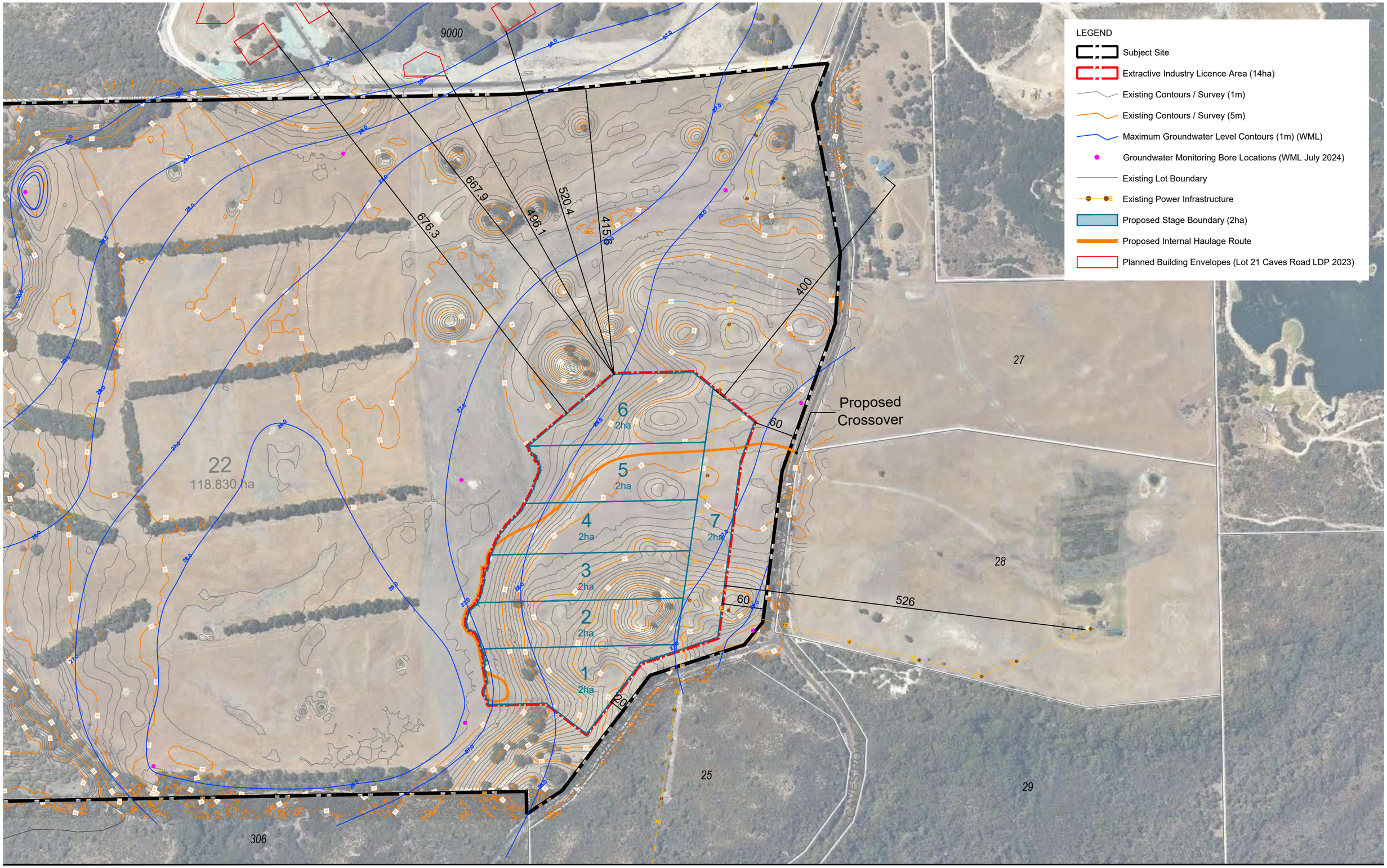
Date: 28 Aug 2024 Scale: NTS @ A3 File: **24-132 CP-1 A** Staff: DL CCG JJ Checked: DL

element.

Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
PO Box 7375 Cloisters Square, Perth Western Australia 6850.
T. +61 8 9289 8300 | **E.** hello@elementwa.com.au **elementwa.com.au**

© Element Advisory WA Pty Ltd. This concept has been prepared for the purposes of meeting client specifications. The drawing does not constitute an invitation, agreement or contract (or part thereof) of any kind whatsoever. Although care has been taken in the compilation of this drawing by Element Advisory WA Pty Ltd, all parties associated with the proposed development disclaim all responsibility for any errors or omissions. The right is reserved to change the plan at any time. Liability is expressly disclaimed by Element Advisory WA Pty Ltd for any loss or damage which may be sustained by any person acting on any visual impression gained from this drawing.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Excavation Works Plan

Lot 22 (9730) Caves Road, Hamelin Bay

0 100m

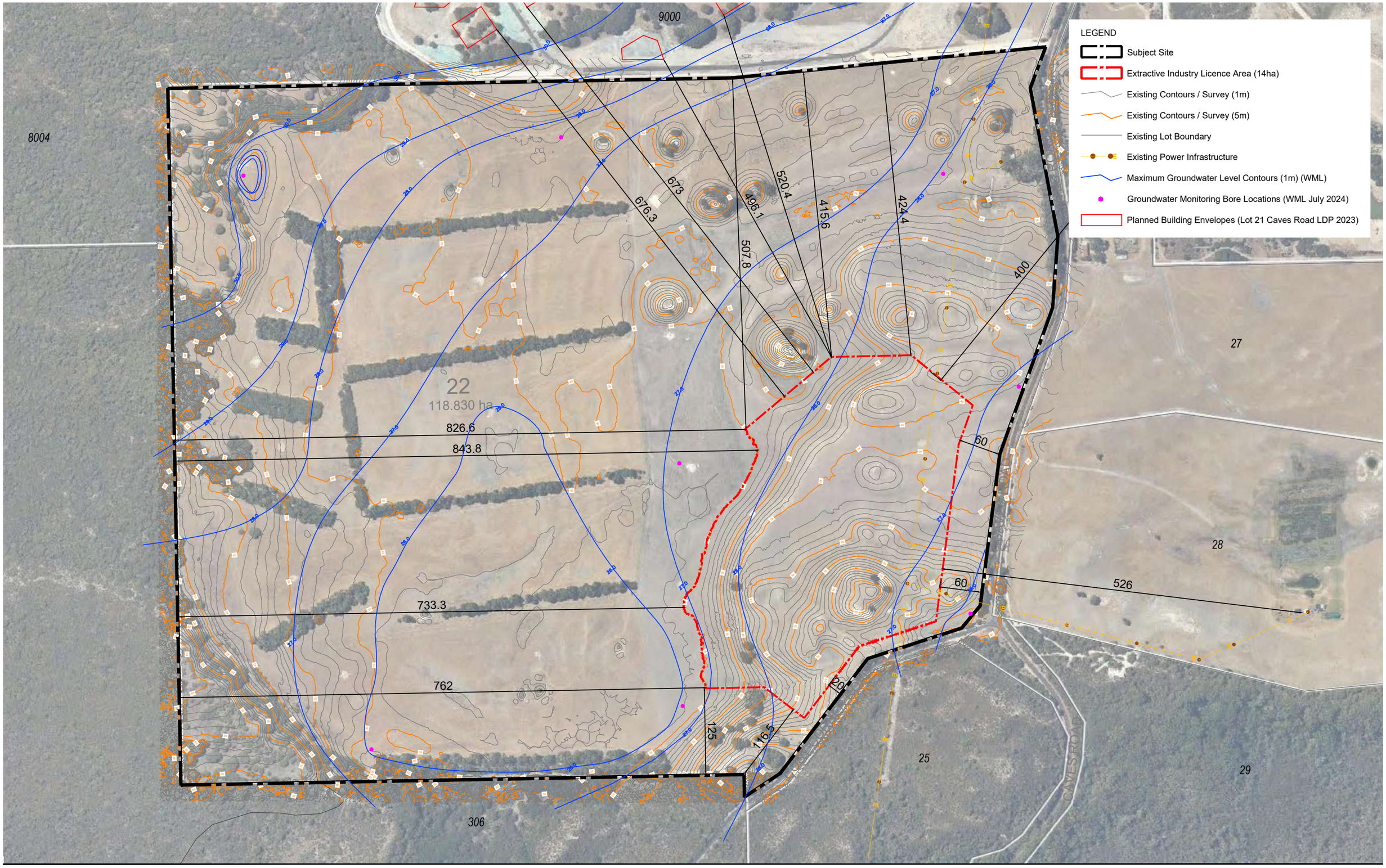
Date: 26 Aug 2024 Scale: 1:5000 @ A3 1:2500 @ A1 File: **24-132 EX01B** Staff: DL CCG JJ Checked: DL

element.

Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
PO Box 7375 Cloisters Square, Perth Western Australia 6850.
T. +61 8 9289 8300 | **E.** hello@elementwa.com.au **elementwa.com.au**

© Element Advisory WA Pty Ltd This concept has been prepared for the purpose of meeting client specifications. The drawing does not constitute an invitation,agreement or contract (or any part thereof) of any kind whatsoever. Although care has been taken in the compilation of this drawing by Element Advisory WA Pty Ltd, all parties associated with the proposed property development disclaim all responsibility for any errors or omissions. The right is reserved to change the plan at any time. Liability is expressly disclaimed by Element Advisory WA Pty Ltd for any loss or damage which may be sustained by any person acting on any visual impression gained from this drawing.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Site Plan

Lot 22 (9730) Caves Road, Hamelin Bay

Date: 26 Aug 2024 Scale: 1:5000 @ A3 1:2500 @ A1 File: **24-132 EX01C** Staff: DL CCG JJ Checked: DL

0 100m

element.

Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
PO Box 7375 Cloisters Square, Perth Western Australia 6850.
T. +61 8 9289 8300 | **E.** hello@elementwa.com.au **elementwa.com.au**

© Element Advisory WA Pty Ltd This concept has been prepared for the purpose of meeting client specifications. The drawing does not constitute an invitation,agreement or contract (or any part thereof) of any kind whatsoever. Although care has been taken in the compilation of this drawing by Element Advisory WA Pty Ltd, all parties associated with the proposed property development disclaim all responsibility for any errors or omissions. The right is reserved to change the plan at any time. Liability is expressly disclaimed by Element Advisory WA Pty Ltd for any loss or damage which may be sustained by any person acting on any visual impression gained from this drawing.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

22
118.8372ha

31

28

29

25

ROAD

CAVES

COSY CORNER ROAD

1:4 Batter

60

226.4

220.5

143.2

41.2

209.6

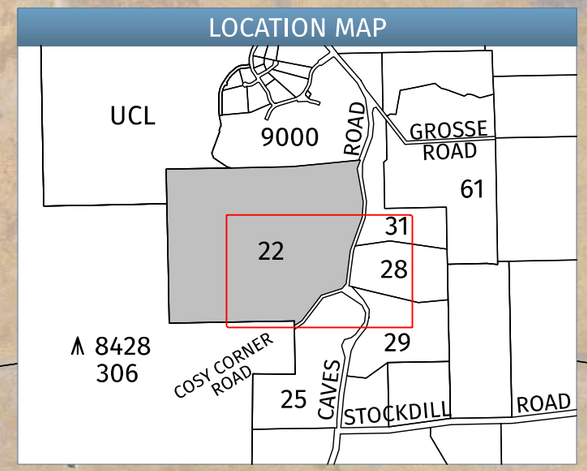
816.5

58.3

31.1

8428
306

LOCATION MAP



LEGEND

- Subject Area (118.8372ha)
- Extractive Industry License (13.9949ha)
- Toe Line (30m AHD)
- Rehabilitated to Pasture
- Existing Contours
- Post Extraction Contours
- AE — Overhead Electricity (DBYD)
- E — Underground Electricity (DBYD)
- T — Telecommunications (DBYD)

Contour data provided by BCP Materials Pty Ltd

EXTRACTION VOLUME SUMMARY

Extraction Pit	Approx. Volume (BCM)
Total	1,314,489

Note:
Volumes have been calculated from the surveyed surface to a pit floor of 30m AHD with 1:4 batters. No allowance has been made for topsoil stripping.

POST EXTRACTION PLAN

Lot 22 (No. 9730) Caves Road, HAMELIN BAY

Plan No.	24210-01	
Date	27/06/24	
Drawn	JW	
Checked	DJ	
Revision	C	
Scale	1:3000@A3	0 40m 80m

BUNBURY OFFICE:
21 Spencer Street,
BUNBURY WA 6230
T: 08 9792 6000
E: bunbury@harleydykstra.com.au
W: www.harleydykstra.com.au
ALBANY | BUNBURY | BUSSELTON | FORRESTDALE | PERTH

COPYRIGHT:
This document is and shall remain the property of HARLEY DYKSTRA.
The document may only be used for the purpose for which it was commissioned and in accordance with the terms of engagement for the commission.
Unauthorised use of this document in any form whatsoever is prohibited

NOTE: This plan has been prepared for planning purposes. Areas, Contours and Dimensions shown are subject to survey

Harley Dykstra®
PLANNING & SURVEY SOLUTIONS

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Appendix D – Acoustic Assessment

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

HERRING STORER ACOUSTICS

MCDOUGALL QUARRIES PTY LTD

EXTRACTIVE INDUSTRY
LOT 22 (9730) CAVES ROAD, HAMELIN BAY

ACOUSTIC ASSESSMENT

AUGUST 2024

OUR REFERENCE: 33157-3-24200

Rochdale Holdings Pty Ltd A.B.N. 85 009 049 067 trading as:
HERRING STORER ACOUSTICS
P.O. Box 219, Como, W.A. 6952
(08) 9367 6200
hsa@hsacoustics.com.au

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

DOCUMENT CONTROL PAGE

ACOUSTIC ASSESSMENT

CAVES ROAD, HAMELIN BAY

Job No: 24200

Document Reference: 33157-3-24200

FOR

MCDOUGALL QUARRIES PTY LTD

DOCUMENT INFORMATION			
Author:	Paul Daly	**Checked By:**	George Watts
Date of Issue:	9th August 2024		

REVISION HISTORY				
Revision	**Description**	**Date**	**Author**	**Checked**
1	Revised Excavation Plan	19/08/2024	PLD	
2	Client Comments	26/08/2024	PLD	

DOCUMENT DISTRIBUTION				
Copy No.	**Version No.**	**Destination**	**Hard Copy**	**Electronic Copy**
1	3	Element Att: Daniel Lewis Email: daniel.lewis@elementwa.com.au		✓

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

CONTENTS

1.	INTRODUCTION	1
2.	SUMMARY	2
3.	CRITERIA	3
4.	CALCULATED NOISE LEVELS	5
5.	MONITORED AMBIENT NOISE	7
6.	RESULTS	10
7.	ASSESSMENT	10
8.	CONCLUSION	11

APPENDICIES

A Site Layout

B Noise Contours

C Ambient Noise Monitoring

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

1. INTRODUCTION

Herring Storer Acoustics have been commissioned by Element on behalf of McDougall Quarries Pty Ltd to undertake an acoustic assessment of noise emissions from the proposed lime sand and limestone extraction operations located at Lot 40 (9730) Caves Road, Hamelin Bay.

The proposed extraction operations will operate from 07:00 – 19:00 Monday to Friday and 07:00 – 13:00 on Saturdays. No operations would occur on Sundays or Public Holidays.

The nearest residential premises are located to the east / northeast of the proposed excavation activities. The most critical in terms of distance from the proposed operations, are approximately 400m from the boundary of the nearest operations. Future residential locations to the north have been noted and also assessed for noise impact.

The main access road is via the east as shown in Figure 1.1, along with the proposed operations.

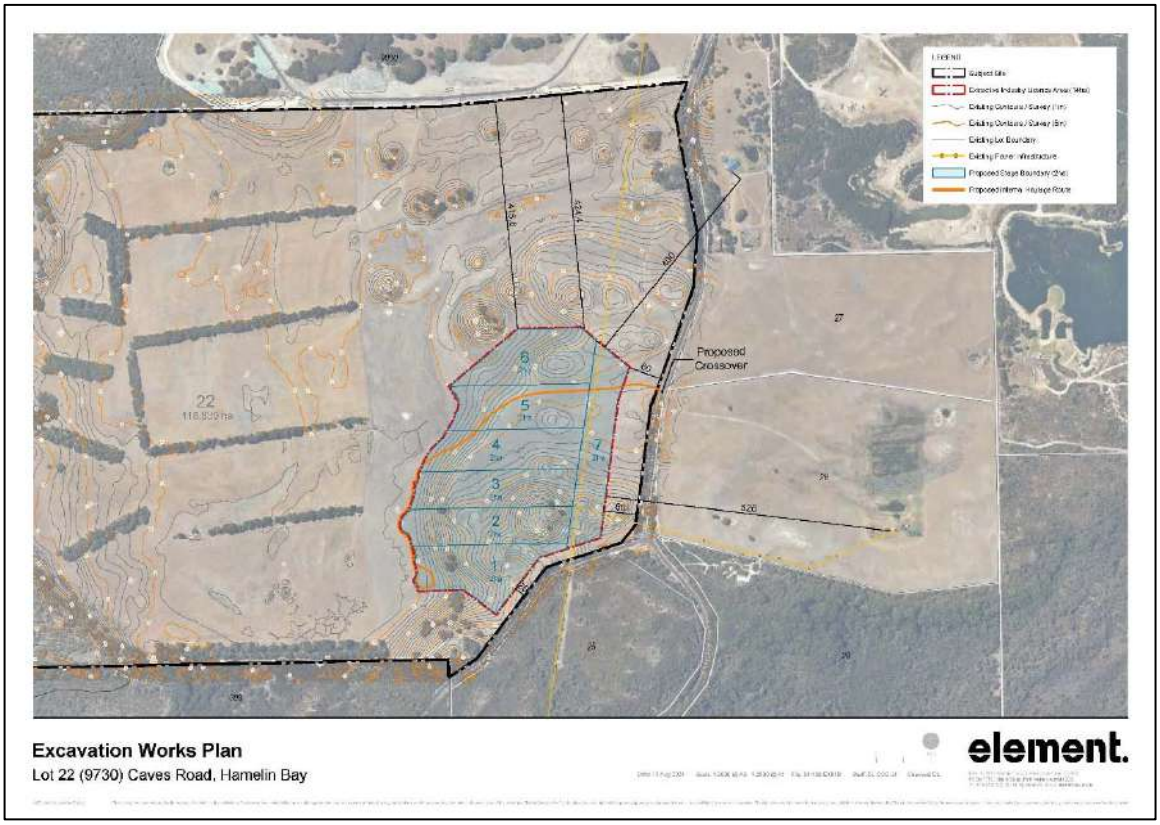


FIGURE 1.1 – EXTRACTION OPERATIONS

This assessment is provided to support the regulatory approvals processes and demonstrate compliance with the requirements of the *Environmental Protection (Noise) Regulations 1997* can be achieved.

As part of the study, the following was carried out:

- Identification of individual operations and the associated noise levels.
- Measurement of the existing background noise levels.
- Assess the predicted noise levels at the nearest surrounding highly noise sensitive premises for compliance with the appropriate criteria.
- If exceedances are predicted, comment on possible noise amelioration options for compliance with the appropriate criteria.

For information, a locality plan is shown in Appendix A.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

2. SUMMARY

Assessment has been conducted on the proposed limestone and sand extraction operations for Lot 40 (9730) Caves Road, Hamelin Bay.

The facility would only operate during the day period (being Monday to Friday 07:00 to 19:00 hours and 07:00 to 16:00 on Saturdays). Therefore, at the neighbouring residences, the applicable acoustic criteria for this assessment is the assigned L_{A10} day period noise level of 45 dB(A).

Noise received at the nearest residential premises has been determined to be 45 dB(A) for the extraction operations for the highest noise level at any stage of the operations. This can be compared to the applicable assigned noise level criteria of 45 dB(A).

Noise monitoring conducted shows that the ambient noise (background) is generally around 45 to 50 dB(A) during the day. Given this, annoying characteristics such as tonality may be present, hence a +5 dB(A) penalty has been included in the assessable noise level stated above.

Information provided is that the material is understood to be located around 10m deep (from ground level). Therefore, as the pits progress, the bottom of the pit will be such that there is a pit wall (operating face) being maintained between equipment and receivers.

As there is a Cat D9 Dozer to be used in the operations, both this and the crushing plant require noise control to ensure compliance. Predictive noise modelling has been conducted where the dozer, located at natural surface level commences operations in Stage 1. The dozer is required to operate from the western most point and clear a sufficient area on the western side of Stage 1 to reach the material. Figure 2.1 below details the active area for the dozer for the commencement of works. Once a sufficient depth (5-6m) is achieved within Stage 1, progression of the pit through to Stage 2 can continue with the use of the dozer.

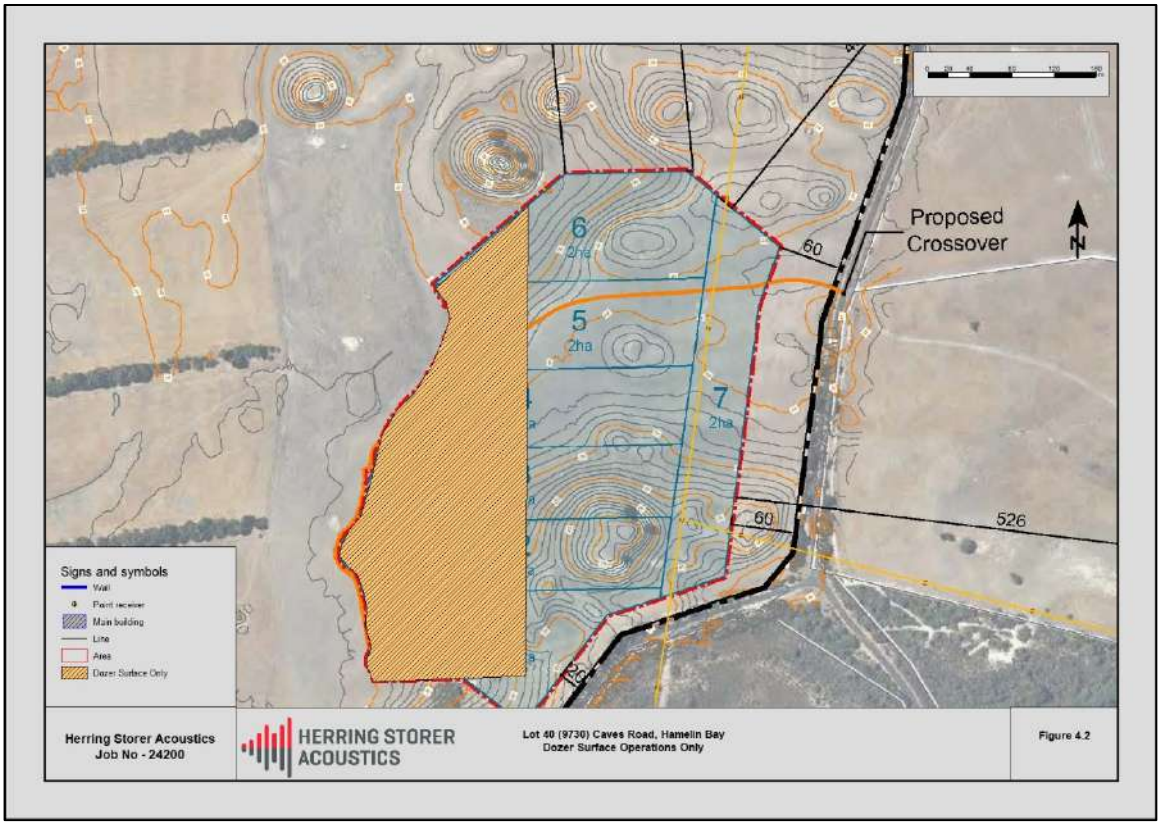


FIGURE 2.1 – DOZER OPERATIONS - SURFACE ONLY

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Additionally, the crushing and screening plant require noise control in the form of a barrier. If the plant is located within the pit at a depth of 5m, then this would provide sufficient attenuation. However, at depth less than this a bund is required in close proximity to the plant to form a barrier.

Modelling has assumed the progression of the pit through the numbered stages. Provided the barrier in the form of a pit wall, or bunding to a minimum height of 3m is maintained, noise levels would be compliant.

Given these operating parameters, noise levels received at the nearest premises has been calculated to comply with the *Environmental Protection (Noise) Regulations 1997* for the operating times as outlined in this assessment.

3. CRITERIA

The allowable noise level for noise sensitive premises in the vicinity of the proposed site is prescribed by the *Environmental Protection (Noise) Regulations 1997*. Regulations 7 and 8 stipulate maximum allowable external noise levels or assigned noise levels that can be received at a premise from another premises. For residential premises, this noise level is determined by the calculation of an influencing factor, which is then added to the base levels shown below. The influencing factor is calculated for the usage of land within two circles, having radii of 100m and 450m from the premises of concern. The base noise levels for residential premises are listed in Table 3.1.

TABLE 3.1 - BASELINE ASSIGNED OUTDOOR NOISE LEVEL

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		$L_{A\ 10}$	$L_{A\ 1}$	$L_{A\ max}$
Noise sensitive premises	0700 - 1900 hours Monday to Saturday (Day)	45 + IF	55 + IF	65 + IF
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day Period)	40 + IF	50 + IF	65 + IF
	1900 - 2200 hours all days (Evening)	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	35 + IF	45 + IF	55 + IF

Note: L_{A10} is the noise level exceeded for 10% of the time.
L_{A1} is the noise level exceeded for 1% of the time.
L_{Amax} is the maximum noise level.
IF is the influencing factor.

It is a requirement that received noise be free of annoying characteristics (tonality, modulation and impulsiveness), defined below as per Regulation 9.

"impulsiveness" means a variation in the emission of a noise where the difference between L_{Apeak} and $L_{Amax\ Slow}$ is more than 15 dB when determined for a single representative event;

"modulation" means a variation in the emission of noise that –

(a) is more than 3dB $L_{A\ Fast}$ or is more than 3 dB $L_{A\ Fast}$ in any one-third octave band;
(b) is present for more at least 10% of the representative assessment period; and
(c) is regular, cyclic and audible;

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

"tonality" means the presence in the noise emission of tonal characteristics where the difference between –

(a) the A-weighted sound pressure level in any one-third octave band; and
(b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3 dB when the sound pressure levels are determined as $L_{Aeq,T}$ levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as $L_{A\ Slow}$ levels.

The nearest potential noise sensitive premises to the proposed development have been identified using the area map in Figure 3.1. It is understood that there is the potential for development to the north of the extractive works, hence, there future residential premises have been assessed, noted at R3.

The usage of the surrounding land use varies from rural (with residential premises) and other extractive industries. Therefore, the assigned noise levels for operational times are as noted in Table 3.2.

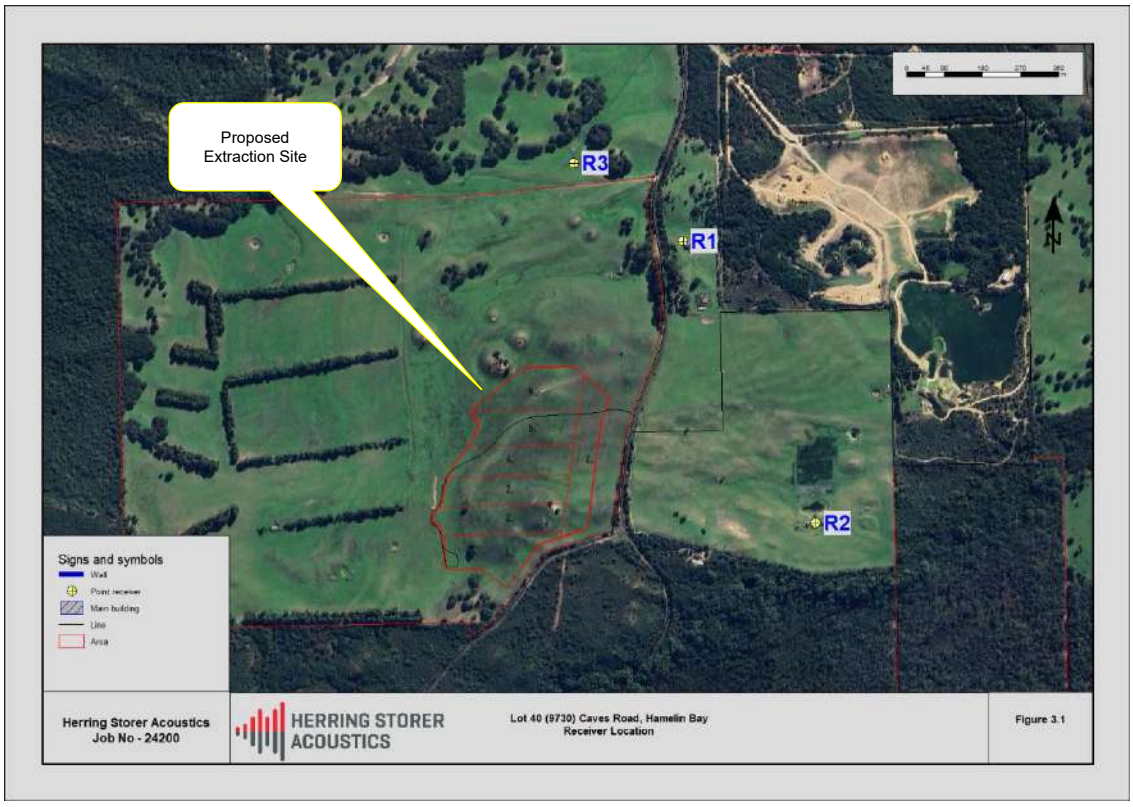


FIGURE 3.1 – RECEIVER LOCATION MAP

TABLE 3.2 – ASSIGNED NOISE LEVELS

Premises Receiving Noise	IF dB	Time of Day	Assigned Level (dB)		
			$L_{A\ 10}$	$L_{A\ 1}$	$L_{A\ max}$
Receivers R1 to R3	0	0700 - 1900 hours Monday to Saturday (Day)	45	55	65

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

4. CALCULATED NOISE LEVELS

Noise immissions[1] at the nearest neighbouring residential premises, due to noise associated with the proposed operations, were modelled with the computer programme SoundPlan using Concawe algorithms. Sound power levels used for the calculations are based on measured sound pressure levels of similar equipment proposed for use on site.

The modelling of noise levels has been based on noise sources and sound power levels shown in Table 4.1.

TABLE 4.1 – SOUND POWER LEVEL - NOISE SOURCES dB(A)

Source Name	Quantity	SWL dB(A)
Loaders (Cat 966 or similar)	1	105
Screening Plant (McCloskey S190 Screener or Similar)	1	101
Crushing Plant (Terex J1175)	1	113
Semi- Tipper Truck	1	98
Excavator (PC330 or similar)	1	100
Dozer (CAT D9)	1	113

Note: The above equipment models have been used to provide an indication of the size. Other models may be used although these have been assumed to have a similar sound power level.

Based on noise emissions from the above equipment, an overall operating scenario has been developed. Figure 4.1 details the source locations assumed in the predictive modelling along with the proposed development of the pit.

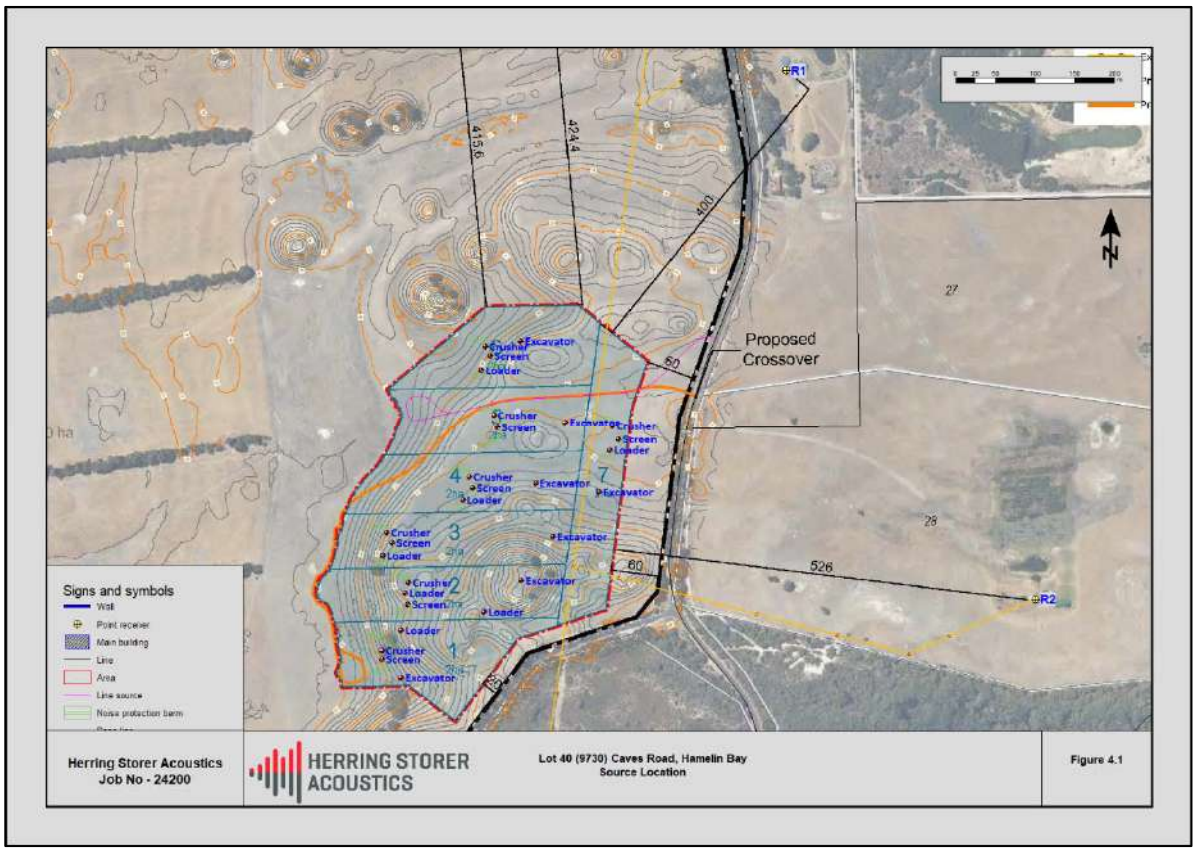


FIGURE 4.1 – SOURCE LOCATION AND PIT PROGRESSION

1 Immissions – noise received at a source
2 Emissions – noise emanating from a source and / or location

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Based on the above, various operating scenarios have been developed for each stage of the proposal. As the fixed plant, being the loader, crusher and screen will generally remain in a static location, this has been modelled for each stage. The truck transporting of material can be within any stage; hence this has been modelled in a separate scenario and included in the overall assessable noise level (added to the fixed plant noise levels). The excavator could operate anywhere within the staged area, whilst the loader would be generally located with the crushing and screen plant, also being available to load out material onto trucks.

It is noted that each stage is assessed individually, with the noise contour plot for the overall noise level being a maximum of each stage (not the cumulative of all stages) for information purposes only.

Information provided is that the material is understood to be located around 10m deep (from ground level). Therefore, as the pits progress, the bottom of the pit will be such that there is a pit wall (operating face) being maintained between equipment and receivers.

As there is a Cat D9 Dozer to be used in the operations, both this and the crushing plant require noise control to ensure compliance. Predictive noise modelling has been conducted where the dozer, located at natural surface level commences operations in Stage 1. The dozer is required to operate from the western most point and clear a sufficient area on the western side of Stage 1 to reach the material. Figure 4.2 details the active area for the dozer for the commencement of works. Once a sufficient depth (5-6m) is achieved within Stage 1, progression of the pit through to stage 2 can continue with the use of the dozer.

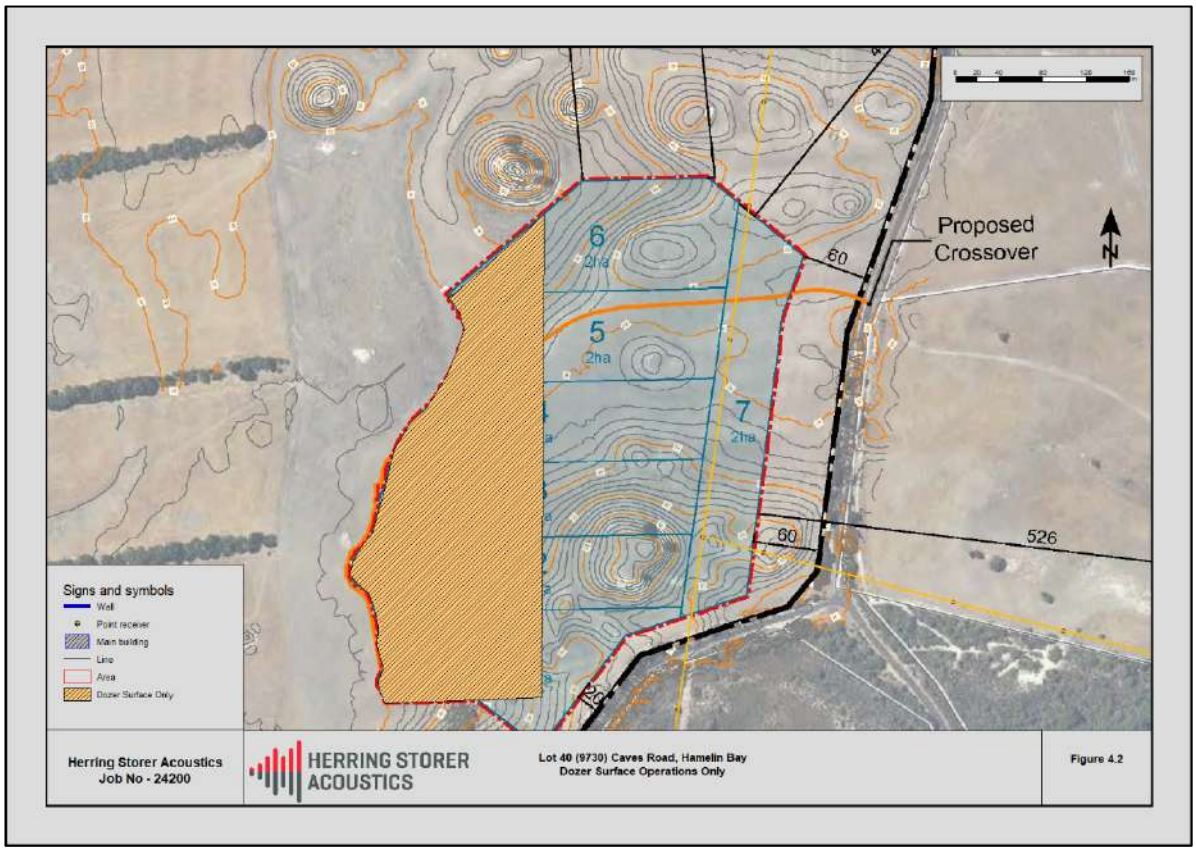


FIGURE 4.2 – DOZER OPERATIONS - SURFACE ONLY

Additionally, the crushing and screening plant require noise control in the form of a barrier. If the plant is located within the pit at a depth of 5m, then this would provide sufficient attenuation. However, at depth less than this a bund is required in close proximity to the plant to form a barrier.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Modelling has assumed the progression of the pit through the numbered stages. Provided the barrier, in the form of a pit wall, or bunding to a minimum height of 3m is maintained, noise levels would be compliant.

Therefore, the operating scenarios considered are:

- Scenario 1 Stage 1 Fixed Plant, Mobile Equipment and truck movements
- Scenario 2 Stage 2 Fixed Plant, Mobile Equipment and truck movements
- Scenario 3 Stage 3 Fixed Plant, Mobile Equipment and truck movements
- Scenario 4 Stage 4 Fixed Plant, Mobile Equipment and truck movements
- Scenario 5 Stage 5 Fixed Plant, Mobile Equipment and truck movements
- Scenario 6 Stage 6 Fixed Plant, Mobile Equipment and truck movements
- Scenario 7 Stage 7 Fixed Plant, Mobile Equipment and truck movements

The following input data was used in the calculations:

a) Provided area plots.
b) Sound Power Levels listed in Table 4.1.
c) Ground contours and receiver point provided by client (Appendix A).

Weather conditions for modelling were as stipulated in the Environmental Protection Authority's "*Draft Guidelines on Environmental Noise for Prescribed Premises"* and for the day period are as listed in Table 4.2.

TABLE 4.2 – WEATHER CONDITIONS

Condition	Day
Temperature	20°C
Relative humidity	50%
Pasquill Stability Class	E
Wind speed	4 m/s*

* From sources, towards receivers.

5. MONITORED AMBIENT NOISE

As per the "Draft Guidelines on Environmental Noise for Prescribed Premises" (released in May 2016), continuous noise monitoring has been conducted to establish the ambient noise levels.

The monitoring location was on the southern boundary of the development, nearest to the neighboring residence. Monitoring commenced on the 19th June 2024 and continued through until the 5th July 2024. Figure 5.1 contains a map of the monitoring location, with Figure 5.2 showing pictures of the monitor in situ.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

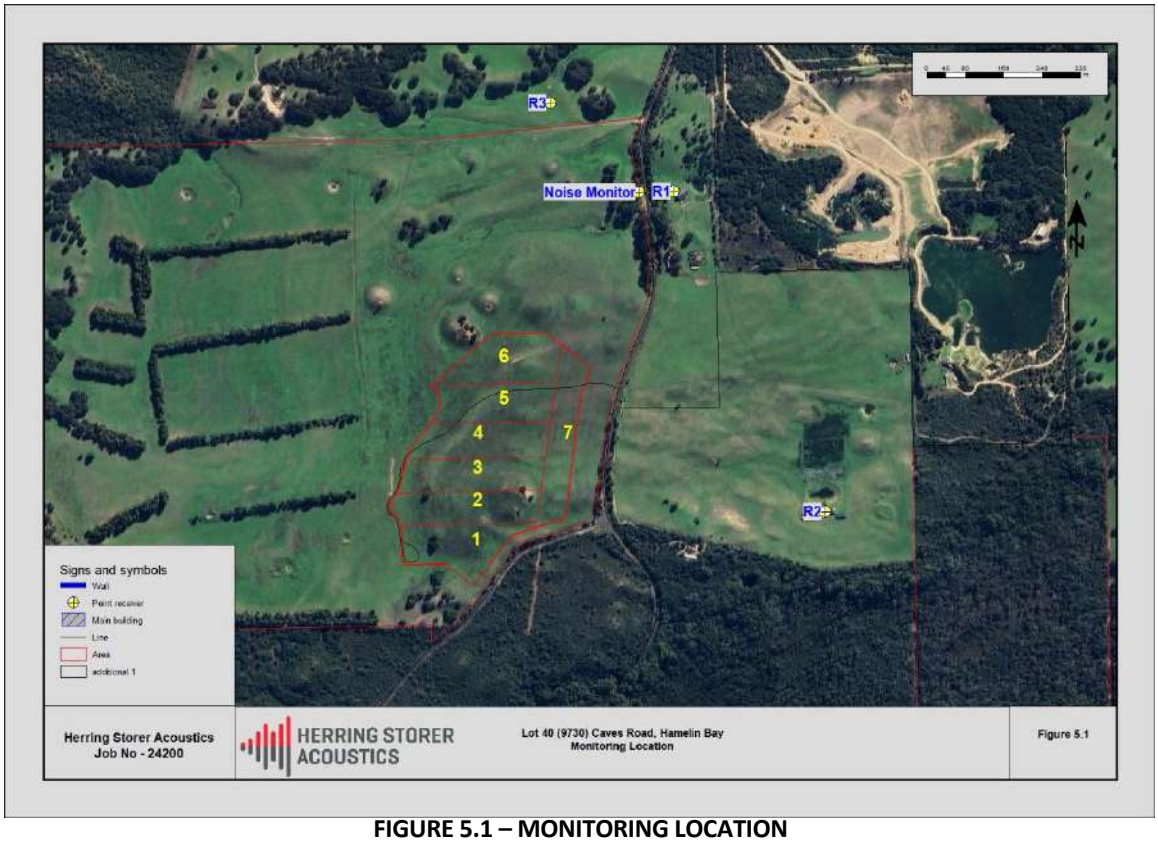


FIGURE 5.1 – MONITORING LOCATION



FIGURE 5.2 – MONITORING PICTURE – IN SITU

Noise monitoring results are summarised graphically below in Figure 5.3, with the full results contained in Appendix C.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

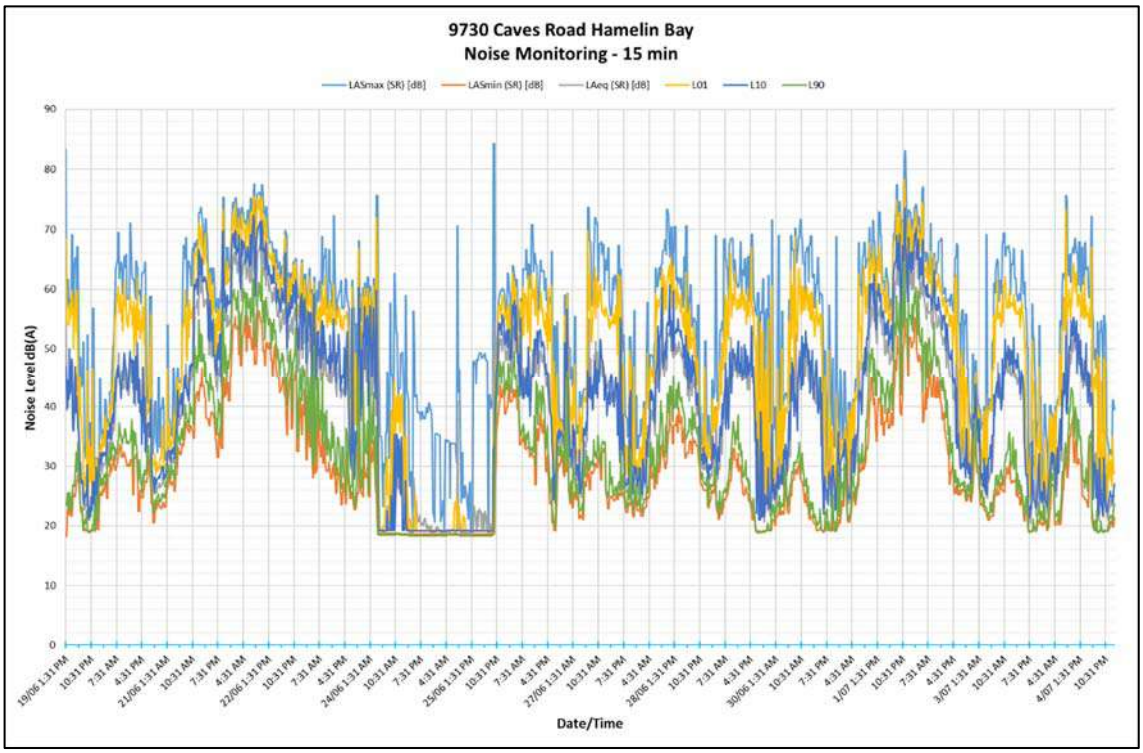


FIGURE 5.3 – MONITORED NOISE LEVELS – TOTAL MONITORING PERIOD

During the monitoring period intermittent rainfall occurred. The days (periods) where rainfall impacted noise levels have been discounted from the assessment of ambient noise.

For informational purposes, a summary of the average noise level for each daily regulatory time period is shown in Table 5.1.

Weather data for the monitoring period was sourced via the Bureau of Meteorology web site for the area.

TABLE 5.1 – SUMMARY NOISE LEVELS

Day / Date	Noise Level	Comments
	Day Period	
Wednesday, 19 June 2024	49.5	
Thursday, 20 June 2024	44.5	
Friday, 21 June 2024	55.2	
Saturday, 22 June 2024	63.0	Rainfall
Sunday, 23 June 2024	46.5	Rainfall
Monday, 24 June 2024	27.5	Rainfall
Tuesday, 25 June 2024	25.8	
Wednesday, 26 June 2024	46.3	Rainfall
Thursday, 27 June 2024	46.1	Rainfall
Friday, 28 June 2024	49.9	Rainfall
Saturday, 29 June 2024	46.1	Rainfall
Sunday, 30 June 2024	45.6	
Monday, 1 July 2024	52.9	
Tuesday, 2 July 2024	53.1	Rainfall
Wednesday, 3 July 2024	45.0	
Thursday, 4 July 2024	48.4	
Average (Good Days)	**49.9**	

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

6. RESULTS

Calculated noise levels associated with the noise emissions from the proposed operations for the assumed scenarios, including bunding to Stages 1 - 3 are summarised below in Table 6.1. Appendix B contains the overall noise contour plots.

TABLE 6.1 – CALCULATED NOISE LEVEL

Operating Scenario	Description	Calculated Noise Level (L_{A10} dB(A))		
		R1	R2	R3
Scenario 1	Stage 1 Fixed Plant, Mobile equipment and Truck Movement	30	24	30
Scenario 2	Stage 2 Fixed Plant, Mobile equipment and Truck Movement	33	31	33
Scenario 3	Stage 3 Fixed Plant, Mobile equipment and Truck Movement	35	33	36
Scenario 4	Stage 4 Fixed Plant, Mobile equipment and Truck Movement	37	35	36
Scenario 5	Stage 5 Fixed Plant, Mobile equipment and Truck Movement	37	36	37
Scenario 6	Stage 6 Fixed Plant, Mobile equipment and Truck Movement	34	29	40
Scenario 7	Stage 7 Fixed Plant, Mobile equipment and Truck Movement	40	39	37

7. ASSESSMENT

For the day time operations, based on calculated noise levels at the nearest premises, noise levels could be considered as potentially containing tonal characteristics.

Based on the assessable noise levels above, comparison against the relevant assigned noise level is contained in Table 7.1. For the purpose of assessment, the highest noise level received for any stage of the operation has been assessed.

TABLE 7.1 – ASSESSMENT OF NOISE LEVELS

Receiver	Premises Receiving Noise Assessable Noise Level dB(A)	Time of Day	Assigned Level (dB)	Compliance
R1	40[45]	0700 - 1900 hours Monday to Saturday (Day)	45	Complies
R2	39[44]			Complies
R3	40[45]			Complies

[ ] Denotes penalty for tonality

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

8. CONCLUSION

Assessment has been conducted on the proposed limestone and sand extraction operations for Lot 40 (9730) Caves Road, Hamelin Bay.

The facility would only operate during the day period (being Monday to Friday 07:00 to 19:00 hours and 07:00 to 13:00 on Saturdays). Therefore, at the neighbouring residences, the applicable acoustic criteria for this assessment is the assigned L_{A10} day period noise level of 45 dB(A).

Noise received at the nearest residential premises has been determined, to be 45 dB(A) for the extraction operations for the highest noise level at any stage of the operations. This can be compared to the applicable assigned noise level criteria of 45 dB(A).

Noise monitoring conducted shows that the ambient noise (background) is generally around 44 dB(A) during the day. Given this, annoying characteristics such as tonality may be present, hence a +5 dB(A) penalty has been included in the assessable noise level stated above.

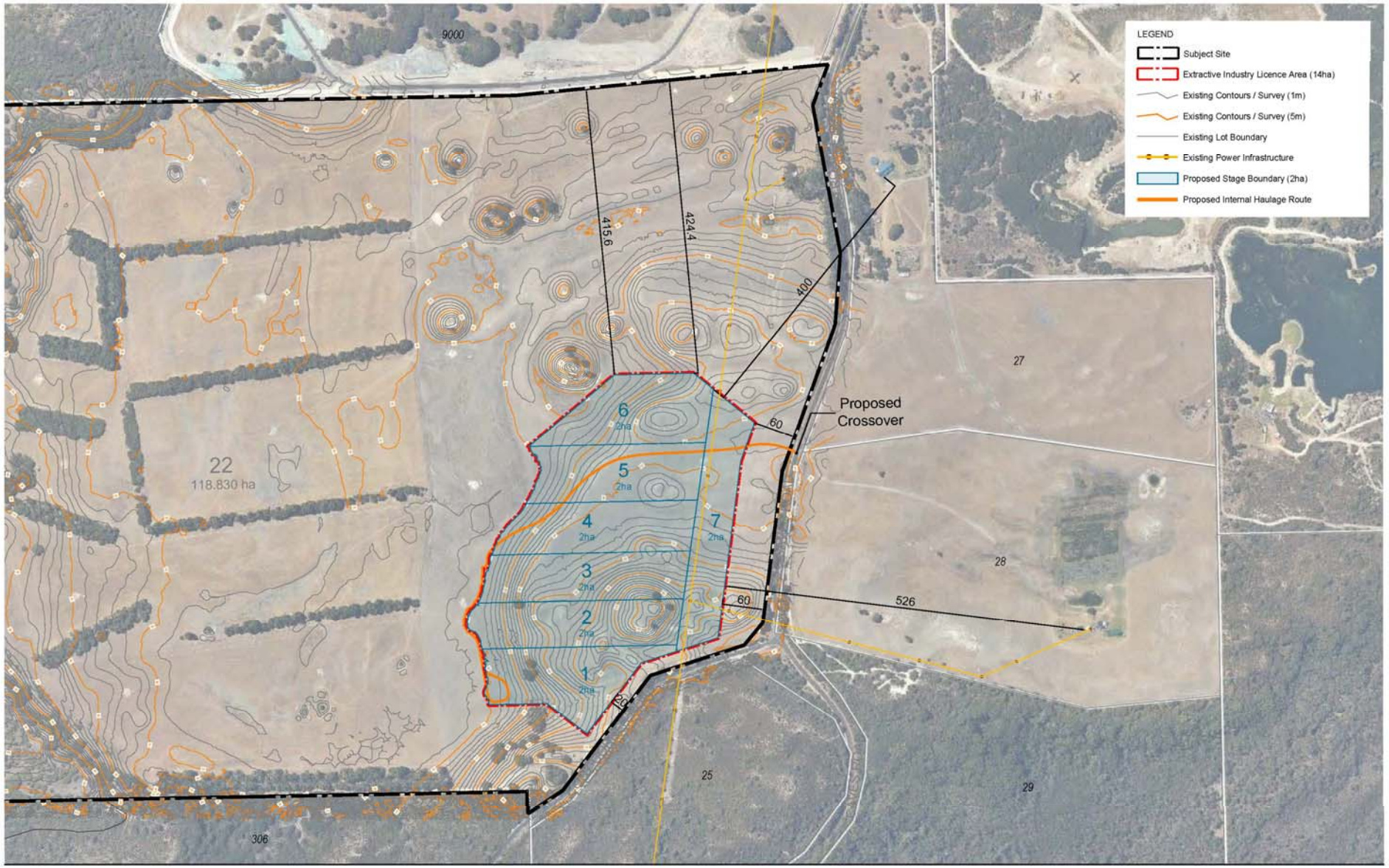
To ensure the above noise levels are maintained, noise control as outline in this report is required.

Given these operating parameters, noise levels received at the nearest premises has been calculated to comply with the *Environmental Protection (Noise) Regulations 1997* for the operating times as outlined in this assessment.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX A

LOCATION MAP



Excavation Works Plan

Lot 22 (9730) Caves Road, Hamelin Bay

Date: 13 Aug 2024 Scale: 1:5000 @ A3 1:2500 @ A1 File: 24-132 EX01B Staff: DL CCG JJ Checked: DL

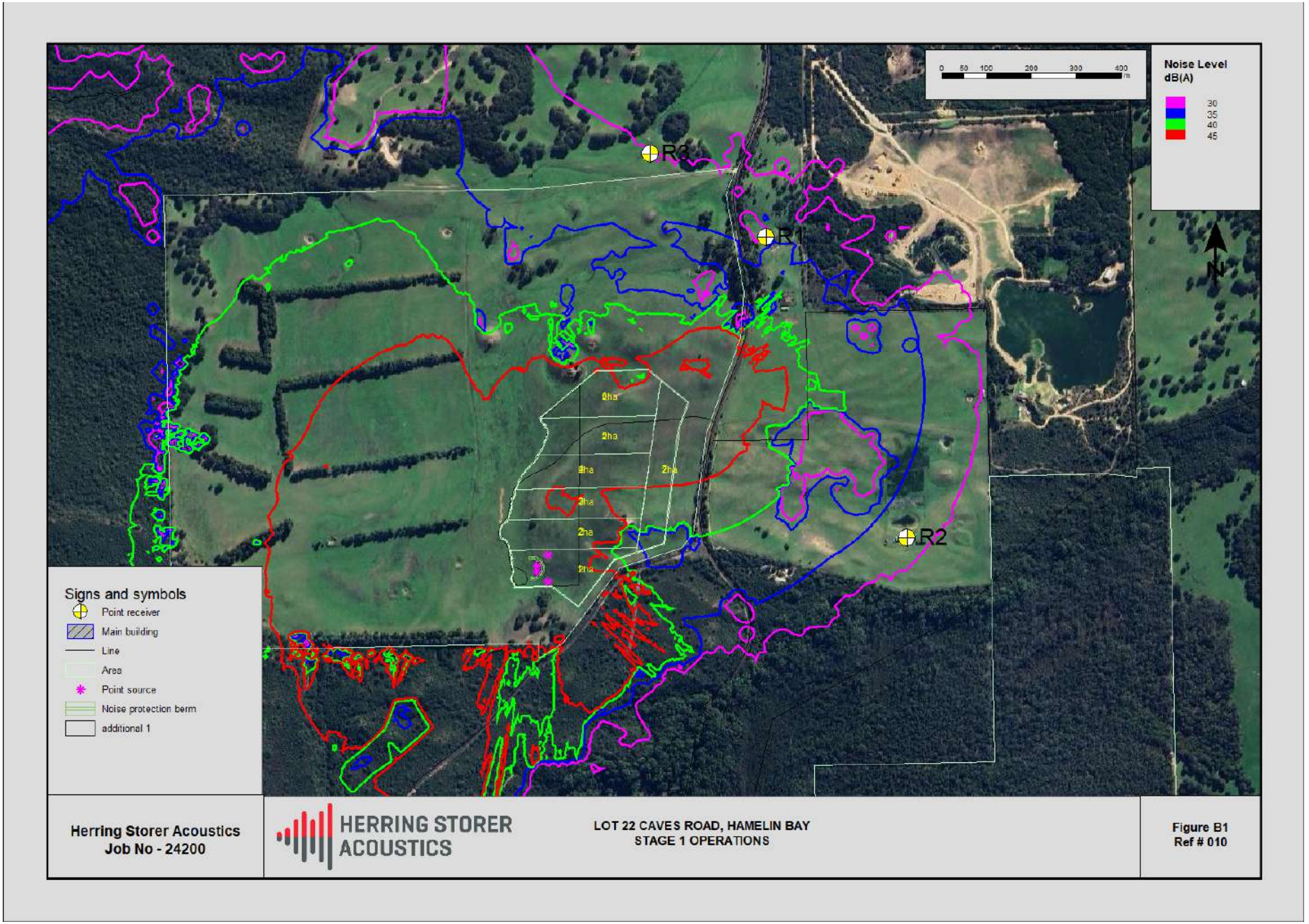
element.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

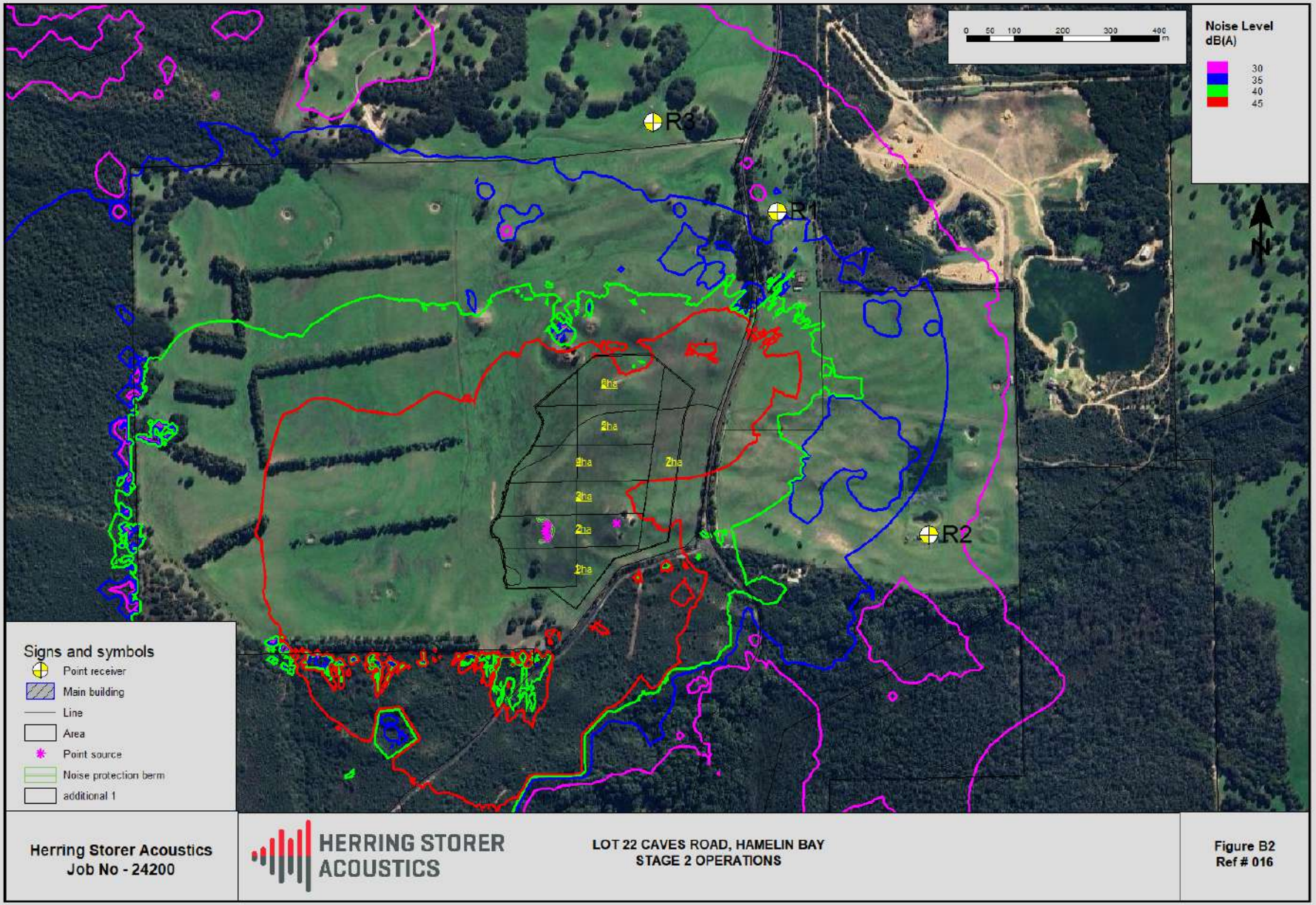
RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX B

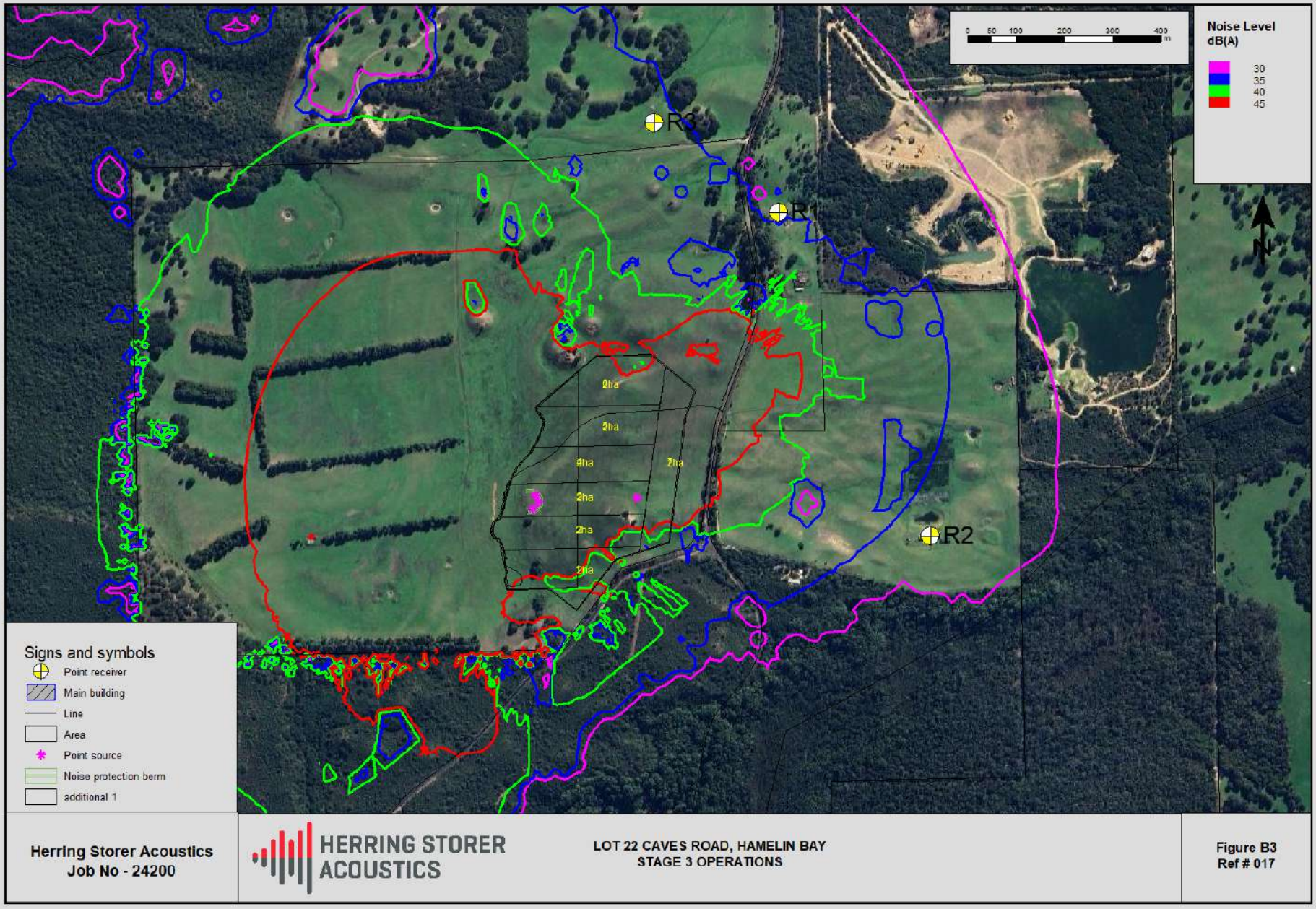
Noise Contours



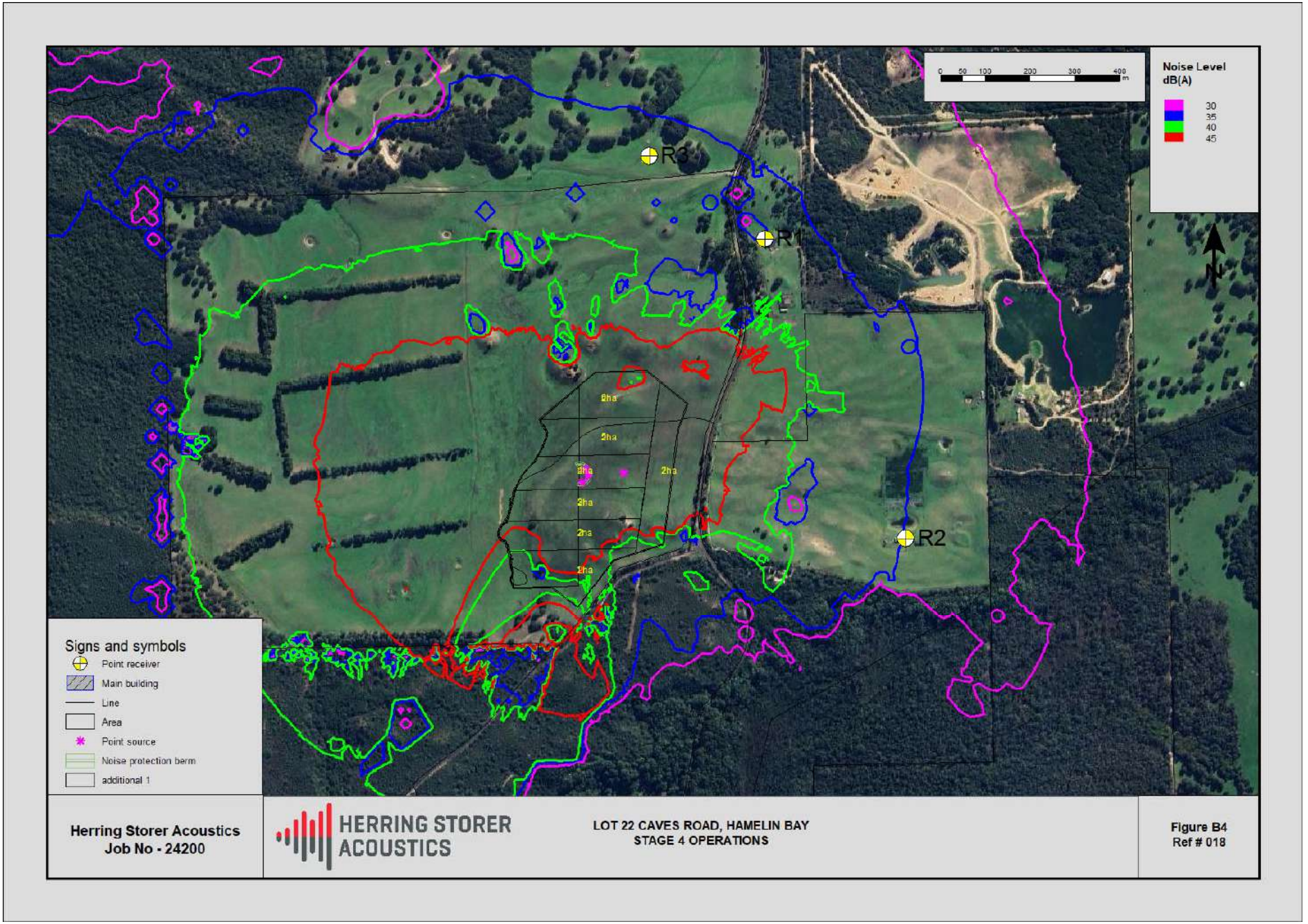
RECEIVED
By Shire of Augusta Margaret River
13 September 2024



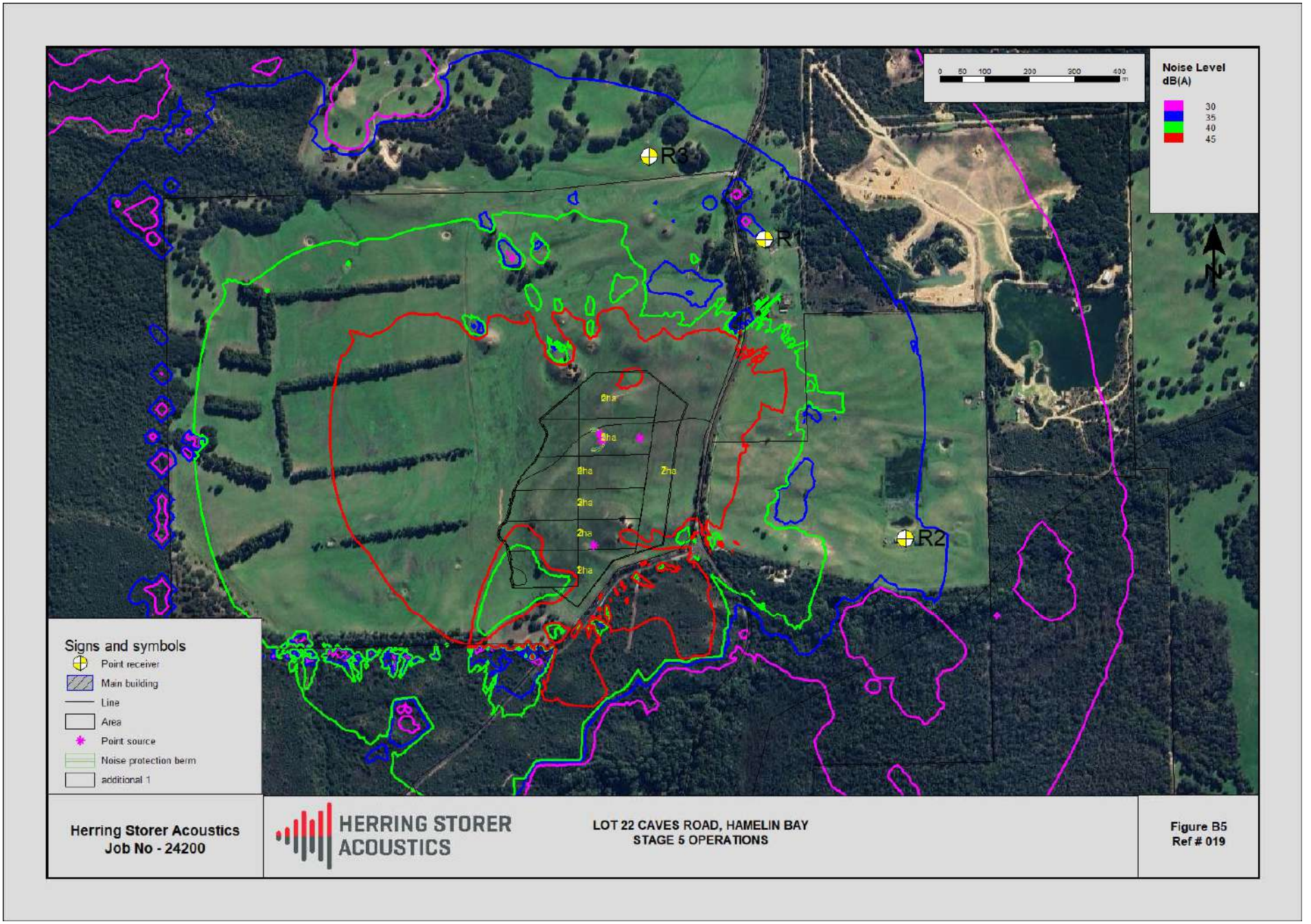
RECEIVED
By Shire of Augusta Margaret River
13 September 2024



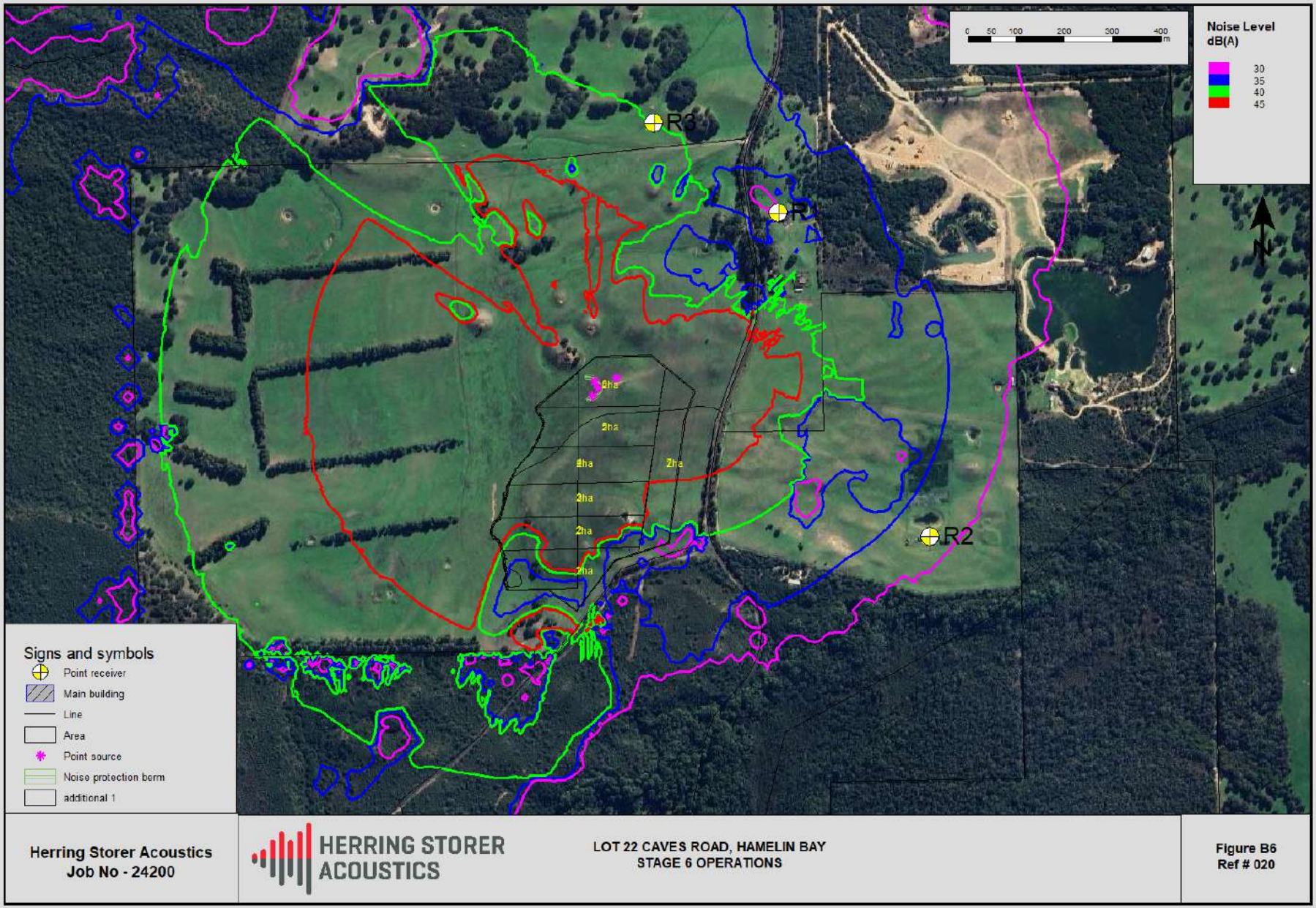
RECEIVED
By Shire of Augusta Margaret River
13 September 2024



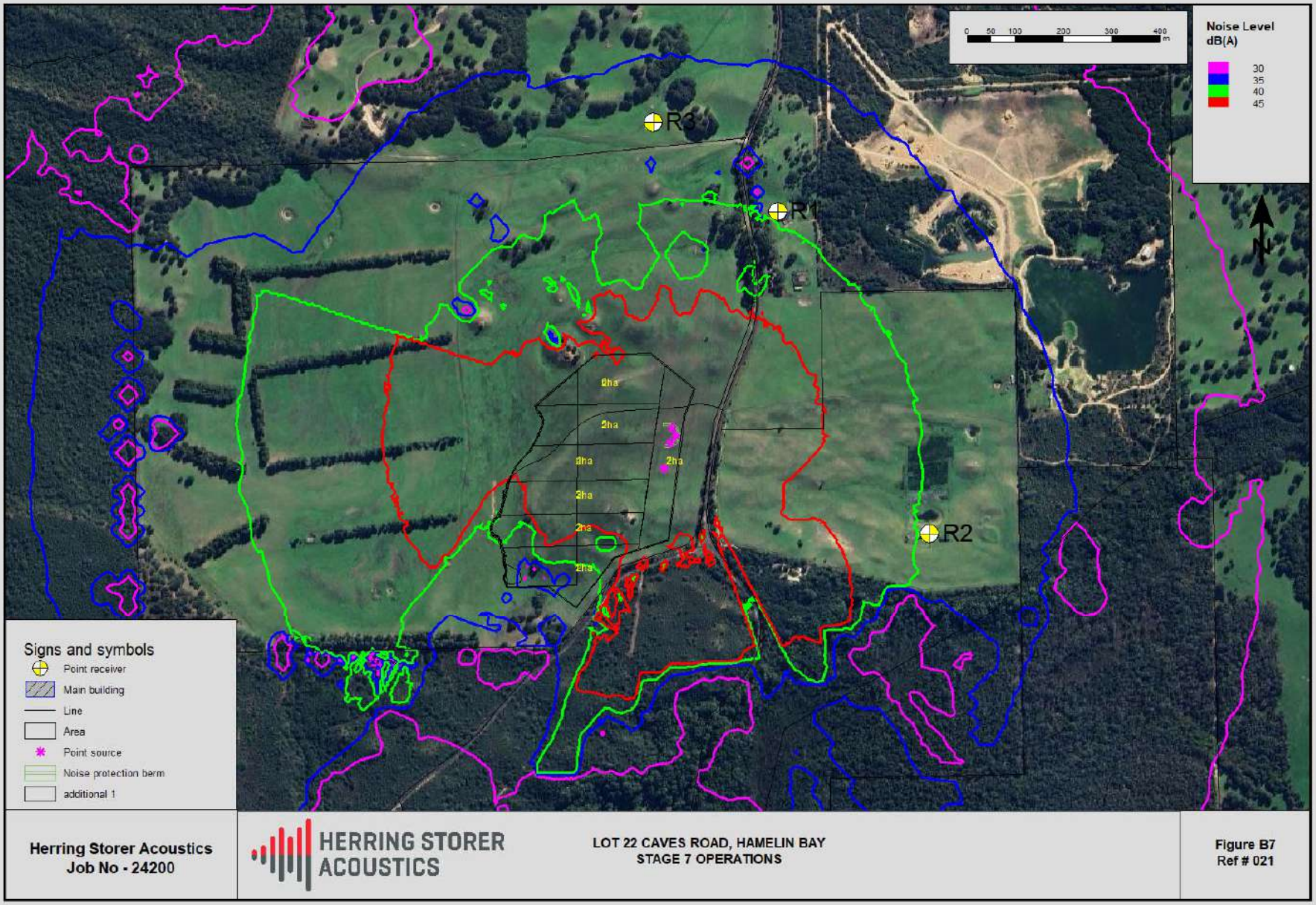
RECEIVED
By Shire of Augusta Margaret River
13 September 2024



RECEIVED
By Shire of Augusta Margaret River
13 September 2024



RECEIVED
By Shire of Augusta Margaret River
13 September 2024

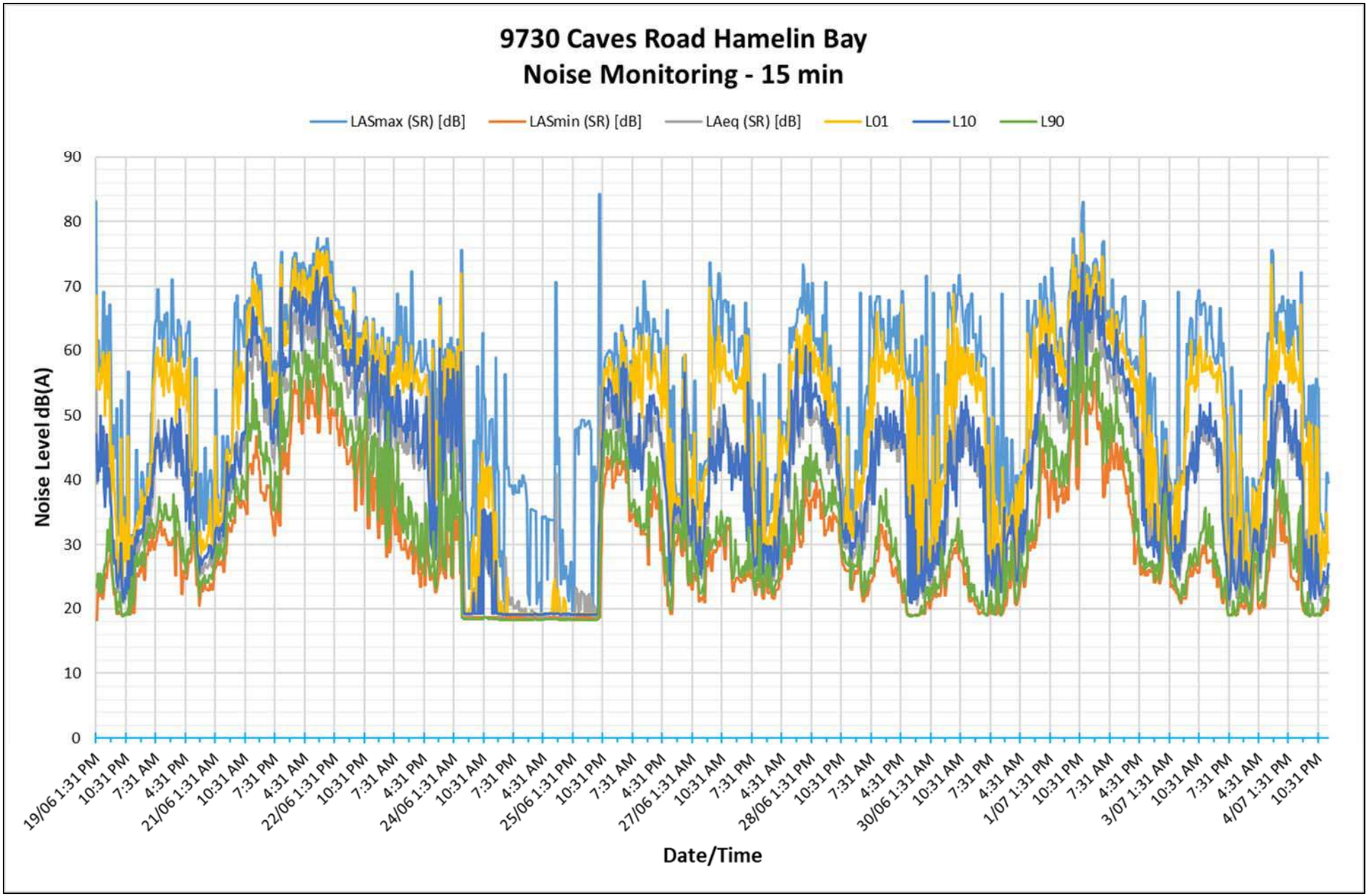


RECEIVED
By Shire of Augusta Margaret River
13 September 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX C

Ambient Noise Monitoring



RECEIVED
By Shire of Augusta Margaret River
13 September 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Appendix E – Traffic Impact Statement

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

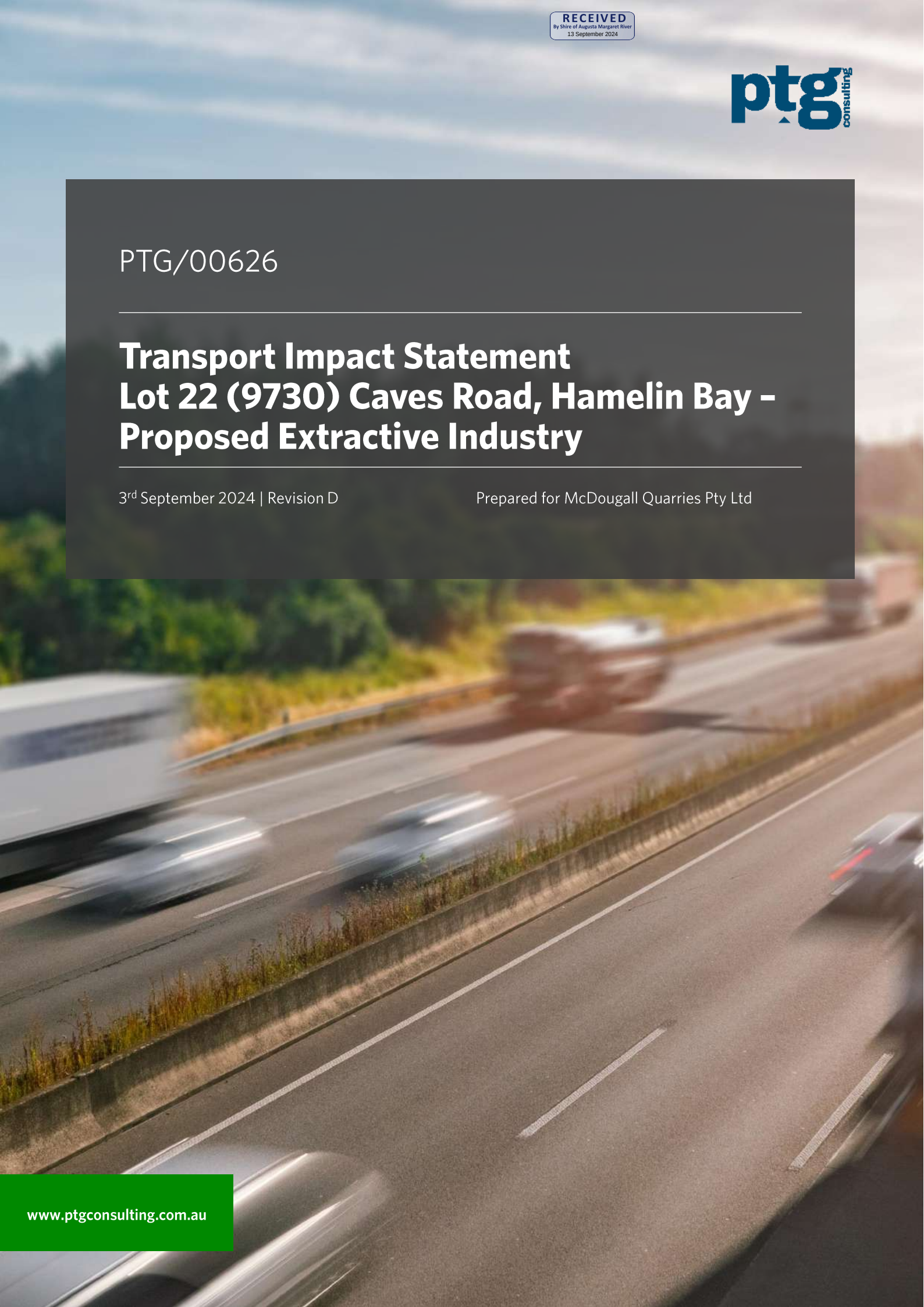
RECEIVED
By Shire of Augusta Margaret River
13 September 2024

PTG/00626

Transport Impact Statement
Lot 22 (9730) Caves Road, Hamelin Bay – Proposed Extractive Industry

3rd September 2024 | Revision D

Prepared for McDougall Quarries Pty Ltd



www.ptgconsulting.com.au

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

CONTENTS

REPORT DETAILS 3
1 Introduction 4
1.1 Background 4
2 Proposed Development 4
2.1 Site Location 4
2.2 Context with Surrounds 5
2.3 Existing Land Use 5
2.4 Proposed Land Use 6
3 Vehicular Access and Parking 7
3.1 Access Arrangements 7
3.2 Public, Private, Disabled Parking Set-Down & Pick-Up 8
4 Service/Delivery Vehicles (non-residential) 8
4.1 Access Arrangements 8
4.2 Loading Facilities 8
5 Service Vehicles (residential) 8
6 Hours of Operation (non-residential) 9
7 Traffic Volumes 9
7.1 Development – Daily / Peak Traffic Volumes 9
7.2 Types of Vehicles 9
8 Traffic Management on Frontage Streets 10
8.1 Road Hierarchy 10
8.2 Restricted Access Vehicle (RAV) Network 11
8.3 Daily / Peak Traffic Volumes 12
8.4 Future Road Network 13
9 Public Transport Access 13
9.1 Nearest Bus / Train Routes 13
9.2 Nearest Bus Stops 13
9.3 Pedestrian / Cycle Links to Bus Stops 13
9.4 Future Public Transport Facilities 13
10 Pedestrian and Cycle Access Facilities 13
10.1 Existing Pedestrian / Cycling Network 13
10.2 Future Pedestrian / Cycling Network 13
11 Site Specific Issues 14
11.1 Turn Treatment Warrant Assessment 14
11.2 Sight Distance Assessment 15
12 Safety Issues 18
13 Summary and Conclusions 19

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

REPORT DETAILS

Unique Document Identification

	Information
Document Title	Transport Impact Statement Lot 22 (9730) Caves Road, Hamelin Bay – Proposed Extractive Industry
Project Number	PTG/00626
Document ID	Rev D
Client	McDougall Quarries Pty Ltd

PTG Consulting Office Details

	Information
Location	Perth
Telephone	0452 530 042
Email	ray.cook@ptgconsulting.com.au

Revision Details

Revision No.	Date	Comments
Rev A	5/8/2024	Draft
Rev B	6/8/2024	Final
Rev C	15/8/2024	Updated Site Plan
Rev D	3/9/2024	Minor updates

Document Approval

Author	Approved By
SGL	RJC

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

1 INTRODUCTION

1.1 Background

PTG Consulting (PTG) has been commissioned by **McDougall Quarries Pty Ltd** to prepare a Transport Impact Statement (TIS) for the proposed extractive industry (lime sands quarry) to be located at Lot 22 (9730) Caves Road, Hamelin Bay.

This report has been prepared in accordance with the Western Australian Planning Commission (WAPC) Transport Assessment Guidelines for Developments: Volume 4 – Individual Developments (2016) and the Transport Impact Statement (TIS) Checklist is included at **Appendix A**.

Specifically, this report aims to assess the operations of the proposed development internally and its connections to the adjacent road network, with a focus on traffic volumes, access and accessibility.

This report also outlines the requirements and opportunities associated with traffic and transport within the development, referencing relevant Council and WAPC policies and guidelines as well as best-practice planning within Western Australia.

2 PROPOSED DEVELOPMENT

2.1 Site Location

The site is located at Lot 22 (9730) Caves Road, Hamelin Bay. The Site is bounded by Caves Road in the east, Cosy Corner Road in the south and Leeuwin-Naturaliste National Park in the west.

Refer to **Figure 1** for the Site location.

Figure 1 – Site Location



Source: SLIP

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

2.2 Context with Surrounds

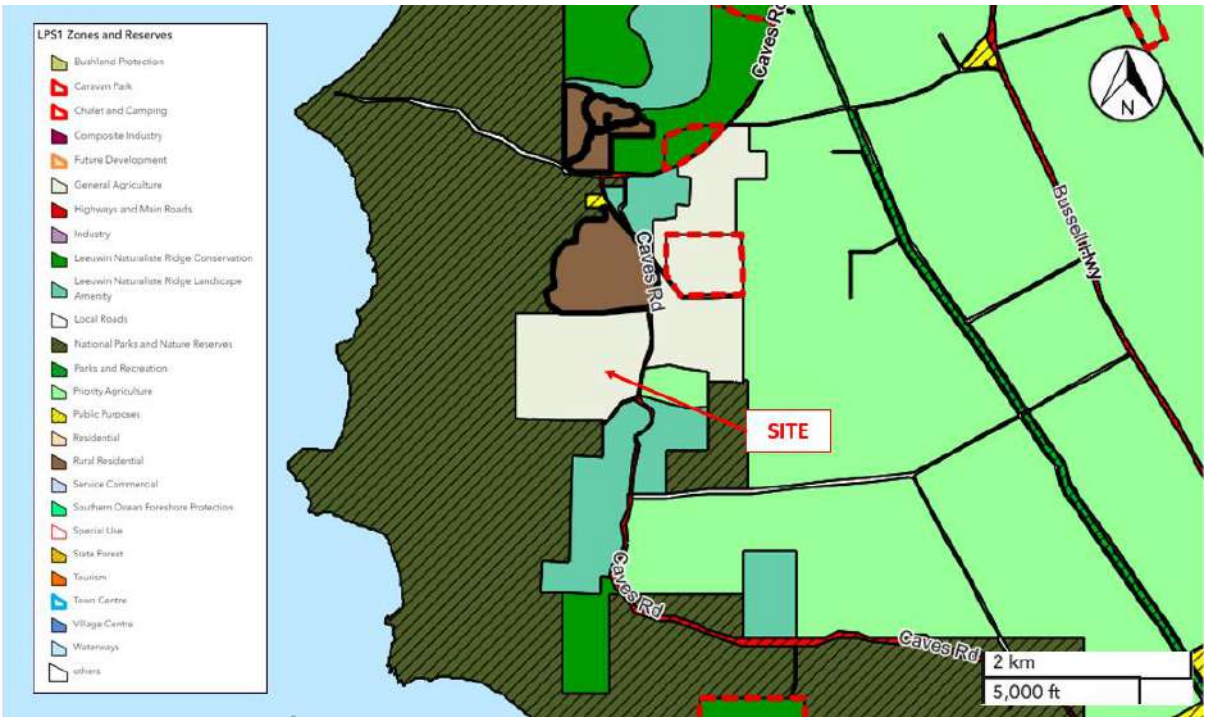
The Site is located approximately 7km south west of Karridale and 15km north of Augusta.

No major attractors and generators are located within 800m of the subject site.

Surrounding land uses mostly consist of Leeuwin-Naturaliste National Park to the west and undeveloped rural land to the east. An existing extractive industry is located nearby on Lot 61 (42) Grosse Road. To the north of the Site a large lot residential subdivision 'The Ridge at Hamelin Bay' is also being developed.

Figure 2 shows the zoning within the surrounding area of the Site.

Figure 2 – Land Use Zoning within the Surrounding Area of the Site



Source: DPLH – Local Planning Scheme 1, Shire of Augusta Margaret River

2.3 Existing Land Use

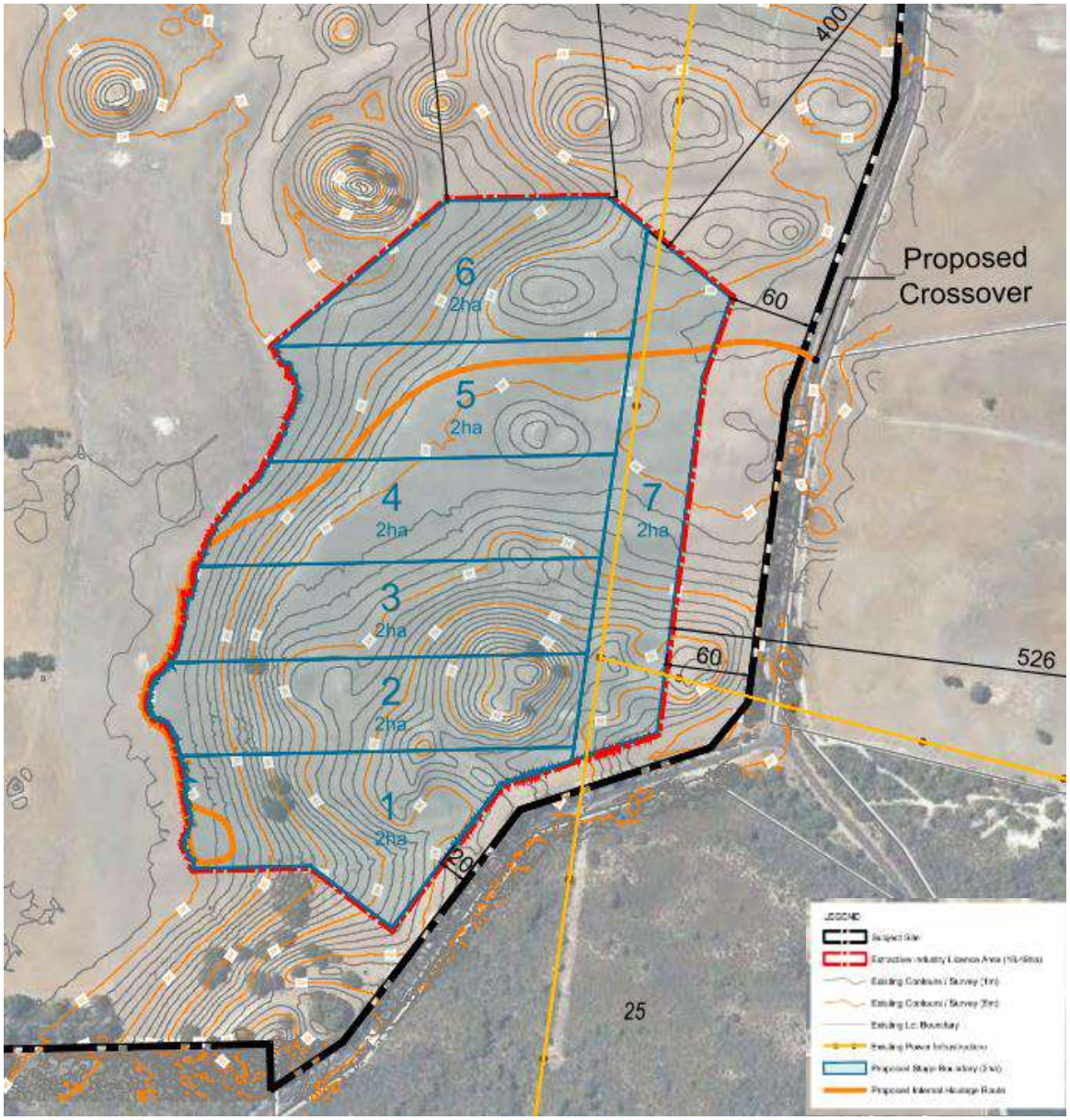
The site currently consists of 118ha of undeveloped rural land, used predominantly for grazing.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

2.4 Proposed Land Use

The proposed development contemplates an extractive industry (lime sands quarry), across a total of 18ha of the site as illustrated in **Figure 3**. A larger version of the site plan is included in **Appendix B**.

Figure 3 – Proposed Development



Source: Element

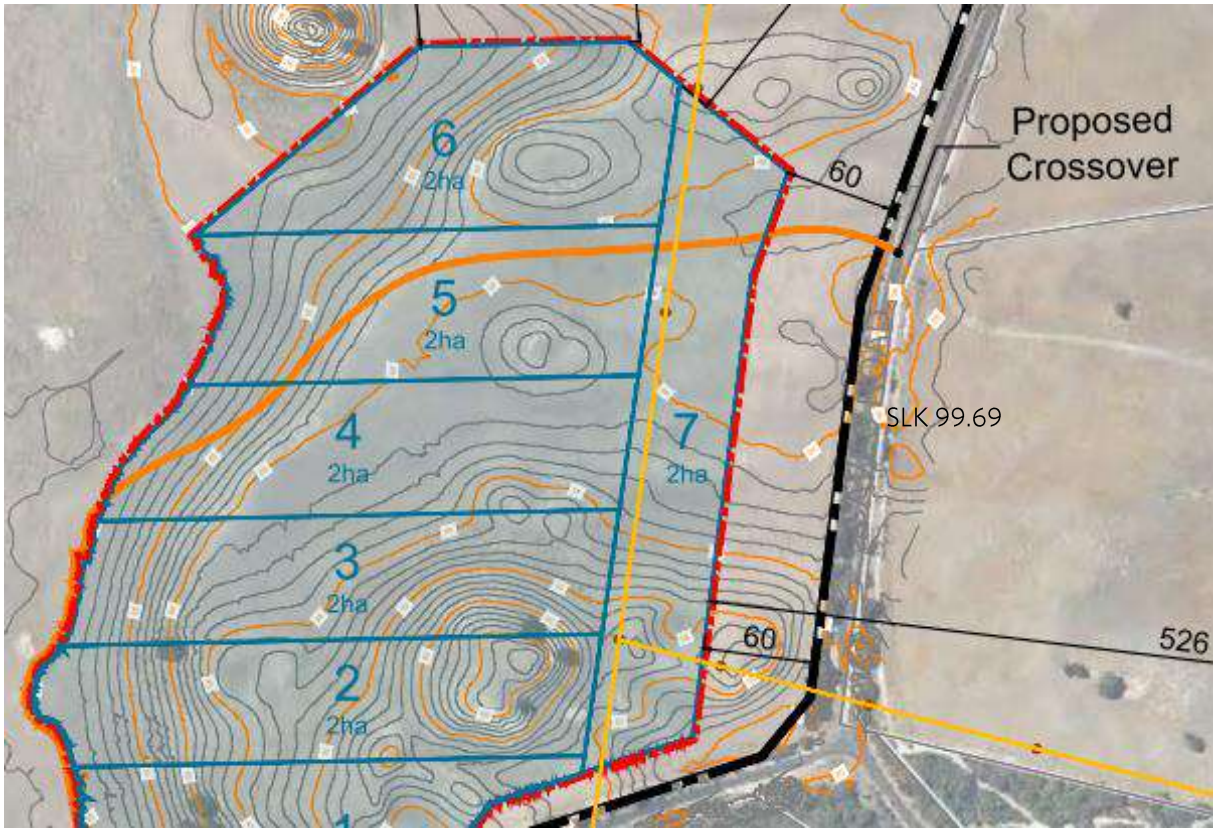
RECEIVED
By Shire of Augusta Margaret River
13 September 2024

3 VEHICULAR ACCESS AND PARKING

3.1 Access Arrangements

Access to the Site is via a proposed crossover on Caves Road, located at SLK 99.69, as indicated on **Figure 4**.

Figure 4 – Proposed Crossover Location



Source: Element

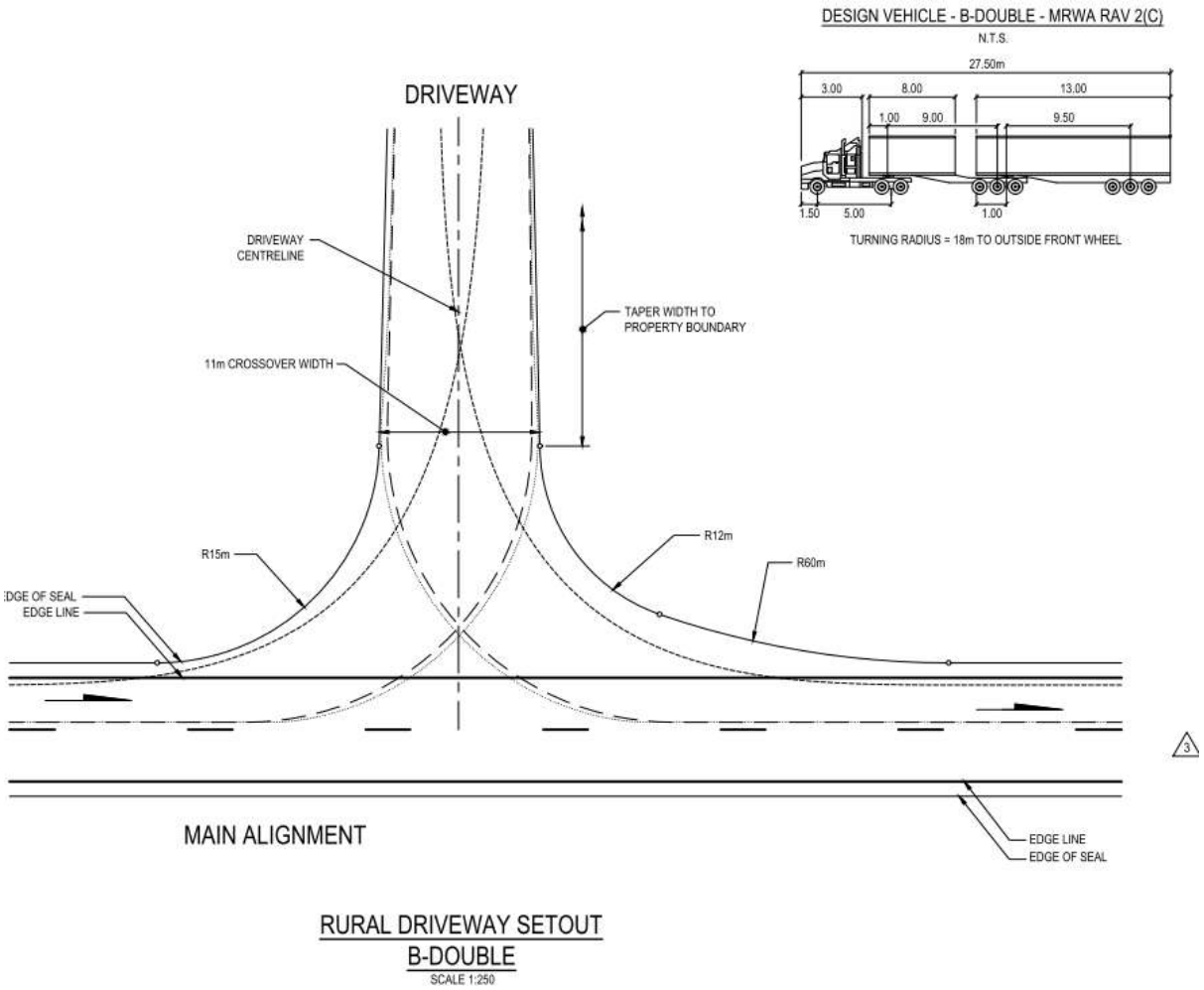
A site inspection was undertaken in July 2024, during which the entire frontage of the Site was examined with a view to identifying the optimum location for a crossover to Caves Road. As this section of Caves Road consists of a curving and undulating road alignment, the proposed crossover location has been selected to provide the maximum available sight distance to both the north and the south. For details of the available sight distance for the proposed crossover, refer to Section 11 – Site Specific Issues.

The proposed crossover will be located opposite two existing crossovers to Lot 31 (18) Grosse Road and Lot 29 (9789) Caves Road, Deepdene. As these crossovers serve undeveloped grazing land, it is anticipated that traffic movements will be extremely low and therefore no issues with the crossover location were identified.

The crossover will be designed to accommodate 27.5m B-double (RAV4) vehicle movements in all directions, in accordance with the typical design specification shown in Main Roads drawing 200431-0195 (**Figure 5**).

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Figure 5 – Guideline Drawing – Rural Driveway Setout – B-Double



Source: Main Roads WA

3.2 Public, Private, Disabled Parking Set-Down & Pick-Up

No formalised parking is proposed on site. Suitable informal areas for the parking of light and heavy vehicles will be developed in accordance with operational requirements.

4 SERVICE/DELIVERY VEHICLES (NON-RESIDENTIAL)

4.1 Access Arrangements

All service and delivery vehicles will use the proposed crossover on Caves Road as described in Section 3.1.

4.2 Loading Facilities

There will be suitable loading and unloading facilities within the proposed site.

5 SERVICE VEHICLES (RESIDENTIAL)

Not applicable as proposal is for an extractive industry.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

6 HOURS OF OPERATION (NON-RESIDENTIAL)

The proposed development is anticipated to operate 7am – 5pm Monday to Saturday.

7 TRAFFIC VOLUMES

7.1 Development – Daily / Peak Traffic Volumes

Trip generation for the proposed development has been estimated based on the following information provided by the Applicant:

- A maximum of 15 laden B-doubles per day.
- 2 staff on-site to operate to the loader and dozer/excavator.

The maximum of 15 laden B-doubles per day is likely to occur only during short peak periods of the year, depending on customer requirements. Over the full year, the average daily volume is expected to be much lower.

Peak hours are not known at this stage, so for a robust assessment, it has been assumed a maximum of 4 laden B-double movements could occur during one hour during busy periods.

For a robust assessment, it has been assumed that both on-site staff may visit the site twice per day (e.g. leaving for lunch break and returning).

Table 1 summarises the estimated traffic generation during for both peak hour and daily.

Table 1 – Development Trip Generation

Users	Peak Hour		Daily	
	IN	OUT	IN	OUT
Light Vehicles	0	0	4	4
Heavy Vehicles	4	4	15	15
Total	4	4	19	19
	8		38	

As can be seen from the table above, the proposed development is estimated to generate approximately 8 trips in the peak hour and 38 trips daily.

The trip generation associated with the development falls within the "low impact" range according to WAPC TIA guidelines.

7.2 Types of Vehicles

The largest vehicle expected to access the Site is a 27.5m B-double (RAV4). Smaller trucks

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

8 TRAFFIC MANAGEMENT ON FRONTAGE STREETS

8.1 Road Hierarchy

The road network within Western Australia is defined by Main Roads WA road hierarchy which describes the function, characteristic and management of each type of road. A description of each road type as per Main Roads WA Road Hierarchy criteria is summarised in **Table 2** below.

Table 2 – Road Hierarchy Description

Road Type	Description
Primary Distributors	Provide for major regional and inter-regional traffic movement and carry large volumes of generally fast moving traffic. Some are strategic freight routes, and all are State Roads. They are managed by Main Roads Western Australia.
District Distributor A	Carry traffic between industrial, commercial and residential areas and generally connect to Primary Distributors. These are likely to be truck routes and provide only limited access to adjoining property. They are managed by local government.
District Distributor B	Perform a similar function to type A District Distributors but with reduced capacity due to flow restrictions from access to and roadside parking alongside adjoining property. These are often older roads with a traffic demand in excess of that originally intended. District Distributor A and B roads run between land-use cells and generally not through them, forming a grid which would ideally space them around 1.5 kilometres apart. They are managed by local government.
Regional Distributor	Roads that are not Primary Distributors, but which link significant destinations and are designed for efficient movement of people and goods within and beyond regional areas. They are managed by local government.
Local Distributor (Urban)	Roads that carry traffic within a cell and link District Distributors or Regional Distributors at the boundary, to access roads. The route of Local Distributors should discourage through traffic so that the cell formed by the grid of District Distributors only carries traffic belonging to or serving the area. These roads should accommodate buses but discourage trucks. Urban Local Distributor roads are managed by local government.
Local Distributor (Rural)	Connect to other Rural Distributors and to Rural Access Roads. Not Regional Distributors, but which are designed for efficient movement of people and goods within regional areas. Rural Local Distributor roads are managed by local government.
Access Roads	Provide access to abutting properties with amenity, safety and aesthetic aspects having priority over the vehicle movement function. These roads are bicycle and pedestrian friendly. They are managed by local government.

Figure 6 shows the road hierarchy network and **Table 3** provides a summary of the road characteristics of the surrounding road network.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Figure 6 – Road Hierarchy



Source: Main Roads WA Road Information Mapping System (RIMS)

Table 3 – Surrounding Network Road Hierarchy

Road Name	Road Hierarchy	No. of Lanes	No. of Footpaths	Road Pavement Width (m)	Speed Limit
Caves Road	Primary Distributor	2	0	~6.1m	80km/h
Cosy Corner Road	Access Road	2	0	~6.1m	110km/h

8.2 Restricted Access Vehicle (RAV) Network

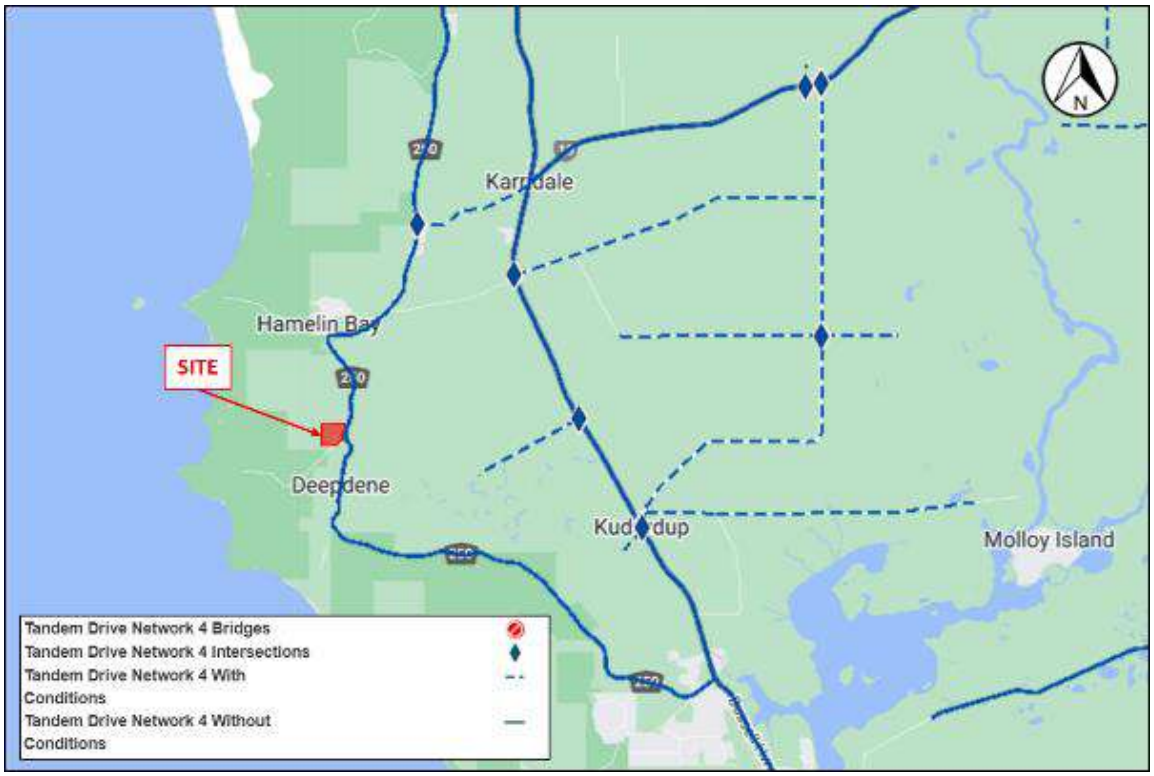
The existing RAV4 network in the vicinity of the Site is shown in **Figure 7.** Unconditional RAV4 access is available via Caves Road to the north and south of the Site, with conditional access also provided along Bushby Road to connect to Bussell and Brockman Highways at Karridale. A summary of the relevant routes is as follows:

- Caves Road – RAV 4 Without Conditions
- Bushby Road – RAV 4 With Conditions
- Bussell Highway – RAV 4 Without Conditions
- Brockman Highway – RAV 4 Without Conditions

RAV movements generated by the Site will utilise existing RAV networks to deliver extracted materials to customers.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Figure 7 – RAV Vehicle Network



Source: Main Roads WA HVS Network Map

8.3 Daily / Peak Traffic Volumes

Existing weekday traffic volumes were obtained from Main Roads WA Traffic Map for key road sections within the vicinity of the Site and are shown below in **Table 4**.

Table 4 – Existing Background Traffic Volumes

Location	Year	Weekday	AM Peak Hour	PM Peak Hour	HV%
Caves Road – South of Cosy Corner Road (1km south of Site)	2018/19	334	43	49	8.1%
Caves Road - North of Bushby Road (6km north of Site)	2023/24	408	53	47	18.4%
Caves Road - West of Bussell Highway (11km south of Site)	2023/24	551	62	58	13.8%

Source: Main Roads WA

As shown in Table 4, the traffic count located closest to the Site is 6 years old and may not reflect current volumes. Therefore, historical data was reviewed for the other two count sites and linear growth rates calculated based on a comparison between 2019/20 and 2023/24 data.

- Caves Road – North of Bushby Road – daily traffic volumes have reduced by 7% since 2019/20 (linear growth rate of -1.48% per annum)
- Caves Road – West of Bussell Highway – daily traffic volumes have reduced by 4% since 2019/20 (linear growth rate of -0.89% per annum)

Based on the above, the 2018/19 daily volume of 334 vehicles per day is considered a reasonable estimate of current traffic on Caves Road in the vicinity of the Site.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

8.4 Future Road Network

PTG is not aware of any planned changes to the road network in the vicinity of the Site.

9 PUBLIC TRANSPORT ACCESS

9.1 Nearest Bus / Train Routes

There are no public transport services located within an 800m radius of the Site.

9.2 Nearest Bus Stops

The closest bus stop to the Site is located on Bussell Highway in Karridale, approximately 7km away from the Site. The stop is served by TransWA coach services between Bunbury and Augusta.

9.3 Pedestrian / Cycle Links to Bus Stops

Not applicable.

9.4 Future Public Transport Facilities

PTG Consulting is not aware of any proposed future public transport services or facilities in the vicinity of the Site.

10 PEDESTRIAN AND CYCLE ACCESS FACILITIES

10.1 Existing Pedestrian / Cycling Network

There are no pedestrian/cycling routes within 400 m of the Site.

10.2 Future Pedestrian / Cycling Network

PTG Consulting is not aware of any planned pedestrian/cycling network development in the vicinity of the Site.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

11 SITE SPECIFIC ISSUES

11.1 Turn Treatment Warrant Assessment

In accordance with Section 2.4.6 'Auxiliary Turn Lanes' of the Main Roads *Driveways* Policy, a turn warrant assessment has been undertaken based on the method formerly located in the Main Roads *Supplement to Austroads Guide to Road Design: Part 4 – Intersections and Crossings: General*.

For a robust assessment, two scenarios have been assessed:

- Scenario 1 – All development traffic movements to/from the north.
- Scenario 2 – All development traffic movements to/from the south.

Peak hour traffic volumes have been taken from Site 52670 (Caves Road, South of Cosy Corner Road – SLK 100.55) for 13:00-14:00 on a weekday.

The results of the turn warrant assessment are presented in **Figure 8**. The peak hour turn volumes have been applied to all turning movements to illustrate both Scenario 1 and Scenario 2 in the one calculation table.

The results indicate that a Standard Right and Standard Left turn treatments are appropriate for the proposed crossover.

Figure 8 – Intersection Warrants

INTERSECTION WARRANTS

Main Roads WA Supplement to Austroads Guide to Road Design - Part 4 A.8

DESIGN SPEED =	90km/h
SPLITTER ISLAND YES / NO =	No
DUAL CARRIAGEWAY YES / NO =	No

MOVEMENT	COUNT (v/h)	HV (%)
Q_{T1} =	26	7.69230769
Q_R =	4	100
Q_{T2} =	22	9.09090909
Q_L =	4	100
Q_{LM} =	4	100
Q_{RM} =	4	100

RIGHT TURN ASSESSMENT

Q_m =	52
% HV =	15.385
x =	0.15
TREATMENT =	SR

LEFT TURN ASSESSMENT

Q_m =	22
% HV =	9.091
x =	0.07
TREATMENT =	SL
OFFSET?	NO

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

11.2 Sight Distance Assessment

Section 4.1 'Sight Distance' of the Main Roads *Driveways* Policy states that it is desirable that Safe Intersection Sight Distance (SISD) is provided at crossovers on state-controlled roads, in accordance with *Main Roads Supplement to Austroads Guide to Road Design: Part 4A – Unsignalised and Signalised Intersections*. However, where this is not possible, sight distance equal to Stopping Sight Distance (SSD) for the design speed for the road shall be provided as an absolute minimum.

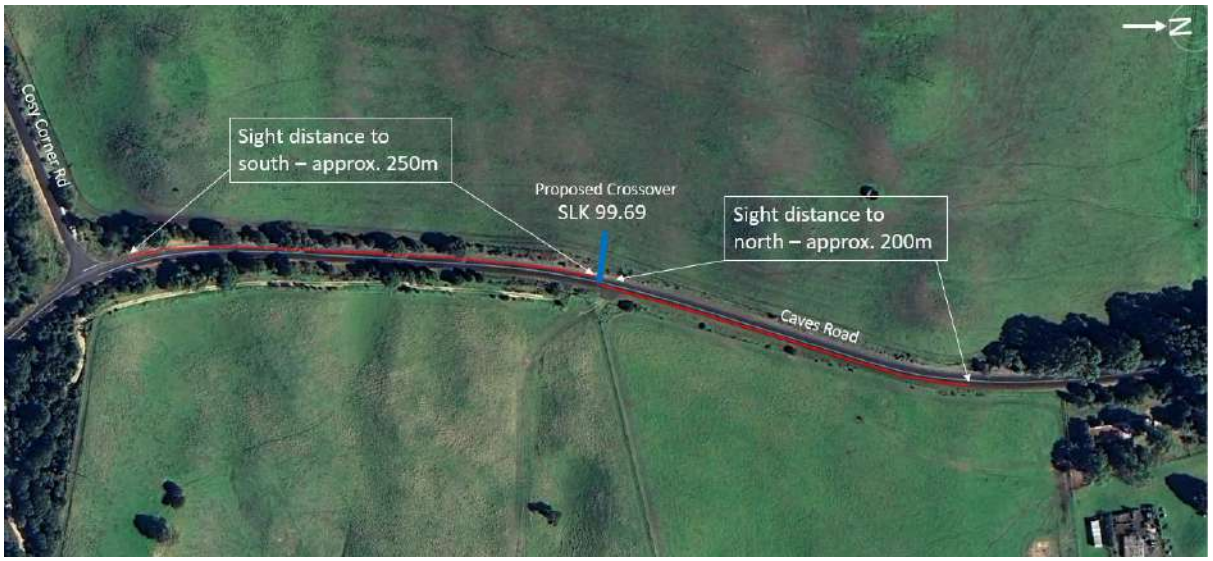
A site inspection was undertaken in July 2024 to determine the preferred location for the crossover. The preferred location is at SLK 99.69[1] as this provides for the maximum sight distance for entering traffic across the entire lot frontage. Photographs illustrating the proposed crossover location and visibility to the north and south are provided in **Figure 10** and Figure 11.

Main Roads Supplement to Austroads Guide to Road Design: Part 4A – Unsignalised and Signalised Intersections, Table 3.2, indicates that SISD is 192m for a design speed of 80km/h and 226m for a design speed of 90km/h. *Austroads Guide to Road Design: Part 3 – Geometric Design*, Table 5.5, indicates that SSD is 114m for a design speed of 80km/h and 139m for a design speed of 90km/h.

Based on site observations, the available sight distance is approximately 200m to the north and 250m to the south, as indicated in **Figure 9**. Sight distance to the north meets SISD for an 80km/h design speed and sight distance to the south meets SISD for a 90km/h design speed. Sight distance in both direction is well in excess of SSD for 90km/h design speed.

As the road alignment to the north consists of a short uphill section followed by a curve right, it is unlikely that southbound traffic is travelling faster than the speed limit before the crossover, and any entering vehicles, become visible.

Figure 9 - Sight Distance



[1] There is some variation between SLK determined from the MRWA GPS-SLK map and those recorded on-site by the MRWA GPS-SLK app

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Figure 10 – Crossover Location Photographs



Looking north from proposed crossover – SLK 99.69



Looking south from proposed crossover – SLK 99.69

Figure 11 - Crossover Location Photographs



Looking south approx. 190m north of proposed crossover (note incorrect SLK recorded by GPS-SLK app)



Looking north at site of proposed crossover (on left)

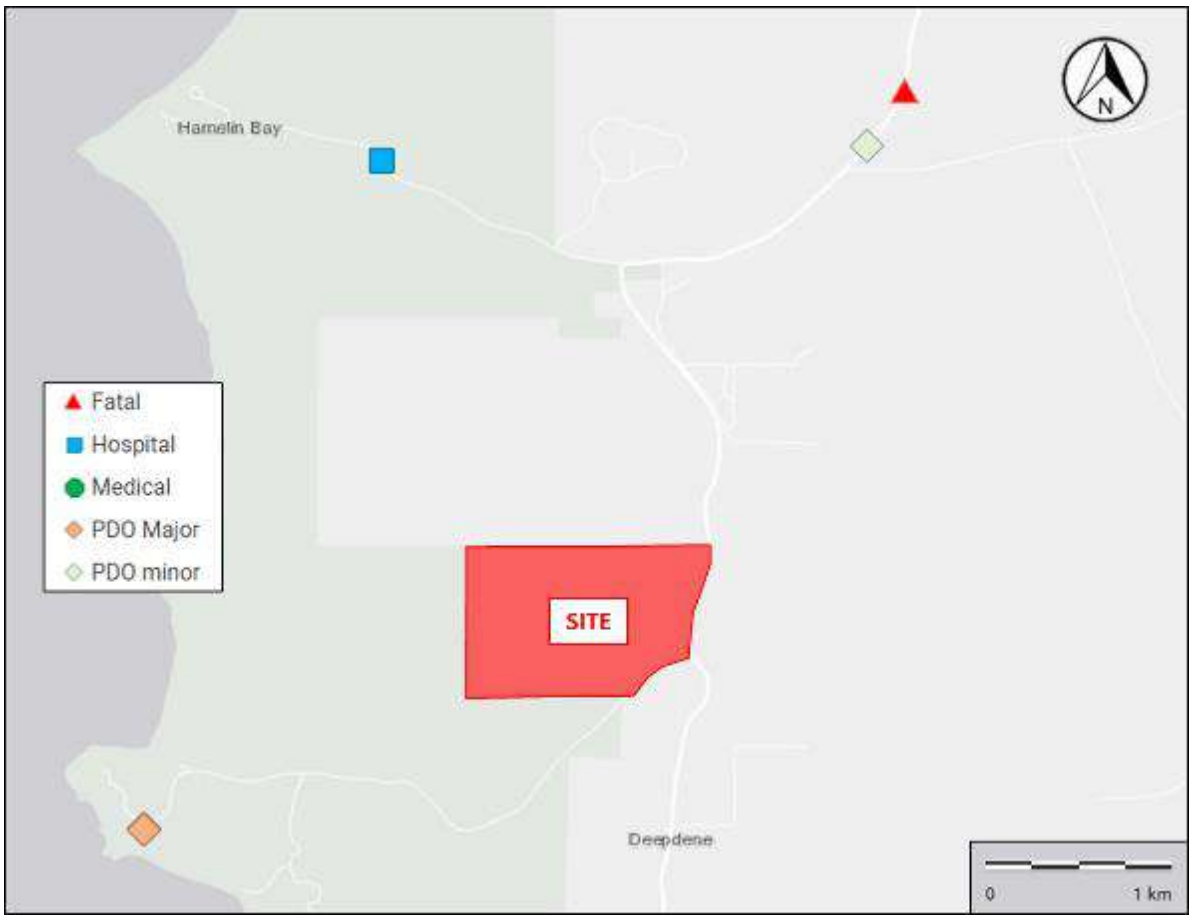
RECEIVED
By Shire of Augusta Margaret River
13 September 2024

12 SAFETY ISSUES

A review of the existing crash data from Main Roads WA Crash Map for the period between 1st January 2019 to 31 December 2023 was conducted for the surrounding roads. The crash locations are illustrated in **Figure 12.**

There are no recorded crashes on Caves Road for a distance of at least 3km either side of the Site. The low volume of traffic movements are not anticipated to have any material impact on road safety.

Figure 12 – Recorded Crash Locations



Source: Main Roads WA Crash Map

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

13 SUMMARY AND CONCLUSIONS

This report has been prepared in accordance with the Western Australian Planning Commission (WAPC) Transport Assessment Guidelines for Developments: Volume 4 – Individual Developments; the checklist is included at **Appendix A**.

The following conclusions can be drawn from this TIS:

- The subject site will be utilised for extractive industry (lime sands quarry).
- The proposed development will generate approximately 38 total daily trips during peak operational periods, consisting mostly of 27.5m B-doubles (RAV4).
- A new crossover is proposed to Caves Road at SLK 99.69. The crossover will be located in a position which maximises the available sight distance, and meets the requirements specified in Main Roads *Driveways* Policy.
- The proposed crossover will be designed in accordance with the general requirements of Main Roads I Policy.
- There are no cycling, walking or public transport facilities within the vicinity of the Site.
- There are no recorded crashes on Caves Road within 3km of the Site.
- The proposed development can be expected to have a low traffic impact.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Appendix A

WAPC CHECKLIST FOR INDIVIDUAL DEVELOPMENT - TRANSPORT IMPACT STATEMENT





RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX A – WAPC CHECKLIST

Item	Status	Comments/Proposal
Proposed development	Section 2	
proposed land use	Section 2	
existing land uses	Section 2	
context with surrounds	Section 2	
Vehicular access and parking	Section 3	
access arrangements	Section 3	
public, private, disabled parking set down / pick up	Section 3	
Service vehicles (non-residential)	Section 4	
access arrangements	Section 4	
on/off-site loading facilities	Section 4	
Service vehicles (residential)	N/A	
Rubbish collection and emergency vehicle access	N/A	
Hours of operation (non-residential only)	Section 6	
Traffic volumes	Section 7	
daily or peak traffic volumes	Section 7	
type of vehicles (e.g. cars, trucks)	Section 7	
Traffic management on frontage streets	Section 8	
Public transport access	Section 9	
nearest bus/train routes	Section 9	
nearest bus stops/train stations	Section 9	
pedestrian/cycle links to bus stops/train station	Section 9	
Pedestrian access/facilities	Section 10	
existing pedestrian facilities within the development (if any)	Section 10	
proposed pedestrian facilities within development	Section 10	
existing pedestrian facilities on surrounding roads	Section 10	
proposals to improve pedestrian access	NA	
Cycle access/facilities	10	
existing cycle facilities within the development (if any)	Section 10	
proposed cycle facilities within the development	N/A	
existing cycle facilities on surrounding roads	Section 10	
proposals to improve cycle access	N/A	
Site specific issues	Section 11	
Safety issues	Section 12	
identify issues	N/A	
remedial measures	N/A	

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Appendix B

SITE PLAN





RECEIVED
By Shire of Augusta Margaret River
13 September 2024

LEGEND
- Subject Site
- Extractive Industry Licence Area (14ha)
- Existing Contours / Survey (1m)
- Existing Contours / Survey (5m)
- Existing Lot Boundary
- Existing Power Infrastructure
- Proposed Stage Boundary (2ha)
- Proposed Internal Haulage Route

9000
22
118.830 ha
27
28
25
29
306
CAVES ROAD
415.6
424.4
400
60
526
20
Proposed Crossover
6 2ha
5 2ha
4 2ha
3 2ha
2 2ha
1 2ha
7 2ha

Excavation Works Plan

Lot 22 (9730) Caves Road, Hamelin Bay

Date: 13 Aug 2024 Scale: 1:5000 @ A3 1:2500 @ A1 File: **24-132 EX01B** Staff: DL CCG JJ Checked: DL

0 100m

element.
Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
PO Box 7375 Cloisters Square, Perth Western Australia 6850.
T. +61 8 9289 8300 | **E.** hello@elementwa.com.au **elementwa.com.au**

© Element Advisory WA Pty Ltd This concept has been prepared for the purpose of meeting client specifications. The drawing does not constitute an invitation,agreement or contract (or any part thereof) of any kind whatsoever. Although care has been taken in the compilation of this drawing by Element Advisory WA Pty Ltd, all parties associated with the proposed property development disclaim all responsibility for any errors or omissions. The right is reserved to change the plan at any time. Liability is expressly disclaimed by Element Advisory WA Pty Ltd for any loss or damage which may be sustained by any person acting on any visual impression gained from this drawing.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024





www.ptgconsulting.com.au



RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Appendix F – Environmental Management Plan

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

accendo AUSTRALIA

DUST MANAGEMENT PLAN

LOT 22 (9730) CAVES ROAD, HAMELIN BAY

August 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Telephone +61 418 950 852

info@accendoaustralia.com.au
PO Box 5178 West Busselton WA 6280
ABN 11 160 028 642

www.accendoaustralia.com.au

Document Control

Version	Date	Author	Reviewer
V1	20/8/2024	PN	KMT/Element
V2	30/8/2024	PN	KMT
Filename	2449_Lot 22 Caves Rd DMP_V2		

Limitations

This report has been prepared by Accendo Australia Pty Ltd in accordance with the scope limitations provided in this report, or as otherwise agreed, between the Client and Accendo.

This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

This report has been prepared based upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report, which Accendo has not independently verified or checked beyond the agreed scope of work. Accendo does not accept liability in connection with such unverified information.

The conclusions and recommendations in this report are based on assumptions made by Accendo described in this report where and as they are required. Accendo disclaims liability arising from any of the assumptions being incorrect.

The report is based on site specific conditions encountered and information received at the time of preparation of this report or the time that site investigations were undertaken. Accendo disclaims responsibility for any changes that may have occurred after this time.

The preparation of this report has been undertaken and performed in a professional manner, in consideration of the scope of services and in accordance with environmental consulting practices. No other warranty is made.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

CONTENTS

1 INTRODUCTION 1
1.1 BACKGROUND 1
1.2 PURPOSE AND SCOPE 1
2 EXISTING ENVIRONMENT 2
2.1 LAND USE 2
2.2 SENSITIVE RECEPTORS 2
2.3 TOPOGRAPHY AND SOILS 2
2.4 CLIMATE 3
3 EXTRACTION ACTIVITIES 4
3.1 OPERATIONAL WORKS 4
3.1.1 Final Contours 5
3.1.2 Water Usage 5
4 POTENTIAL IMPACTS 6
4.1 DUST SOURCES 6
4.2 RISK ASSESSMENT 6
4.3 MANAGEMENT MEASURES 8
REFERENCES 12
FIGURES 13
APPENDIX A – EXCAVATION WORKS PLAN 14
APPENDIX B – WIND ROSES 15
APPENDIX C – POST EXTRACTION PLAN 16
APPENDIX D - COMPLAINTS REGISTER 17

TABLES

Table 1. Residential dwellings within 500 m of subject site 2
Table 2. Dust management measures 9

FIGURES

Figure 1. Regional Location of the Subject Site

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

1 INTRODUCTION

1.1 Background

McDougall Quarries Pty Ltd (the applicant) is proposing to extract lime sand and limestone from a 14 hectare (ha) area within Lot 22 (HSE 9730) Caves Road, Hamelin Bay (herein referred to as the subject site) (refer to **Figure 1** and **Appendix A**).

This application is made for a ten year period however, the exact life of the project is difficult to estimate as it will be dependent on supply and demand trends.

The available volume of sand (*insitu* volume of approximately 1,314,489 m^3) is to be extracted, commencing in the south and moving in a northerly direction before finishing in a stage along the east of the subject site (refer to **Appendix A**).

The slope of the final contours of the quarry will be approximately 30 m AHD which is consistent with the adjoining land.

Slopes of the batters at the end of excavation will be retained at 1:4 vertical to horizontal.

1.2 Purpose and Scope

This Dust Management Plan (DMP) has been prepared to fulfil the relevant requirements provided within the Shire of Augusta-Margaret River's (the Shire) *Local Planning Scheme No. 1* and *Local Planning Policy No. 3 Extractive Industries*. It is intended to provide the Shire, the public and relevant government agencies with an understanding of the proposal and the environmental strategies and commitments proposed to address dust emissions associated with the proposed land use. This document has been prepared to support and should be read in conjunction with, the *Environmental Management Plan* prepared by Accendo Australia (2024) for sand and limestone extraction within the subject site.

Recognised industry standard practices for dust control are well-established within Western Australia. The utilisation of these standard practices is proposed at the subject site to suppress dust and reduce potential impacts associated with dust emissions.

Management of these activities are an effective means to prevent adverse effects of dust. The purpose of this DMP is to review the risks and control measures to appropriately manage dust and mitigate its impact.

The scope of the DMP is to cover the following:

- Legislative and regulatory compliance;
- Existing environment;
- Risk assessment of potential dust sources and air quality impacts;
- Mitigation and measurement measures; and
- Roles and responsibilities in relation to dust management.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

2 EXISTING ENVIRONMENT

2.1 Land Use

The subject site is zoned 'General Agriculture' pursuant to the Shire's *Local Planning Scheme No.* 1 and has previously been used for agriculture. The subject site is currently used for pasture.

The surrounding properties are zoned 'Rural Residential' to the north, 'National Park and Nature Reserve' to the west and south and a mixture of 'General Agriculture', 'Priority Agriculture' and 'Landscape Amenity' to the east pursuant to the Shire *Local Planning Scheme No. 1*.

2.2 Sensitive Receptors

The Environmental Protection Authority (EPA) *Guidance for the Assessment of Environmental Factors* (June 2005) provides generic separation distances to assist in the determination of suitable buffers where industry may have the potential to affect the amenity of a sensitive land use. In particular, for extractive industries, a buffer distance of 300 m to 500 m is recommended from sensitive land uses.

The closest residential dwellings to the subject site are provided below and shown in **Appendix A.**

Table 1. Residential dwellings within 500 m of the subject site.

Address	Distance to subject site (m)
Lot 31 (18) Grosse Road	400 m
Lot 9001 (Hamelin Ridge Estate)	>415 m
Lot 28 (9789) Caves Road	526 m

The closest residential dwelling to the subject site is located approximately 400 m to the north east of the subject site. Hamelin Ridge Estate, where most dwellings are yet to be constructed, is located to the north of the subject site, at distances greater than 415 m from the boundary. An additional residential dwelling is located to the east of the subject site at a distance greater than 500 m away.

2.3 Topography and Soils

The current topography of the subject site can be described as variable with the elevation ranging from 30 m Australian Height Datum (AHD) through the eastern portion of the subject site to approximately 40m AHD in the west. Elevated areas are located throughout the subject site and range in elevation from approximately 45 m AHD to 60 m AHD (refer to **Appendix A**).

The subject site is located within the Leeuwin Zone landform within the Gracetown Ridge systems consisting of "*lateritic plateau containing sandy gravel, loamy gravel and grey sandy duplex*" and *"a limestone ridge, in the coastal edge of the Leeuwin Zone containing yellow deep sand and red deep sand",* respectively. (Tille 2006).

The subject site is located within the following sub-systems:

- Kilcarnup rocky dunes phase – Low to steep dunes (gradients 5-10%) not exposed to prevailing wines. Dark calcareous sands containing limestone rubble.
- Kilcarnup dunes (organic) phase – Steep dunes (gradients usually in excess of 20%) not exposed to prevailing winds. Deep pale calcareous sands with brown topsoil.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

2.4 Climate

The climate of the locality is classified as Mediterranean with warm to hot summers and cool wet winters.

The closest weather recording station is Cape Leeuwin (Station 9518). Temperatures are highest on average in February, at approximately 23.4°C. August has the lowest average temperature of the year of 11.3°C.

Rainfall for the area is approximately 950 mm per annum with approximately 88% of the rain falling during the winter months, April to October inclusive. Evaporation generally exceeds rainfall from October to March.

During the summer months the dominant wind in the mornings is from the south-east at 18 - 26 kms, swinging to the south-west at 37-46 kms in the afternoon. During winter, the winds are most commonly 18 - 26 kms with no dominant prevailing direction. During storms winds from the west and north-west can reach 74 kms (BoM 2020).

Rainfall intensity has been calculated using the Bureau of Meteorology (BoM) Intensity-Frequency-Duration (IFD) data system which yields the two hour 10 year average return interval storm event for the subject site as 38.3 mm/hr (refer to **Appendix B)**.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

3 EXTRACTION ACTIVITIES

The lime sand and limestone quarry will cover an area of approximately 14 ha, with a current maximum elevation ranging from 30 m AHD to 60 m AHD. It will be excavated to an elevation of 30 m AHD commencing in the south of the subject site and heading north. Extraction activities will be divided into seven stages, of 2.0 ha in size (refer to **Appendix A**).

It is estimated that the total maximum volume of material to be removed will be approximately 1,314,489 m^3. Over a ten year period, a maximum of approximately 131,449 m^3 will be excavated each year, depending on supply and demand.

Earthen bunds for noise mitigation will be constructed with topsoil and overburden that will be stripped from the extraction footprint and other areas within the premise boundary. Construction of the bunds will be undertaken with an excavator and loader.

The planned end use of the quarry is to restore a natural soil profile and return the extraction area to pasture, ensuring that there is no net loss of agricultural land.

3.1 Operational Works

Using a loader, the topsoil (where available) will be stripped and placed in stockpiles. Overburden, if present, will be removed using a dump truck and stockpiled to a convenient location within each extraction stage for operations. Topsoil stockpiles will be less than 2 m high with a batter no greater than 1:3.

In order to comply with noise regulations, surface works with the dozer must commence from the western most point and clear a sufficient area on the western side of Stage 1 to reach the material. Once a sufficient depth (5-6m) is achieved within Stage 1, progression of the pit through to Stage 2 can continue with the use of the dozer (Herring Storer Acoustics, 2024).

The material will be excavated by an excavator, bulldozer or loader to a stockpile or loaded directly to waiting trucks for transport. A summary of the proposed extraction activities is provided below:

- Prior to excavation commencing the site will be ground surveyed, the excavation footprint marked out and a 1 m contour plan developed.
- The topsoil/overburden will be stripped and used to construct earthen bunds using a loader.
- An excavator or front-end loader will be used to dig the sand and transport it to a stockpile.
- The sand will then be picked up by a loader and loaded to trucks for transport.
- All static and other equipment, will be located on the floor of the quarry to provide visual and acoustic screening.
- Excavation will commence in the south of the quarry initially moving north before returning to the east to complete extraction works. The face and walls of the pit will act as noise barriers.
- Crushing and screening of material may be required. Where crushing and screening is required noise bunds will be constructed to ensure compliance with the noise regulations.
- Upon completion of each section of quarry, the section will be reformed and back filled using a combination of equipment such as a tracked bobcat, excavator and front end loader, where subgrade material is available, to achieve the proposed final contours.
- At the end of excavation, the noise bunds will be removed, and the floor of the quarry will be deep ripped, covered by overburden and topsoil, and rehabilitated to a constructed soil.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

3.1.1 Final Contours

The final surface contours of the quarry will be approximately 30 m AHD which is consistent with the adjoining land.

Slopes of the batters at the end of excavation will be retained at 1:4 vertical to horizontal (refer to **Appendix C**).

3.1.2 Water Usage

Water is only required for dust suppression within the quarry and the access road. Water will be sourced either onsite or nearby. Should an onsite source be required, a DWER licence will be obtained for the extraction of water.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

4 POTENTIAL IMPACTS

4.1 Dust Sources

The proposed extraction activities will involve the disturbance of large quantities of soil and earthen material. Specifically, this may include the following activities:

- Earthworks during extraction activities;
- Topsoil stripping;
- Loading and transportation of material;
- Screening of material;
- Vehicle movement within the site; and
- Wind erosion of exposed surfaces.

These activities have the potential to generate dust that, if not adequately controlled, can cause nuisance and safety risks. In-pit operations tend to generate less dust than surrounding activities due to the reduced airflow within the pit. The removal and replacement of topsoil material has the highest risk associated with dust generation due to the large volumes of material involved and generally lower levels of soil moisture.

4.2 Risk Assessment

In accordance with the DWER's "*A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities*", a risk assessment for dust emissions has been prepared (DWER 2021).

For a site that is generating uncontaminated dust, such as extractive industry sites, the site classification chart in Appendix 1 of the DWER guideline can be used for assessing the site risk. Appendix 1 also details the provisions and contingency arrangements for dust management which apply to each site classification score.

The site classification assessment is provided below.

Part A. Nature of site

Item	**Score Options**				**Score**
1.Nuisance potential of soil when disturbed	Very low - 1	Low – 2 *Material is of coarse composition*	Medium - 4	High - 6	2
2. Topography and protection provided by undisturbed vegetation	Sheltered and screened - 1	Medium screening – 6 *Screening provided by stabilised bunds and roadside vegetation*	Little screening – 12	Exposed and wind prone - 18	6

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

3. Area of site disturbed by the works	Less than 1ha - 1	Between 1 and 5ha – 3 *Excavation will occur in stages less than 2 ha.*	Between 5 and 10ha – 6	More than 10ha - 9	3
4. Type of work being done	Roads and trenches - 1	Roads, drains and medium deep sewers - 3	Roads, drains, sewers and partial earthworks - 6	Bulk earthworks – 9 *Sand extraction*	9
Total score for Part A					20

Part B. Proximity of site to other land uses

Item	**Score Options**				**Score**
1.Distance of other land uses from site	More than 1km - 1	Between 1km and 500m – 6	Between 100m and 500m - 12	Less than 100m - 18	12
2. Affect of prevailing wind direction (easterly) on other land uses	Not affected - 1	Isolated land uses affected by one wind direction – 6	Dense land uses affected by one wind direction – 9	Dense/sensitive land uses highly affected by prevailing winds - 12	6
Total score for Part A					18

Site Classification Score (A x B) = 360

Classification 2 (score between 200 and 399, considered **Low risk**). The provisions, contingency arrangements and monitoring requirements as specified by the DWER (2011) associated with a Classification 2 proposal are provided below.

Provisions:

The developer shall supply a contingency plan to the local government, which shall detail the activities should dust impacts occur.

Contingency arrangements:

If required, include an allowance for water-cart operation, wind fencing and surface stabilisation during the construction period for the purposes of dust suppression.

All areas of disturbed land should be stabilised to ensure that the disturbed area exposed at any time is kept to a practical minimum.

Monitoring requirements:

Complaints management system in place.

Notice to be erected at the site providing contact details of the person to be contacted.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

4.3 Management Measures

While the potential impacts to amenity from dust emissions are considered low, standard dust suppression measures will be implemented during operation activities, as provided within **Table 2**.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Table 2. Dust management measures.

Legislation and Key Standards		
Environmental Protection Act 1986 (EP Act) *A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities* (DEC 2011)		
Objectives		
• Minimise dust lift during all activities. • No adverse dust impacts to sensitive receptors from the quarry operations.		
Targets		
• No visible dust beyond the property boundary. • No dust complaints.		
Management Actions		
Description	**Responsibility**	**Timing**
Notice to be erected at the site, providing contact details of the person to be contacted regarding the works. This person will also be available outside of operational hours to address any complaints.	Site Manager	Prior to extraction
Induction for all employees will include information on: • Potential sources of dust • Dust Management Plan • Speed limits onsite and staying on designated roads • Reporting procedure for dust issues	Site Manager	Prior to extraction
Topsoil stripping shall not occur during the following conditions: • Winds in excess of 30 km/hr;	Site Manager	Topsoil stripping and bund construction

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Areas of land cleared and the period of time they remain cleared are to be kept to a minimum.	Site Manager	At all times
Water trucks are to water down unsealed roads during operation to reduce dust lift.	Site Manager	As required
Stockpiles, will be limited to 3 m in height.	Machine Operator	At all times
Temporary stockpiles and exposed areas will be watered and stabilised as required. Stabilisation techniques that will be considered depending on environmental conditions will include hydro-mulching.	Site Manager	As required
Transport of dust-prone material will be via covered trucks or dampened prior to transport to prevent dust lift during transport.	Drivers	During soil transport activities
Water trucks are to be available at all times during quarry activities to water the site on observation of dust lift.	Site Manager	As required
Vehicle speeds will be restricted to no more than 30km/hr on the site to minimize dust lift off.	Drivers	At all times
Wind fencing and soil stabilisation equipment will be available for commissioning if required.	Site Manager	As required
Maintain a complaints register (refer to **Appendix D**). A Complaints Register will be established for the site to record the following information: • Date, time, location and nature of the exceedance. • Identify the cause (or likely cause) of the exceedance and responsible parties. • Identify the activities that were occurring at the time of the non-compliance. • Determine the activities that were most likely contributing to the non-compliance. • Describe what action has been taken to date. • Describe the proposed measures to address the exceedance.	Site Manager	As required

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Monitoring			
Description	**Parameter**	**Responsibility**	**Frequency**
Visual monitoring of dust will be ongoing throughout the day during operations. All monitoring is to be maintained on a logging sheet for reference and proof of compliance.	Dust lift and signs of dust deposition near property boundary. Evidence of no visible dust crossing the site boundary will be used as the visual monitoring criteria for compliance.	Site Manager	Continuous

Contingency and Corrective Actions		
Incident or Consequence	**Corrective Action**	**Responsibility**
Observation of excessive dust lift onsite	Report and investigate as incident.	Site Manager
	Halt work within proximity of the area until cause of dust is addressed.	Site Manager
	Increase dust mitigation measures (e.g. additional watering of exposed areas).	Site Manager
Complaint received	Report and investigate as incident. To determine the validity of the complaint, the wind direction, wind speed and activities being undertaken on site at the time of the complaint will be established.	Site Manager
	If required, halt work until cause of dust is addressed.	Site Manager
	If the complaint is verified as being due to a site source, remedial action will be undertaken within 2 hours. The Shire will be advised of all complaints as soon as they are received. If a complaint cannot be resolved within the 2 hour response period, it may be necessary to cease operations.	Site Manger
	Review dust management procedures and adjust if deemed necessary.	Site Manager

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

REFERENCES

Accendo Australia (2024). *Works and Excavation. Plan, Lot 22 (9730) Caves Road, Hamelin Bay*. Busselton, WA.

Barnesby, B.A. and Proulx-Nixon, M.E. (2000). *Land resources from Harvey to Capel on the Swan Coastal Plain, Western Australia - Sheets 1 and 2.* Land Resources Maps No. 23/1 and 23/2. Agriculture Western Australia.

Churchward, H.M. and McArthur, W.M. (1978). Landforms and soils of the Darling System, Western Australia. In *'Atlas of Natural Resources, Darling System, Western Australia'*. Department of Conservation and Environment, Western Australia.

Department of Primary Industries and Regional Development (DPRD) (2019). *Interpolated contours lines at 2 metre intervals database*. Accessed August 2021.

Environmental Protection Authority (EPA) (2005). *Guidance for the Assessment of Environmental Factors.*

Environmental Protection Authority (EPA) (2006). *Guidance Statement No.10 for the Assessment of Environmental Factors (in accordance with the EP Act 1986: Levels of Assessment for Proposals Affecting Natural Areas Within the System 6 Region and Swan Coastal Plain Portion of the System 1 Region.*

Environmental Protection Authority (EPA) (2009). *South West Regional Ecological Linkages.* Bulletin No 8. Retrieved from: http://epa.wa.gov.au/EPADocLib/3040_SWREL_EPB821009.pdf

Geological Survey of Western Australia (1978). *Geology and mineral resources of Western Australia, memoir 3*. Geological Survey of Western Australia, Perth, WA.

Heddle, E.M., Loneragan, O.W. and Havel, J.J. (1980). *Darling Systems – Vegetation Complexes, In: Atlas of Natural Resources Darling System*, Western Australia, Department of Conservation and Environment, Perth.

Molly, S., Wood, J. Hall, S., Wallrodt, S. & Whisson, G. (2009). *South West Regional Ecological Linkages Technical Report*. Available from: http://walga.asn.au/AboutWALGA/Policy/SouthWestBiodiversityProject/SouthWestRegionalEcologicalLinkagesTechnicalReport.aspx

Semeniuk, C. A. & Semeniuk, V. (1995). *A geomorphic approach to global classification for inland wetlands*. Vegetation, 118, 103-124.

Thackway, R, and Cresswell, ID, (Eds) (1995). *An Interim Biogeographic Regionalisation for Australia: a framework for establishing the national system of reserves*, Version 4.0. Australian Nature Conservation Agency, Canberra.

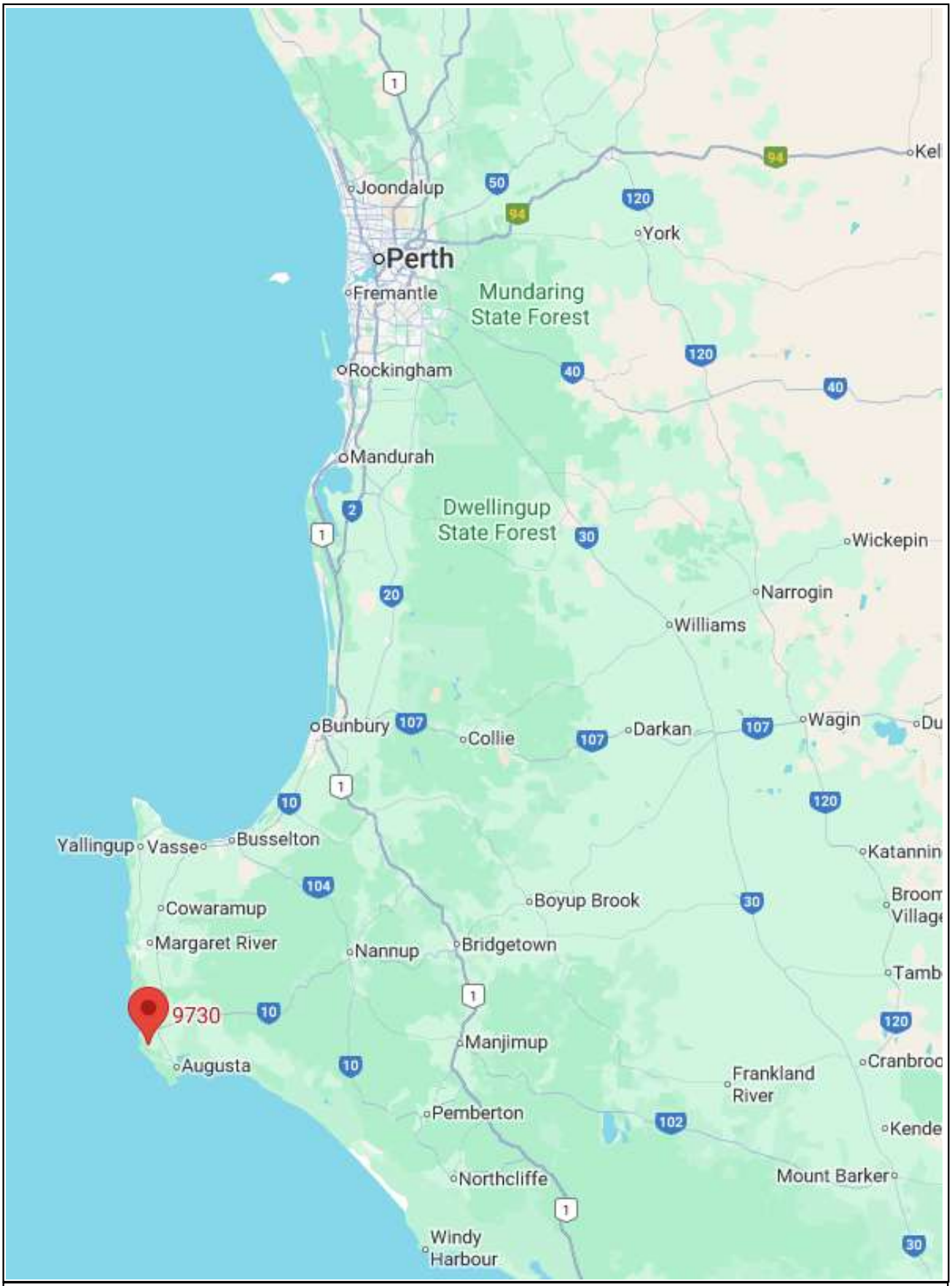
Tille, P (2006). Soil-Landscape Zones of the WA Rangelands and Interior.

Western Australian Planning Commission (WAPC) (2007). *Planning Bulletin No. 64: Acid Sulfate Soils*, Western Australian Planning Commission, Western Australia.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

FIGURES

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



PROJECT	Lot 22 Caves Road, Hamelin Bay	Project Number	Drawing Number	Revision
		2449	Figure 1	A
DRAWING TITLE	Figure 1 - Regional location of the subject site	Designed PN	Checked	
		Drawn PN	Approved	
CLIENT	McDougall Quarries Pty Ltd	Date	20/8/2024	
		Local Authority	City of Busselton	
		Sheet 1 of 1		

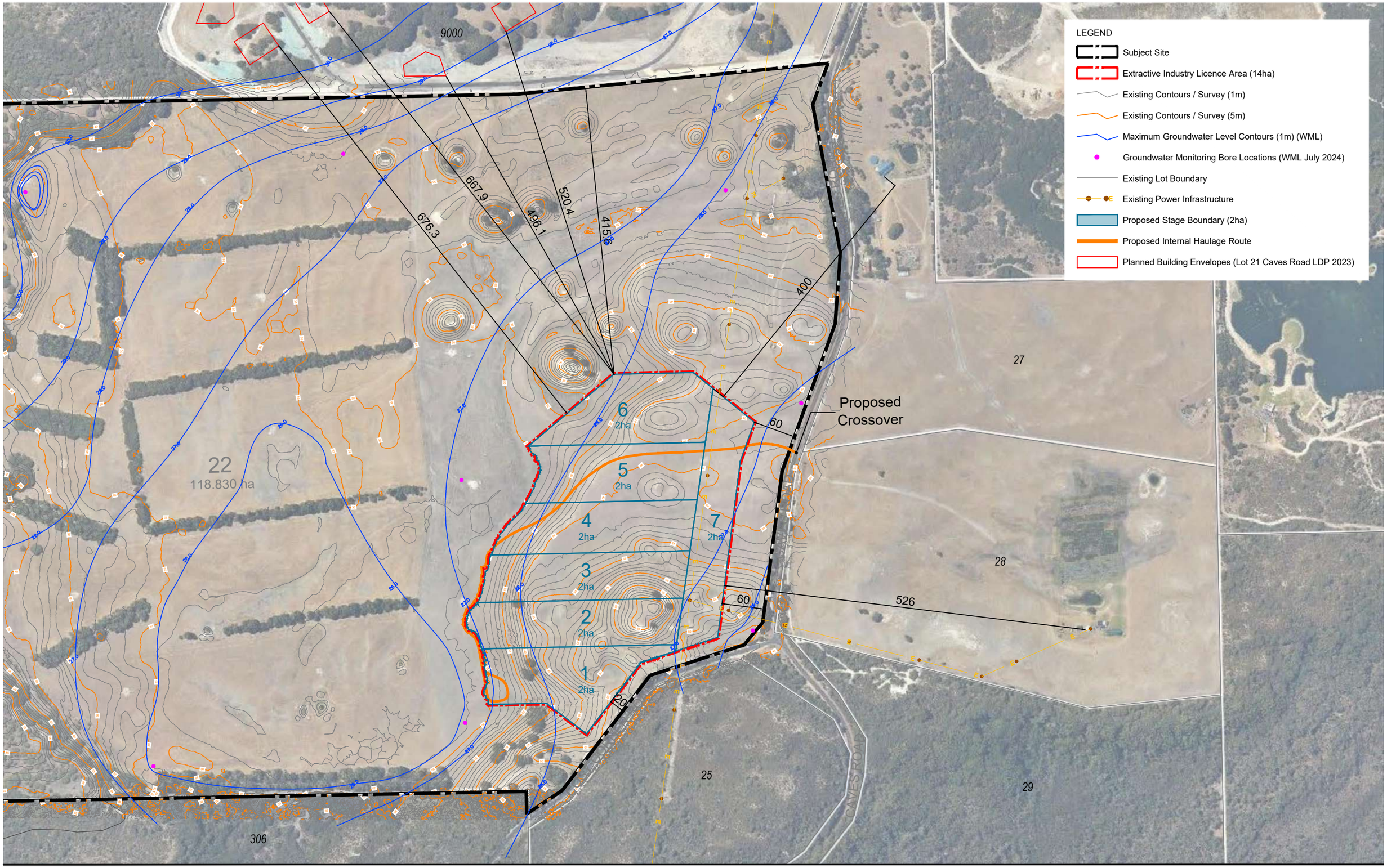
This drawing has been prepared by, and remains the property of Accendo Australia Pty Ltd. This drawing shall not be used without permission. The drawing shall be preliminary only and/or not for construciton until signed approved.

PO Box 5178
West Busselton
Western Australia 6280
Mobile 0418 950 852

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX A – EXCAVATION WORKS PLAN

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Excavation Works Plan

Lot 22 (9730) Caves Road, Hamelin Bay

0 100m

Date: 26 Aug 2024 Scale: 1:5000 @ A3 1:2500 @ A1 File: **24-132 EX01B** Staff: DL CCG JJ Checked: DL

element.

Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
PO Box 7375 Cloisters Square, Perth Western Australia 6850.
T. +61 8 9289 8300 | **E.** hello@elementwa.com.au **elementwa.com.au**

© Element Advisory WA Pty Ltd This concept has been prepared for the purpose of meeting client specifications. The drawing does not constitute an invitation,agreement or contract (or any part thereof) of any kind whatsoever. Although care has been taken in the compilation of this drawing by Element Advisory WA Pty Ltd, all parties associated with the proposed property development disclaim all responsibility for any errors or omissions. The right is reserved to change the plan at any time. Liability is expressly disclaimed by Element Advisory WA Pty Ltd for any loss or damage which may be sustained by any person acting on any visual impression gained from this drawing.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX B – WIND ROSES

Rose of Wind direction versus Wind speed in km/h (01 Jan 1907 to 31 Jul 2019)

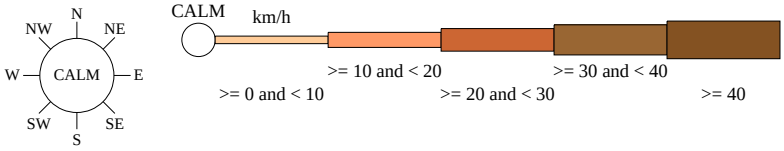
RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Custom times selected, refer to attached note for details

CAPE LEEUWIN

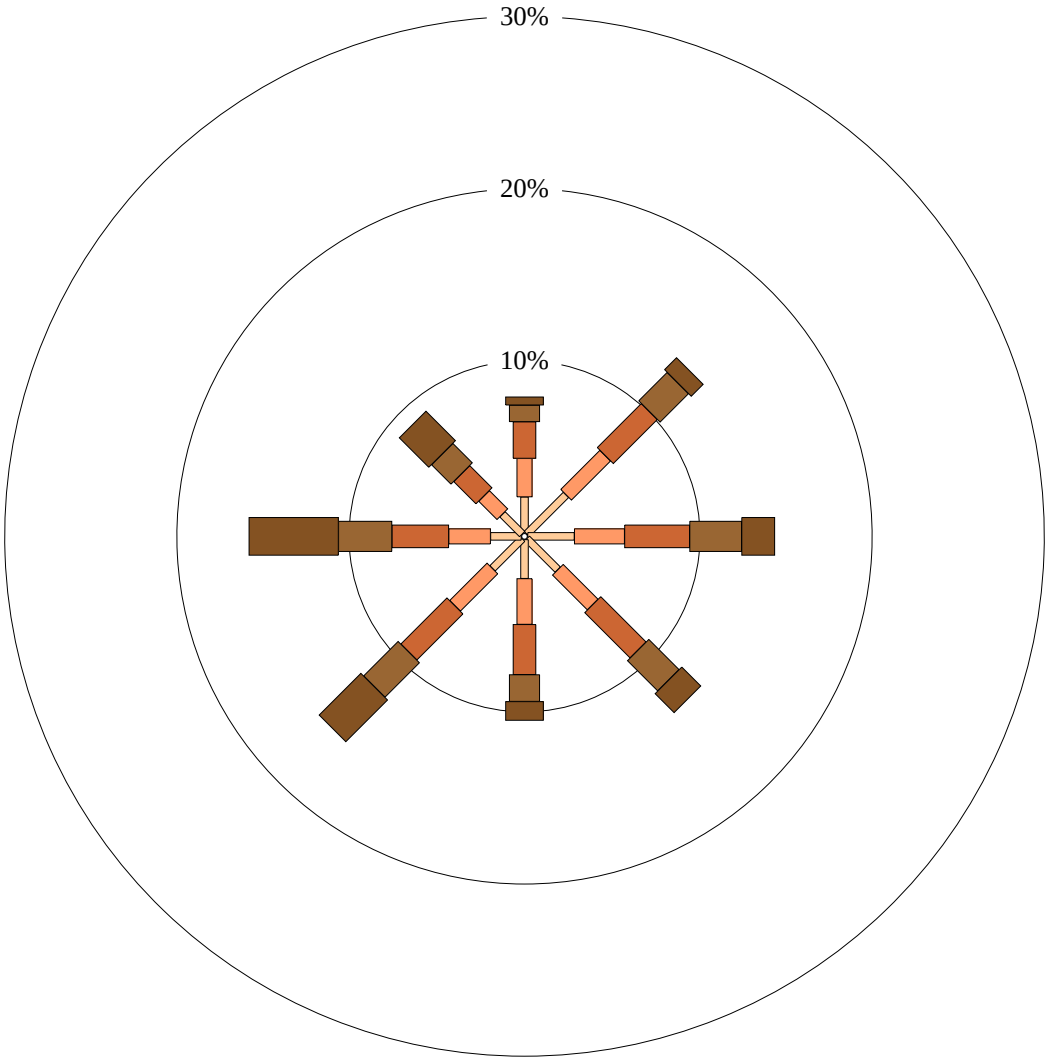
Site No: 009518 • Opened Jan 1897 • Still Open • Latitude: -34.3728° • Longitude: 115.1358° • Elevation 13m

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



9 am
40676 Total Observations

Calm 1%



Australian Government
Bureau of Meteorology

Copyright © *Commonwealth of Australia 2019 . Prepared on 31 Jul 2019*
Prepared by the Bureau of Meteorology.
Contact us by phone on (03) 9669 4082, by fax on (03) 9669 4515, or by email on climatedata@bom.gov.au
We have taken all due care but cannot provide any warranty nor accept any liability for this information.

Rose of Wind direction versus Wind speed in km/h (01 Jan 1907 to 31 Jul 2019)

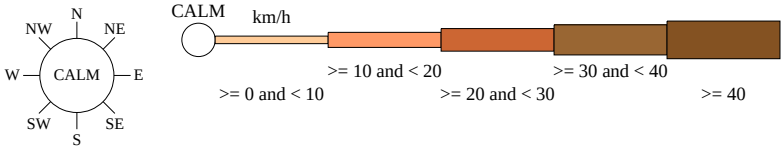
RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Custom times selected, refer to attached note for details

CAPE LEEUWIN

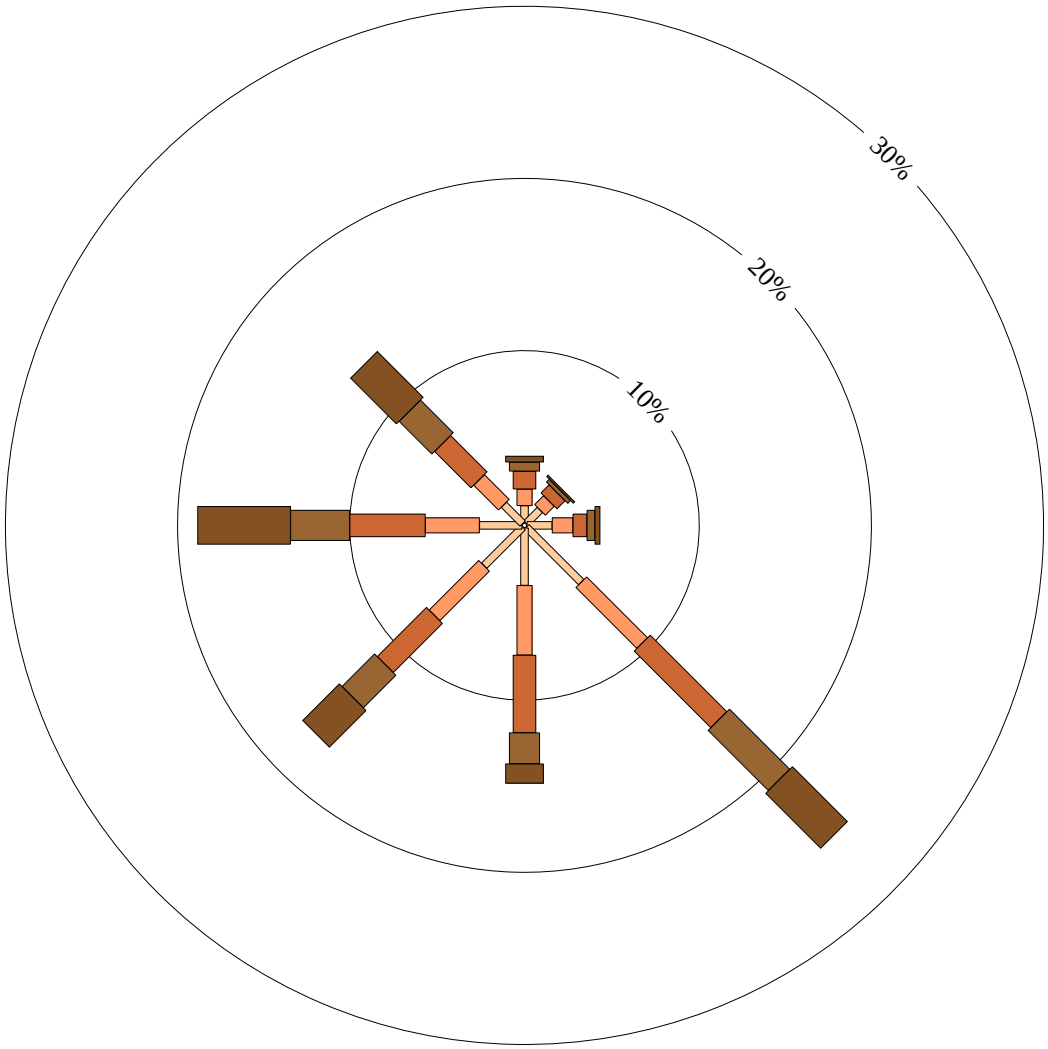
Site No: 009518 • Opened Jan 1897 • Still Open • Latitude: -34.3728° • Longitude: 115.1358° • Elevation 13m

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



3 pm
40648 Total Observations

Calm 1%



Australian Government
Bureau of Meteorology

Copyright © *Commonwealth of Australia 2019 . Prepared on 31 Jul 2019*
Prepared by the Bureau of Meteorology.
Contact us by phone on (03) 9669 4082, by fax on (03) 9669 4515, or by email on climatedata@bom.gov.au
We have taken all due care but cannot provide any warranty nor accept any liability for this information.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX C – POST EXTRACTION PLAN

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

22
118.8372ha

31

28

29

25

ROAD

CAVES

COSY CORNER ROAD

1:4 Batter

60

226.4

220.5

143.2

41.2

209.6

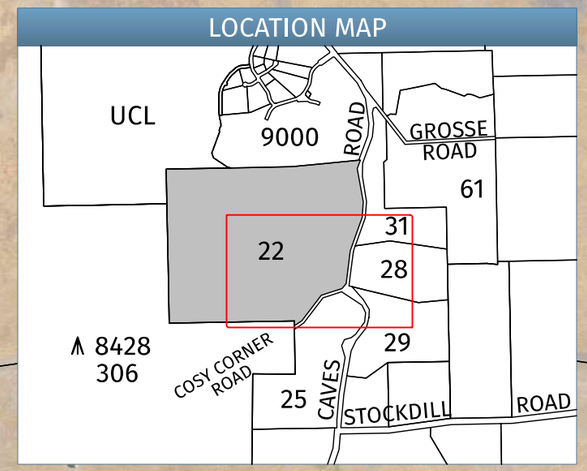
816.5

58.3

31.1

8428
306

LOCATION MAP



LEGEND

- Subject Area (118.8372ha)
- Extractive Industry License (13.9949ha)
- Toe Line (30m AHD)
- Rehabilitated to Pasture
- Existing Contours
- Post Extraction Contours
- AE — Overhead Electricity (DBYD)
- E — Underground Electricity (DBYD)
- T — Telecommunications (DBYD)

Contour data provided by BCP Materials Pty Ltd

EXTRACTION VOLUME SUMMARY

Extraction Pit	Approx. Volume (BCM)
Total	1,314,489

Note:
Volumes have been calculated from the surveyed surface to a pit floor of 30m AHD with 1:4 batters. No allowance has been made for topsoil stripping.

POST EXTRACTION PLAN

Lot 22 (No. 9730) Caves Road, HAMELIN BAY

Plan No.	24210-01	
Date	27/06/24	
Drawn	JW	
Checked	DJ	
Revision	C	
Scale	1:3000@A3	0 40m 80m

BUNBURY OFFICE:
21 Spencer Street,
BUNBURY WA 6230
T: 08 9792 6000
E: bunbury@harleydykstra.com.au
W: www.harleydykstra.com.au
ALBANY | BUNBURY | BUSSELTON | FORRESTDALE | PERTH

COPYRIGHT:
This document is and shall remain the property of HARLEY DYKSTRA.
The document may only be used for the purpose for which it was commissioned and in accordance with the terms of engagement for the commission.
Unauthorised use of this document in any form whatsoever is prohibited

NOTE: This plan has been prepared for planning purposes. Areas, Contours and Dimensions shown are subject to survey

Harley Dykstra®
PLANNING & SURVEY SOLUTIONS

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX D - COMPLAINTS REGISTER

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Complaints Register

Ref. No.	Date	Name & Address of Complainant	Time/Date of Complaint	Detail of Complaint	Summary of Actions Taken	Shire Notified	Person Responsible

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

accendo AUSTRALIA

NOISE MANAGEMENT PLAN

LOT 22 (9730) CAVES ROAD, HAMELIN BAY

August 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Telephone +61 418 950 852

info@accendoaustralia.com.au
PO Box 5178 West Busselton WA 6280
ABN 11 160 028 642

www.accendoaustralia.com.au

Document Control

Version	Date	Author	Reviewer
V1	20/08/2024	PN	KMT/Element
V2	30/08/2024	PN	KMT
Filename	2449_Lot 22 Caves Rd NMP_v2		

Limitations

This report has been prepared by Accendo Australia Pty Ltd in accordance with the scope limitations provided in this report, or as otherwise agreed, between the Client and Accendo.

This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

This report has been prepared based upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report, which Accendo has not independently verified or checked beyond the agreed scope of work. Accendo does not accept liability in connection with such unverified information.

The conclusions and recommendations in this report are based on assumptions made by Accendo described in this report where and as they are required. Accendo disclaims liability arising from any of the assumptions being incorrect.

The report is based on site specific conditions encountered and information received at the time of preparation of this report or the time that site investigations were undertaken. Accendo disclaims responsibility for any changes that may have occurred after this time.

The preparation of this report has been undertaken and performed in a professional manner, in consideration of the scope of services and in accordance with environmental consulting practices. No other warranty is made.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

CONTENTS

1 INTRODUCTION 4
1.1 BACKGROUND 4
1.2 PURPOSE AND SCOPE 4
2 EXISTING ENVIRONMENT 5
2.1 LAND USE 5
2.2 TOPOGRAPHY AND SOILS 5
2.3 CLIMATE 5
3 EXTRACTION ACTIVITIES 6
3.1 OPERATIONAL WORKS 6
3.1.1 Final Contours 7
3.1.2 Rehabilitation 7
3.2 PROPOSED OPERATING TIMES 7
3.3 EQUIPMENT 7
4 NOISE IMPACTS AND MANAGEMENT 9
4.1 SENSITIVE RECEPTORS 9
4.2 NOISE GENERATING ACTIVITIES 9
4.3 NOISE MANAGEMENT MEASURES 11
REFERENCES 14
FIGURES 15
APPENDIX A – EXCAVATION WORKS PLAN 16
APPENDIX B – POST EXTRACTION PLAN 17
APPENDIX C – ACOUSTIC ASSESSMENT 18
APPENDIX D - COMPLAINTS REGISTER 19

TABLES

Table 1. Equipment 7
Table 2. Residential dwellings within 500m of the subject site 9
Table 3. Noise generating activities 10
Table 4. Management actions for noise 11

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

FIGURES

Figure 1. Regional Location of the Subject Site

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

1 INTRODUCTION

1.1 Background

McDougall Quarries Pty Ltd (the applicant) is proposing to extract lime sand and limestone from a 14 hectare (ha) area within Lot 22 (HSE 9730) Caves Road, Hamelin Bay (herein referred to as the subject site) (refer to **Figure 1** and **Appendix A**).

The available volume of sand (*insitu* volume of approximately 1,314,489 m^3) is to be extracted, commencing in the south and moving in a northerly direction before finishing in a stage along the east of the subject site (refer to **Appendix A**).

The post extraction landform will be designed with minimum batters of 1:4.

1.2 Purpose and Scope

This Noise Management Plan (NMP) has been prepared to fulfil the relevant requirements provided within the Shire of Augusta-Margaret River's (the Shire) *Local Planning Scheme No. 1* and the Shire's *Extractive Industries Policy 3.* It is intended to provide the Shire, the public and relevant government agencies with an understanding of the proposal and the environmental strategies and commitments proposed to address noise emissions associated with the proposed land use. This document has been prepared to support and should be read in conjunction with, the *Environmental Management Plan* prepared by Accendo Australia (2024) for sand and limestone extraction within the subject site.

The Plan will describe the proposed management measures necessary to ensure noise impacts on surrounding receptors will be managed in accordance with best practice and the *Environmental Protection (Noise) Regulations 1997*.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

2 EXISTING ENVIRONMENT

2.1 Land Use

The subject site is zoned 'General Agriculture' pursuant to the Shire's *Local Planning Scheme No.* 1 and has previously been used for agriculture.

The surrounding properties are zoned 'Rural Residential' to the north, 'National Park and Nature Reserve' to the west and south and a mixture of 'General Agriculture', 'Priority Agriculture' and 'Landscape Amenity' to the east pursuant to the Shire *Local Planning Scheme No. 1*.

2.2 Topography and Soils

The current topography of the subject site can be described as variable with the elevation ranging from 30 m Australian Height Datum (AHD) through the eastern portion of the subject site to approximately 40m AHD in the west. Elevated areas are located throughout the subject site and range in elevation from approximately 45 m AHD to 60 m AHD (refer to **Appendix A**).

The subject site is located within the Leeuwin Zone landform within the Gracetown Ridge systems consisting of "*lateritic plateau containing sandy gravel, loamy gravel and grey sandy duplex*" and *"a limestone ridge, in the coastal edge of the Leeuwin Zone containing yellow deep sand and red deep sand",* respectively. (Tille 2006).

The subject site is located within the following sub-systems:

- Kilcarnup rocky dunes phase – Low to steep dunes (gradients 5-10%) not exposed to prevailing wines. Dark calcareous sands containing limestone rubble.
- Kilcarnup dunes (organic) phase – Steep dunes (gradients usually in excess of 20%) not exposed to prevailing winds. Deep pale calcareous sands with brown topsoil.

2.3 Climate

The climate of the locality is classified as Mediterranean with warm to hot summers and cool wet winters.

The closest weather recording station is Cape Leeuwin (Station 9518). Temperatures are highest on average in February, at approximately 23.4°C. August has the lowest average temperature of the year of 11.3°C.

Rainfall for the area is approximately 950 mm per annum with approximately 88% of the rain falling during the winter months, April to October inclusive. Evaporation generally exceeds rainfall from October to March.

During the summer months the dominant wind in the mornings is from the south-east at 18-26 kms, swinging to the south-west at 37-46 kms in the afternoon. During winter, the winds are most commonly 18-26 kms with no dominant prevailing direction. During storms winds from the west and north-west can reach 74 kms (BoM 2020).

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

3 EXTRACTION ACTIVITIES

The lime sand and limestone quarry will cover an area of approximately 14 ha, with a current maximum elevation ranging from 30 m AHD to 60 m AHD. It will be excavated to an elevation of 30 m AHD commencing in the south of the subject site and heading north. Extraction activities will be divided into seven stages, of 2.0 ha in size (refer to **Appendix A**).

It is estimated that the total maximum volume of material to be removed will be approximately 1,314,489 m^3. Over a ten year period, a maximum of approximately 131,449 m^3 will be excavated each year, depending on supply and demand.

Earthen bunds for noise mitigation will be constructed with topsoil and overburden that will be stripped from the extraction footprint and other areas within the premise boundary. Construction of the bunds will be undertaken with an excavator and loader.

The planned end use of the quarry is to restore a natural soil profile and return the extraction area to pasture, ensuring that there is no net loss of agricultural land.

3.1 Operational Works

Using a loader, the topsoil (where available) will be stripped and placed in stockpiles. Overburden, if present, will be removed using a dump truck and stockpiled to a convenient location within each extraction stage for operations. Topsoil stockpiles will be less than 2 m high with a batter no greater than 1:3.

In order to comply with noise regulations, surface works with the dozer must commence from the western most point and clear a sufficient area on the western side of Stage 1 to reach the material. Once a sufficient depth (5-6m) is achieved within Stage 1, progression of the pit through to Stage 2 can continue with the use of the dozer (Herring Storer Acoustics, 2024).

The material will be excavated by an excavator, bulldozer or loader to a stockpile or loaded directly to waiting trucks for transport. A summary of the proposed extraction activities is provided below:

- Prior to excavation commencing the site will be ground surveyed, the excavation footprint marked out and a 1 m contour plan developed.
- The topsoil/overburden will be stripped and used to construct earthen bunds using a loader.
- An excavator or front-end loader will be used to dig the sand and transport it to a stockpile.
- The sand will then be picked up by a loader and loaded to trucks for transport.
- All static and other equipment, will be located on the floor of the quarry to provide visual and acoustic screening.
- Excavation will commence in the south of the quarry initially moving north before returning to the east to complete extraction works. The face and walls of the pit will act as noise barriers.
- Crushing and screening of material may be required. Where crushing and screening is required noise bunds will be constructed to ensure compliance with the noise regulations.
- Upon completion of each section of quarry, the section will be reformed and back filled using a combination of equipment such as a tracked bobcat, excavator and front end loader, where subgrade material is available, to achieve the proposed final contours.
- At the end of excavation, the noise bunds will be removed, and the floor of the quarry will be deep ripped, covered by overburden and topsoil, and rehabilitated to a constructed soil.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

3.1.1 Final Contours

The final surface contours of the quarry will be approximately 30 m AHD which is consistent with the adjoining land.

Slopes of the batters at the end of excavation will be retained at 1:4 vertical to horizontal (refer to **Appendix E**).

3.1.2 Rehabilitation

During operations, quarrying and rehabilitation of the extraction area will be undertaken progressively. Following quarrying of each cell, rehabilitation will be undertaken.

Upon completion of each cell, the following broad completion criteria will be achieved:

- A self-sustaining cover of pasture;
- Weed levels that are not likely to impact on the viability of the reconstructed soils; and
- A safe and stable landform suitable for the proposed future land use which will be productive, grazing pasturelands.

Rehabilitation is discussed in further detail in the *Rehabilitation Management Plan* prepared by Accendo Australia (2024).

3.2 Proposed Operating Times

Typical operating hours for quarries will be adopted for the subject site which involves 7am to 5pm each Monday to Friday and Saturdays 7am to 1pm, excluding public holidays. The subject site will be worked by 2 - 3 persons, depending on market demand.

3.3 Equipment

All operational equipment will work on the quarry floor to provide maximum sound and visual screening. All equipment and infrastructure will be fully portable to facilitate movement throughout the site required for staged quarrying operations. The site will be secured by locked gates when it is not being actively worked. The boundary fencing will be maintained to prevent inadvertent and unauthorised entry.

Equipment and facilities that may be used onsite are provided in the Table below.

Table 2. Equipment.

Equipment	Description
Site office and/or containers	May be required for the management and security of small items.
Toilet	A portable toilet may be required on site.
Water tanker	Used for dust suppression on the access roads and working floors when required.
Bulldozer	Topsoil will be stripped using a bulldozer. Bulldozers will also be used for the movement of material and loading trucks.
Front End Loader	Loaders will be used for the movement of material and loading road trucks.
Track Loader	Track loaders will be used for the movement of material, loading road trucks and in rehabilitation.
Excavator	An excavator may be used for the removal of material.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Equipment	Description
Mobile crushing and screening plant	Mobile crushing and screening plant (licensed by DWER) will be utilised for the processing of material. Mobile screening and crushing plants are to be used for the preparation of various grades of lime sand and limestone.
Fuel storage	No fuel will be stored onsite.
Light vehicles	Access to and around the site.
Tip truck	Removal of lime sand and limestone from site.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

4 NOISE IMPACTS AND MANAGEMENT

4.1 Sensitive Receptors

The subject site has been designed to maximise setbacks to the closest sensitive receptors. This has involved extensive analysis of the local landform, environmental characteristics, land uses and location of sensitive receptors. Consultation with all sensitive receptors has also been undertaken by the Proponent.

The Environmental Protection Authority's (EPA) *Guidance for the Assessment of Environmental Factors* (June 2005) provides generic separation distances to assist in the determination of suitable buffers where industry may have the potential to affect the amenity of a sensitive land use. In particular, for extractive industries, a buffer distance of 300 m to 500 m is recommended from sensitive land uses. A conservative buffer of 500 m to sensitive receptors has been adopted for this proposal given that onsite screening and crushing is proposed.

The closest residential dwellings to the subject site are provided below and shown in **Appendix A.**

Table 2. Residential dwellings within 500 m of the subject site

Address	Distance to subject site (m)
Lot 31 (18) Grosse Road	400 m
Lot 9001 (Hamelin Ridge Estate)	>415 m
Lot 28 (9789) Caves Road	526 m

The closest residential dwelling to the subject site is located approximately 400 m to the north east of the subject site. Hamelin Ridge Estate, where most dwellings are yet to be constructed, is located to the north of the subject site, at distances greater than 415 m from the boundary. An additional residential dwelling is located to the east of the subject site at a distance greater than 500 m away.

4.2 Noise Generating Activities

The project works will involve the use of machinery and equipment that will generate noise during operation. Sources of noise from the subject site will include:

- Machinery noise from equipment use.
- Noise from safety equipment (beepers on machinery).
- Noise from trucks departing the site.

Reversing alarms can represent significant nuisance noise to sensitive receptors. There are a number of alternatives to alarms that maintain a safe work environment and also comply with occupational health and safety legislation. Reversing alarms alert pedestrians when a vehicle is moving, however, given that no pedestrians will be onsite (private property), the applicant has committed to using flashing lights or a broadband alarm system as an alternative. The sound of a broadband alarm is much less intrusive by nature than the sound of a tonal alarm and tends to be masked by the background noise at a lesser distance. This will eliminate/reduce noise emissions associated with reversing alarms.

Extraction activities will only be undertaken during standard hours of operation (in accordance with the conditions of the Extractive Industry Licence). A summary of potential noise generating activities is presented in **Table 3**.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Table 3. Noise generating activities.

Activity	Duration	Equipment to be used	Sound pressure Level (dB(A))	Comments
Topsoil stripping	3 weeks per year	CAT D9 Dozer	113	Initial impact to closest resident which will reduce as stockpiles increase.
		CAT 966 FEL or similar	105	Initial impact to closest resident which will reduce as stockpiles increase.
Screening and stockpiling of sand	6 weeks per year	CAT 966 FEL or similar	105	Noise will be muffled by stockpiles and site topography
		Sand Screen	101	Noise will be muffled by stockpiles
		CAT 330 Excavator or similar	105	Noise will be muffled by stockpiles
Crushing and stockpiling of limestone	6 weeks per year	Mobile Crusher	113	Noise will be muffled by noise bunds
		PC 330 Excavator or similar	100	Noise will be muffled by noise bunds
Loading of trucks from stockpiles	A maximum of 10 years with 15 loads per day, dependent on demand.	CAT 966 FEL or similar	105	Noise will be muffled by stockpiles, vehicles are new and well maintained.
Rehabilitation of completed stages	To be undertaken in conjunction with excavation works where applicable.	CAT 966 FEL or similar	105	Limited period of moderate noise levels, indistinguishable from excavation noise when undertaken concurrently.

Noise levels have been obtained from the *Acoustic Assessment* (Herring Storer Acoustics 2024) prepared for Lot 22 (9730) Caves Road, Hamelin Bay for the extraction of limestone and sand.

The *Acoustic Assessment* (Herring Storer Acoustics 2024) (refer to **Appendix C**) demonstrated that noise levels resulting from the extraction, crushing and screening works, and the noise from trucks entering the site, when coupled with the dozer operation (at surface level), are predicted to exceed the assigned level of 45 dB L_{A10} at the closest receptors. To address the noise exceedance, where the pit wall is less than 5 m, it is recommended to construct an earthen bund in proximity to the plant to form a barrier. Additionally, the dozer is required to operate from the western most point of any cells and clear a sufficient area on the western side of the stage to reach the material. Works must remain within the active area for the dozer (refer to Figure 2.1 of **Appendix C**) until a sufficient depth (5-6 m) is achieved. Progression of the pit through to Stage 2 can then continue with the use of the dozer.

Provided the recommended noise mitigation measures are implemented, it is concluded that compliance with the applicable assigned noise level can be achieved at all noise sensitive receptors during the specified working hours.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

4.3 Noise Management Measures

The proponent will ensure that noise emissions comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times. In addition, the management measures prescribed within **Table 4** will be implemented to reduce noise emissions as far as practicable.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Table 4. Management actions for noise.

Item	Action	Trigger/Timing	Responsibility
Inductions			
1	As part of site inductions, employees, contractors and visitors to the site are reminded of their responsibility to undertake work activities in an environmentally sensitive manner, including minimising noise while on site, or entering and leaving the site.	Ongoing	Site Manager
Planning Controls			
2	Daily Planning • The use of significant noise generating equipment or activities simultaneously is avoided. • The noisiest activities are scheduled to the least sensitive times of the day.	Where possible	Site Manager
3	Regular review of meteorological data, specifically wind speed and direction, to guide decisions on quarrying activities.	As required, with consideration to the intensity of activities onsite and the prevailing weather conditions	Site Manager
Operational Controls			
4	Equipment and Machinery • Use machinery and equipment with minimal noise output levels. • Ensure all machinery is regularly serviced as per the equipment's maintenance schedule to minimise noise generation. • Where appropriate, all machinery and equipment will be shut off when not in use. • Use flashing lights/broadband alarms instead of tonal reversing alarms on excavators/loaders. • Apply speed restrictions (20 km/hr within site) and a ban on exhaust braking. • Dozer works at surface level will commence within the western most point of the subject site and remain within the 'Dozer surface only' area as specified within Figure 2.1 of **Appendix C**.	Continuous	All employees & contractors
5	Earth bunds • Overburden and topsoil will be used to form perimeter bunds to assist with noise screening.	Prior to quarrying	Site Manager

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Item	Action	Trigger/Timing	Responsibility
Inductions			
	• Earth bunds around the plant, as specified within Figure 4.1 of **Appendix C** will be constructed to reduce noise impacts to nearby residents.		
Complaints Management			
6	Erect on-site signage directing public to make complaints to the relevant person.	Prior to quarrying	Site Manager
7	Maintain a complaints register (refer to **Appendix D**). A Complaints Register will be established for the site to record the following information: • Date, time, location and nature of the exceedance. • Identify the cause (or likely cause) of the exceedance and responsible parties. • Identify the activities that were occurring at the time of the non-compliance. • Determine the activities that were most likely contributing to the non-compliance. • Describe what action has been taken to date. • Describe the proposed measures to address the exceedance. If the complaint is verified as being due to a site source, remedial action will be undertaken within 2 hours. The Shire of Augusta Margaret River will be advised of all complaints as soon as they are received. If a compliant cannot be resolved within the 2 hour response period, it may be necessary to cease operations.	Upon receiving complaint	Site Manager

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

REFERENCES

Beard J. S. (1990). *Plant life of Western Australia*, Kangaroo Press, Perth.

Barnesby, B.A. and Proulx-Nixon, M.E. (2000). *Land resources from Harvey to Capel on the Swan Coastal Plain, Western Australia - Sheets 1 and 2.* Land Resources Maps No. 23/1 and 23/2. Agriculture Western Australia.

Churchward, H.M. and McArthur, W.M. (1978). Landforms and soils of the Darling System, Western Australia. In *'Atlas of Natural Resources, Darling System, Western Australia'*. Department of Conservation and Environment, Western Australia.

Department of Parks and Wildlife (DBCA) (2004). *Geomorphic Wetlands of the Swan Coastal Plain dataset*.

Department of Water (DoW) (2014). *South West Region Guideline, Water resource considerations for extractive industries.* DoW, Perth WA.

Environmental Protection Authority (EPA) (2006). *Guidance Statement No.10 for the Assessment of Environmental Factors (in accordance with the EP Act 1986: Levels of Assessment for Proposals Affecting Natural Areas Within the System 6 Region and Swan Coastal Plain Portion of the System 1 Region.*

Environmental Protection Authority (EPA) (2009). *South West Regional Ecological Linkages.* Bulletin No 8. Retrieved from: http://epa.wa.gov.au/EPADocLib/3040_SWREL_EPB821009.pdf

Geological Survey of Western Australia (1978). *Geology and mineral resources of Western Australia, memoir 3*. Geological Survey of Western Australia, Perth, WA.

Heddle, E.M., Loneragan, O.W. and Havel, J.J. (1980). *Darling Systems – Vegetation Complexes, In: Atlas of Natural Resources Darling System*, Western Australia, Department of Conservation and Environment, Perth.

Herring Storer Acoustics (2024). *McDougall Quarries Pty Ltd, Extractive Industry, Lot 22 (9730) Caves Road, Hamelin Bay, Acoustic Assessment.* August 2024.

Molly, S., Wood, J. Hall, S., Wallrodt, S. & Whisson, G. (2009). *South West Regional Ecological Linkages Technical Report*. Available from: http://walga.asn.au/AboutWALGA/Policy/SouthWestBiodiversityProject/SouthWestRegionalEcologicalLinkagesTechnicalReport.aspx

Semeniuk, C. A. & Semeniuk, V. (1995). *A geomorphic approach to global classification for inland wetlands*. Vegetation, 118, 103-124.

Thackway, R, and Cresswell, ID, (Eds) (1995). *An Interim Biogeographic Regionalisation for Australia: a framework for establishing the national system of reserves*, Version 4.0. Australian Nature Conservation Agency, Canberra.

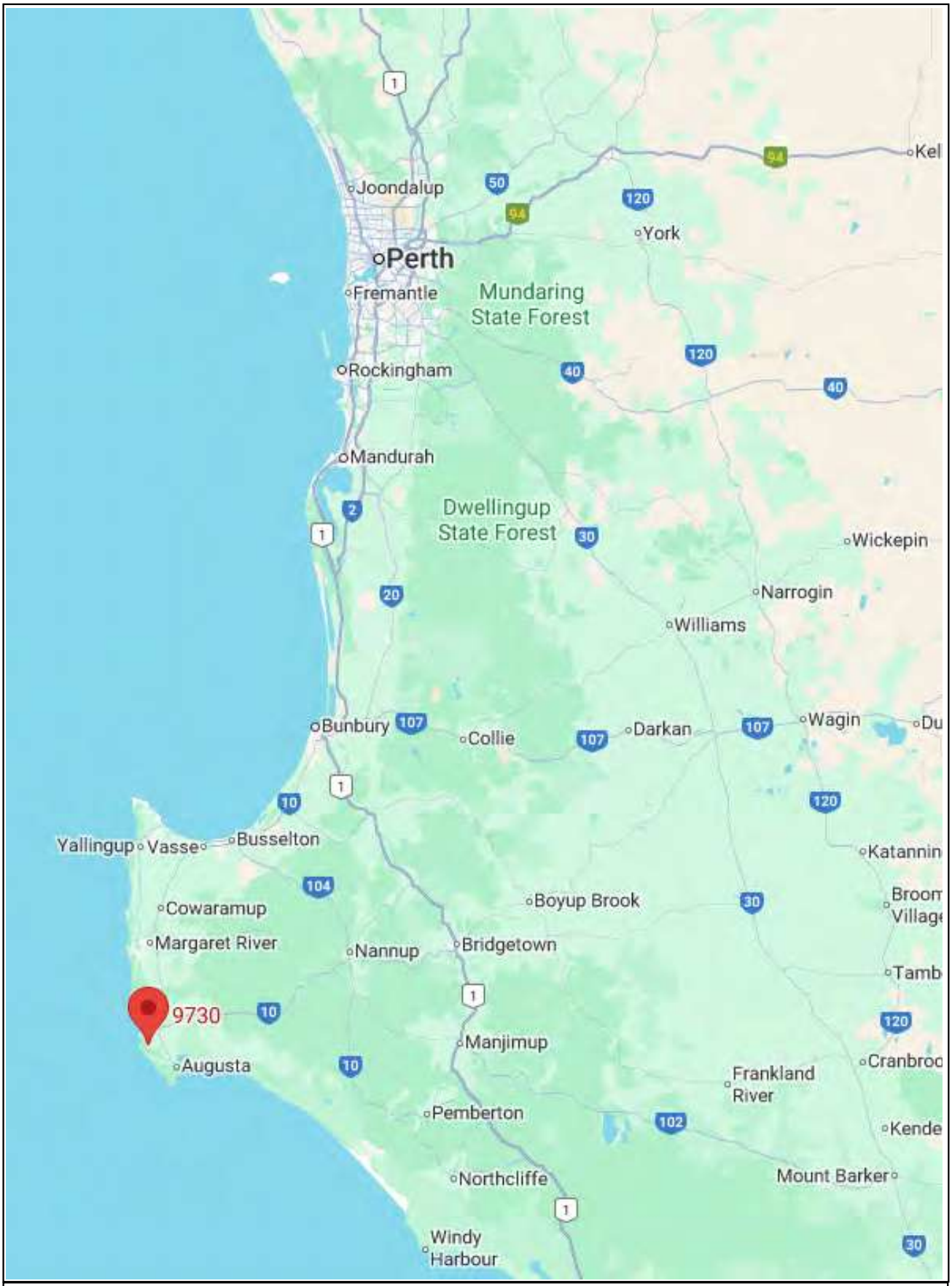
Tille, P (2006). Soil-Landscape Zones of the WA Rangelands and Interior.

Western Australian Planning Commission (WAPC) (2007). *Planning Bulletin No. 64: Acid Sulfate Soils*, Western Australian Planning Commission, Western Australia.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

FIGURES

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



PROJECT	Lot 22 Caves Road, Hamelin Bay	Project Number	Drawing Number	Revision
		2449	Figure 1	A
DRAWING TITLE	Figure 1 - Regional location of the subject site	Designed PN	Checked	
		Drawn PN	Approved	
CLIENT	McDougall Quarries Pty Ltd	Date	20/8/2024	
		Local Authority	City of Busselton	
		Sheet 1 of 1		

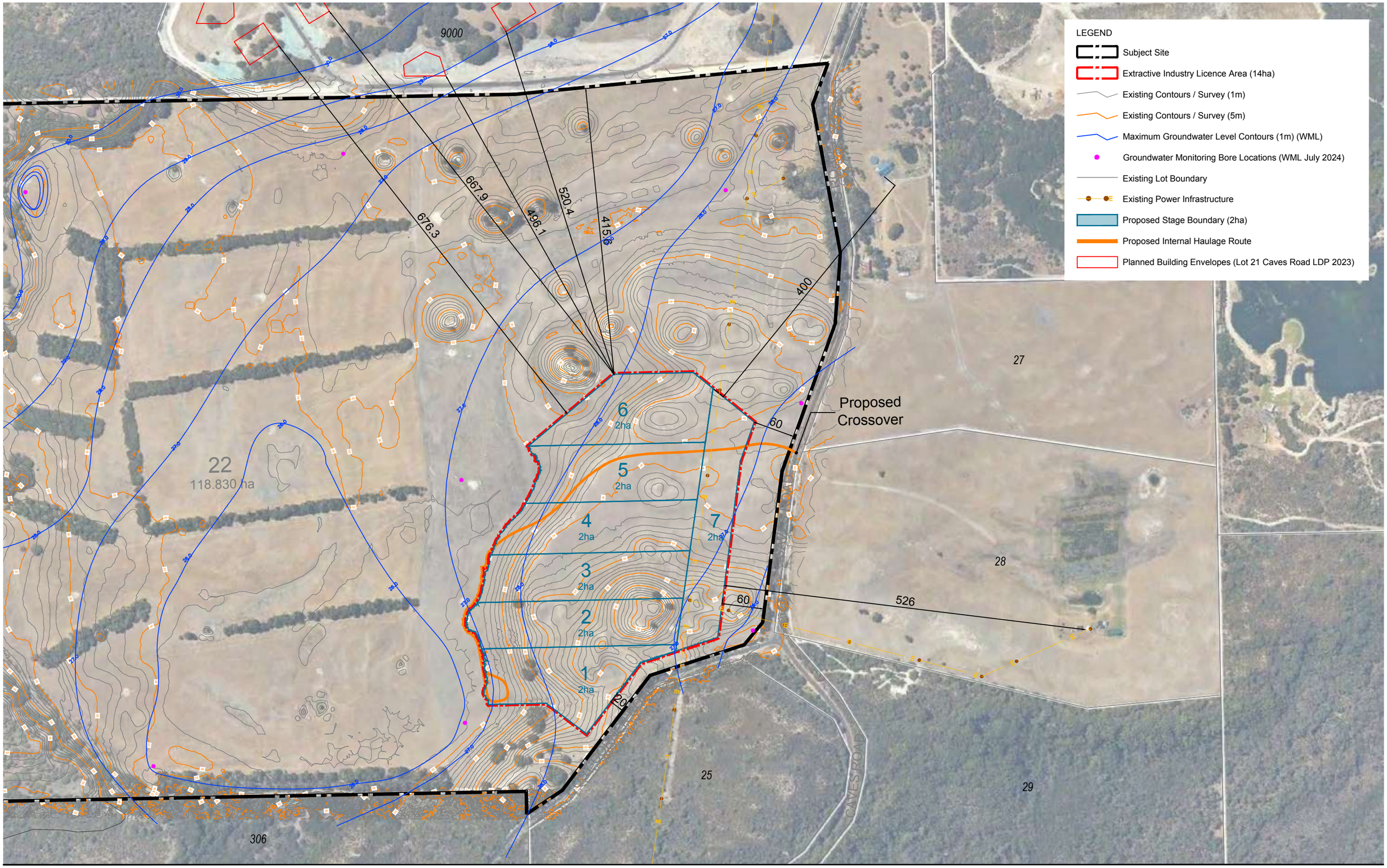
This drawing has been prepared by, and remains the property of Accendo Australia Pty Ltd. This drawing shall not be used without permission. The drawing shall be preliminary only and/or not for construciton until signed approved.

PO Box 5178
West Busselton
Western Australia 6280
Mobile 0418 950 852

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX A – EXCAVATION WORKS PLAN

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Excavation Works Plan

Lot 22 (9730) Caves Road, Hamelin Bay

Date: 26 Aug 2024 Scale: 1:5000 @ A3 1:2500 @ A1 File: **24-132 EX01B** Staff: DL CCG JJ Checked: DL

0 100m

element.

Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
PO Box 7375 Cloisters Square, Perth Western Australia 6850.
T. +61 8 9289 8300 | **E.** hello@elementwa.com.au **elementwa.com.au**

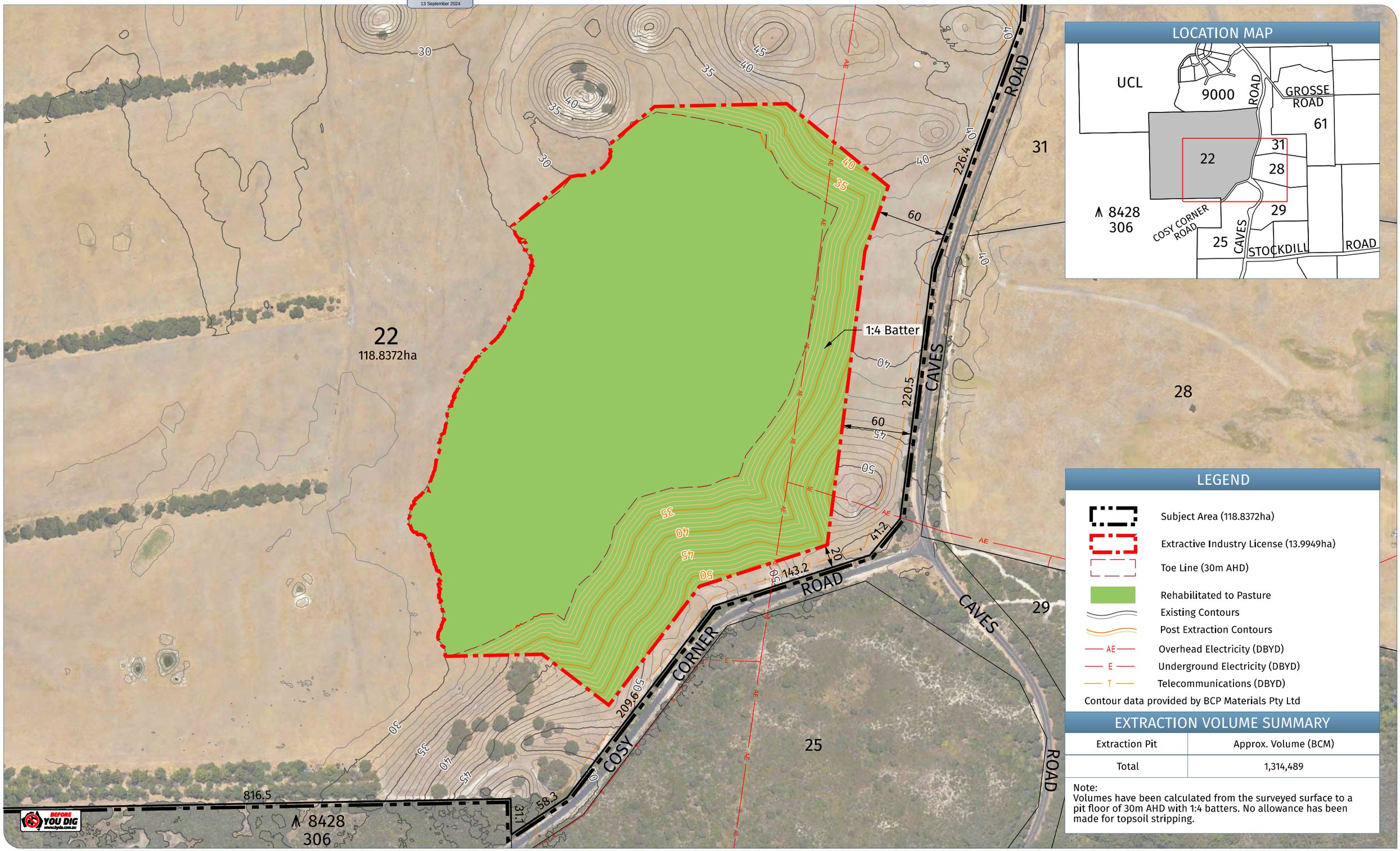
© Element Advisory WA Pty Ltd

This concept has been prepared for the purpose of meeting client specifications. The drawing does not constitute an invitation,agreement or contract (or any part thereof) of any kind whatsoever. Although care has been taken in the compilation of this drawing by Element Advisory WA Pty Ltd, all parties associated with the proposed property development disclaim all responsibility for any errors or omissions. The right is reserved to change the plan at any time. Liability is expressly disclaimed by Element Advisory WA Pty Ltd for any loss or damage which may be sustained by any person acting on any visual impression gained from this drawing.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX B – POST EXTRACTION PLAN

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



LOCATION MAP

LEGEND

- Subject Area (118.8372ha)
- Extractive Industry License (13.9949ha)
- Toe Line (30m AHD)
- Rehabilitated to Pasture
- Existing Contours
- Post Extraction Contours
- AE — Overhead Electricity (DBYD)
- E — Underground Electricity (DBYD)
- T — Telecommunications (DBYD)

Contour data provided by BCP Materials Pty Ltd

EXTRACTION VOLUME SUMMARY

Extraction Pit	Approx. Volume (BCM)
Total	1,314,489

Note:
Volumes have been calculated from the surveyed surface to a pit floor of 30m AHD with 1:4 batters. No allowance has been made for topsoil stripping.

POST EXTRACTION PLAN

Lot 22 (No. 9730) Caves Road, HAMELIN BAY

Plan No.	24210-01	
Date	27/06/24	
Drawn	JW	
Checked	DJ	
Revision	C	
Scale	1:3000@A3	0 40m 80m

BUNBURY OFFICE:
21 Spencer Street,
BUNBURY WA 6230
T: 08 9792 6000
E: bunbury@harleydykstra.com.au
W: www.harleydykstra.com.au
ALBANY | BUNBURY | BUSSELTON | FORRESTDALE | PERTH

COPYRIGHT:
This document is and shall remain the property of HARLEY DYKSTRA.
The document may only be used for the purpose for which it was commissioned and in accordance with the terms of engagement for the commission.
Unauthorised use of this document in any form whatsoever is prohibited

NOTE: This plan has been prepared for planning purposes. Areas, Contours and Dimensions shown are subject to survey

Harley Dykstra
PLANNING & SURVEY SOLUTIONS

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX C – ACOUSTIC ASSESSMENT

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

HERRING STORER ACOUSTICS

MCDOUGALL QUARRIES PTY LTD

EXTRACTIVE INDUSTRY
LOT 22 (9730) CAVES ROAD, HAMELIN BAY

ACOUSTIC ASSESSMENT

AUGUST 2024

OUR REFERENCE: 33157-3-24200

Rochdale Holdings Pty Ltd A.B.N. 85 009 049 067 trading as:
HERRING STORER ACOUSTICS
P.O. Box 219, Como, W.A. 6952
(08) 9367 6200
hsa@hsacoustics.com.au

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

DOCUMENT CONTROL PAGE

ACOUSTIC ASSESSMENT

CAVES ROAD, HAMELIN BAY

Job No: 24200

Document Reference: 33157-3-24200

FOR

MCDOUGALL QUARRIES PTY LTD

DOCUMENT INFORMATION			
Author:	Paul Daly	**Checked By:**	George Watts
Date of Issue:	9th August 2024		

REVISION HISTORY				
Revision	**Description**	**Date**	**Author**	**Checked**
1	Revised Excavation Plan	19/08/2024	PLD	
2	Client Comments	26/08/2024	PLD	

DOCUMENT DISTRIBUTION				
Copy No.	**Version No.**	**Destination**	**Hard Copy**	**Electronic Copy**
1	3	Element Att: Daniel Lewis Email: daniel.lewis@elementwa.com.au		✓

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

CONTENTS

1.	INTRODUCTION	1
2.	SUMMARY	2
3.	CRITERIA	3
4.	CALCULATED NOISE LEVELS	5
5.	MONITORED AMBIENT NOISE	7
6.	RESULTS	10
7.	ASSESSMENT	10
8.	CONCLUSION	11

APPENDICIES

A Site Layout

B Noise Contours

C Ambient Noise Monitoring

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

1. INTRODUCTION

Herring Storer Acoustics have been commissioned by Element on behalf of McDougall Quarries Pty Ltd to undertake an acoustic assessment of noise emissions from the proposed lime sand and limestone extraction operations located at Lot 40 (9730) Caves Road, Hamelin Bay.

The proposed extraction operations will operate from 07:00 – 19:00 Monday to Friday and 07:00 – 13:00 on Saturdays. No operations would occur on Sundays or Public Holidays.

The nearest residential premises are located to the east / northeast of the proposed excavation activities. The most critical in terms of distance from the proposed operations, are approximately 400m from the boundary of the nearest operations. Future residential locations to the north have been noted and also assessed for noise impact.

The main access road is via the east as shown in Figure 1.1, along with the proposed operations.

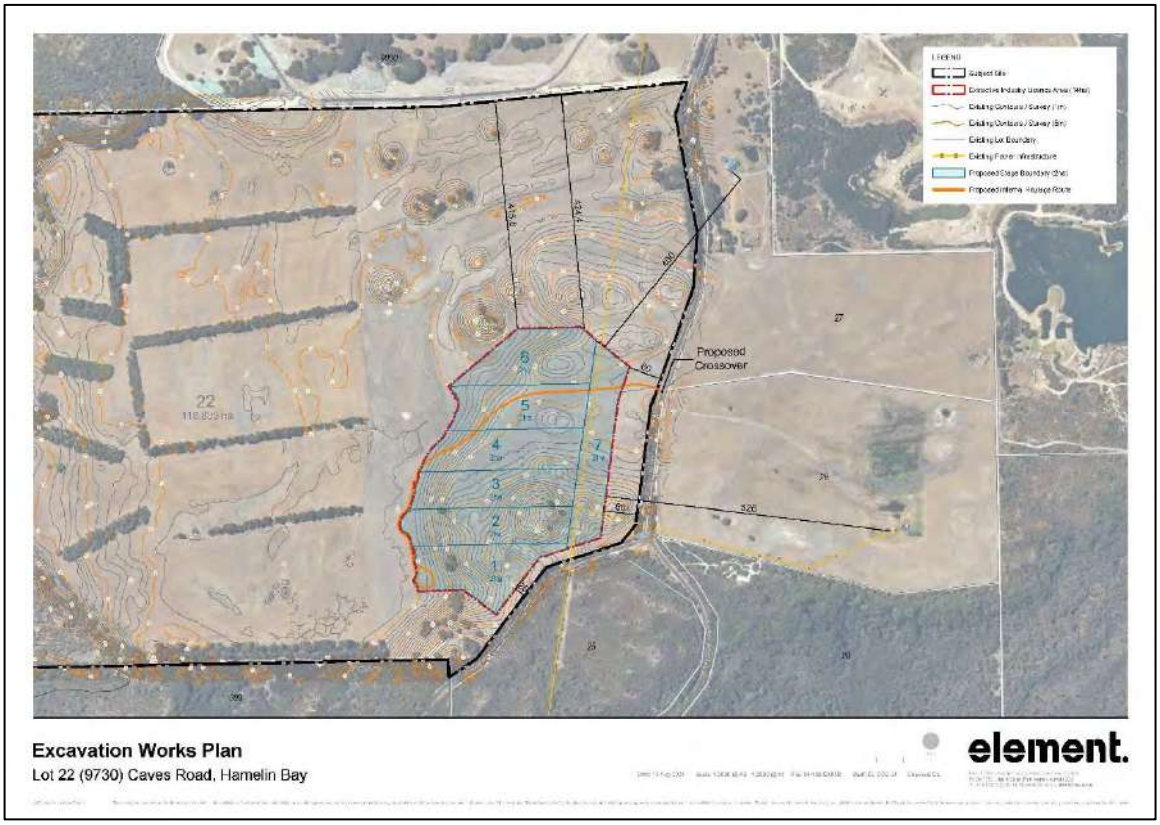


FIGURE 1.1 – EXTRACTION OPERATIONS

This assessment is provided to support the regulatory approvals processes and demonstrate compliance with the requirements of the *Environmental Protection (Noise) Regulations 1997* can be achieved.

As part of the study, the following was carried out:

- Identification of individual operations and the associated noise levels.
- Measurement of the existing background noise levels.
- Assess the predicted noise levels at the nearest surrounding highly noise sensitive premises for compliance with the appropriate criteria.
- If exceedances are predicted, comment on possible noise amelioration options for compliance with the appropriate criteria.

For information, a locality plan is shown in Appendix A.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

2. SUMMARY

Assessment has been conducted on the proposed limestone and sand extraction operations for Lot 40 (9730) Caves Road, Hamelin Bay.

The facility would only operate during the day period (being Monday to Friday 07:00 to 19:00 hours and 07:00 to 16:00 on Saturdays). Therefore, at the neighbouring residences, the applicable acoustic criteria for this assessment is the assigned L_{A10} day period noise level of 45 dB(A).

Noise received at the nearest residential premises has been determined to be 45 dB(A) for the extraction operations for the highest noise level at any stage of the operations. This can be compared to the applicable assigned noise level criteria of 45 dB(A).

Noise monitoring conducted shows that the ambient noise (background) is generally around 45 to 50 dB(A) during the day. Given this, annoying characteristics such as tonality may be present, hence a +5 dB(A) penalty has been included in the assessable noise level stated above.

Information provided is that the material is understood to be located around 10m deep (from ground level). Therefore, as the pits progress, the bottom of the pit will be such that there is a pit wall (operating face) being maintained between equipment and receivers.

As there is a Cat D9 Dozer to be used in the operations, both this and the crushing plant require noise control to ensure compliance. Predictive noise modelling has been conducted where the dozer, located at natural surface level commences operations in Stage 1. The dozer is required to operate from the western most point and clear a sufficient area on the western side of Stage 1 to reach the material. Figure 2.1 below details the active area for the dozer for the commencement of works. Once a sufficient depth (5-6m) is achieved within Stage 1, progression of the pit through to Stage 2 can continue with the use of the dozer.

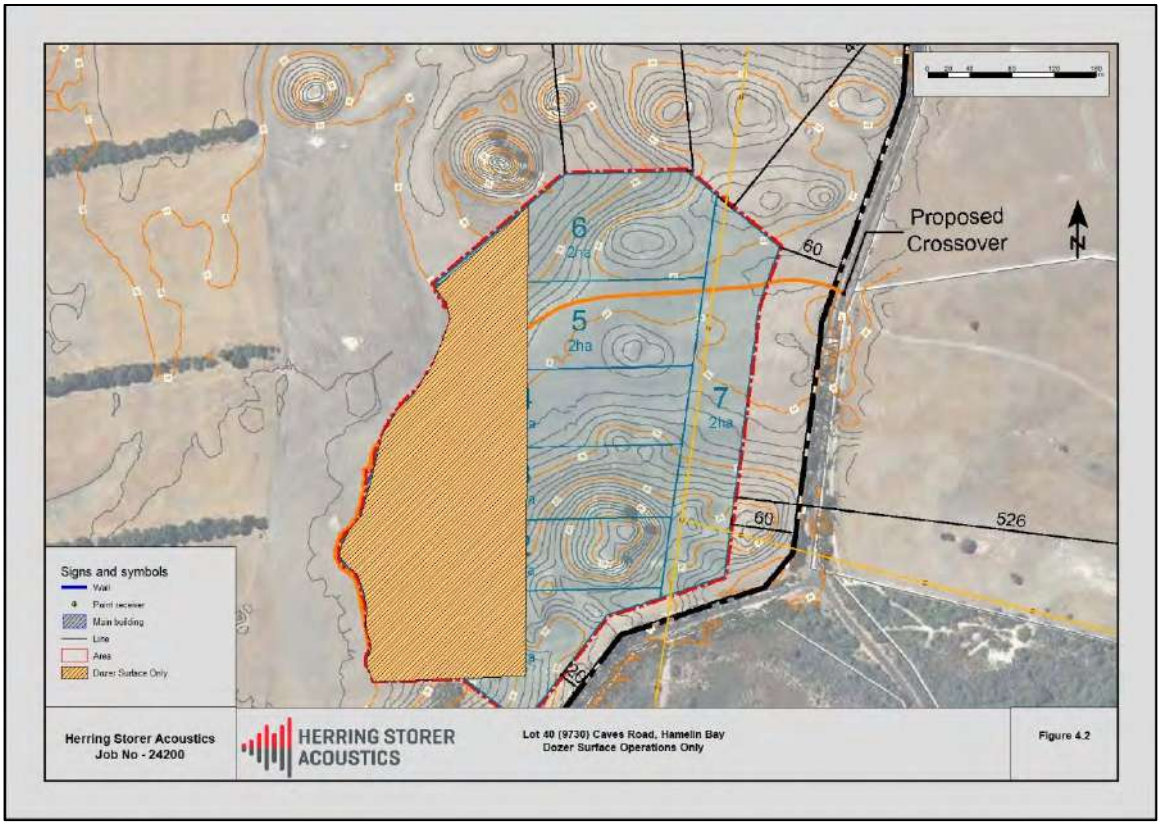


FIGURE 2.1 – DOZER OPERATIONS - SURFACE ONLY

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Additionally, the crushing and screening plant require noise control in the form of a barrier. If the plant is located within the pit at a depth of 5m, then this would provide sufficient attenuation. However, at depth less than this a bund is required in close proximity to the plant to form a barrier.

Modelling has assumed the progression of the pit through the numbered stages. Provided the barrier in the form of a pit wall, or bunding to a minimum height of 3m is maintained, noise levels would be compliant.

Given these operating parameters, noise levels received at the nearest premises has been calculated to comply with the *Environmental Protection (Noise) Regulations 1997* for the operating times as outlined in this assessment.

3. CRITERIA

The allowable noise level for noise sensitive premises in the vicinity of the proposed site is prescribed by the *Environmental Protection (Noise) Regulations 1997*. Regulations 7 and 8 stipulate maximum allowable external noise levels or assigned noise levels that can be received at a premise from another premises. For residential premises, this noise level is determined by the calculation of an influencing factor, which is then added to the base levels shown below. The influencing factor is calculated for the usage of land within two circles, having radii of 100m and 450m from the premises of concern. The base noise levels for residential premises are listed in Table 3.1.

TABLE 3.1 - BASELINE ASSIGNED OUTDOOR NOISE LEVEL

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		$L_{A\ 10}$	$L_{A\ 1}$	$L_{A\ max}$
Noise sensitive premises	0700 - 1900 hours Monday to Saturday (Day)	45 + IF	55 + IF	65 + IF
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day Period)	40 + IF	50 + IF	65 + IF
	1900 - 2200 hours all days (Evening)	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	35 + IF	45 + IF	55 + IF

Note: L_{A10} is the noise level exceeded for 10% of the time.
L_{A1} is the noise level exceeded for 1% of the time.
L_{Amax} is the maximum noise level.
IF is the influencing factor.

It is a requirement that received noise be free of annoying characteristics (tonality, modulation and impulsiveness), defined below as per Regulation 9.

"impulsiveness" means a variation in the emission of a noise where the difference between L_{Apeak} and $L_{Amax\ Slow}$ is more than 15 dB when determined for a single representative event;

"modulation" means a variation in the emission of noise that –

(a) is more than 3dB $L_{A\ Fast}$ or is more than 3 dB $L_{A\ Fast}$ in any one-third octave band;
(b) is present for more at least 10% of the representative assessment period; and
(c) is regular, cyclic and audible;

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

"tonality" means the presence in the noise emission of tonal characteristics where the difference between –

(a) the A-weighted sound pressure level in any one-third octave band; and
(b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3 dB when the sound pressure levels are determined as $L_{Aeq,T}$ levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as $L_{A\ Slow}$ levels.

The nearest potential noise sensitive premises to the proposed development have been identified using the area map in Figure 3.1. It is understood that there is the potential for development to the north of the extractive works, hence, there future residential premises have been assessed, noted at R3.

The usage of the surrounding land use varies from rural (with residential premises) and other extractive industries. Therefore, the assigned noise levels for operational times are as noted in Table 3.2.

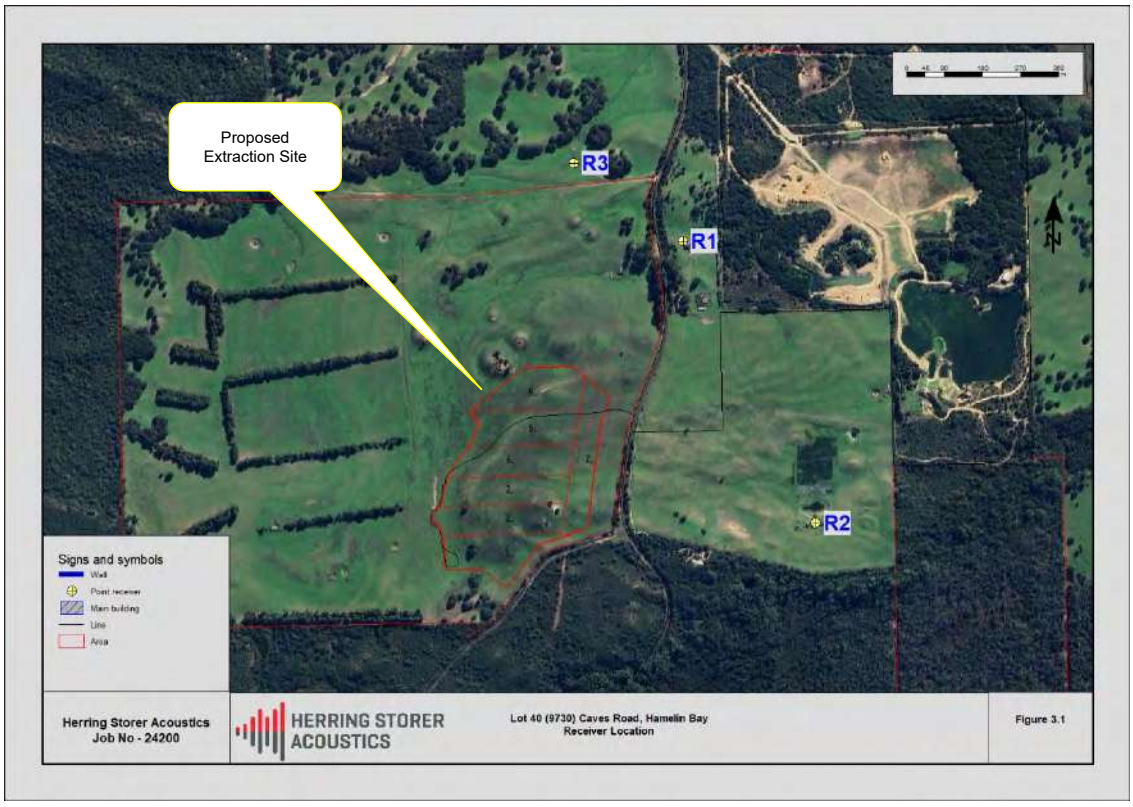


FIGURE 3.1 – RECEIVER LOCATION MAP

TABLE 3.2 – ASSIGNED NOISE LEVELS

Premises Receiving Noise	IF dB	Time of Day	Assigned Level (dB)		
			$L_{A\ 10}$	$L_{A\ 1}$	$L_{A\ max}$
Receivers R1 to R3	0	0700 - 1900 hours Monday to Saturday (Day)	45	55	65

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

4. CALCULATED NOISE LEVELS

Noise immissions[1] at the nearest neighbouring residential premises, due to noise associated with the proposed operations, were modelled with the computer programme SoundPlan using Concawe algorithms. Sound power levels used for the calculations are based on measured sound pressure levels of similar equipment proposed for use on site.

The modelling of noise levels has been based on noise sources and sound power levels shown in Table 4.1.

TABLE 4.1 – SOUND POWER LEVEL - NOISE SOURCES dB(A)

Source Name	Quantity	SWL dB(A)
Loaders (Cat 966 or similar)	1	105
Screening Plant (McCloskey S190 Screener or Similar)	1	101
Crushing Plant (Terex J1175)	1	113
Semi- Tipper Truck	1	98
Excavator (PC330 or similar)	1	100
Dozer (CAT D9)	1	113

Note: The above equipment models have been used to provide an indication of the size. Other models may be used although these have been assumed to have a similar sound power level.

Based on noise emissions from the above equipment, an overall operating scenario has been developed. Figure 4.1 details the source locations assumed in the predictive modelling along with the proposed development of the pit.

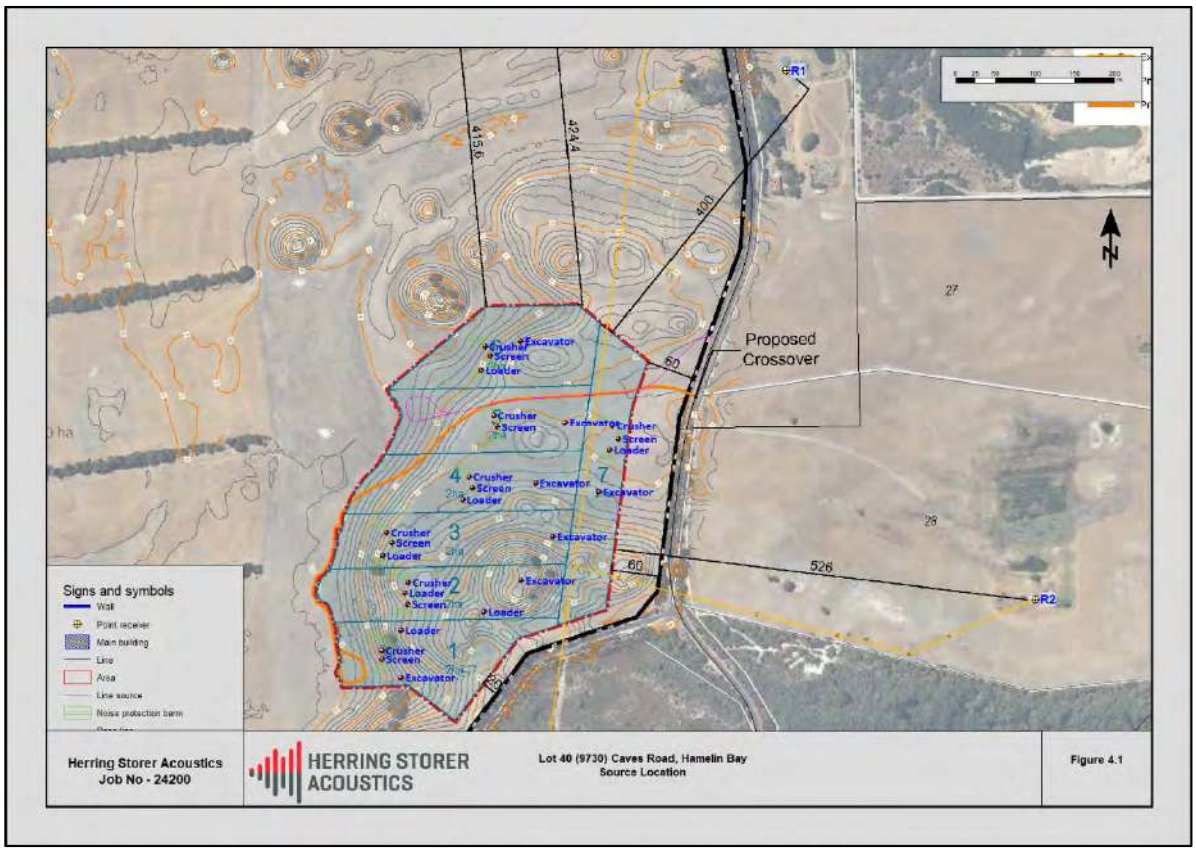


FIGURE 4.1 – SOURCE LOCATION AND PIT PROGRESSION

1 Immissions – noise received at a source
2 Emissions – noise emanating from a source and / or location

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Based on the above, various operating scenarios have been developed for each stage of the proposal. As the fixed plant, being the loader, crusher and screen will generally remain in a static location, this has been modelled for each stage. The truck transporting of material can be within any stage; hence this has been modelled in a separate scenario and included in the overall assessable noise level (added to the fixed plant noise levels). The excavator could operate anywhere within the staged area, whilst the loader would be generally located with the crushing and screen plant, also being available to load out material onto trucks.

It is noted that each stage is assessed individually, with the noise contour plot for the overall noise level being a maximum of each stage (not the cumulative of all stages) for information purposes only.

Information provided is that the material is understood to be located around 10m deep (from ground level). Therefore, as the pits progress, the bottom of the pit will be such that there is a pit wall (operating face) being maintained between equipment and receivers.

As there is a Cat D9 Dozer to be used in the operations, both this and the crushing plant require noise control to ensure compliance. Predictive noise modelling has been conducted where the dozer, located at natural surface level commences operations in Stage 1. The dozer is required to operate from the western most point and clear a sufficient area on the western side of Stage 1 to reach the material. Figure 4.2 details the active area for the dozer for the commencement of works. Once a sufficient depth (5-6m) is achieved within Stage 1, progression of the pit through to stage 2 can continue with the use of the dozer.

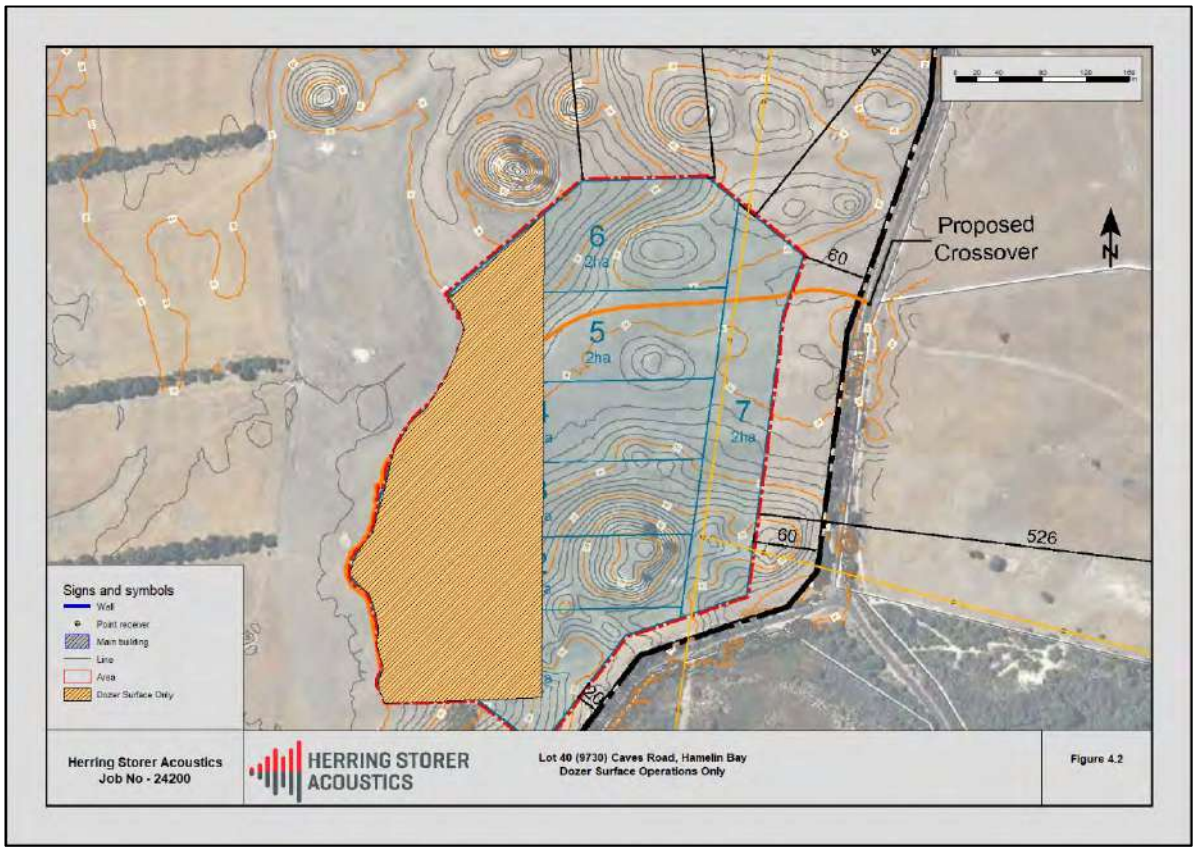


FIGURE 4.2 – DOZER OPERATIONS - SURFACE ONLY

Additionally, the crushing and screening plant require noise control in the form of a barrier. If the plant is located within the pit at a depth of 5m, then this would provide sufficient attenuation. However, at depth less than this a bund is required in close proximity to the plant to form a barrier.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Modelling has assumed the progression of the pit through the numbered stages. Provided the barrier, in the form of a pit wall, or bunding to a minimum height of 3m is maintained, noise levels would be compliant.

Therefore, the operating scenarios considered are:

- Scenario 1 Stage 1 Fixed Plant, Mobile Equipment and truck movements
- Scenario 2 Stage 2 Fixed Plant, Mobile Equipment and truck movements
- Scenario 3 Stage 3 Fixed Plant, Mobile Equipment and truck movements
- Scenario 4 Stage 4 Fixed Plant, Mobile Equipment and truck movements
- Scenario 5 Stage 5 Fixed Plant, Mobile Equipment and truck movements
- Scenario 6 Stage 6 Fixed Plant, Mobile Equipment and truck movements
- Scenario 7 Stage 7 Fixed Plant, Mobile Equipment and truck movements

The following input data was used in the calculations:

a) Provided area plots.
b) Sound Power Levels listed in Table 4.1.
c) Ground contours and receiver point provided by client (Appendix A).

Weather conditions for modelling were as stipulated in the Environmental Protection Authority's "*Draft Guidelines on Environmental Noise for Prescribed Premises"* and for the day period are as listed in Table 4.2.

TABLE 4.2 – WEATHER CONDITIONS

Condition	Day
Temperature	20°C
Relative humidity	50%
Pasquill Stability Class	E
Wind speed	4 m/s*

* From sources, towards receivers.

5. MONITORED AMBIENT NOISE

As per the "Draft Guidelines on Environmental Noise for Prescribed Premises" (released in May 2016), continuous noise monitoring has been conducted to establish the ambient noise levels.

The monitoring location was on the southern boundary of the development, nearest to the neighboring residence. Monitoring commenced on the 19th June 2024 and continued through until the 5th July 2024. Figure 5.1 contains a map of the monitoring location, with Figure 5.2 showing pictures of the monitor in situ.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

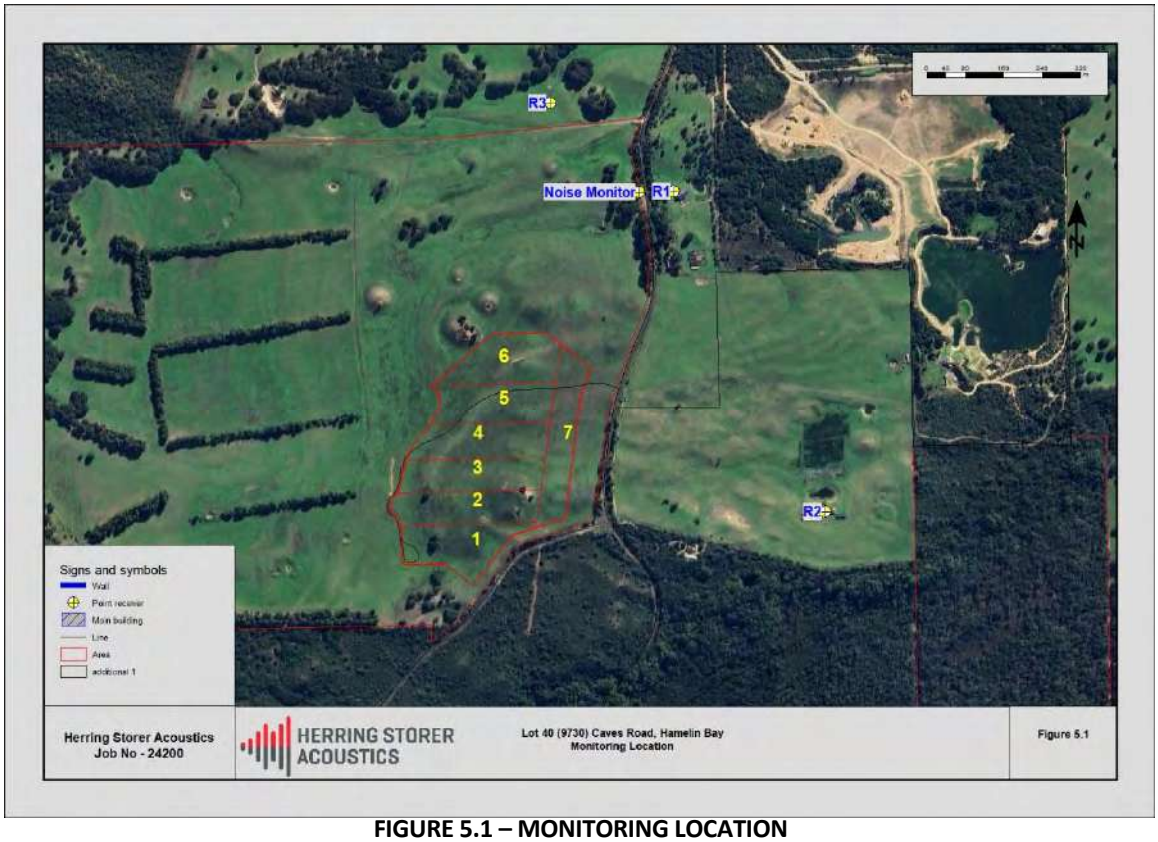


FIGURE 5.1 – MONITORING LOCATION



FIGURE 5.2 – MONITORING PICTURE – IN SITU

Noise monitoring results are summarised graphically below in Figure 5.3, with the full results contained in Appendix C.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

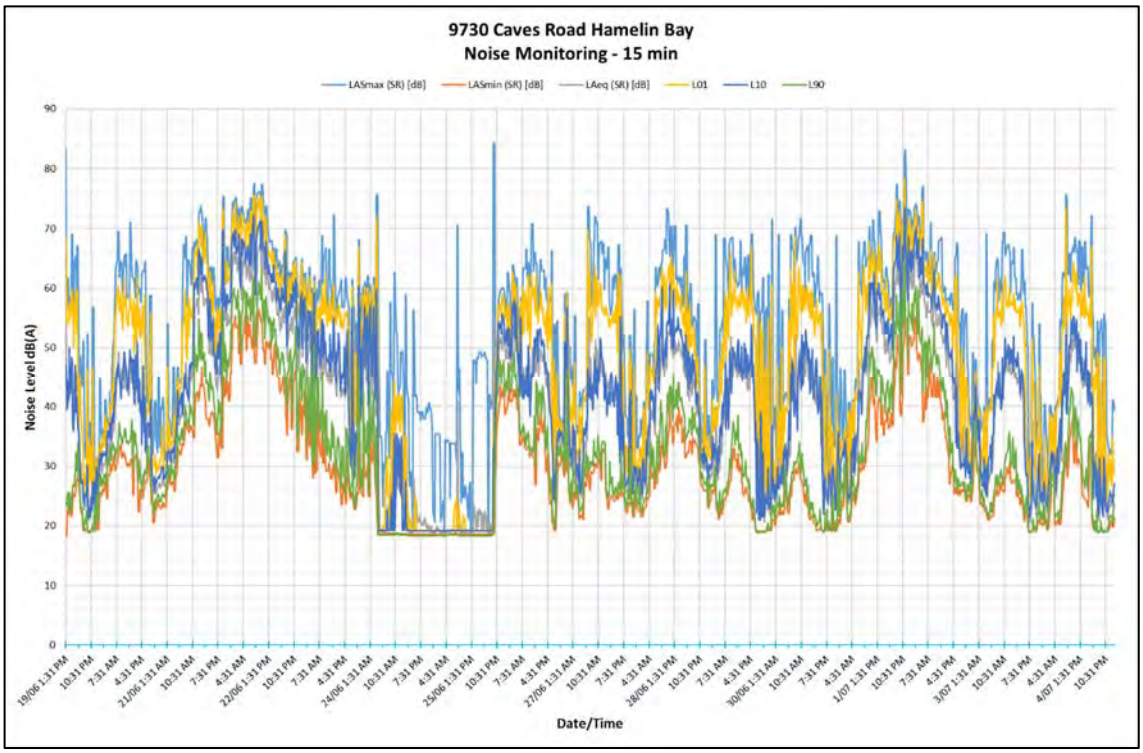


FIGURE 5.3 – MONITORED NOISE LEVELS – TOTAL MONITORING PERIOD

During the monitoring period intermittent rainfall occurred. The days (periods) where rainfall impacted noise levels have been discounted from the assessment of ambient noise.

For informational purposes, a summary of the average noise level for each daily regulatory time period is shown in Table 5.1.

Weather data for the monitoring period was sourced via the Bureau of Meteorology web site for the area.

TABLE 5.1 – SUMMARY NOISE LEVELS

Day / Date	Noise Level	Comments
	Day Period	
Wednesday, 19 June 2024	49.5	
Thursday, 20 June 2024	44.5	
Friday, 21 June 2024	55.2	
Saturday, 22 June 2024	63.0	Rainfall
Sunday, 23 June 2024	46.5	Rainfall
Monday, 24 June 2024	27.5	Rainfall
Tuesday, 25 June 2024	25.8	
Wednesday, 26 June 2024	46.3	Rainfall
Thursday, 27 June 2024	46.1	Rainfall
Friday, 28 June 2024	49.9	Rainfall
Saturday, 29 June 2024	46.1	Rainfall
Sunday, 30 June 2024	45.6	
Monday, 1 July 2024	52.9	
Tuesday, 2 July 2024	53.1	Rainfall
Wednesday, 3 July 2024	45.0	
Thursday, 4 July 2024	48.4	
Average (Good Days)	**49.9**	

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

6. RESULTS

Calculated noise levels associated with the noise emissions from the proposed operations for the assumed scenarios, including bunding to Stages 1 - 3 are summarised below in Table 6.1. Appendix B contains the overall noise contour plots.

TABLE 6.1 – CALCULATED NOISE LEVEL

Operating Scenario	Description	Calculated Noise Level (L_{A10} dB(A))		
		R1	R2	R3
Scenario 1	Stage 1 Fixed Plant, Mobile equipment and Truck Movement	30	24	30
Scenario 2	Stage 2 Fixed Plant, Mobile equipment and Truck Movement	33	31	33
Scenario 3	Stage 3 Fixed Plant, Mobile equipment and Truck Movement	35	33	36
Scenario 4	Stage 4 Fixed Plant, Mobile equipment and Truck Movement	37	35	36
Scenario 5	Stage 5 Fixed Plant, Mobile equipment and Truck Movement	37	36	37
Scenario 6	Stage 6 Fixed Plant, Mobile equipment and Truck Movement	34	29	40
Scenario 7	Stage 7 Fixed Plant, Mobile equipment and Truck Movement	40	39	37

7. ASSESSMENT

For the day time operations, based on calculated noise levels at the nearest premises, noise levels could be considered as potentially containing tonal characteristics.

Based on the assessable noise levels above, comparison against the relevant assigned noise level is contained in Table 7.1. For the purpose of assessment, the highest noise level received for any stage of the operation has been assessed.

TABLE 7.1 – ASSESSMENT OF NOISE LEVELS

Receiver	Premises Receiving Noise Assessable Noise Level dB(A)	Time of Day	Assigned Level (dB)	Compliance
R1	40[45]	0700 - 1900 hours Monday to Saturday (Day)	45	Complies
R2	39[44]			Complies
R3	40[45]			Complies

[ ] Denotes penalty for tonality

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

8. CONCLUSION

Assessment has been conducted on the proposed limestone and sand extraction operations for Lot 40 (9730) Caves Road, Hamelin Bay.

The facility would only operate during the day period (being Monday to Friday 07:00 to 19:00 hours and 07:00 to 13:00 on Saturdays). Therefore, at the neighbouring residences, the applicable acoustic criteria for this assessment is the assigned L_{A10} day period noise level of 45 dB(A).

Noise received at the nearest residential premises has been determined, to be 45 dB(A) for the extraction operations for the highest noise level at any stage of the operations. This can be compared to the applicable assigned noise level criteria of 45 dB(A).

Noise monitoring conducted shows that the ambient noise (background) is generally around 44 dB(A) during the day. Given this, annoying characteristics such as tonality may be present, hence a +5 dB(A) penalty has been included in the assessable noise level stated above.

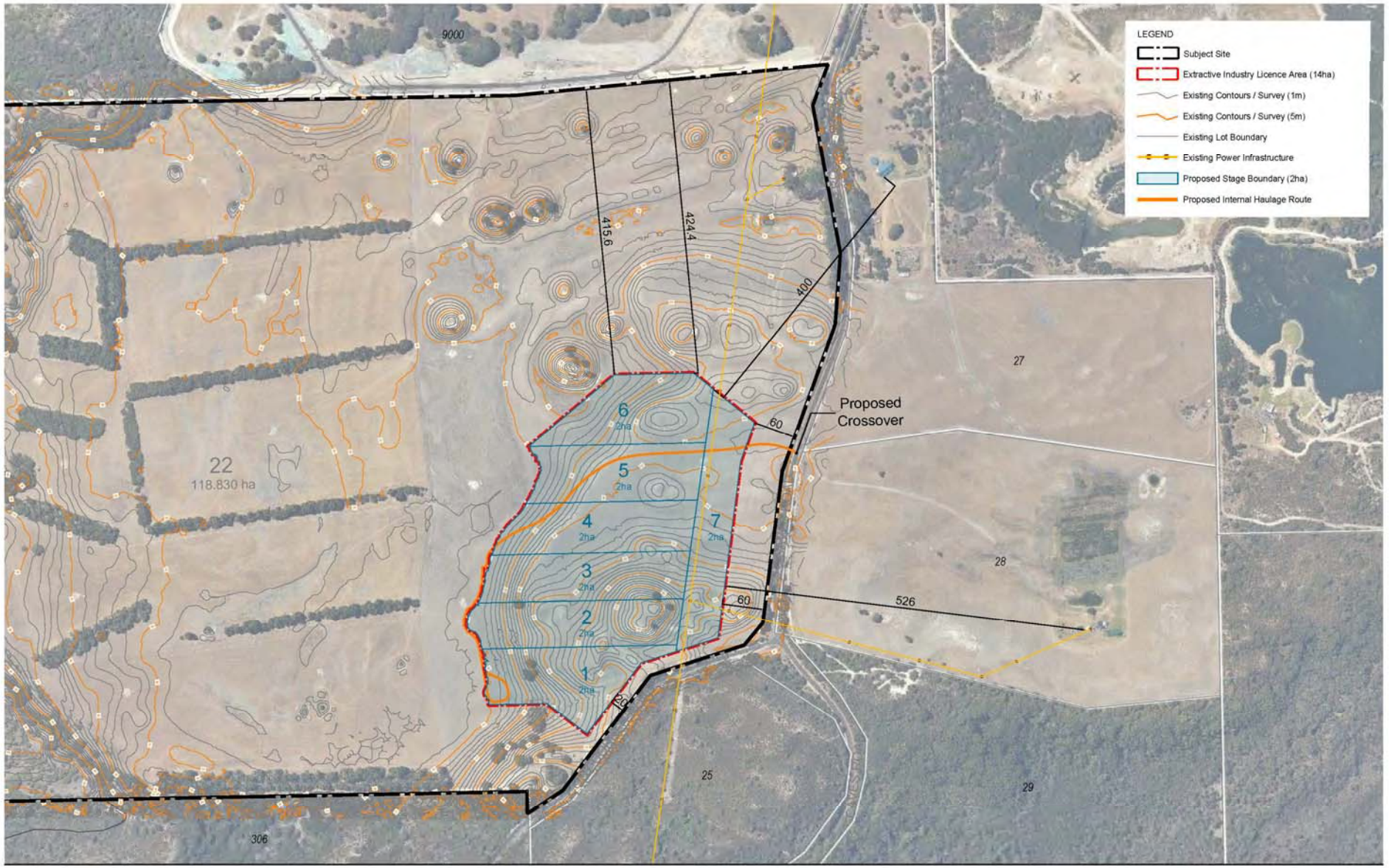
To ensure the above noise levels are maintained, noise control as outline in this report is required.

Given these operating parameters, noise levels received at the nearest premises has been calculated to comply with the *Environmental Protection (Noise) Regulations 1997* for the operating times as outlined in this assessment.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX A

LOCATION MAP



Excavation Works Plan

Lot 22 (9730) Caves Road, Hamelin Bay

Date: 13 Aug 2024 Scale: 1:5000 @ A3 1:2500 @ A1 File: 24-132 EX01B Staff: DL CCG JJ Checked: DL

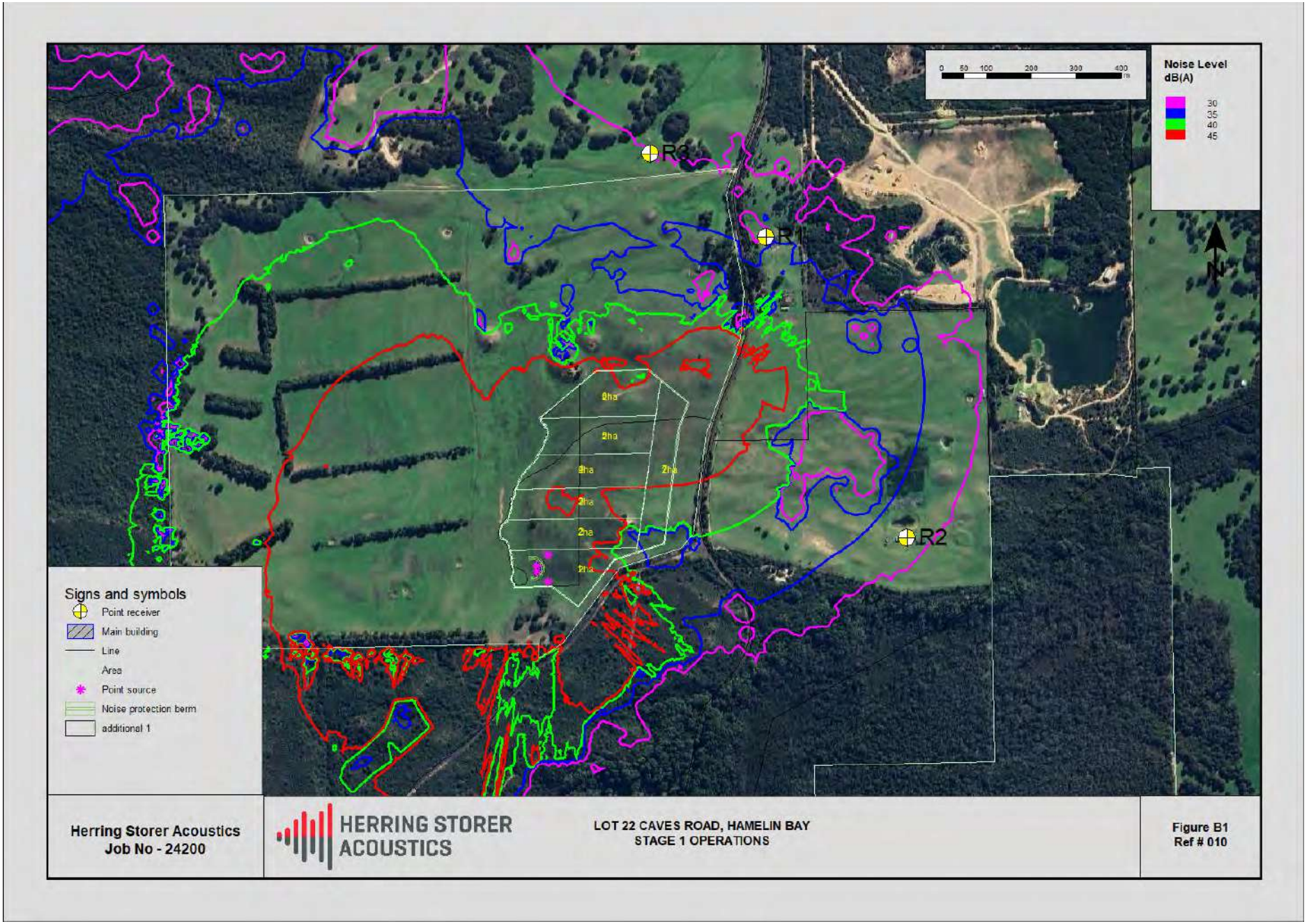
element.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

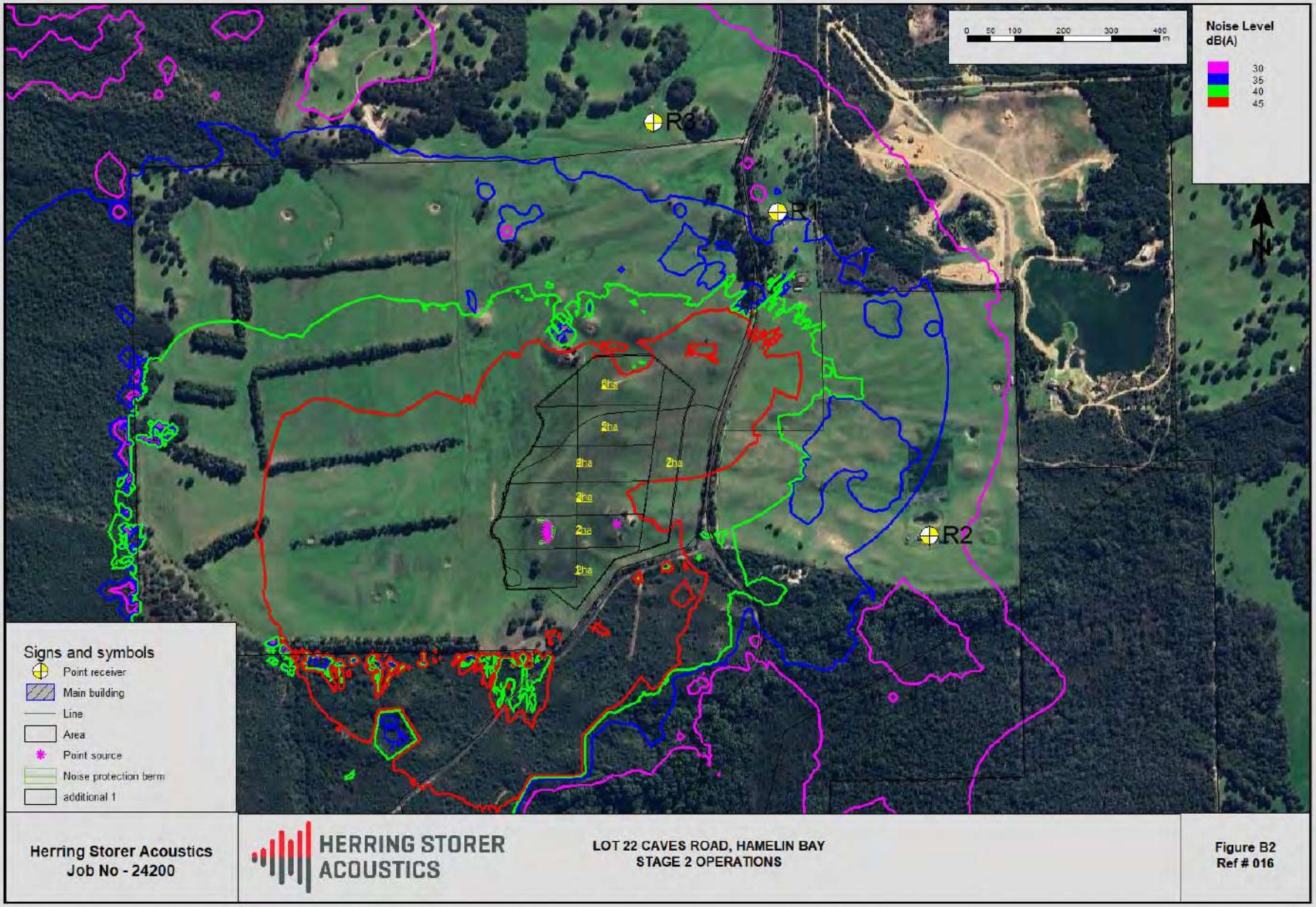
RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX B

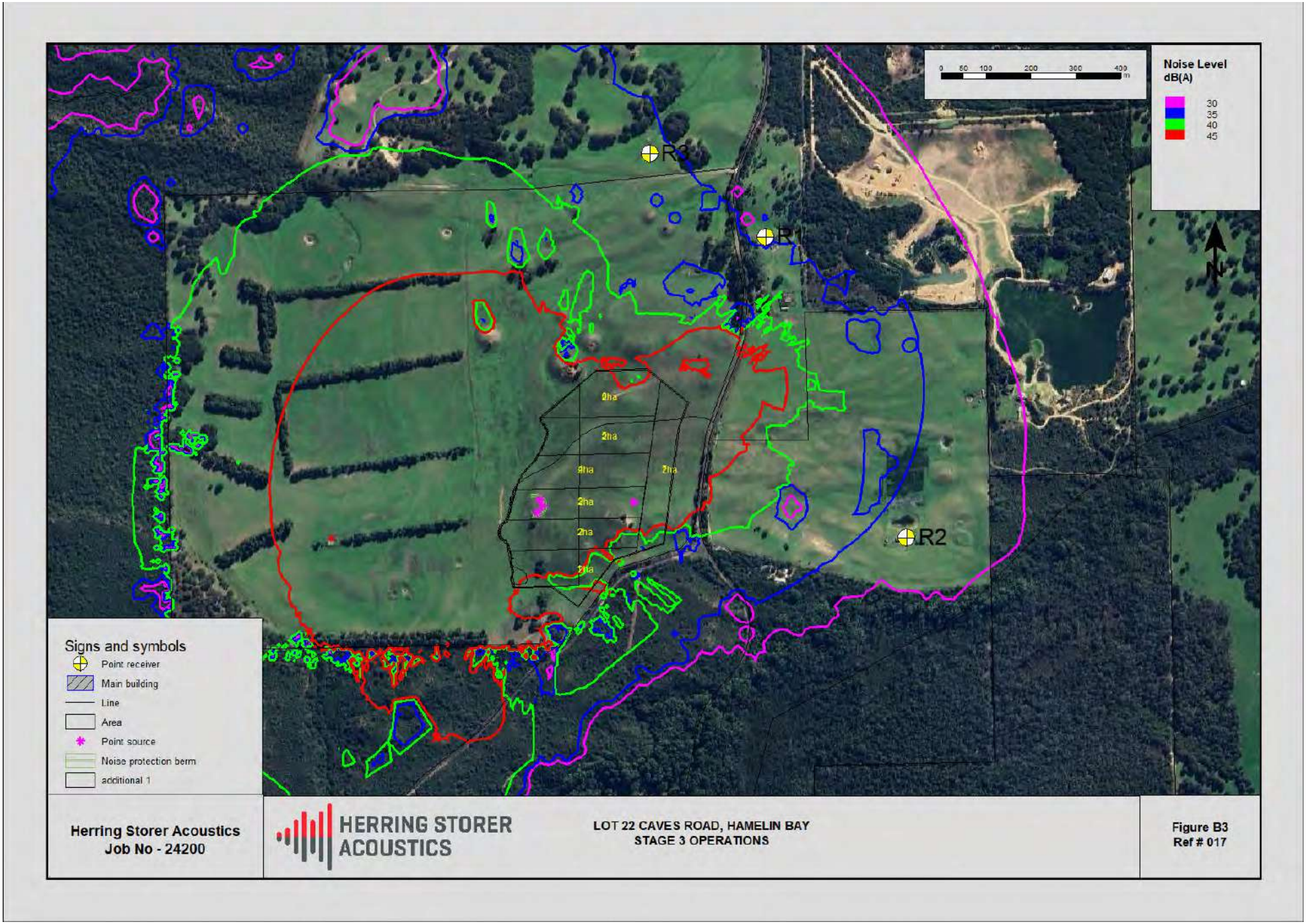
Noise Contours



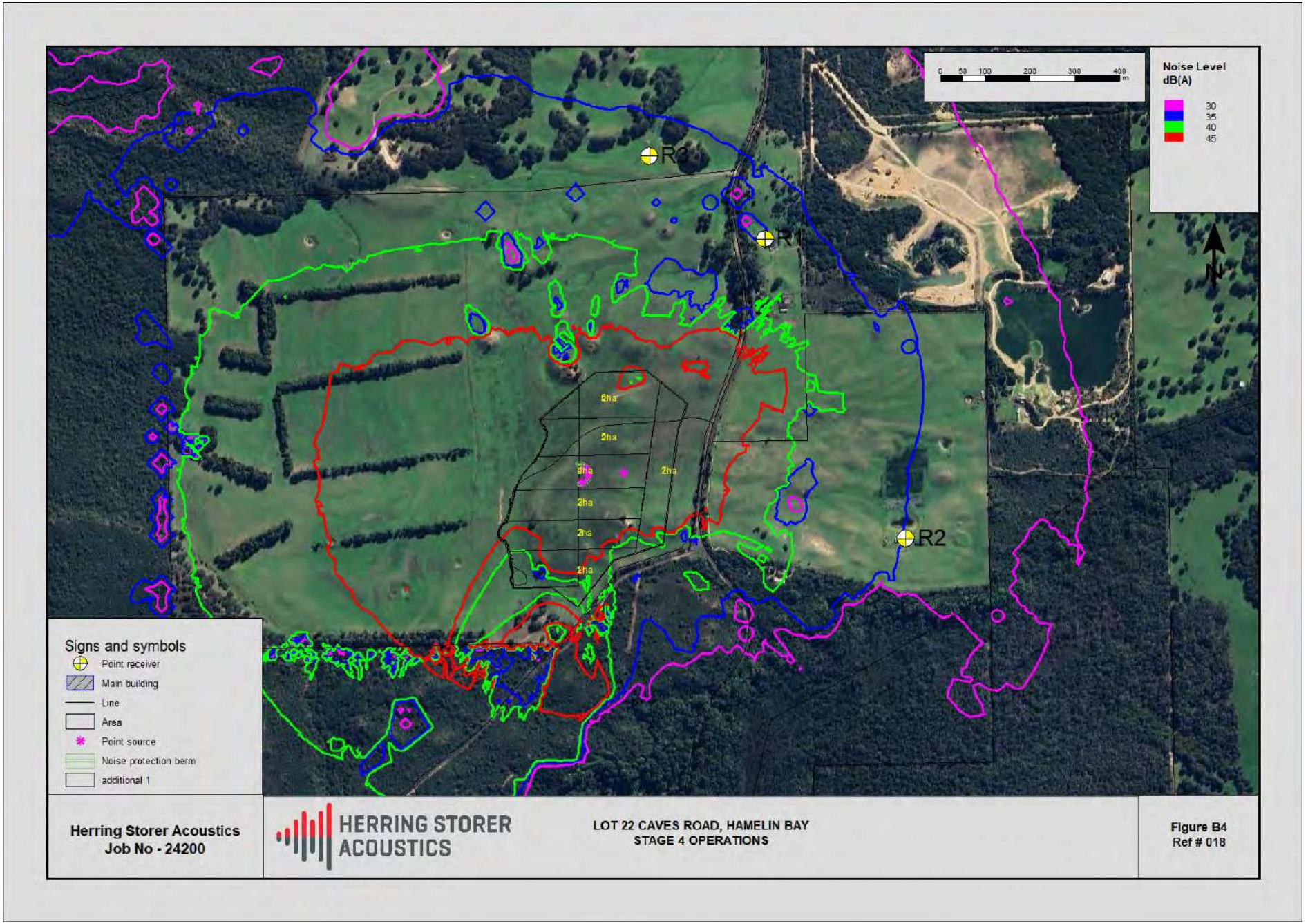
RECEIVED
By Shire of Augusta Margaret River
13 September 2024



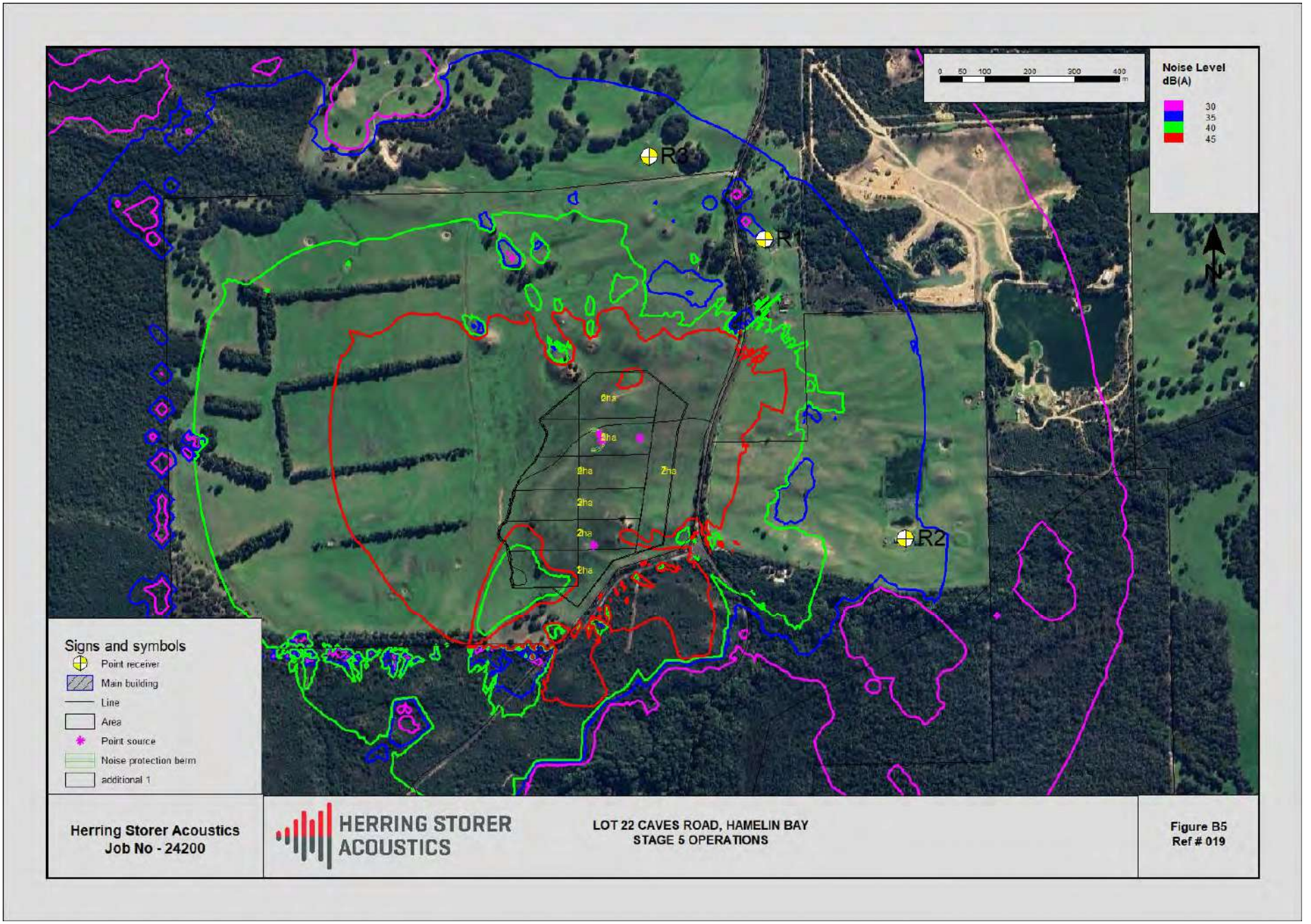
RECEIVED
Shire of Augusta Margaret River
13 September 2024



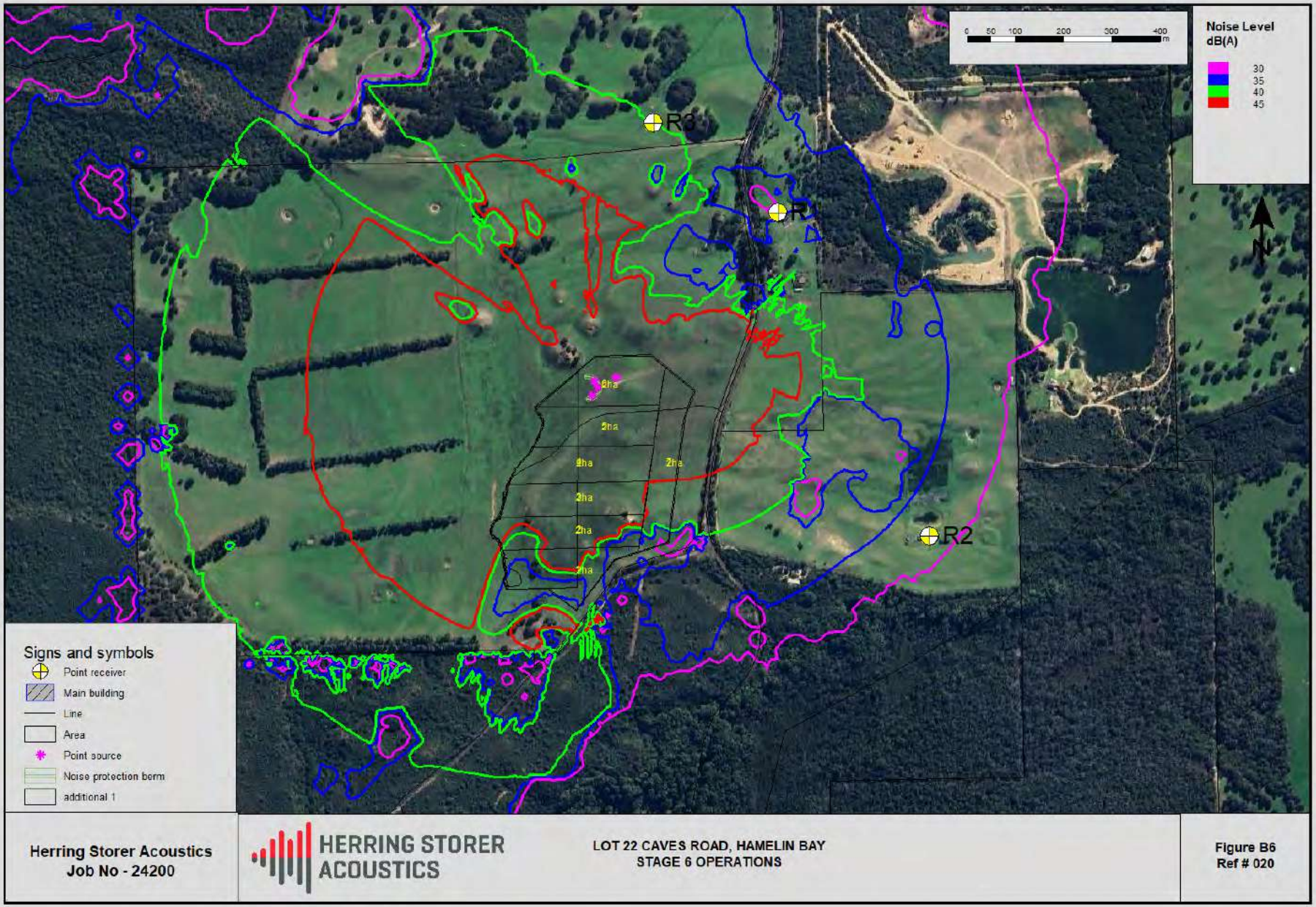
RECEIVED
By Shire of Augusta Margaret River
13 September 2024



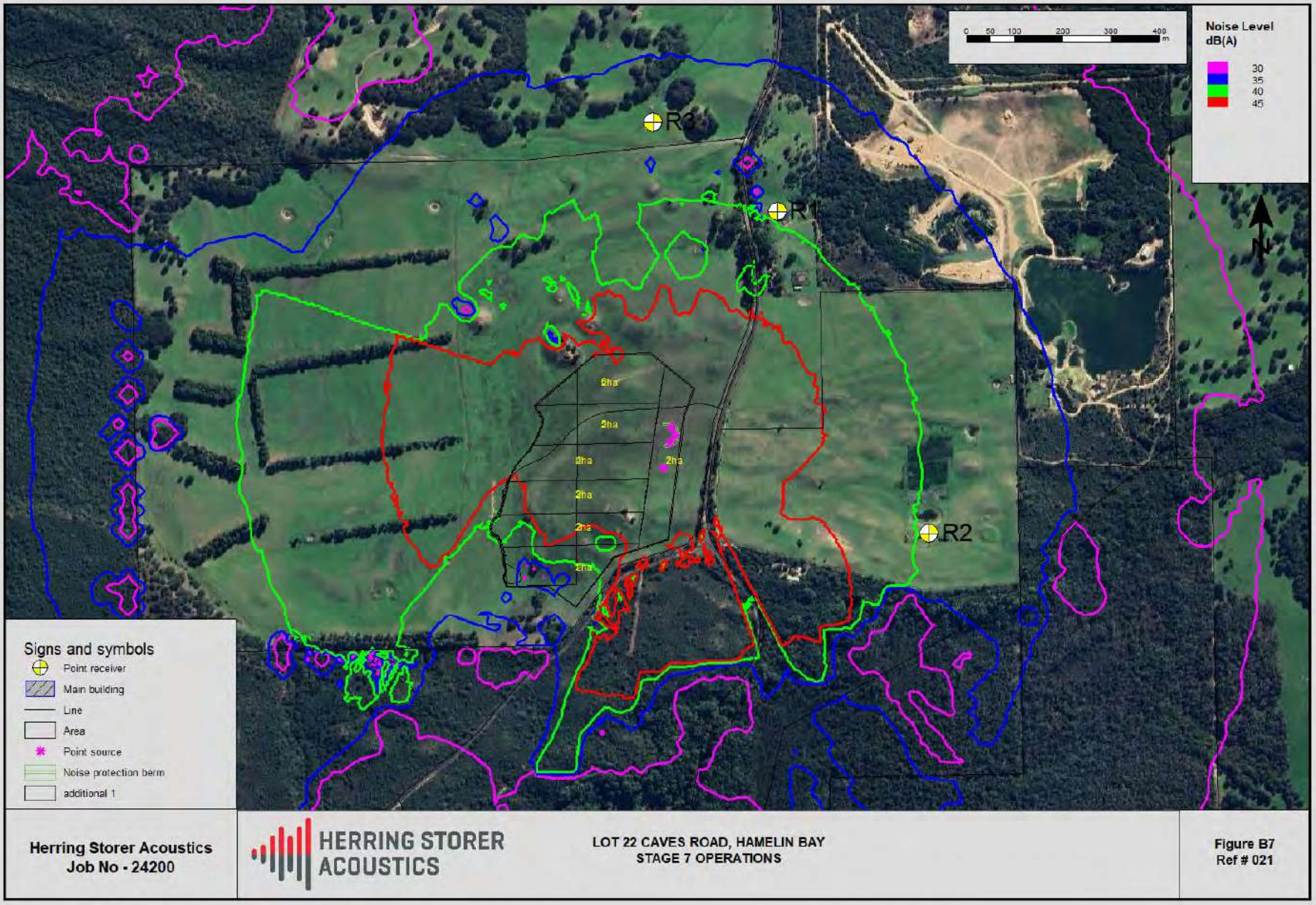
RECEIVED
By Shire of Augusta Margaret River
13 September 2024



RECEIVED
By Shire of Augusta Margaret River
13 September 2024



RECEIVED
By Shire of Augusta Margaret River
13 September 2024

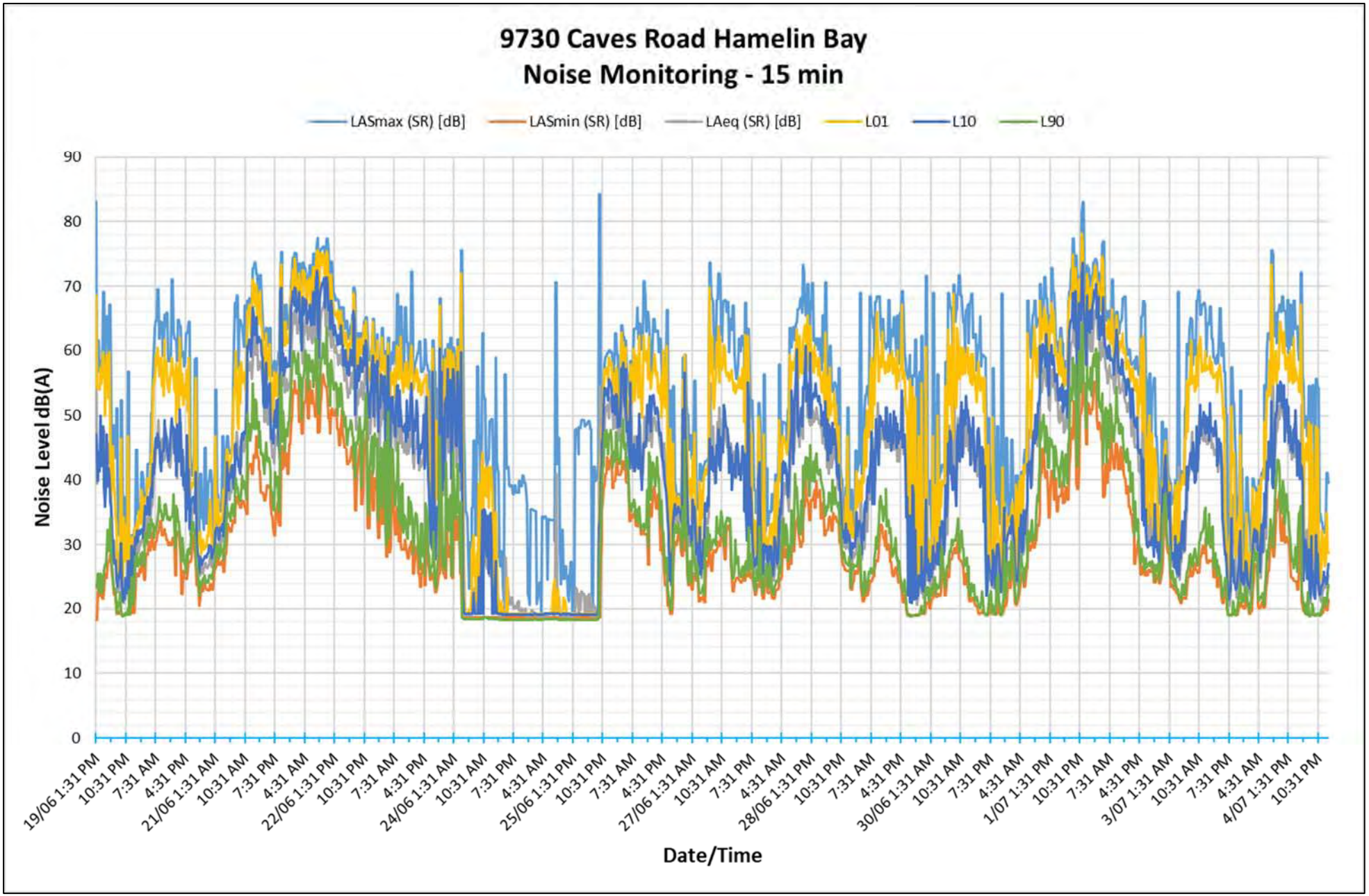


RECEIVED
By Shire of Augusta Margaret River
13 September 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX C

Ambient Noise Monitoring



RECEIVED
By Shire of Augusta Margaret River
13 September 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX D - COMPLAINTS REGISTER

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Complaints Register

Ref. No.	Date	Name & Address of Complainant	Time/Date of Complaint	Detail of Complaint	Summary of Actions Taken	Shire Notified	Person Responsible

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

accendo AUSTRALIA

REHABILITATION MANAGEMENT PLAN

LOT 22 (9730) CAVES ROAD, HAMELIN BAY

August 2023

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Telephone +61 418 950 852

info@accendoaustralia.com.au
PO Box 5178 West Busselton WA 6280
ABN 11 160 028 642

www.accendoaustralia.com.au

Document Control

Version	Date	Author	Reviewer
V1	25/08/2024	PN	KMT/Element
V2	30/08/2024	PN	KMT
Filename	2449_Lot 22 Caves Rd RMP_v2		

Limitations

This report has been prepared by Accendo Australia Pty Ltd in accordance with the scope limitations provided in this report, or as otherwise agreed, between the Client and Accendo.

This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

This report has been prepared based upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report, which Accendo has not independently verified or checked beyond the agreed scope of work. Accendo does not accept liability in connection with such unverified information.

The conclusions and recommendations in this report are based on assumptions made by Accendo described in this report where and as they are required. Accendo disclaims liability arising from any of the assumptions being incorrect.

The report is based on site specific conditions encountered and information received at the time of preparation of this report or the time that site investigations were undertaken. Accendo disclaims responsibility for any changes that may have occurred after this time.

The preparation of this report has been undertaken and performed in a professional manner, in consideration of the scope of services and in accordance with environmental consulting practices. No other warranty is made.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

CONTENTS

1 INTRODUCTION 1
1.1 BACKGROUND 1
1.2 PURPOSE 1
2 EXISTING ENVIRONMENT 2
2.1 LAND USE 2
2.2 TOPOGRAPHY AND SOILS 2
2.3 CLIMATE 2
2.4 VEGETATION AND FAUNA 3
2.5 HYDROLOGY 5
3 EXTRACTION ACTIVITIES 6
4 REHABILITATION MANAGEMENT PLAN 7
4.1 OBJECTIVES 7
4.2 EXTRACTION AREA 7
4.2.1 Topsoil and Overburden Removal 7
4.2.2 Landform Reconstruction and Contouring 8
4.2.3 Site Preparation 8
4.3 LANDSCAPING 8
4.3.1 Site Preparation 8
4.4 WEED MANAGEMENT 9
4.4.1 Weed Control 9
4.4.2 Weed Management Plan 9
4.5 REHABILITATION 10
4.5.1 Pasture 10
4.5.2 Landscaping 10
4.6 MAINTENANCE 11
4.7 MONITORING AND REPORTING 11
4.7.1 Completion Criteria 11
4.8 SCHEDULING 11
4.9 DECOMMISSIONING 12
REFERENCES 13
FIGURES 14

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX A – EXCAVATION WORKS PLAN 15

APPENDIX B – SCREENING VEGETATION PLAN 16

TABLES

Table 1. Rehabilitation Objectives.....6

Table 2. Weed Control Treatment.....7

Table 3. Management actions for weed control.....8

FIGURES

Figure 1. Regional Location of the Subject Site

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

1 INTRODUCTION

1.1 Background

McDougall Quarries Pty Ltd (the applicant) is proposing to extract lime sand and limestone from a 14 hectare (ha) area within Lot 22 (HSE 9730) Caves Road, Hamelin Bay (herein referred to as the subject site) (refer to **Figure 1** and **Appendix A**).

This application is made for a ten year period however, the exact life of the project is difficult to estimate as it will be dependent on supply and demand trends.

The available volume of sand (*insitu* volume of approximately 1,314,489 m^3) is to be extracted, commencing in the south and moving in a northerly direction before finishing in a stage along the east of the subject site (refer to **Appendix A**).

1.2 Purpose

This Rehabilitation Management Plan has been prepared to fulfil the relevant requirements provided within the Shire of Augusta-Margaret River's (the Shire) *Local Planning Scheme No. 1* and the Shire's *Extractive Industries Policy 3*. It is intended to provide the Shire of Augusta-Margaret River, the public and relevant government agencies with an understanding of the proposal and the environmental strategies and commitments proposed to address rehabilitation of the site post extraction activities.

The Plan will describe the proposed management measures necessary to ensure the return of the subject site to a safe and stable landform capable of supporting agriculture (pasture).

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

2 EXISTING ENVIRONMENT

2.1 Land Use

The subject site is zoned 'General Agriculture' pursuant to the Shire's *Local Planning Scheme No.* 1 and has previously been used for agriculture.

The surrounding properties are zoned 'Rural Residential' to the north, 'National Park and Nature Reserve' to the west and south and a mixture of 'General Agriculture', 'Priority Agriculture' and 'Landscape Amenity' to the east pursuant to the Shire *Local Planning Scheme No. 1*.

2.2 Topography and Soils

The current topography of the subject site can be described as variable with the elevation ranging from 30 m Australian Height Datum (AHD) through the eastern portion of the subject site to approximately 40m AHD in the west. Elevated areas are located throughout the subject site and range in elevation from approximately 45 m AHD to 60 m AHD (refer to **Appendix A**).

The subject site is located within the Leeuwin Zone landform within the Gracetown Ridge systems consisting of "*lateritic plateau containing sandy gravel, loamy gravel and grey sandy duplex*" and *"a limestone ridge, in the coastal edge of the Leeuwin Zone containing yellow deep sand and red deep sand",* respectively. (Tille 2006).

The subject site is located within the following sub-systems:

- Kilcarnup rocky dunes phase – Low to steep dunes (gradients 5-10%) not exposed to prevailing wines. Dark calcareous sands containing limestone rubble.
- Kilcarnup dunes (organic) phase – Steep dunes (gradients usually in excess of 20%) not exposed to prevailing winds. Deep pale calcareous sands with brown topsoil.

2.2.1 Acid Sulfate Soils

Acid Sulfate Soils (ASS) is the common name given to naturally occurring soil and sediment containing iron sulfides. They have become a potential issue in land development projects on the Swan Coastal Plain when the naturally anaerobic conditions in which they are situated are disturbed and they are exposed to aerobic conditions and subsequently oxidise. When oxidised, ASS produce sulfuric acid, which can result in a range of impacts to the surrounding environment. ASS that has oxidised and resulted in the creation of acidic conditions are termed "Actual ASS" (AASS), and those that have acid generating potential but remain in their naturally anaerobic conditions are termed "Potential ASS" (PASS).

ASS risk mapping (DWER 2021) indicates that there is a 'nil risk' of ASS occurring within the subject site. This proposal involves the excavation of material above the watertable (at least 2 m separation to maximum groundwater levels will be maintained at all times) and no dewatering will be undertaken during excavation works. Accordingly, the potential impacts associated with ASS are expected to be low and therefore no further investigations regarding ASS are considered necessary.

2.3 Climate

The climate of the locality is classified as Mediterranean with warm to hot summers and cool wet winters.

The closest weather recording station is Cape Leeuwin (Station 9518). Temperatures are highest on average in February, at approximately 23.4°C. August has the lowest average temperature of the year of 11.3°C.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Rainfall for the area is approximately 950 mm per annum with approximately 88% of the rain falling during the winter months, April to October inclusive. Evaporation generally exceeds rainfall from October to March.

During the summer months the dominant wind in the mornings is from the south-east at 18 - 26 kms, swinging to the south-west at 37-46 kms in the afternoon. During winter, the winds are most commonly 18 - 26 kms with no dominant prevailing direction. During storms winds from the west and north-west can reach 74 kms (BoM 2020).

Rainfall intensity has been calculated using the Bureau of Meteorology (BoM) Intensity-Frequency-Duration (IFD) data system which yields the two hour 10 year average return interval storm event for the subject site as 38.3 mm/hr.

2.4 Vegetation and Fauna

Given the condition of vegetation within the subject site and the current land use (livestock grazing and pasture), no flora of conservation significance is likely to occur. Furthermore, mapping prepared by the Department of Biodiversity, Conservation and Attractions (DBCA) does not indicate the presence of any Declared Rare Flora (DRF) species mapped in proximity to the subject site.

Vegetation within the extraction area is in a 'Completely Degraded' condition sowed crops on the flat areas and isolated hills containing *Agonis flexuosa* with no mid or under storey present (refer to **Plates 1** to **3**).



Plate 1: Sowed crops in the foreground with hills with Peppermint trees in background.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Plate 2: View from top of hill looking across extraction area



Plate 3: View across the extraction area towards hill with Peppermint and no understorey.

A search of the DBCA's and EPBC databases found one TEC endorsed under State and Commonwealth legislation and policy recorded within proximity to the subject site. This was the *Empodisma* peatlands of southwestern Australia ecological community.

None of the vegetation within the subject site is representative of this TEC due to the 'completely degraded' condition of the vegetation and the absence of suitable soil types associated with this TEC.

The presence of preferential foraging species within the subject site such as Peppermints represents potential WRP habitat, albeit marginal in quality due to the absence of canopy connectivity and understorey. The extraction footprint has been designed to avoid this vegetation as far as practicable however the removal of some Peppermint trees will be required. The subject site contains less than approximately 0.1 ha of potential habitat which will be removed. However, given the degraded nature of the vegetation and its lack of connectivity to surrounding vegetation this is unlikely to be significant to the WRP population in the local area.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

2.5 Hydrology

2.5.1 Groundwater

The subject site is located within the Cape to Cape South subarea of the *Rights in Irrigation and Water Act 1914* (RiWI Act) proclaimed Blackwood Groundwater Area.

A technical memorandum prepared by WML Consulting Engineers (WML, 2024) reviewed data from the Urban Water Management Plan (UWMP) for the Hamelin Ridge subdivision located directly to the north of the subject site. Additionally, eight bores were installed within the subject site and groundwater levels were measured on the 25th July 2024.

Based on the results from the July groundwater monitoring event and the data from the UWMP for the Hamelin Ridge subdivision, groundwater levels have been estimated to range from approximately 28 m AHD in at the northeastern boundary to approximately 25 m AHD at the southeastern boundary. Given a maximum excavation depth of 30 m AHD, at least 2 m of separation to groundwater is expected to be achieved at all times.

2.5.2 Surface Water

The subject site is located in the Turner subarea of the RiWI Act proclaimed Cape to Cape South surface water area. The subject site is not proclaimed under the *Country Areas Water Supply Act 1947* as a public drinking water source area.

There are no surface water features present within the subject site. The property has three dams, two located to the north west of the subject site and one to the south west. A buffer of greater than 200 m will be maintained from the extraction area to all onsite dams.

The current water cycle within the subject site consists of inputs from rainwater flowing downhill towards the wider drainage system located to the south and east of the subject site. The development is not proposing to alter this process, as there are no drainage lines within the proposed extraction area.

2.5.3 Wetlands

Areas of wetlands in Western Australia have been mapped and this mapping has been converted into a digital dataset that is maintained by the DBCA and is referred to as the '*Geomorphic Wetlands Augusta to Walpole'* dataset. Pursuant to this dataset, there are no mapped wetlands within the subject site. The closest wetlands to the subject site are located to the southeast and are greater than 300m from the extraction area boundary.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

3 EXTRACTION ACTIVITIES

The lime sand and limestone quarry will cover an area of approximately 14 ha, with a current maximum elevation ranging from 30 m AHD to 60 m AHD. It will be excavated to an elevation of 30 m AHD commencing in the south of the subject site and heading north. Extraction activities will be divided into seven stages, of 2.0 ha in size (refer to **Appendix A**).

It is estimated that the total maximum volume of material to be removed will be approximately 1,314,489m^3. Over a ten year period, a maximum of approximately 131,489 m^3 will be excavated each year, depending on supply and demand.

Earthen bunds for noise mitigation will be constructed with topsoil and overburden that will be stripped from the extraction footprint and other areas within the premise boundary. Construction of the bunds will be undertaken with a scraper and dozer.

The planned end use of the quarry is to restore a natural soil profile and return the extraction area to pasture, ensuring that there is no net loss of agricultural land.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

4 REHABILITATION MANAGEMENT PLAN

4.1 Objectives

The objective is to return the land to a condition capable of supporting agricultural activities, with pasture production rates equivalent to or better than pre-mining production rates. This will include dryland pasture with a variety of species.

Table 1. Rehabilitation Objectives

Land Use	Closure Objectives	Completion Criteria	Performance Criteria	Measurement Tool
Agriculture	A self sustaining cover of pasture	Crops cover the extraction area after completion of the rehabilitation works.	Less than 10% bare ground	Annual monitoring as provided in **Section 4.8**
	Weed levels that are not likely to impact on the viability of the reconstructed soils	No declared weed species are present. Weed species are not competing with cover crop across the site.	Declared weed species absent from the rehabilitation area.	Annual monitoring as provided in **Section 4.8**
	A safe and stable landform suitable for the proposed future land use	No areas of erosion or soil collapse are observed.	Rehabilitation surface remains flat and stable, with no evidence of surface erosion.	Annual monitoring as provided in **Section 4.8**
Landscaping	Provide vegetative screening and an ecological linkage along Caves Road and Cosy Corner Road	Provision of one plant (*Agonis flexuosa)* every 5 m along planting area demarcated in **Appendix B**.	85% survival rate for *Agonis flexuosa* planted within the vegetation corridors.	Annual monitoring as provided in **Section 4.8**

4.2 Extraction Area

4.2.1 Topsoil and Overburden Removal

Topsoil is an integral part of rehabilitation as it contains organic matter and a seed bank which assists in establishing vegetation when respread on disturbed areas.

Topsoil at the subject site, where available, will be stripped and stockpiled separately, prior to commencing quarrying.

The soils will be stripped in a dry state to preserve soil structure and stripping will be undertaken in relatively still weather conditions. Management of the topsoil will involve the following:

- Stockpiles will be located sufficiently distant from quarrying operations so that they will not be disturbed prior to being used in rehabilitation.
- Soil stripping should be avoided during wet conditions.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

- The dimensions of the topsoil stockpiles will not exceed 2 m in height. This is to prevent topsoil becoming anaerobic and deteriorating in soil structure, organic matter, nutrients, seed resource and populations of beneficial soil micro-organisms.

Overburden within the subject site will be used in the construction of the noise bunds as specified within the Noise Management Plan.

4.2.2 Landform Reconstruction and Contouring

Landform reconstruction and contouring will involve the following:

- The final landform will be formed to approximately 30 m AHD.
- The post extraction landform will be designed with maximum batters of 1:4.
- Any bunds will be removed and the excavated floor will be deep ripped in two directions. The width between rip lines will be 1 m intervals.

4.2.3 Site Preparation

To ensure the success of the revegetation works, site preparation should occur well before planting is undertaken. This includes landform reconstruction and contouring measures as outlined in **Section 4.3** the implementation of a weed control programme as outlined in **Section 4.5**.

In the event that compacted areas are identified within the revegetation area, contour ripping may be required. Ripping loosens soil aggregates and provides a softer soil surface for the establishment of plant roots. Ripping also promotes aeration of soil, assisting in the breakdown of organic matter and water infiltration.

4.3 Landscaping

4.3.1 Site Preparation

To ensure the success of the revegetation works within the landscaping corridor (refer to **Appendix B**) which will provide screening and an ecological linkage, site preparation will occur well before planting is undertaken. This includes measures such as ploughing or ripping of unvegetated areas and the implementation of a weed control programme as outlined below.

Ploughing may be required to break down the dense mat of dead weed biomass on the ground surface following the weed spraying event and to break up the densely packed fibrous root systems holding the soil together. Following this, contour ripping, at widths which will allow access for equipment required for follow up weed control to occur, may be required to break up the sandy loams/sandy clay loam soils likely to be present on site. Ripping loosens soil aggregates and provides a softer soil surface for the establishment of plant roots. Ripping also promotes aeration of soil, assisting in the breakdown of organic matter and water infiltration. Loam or clay soils are more susceptible to compaction due to their lower porosity.

It is important to note that site preparation works will not occur in proximity to existing native vegetation to avoid physical disturbance or root damage. Furthermore, site works shall not occur within the fire access track.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

4.4 Weed Management

4.4.1 Weed Control

Pre-seeding weed control is only likely to be required where topsoils are used that contain weed species. Given the current land use, it is not anticipated that weed control will be other than normal agriculture practice. If required, weed control will only be conducted after overburden and topsoil have been spread and any seeds have been allowed to germinate.

Herbicides will be selected for the target species, taking into account the surrounding environment and the constraints this may present.

Based on the location and species of weeds present, the recommended weed treatments are detailed in **Table 2**. The timing for weed control is specified within **Table 3**.

Table 2. Weed control treatment.

Treatment	Suggested Constituents	Target Species
Glyphosate spray	2% Glyphosate including Pulse®, wetting agent and Chlorsulfuron	Broadleaf species e.g. *Pelargonium capitatum* Woody weeds e.g. *Zantedeschia aethiopica*
Selective grass spray	Fusilade and approved adjuvant (e.g. Pulse®)	Grass species e.g. *Ehrharta longifolia*

4.4.2 Weed Management Plan

The following weed and disease controls will be implemented within the subject site to assist in the control of invasive species and enhance the outcomes of the proposed rehabilitation works.

Table 3. Management actions for weed control.

Parameter	Action	Timing
Surface Material	Assess weed potential within topsoil material prior to removal and separate weed affected topsoil for treatment or disposal.	Prior to and during topsoil removal
	Store significantly weedy surface material separately to clean surface material.	Surface material removal
	Stockpile all surface materials in the general vicinity of its origin.	Surface material removal
Hygiene Measures	Avoid moving surface material or fill material from weed infected areas to non-infested areas.	At all times
	All earthmoving and ground engaging equipment will be cleaned of vegetation, mud and soil prior to entry and exit of the subject site.	At all times
	No soil and vegetation should be brought to the site apart from that to be used in rehabilitation and plants used in rehabilitation should be free of weeds.	At all times
Access	Control access within the quarry area to reduce the spread of weeds, especially off-road vehicle access, to prevent disturbance to vegetation and weed invasion.	At all times
	Restrict access to areas outside the subject site to reduce the spread of weeds into or out of the site.	At all times
Weed Control	Chemical spraying is to be undertaken as per **Section 4.5.1**.	

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Parameter	Action	Timing
Monitoring and Reporting	Monitoring and reporting work are required to ensure that the revegetation objections are achieved.	Refer to **Section 4.8**

4.5 Rehabilitation

4.5.1 Pasture

Ripping will be undertaken within the completed cells to reduce the potential for surface erosion and promote a seed bed for establishing pasture. During this process, a number of measures will be utilised to ensure maximum efficiency with minimal disturbance. Any ripping that occurs along slopes will have regular contour banks built across the tracks to prevent erosion from water runoff.

As far as possible, topsoil will be placed along the contour to help reduce erosion. Placing the topsoil in such a manner will reduce the down slope flow of water and increase water storage. The final landform will be a more uniform landform with the removal of the isolated raised areas (minus the excavated material). The overburden storage area will take into consideration the surrounding landform and as far as practicable match the surrounding features.

While no specific soil preparation is anticipated, the requirement for the application of lime and/or fertiliser can be determined by soil testing once the landform has been rehabilitated.

For pasture revegetation it is essential that the species are matched to the soil types and rainfall. The location falls into the “High Rainfall Coastal” planting regime with sandy to gravelly soils. Suitable perennial legumes include birdsfoot trefoil, lucerne, strawberry clover and sulla. Perennial pasture includes perennial ryegrass, phalaris, cocksfoot and Rhodes grass. Annual pasture species include ryegrass, serradella and subterranean clover.

The actual species used will be determined by the individual season, nature of the rainfall in the preceding months and stocking/hay production proposed by the landholder which may change from time to time.

Seeding rates are 2 – 5 kg/ha depending on the species used; for example, ryegrass is seeded at 3 kg/ha whereas Rhodes grass is seeded at 4 kg/ha. Seed will be broadcast uniformly within the marked areas in overlapping passes using mechanical equipment to allow for complete and even seed coverage of the pre-prepared area. Seed will be mixed with a bulking agent such as vermiculite, clean sand or sawdust in a ratio of 2 parts bulking agent to 1 part seed. If deemed necessary, seed will be covered by very light harrowing, scarifying, bagging, dragging or light raking of the seeded area as soon as practical and within the same day of seeding.

4.5.2 Landscaping

Upon receipt of the relevant approvals and prior to commencement of extraction activities (excluding the months December to March), a row of vegetation (*Agonis flexuosa*) will be planted at 5 m spacings between the extraction area and fence line along Caves Road, Cosy Corner Road and to the north of the Lot adjacent to the Hamelin Ridge Estate (refer to **Appendix C**). With a completion criteria of 85% survival rate, this will provide approximately 1.4 ha of *Agonis flexuosa* which will offset the clearing of 0.1 ha.

Tubestock provide the most reliable method of establishment for *Agonis flexuosa*. The maximum stock size will be limited to tubestock size as larger stock is likely to require supplementary watering to ensure survival. All revegetation stock will be sourced from (preferably) local nurseries with NIASA accreditation to ensure that tubestock soil is disease free. Only provenance stock will be used.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Planting will preferably be undertaken with a motorised post hole digger by skilled personnel. The planting hole will be excavated vertically into free draining mulched soil to an approximate depth of 0.5 – 0.7 m to accommodate the root ball of the plant.

The planting of seedlings will occur between the months of May to July after substantial rain has saturated the soil profile. Prior to planting the seedling, any tangled roots will be loosened and good soil to plant contact will be made. Seedlings will not be staked for support as free standing plants have increased durability and strength as opposed to staked plants.

4.6 Maintenance

Maintenance will be undertaken following planting/seeding with all activities to be conducted in response to the maintenance inspections and monitoring (as discussed below). The key elements associated with maintenance works will include suppression of smothering weeds, watering of tubestock in summer and infill planting. The requirement to implement revegetation maintenance and infill planting measures will be determined following each monitoring event.

4.7 Monitoring and Reporting

A program of monitoring of the rehabilitation works is required to ensure that the objectives are achieved.

Maintenance inspections will be undertaken annually in spring by the proponent to determine the requirement for maintenance measures.

During these monitoring events, the area will be assessed to determine pasture and tubestock, and weed coverage within areas that have been rehabilitated.

4.7.1 Completion Criteria

To achieve the objectives of the Management Plan and ensure that future management is minimised, the measurable goals for rehabilitated areas are as follows:

- Self-sustaining crop cover with less than 10% bare ground;
- Reduce weed cover to less than 10% (noting that the pasture is not considered a ‘weed’);
- Rehabilitation surface remains flat and stable, with no evidence of surface erosion; and
- 85% survival rate for *Agonis flexuosa* planted within the vegetation corridors (refer to **Appendix B**).

Maintenance will continue to be undertaken as required until this criterion has been achieved or as otherwise agreed with the Shire of Augusta Margaret River. Following the successful completion of the revegetation program, and the submission of the final report, the Shire will, upon application from the owner, refund the bond lodged against the implementation of the Plan.

4.8 Scheduling

Planting of *Agonis flexuosa* planted within the vegetation corridors will occur upon receipt of the relevant approvals and prior to commencement of extraction activities (excluding the months October to April).

The rehabilitation of the excavation area will be undertaken on the completion of excavation. Accordingly, a definitive timeline for rehabilitation is not prescribed, but rather a commitment to establish pasture by the first month of August, following completion of the extraction works.

Rehabilitation works will be undertaken at the following specified times of year:

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

1. Spring/summer:
    - Excavated area to be graded to levels and contours conforming to the adjacent unaffected areas minus the thickness of the excavated material.
    - Deep ripping along the contour at 1 m intervals.
    - Embankment batters will be cut to no less than 1 in 4.
    - Stockpiled topsoil will be spread over the shaped surface.
2. Autumn:
    - Pre-seeding weed control.
3. Autumn/winter:
    - Planting landscape corridor vegetation.
    - Seeding with appropriate agricultural seed mix.
    - If sufficient vegetation does not germinate following initial seeding, the area will be re-seeded.
4. Spring:
    - Maintenance inspections to determine extent of maintenance requirements.
    - Formal monitoring will be undertaken in areas that have been rehabilitated.

4.9 Decommissioning

Following completion of the extraction activities, the applicant will undertake the following actions to decommission the site:

- All buildings and infrastructure will be removed;
- Any hard stand surfaces will be removed and used to backfill the pit;
- Overburden will be used as backfill;
- The area will have the slopes and soils constructed to allow for the future proposed land use.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

REFERENCES

Accendo Australia (2024). *Lot 22 Caves Road, Hamelin Bay Works and Excavation Plan*. Busselton, WA.

Beard J. S. (1990). *Plant life of Western Australia*, Kangaroo Press, Perth.

Churchward, H.M. and McArthur, W.M. (1978). Landforms and soils of the Darling System, Western Australia. In *'Atlas of Natural Resources, Darling System, Western Australia'*. Department of Conservation and Environment, Western Australia.

Department of Biodiversity, Conservation and Attractions (DBCA) (2021). *Geomorphic Wetlands of the Swan Coastal Plain dataset.* Accessed August 2021.

Department of Primary Industries and Regional Development (DPRD) (2019). *Interpolated contours lines at 2 metre intervals database*. Accessed August 2021.

Department of Water (DoW) (2014). *South West Region Guideline, Water resource considerations for extractive industries.* DoW, Perth WA.

Department of Water and Environmental Regulation (DWER) (2021). *Public Drinking Water Source Areas database*. Accessed August 2021.

Environmental Protection Authority (EPA) (2006). *Guidance Statement No.10 for the Assessment of Environmental Factors (in accordance with the EP Act 1986: Levels of Assessment for Proposals Affecting Natural Areas Within the System 6 Region and Swan Coastal Plain Portion of the System 1 Region.*

Environmental Protection Authority (EPA) (2009). *South West Regional Ecological Linkages.* Bulletin No 8. Retrieved from: http://epa.wa.gov.au/EPADocLib/3040_SWREL_EPB821009.pdf

Geological Survey of Western Australia (1978). *Geology and mineral resources of Western Australia, memoir 3*. Geological Survey of Western Australia, Perth, WA.

Thackway, R, and Cresswell, ID, (Eds) (1995). *An Interim Biogeographic Regionalisation for Australia: a framework for establishing the national system of reserves*, Version 4.0. Australian Nature Conservation Agency, Canberra.

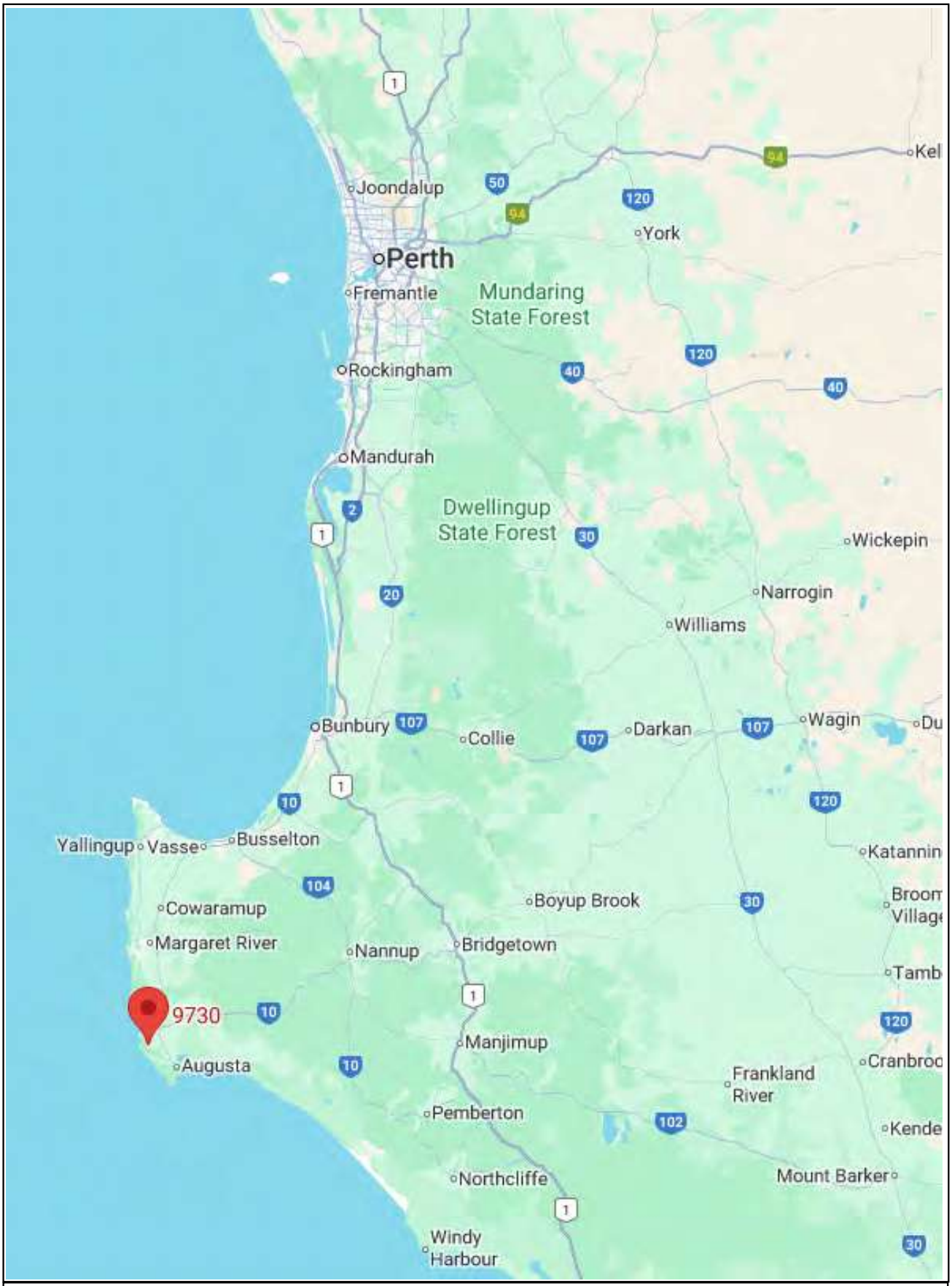
Tille, P (2006). Soil-Landscape Zones of the WA Rangelands and Interior.

Western Australian Planning Commission (WAPC) (2007). *Planning Bulletin No. 64: Acid Sulfate Soils*, Western Australian Planning Commission, Western Australia.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

FIGURES

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



PROJECT	Lot 22 Caves Road, Hamelin Bay	Project Number	Drawing Number	Revision
		2449	Figure 1	A
DRAWING TITLE	Figure 1 - Regional location of the subject site	Designed PN	Checked	
		Drawn PN	Approved	
CLIENT	McDougall Quarries Pty Ltd	Date	20/8/2024	
		Local Authority	City of Busselton	
		Sheet 1 of 1		

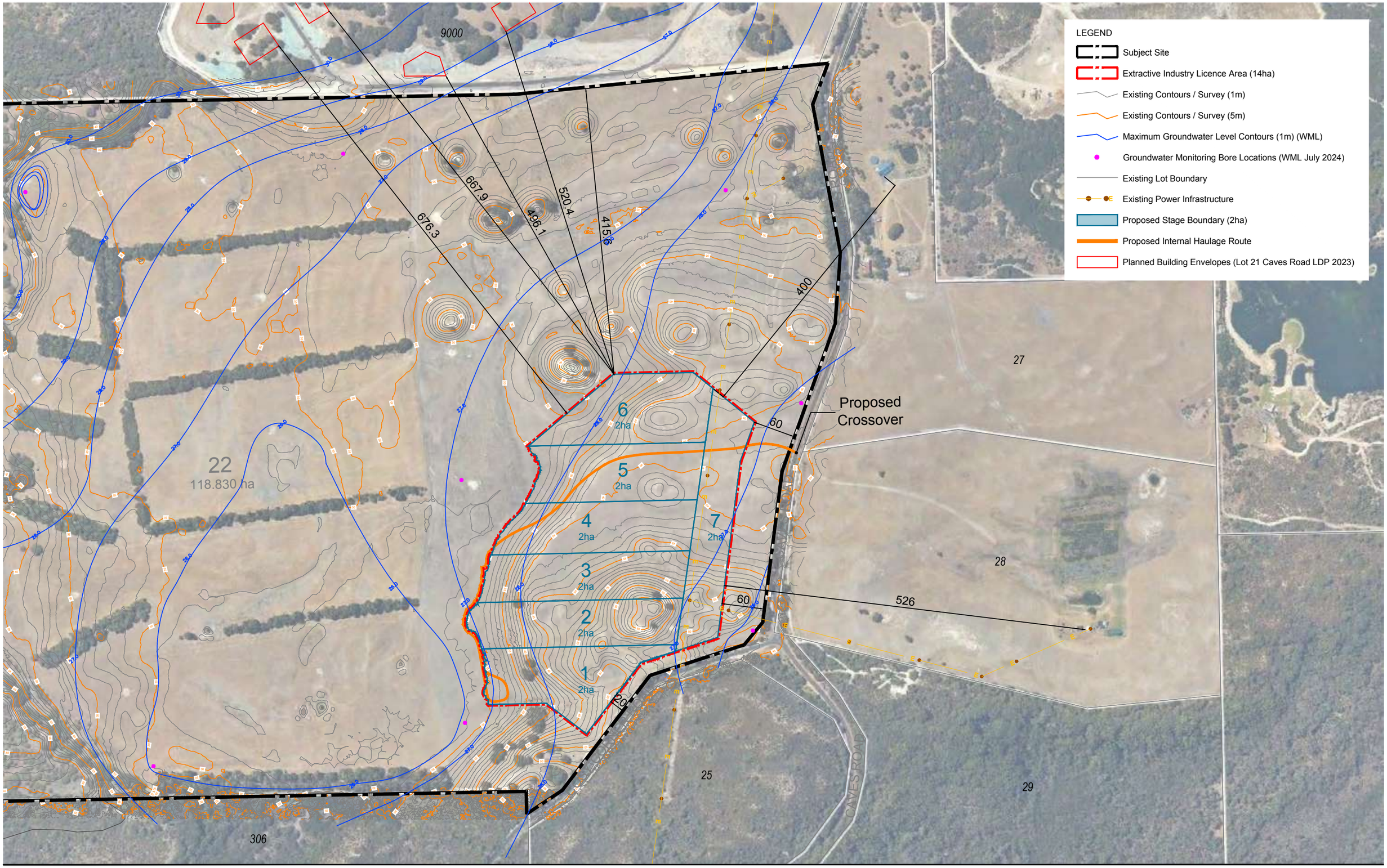
This drawing has been prepared by, and remains the property of Accendo Australia Pty Ltd. This drawing shall not be used without permission. The drawing shall be preliminary only and/or not for construciton until signed approved.

PO Box 5178
West Busselton
Western Australia 6280
Mobile 0418 950 852

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX A – EXCAVATION WORKS PLAN

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Excavation Works Plan

Lot 22 (9730) Caves Road, Hamelin Bay

Date: 26 Aug 2024 Scale: 1:5000 @ A3 1:2500 @ A1 File: **24-132 EX01B** Staff: DL CCG JJ Checked: DL

0 100m

element.

Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
PO Box 7375 Cloisters Square, Perth Western Australia 6850.
T. +61 8 9289 8300 | **E.** hello@elementwa.com.au **elementwa.com.au**

© Element Advisory WA Pty Ltd

This concept has been prepared for the purpose of meeting client specifications. The drawing does not constitute an invitation,agreement or contract (or any part thereof) of any kind whatsoever. Although care has been taken in the compilation of this drawing by Element Advisory WA Pty Ltd, all parties associated with the proposed property development disclaim all responsibility for any errors or omissions. The right is reserved to change the plan at any time. Liability is expressly disclaimed by Element Advisory WA Pty Ltd for any loss or damage which may be sustained by any person acting on any visual impression gained from this drawing.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX B – SCREENING VEGETATION PLAN

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

60m

120m

Legend

- Subject Site Boundary
- Partially Visible
- Visible
- 5m Screening Vegetation Planting
- Extraction Area

Screening Vegetation Plan

Caves Road, Hamelin Bay

Date: 31 July 2024 | Scale: NTS @A3 | Drawing No. **24-132** | Staff: CCG | Checked: DKL

element.

Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
PO Box 7375 Cloisters Square, Perth Western Australia 6850.
T. +61 8 9289 8300 | **E.** hello@elementwa.com.au **elementwa.com.au**

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

accendo AUSTRALIA

WATER MANAGEMENT PLAN

LOT 22 (9730) CAVES ROAD, HAMELIN BAY

August 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Telephone +61 418 950 852

info@accendoaustralia.com.au
PO Box 5178 West Busselton WA 6280
ABN 11 160 028 642

www.accendoaustralia.com.au

Document Control

Version	Date	Author	Reviewer
V1	25/08/2024	PN	KMT/Element
V2	30/08/2024	PN	KMT
Filename	2449_Lot 22 Caves Rd WMP_V1		

Limitations

This report has been prepared by Accendo Australia Pty Ltd in accordance with the scope limitations provided in this report, or as otherwise agreed, between the Client and Accendo.

This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

This report has been prepared based upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report, which Accendo has not independently verified or checked beyond the agreed scope of work. Accendo does not accept liability in connection with such unverified information.

The conclusions and recommendations in this report are based on assumptions made by Accendo described in this report where and as they are required. Accendo disclaims liability arising from any of the assumptions being incorrect.

The report is based on site specific conditions encountered and information received at the time of preparation of this report or the time that site investigations were undertaken. Accendo disclaims responsibility for any changes that may have occurred after this time.

The preparation of this report has been undertaken and performed in a professional manner, in consideration of the scope of services and in accordance with environmental consulting practices. No other warranty is made.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

CONTENTS

1 INTRODUCTION 1
1.1 BACKGROUND 1
1.2 PURPOSE AND SCOPE 1
2 EXISTING ENVIRONMENT 2
2.1 LOCATION 2
2.2 LAND USE 2
2.3 TOPOGRAPHY AND SOILS 2
2.4 CLIMATE 2
2.5 HYDROLOGY 3
3 EXTRACTION ACTIVITIES 4
3.1 OPERATIONAL WORKS 4
3.1.1 Final Contours 5
3.1.2 Rehabilitation 5
3.2 PROPOSED OPERATING TIMES 5
3.3 EQUIPMENT 5
3.3.1 Water Usage 6
4 POTENTIAL IMPACTS AND MANAGEMENT 7
4.1 SURFACE WATER 7
4.2 DRAINAGE 7
4.3 GROUNDWATER 8
4.4 HYDROCARBONS AND DANGEROUS GOODS MANAGEMENT 8
REFERENCES 10
FIGURES 11
APPENDIX A – EXCAVATION WORKS PLAN 12
APPENDIX B – GROUNDWATER TECHNICAL MEMORANDUM 13
APPENDIX C – POST EXTRACTION PLAN 14

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

TABLES

Table 1. Equipment……5

Table 2. Risk assessment associated with surface water and stormwater……7

Table 3. Risk assessment associated with groundwater……8

Table 4. Hydrocarbon and dangerous goods management measures……9

Table 5. Risk assessment associated with the uncontrolled discharge of contaminants……9

FIGURES

Figure 1. Regional location of the subject site

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

1 INTRODUCTION

1.1 Background

McDougall Quarries Pty Ltd (the applicant) is proposing to extract lime sands and limestone from a 14 hectare (ha) area within Lot 22 (HSE 9730) Caves Road, Hamelin Bay (herein referred to as the subject site) (refer to **Figure 1** and **Appendix A**).

The available volume of sand (*insitu* volume of approximately 1,314,489 m^3) is to be extracted, commencing in the south and moving in a northerly direction before finishing in a stage along the east of the subject site (refer to **Appendix A**).

The post extraction landform will be designed with minimum batters of 1:4.

1.2 Purpose and Scope

The purpose of this Water Management Plan (WMP) is to review the risks and control measures to appropriately manage and minimise the environmental impacts of the extractive industry on both groundwater and surface water in proximity to the subject site.

The scope of the WMP is to cover the following:

- Legislative and regulatory compliance;
- Existing environment;
- Risk assessment water quality impacts;
- Mitigation and measurement measures; and
- Roles and responsibilities in relation to water management.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

2 EXISTING ENVIRONMENT

2.1 Location

The subject site is located within Lot 22 Caves Road, Hamelin Bay. The Lot is wholly owned by Joe Fish Pty Ltd. Subject to development approval for the extractive industry, the Lot will be purchased by the proponent.

The subject site is located within the municipality of the Shire of Augusta-Margaret River, approximately 32 km south of the Margaret River town centre and approximately 260 km south of Perth.

2.2 Land Use

The subject site is zoned 'General Agriculture' pursuant to the Shire's *Local Planning Scheme No.* 1 and has previously been used for agriculture.

The surrounding properties are zoned 'Rural Residential' to the north, 'National Park and Nature Reserve' to the west and south and a mixture of 'General Agriculture', 'Priority Agriculture' and 'Landscape Amenity' to the east pursuant to the Shire *Local Planning Scheme No. 1*.

2.3 Topography and Soils

The current topography of the subject site can be described as variable with the elevation ranging from 30 m Australian Height Datum (AHD) through the eastern portion of the subject site to approximately 40m AHD in the west. Elevated areas are located throughout the subject site and range in elevation from approximately 45 m AHD to 60 m AHD (refer to **Appendix A**).

The subject site is located within the Leeuwin Zone landform within the Gracetown Ridge systems consisting of "*lateritic plateau containing sandy gravel, loamy gravel and grey sandy duplex*" and *"a limestone ridge, in the coastal edge of the Leeuwin Zone containing yellow deep sand and red deep sand",* respectively. (Tille 2006).

The subject site is located within the following sub-systems:

- Kilcarnup rocky dunes phase – Low to steep dunes (gradients 5-10%) not exposed to prevailing wines. Dark calcareous sands containing limestone rubble.
- Kilcarnup dunes (organic) phase – Steep dunes (gradients usually in excess of 20%) not exposed to prevailing winds. Deep pale calcareous sands with brown topsoil.

2.4 Climate

The climate of the locality is classified as Mediterranean with warm to hot summers and cool wet winters.

The closest weather recording station is Cape Leeuwin (Station 9518). Temperatures are highest on average in February, at approximately 23.4°C. August has the lowest average temperature of the year of 11.3°C.

Rainfall for the area is approximately 950 mm per annum with approximately 88% of the rain falling during the winter months, April to October inclusive. Evaporation generally exceeds rainfall from October to March.

During the summer months the dominant wind in the mornings is from the south-east at 18-26 kms, swinging to the south-west at 37-46 kms in the afternoon. During winter, the winds are most commonly

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

18-26 kms with no dominant prevailing direction. During storms winds from the west and north-west can reach 74 kms (BoM 2020).

Rainfall intensity has been calculated using the Bureau of Meteorology (BoM) Intensity-Frequency-Duration (IFD) data system which yields the two hour 10 year average return interval storm event for the subject site as 38.3 mm/hr.

2.5 Hydrology

2.5.1 Groundwater

The subject site is located within the Cape to Cape South subarea of the *Rights in Irrigation and Water Act 1914* (RiWI Act) proclaimed Blackwood Groundwater Area.

A technical memorandum prepared by WML Consulting Engineers (WML, 2024) reviewed data from the Urban Water Management Plan (UWMP) for the Hamelin Ridge subdivision located directly to the north of the subject site. Additionally, eight bores were installed within the subject site and groundwater levels were measured on the 25th July 2024.

Based on the results from the July groundwater monitoring event and the data from the UWMP for the Hamelin Ridge subdivision, groundwater levels have been estimated to range from approximately 28 m AHD in at the northeastern boundary to approximately 25 m AHD at the southeastern boundary (refer to **Appendix B**). Further groundwater monitoring events planned for the remainder of the 2024 winter season will be used to update these contours, however data obtained from the July monitoring event is expected to represent levels close to the expected annual maximum groundwater levels (WML, 2024). Given a maximum excavation depth of 30 m AHD, at least 2 m of separation to groundwater is expected to be achieved at all times.

2.5.2 Surface Water

The subject site is located in the Turner subarea of the RiWI Act proclaimed Cape to Cape South surface water area. The subject site is not proclaimed under the *Country Areas Water Supply Act 1947* as a public drinking water source area.

There are no surface water features present within the subject site. The property has three dams, two located to the north west of the subject site and one to the south west. A buffer of greater than 200 m will be maintained from the extraction are to all onsite dams.

The current water cycle within the subject site consists of inputs from rainwater flowing downhill towards the wider drainage system located to the south and east of the subject site. The development is not proposing to alter this process, as there are no drainage lines within the proposed extraction area.

2.5.3 Wetlands

Areas of wetlands in Western Australia have been mapped and this mapping has been converted into a digital dataset that is maintained by the DBCA and is referred to as the '*Geomorphic Wetlands Augusta to Walpole'* dataset. Pursuant to this dataset, there are no mapped wetlands within the subject site. The closest wetlands to the subject site are located to the southeast and are greater than 300 m from the extraction area boundary.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

3 EXTRACTION ACTIVITIES

The agricultural lime, lime sand and limestone quarry will cover an area of approximately 14 ha, with a current maximum elevation ranging from 30 m AHD to 60 m AHD. It will be excavated to an elevation of 30 m AHD commencing in the south of the subject site and heading north. Extraction activities will be divided into seven stages, of 2.0 ha in size (refer to **Appendix A**).

It is estimated that the total maximum volume of material to be removed will be approximately 1,314,489 m^3. Over a ten year period, a maximum of approximately 131,449 m^3 will be excavated each year, depending on supply and demand.

Earthen bunds for noise mitigation will be constructed with topsoil and overburden that will be stripped from the extraction footprint and other areas within the premise boundary. Construction of the bunds will be undertaken with an excavator and loader.

The planned end use of the quarry is to restore a natural soil profile and return the extraction area to pasture, ensuring that there is no net loss of agricultural land.

3.1 Operational Works

Using a loader, the topsoil (where available) will be stripped and placed in stockpiles. Overburden, if present, will be removed using a dump truck and stockpiled to a convenient location within each extraction stage for operations. Topsoil stockpiles will be less than 2 m high with a batter no greater than 1:3.

In order to comply with noise regulations, surface works with the dozer must commence from the western most point and clear a sufficient area on the western side of Stage 1 to reach the material. Once a sufficient depth (5-6m) is achieved within Stage 1, progression of the pit through to Stage 2 can continue with the use of the dozer (Herring Storer Acoustics, 2024).

The material will be excavated by an excavator, bulldozer or loader to a stockpile or loaded directly to waiting trucks for transport. A summary of the proposed extraction activities is provided below:

- Prior to excavation commencing the site will be ground surveyed, the excavation footprint marked out and a 1 m contour plan developed.
- The topsoil/overburden will be stripped and used to construct earthen bunds using a loader.
- An excavator or front-end loader will be used to dig the sand and transport it to a stockpile.
- The sand will then be picked up by a loader and loaded to trucks for transport.
- All static and other equipment, will be located on the floor of the quarry to provide visual and acoustic screening.
- Excavation will commence in the south of the quarry initially moving north before returning to the east to complete extraction works. The face and walls of the pit will act as noise barriers.
- Crushing and screening of material may be required. Where crushing and screening is required noise bunds will be constructed to ensure compliance with the noise regulations.
- Upon completion of each section of quarry, the section will be reformed and back filled using a combination of equipment such as a tracked bobcat, excavator and front end loader, where subgrade material is available, to achieve the proposed final contours.
- At the end of excavation, the noise bunds will be removed, and the floor of the quarry will be deep ripped, covered by overburden and topsoil, and rehabilitated to a constructed soil.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

3.1.1 Final Contours

The final surface contours of the quarry will be approximately 30 m AHD which is consistent with the adjoining land.

Slopes of the batters at the end of excavation will be retained at 1:4 vertical to horizontal (refer to **Appendix E**).

3.1.2 Rehabilitation

During operations, quarrying and rehabilitation of the extraction area will be undertaken progressively. Following quarrying of each cell, rehabilitation will be undertaken.

Upon completion of each cell, the following broad completion criteria will be achieved:

- A self-sustaining cover of pasture;
- Weed levels that are not likely to impact on the viability of the reconstructed soils; and
- A safe and stable landform suitable for the proposed future land use which will be productive, grazing pasturelands.

Rehabilitation is discussed in further detail in the *Rehabilitation Management Plan* prepared by Accendo Australia (2024).

3.2 Proposed Operating Times

Typical operating hours for quarries will be adopted for the subject site which involves 7am to 5pm each Monday to Friday and Saturdays 7am to 1pm, excluding public holidays. The subject site will be worked by 2 - 3 persons, depending on market demand.

3.3 Equipment

All operational equipment will work on the quarry floor to provide maximum sound and visual screening. All equipment and infrastructure will be fully portable to facilitate movement throughout the site required for staged quarrying operations. The site will be secured by locked gates when it is not being actively worked. The boundary fencing will be maintained to prevent inadvertent and unauthorised entry.

Equipment and facilities that may be used onsite are provided in the Table below.

Table 2. Equipment.

Equipment	Description
Site office and/or containers	May be required for the management and security of small items.
Toilet	A portable toilet may be required on site.
Water tanker	Used for dust suppression on the access roads and working floors when required.
Bulldozer	Topsoil will be stripped using a bulldozer. Bulldozers will also be used for the movement of material and loading trucks.
Front End Loader	Loaders will be used for the movement of material and loading road trucks.
Track Loader	Track loaders will be used for the movement of material, loading road trucks and in rehabilitation.
Excavator	An excavator may be used for the removal of material.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Equipment	Description
Mobile crushing and screening plant	Mobile crushing and screening plant (licensed by DWER) will be utilised for the processing of material. Mobile screening and crushing plants are to be used for the preparation of various grades of lime sand and limestone.
Fuel storage	No fuel will be stored onsite.
Light vehicles	Access to and around the site.
Tip truck	Removal of lime sand and limestone from site.

3.3.1 Water Usage

Water is only required for dust suppression within the quarry and the access road. Water will be sourced either onsite or nearby. Should an onsite source be required, a DWER licence will be obtained for the extraction of water.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

4 POTENTIAL IMPACTS AND MANAGEMENT

The Section provides and overview of the potential impacts to water resources associated with the proposed land use, and the proposed management measures to address the identified impacts.

4.1 Surface Water

The area has no surface drainage because of the permeable and porous nature of the sand. There is no surface drainage from the excavation site. All excess water infiltrates the permeable sand. The development is not proposing to alter this process, as there are no drainage lines within the proposed extraction area and surface will continue to be free draining to the water table.

No surface water features have been identified within the extraction site with the closest wetland located at a distance greater than 300 m to the southeast of the subject site. Therefore, the development is unlikely to impact on surface flows.

Any surface water falling outside of the pit will be diverted around the pit by the perimeter bunds to the drainage system. Surface water retained within the excavated areas will either evaporate or infiltrate through the pit ensuring water quality to the drainage system is maintained.

The operation of the crushing and screening plant will be a dry operation.

4.2 Drainage

The DWER recommendation is that surface water runoff produced within the excavation area from the two hour, 1 in 10 (10%) annual exceedance probability storm event should be contained within the pit (DoW 2019). Rainfall intensity has been calculated using the Bureau of Meteorology (BoM) Intensity-Frequency-Duration (IFD) data system (BoM 2022), which yields the two hour 1 in 10 (10%) annual exceedance probability storm event for the site as 38 mm. Since the size of the open area will not exceed 2.0 ha at any time, it is calculated that a holding volume of 840 m^3 is required. To achieve a holding volume of 840 m^3, an area of approximately 42 m by 20 m by 1 m deep is required. This will easily be achieved within each of the 2 ha stages.

During excavation activities, the surface will be internally drained, with the gradients in the cells being constructed to ensure that no surface water runoff occurs.

A risk assessment relating to surface water and stormwater runoff in consideration of the proposed management measures is provided below. The residual risk associated with sedimentation and erosion from stormwater runoff during the operation of the extractive industry is considered low.

Table 2. Risk assessment associated with surface water and stormwater.

Hazard	Source of Hazard	Potential Impacts	Mitigation	Likelihood	Consequence	Residual Risk
Erosion and sedimentation	Uncontrolled and contaminated stormwater runoff	Erosion and sedimentation resulting in poor surface water quality in the	Contain any potentially sediment laden surface water within the pit. Cells constructed with a gradient to ensure that stormwater is contained	1	2	Low

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Hazard	Source of Hazard	Potential Impacts	Mitigation	Likelihood	Consequence	Residual Risk
		nearby drainage system.	within the excavation footprint.			

4.3 Groundwater

Groundwater will not be extracted or dewatered during the operation of the quarry and therefore, no impacts to groundwater levels are proposed.

Maximum excavation levels are estimated to be between 0.5 m to 30 m below ground level at the highest point so a minimum estimated separation of 2 m from the maximum groundwater level will be maintained at all times. The final contours of the quarry will provide a level surface of approximately 30 m AHD.

The extraction and processing of lime sand and limestone is a chemically free operation with the liquids used being lubricants for machinery and fuel. There will be no storage of chemicals or fuel on the subject site.

Table 3. Risk assessment associated with groundwater.

Hazard	Source of Hazard	Potential Impacts	Mitigation	Likelihood	Consequence	Residual Risk
Contamination of groundwater	Machinery	Contamination of groundwater impacting localised water table	Maintenance of approximately 2 m separation to groundwater at all times.	1	2	Low

4.4 Hydrocarbons and Dangerous Goods Management

Hydrocarbons are the only dangerous goods that will be utilised within the proposed subject site for the operation of machinery. However, storage of hydrocarbons on the subject site will not occur.

Servicing of machinery and equipment will not occur onsite further reducing the possibility of contamination.

There is the minor possibility for soil and water contamination as a result of incidental hydrocarbon leakages or spills during the operation of machinery. In such instances the management measures specified below will be implemented.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Table 4. Hydrocarbon and dangerous goods management measures.

Timing	Management Measure
During quarry operations	Mobile refuelling of equipment and vehicles will be undertaken off site at the nearby MGM Bulk depot.
	Spill kits containing appropriate equipment for control, containment and cleanup of hydrocarbon and chemical spills will be available in appropriate locations onsite and maintained.
	No vehicles or machinery are to be serviced or cleaned within the subject site.

A risk assessment to determine the residual risk associated with the uncontrolled discharge of contaminants is provided below. The risk assessment indicates that with the application of suitable management measures the potential risk associated with uncontrolled discharges is 'Low'.

Table 5. Risk assessment associated with the uncontrolled discharge of contaminants.

Hazard	Source of Hazard	Potential Impacts	Mitigation	Likelihood	Consequence	Residual Risk
Uncontrolled discharge of contaminants to land	Machinery	Contamination of soils and/or water	Refer to Management Measures provided in **Table 4**.	1	2	Low

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

REFERENCES

Barnesby, B.A. and Proulx-Nixon, M.E. (2000). *Land resources from Harvey to Capel on the Swan Coastal Plain, Western Australia - Sheets 1 and 2.* Land Resources Maps No. 23/1 and 23/2. Agriculture Western Australia.

Churchward, H.M. and McArthur, W.M. (1978). Landforms and soils of the Darling System, Western Australia. In *'Atlas of Natural Resources, Darling System, Western Australia'*. Department of Conservation and Environment, Western Australia.

Davidson, W. A. (1995). *Hydrogeology and groundwater resources of the Perth Region, WA*. Geological Survey of Western Australia. Bulletin 142. 257 pp.

Deeney, A. (1989) *Geology and Groundwater Resources of the superficial formations between Pinjarra and Bunbury, Perth Basin.*

Department of Parks and Wildlife (DBCA) (2004). *Geomorphic Wetlands of the Swan Coastal Plain dataset*.

Department of Water (DoW) (2014). *South West Region Guideline, Water resource considerations for extractive industries.* DoW, Perth WA.

Environmental Protection Authority (EPA) (2006). *Guidance Statement No.10 for the Assessment of Environmental Factors (in accordance with the EP Act 1986: Levels of Assessment for Proposals Affecting Natural Areas Within the System 6 Region and Swan Coastal Plain Portion of the System 1 Region.*

Environmental Protection Authority (EPA) (2009). *South West Regional Ecological Linkages.* Bulletin No 8. Retrieved from: http://epa.wa.gov.au/EPADocLib/3040_SWREL_EPB821009.pdf

Geological Survey of Western Australia (1978). *Geology and mineral resources of Western Australia, memoir 3*. Geological Survey of Western Australia, Perth, WA.

Heddle, E.M., Loneragan, O.W. and Havel, J.J. (1980). *Darling Systems – Vegetation Complexes, In: Atlas of Natural Resources Darling System*, Western Australia, Department of Conservation and Environment, Perth.

Semeniuk, C. A. & Semeniuk, V. (1995). *A geomorphic approach to global classification for inland wetlands*. Vegetation, 118, 103-124.

Thackway, R, and Cresswell, ID, (Eds) (1995). *An Interim Biogeographic Regionalisation for Australia: a framework for establishing the national system of reserves*, Version 4.0. Australian Nature Conservation Agency, Canberra.

Tille, P (2006). Soil-Landscape Zones of the WA Rangelands and Interior.

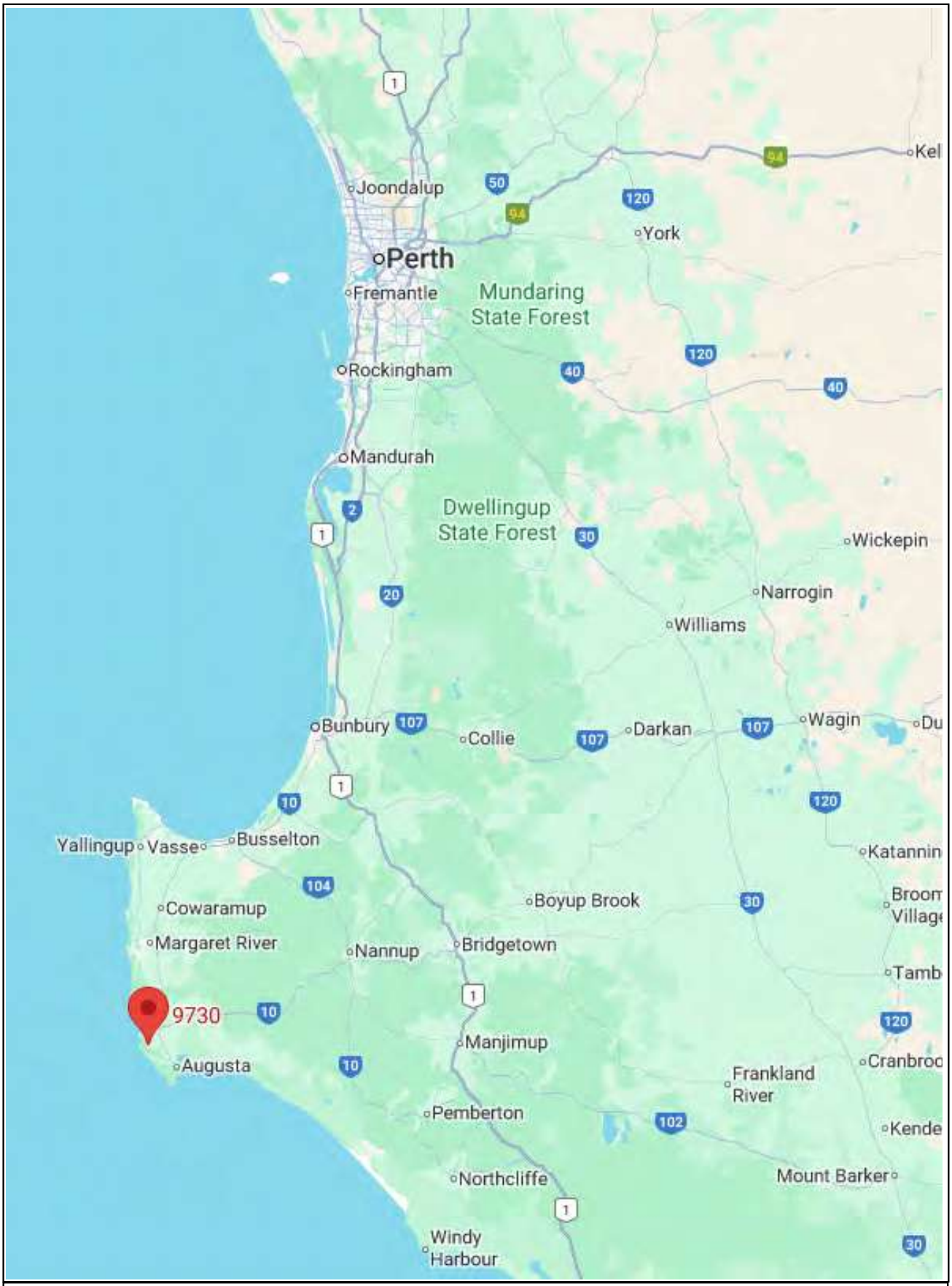
Tille, P J, Mathwin, T W, and George, R J (2001). *South west hydrological information package : understanding and managing hydrological issues on agricultural land in the south west of Western Australia.* Department of Primary Industries and Regional Development, Western Australia, Perth. Bulletin 4488.

Western Australian Planning Commission (WAPC) (2007). *Planning Bulletin No. 64: Acid Sulfate Soils*, Western Australian Planning Commission, Western Australia.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

FIGURES

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



PROJECT	Lot 22 Caves Road, Hamelin Bay	Project Number	Drawing Number	Revision
		2449	Figure 1	A
DRAWING TITLE	Figure 1 - Regional location of the subject site	Designed PN	Checked	
		Drawn PN	Approved	
CLIENT	McDougall Quarries Pty Ltd	Date	20/8/2024	
		Local Authority	City of Busselton	
		Sheet 1 of 1		

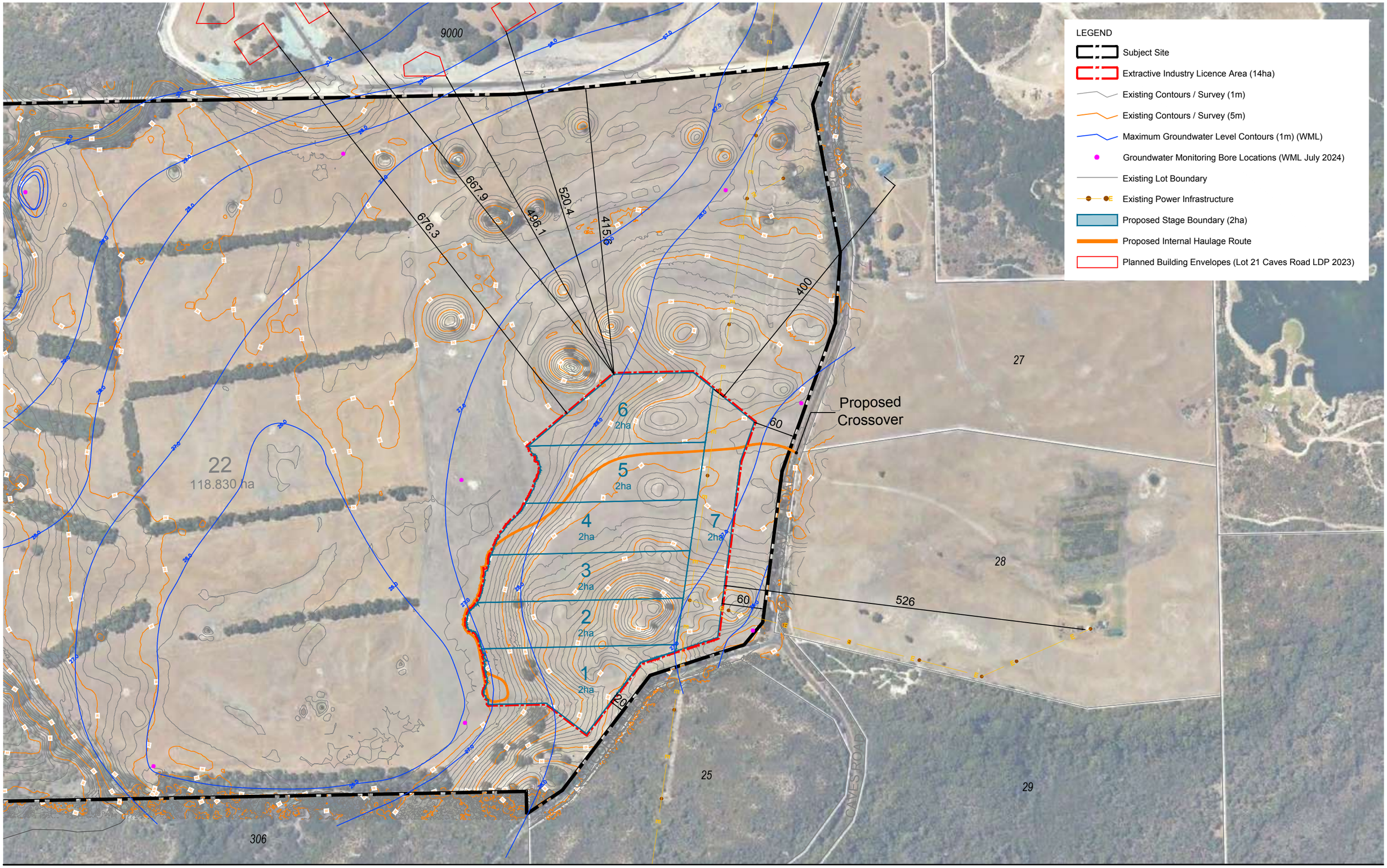
This drawing has been prepared by, and remains the property of Accendo Australia Pty Ltd. This drawing shall not be used without permission. The drawing shall be preliminary only and/or not for construciton until signed approved.

PO Box 5178
West Busselton
Western Australia 6280
Mobile 0418 950 852

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX A – EXCAVATION WORKS PLAN

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Excavation Works Plan

Lot 22 (9730) Caves Road, Hamelin Bay

Date: 26 Aug 2024 Scale: 1:5000 @ A3 1:2500 @ A1 File: **24-132 EX01B** Staff: DL CCG JJ Checked: DL

0 100m

element.

Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
PO Box 7375 Cloisters Square, Perth Western Australia 6850.
T. +61 8 9289 8300 | **E.** hello@elementwa.com.au **elementwa.com.au**

© Element Advisory WA Pty Ltd

This concept has been prepared for the purpose of meeting client specifications. The drawing does not constitute an invitation,agreement or contract (or any part thereof) of any kind whatsoever. Although care has been taken in the compilation of this drawing by Element Advisory WA Pty Ltd, all parties associated with the proposed property development disclaim all responsibility for any errors or omissions. The right is reserved to change the plan at any time. Liability is expressly disclaimed by Element Advisory WA Pty Ltd for any loss or damage which may be sustained by any person acting on any visual impression gained from this drawing.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX B – GROUNDWATER TECHNICAL MEMORANDUM

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

TECHNICAL MEMORANDUM

Our Ref: 11878-G-TM-001-0

31 July 2024

McDougall Quarries Pty Ltd
44 Forrest Beach Road,
Wonnerup, WA 6280

Attention: Kyle Jackson

LOT 22 CAVES ROAD, HAMELIN BAY – GROUNDWATER LEVELS ASSESSMENT

WML Consultants (WML) was engaged by McDougall Quarries Pty Ltd (the Client) to carry out a groundwater monitoring programme at Lot 22 Caves Road, Hamelin Bay (the site), for the proposed material extractive development. The study will inform on the groundwater levels across the site measured between July and November 2024.

This technical memorandum letter presents the results of the preliminary groundwater levels study for the proposed development, based on currently available information.

At the time of the preparation of this letter, the following groundwater information was reviewed:

- Urban Water Management Plan (UWMP) for Lot 21 Caves Road, Hamelin Bay (Hamelin Ridge subdivision directly north of the site), prepared by Oversby Consulting in December 2021 (Ref. B21031 V1);
- Groundwater monitoring event data for Lot 22 Caves Road, Hamelin Bay (subject site), collected on 25th July 2024 (the first out of five scheduled monitoring events that WML is currently undertaking).

Based on the information included in the UWMP, five groundwater monitoring wells were installed at Lot 22 Caves Road and groundwater levels were measured in August and September 2016. Level Surveys Pty Ltd completed a survey of the old monitoring wells on 22 July 2024. Three out of five monitoring wells (bore No 2, 3 and 4) no longer existed on site; therefore, no accurate measurements could be undertaken. It is believed those wells were removed during the construction of the subdivision (roads and minor earthworks). The approximate ground surface levels were recorded in the likely proximity of the former monitoring wells. The remaining two wells (bore No 1 and 5) were picked up to 8 cm accuracy (horizontal and vertical). Summary of the peak groundwater levels observed in winter 2016 (August 2016) are summarised in Table 1 below.

Table 1: Summary of groundwater monitoring data – Lot 21 Caves Road, Hamelin Bay

Location ID	Coordinates (MGA94 Zone 50)		Elevation (TOC) RL (m)	Upstand (m)	Termination Depth form TOC (m)	Depth to GW (mBGL)	GW levels (m AHD)
	Easting	Northing					
1	321094.91	6209765.243	32.299	0.52	4.00	2.25	29.529
2	320586.241	6209790.014	34.023[1)]	0.50	3.98	DRY	DRY
3	320664.972	6210060.981	48.266[1)]	0.57	3.88	DRY	DRY
4	321012.657	6209966.238	31.568[1)]	0.47	3.67	1.41	30.158
5	321279.968	6210062.191	31.155	0.49	3.60	1.18	29.485

Notes: All depths are relative to the existing ground surface
TOC – Top of Casing
[1)] Monitoring well destroyed; RL level represents ground level in the approximate area.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

WML engaged EDrill Pty Ltd to install groundwater monitoring wells at Lot 22 Caves Road, Hamelin Bay. The works were completed between the 23rd and 24th of July 2024 and comprised the installation of 8 monitoring wells to depths between 3.7 m and 22.0 m below the existing ground level. Summary of the first groundwater monitoring event completed on 25th July 2024 by WML is provided in Table 2 below.

Table 2: Summary of groundwater monitoring data – Lot 22 Caves Road, Hamelin Bay

Location ID	Coordinates (MGA94 Zone 50)		Elevation (TOC) RL (m)	Upstand (m)	Termination Depth (m)	Depth to GW (mBGL)	GW levels (m AHD)
	Easting	Northing					
MW1	320717.901	6209455.786	31.798	0.575	5.1	3.575	27.648
MW2	320257.634	6209400.089	30.557	0.595	3.7	3.485	26.477
MW3	320443.070	6208568.909	29.827	0.570	5.2	3.3	25.957
MW4	320894.124	6208631.739	29.684	0.630	5.1	2.96	26.094
MW5	320889.088	6208983.295	29.964	0.580	4.4	2.17	27.214
MW6	321311.086	6208765.454	45.301	0.545	22.0	19.435	25.321
MW7	321381.067	6209094.519	39.403	0.550	14.3	12.01	26.843
MW8	321271.648	6209402.900	31.281	0.575	5.2	2.575	28.131

Notes: All depths are relative to the existing ground surface
TOC – Top of Casing

Based on the timing of the first groundwater monitoring event (end of July), the above data is considered to represent the levels close to the expected average annual maximum groundwater levels (typically observed towards the end of August), depending on the recorded rainfall.

Based on the results of the historical groundwater monitoring programme at the Hamelin Ridge development site and the first groundwater monitoring event completed on the 25th of July 2024 for the proposed site (Lot 22 Caves Road), it can be observed that the groundwater levels range from about RL 28 m AHD at the northeastern boundary of the site to about RL 25 m AHD at the southeastern boundary of the site. The approximate groundwater contours showing indicative groundwater levels are included in WML drawings No 11878-SK-101 and 11878-SK-102 attached to this report.

We consider the above groundwater levels to be consistent with the topography of the site, with groundwater mounding towards the higher elevated areas and draining towards the existing creek systems south and east of the site.

Yours faithfully,

Aleksandra Gorczynska
Senior Geotechnical Engineer
Author

Raphael Hyde
Senior Geotechnical Engineer
Reviewer

For and on behalf of WML Consultants Pty Ltd

Attachments:

Report Limitations

Drawings

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

REPORT LIMITATIONS

WML Consulting Engineers

This geotechnical report is provided for the sole use by the Client. This report must not be applied for any other purpose or project except the one originally contemplated without written authorisation from WML. WML accepts no responsibility for the use of this report / document, in whole or in part, in other contexts or for any other purpose.

WML have undertaken investigations, performed consulting services, and prepared this report based on the Client's specific requirements, documents and information supplied, and previous experience. If changes occur in the nature or design of the project, however minor, it is recommended WML review this report to assess their impacts and provide additional recommendations, if any. WML does not assume any responsibility or liability for problems that arise due to developments on site of which we were not informed.

This report utilises data and information provided by third parties, including, but not limited to sub-consultants, published data, and the Client. This information has been assumed to be correct unless otherwise stated. WML assumes no responsibility for assessments made partly or entirely based on information provided by third parties or for the adequacy, incompleteness, inaccuracies, or reliability of any data provided by third parties.

It is the responsibility of the Client to transmit the information, recommendations, and limitations of this report to the appropriate organisations or people involved in design of the project, including, but not limited to developers, builders, owners, buyers, architects, engineers, and designers.

WML's opinions are based on upon information that existed at the time of the production of this report and ground conditions encountered at the time the site study was performed. This geotechnical report should not be relied upon if its adequacy has been affected by: the passage of time, by man-made events, such as construction on or adjacent to the site, or by natural events, such as floods, earthquakes, or groundwater fluctuations. In the event of the above changes, WML should be contacted to determine if this report is still reliable or whether additional testing is required.

The subsurface conditions identified within this report are based only upon investigation locations where subsurface tests have been conducted and / or samples obtained, which are explicitly representative of the specific sample or test location. Interpretation of conditions between such points cannot be assumed to represent actual subsurface information and unknowns or variations in ground conditions between test locations that cannot be inferred or predicted. Actual subsurface conditions may differ significantly from those indicated in this report. Specific warning is also given that many factors, either natural or artificial, may render ground conditions different from those which pertained at the time of the investigation. WML does not accept any responsibility for any variance in the ground conditions that may exist across the site. If unexpected subsurface conditions are encountered, WML shall be notified immediately to review those conditions and provide additional and/or modified recommendations, as necessary.

This geotechnical assessment is based upon judgment of the investigation data, visual observations of the site and materials encountered, along with the proposed land use and project specifications. The findings and recommendations presented within this report represent professional opinions and estimates and should not be taken as fact unless explicitally stated. In general, statements of fact are are limited to what was done and / or what was observed on site.

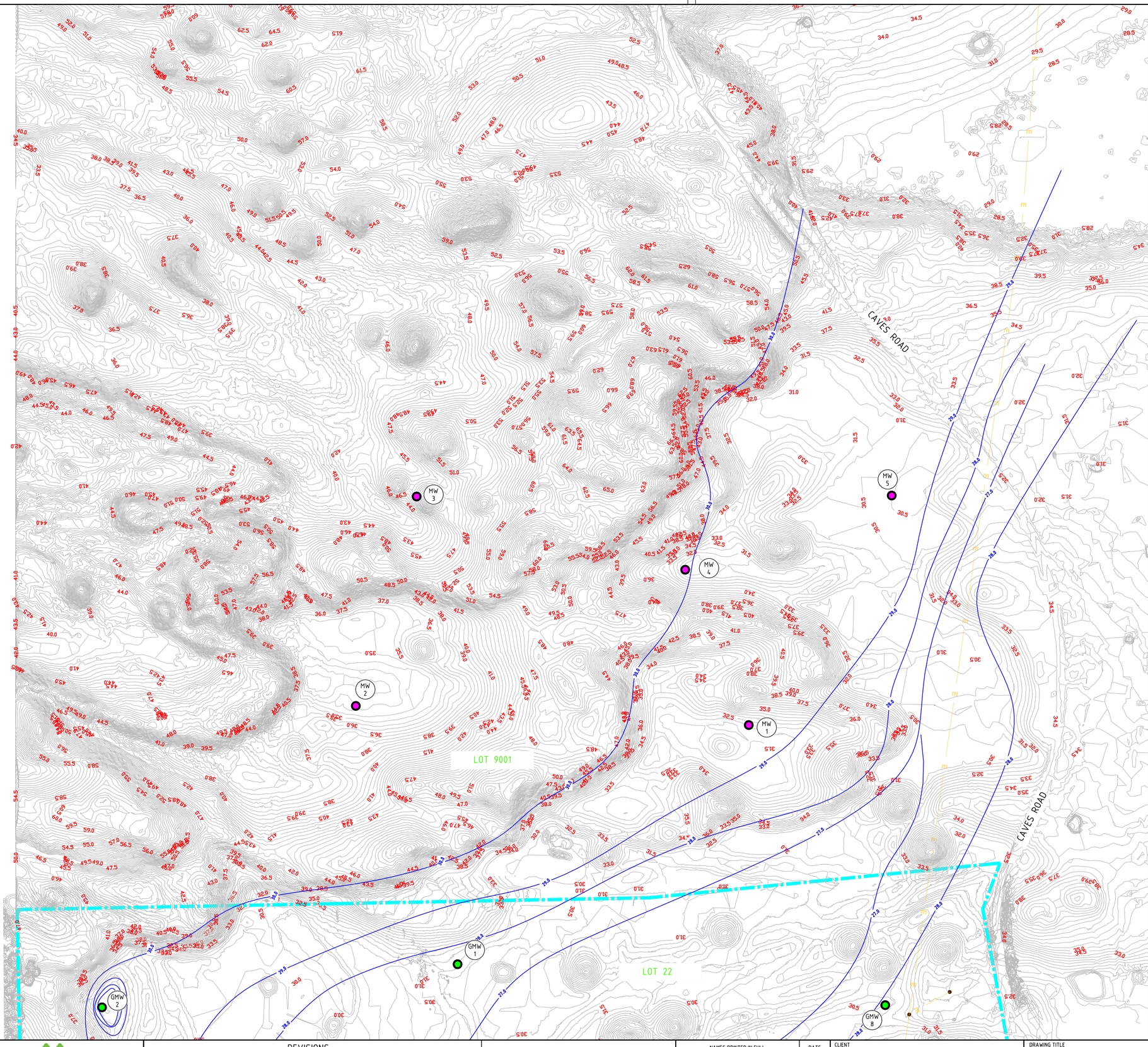
The recommendations provided in this report are preliminary only; final recommendations can only be given after observing the actual subsurface conditions revealed during construction. WML does not assume responsibility or liability for the recommendations in this report if construction observation has not been performed by a WML geotechnical engineer.

Our services did not include any contamination or environmental assessment of the site or adjacent sites. The equipment and techniques used to perform a geoenvironmental study differ from those used to perform a geotechnical investigation. If you require any geoenvironmental information for your project, WML can advise on further steps to be undertaken.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

REPORT LIMITATIONS

WML have performed our professional services in accordance with generally accepted geotechnical engineering principles and practices currently employed in the area; no warranty, expressed or implied, is made as to the professional advice included in this report.



LEGEND

- EXISTING NATURAL SURFACE CONTOUR (0.5m INTERVALS)
- LOT 9001 — LOT NUMBERS
- EXISTING POWER LINE
- LOT 22 BOUNDARY
- 27.0 — INDICATIVE GROUNDWATER CONTOUR (1.0m INTERVALS)
- GROUNDWATER MONITORING WELL (AUGUST 2016)
- GROUNDWATER MONITORING WELL (JULY 2024)
- MW 17 — TYPE MONITOR WELL NUMBER

RECEIVED
By Shire of Ashburton at 8:00 am
13 September 2024

SCALE 1:2500

INFORMATION ONLY

A1

WML Consulting Engineers
Civil | Geotechnical | Structural
BUNBURY +61 8 9722 3544
KALGOORLIE +61 8 9021 1811
PERTH +61 8 9722 3566
wml.com.au

REVISIONS					
A	ISSUED FOR REVIEW	L. RUSCONI	07/24	BC	
N°.	DESCRIPTION	APPROVED	DATE	DRAWN	

NOTE: ✻INDICATES SIGNATURES ON ORIGINAL ISSUE OF DRAWING OR LAST REVISION OF DRAWING

NAMES PRINTED IN FULL		DATE
DESIGNED	B.CHEN	07/24
DRAWN	B.CHEN	07/24
VERIFIED	L. RUSCONI	07/24
APPROVED		

CLIENT: ELEMENT ADVISORY

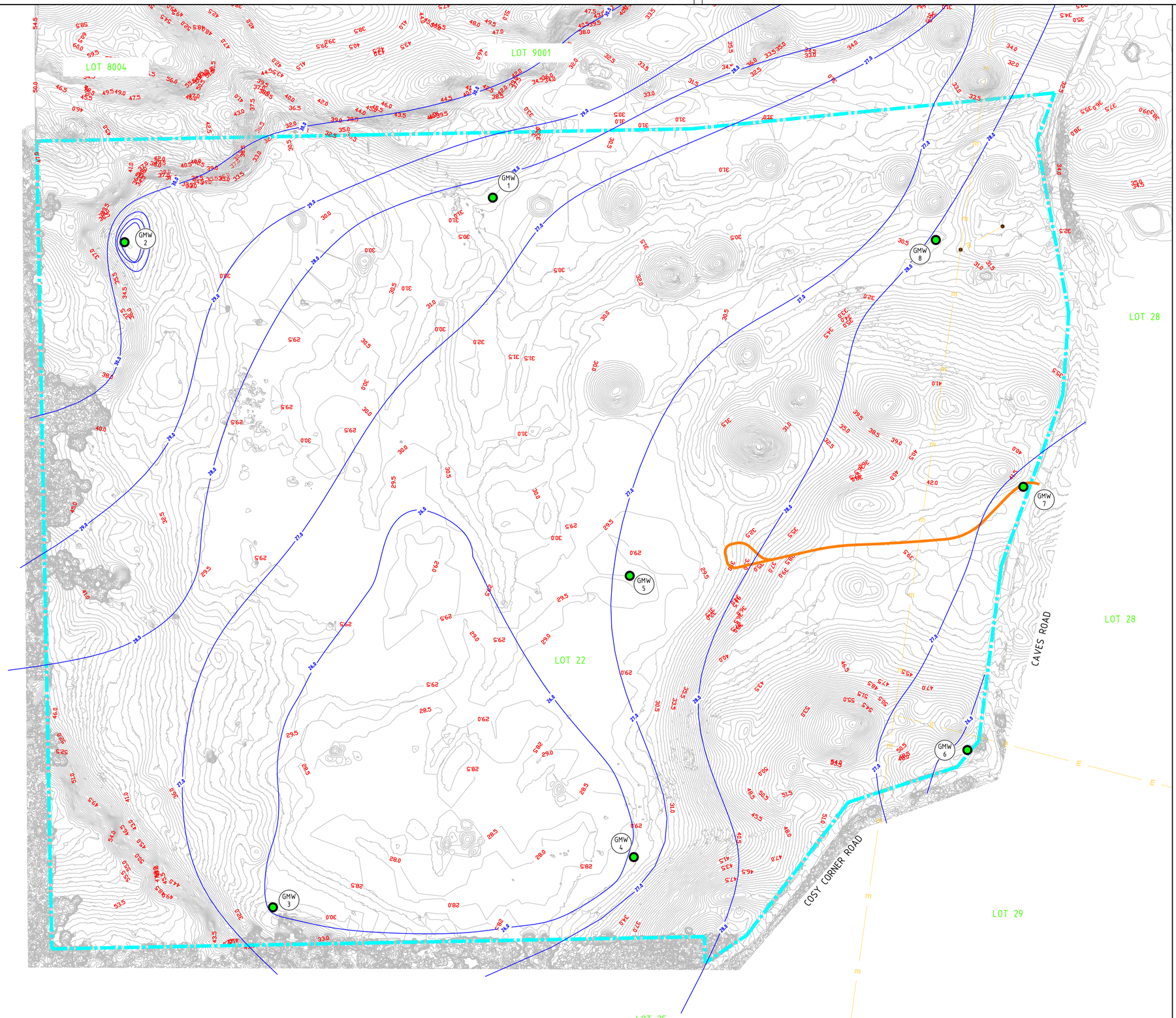
PROJECT: LOT 22 CAVES ROAD HAMELIN BAY

DRAWING TITLE: LOT 21 CAVES ROAD, HAMELIN BAY
GROUNDWATER MONITORING WELLS

THIS DRAWING SHALL BE TREATED AS PRELIMINARY AND IS NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS SIGNED AS APPROVED.

DRAWING NUMBER: 11878-SK-101

REVISION: A



RECEIVED
By Shire of Augusta Margaret River
13 September 2024

LEGEND

- EXISTING NATURAL SURFACE CONTOUR (0.5m INTERVALS)
- LOT 1624 — LOT NUMBERS
- EXISTING POWER LINE
- EXISTING ACCESS ROAD
- LOT 22 BOUNDARY
- 27.0 — INDICATIVE GROUNDWATER CONTOUR (1.0m INTERVALS)
- GROUNDWATER MONITORING WELL (AUGUST 2016)
- GROUNDWATER MONITORING WELL (JULY 2024)
- MW 17 — TYPE / MONITOR WELL NUMBER

SCALE 1:2500 (0 25m 50 75 100 125 150 175 200 225 250 275 300 325 350 375)

A1

INFORMATION ONLY

WML Consulting Engineers
Civil | Geotechnical | Structural
BUNBURY +61 8 9722 3544
KALGOORLIE +61 8 9021 1811
PERTH +61 8 9722 3566
wml.com.au

REVISIONS					
N°	DESCRIPTION	APPROVED	DATE	DRAWN	
A	ISSUED FOR REVIEW	L. RUSCONI	07/24	BC	

NOTE: *INDICATES SIGNATURES ON ORIGINAL ISSUE OF DRAWING OR LAST REVISION OF DRAWING

NAMES PRINTED IN FULL		DATE
DESIGNED	B.CHEN	07/24
DRAWN	B.CHEN	07/24
VERIFIED	L. RUSCONI	07/24
APPROVED		

CLIENT: ELEMENT ADVISORY

PROJECT: LOT 22 CAVES ROAD HAMELIN BAY

DRAWING TITLE: LOT 22 CAVES ROAD, HAMELIN BAY GROUNDWATER MONITORING WELLS

THIS DRAWING SHALL BE TREATED AS PRELIMINARY AND IS NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS SIGNED AS APPROVED.

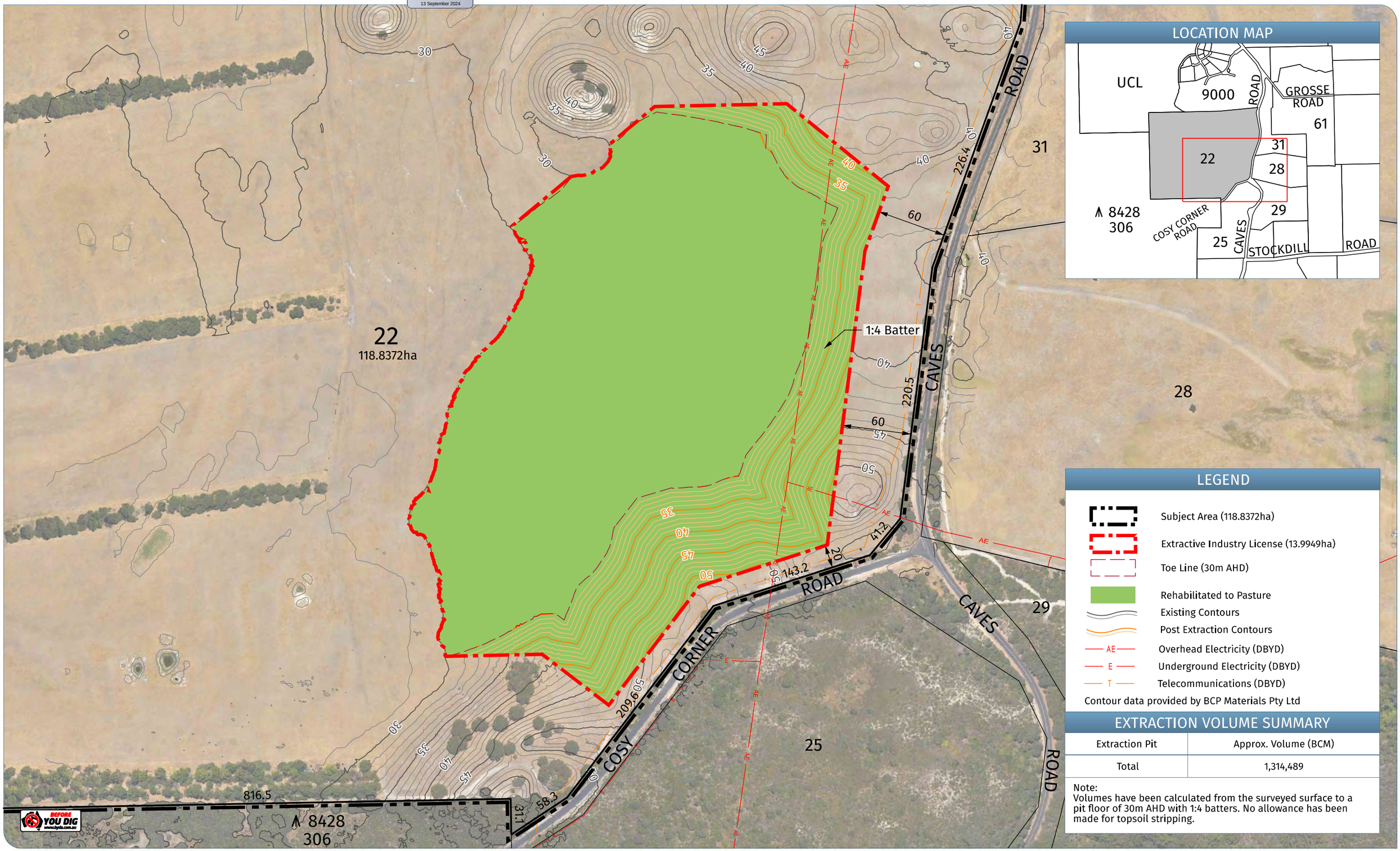
DRAWING NUMBER: 11878-SK-102

REVISION: A

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX C – POST EXTRACTION PLAN

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



LOCATION MAP

LEGEND

- Subject Area (118.8372ha)
- Extractive Industry License (13.9949ha)
- Toe Line (30m AHD)
- Rehabilitated to Pasture
- Existing Contours
- Post Extraction Contours
- AE — Overhead Electricity (DBYD)
- E — Underground Electricity (DBYD)
- T — Telecommunications (DBYD)

Contour data provided by BCP Materials Pty Ltd

EXTRACTION VOLUME SUMMARY

Extraction Pit	Approx. Volume (BCM)
Total	1,314,489

Note:
Volumes have been calculated from the surveyed surface to a pit floor of 30m AHD with 1:4 batters. No allowance has been made for topsoil stripping.

POST EXTRACTION PLAN

Lot 22 (No. 9730) Caves Road, HAMELIN BAY

Plan No.	24210-01	
Date	27/06/24	
Drawn	JW	
Checked	DJ	
Revision	C	
Scale	1:3000@A3	0 40m 80m

BUNBURY OFFICE:
21 Spencer Street,
BUNBURY WA 6230
T: 08 9792 6000
E: bunbury@harleydykstra.com.au
W: www.harleydykstra.com.au
ALBANY | BUNBURY | BUSSELTON | FORRESTDALE | PERTH

COPYRIGHT:
This document is and shall remain the property of HARLEY DYKSTRA.
The document may only be used for the purpose for which it was commissioned and in accordance with the terms of engagement for the commission.
Unauthorised use of this document in any form whatsoever is prohibited

NOTE: This plan has been prepared for planning purposes. Areas, Contours and Dimensions shown are subject to survey

Harley Dykstra
PLANNING & SURVEY SOLUTIONS

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

accendo AUSTRALIA

ENVIRONMENTAL MANAGEMENT PLAN

LOT 22 (9730) CAVES ROAD, HAMELIN BAY

August 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Telephone +61 418 950 852

info@accendoaustralia.com.au
PO Box 5178 West Busselton WA 6280
ABN 11 160 028 642

www.accendoaustralia.com.au

Document Control

Version	Date	Author	Reviewer
V1	15/8/2024	PN	KMT/DL
V2	26/8/2024	PN	KMT
Filename	2449_Lot 22 Caves Rd EMP _v2		

Limitations

This report has been prepared by Accendo Australia Pty Ltd in accordance with the scope limitations provided in this report, or as otherwise agreed, between the Client and Accendo.

This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

This report has been prepared based upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report, which Accendo has not independently verified or checked beyond the agreed scope of work. Accendo does not accept liability in connection with such unverified information.

The conclusions and recommendations in this report are based on assumptions made by Accendo described in this report where and as they are required. Accendo disclaims liability arising from any of the assumptions being incorrect.

The report is based on site specific conditions encountered and information received at the time of preparation of this report or the time that site investigations were undertaken. Accendo disclaims responsibility for any changes that may have occurred after this time.

The preparation of this report has been undertaken and performed in a professional manner, in consideration of the scope of services and in accordance with environmental consulting practices. No other warranty is made.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

CONTENTS

1 INTRODUCTION 3
1.1 BACKGROUND 3
1.2 LOCATION AND LAYOUT PLANS 3
2 EXISTING ENVIRONMENT 4
2.1 TOPOGRAPHY AND SOILS 4
2.2 CLIMATE 4
2.3 VEGETATION AND FLORA 5
2.4 FAUNA 7
2.4.1 Western Ringtail Possums 9
2.5 HYDROLOGY 10
2.6 ABORIGINAL HERITAGE 10
3 EXTRACTION ACTIVITIES 12
3.1 OPERATIONAL WORKS 12
3.1.1 Final Contours 13
3.1.2 Rehabilitation 13
3.2 PROPOSED OPERATING TIMES 13
3.3 EQUIPMENT 13
3.3.1 Water Usage 14
4 SOCIAL IMPACTS 15
4.1 RECEPTORS 15
4.2 VISUAL IMPACT 15
5 ENVIRONMENTAL IMPACTS AND MANAGEMENT 16
5.1 HYDROLOGY 16
5.2 VEGETATION AND FAUNA 16
5.3 DIEBACK (*PHYTOPHTHORA CINNAMOMI*) 17
5.4 NOISE 18
5.5 DUST 18
5.6 HERITAGE SITES 18
5.7 DOMESTIC AND INDUSTRIAL WASTE PRODUCTS 18
5.8 HYDROCARBONS AND DANGEROUS GOODS MANAGEMENT 19
6 REHABILITATION 20

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

REFERENCES 21

FIGURES 22

APPENDIX A – EXCAVATION WORKS PLAN 23

APPENDIX B - CERTIFICATE OF TITLE 24

APPENDIX C – GROUNDWATER TECHNICAL MEMORANDUM..... 25

APPENDIX D – CONTEXT PLAN 26

APPENDIX E – POST EXTRACTION PLAN..... 27

APPENDIX F – LANDSCAPE AND VISUAL ASSESSMENT 28

APPENDIX G – WATER MANAGEMENT PLAN..... 29

APPENDIX H – NOISE MANAGEMENT PLAN 30

APPENDIX I – DUST MANAGEMENT PLAN..... 31

APPENDIX J – REHABILITATION MANAGEMENT PLAN 32

TABLES

Table 1. Significant fauna potentially occurring within proximity of the subject site as identified by State and Commonwealth database searches……..…7

Table 2. Equipment……..……..……..13

Table 3. Residential dwellings within 500m of the subject site.....……..……15

Table 4. Dieback management measures……17

Table 5. Risk assessment associated with dieback ……..……17

FIGURES

Figure 1. Site Locality

Figure 2. Soils of the subject site

Figure 3. Vegetation to be removed

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

1 INTRODUCTION

1.1 Background

McDougall Quarries Pty Ltd (the applicant) is proposing to extract lime sand and limestone from a 14 hectare (ha) area within Lot 22 (HSE 9730) Caves Road, Hamelin Bay (herein referred to as the subject site) (refer to **Figure 1** and **Appendix A**).

This application is made for a ten year period however, the exact life of the project is difficult to estimate as it will be dependent on supply and demand trends.

The available volume of sand (*insitu* volume of approximately 1,314,489 m^3) is to be extracted, commencing in the south and moving in a northerly direction before finishing in a stage along the east of the subject site (refer to **Appendix A**).

This document has been submitted to fulfil the relevant requirements provided within the Shire of Augusta Margaret River's (the Shire's) *Local Planning Scheme No. 1* and the Shire's *Local Planning Policy No. 3 Extractive Industries*. It is intended to provide the Shire, the public and relevant government agencies with an understanding of the proposal and the environmental strategies and commitments proposed to address various environmental and social issues.

1.2 Location and Layout Plans

The subject site is located within Lot 22 Caves Road, Hamelin Bay. The Lot is wholly owned by Joe Fish Pty Ltd (refer to **Appendix B** for Certificate of Title).

The subject site is zoned 'General Agriculture' pursuant to the Shire's *Local Planning Scheme No.* 1 and has previously been used for agriculture.

The surrounding properties are zoned 'Rural Residential' to the north, 'National Park and Nature Reserve' to the west and south and a mixture of 'General Agriculture', 'Priority Agriculture' and 'Landscape Amenity' to the east pursuant to the Shire *Local Planning Scheme No. 1*.

The subject site is located within the municipality of the Shire of Augusta-Margaret River, approximately 32 km south of the Margaret River town centre and approximately 260 km south of Perth.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

2 EXISTING ENVIRONMENT

2.1 Topography and Soils

The current topography of the subject site can be described as variable with the elevation ranging from 30 m Australian Height Datum (AHD) through the eastern portion of the subject site to approximately 40m AHD in the west. Elevated areas are located throughout the subject site and range in elevation from approximately 45 m AHD to 60 m AHD (refer to **Appendix A**).

The subject site is located within the Leeuwin Zone landform within the Gracetown Ridge systems consisting of "*lateritic plateau containing sandy gravel, loamy gravel and grey sandy duplex*" and *"a limestone ridge, in the coastal edge of the Leeuwin Zone containing yellow deep sand and red deep sand",* respectively. (Tille 2006).

The subject site is located within the following sub-systems (refer to **Figure 2**):

- Kilcarnup rocky dunes phase – Low to steep dunes (gradients 5-10%) not exposed to prevailing wines. Dark calcareous sands containing limestone rubble.
- Kilcarnup dunes (organic) phase – Steep dunes (gradients usually in excess of 20%) not exposed to prevailing winds. Deep pale calcareous sands with brown topsoil.

2.1.1 Acid Sulfate Soils

Acid Sulfate Soils (ASS) is the common name given to naturally occurring soil and sediment containing iron sulfides. They have become a potential issue in land development projects on the Swan Coastal Plain when the naturally anaerobic conditions in which they are situated are disturbed and they are exposed to aerobic conditions and subsequently oxidise. When oxidised, ASS produce sulfuric acid, which can result in a range of impacts to the surrounding environment. ASS that has oxidised and resulted in the creation of acidic conditions are termed "Actual ASS" (AASS), and those that have acid generating potential but remain in their naturally anaerobic conditions are termed "Potential ASS" (PASS).

ASS risk mapping (DWER 2021) indicates that there is a 'nil risk' of ASS occurring within the subject site. This proposal involves the excavation of material above the watertable (at least 0.5 m separation to maximum groundwater levels will be maintained at all times) and no dewatering will be undertaken during excavation works. Accordingly, the potential impacts associated with ASS are expected to be low and therefore no further investigations regarding ASS are considered necessary.

2.2 Climate

The climate of the locality is classified as Mediterranean with warm to hot summers and cool wet winters.

The closest weather recording station is Cape Leeuwin (Station 9518). Temperatures are highest on average in February, at approximately 23.4°C. August has the lowest average temperature of the year of 11.3°C.

Rainfall for the area is approximately 950 mm per annum with approximately 88% of the rain falling during the winter months, April to October inclusive. Evaporation generally exceeds rainfall from October to March.

During the summer months the dominant wind in the mornings is from the south-east at 18 - 26 kms, swinging to the south-west at 37-46 kms in the afternoon. During winter, the winds are most commonly 18 - 26 kms with no dominant prevailing direction. During storms winds from the west and north-west can reach 74 kms (BoM 2020).

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Rainfall intensity has been calculated using the Bureau of Meteorology (BoM) Intensity-Frequency-Duration (IFD) data system which yields the two hour 10 year average return interval storm event for the subject site as 38.3 mm/hr.

2.3 Vegetation and Flora

2.3.1 Flora

Given the condition of vegetation within the subject site and the current land use (livestock grazing and pasture), no flora of conservation significance is likely to occur. Furthermore, mapping prepared by the Department of Biodiversity, Conservation and Attractions (DBCA) does not indicate the presence of any Declared Rare Flora (DRF) species mapped in proximity to the subject site.

Vegetation within the extraction area is in a 'Completely Degraded' condition sowed crops on the flat areas and isolated hills containing *Agonis flexuosa* with no mid or under storey present (refer to **Plates 1** to **3**).



Plate 1: Sowed crops in the foreground with hills with Peppermint trees in background.



Plate 2: View from top of hill looking across extraction area

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Plate 3: View across the extraction area towards hill with Peppermint and no understorey.

2.3.2 Threatened Ecological Communities

An ecological community is defined as "a naturally occurring assemblage that occurs in a particular type of habitat" (PWS 2015). A Threatened Ecological Community (TEC) is one that has declined in area or was originally limited in distribution. Uncommon ecological communities that do not strictly meet TEC defined criteria, or are inadequately defined, are listed by the DBCA as a Priority Ecological Community (PEC).

As well as protection under State legislation, selected ecological communities are also afforded statutory protection at a Federal level pursuant to the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The EPBC Act provides for the protection of TECs, which are listed under section 181 of the Act, and are defined as "Critically Endangered", "Endangered" or "Vulnerable" under Section 182.

A search of the DBCA's and EPBC databases found one TEC endorsed under State and Commonwealth legislation and policy recorded within proximity to the subject site. This was the *Empodisma* peatlands of southwestern Australia ecological community.

None of the vegetation within the subject site is representative of this TEC due to the 'completely degraded' condition of the vegetation and the absence of suitable soil types associated with this TEC.

2.3.3 Environmentally Sensitive Areas

Section 51B of the *Environmental Protection Act 1986* (EP Act) allows the Minister to declare an Environmentally Sensitive Area (ESA). Once declared, the exemptions to clear native vegetation under the regulations do not apply in these areas. TEC's areas within 50 m of any Declared Rare flora (DRF) and defined wetland areas constitute ESAs. However, a number of other areas of environmental significance are also listed. Current declared ESAs are listed in the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*.

The subject site is not mapped as occurring within an ESA. An ESA associated with the Leeuwin Naturaliste National Park is mapped in the property located to the south of Cosy Corner Road. A buffer of at least 100m from this ESA will be maintained at all times.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

2.4 Fauna

A search of the DBCA's Threatened Fauna database (Djandoo) was undertaken to establish whether species declared as 'Rare or likely to become extinct' (Schedule 1), 'Birds protected under an international agreement' (Schedule 3) and 'Other specially protected fauna' (Schedule 4) as listed under the *Biodiversity Conservation Act 2016* have been recorded in proximity to the subject site. The Djandoo Report identified 24 threatened species, one Priority 2 species, one Priority 3 species, eight Priority 4 species and three 'Other specially protected fauna' species (refer to **Table 1**), within a 5 km radius of the subject site. A search of the EPBC Act *Matters of National Environmental Significance* database identified a further five species of conservation significant fauna species in proximity to the subject site.

Table 1: Significant fauna potentially occurring within proximity of the subject site as identified by State and Commonwealth database searches

Species	DBCA Status	EPBC Act Status	Likelihood of Occurrence
Anstisia alba (White-bellied Frog, Creek Frog)	T	Critically Endangered	Unlikely, absence of suitable habitat
Ardenna carneipes (Flesh-footed Shearwater)	T	Migratory	Unlikely to rely on the habitat for survival
Austroassiminea letha solem (Cape Leeuwin Freshwater Snail)	T	-	Unlikely, absence of suitable habitat.
Bettongia penicillata ogilbyi (woylie)	T	Endangered	Unlikely, absence of suitable habitat.
*Botaurus poiciloptilus (*Australasian Bittern)	T	Endangered	Unlikely, absence of suitable habitat.
Cacatua pastinator pastinator (Muir's Corella)	CD	-	Unlikely, absence of suitable habitat.
Calidris acuminata (Sharp-tailed Sandpiper)	-	Vulnerable	Unlikely to rely on the habitat for survival
Calidris canutus (Red Knot)	-	Vulnerable	Unlikely, absence of suitable habitat.
Calidris ferruginea (Curlew Sandpiper)	-	Critically Endangered	Unlikely, absence of suitable habitat.
Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black Cockatoo)	T	Vulnerable	Unlikely, absence of suitable habitat.
Calyptorhynchus baudinii (Baudin's Cockatoo)	T	Endangered	Unlikely, absence of suitable habitat.
Calyptorhynchus latirostris (Carnaby's Cockatoo)	T	Endangered	Unlikely, absence of suitable habitat.
Charadrius cucullatus Vieillot (Hooded Plover)	P4	-	Unlikely, absence of suitable habitat.
Charadrius leschenaultia (Greater Sand Plover)	-	Vulnerable	Unlikely, absence of suitable habitat.
Dasyurus geoffroii (Western Quoll, Chuditch)	T	Vulnerable	Unlikely, absence of suitable habitat.
Diomedea exulans (Wandering Albatros)	T	Vulnerable	Unlikely to rely on the habitat for survival

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Species	DBCA Status	EPBC Act Status	Likelihood of Occurrence
Elapognathus minor (Short-nosed Snake)	P2	-	Unlikely, absence of suitable habitat.
Engaewa pseudoreducta (Margaret River Burrowing Crayfish)	T	Critically Endangered	Unlikely, absence of suitable habitat.
Falco peregrinus (Peregrine Falcon)	OS	-	Unlikely to rely on the habitat for survival
Falsistrellus mackenziei (Western false pipistrelle)	P4	-	Unlikely, absence of suitable habitat.
Galaxiella munda (Western Dwarf Galaxias)	T	-	Unlikely, absence of suitable habitat.
Galaxiella nigrostriatal (Blackstriped Dwarf Galaxias)	T	Endangered	Unlikely, absence of suitable habitat.
Numenius madagascariensis (Eastern Curlew)	-	Critically Endangered	Unlikely, absence of suitable habitat.
Hydromys chrysogaster (Water Rat, Rakali)	P4	-	Unlikely, absence of suitable habitat.
Isodon fusciventer (Southwestern Brown Bandicoot)	P4	-	Unlikely, absence of suitable habitat.
Leipoa ocellata (Malleefowl)	T	Vulnerable	Unlikely, absence of suitable habitat.
Lepidogalaxias salamandroides (Salamanderfish, Shannon mudminnow)	T	-	Unlikely, absence of suitable habitat.
Nannatherina balstoni (Balston's Pygmy Perch)	T	Vulnerable	Unlikely, absence of suitable habitat.
Notamacropus eugenii derbianus (Tammar Wallaby)	P4	-	Unlikely, absence of suitable habitat.
Notamacropus Irma (Western brush wallaby)	P4	-	Unlikely, absence of suitable habitat.
Phascogale tapoatafa wambenger (Southwestern brush-tailed phascogale)	CD	-	Unlikely, absence of suitable habitat.
Platycercus icterotis xanthogenys Salvadori	P4	-	Unlikely, absence of suitable habitat.
Potorous gilbertii (Gilbert's Potoroo)	T	Critically Endangered	Unlikely, absence of suitable habitat.
Pseudocheirus occidentalis (Western Ringtail Possum)	T	Critically Endangered	Possible but unlikely to rely on the area due to the limited/degraded habitat.
Setonix brachyurus (Quokka)	T	Vulnerable	Unlikely, outside of known extent
Sternula nereis nereis Australian Fairy Tern)	T	Vulnerable	Unlikely, absence of suitable habitat.
Thalassarche carteri (Indian Yellow-nosed Albatross)	T	Vulnerable	Unlikely, absence of suitable habitat.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Species	DBCA Status	EPBC Act Status	Likelihood of Occurrence
Thalassarche cauta cauta (Shy Albatross)	T	Endangered	Unlikely, absence of suitable habitat.
Thalassarche melanophris (Blakc-browed Albatross)	T	Vulnerable	Unlikely, absence of suitable habitat.
Thiornis cucullatus (Hooded Plover)	P4	-	Unlikely, absence of suitable habitat.
Tyto novaehollandiae novaehollandiae	P3	-	Unlikely, absence of suitable habitat.
Westralunio carteri (Carter's Freshwater Mussel)	T	Vulnerable	Unlikely, absence of suitable habitat.

While migratory bird species may infrequently visit the subject site, they will not rely on it for their persistence in consideration of its degraded condition. They have therefore been omitted from the list above.

Of the abovementioned conservation significant species, based on preferred habitat types, only Western Ringtail Possums have the potential to occur within the subject site.

2.4.1 Western Ringtail Possums

The Western Ringtail Possum (WRP) is endemic to the south- west of Western Australia. It was formerly patchily distributed through the near-coastal southwest from approximately 120 km southeast of Geraldton to the southern edge of the Nullabor Plain and its range has now substantially contracted (How *et al.*, 1978, de Tores *et al*., 2005, Jones 2004). Extant populations now occur mostly on the coastal strip from Yalgorup (100km south of Perth) to Waychinicup National Park (just east of Albany), with isolated inland populations in the lower Collie River valley, Harvey River valley and at Perup (Manjimup) (de Tores *et al.*, 2005, Jones 2004, Jones 2007).

With the exception of the few isolated inland populations in Eucalypt forests, the WRP generally occurs in coastal Peppermint (*Agonis flexuosa*) woodlands, Peppermint/Tuart (*Eucalyptus gomphocephala*) woodlands, and Peppermint/Eucalypt woodlands associations, with the highest density populations occurring within the Busselton to Dunsborough coastal strip (*de Tores et al.*, 2005; Jones *et al.*, 2007).

The presence of preferential foraging species within the subject site such as Peppermints represents potential WRP habitat, albeit marginal in quality due to the absence of canopy connectivity and understorey. The extraction footprint has been designed to avoid this vegetation as far as practicable however the removal of some Peppermint trees will be required. The subject site contains less than approximately 0.1 ha of potential habitat which will be removed (refer to **Figure 3**). However, given the degraded nature of the vegetation and its lack of connectivity to surrounding vegetation this is unlikely to be significant to the WRP population in the local area.

Furthermore, available mapping indicates that there is approximately 898 ha of remnant native vegetation within a 2 km radius, the WRP maximum home range, of the subject site. Of this approximately 78 % is mapped as containing *Agonis flexuosa* to some degree and can therefore be classified as potential WRP habitat. On this basis, the removal of 0.1 ha of highly degraded vegetation will constitute a 0.01% reduction of potential WRP habitat within a 2 km radius of the subject site.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

2.5 Hydrology

2.5.1 Groundwater

The subject site is located within the Cape to Cape South subarea of the *Rights in Irrigation and Water Act 1914* (RiWI Act) proclaimed Blackwood Groundwater Area.

A technical memorandum prepared by WML Consulting Engineers (WML, 2024) reviewed data from the Urban Water Management Plan (UWMP) for the Hamelin Ridge subdivision located directly to the north of the subject site. Additionally, eight bores were installed within the subject site and groundwater levels were measured on the 25th July 2024.

Based on the results from the July groundwater monitoring event and the data from the UWMP for the Hamelin Ridge subdivision, groundwater levels have been estimated to range from approximately 28 m AHD in at the northeastern boundary to approximately 25 m AHD at the southeastern boundary (refer to **Appendix C**). Further groundwater monitoring events planned for the remainder of the 2024 winter season will be used to update these contours, however data obtained from the July monitoring event is expected to represent levels close to the expected annual maximum groundwater levels (WML, 2024). Given a maximum excavation depth of 30 m AHD, at least 2 m of separation to groundwater is expected to be achieved at all times.

2.5.2 Surface Water

The subject site is located in the Turner subarea of the RiWI Act proclaimed Cape to Cape South surface water area. The subject site is not proclaimed under the *Country Areas Water Supply Act 1947* as a public drinking water source area.

There are no surface water features present within the subject site. The property has three dams, two located to the northwest of the subject site and one to the southwest. A buffer of greater than 200 m will be maintained from the extraction area to all onsite dams.

The current water cycle within the subject site consists of inputs from rainwater flowing downhill towards the wider drainage system located to the south and east of the subject site. The development is not proposing to alter this process, as there are no drainage lines within the proposed extraction area.

2.5.3 Wetlands

Areas of wetlands in Western Australia have been mapped and this mapping has been converted into a digital dataset that is maintained by the DBCA and is referred to as the '*Geomorphic Wetlands Augusta to Walpole'* dataset. Pursuant to this dataset, there are no mapped wetlands within the subject site. The closest wetlands to the subject site are located to the southeast and are greater than 300 m from the extraction area boundary.

2.6 Aboriginal Heritage

All Aboriginal sites in Western Australia are provided protection under the *Aboriginal Heritage Act 1972* in which it is an offence for anyone to excavate, damage, destroy, conceal or in any way alter an Aboriginal site without the Minister's permission.

An online search for relevant Aboriginal heritage information was undertaken using the Department for Planning, Lands and Heritage *Aboriginal Cultural Heritage Inquiry System* that incorporates both the heritage site register and the heritage survey database (DPLH 2023). The Aboriginal Heritage Site Register is maintained pursuant to Section 38 of the *Aboriginal Heritage Act 1972* and contains information on over 22,000 listed Aboriginal sites throughout Western Australia.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Results of the database search revealed that no Aboriginal heritage sites are present within the subject site. Furthermore, there are no Aboriginal heritage sites recorded within 1 km of the subject site.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

3 EXTRACTION ACTIVITIES

The lime sand and limestone quarry will cover an area of approximately 14 ha, with a current maximum elevation ranging from 30 m AHD to 60 m AHD. It will be excavated to an elevation of 30 m AHD commencing in the south of the subject site and heading north. Extraction activities will be divided into seven stages, of 2.0 ha in size (refer to **Appendix A**).

It is estimated that the total maximum volume of material to be removed will be approximately 1,314,489 m^3. Over a ten year period, a maximum of approximately 131,449 m^3 will be excavated each year, depending on supply and demand.

Earthen bunds for noise mitigation will be constructed with topsoil and overburden that will be stripped from the extraction footprint and other areas within the premise boundary. Construction of the bunds will be undertaken with an excavator and loader.

The planned end use of the quarry is to restore a natural soil profile and return the extraction area to pasture, ensuring that there is no net loss of agricultural land.

3.1 Operational Works

Using a loader, the topsoil (where available) will be stripped and placed in stockpiles. Overburden, if present, will be removed using a dump truck and stockpiled to a convenient location within each extraction stage for operations. Topsoil stockpiles will be less than 2 m high with a batter no greater than 1:3.

In order to comply with noise regulations, surface works with the dozer must commence from the western most point and clear a sufficient area on the western side of Stage 1 to reach the material. Once a sufficient depth (5-6m) is achieved within Stage 1, progression of the pit through to Stage 2 can continue with the use of the dozer (Herring Storer Acoustics, 2024).

The material will be excavated by an excavator, bulldozer or loader to a stockpile or loaded directly to waiting trucks for transport. A summary of the proposed extraction activities is provided below:

- Prior to excavation commencing the site will be ground surveyed, the excavation footprint marked out and a 1 m contour plan developed.
- The topsoil/overburden will be stripped and used to construct earthen bunds using a loader.
- An excavator or front-end loader will be used to dig the sand and transport it to a stockpile.
- The sand will then be picked up by a loader and loaded to trucks for transport.
- All static and other equipment, will be located on the floor of the quarry to provide visual and acoustic screening.
- Excavation will commence in the south of the quarry initially moving north before returning to the east to complete extraction works. The face and walls of the pit will act as noise barriers.
- Crushing and screening of material may be required. Where crushing and screening is required noise bunds will be constructed to ensure compliance with the noise regulations.
- Upon completion of each section of quarry, the section will be reformed and back filled using a combination of equipment such as a tracked bobcat, excavator and front end loader, where subgrade material is available, to achieve the proposed final contours.
- At the end of excavation, the noise bunds will be removed, and the floor of the quarry will be deep ripped, covered by overburden and topsoil, and rehabilitated to a constructed soil.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

3.1.1 Final Contours

The final surface contours of the quarry will be approximately 30 m AHD which is consistent with the adjoining land.

Slopes of the batters at the end of excavation will be retained at 1:4 vertical to horizontal (refer to **Appendix E**).

3.1.2 Rehabilitation

During operations, quarrying and rehabilitation of the extraction area will be undertaken progressively. Following quarrying of each cell, rehabilitation will be undertaken.

Upon completion of each cell, the following broad completion criteria will be achieved:

- A self-sustaining cover of pasture;
- Weed levels that are not likely to impact on the viability of the reconstructed soils; and
- A safe and stable landform suitable for the proposed future land use which will be productive, grazing pasturelands.

Rehabilitation is discussed in further detail in the *Rehabilitation Management Plan* prepared by Accendo Australia (2024).

3.2 Proposed Operating Times

Typical operating hours for quarries will be adopted for the subject site which involves 7am to 5pm each Monday to Friday and Saturdays 7am to 1pm, excluding public holidays. The subject site will be worked by 2 - 3 persons, depending on market demand.

3.3 Equipment

All operational equipment will work on the quarry floor to provide maximum sound and visual screening. All equipment and infrastructure will be fully portable to facilitate movement throughout the site required for staged quarrying operations. The site will be secured by locked gates when it is not being actively worked. The boundary fencing will be maintained to prevent inadvertent and unauthorised entry.

Equipment and facilities that may be used onsite are provided in the Table below.

Table 2. Equipment.

Equipment	Description
Site office and/or containers	May be required for the management and security of small items.
Toilet	A portable toilet may be required on site.
Water tanker	Used for dust suppression on the access roads and working floors when required.
Bulldozer	Topsoil will be stripped using a bulldozer. Bulldozers will also be used for the movement of material and loading trucks.
Front End Loader	Loaders will be used for the movement of material and loading road trucks.
Track Loader	Track loaders will be used for the movement of material, loading road trucks and in rehabilitation.
Excavator	An excavator may be used for the removal of material.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Equipment	Description
Mobile crushing and screening plant	Mobile crushing and screening plant (licensed by DWER) will be utilised for the processing of material. Mobile screening and crushing plants are to be used for the preparation of various grades of lime sand and limestone.
Fuel storage	No fuel will be stored onsite.
Light vehicles	Access to and around the site.
Tip truck	Removal of lime sand and limestone from site.

3.3.1 Water Usage

Water is only required for dust suppression within the quarry and the access road. Water will be sourced either onsite or nearby. Should an onsite source be required, a DWER licence will be obtained for the extraction of water.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

4 SOCIAL IMPACTS

4.1 Receptors

The subject site has been designed to maximise setbacks to the closest sensitive receptors, where possible. This has involved extensive analysis of the local landform, environmental characteristics, land uses and location of sensitive receptors.

The key amenity issues for sensitive premises associated with the proposal are:

- Visual amenity;
- Dust; and
- Noise.

The Environmental Protection Authority's (EPA) *Guidance for the Assessment of Environmental Factors* (June 2005) provides generic separation distances to assist in the determination of suitable buffers where industry may have the potential to affect the amenity of a sensitive land use. In particular, for extractive industries, a buffer distance of 300 m to 500 m is recommended from sensitive land uses.

The closest residential dwellings and other sensitive receptors to the subject site are provided below and shown in **Appendix A.**

Table 3. Residential dwellings within 500 m of the subject site.

Address	Distance to subject site (m)
Lot 31 (18) Grosse Road	400 m
Lot 9001 (Hamelin Ridge Estate)	> 415 m
Lot 28 (9789) Caves Road	526 m

The closest residential dwelling to the subject site is located approximately 400 m to the northeast of the subject site. Hamelin Ridge Estate, where most dwellings are yet to be constructed, is located to the north of the subject site, at distances greater than 415 m from the boundary. An additional residential dwelling is located to the east of the subject site at a distance greater than 500 m away.

Management measures associated with noise and dust are discussed in further detail in **Sections 5.4** and **5.5**, respectively.

4.2 Visual Impact

Visual impact can occur in a number of circumstances, by the operation being set too high in the landscape, by being too close to neighbours and by insufficient visual protection.

A *Visual Impact Assessment* (refer to **Appendix F**) was prepared in which it was determined that from 41 photo view points, the subject site is visible from nine, partially visible from 11 and not visible from 21 points.

Over time, various view angles will observe the progressive removal of the resource and the change in topography. For that reason, at any locations identified as having a'partially visible' or 'visible' category a 5 m buffer of screening vegetation will be planted to reduce the visual impact from all three roads and therefore sensitive receptors.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

5 ENVIRONMENTAL IMPACTS AND MANAGEMENT

The following factors are considered to represent the potential environmental and amenity impacts associated with the proposal:

- Hydrology;
- Dust;
- Noise;
- Dieback and weeds; and
- Uncontrolled discharge of contaminants to land.

These environmental factors are discussed in more detail below, together with the proposed management actions.

5.1 Hydrology

5.1.1 Surface Water

The current water cycle within the subject site consists of inputs from rainwater flowing downhill towards the wider drainage system located to the south and east of the subject site. The development is not proposing to alter this process, as there are no drainage lines within the proposed extraction area.

A *Water Management Plan* has been prepared for the subject site and is provided in **Appendix G**. This Plan documents the proposed surface water management measures associated with the extractive industry operation.

5.1.2 Groundwater

Groundwater will not be extracted or dewatered during the operation of the quarry and therefore, no impacts to groundwater levels are proposed.

Maximum excavation levels will be to 30 m AHD. As discussed within **Section 2.5.1** no interaction with groundwater is expected during excavation works. Furthermore, a separation of at least 2 m, between the final contours and the maximum groundwater elevation will be maintained.

Accordingly, no impacts to groundwater are expected as a result of this proposal.

5.2 Vegetation and Fauna

As described in **Section 2.3**, the subject site has undergone historic disturbance and is currently comprised of a variety of pasture grasses with scattered paddock Peppermint (*Agonis flexuosa*) trees.

No impacts to groundwater will result from the proposal and therefore any potential impacts to stygofauna or troglofauna are considered unlikely.

The presence of preferential foraging species within the subject site such as Peppermints represents potential WRP habitat, albeit marginal in quality due to the absence of canopy connectivity and understorey. The subject site contains less than approximately 0.10 ha of potential habitat which will be removed. Given that this is a reduction of 0.01% of the WRP habitat within a 2 km radius, this is unlikely to be significant to the WRP population in the local area.

Based on the above, the proposal will require a clearing permit application to be submitted to the Department of Water and Environmental Regulation (DWER) for the vegetation clearing. Any impacts to

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

native flora, vegetation or fauna, and appropriate management measures will be addressed through this process.

5.3 Dieback (*Phytophthora cinnamomi*)

Given that native vegetation has largely been altered within the subject site to enable the establishment of pasture, dieback indicator species are largely absent and therefore it is not possible to detect whether dieback is present or absent. On this basis, it is reasonable to classify the subject site as 'uninterpretable', denoting that a precautionary management approach should be adopted.

The primary objective of dieback management during operations is to minimise the risk of entry of dieback to the subject site. This can be achieved by preventing the importation of soil or plant material to and from the subject site. The risk of transportation via vehicles and equipment is low given that sealed roads will be utilised prior to entering the subject site.

The management measures proposed for dieback control are developed in accordance with the *Dieback Working Group (DWG) – Best Practice Guidelines* (DWG, 2005) for an uninterpretable site and are provided within **Table 4.**

Table 4. Dieback management measures.

Timing	Management Measures
Topsoil removal, excavation and rehabilitation activities	Training will be provided to all personnel during an initial safety and environment induction course. This will include an explanation of the specific requirements with regard to Phytophthora dieback management.
	Fencing and lockable gates will be maintained and used to control unauthorised access to the excavation area.
	As far as reasonable and practicable haulage vehicles are to be cleaned of all loose external soil and plant material prior to entry and exit from the extraction area.
	Access to the subject site during operation will be restricted to the proposed roads. No other access points should be established. The access location and vehicle inspection point should be clearly sign posted.
	The extraction area will be managed to avoid ponding of surface water where vehicle access is required.
	Trucks will be loaded and covered to ensure there is no spillage of material during transport.

A risk assessment to determine the residual risk associated with dieback is provided below. The risk assessment indicates that with the application of suitable management measures the potential risk associated with dieback introduction and spread is 'Low'.

Table 5. Risk assessment associated with dieback.

Hazard	Source of Hazard	Potential Impacts	Mitigation	Likelihood	Consequence	Residual Risk

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Introduction/ spread of dieback	Importation of soil/plant material. Onsite movement of soil.	Impacts to the condition of remnant vegetation. Spread to offsite locations.	Refer to Management Measures provided in **Table 4**.	1	2	Low

5.4 Noise

Noise can originate from various operations and may impact on onsite workers, or travel offsite and impact nearby sensitive premises. Both potential noise impacts are addressed by reducing the noise generated from the quarrying and processing operations.

The proponent will ensure that all noise emissions comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times. A *Noise Management Plan* has been prepared for the subject site and is provided in **Appendix H**. This Plan documents the proposed noise management measures associated with the extractive industry operation.

5.5 Dust

The proposed extractive industry activities will involve the disturbance of large quantities of soil and earthen material. Specifically, this may include the following activities:

- Earthworks during extraction activities;
- Topsoil stripping;
- Loading and transportation of material;
- Crushing and screening of material;
- Vehicle movement within the site; and
- Wind erosion of exposed surfaces.

These activities have the potential to generate dust that, if not adequately controlled, can cause nuisance and safety risks. In-pit operations tend to generate less dust than surrounding activities due to the reduced airflow within the pit. The removal and replacement of topsoil material has the highest risk associated with dust generation due to the large volumes of material involved and generally lower levels of soil moisture.

A *Dust Management Plan* has been prepared for the subject site and is provided in **Appendix I**. This Plan documents the proposed dust management measures associated with the extraction industry operation.

5.6 Heritage Sites

A search of the DPLH *Aboriginal Cultural Heritage Inquiry System* shows no specific sites of Aboriginal significance occurring within or in proximity to the subject site. If during the course of mining an Aboriginal cultural heritage site is discovered, the proponent will immediately advise the DPLH and abide by the *Aboriginal Heritage Act 1972*.

5.7 Domestic and Industrial Waste Products

No domestic or industrial waste will be stored onsite. Any waste material generated during the operational activities will be taken offsite for disposal at an approved landfill facility on a daily basis. Hydrocarbon wastes such as accidental oil spills will be mopped up with absorbent material and segregated for removal and disposal offsite by a licensed contractor.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

An approved portable toilet system may be temporarily placed onsite during construction activities. Waste from the toilet system will be disposed of offsite at an approved treatment facility.

5.8 Hydrocarbons and Dangerous Goods Management

Hydrocarbons are the only dangerous goods that will be utilised within the proposed extraction area. However, storage of hydrocarbons on the site will not occur.

Servicing of machinery and equipment will not occur onsite further reducing the possibility of contamination.

There is the minor possibility for soil and water contamination as a result of an incidental hydrocarbon leakages or spills during the operation of machinery. Accordingly, management measures for hydrocarbon spills are provided in the *Water Management Plan* (refer to **Appendix G**).

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

6 REHABILITATION

The end land use of the extraction area will be returned to pasture. Accordingly, it will be necessary to establish a safe and stable landform capable of supporting the proposed future land use.

A *Rehabilitation Management Plan* has been prepared for the subject site and is provided in **Appendix J**. This Plan documents the proposed rehabilitation management measures associated with the extraction industry operation.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

REFERENCES

Beard J. S. (1990). *Plant life of Western Australia*, Kangaroo Press, Perth.

Barnesby, B.A. and Proulx-Nixon, M.E. (2000). *Land resources from Harvey to Capel on the Swan Coastal Plain, Western Australia - Sheets 1 and 2.* Land Resources Maps No. 23/1 and 23/2. Agriculture Western Australia.

Churchward, H.M. and McArthur, W.M. (1978). Landforms and soils of the Darling System, Western Australia. In *'Atlas of Natural Resources, Darling System, Western Australia'*. Department of Conservation and Environment, Western Australia.

Department of Parks and Wildlife (DBCA) (2004). *Geomorphic Wetlands of the Swan Coastal Plain dataset*.

Department of Water (DoW) (2014). *South West Region Guideline, Water resource considerations for extractive industries.* DoW, Perth WA.

Dieback Working Group (DWG) (2004). *Managing Phytophthora Dieback: Guidelines for Local government.* Dieback Working Group, Western Australia.

Dieback Working Group (DWG) (2005). *Management of Phytophthora Dieback in Extractive Industries*. Dieback Working Group, Western Australia.

Environmental Protection Authority (EPA) (2006). *Guidance Statement No.10 for the Assessment of Environmental Factors (in accordance with the EP Act 1986: Levels of Assessment for Proposals Affecting Natural Areas Within the System 6 Region and Swan Coastal Plain Portion of the System 1 Region.*

Environmental Protection Authority (EPA) (2009). *South West Regional Ecological Linkages.* Bulletin No 8. Retrieved from: http://epa.wa.gov.au/EPADocLib/3040_SWREL_EPB821009.pdf

Geological Survey of Western Australia (1978). *Geology and mineral resources of Western Australia, memoir 3*. Geological Survey of Western Australia, Perth, WA.

Heddle, E.M., Loneragan, O.W. and Havel, J.J. (1980). *Darling Systems – Vegetation Complexes, In: Atlas of Natural Resources Darling System*, Western Australia, Department of Conservation and Environment, Perth.

Molly, S., Wood, J. Hall, S., Wallrodt, S. & Whisson, G. (2009). *South West Regional Ecological Linkages Technical Report*. Available from: http://walga.asn.au/AboutWALGA/Policy/SouthWestBiodiversityProject/SouthWestRegionalEcologicalLinkagesTechnicalReport.aspx

Semeniuk, C. A. & Semeniuk, V. (1995). *A geomorphic approach to global classification for inland wetlands*. Vegetation, 118, 103-124.

Thackway, R, and Cresswell, ID, (Eds) (1995). *An Interim Biogeographic Regionalisation for Australia: a framework for establishing the national system of reserves*, Version 4.0. Australian Nature Conservation Agency, Canberra.

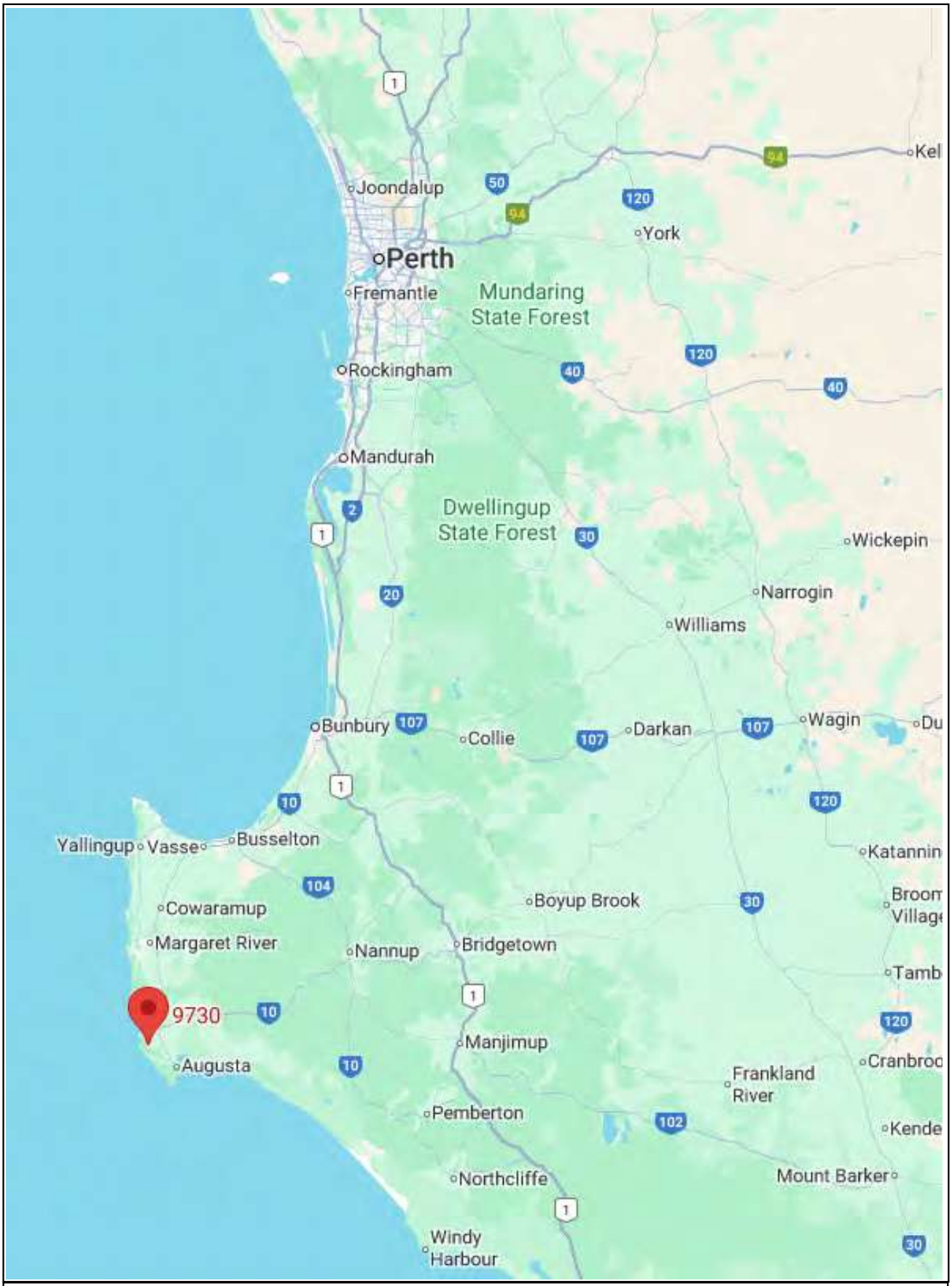
Tille, P (2006). Soil-Landscape Zones of the WA Rangelands and Interior.

Western Australian Planning Commission (WAPC) (2007). *Planning Bulletin No. 64: Acid Sulfate Soils*, Western Australian Planning Commission, Western Australia.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

FIGURES

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

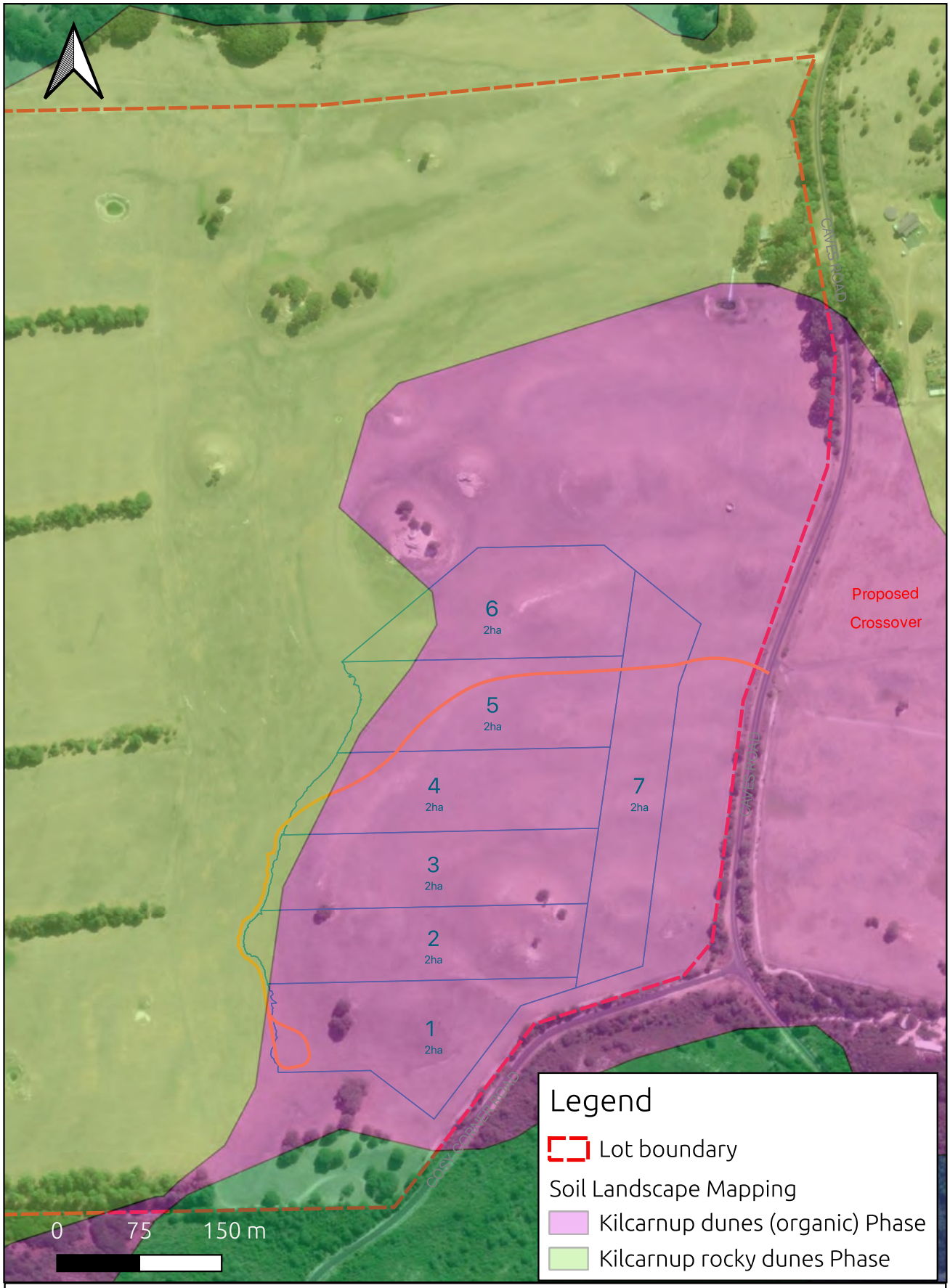


PROJECT	Lot 22 Caves Road, Hamelin Bay	Project Number	Drawing Number	Revision
		2449	Figure 1	A
DRAWING TITLE	Figure 1 - Regional location of the subject site	Designed PN	Checked	
		Drawn PN	Approved	
CLIENT	McDougall Quarries Pty Ltd	Date	20/8/2024	
		Local Authority	City of Busselton	
		Sheet 1 of 1		

This drawing has been prepared by, and remains the property of Accendo Australia Pty Ltd. This drawing shall not be used without permission. The drawing shall be preliminary only and/or not for construciton until signed approved.

PO Box 5178
West Busselton
Western Australia 6280
Mobile 0418 950 852

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



PROJECT	9730 Caves Road, Hamelin Bay
DRAWING TITLE	Figure 2 – Soils of the subject site
CLIENT	Mc Dougall Quarries Pty Ltd

Project Number	Drawing Number	Revision
2449	Figure 2	A

Designed	PN	Checked	
Drawn	PN	Approved	

Date 20/8/2024
Local Authority Shire of Augusta Margaret River
Sheet 1 of 1

accendo AUSTRALIA
PO Box 5178
West Busselton
Western Australia 6280
Mobile 0418 950 852

This drawing has been prepared by, and remains the property of Accendo Australia Pty Ltd. This drawing shall not be used without permission. The drawing shall be preliminary only and/or not for construciton until signed approved.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



PROJECT	9730 Caves Road, Hamelin Bay	Project Number	Drawing Number	Revision
		2449	Figure 3	A
DRAWING TITLE	Figure 3 – Vegetation to be removed	Designed PN	Checked	
CLIENT	Mc Dougall Quarries Pty Ltd	Drawn PN	Approved	
		Date	20/8/2024	
		Local Authority	Shire of Augusta Margaret River	
		Sheet 1 of 1		

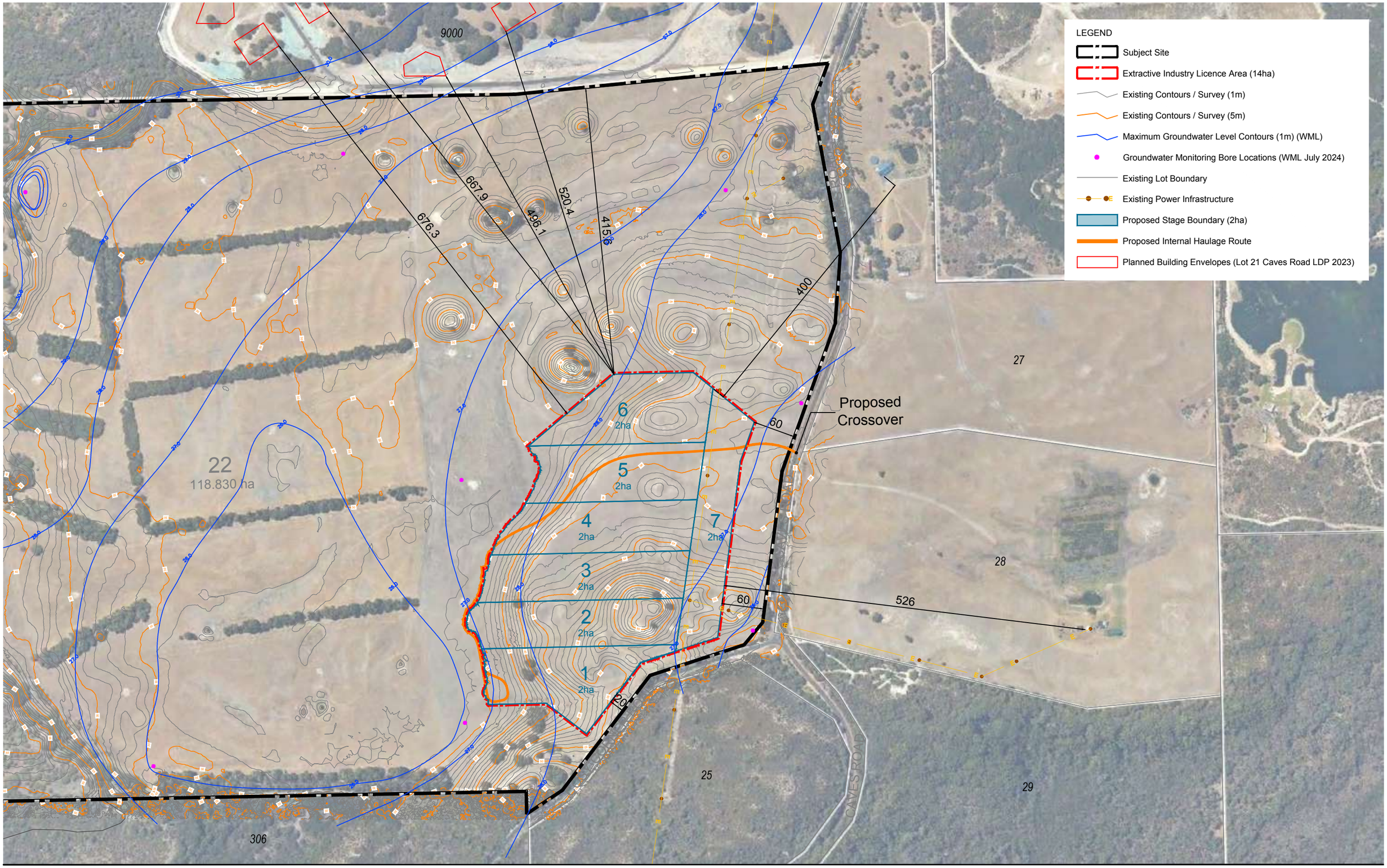
accendo AUSTRALIA
PO Box 5178
West Busselton
Western Australia 6280
Mobile 0418 950 852

This drawing has been prepared by, and remains the property of Accendo Australia Pty Ltd. This drawing shall not be used without permission. The drawing shall be preliminary only and/or not for construciton until signed approved.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX A – EXCAVATION WORKS PLAN

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Excavation Works Plan

Lot 22 (9730) Caves Road, Hamelin Bay

Date: 26 Aug 2024 Scale: 1:5000 @ A3 1:2500 @ A1 File: **24-132 EX01B** Staff: DL CCG JJ Checked: DL

0 100m

element.

Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
PO Box 7375 Cloisters Square, Perth Western Australia 6850.
T. +61 8 9289 8300 | **E.** hello@elementwa.com.au **elementwa.com.au**

© Element Advisory WA Pty Ltd

This concept has been prepared for the purpose of meeting client specifications. The drawing does not constitute an invitation,agreement or contract (or any part thereof) of any kind whatsoever. Although care has been taken in the compilation of this drawing by Element Advisory WA Pty Ltd, all parties associated with the proposed property development disclaim all responsibility for any errors or omissions. The right is reserved to change the plan at any time. Liability is expressly disclaimed by Element Advisory WA Pty Ltd for any loss or damage which may be sustained by any person acting on any visual impression gained from this drawing.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX B - CERTIFICATE OF TITLE

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX C – GROUNDWATER TECHNICAL MEMORANDUM

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

TECHNICAL MEMORANDUM

Our Ref: 11878-G-TM-001-0

31 July 2024

McDougall Quarries Pty Ltd
44 Forrest Beach Road,
Wonnerup, WA 6280

Attention: Kyle Jackson

LOT 22 CAVES ROAD, HAMELIN BAY – GROUNDWATER LEVELS ASSESSMENT

WML Consultants (WML) was engaged by McDougall Quarries Pty Ltd (the Client) to carry out a groundwater monitoring programme at Lot 22 Caves Road, Hamelin Bay (the site), for the proposed material extractive development. The study will inform on the groundwater levels across the site measured between July and November 2024.

This technical memorandum letter presents the results of the preliminary groundwater levels study for the proposed development, based on currently available information.

At the time of the preparation of this letter, the following groundwater information was reviewed:

- Urban Water Management Plan (UWMP) for Lot 21 Caves Road, Hamelin Bay (Hamelin Ridge subdivision directly north of the site), prepared by Oversby Consulting in December 2021 (Ref. B21031 V1);
- Groundwater monitoring event data for Lot 22 Caves Road, Hamelin Bay (subject site), collected on 25th July 2024 (the first out of five scheduled monitoring events that WML is currently undertaking).

Based on the information included in the UWMP, five groundwater monitoring wells were installed at Lot 22 Caves Road and groundwater levels were measured in August and September 2016. Level Surveys Pty Ltd completed a survey of the old monitoring wells on 22 July 2024. Three out of five monitoring wells (bore No 2, 3 and 4) no longer existed on site; therefore, no accurate measurements could be undertaken. It is believed those wells were removed during the construction of the subdivision (roads and minor earthworks). The approximate ground surface levels were recorded in the likely proximity of the former monitoring wells. The remaining two wells (bore No 1 and 5) were picked up to 8 cm accuracy (horizontal and vertical). Summary of the peak groundwater levels observed in winter 2016 (August 2016) are summarised in Table 1 below.

Table 1: Summary of groundwater monitoring data – Lot 21 Caves Road, Hamelin Bay

Location ID	Coordinates (MGA94 Zone 50)		Elevation (TOC) RL (m)	Upstand (m)	Termination Depth form TOC (m)	Depth to GW (mBGL)	GW levels (m AHD)
	Easting	Northing					
1	321094.91	6209765.243	32.299	0.52	4.00	2.25	29.529
2	320586.241	6209790.014	34.023[1)]	0.50	3.98	DRY	DRY
3	320664.972	6210060.981	48.266[1)]	0.57	3.88	DRY	DRY
4	321012.657	6209966.238	31.568[1)]	0.47	3.67	1.41	30.158
5	321279.968	6210062.191	31.155	0.49	3.60	1.18	29.485

Notes: All depths are relative to the existing ground surface
TOC – Top of Casing
[1)] Monitoring well destroyed; RL level represents ground level in the approximate area.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

WML engaged EDrill Pty Ltd to install groundwater monitoring wells at Lot 22 Caves Road, Hamelin Bay. The works were completed between the 23rd and 24th of July 2024 and comprised the installation of 8 monitoring wells to depths between 3.7 m and 22.0 m below the existing ground level. Summary of the first groundwater monitoring event completed on 25th July 2024 by WML is provided in Table 2 below.

Table 2: Summary of groundwater monitoring data – Lot 22 Caves Road, Hamelin Bay

Location ID	Coordinates (MGA94 Zone 50)		Elevation (TOC) RL (m)	Upstand (m)	Termination Depth (m)	Depth to GW (mBGL)	GW levels (m AHD)
	Easting	Northing					
MW1	320717.901	6209455.786	31.798	0.575	5.1	3.575	27.648
MW2	320257.634	6209400.089	30.557	0.595	3.7	3.485	26.477
MW3	320443.070	6208568.909	29.827	0.570	5.2	3.3	25.957
MW4	320894.124	6208631.739	29.684	0.630	5.1	2.96	26.094
MW5	320889.088	6208983.295	29.964	0.580	4.4	2.17	27.214
MW6	321311.086	6208765.454	45.301	0.545	22.0	19.435	25.321
MW7	321381.067	6209094.519	39.403	0.550	14.3	12.01	26.843
MW8	321271.648	6209402.900	31.281	0.575	5.2	2.575	28.131

Notes: All depths are relative to the existing ground surface
TOC – Top of Casing

Based on the timing of the first groundwater monitoring event (end of July), the above data is considered to represent the levels close to the expected average annual maximum groundwater levels (typically observed towards the end of August), depending on the recorded rainfall.

Based on the results of the historical groundwater monitoring programme at the Hamelin Ridge development site and the first groundwater monitoring event completed on the 25th of July 2024 for the proposed site (Lot 22 Caves Road), it can be observed that the groundwater levels range from about RL 28 m AHD at the northeastern boundary of the site to about RL 25 m AHD at the southeastern boundary of the site. The approximate groundwater contours showing indicative groundwater levels are included in WML drawings No 11878-SK-101 and 11878-SK-102 attached to this report.

We consider the above groundwater levels to be consistent with the topography of the site, with groundwater mounding towards the higher elevated areas and draining towards the existing creek systems south and east of the site.

Yours faithfully,

Aleksandra Gorczynska
Senior Geotechnical Engineer
Author

Raphael Hyde
Senior Geotechnical Engineer
Reviewer

For and on behalf of WML Consultants Pty Ltd

Attachments:

Report Limitations

Drawings

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

REPORT LIMITATIONS

WML Consulting Engineers

This geotechnical report is provided for the sole use by the Client. This report must not be applied for any other purpose or project except the one originally contemplated without written authorisation from WML. WML accepts no responsibility for the use of this report / document, in whole or in part, in other contexts or for any other purpose.

WML have undertaken investigations, performed consulting services, and prepared this report based on the Client's specific requirements, documents and information supplied, and previous experience. If changes occur in the nature or design of the project, however minor, it is recommended WML review this report to assess their impacts and provide additional recommendations, if any. WML does not assume any responsibility or liability for problems that arise due to developments on site of which we were not informed.

This report utilises data and information provided by third parties, including, but not limited to sub-consultants, published data, and the Client. This information has been assumed to be correct unless otherwise stated. WML assumes no responsibility for assessments made partly or entirely based on information provided by third parties or for the adequacy, incompleteness, inaccuracies, or reliability of any data provided by third parties.

It is the responsibility of the Client to transmit the information, recommendations, and limitations of this report to the appropriate organisations or people involved in design of the project, including, but not limited to developers, builders, owners, buyers, architects, engineers, and designers.

WML's opinions are based on upon information that existed at the time of the production of this report and ground conditions encountered at the time the site study was performed. This geotechnical report should not be relied upon if its adequacy has been affected by: the passage of time, by man-made events, such as construction on or adjacent to the site, or by natural events, such as floods, earthquakes, or groundwater fluctuations. In the event of the above changes, WML should be contacted to determine if this report is still reliable or whether additional testing is required.

The subsurface conditions identified within this report are based only upon investigation locations where subsurface tests have been conducted and / or samples obtained, which are explicitly representative of the specific sample or test location. Interpretation of conditions between such points cannot be assumed to represent actual subsurface information and unknowns or variations in ground conditions between test locations that cannot be inferred or predicted. Actual subsurface conditions may differ significantly from those indicated in this report. Specific warning is also given that many factors, either natural or artificial, may render ground conditions different from those which pertained at the time of the investigation. WML does not accept any responsibility for any variance in the ground conditions that may exist across the site. If unexpected subsurface conditions are encountered, WML shall be notified immediately to review those conditions and provide additional and/or modified recommendations, as necessary.

This geotechnical assessment is based upon judgment of the investigation data, visual observations of the site and materials encountered, along with the proposed land use and project specifications. The findings and recommendations presented within this report represent professional opinions and estimates and should not be taken as fact unless explicitally stated. In general, statements of fact are are limited to what was done and / or what was observed on site.

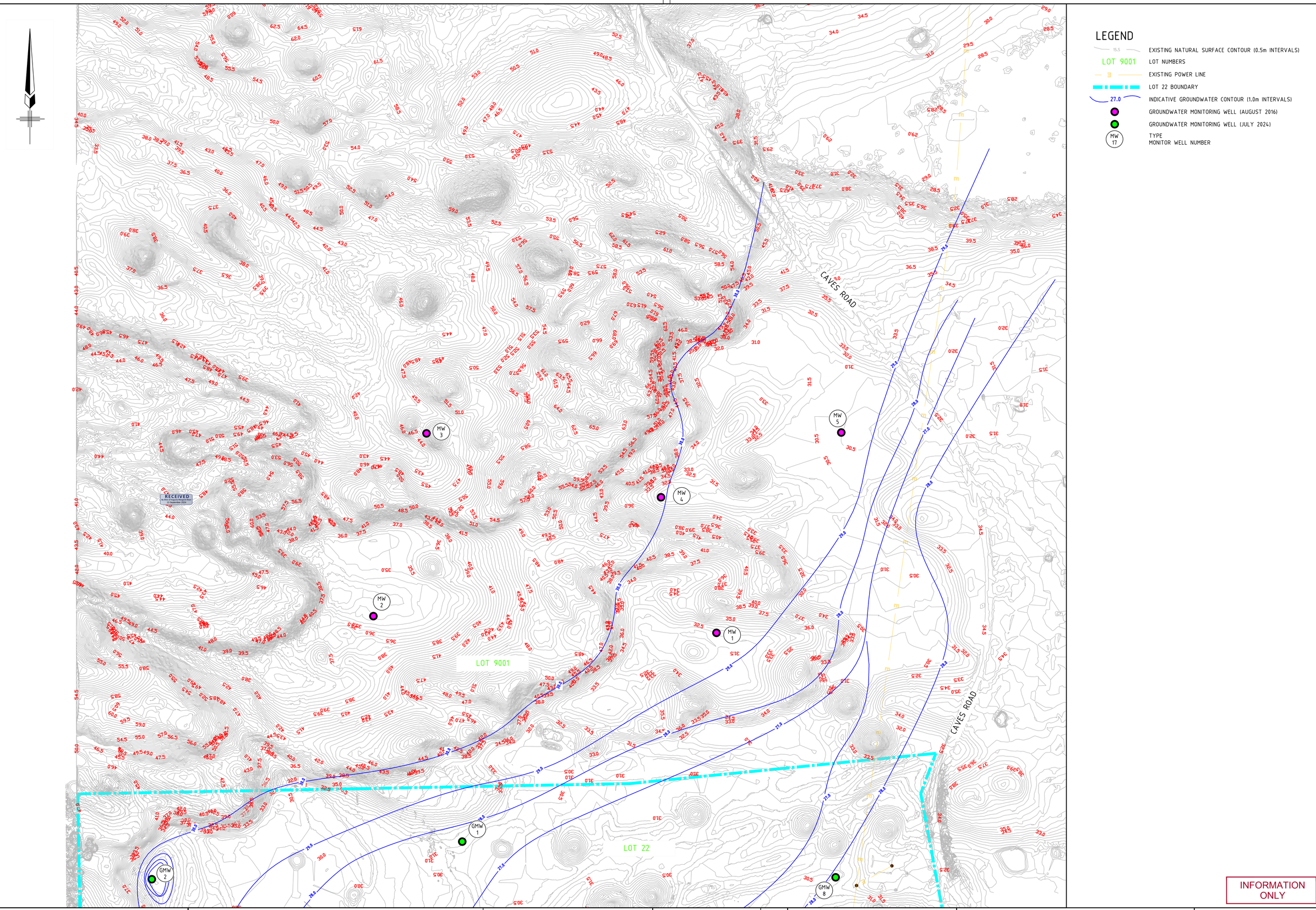
The recommendations provided in this report are preliminary only; final recommendations can only be given after observing the actual subsurface conditions revealed during construction. WML does not assume responsibility or liability for the recommendations in this report if construction observation has not been performed by a WML geotechnical engineer.

Our services did not include any contamination or environmental assessment of the site or adjacent sites. The equipment and techniques used to perform a geoenvironmental study differ from those used to perform a geotechnical investigation. If you require any geoenvironmental information for your project, WML can advise on further steps to be undertaken.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

REPORT LIMITATIONS

WML have performed our professional services in accordance with generally accepted geotechnical engineering principles and practices currently employed in the area; no warranty, expressed or implied, is made as to the professional advice included in this report.



LEGEND

- EXISTING NATURAL SURFACE CONTOUR (0.5m INTERVALS)
- LOT NUMBERS
- EXISTING POWER LINE
- LOT 22 BOUNDARY
- INDICATIVE GROUNDWATER CONTOUR (1.0m INTERVALS)
- GROUNDWATER MONITORING WELL (AUGUST 2016)
- GROUNDWATER MONITORING WELL (JULY 2024)
- MW 17 — TYPE / MONITOR WELL NUMBER

SCALE 1:2500

INFORMATION ONLY

A1

WML Consulting Engineers
Civil | Geotechnical | Structural
BUNBURY +61 8 9722 3544
KALGOORLIE +61 8 9021 1811
PERTH +61 8 9722 3566
wml.com.au

REVISIONS				
N°.	DESCRIPTION	APPROVED	DATE	DRAWN
A	ISSUED FOR REVIEW	L. RUSCONI	07/24	BC

NOTE: *INDICATES SIGNATURES ON ORIGINAL ISSUE OF DRAWING OR LAST REVISION OF DRAWING

NAMES PRINTED IN FULL		DATE
DESIGNED	B.CHEN	07/24
DRAWN	B.CHEN	07/24
VERIFIED	L. RUSCONI	07/24
APPROVED		

CLIENT: ELEMENT ADVISORY

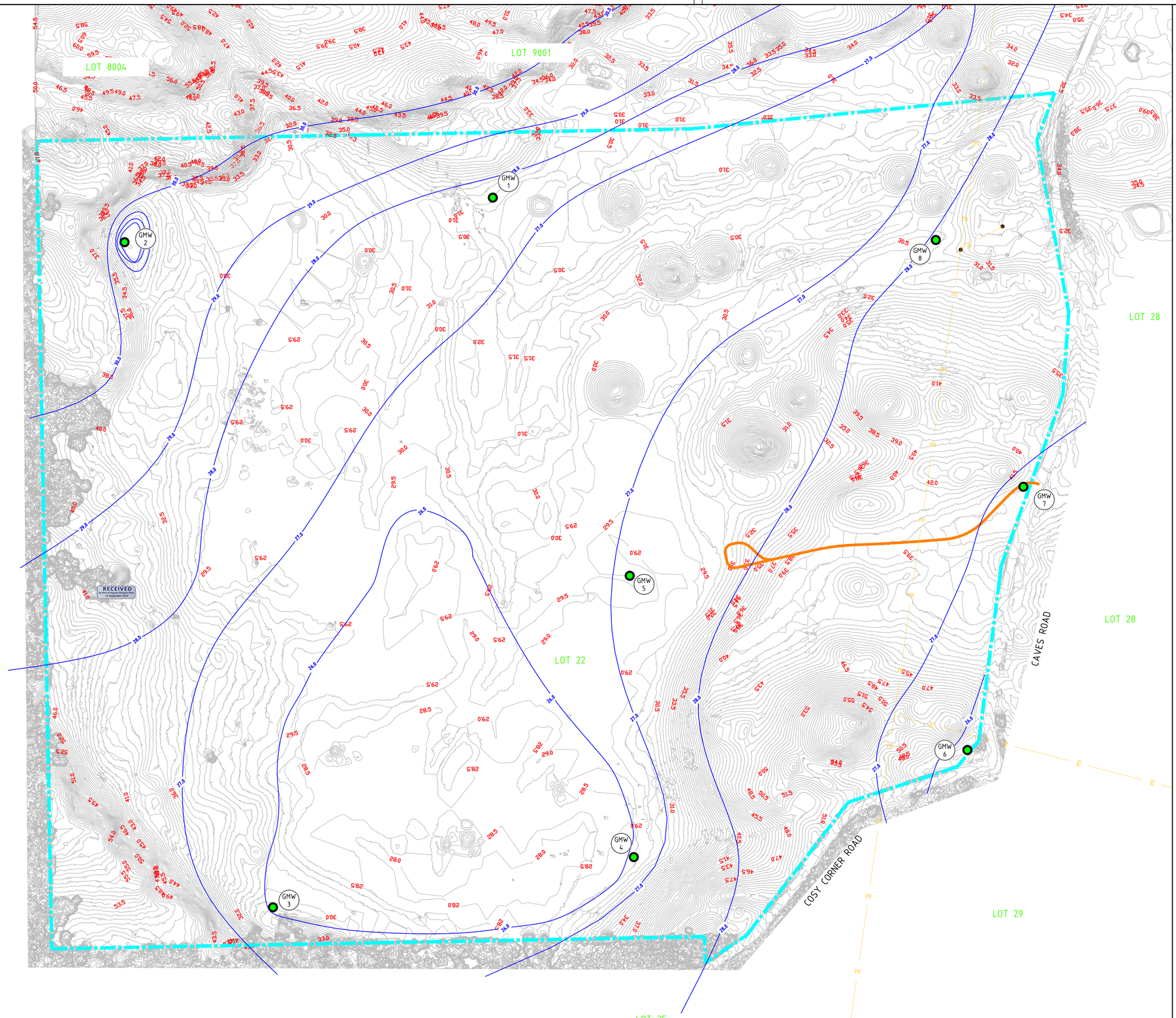
PROJECT: LOT 22 CAVES ROAD HAMELIN BAY

DRAWING TITLE: LOT 21 CAVES ROAD, HAMELIN BAY
GROUNDWATER MONITORING WELLS

THIS DRAWING SHALL BE TREATED AS PRELIMINARY AND IS NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS SIGNED AS APPROVED.

DRAWING NUMBER: 11878-SK-101

REVISION: A



LEGEND

- EXISTING NATURAL SURFACE CONTOUR (0.5m INTERVALS)
- LOT NUMBERS (LOT 1624)
- EXISTING POWER LINE
- EXISTING ACCESS ROAD
- LOT 22 BOUNDARY
- INDICATIVE GROUNDWATER CONTOUR (1.0m INTERVALS) (27.0)
- GROUNDWATER MONITORING WELL (AUGUST 2016)
- GROUNDWATER MONITORING WELL (JULY 2024)
- TYPE / MONITOR WELL NUMBER (MW 17)

SCALE 1:2500

A1

INFORMATION ONLY

WML Consulting Engineers
Civil | Geotechnical | Structural
BUNBURY +61 8 9722 3544
KALGOORLIE +61 8 9021 1811
PERTH +61 8 9722 3566
wml.com.au

REVISIONS					
N°	DESCRIPTION	APPROVED	DATE	DRAWN	
A	ISSUED FOR REVIEW	L. RUSCONI	07/24	BC	

NOTE: »NDICATES SIGNATURES ON ORIGINAL ISSUE OF DRAWING OR LAST REVISION OF DRAWING

NAMES PRINTED IN FULL		DATE
DESIGNED	B.CHEN	07/24
DRAWN	B.CHEN	07/24
VERIFIED	L. RUSCONI	07/24
APPROVED		

CLIENT: ELEMENT ADVISORY

PROJECT: LOT 22 CAVES ROAD HAMELIN BAY

DRAWING TITLE: LOT 22 CAVES ROAD, HAMELIN BAY GROUNDWATER MONITORING WELLS

THIS DRAWING SHALL BE TREATED AS PRELIMINARY AND IS NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS SIGNED AS APPROVED.

DRAWING NUMBER: 11878-SK-102

REVISION: A

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX D – CONTEXT PLAN



RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Context Plan

Lot 22 (9730) Caves Road, Hamelin Bay

Date: 28 Aug 2024 Scale: NTS @ A3 File: **24-132 CP-1 A** Staff: DL CCG JJ Checked: DL

element.

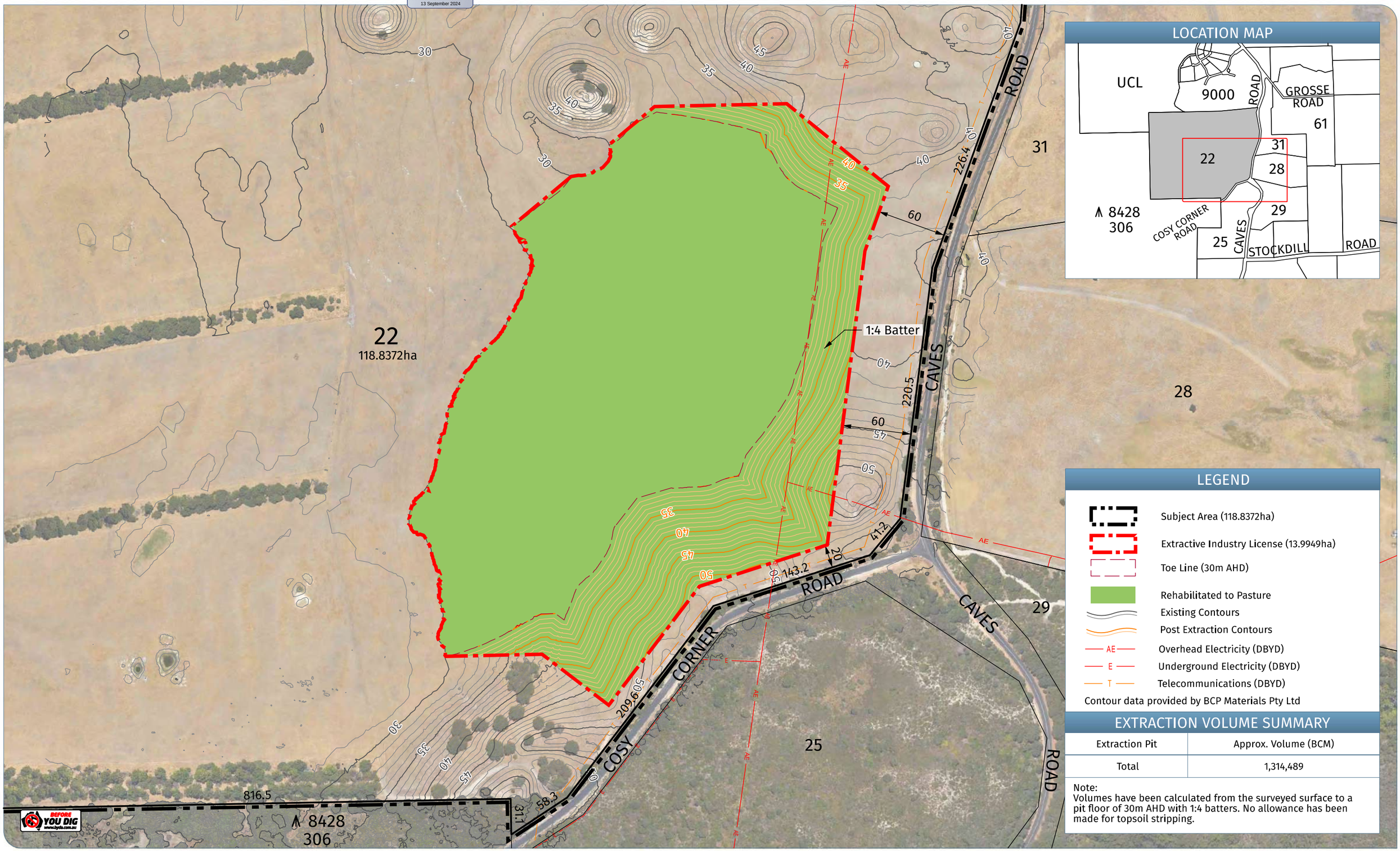
Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
PO Box 7375 Cloisters Square, Perth Western Australia 6850.
T. +61 8 9289 8300 | **E.** hello@elementwa.com.au **elementwa.com.au**

© Element Advisory WA Pty Ltd. This concept has been prepared for the purposes of meeting client specifications. The drawing does not constitute an invitation, agreement or contract (or part thereof) of any kind whatsoever. Although care has been taken in the compilation of this drawing by Element Advisory WA Pty Ltd, all parties associated with the proposed development disclaim all responsibility for any errors or omissions. The right is reserved to change the plan at any time. Liability is expressly disclaimed by Element Advisory WA Pty Ltd for any loss or damage which may be sustained by any person acting on any visual impression gained from this drawing.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX E – POST EXTRACTION PLAN

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



LOCATION MAP

LEGEND

- Subject Area (118.8372ha)
- Extractive Industry License (13.9949ha)
- Toe Line (30m AHD)
- Rehabilitated to Pasture
- Existing Contours
- Post Extraction Contours
- AE — Overhead Electricity (DBYD)
- E — Underground Electricity (DBYD)
- T — Telecommunications (DBYD)

Contour data provided by BCP Materials Pty Ltd

EXTRACTION VOLUME SUMMARY

Extraction Pit	Approx. Volume (BCM)
Total	1,314,489

Note:
Volumes have been calculated from the surveyed surface to a pit floor of 30m AHD with 1:4 batters. No allowance has been made for topsoil stripping.

POST EXTRACTION PLAN

Lot 22 (No. 9730) Caves Road, HAMELIN BAY

Plan No.	24210-01	
Date	27/06/24	
Drawn	JW	
Checked	DJ	
Revision	C	
Scale	1:3000@A3	0 40m 80m

BUNBURY OFFICE:
21 Spencer Street,
BUNBURY WA 6230
T: 08 9792 6000
E: bunbury@harleydykstra.com.au
W: www.harleydykstra.com.au
ALBANY | BUNBURY | BUSSELTON | FORRESTDALE | PERTH

COPYRIGHT:
This document is and shall remain the property of HARLEY DYKSTRA.
The document may only be used for the purpose for which it was commissioned and in accordance with the terms of engagement for the commission.
Unauthorised use of this document in any form whatsoever is prohibited

NOTE: This plan has been prepared for planning purposes. Areas, Contours and Dimensions shown are subject to survey

Harley Dykstra
PLANNING & SURVEY SOLUTIONS

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX F – LANDSCAPE AND VISUAL ASSESSMENT

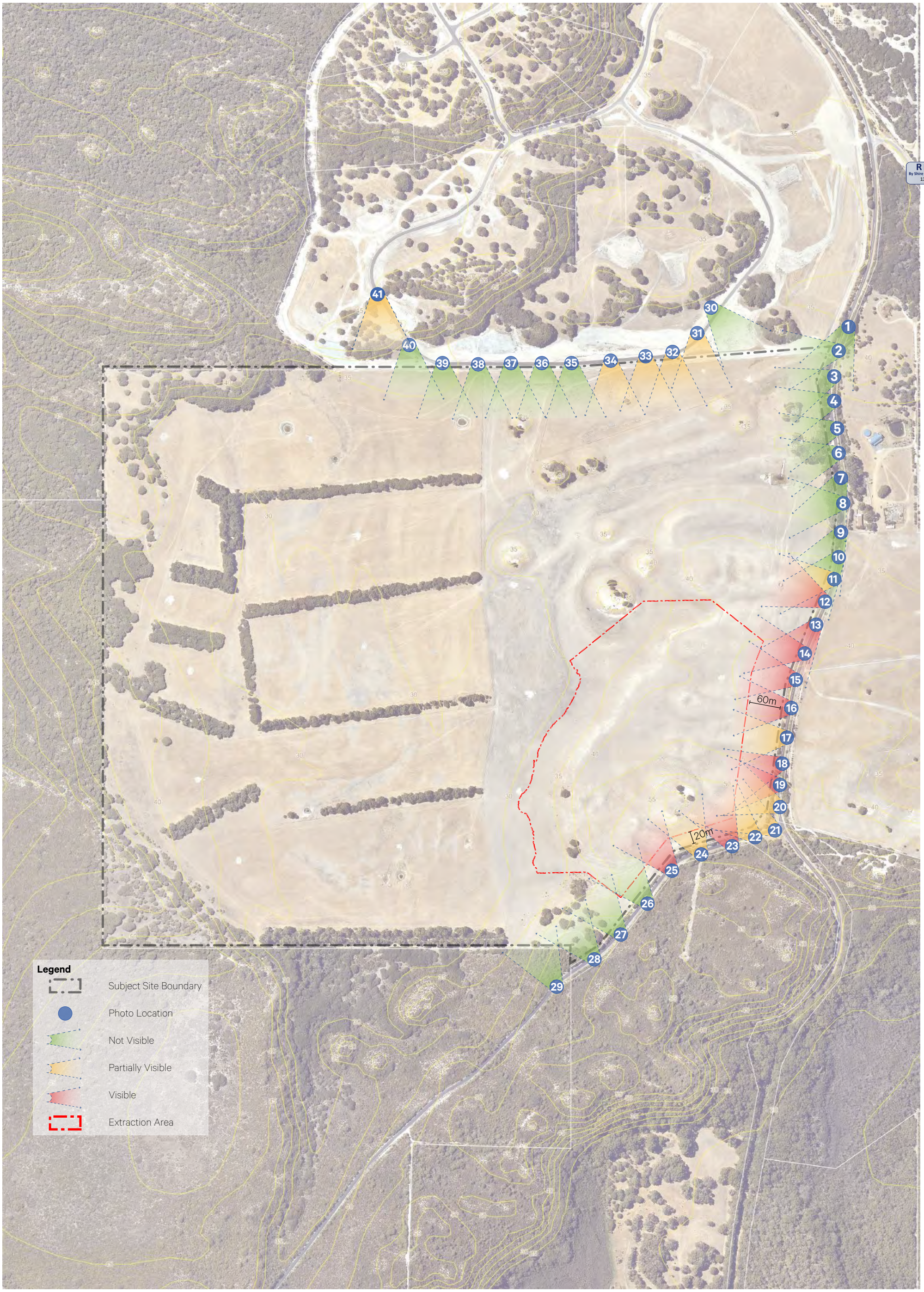
RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Visual Impact Analysis

Lot 22 (No. 9730) Caves Road, Hamelin Bay
Proposed Extractive Industry

element.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Viewing Diagram

Caves Road, Hamelin Bay

Date: 31 July 2024 Scale: NTS @A3 Drawing No. **24-132** Staff: CCG Checked: DKL

element.

Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
PO Box 7375 Cloisters Square, Perth Western Australia 6850.
T. +61 8 9289 8300 | **E.** hello@elementwa.com.au **elementwa.com.au**

1





Photo taken: 27/07/2024 2:45:24 PM

View direction: South-West

Visibility of proposed development: Not Visible,

2





Photo taken: 27/07/2024 2:45:39 PM

View direction: West

Visibility of proposed development: Not Visible

3





Photo taken: 27/07/2024 2:46:00 PM

View direction: South-West

Visibility of proposed development: Not Visible

4





Photo taken: 27/07/2024 2:46:22 PM

View direction: West

Visibility of proposed development: Not Visible





Photo taken: 27/07/2024 2:25:44 PM

View direction: West

Visibility of proposed development: Not Visible





Photo taken: 27/07/2024 2:26:29 PM

View direction: West

Visibility of proposed development: Not Visible

7

RECEIVED
By Shire of Augusta Margaret River
13 September 2024





Photo taken: 27/07/2024 2:26:56 PM

View direction: South-South-West

Visibility of proposed development: Not Visible

8





Photo taken: 27/07/2024 2:27:17 PM

View direction: West

Visibility of proposed development: Not Visible

9

RECEIVED
By Shire of Augusta Margaret River
13 September 2024





Photo taken: 27/07/2024 2:27:43 PM

View direction: South-South-West

Visibility of proposed development: Not Visible

10





Photo taken: 27/07/2024 2:28:07 PM

View direction: South-West

Visibility of proposed development: Not Visible

11

RECEIVED
By Shire of Augusta Margaret River
13 September 2024





Photo taken: 27/07/2024 2:28:28 PM

View direction: West

Visibility of proposed development: Partially Visible

12





Photo taken: 27/07/2024 2:29:08 PM

View direction: West-North-West

Visibility of proposed development: Visible

13

RECEIVED
By Shire of Augusta Margaret River
13 September 2024





Photo taken: 27/07/2024 2:29:56 PM

View direction: South-West

Visibility of proposed development: Visible

14





Photo taken: 27/07/2024 2:30:20 PM

View direction: West

Visibility of proposed development: Visible

15

RECEIVED
By Shire of Augusta Margaret River
13 September 2024





Photo taken: 27/07/2024 2:30:41 PM

View direction: West

Visibility of proposed development: Visible

16





Photo taken: 27/07/2024 2:31:04 PM

View direction: West

Visibility of proposed development: Visible

17

RECEIVED
By Shire of Augusta Margaret River
13 September 2024





Photo taken: 27/07/2024 2:31:30 PM

View direction: West

Visibility of proposed development: Partially Visible

18





Photo taken: 27/07/2024 2:31:55 PM

View direction: West-South-West

Visibility of proposed development: Visible

19

RECEIVED
By Shire of Augusta Margaret River
13 September 2024





Photo taken: 27/07/2024 2:32:19 PM

View direction: West

Visibility of proposed development: Visible

20





Photo taken: 27/07/2024 2:32:48 PM

View direction: West

Visibility of proposed development: Partially Visible

21

RECEIVED
By Shire of Augusta Margaret River
13 September 2024





Photo taken: 27/07/2024 2:34:59 PM

View direction: North-West

Visibility of proposed development: Partially Visible

22





Photo taken: 27/07/2024 2:35:16 PM

View direction: North-West

Visibility of proposed development: Partially Visible





Photo taken: 27/07/2024 2:35:39 PM

View direction: North-West

Visibility of proposed development: Visible





Photo taken: 27/07/2024 2:36:04 PM

View direction: North-North-West

Visibility of proposed development: Partially Visible

25

RECEIVED
By Shire of Augusta Margaret River
13 September 2024





Photo taken: 27/07/2024 2:36:31 PM

View direction: North-West

Visibility of proposed development: Visible

26





Photo taken: 27/07/2024 2:36:53 PM

View direction: North-West

Visibility of proposed development: Not Visible

27

RECEIVED
By Shire of Augusta Margaret River
13 September 2024





Photo taken: 27/07/2024 2:37:21 PM

View direction: North-West

Visibility of proposed development: Not Visible

28





Photo taken: 27/07/2024 2:38:02 PM

View direction: North-West

Visibility of proposed development: Not Visible

29

RECEIVED
By Shire of Augusta Margaret River
13 September 2024





Photo taken: 27/07/2024 2:38:01 PM

View direction: North-West

Visibility of proposed development: Not Visible

30





Photo taken: 4/08/2024 11:41:08 AM

View direction: South-East

Visibility of proposed development: Not Visible

31

RECEIVED
By Shire of Augusta Margaret River
13 September 2024





Photo taken: 4/08/2024 11:40:44 AM

View direction: South

Visibility of proposed development: Partially Visible

32





Photo taken: 4/08/2024 11:40:15 AM

View direction: South

Visibility of proposed development: Partially Visible

33

RECEIVED
By Shire of Augusta Margaret River
13 September 2024





Photo taken: 4/08/2024 11:39:51 AM

View direction: South

Visibility of proposed development: Partially Visible

34





Photo taken: 4/08/2024 11:39:27 AM

View direction: South

Visibility of proposed development: Partially Visible

35

RECEIVED
By Shire of Augusta Margaret River
13 September 2024





Photo taken: 4/08/2024 11:39:00 AM

View direction: South

Visibility of proposed development: Not Visible

36





Photo taken: 4/08/2024 11:38:34 AM

View direction: South

Visibility of proposed development: Not Visible

37

RECEIVED
By Shire of Augusta Margaret River
13 September 2024





Photo taken: 4/08/2024 11:38:09 AM

View direction: South

Visibility of proposed development: Not visible

38





Photo taken: 4/08/2024 11:37:40 AM

View direction: South

Visibility of proposed development: Not Visible

39

RECEIVED
By Shire of Augusta Margaret River
13 September 2024





Photo taken: 4/08/2024 11:37:17 AM

View direction: South

Visibility of proposed development: Not Visible

40





Photo taken: 4/08/2024 11:36:46 AM

View direction: South

Visibility of proposed development: Not Visible



RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Photo taken: 4/08/2024 11:36:12 AM

View direction: South

Visibility of proposed development: Partially Visible

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Screening Vegetation Plan

Caves Road, Hamelin Bay

Date: 31 July 2024 Scale: NTS @A3 Drawing No. **24-132** Staff: CCG Checked: DKL

element.

Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
PO Box 7375 Cloisters Square, Perth Western Australia 6850.
T. +61 8 9289 8300 | **E.** hello@elementwa.com.au **elementwa.com.au**

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX G – WATER MANAGEMENT PLAN

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

accendo AUSTRALIA

WATER MANAGEMENT PLAN

LOT 22 (9730) CAVES ROAD, HAMELIN BAY

August 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Telephone +61 418 950 852

info@accendoaustralia.com.au
PO Box 5178 West Busselton WA 6280
ABN 11 160 028 642

www.accendoaustralia.com.au

Document Control

Version	Date	Author	Reviewer
V1	25/08/2024	PN	KMT/Element
V2	30/08/2024	PN	KMT
Filename	2449_Lot 22 Caves Rd WMP_V1		

Limitations

This report has been prepared by Accendo Australia Pty Ltd in accordance with the scope limitations provided in this report, or as otherwise agreed, between the Client and Accendo.

This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

This report has been prepared based upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report, which Accendo has not independently verified or checked beyond the agreed scope of work. Accendo does not accept liability in connection with such unverified information.

The conclusions and recommendations in this report are based on assumptions made by Accendo described in this report where and as they are required. Accendo disclaims liability arising from any of the assumptions being incorrect.

The report is based on site specific conditions encountered and information received at the time of preparation of this report or the time that site investigations were undertaken. Accendo disclaims responsibility for any changes that may have occurred after this time.

The preparation of this report has been undertaken and performed in a professional manner, in consideration of the scope of services and in accordance with environmental consulting practices. No other warranty is made.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

CONTENTS

1 INTRODUCTION 1
1.1 BACKGROUND 1
1.2 PURPOSE AND SCOPE 1
2 EXISTING ENVIRONMENT 2
2.1 LOCATION 2
2.2 LAND USE 2
2.3 TOPOGRAPHY AND SOILS 2
2.4 CLIMATE 2
2.5 HYDROLOGY 3
3 EXTRACTION ACTIVITIES 4
3.1 OPERATIONAL WORKS 4
3.1.1 Final Contours 5
3.1.2 Rehabilitation 5
3.2 PROPOSED OPERATING TIMES 5
3.3 EQUIPMENT 5
3.3.1 Water Usage 6
4 POTENTIAL IMPACTS AND MANAGEMENT 7
4.1 SURFACE WATER 7
4.2 DRAINAGE 7
4.3 GROUNDWATER 8
4.4 HYDROCARBONS AND DANGEROUS GOODS MANAGEMENT 8
REFERENCES 10
FIGURES 11
APPENDIX A – EXCAVATION WORKS PLAN 12
APPENDIX B – GROUNDWATER TECHNICAL MEMORANDUM 13
APPENDIX C – POST EXTRACTION PLAN 14

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

TABLES

Table 1. Equipment……5

Table 2. Risk assessment associated with surface water and stormwater……7

Table 3. Risk assessment associated with groundwater……8

Table 4. Hydrocarbon and dangerous goods management measures……9

Table 5. Risk assessment associated with the uncontrolled discharge of contaminants……9

FIGURES

Figure 1. Regional location of the subject site

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

1 INTRODUCTION

1.1 Background

McDougall Quarries Pty Ltd (the applicant) is proposing to extract lime sands and limestone from a 14 hectare (ha) area within Lot 22 (HSE 9730) Caves Road, Hamelin Bay (herein referred to as the subject site) (refer to **Figure 1** and **Appendix A**).

The available volume of sand (*insitu* volume of approximately 1,314,489 m^3) is to be extracted, commencing in the south and moving in a northerly direction before finishing in a stage along the east of the subject site (refer to **Appendix A**).

The post extraction landform will be designed with minimum batters of 1:4.

1.2 Purpose and Scope

The purpose of this Water Management Plan (WMP) is to review the risks and control measures to appropriately manage and minimise the environmental impacts of the extractive industry on both groundwater and surface water in proximity to the subject site.

The scope of the WMP is to cover the following:

- Legislative and regulatory compliance;
- Existing environment;
- Risk assessment water quality impacts;
- Mitigation and measurement measures; and
- Roles and responsibilities in relation to water management.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

2 EXISTING ENVIRONMENT

2.1 Location

The subject site is located within Lot 22 Caves Road, Hamelin Bay. The Lot is wholly owned by Joe Fish Pty Ltd. Subject to development approval for the extractive industry, the Lot will be purchased by the proponent.

The subject site is located within the municipality of the Shire of Augusta-Margaret River, approximately 32 km south of the Margaret River town centre and approximately 260 km south of Perth.

2.2 Land Use

The subject site is zoned 'General Agriculture' pursuant to the Shire's *Local Planning Scheme No.* 1 and has previously been used for agriculture.

The surrounding properties are zoned 'Rural Residential' to the north, 'National Park and Nature Reserve' to the west and south and a mixture of 'General Agriculture', 'Priority Agriculture' and 'Landscape Amenity' to the east pursuant to the Shire *Local Planning Scheme No. 1*.

2.3 Topography and Soils

The current topography of the subject site can be described as variable with the elevation ranging from 30 m Australian Height Datum (AHD) through the eastern portion of the subject site to approximately 40m AHD in the west. Elevated areas are located throughout the subject site and range in elevation from approximately 45 m AHD to 60 m AHD (refer to **Appendix A**).

The subject site is located within the Leeuwin Zone landform within the Gracetown Ridge systems consisting of "*lateritic plateau containing sandy gravel, loamy gravel and grey sandy duplex*" and *"a limestone ridge, in the coastal edge of the Leeuwin Zone containing yellow deep sand and red deep sand",* respectively. (Tille 2006).

The subject site is located within the following sub-systems:

- Kilcarnup rocky dunes phase – Low to steep dunes (gradients 5-10%) not exposed to prevailing wines. Dark calcareous sands containing limestone rubble.
- Kilcarnup dunes (organic) phase – Steep dunes (gradients usually in excess of 20%) not exposed to prevailing winds. Deep pale calcareous sands with brown topsoil.

2.4 Climate

The climate of the locality is classified as Mediterranean with warm to hot summers and cool wet winters.

The closest weather recording station is Cape Leeuwin (Station 9518). Temperatures are highest on average in February, at approximately 23.4°C. August has the lowest average temperature of the year of 11.3°C.

Rainfall for the area is approximately 950 mm per annum with approximately 88% of the rain falling during the winter months, April to October inclusive. Evaporation generally exceeds rainfall from October to March.

During the summer months the dominant wind in the mornings is from the south-east at 18-26 kms, swinging to the south-west at 37-46 kms in the afternoon. During winter, the winds are most commonly

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

18-26 kms with no dominant prevailing direction. During storms winds from the west and north-west can reach 74 kms (BoM 2020).

Rainfall intensity has been calculated using the Bureau of Meteorology (BoM) Intensity-Frequency-Duration (IFD) data system which yields the two hour 10 year average return interval storm event for the subject site as 38.3 mm/hr.

2.5 Hydrology

2.5.1 Groundwater

The subject site is located within the Cape to Cape South subarea of the *Rights in Irrigation and Water Act 1914* (RiWI Act) proclaimed Blackwood Groundwater Area.

A technical memorandum prepared by WML Consulting Engineers (WML, 2024) reviewed data from the Urban Water Management Plan (UWMP) for the Hamelin Ridge subdivision located directly to the north of the subject site. Additionally, eight bores were installed within the subject site and groundwater levels were measured on the 25th July 2024.

Based on the results from the July groundwater monitoring event and the data from the UWMP for the Hamelin Ridge subdivision, groundwater levels have been estimated to range from approximately 28 m AHD in at the northeastern boundary to approximately 25 m AHD at the southeastern boundary (refer to **Appendix B**). Further groundwater monitoring events planned for the remainder of the 2024 winter season will be used to update these contours, however data obtained from the July monitoring event is expected to represent levels close to the expected annual maximum groundwater levels (WML, 2024). Given a maximum excavation depth of 30 m AHD, at least 2 m of separation to groundwater is expected to be achieved at all times.

2.5.2 Surface Water

The subject site is located in the Turner subarea of the RiWI Act proclaimed Cape to Cape South surface water area. The subject site is not proclaimed under the *Country Areas Water Supply Act 1947* as a public drinking water source area.

There are no surface water features present within the subject site. The property has three dams, two located to the north west of the subject site and one to the south west. A buffer of greater than 200 m will be maintained from the extraction are to all onsite dams.

The current water cycle within the subject site consists of inputs from rainwater flowing downhill towards the wider drainage system located to the south and east of the subject site. The development is not proposing to alter this process, as there are no drainage lines within the proposed extraction area.

2.5.3 Wetlands

Areas of wetlands in Western Australia have been mapped and this mapping has been converted into a digital dataset that is maintained by the DBCA and is referred to as the '*Geomorphic Wetlands Augusta to Walpole'* dataset. Pursuant to this dataset, there are no mapped wetlands within the subject site. The closest wetlands to the subject site are located to the southeast and are greater than 300 m from the extraction area boundary.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

3 EXTRACTION ACTIVITIES

The agricultural lime, lime sand and limestone quarry will cover an area of approximately 14 ha, with a current maximum elevation ranging from 30 m AHD to 60 m AHD. It will be excavated to an elevation of 30 m AHD commencing in the south of the subject site and heading north. Extraction activities will be divided into seven stages, of 2.0 ha in size (refer to **Appendix A**).

It is estimated that the total maximum volume of material to be removed will be approximately 1,314,489 m^3. Over a ten year period, a maximum of approximately 131,449 m^3 will be excavated each year, depending on supply and demand.

Earthen bunds for noise mitigation will be constructed with topsoil and overburden that will be stripped from the extraction footprint and other areas within the premise boundary. Construction of the bunds will be undertaken with an excavator and loader.

The planned end use of the quarry is to restore a natural soil profile and return the extraction area to pasture, ensuring that there is no net loss of agricultural land.

3.1 Operational Works

Using a loader, the topsoil (where available) will be stripped and placed in stockpiles. Overburden, if present, will be removed using a dump truck and stockpiled to a convenient location within each extraction stage for operations. Topsoil stockpiles will be less than 2 m high with a batter no greater than 1:3.

In order to comply with noise regulations, surface works with the dozer must commence from the western most point and clear a sufficient area on the western side of Stage 1 to reach the material. Once a sufficient depth (5-6m) is achieved within Stage 1, progression of the pit through to Stage 2 can continue with the use of the dozer (Herring Storer Acoustics, 2024).

The material will be excavated by an excavator, bulldozer or loader to a stockpile or loaded directly to waiting trucks for transport. A summary of the proposed extraction activities is provided below:

- Prior to excavation commencing the site will be ground surveyed, the excavation footprint marked out and a 1 m contour plan developed.
- The topsoil/overburden will be stripped and used to construct earthen bunds using a loader.
- An excavator or front-end loader will be used to dig the sand and transport it to a stockpile.
- The sand will then be picked up by a loader and loaded to trucks for transport.
- All static and other equipment, will be located on the floor of the quarry to provide visual and acoustic screening.
- Excavation will commence in the south of the quarry initially moving north before returning to the east to complete extraction works. The face and walls of the pit will act as noise barriers.
- Crushing and screening of material may be required. Where crushing and screening is required noise bunds will be constructed to ensure compliance with the noise regulations.
- Upon completion of each section of quarry, the section will be reformed and back filled using a combination of equipment such as a tracked bobcat, excavator and front end loader, where subgrade material is available, to achieve the proposed final contours.
- At the end of excavation, the noise bunds will be removed, and the floor of the quarry will be deep ripped, covered by overburden and topsoil, and rehabilitated to a constructed soil.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

3.1.1 Final Contours

The final surface contours of the quarry will be approximately 30 m AHD which is consistent with the adjoining land.

Slopes of the batters at the end of excavation will be retained at 1:4 vertical to horizontal (refer to **Appendix E**).

3.1.2 Rehabilitation

During operations, quarrying and rehabilitation of the extraction area will be undertaken progressively. Following quarrying of each cell, rehabilitation will be undertaken.

Upon completion of each cell, the following broad completion criteria will be achieved:

- A self-sustaining cover of pasture;
- Weed levels that are not likely to impact on the viability of the reconstructed soils; and
- A safe and stable landform suitable for the proposed future land use which will be productive, grazing pasturelands.

Rehabilitation is discussed in further detail in the *Rehabilitation Management Plan* prepared by Accendo Australia (2024).

3.2 Proposed Operating Times

Typical operating hours for quarries will be adopted for the subject site which involves 7am to 5pm each Monday to Friday and Saturdays 7am to 1pm, excluding public holidays. The subject site will be worked by 2 - 3 persons, depending on market demand.

3.3 Equipment

All operational equipment will work on the quarry floor to provide maximum sound and visual screening. All equipment and infrastructure will be fully portable to facilitate movement throughout the site required for staged quarrying operations. The site will be secured by locked gates when it is not being actively worked. The boundary fencing will be maintained to prevent inadvertent and unauthorised entry.

Equipment and facilities that may be used onsite are provided in the Table below.

Table 2. Equipment.

Equipment	Description
Site office and/or containers	May be required for the management and security of small items.
Toilet	A portable toilet may be required on site.
Water tanker	Used for dust suppression on the access roads and working floors when required.
Bulldozer	Topsoil will be stripped using a bulldozer. Bulldozers will also be used for the movement of material and loading trucks.
Front End Loader	Loaders will be used for the movement of material and loading road trucks.
Track Loader	Track loaders will be used for the movement of material, loading road trucks and in rehabilitation.
Excavator	An excavator may be used for the removal of material.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Equipment	Description
Mobile crushing and screening plant	Mobile crushing and screening plant (licensed by DWER) will be utilised for the processing of material. Mobile screening and crushing plants are to be used for the preparation of various grades of lime sand and limestone.
Fuel storage	No fuel will be stored onsite.
Light vehicles	Access to and around the site.
Tip truck	Removal of lime sand and limestone from site.

3.3.1 Water Usage

Water is only required for dust suppression within the quarry and the access road. Water will be sourced either onsite or nearby. Should an onsite source be required, a DWER licence will be obtained for the extraction of water.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

4 POTENTIAL IMPACTS AND MANAGEMENT

The Section provides and overview of the potential impacts to water resources associated with the proposed land use, and the proposed management measures to address the identified impacts.

4.1 Surface Water

The area has no surface drainage because of the permeable and porous nature of the sand. There is no surface drainage from the excavation site. All excess water infiltrates the permeable sand. The development is not proposing to alter this process, as there are no drainage lines within the proposed extraction area and surface will continue to be free draining to the water table.

No surface water features have been identified within the extraction site with the closest wetland located at a distance greater than 300 m to the southeast of the subject site. Therefore, the development is unlikely to impact on surface flows.

Any surface water falling outside of the pit will be diverted around the pit by the perimeter bunds to the drainage system. Surface water retained within the excavated areas will either evaporate or infiltrate through the pit ensuring water quality to the drainage system is maintained.

The operation of the crushing and screening plant will be a dry operation.

4.2 Drainage

The DWER recommendation is that surface water runoff produced within the excavation area from the two hour, 1 in 10 (10%) annual exceedance probability storm event should be contained within the pit (DoW 2019). Rainfall intensity has been calculated using the Bureau of Meteorology (BoM) Intensity-Frequency-Duration (IFD) data system (BoM 2022), which yields the two hour 1 in 10 (10%) annual exceedance probability storm event for the site as 38 mm. Since the size of the open area will not exceed 2.0 ha at any time, it is calculated that a holding volume of 840 m^3 is required. To achieve a holding volume of 840 m^3, an area of approximately 42 m by 20 m by 1 m deep is required. This will easily be achieved within each of the 2 ha stages.

During excavation activities, the surface will be internally drained, with the gradients in the cells being constructed to ensure that no surface water runoff occurs.

A risk assessment relating to surface water and stormwater runoff in consideration of the proposed management measures is provided below. The residual risk associated with sedimentation and erosion from stormwater runoff during the operation of the extractive industry is considered low.

Table 2. Risk assessment associated with surface water and stormwater.

Hazard	Source of Hazard	Potential Impacts	Mitigation	Likelihood	Consequence	Residual Risk
Erosion and sedimentation	Uncontrolled and contaminated stormwater runoff	Erosion and sedimentation resulting in poor surface water quality in the	Contain any potentially sediment laden surface water within the pit. Cells constructed with a gradient to ensure that stormwater is contained	1	2	Low

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Hazard	Source of Hazard	Potential Impacts	Mitigation	Likelihood	Consequence	Residual Risk
		nearby drainage system.	within the excavation footprint.			

4.3 Groundwater

Groundwater will not be extracted or dewatered during the operation of the quarry and therefore, no impacts to groundwater levels are proposed.

Maximum excavation levels are estimated to be between 0.5 m to 30 m below ground level at the highest point so a minimum estimated separation of 2 m from the maximum groundwater level will be maintained at all times. The final contours of the quarry will provide a level surface of approximately 30 m AHD.

The extraction and processing of lime sand and limestone is a chemically free operation with the liquids used being lubricants for machinery and fuel. There will be no storage of chemicals or fuel on the subject site.

Table 3. Risk assessment associated with groundwater.

Hazard	Source of Hazard	Potential Impacts	Mitigation	Likelihood	Consequence	Residual Risk
Contamination of groundwater	Machinery	Contamination of groundwater impacting localised water table	Maintenance of approximately 2 m separation to groundwater at all times.	1	2	Low

4.4 Hydrocarbons and Dangerous Goods Management

Hydrocarbons are the only dangerous goods that will be utilised within the proposed subject site for the operation of machinery. However, storage of hydrocarbons on the subject site will not occur.

Servicing of machinery and equipment will not occur onsite further reducing the possibility of contamination.

There is the minor possibility for soil and water contamination as a result of incidental hydrocarbon leakages or spills during the operation of machinery. In such instances the management measures specified below will be implemented.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Table 4. Hydrocarbon and dangerous goods management measures.

Timing	Management Measure
During quarry operations	Mobile refuelling of equipment and vehicles will be undertaken off site at the nearby MGM Bulk depot.
	Spill kits containing appropriate equipment for control, containment and cleanup of hydrocarbon and chemical spills will be available in appropriate locations onsite and maintained.
	No vehicles or machinery are to be serviced or cleaned within the subject site.

A risk assessment to determine the residual risk associated with the uncontrolled discharge of contaminants is provided below. The risk assessment indicates that with the application of suitable management measures the potential risk associated with uncontrolled discharges is 'Low'.

Table 5. Risk assessment associated with the uncontrolled discharge of contaminants.

Hazard	Source of Hazard	Potential Impacts	Mitigation	Likelihood	Consequence	Residual Risk
Uncontrolled discharge of contaminants to land	Machinery	Contamination of soils and/or water	Refer to Management Measures provided in **Table 4**.	1	2	Low

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

REFERENCES

Barnesby, B.A. and Proulx-Nixon, M.E. (2000). *Land resources from Harvey to Capel on the Swan Coastal Plain, Western Australia - Sheets 1 and 2.* Land Resources Maps No. 23/1 and 23/2. Agriculture Western Australia.

Churchward, H.M. and McArthur, W.M. (1978). Landforms and soils of the Darling System, Western Australia. In *'Atlas of Natural Resources, Darling System, Western Australia'*. Department of Conservation and Environment, Western Australia.

Davidson, W. A. (1995). *Hydrogeology and groundwater resources of the Perth Region, WA*. Geological Survey of Western Australia. Bulletin 142. 257 pp.

Deeney, A. (1989) *Geology and Groundwater Resources of the superficial formations between Pinjarra and Bunbury, Perth Basin.*

Department of Parks and Wildlife (DBCA) (2004). *Geomorphic Wetlands of the Swan Coastal Plain dataset*.

Department of Water (DoW) (2014). *South West Region Guideline, Water resource considerations for extractive industries.* DoW, Perth WA.

Environmental Protection Authority (EPA) (2006). *Guidance Statement No.10 for the Assessment of Environmental Factors (in accordance with the EP Act 1986: Levels of Assessment for Proposals Affecting Natural Areas Within the System 6 Region and Swan Coastal Plain Portion of the System 1 Region.*

Environmental Protection Authority (EPA) (2009). *South West Regional Ecological Linkages.* Bulletin No 8. Retrieved from: http://epa.wa.gov.au/EPADocLib/3040_SWREL_EPB821009.pdf

Geological Survey of Western Australia (1978). *Geology and mineral resources of Western Australia, memoir 3*. Geological Survey of Western Australia, Perth, WA.

Heddle, E.M., Loneragan, O.W. and Havel, J.J. (1980). *Darling Systems – Vegetation Complexes, In: Atlas of Natural Resources Darling System*, Western Australia, Department of Conservation and Environment, Perth.

Semeniuk, C. A. & Semeniuk, V. (1995). *A geomorphic approach to global classification for inland wetlands*. Vegetation, 118, 103-124.

Thackway, R, and Cresswell, ID, (Eds) (1995). *An Interim Biogeographic Regionalisation for Australia: a framework for establishing the national system of reserves*, Version 4.0. Australian Nature Conservation Agency, Canberra.

Tille, P (2006). Soil-Landscape Zones of the WA Rangelands and Interior.

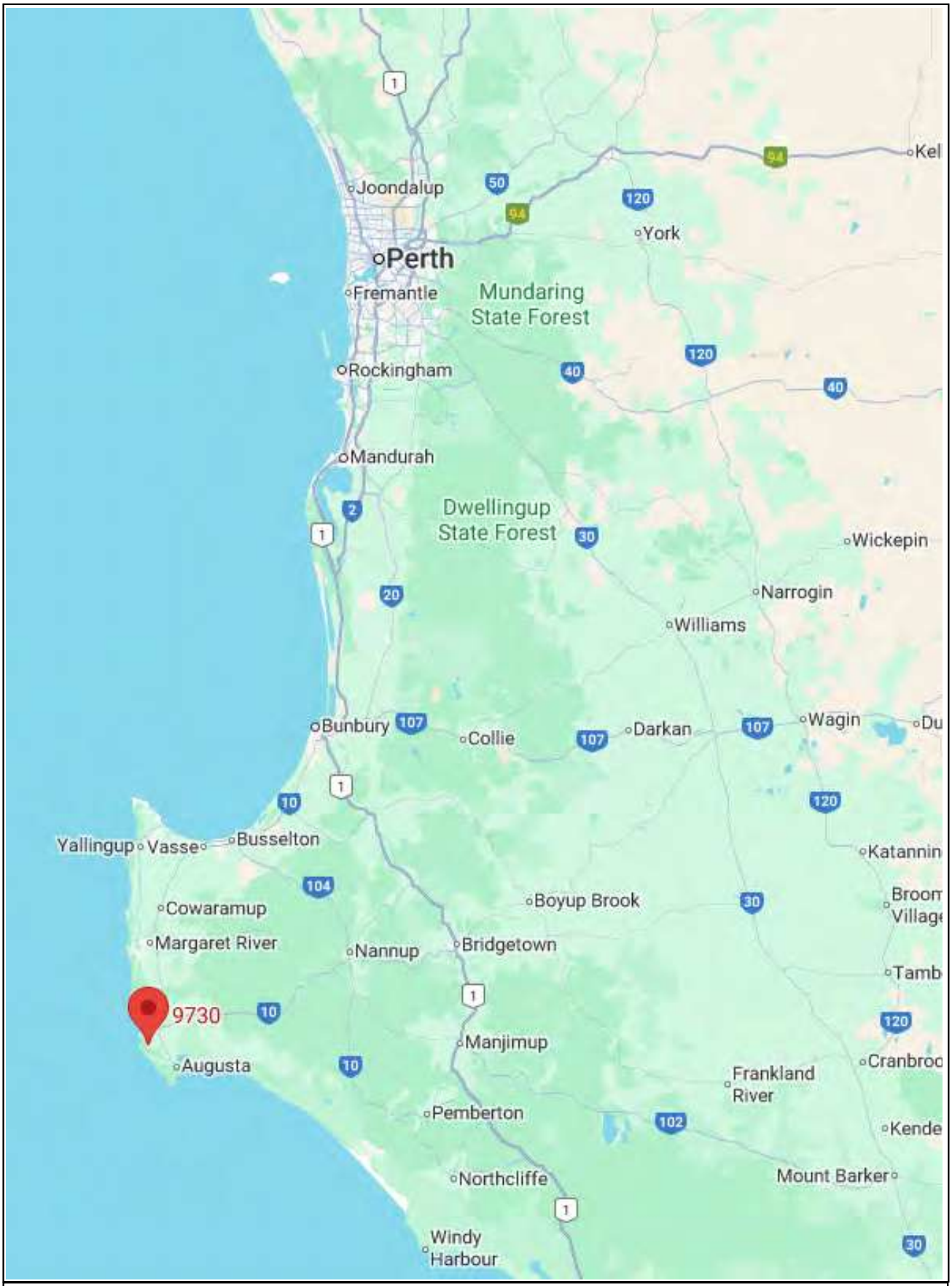
Tille, P J, Mathwin, T W, and George, R J (2001). *South west hydrological information package : understanding and managing hydrological issues on agricultural land in the south west of Western Australia.* Department of Primary Industries and Regional Development, Western Australia, Perth. Bulletin 4488.

Western Australian Planning Commission (WAPC) (2007). *Planning Bulletin No. 64: Acid Sulfate Soils*, Western Australian Planning Commission, Western Australia.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

FIGURES

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



PROJECT	Lot 22 Caves Road, Hamelin Bay	Project Number	Drawing Number	Revision
		2449	Figure 1	A
DRAWING TITLE	Figure 1 - Regional location of the subject site	Designed PN	Checked	
		Drawn PN	Approved	
CLIENT	McDougall Quarries Pty Ltd	Date	20/8/2024	
		Local Authority	City of Busselton	
		Sheet 1 of 1		

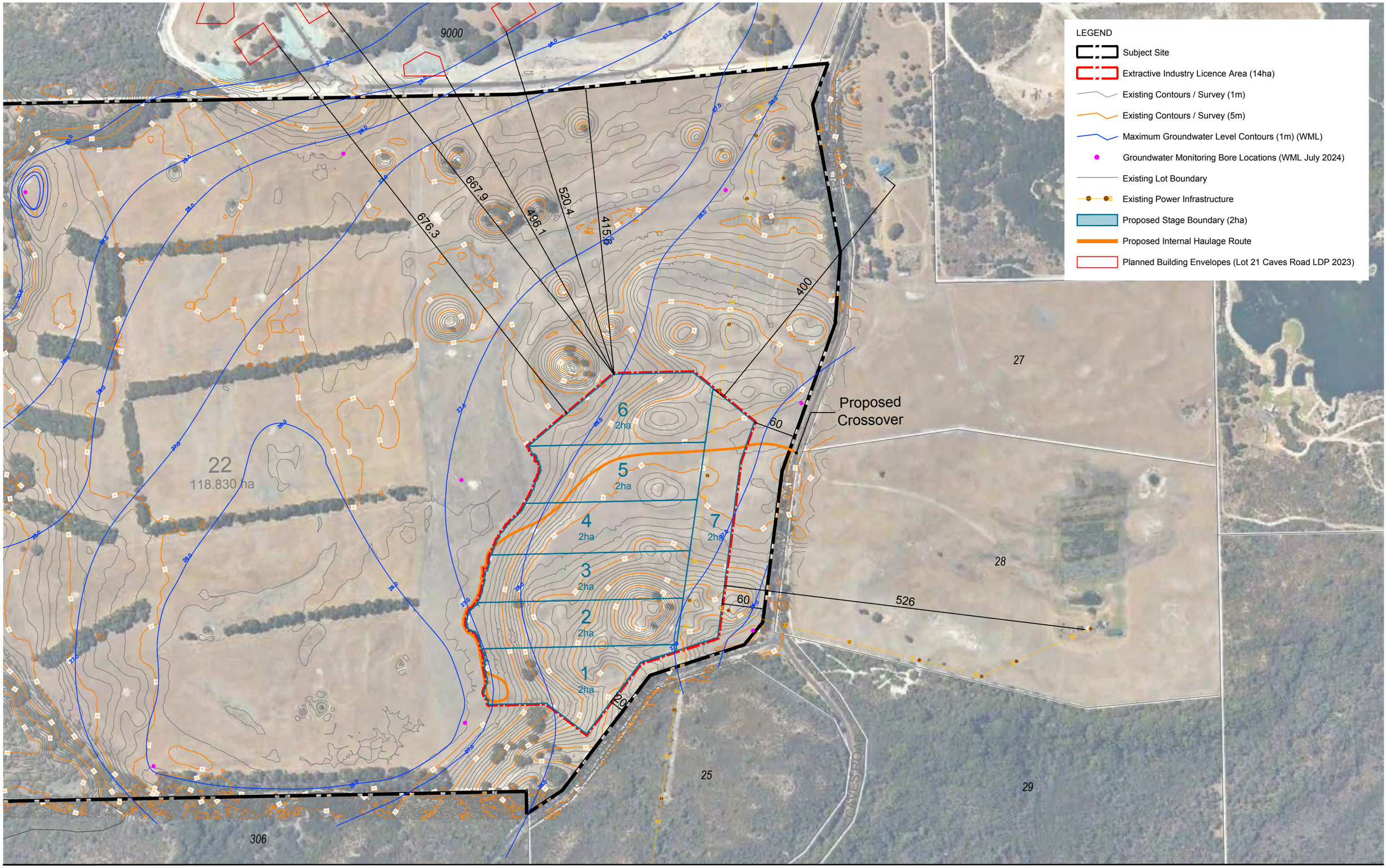
This drawing has been prepared by, and remains the property of Accendo Australia Pty Ltd. This drawing shall not be used without permission. The drawing shall be preliminary only and/or not for construciton until signed approved.

PO Box 5178
West Busselton
Western Australia 6280
Mobile 0418 950 852

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX A – EXCAVATION WORKS PLAN

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Excavation Works Plan

Lot 22 (9730) Caves Road, Hamelin Bay

Date: 26 Aug 2024 Scale: 1:5000 @ A3 1:2500 @ A1 File: **24-132 EX01B** Staff: DL CCG JJ Checked: DL

0 100m

element.

Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
PO Box 7375 Cloisters Square, Perth Western Australia 6850.
T. +61 8 9289 8300 | **E.** hello@elementwa.com.au **elementwa.com.au**

© Element Advisory WA Pty Ltd

This concept has been prepared for the purpose of meeting client specifications. The drawing does not constitute an invitation,agreement or contract (or any part thereof) of any kind whatsoever. Although care has been taken in the compilation of this drawing by Element Advisory WA Pty Ltd, all parties associated with the proposed property development disclaim all responsibility for any errors or omissions. The right is reserved to change the plan at any time. Liability is expressly disclaimed by Element Advisory WA Pty Ltd for any loss or damage which may be sustained by any person acting on any visual impression gained from this drawing.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX B – GROUNDWATER TECHNICAL MEMORANDUM

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

TECHNICAL MEMORANDUM

Our Ref: 11878-G-TM-001-0

31 July 2024

McDougall Quarries Pty Ltd
44 Forrest Beach Road,
Wonnerup, WA 6280

Attention: Kyle Jackson

LOT 22 CAVES ROAD, HAMELIN BAY – GROUNDWATER LEVELS ASSESSMENT

WML Consultants (WML) was engaged by McDougall Quarries Pty Ltd (the Client) to carry out a groundwater monitoring programme at Lot 22 Caves Road, Hamelin Bay (the site), for the proposed material extractive development. The study will inform on the groundwater levels across the site measured between July and November 2024.

This technical memorandum letter presents the results of the preliminary groundwater levels study for the proposed development, based on currently available information.

At the time of the preparation of this letter, the following groundwater information was reviewed:

- Urban Water Management Plan (UWMP) for Lot 21 Caves Road, Hamelin Bay (Hamelin Ridge subdivision directly north of the site), prepared by Oversby Consulting in December 2021 (Ref. B21031 V1);
- Groundwater monitoring event data for Lot 22 Caves Road, Hamelin Bay (subject site), collected on 25th July 2024 (the first out of five scheduled monitoring events that WML is currently undertaking).

Based on the information included in the UWMP, five groundwater monitoring wells were installed at Lot 22 Caves Road and groundwater levels were measured in August and September 2016. Level Surveys Pty Ltd completed a survey of the old monitoring wells on 22 July 2024. Three out of five monitoring wells (bore No 2, 3 and 4) no longer existed on site; therefore, no accurate measurements could be undertaken. It is believed those wells were removed during the construction of the subdivision (roads and minor earthworks). The approximate ground surface levels were recorded in the likely proximity of the former monitoring wells. The remaining two wells (bore No 1 and 5) were picked up to 8 cm accuracy (horizontal and vertical). Summary of the peak groundwater levels observed in winter 2016 (August 2016) are summarised in Table 1 below.

Table 1: Summary of groundwater monitoring data – Lot 21 Caves Road, Hamelin Bay

Location ID	Coordinates (MGA94 Zone 50)		Elevation (TOC) RL (m)	Upstand (m)	Termination Depth form TOC (m)	Depth to GW (mBGL)	GW levels (m AHD)
	Easting	Northing					
1	321094.91	6209765.243	32.299	0.52	4.00	2.25	29.529
2	320586.241	6209790.014	34.023[1)]	0.50	3.98	DRY	DRY
3	320664.972	6210060.981	48.266[1)]	0.57	3.88	DRY	DRY
4	321012.657	6209966.238	31.568[1)]	0.47	3.67	1.41	30.158
5	321279.968	6210062.191	31.155	0.49	3.60	1.18	29.485

Notes: All depths are relative to the existing ground surface
TOC – Top of Casing
[1)] Monitoring well destroyed; RL level represents ground level in the approximate area.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

WML engaged EDrill Pty Ltd to install groundwater monitoring wells at Lot 22 Caves Road, Hamelin Bay. The works were completed between the 23rd and 24th of July 2024 and comprised the installation of 8 monitoring wells to depths between 3.7 m and 22.0 m below the existing ground level. Summary of the first groundwater monitoring event completed on 25th July 2024 by WML is provided in Table 2 below.

Table 2: Summary of groundwater monitoring data – Lot 22 Caves Road, Hamelin Bay

Location ID	Coordinates (MGA94 Zone 50)		Elevation (TOC) RL (m)	Upstand (m)	Termination Depth (m)	Depth to GW (mBGL)	GW levels (m AHD)
	Easting	Northing					
MW1	320717.901	6209455.786	31.798	0.575	5.1	3.575	27.648
MW2	320257.634	6209400.089	30.557	0.595	3.7	3.485	26.477
MW3	320443.070	6208568.909	29.827	0.570	5.2	3.3	25.957
MW4	320894.124	6208631.739	29.684	0.630	5.1	2.96	26.094
MW5	320889.088	6208983.295	29.964	0.580	4.4	2.17	27.214
MW6	321311.086	6208765.454	45.301	0.545	22.0	19.435	25.321
MW7	321381.067	6209094.519	39.403	0.550	14.3	12.01	26.843
MW8	321271.648	6209402.900	31.281	0.575	5.2	2.575	28.131

Notes: All depths are relative to the existing ground surface
TOC – Top of Casing

Based on the timing of the first groundwater monitoring event (end of July), the above data is considered to represent the levels close to the expected average annual maximum groundwater levels (typically observed towards the end of August), depending on the recorded rainfall.

Based on the results of the historical groundwater monitoring programme at the Hamelin Ridge development site and the first groundwater monitoring event completed on the 25th of July 2024 for the proposed site (Lot 22 Caves Road), it can be observed that the groundwater levels range from about RL 28 m AHD at the northeastern boundary of the site to about RL 25 m AHD at the southeastern boundary of the site. The approximate groundwater contours showing indicative groundwater levels are included in WML drawings No 11878-SK-101 and 11878-SK-102 attached to this report.

We consider the above groundwater levels to be consistent with the topography of the site, with groundwater mounding towards the higher elevated areas and draining towards the existing creek systems south and east of the site.

Yours faithfully,

Aleksandra Gorczynska
Senior Geotechnical Engineer
Author

Raphael Hyde
Senior Geotechnical Engineer
Reviewer

For and on behalf of WML Consultants Pty Ltd

Attachments:

Report Limitations

Drawings

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

REPORT LIMITATIONS

WML Consulting Engineers

This geotechnical report is provided for the sole use by the Client. This report must not be applied for any other purpose or project except the one originally contemplated without written authorisation from WML. WML accepts no responsibility for the use of this report / document, in whole or in part, in other contexts or for any other purpose.

WML have undertaken investigations, performed consulting services, and prepared this report based on the Client's specific requirements, documents and information supplied, and previous experience. If changes occur in the nature or design of the project, however minor, it is recommended WML review this report to assess their impacts and provide additional recommendations, if any. WML does not assume any responsibility or liability for problems that arise due to developments on site of which we were not informed.

This report utilises data and information provided by third parties, including, but not limited to sub-consultants, published data, and the Client. This information has been assumed to be correct unless otherwise stated. WML assumes no responsibility for assessments made partly or entirely based on information provided by third parties or for the adequacy, incompleteness, inaccuracies, or reliability of any data provided by third parties.

It is the responsibility of the Client to transmit the information, recommendations, and limitations of this report to the appropriate organisations or people involved in design of the project, including, but not limited to developers, builders, owners, buyers, architects, engineers, and designers.

WML's opinions are based on upon information that existed at the time of the production of this report and ground conditions encountered at the time the site study was performed. This geotechnical report should not be relied upon if its adequacy has been affected by: the passage of time, by man-made events, such as construction on or adjacent to the site, or by natural events, such as floods, earthquakes, or groundwater fluctuations. In the event of the above changes, WML should be contacted to determine if this report is still reliable or whether additional testing is required.

The subsurface conditions identified within this report are based only upon investigation locations where subsurface tests have been conducted and / or samples obtained, which are explicitly representative of the specific sample or test location. Interpretation of conditions between such points cannot be assumed to represent actual subsurface information and unknowns or variations in ground conditions between test locations that cannot be inferred or predicted. Actual subsurface conditions may differ significantly from those indicated in this report. Specific warning is also given that many factors, either natural or artificial, may render ground conditions different from those which pertained at the time of the investigation. WML does not accept any responsibility for any variance in the ground conditions that may exist across the site. If unexpected subsurface conditions are encountered, WML shall be notified immediately to review those conditions and provide additional and/or modified recommendations, as necessary.

This geotechnical assessment is based upon judgment of the investigation data, visual observations of the site and materials encountered, along with the proposed land use and project specifications. The findings and recommendations presented within this report represent professional opinions and estimates and should not be taken as fact unless explicitally stated. In general, statements of fact are are limited to what was done and / or what was observed on site.

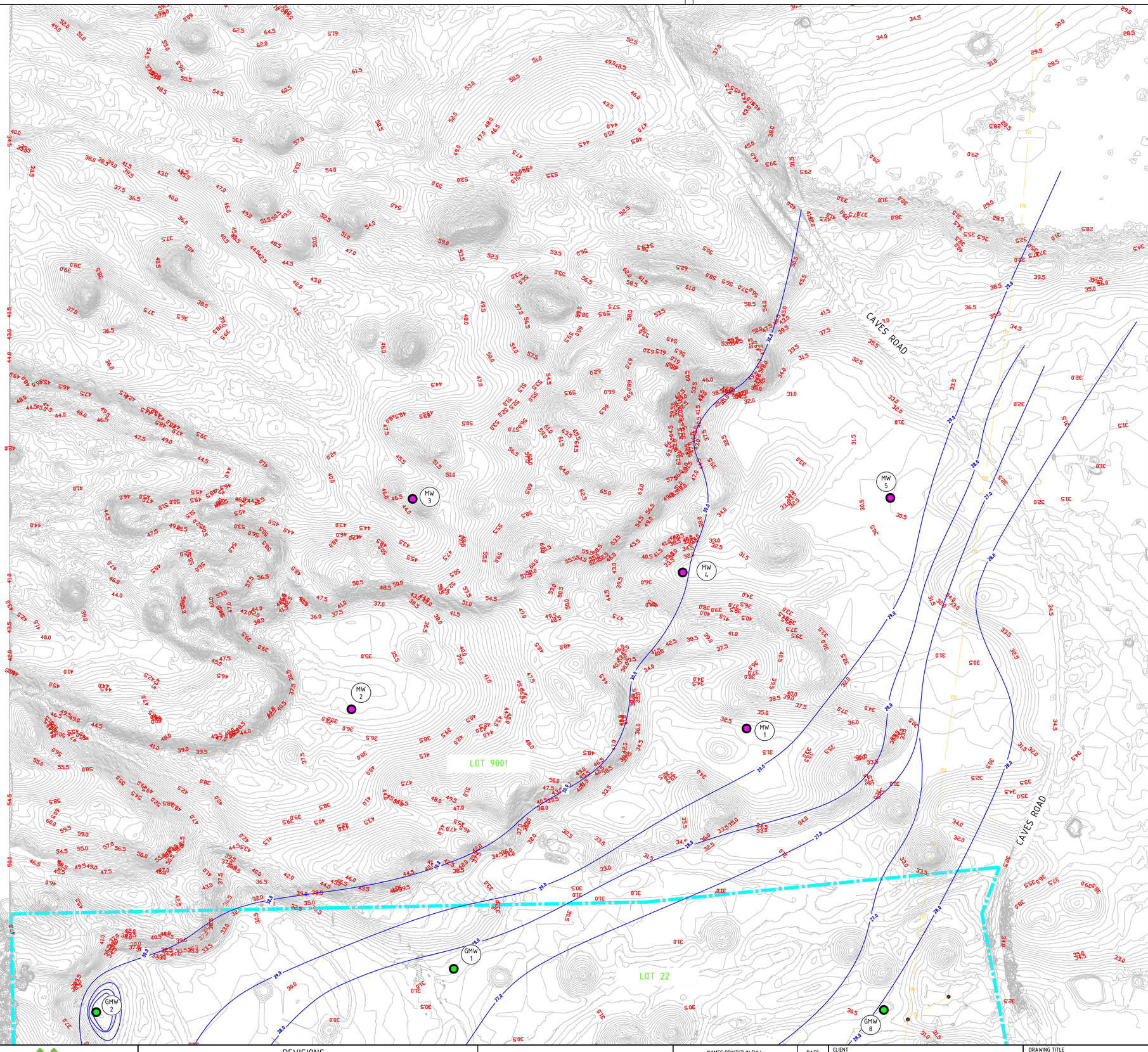
The recommendations provided in this report are preliminary only; final recommendations can only be given after observing the actual subsurface conditions revealed during construction. WML does not assume responsibility or liability for the recommendations in this report if construction observation has not been performed by a WML geotechnical engineer.

Our services did not include any contamination or environmental assessment of the site or adjacent sites. The equipment and techniques used to perform a geoenvironmental study differ from those used to perform a geotechnical investigation. If you require any geoenvironmental information for your project, WML can advise on further steps to be undertaken.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

REPORT LIMITATIONS

WML have performed our professional services in accordance with generally accepted geotechnical engineering principles and practices currently employed in the area; no warranty, expressed or implied, is made as to the professional advice included in this report.



LEGEND

- EXISTING NATURAL SURFACE CONTOUR (0.5m INTERVALS)
- LOT 9001 — LOT NUMBERS
- EXISTING POWER LINE
- LOT 22 BOUNDARY
- 27.0 — INDICATIVE GROUNDWATER CONTOUR (1.0m INTERVALS)
- GROUNDWATER MONITORING WELL (AUGUST 2016)
- GROUNDWATER MONITORING WELL (JULY 2024)
- MW 17 — TYPE MONITOR WELL NUMBER

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

SCALE 1:2500

INFORMATION ONLY

A1

WML Consulting Engineers
Civil | Geotechnical | Structural
BUNBURY +61 8 9722 3544
KALGOORLIE +61 8 9021 1811
PERTH +61 8 9722 3566
wml.com.au

REVISIONS					
A	ISSUED FOR REVIEW	L. RUSCONI	07/24	BC	
N°.	DESCRIPTION	APPROVED	DATE	DRAWN	

NOTE: ✻INDICATES SIGNATURES ON ORIGINAL ISSUE OF DRAWING OR LAST REVISION OF DRAWING

NAMES PRINTED IN FULL		DATE
DESIGNED	B.CHEN	07/24
DRAWN	B.CHEN	07/24
VERIFIED	L. RUSCONI	07/24
APPROVED		

CLIENT: ELEMENT ADVISORY

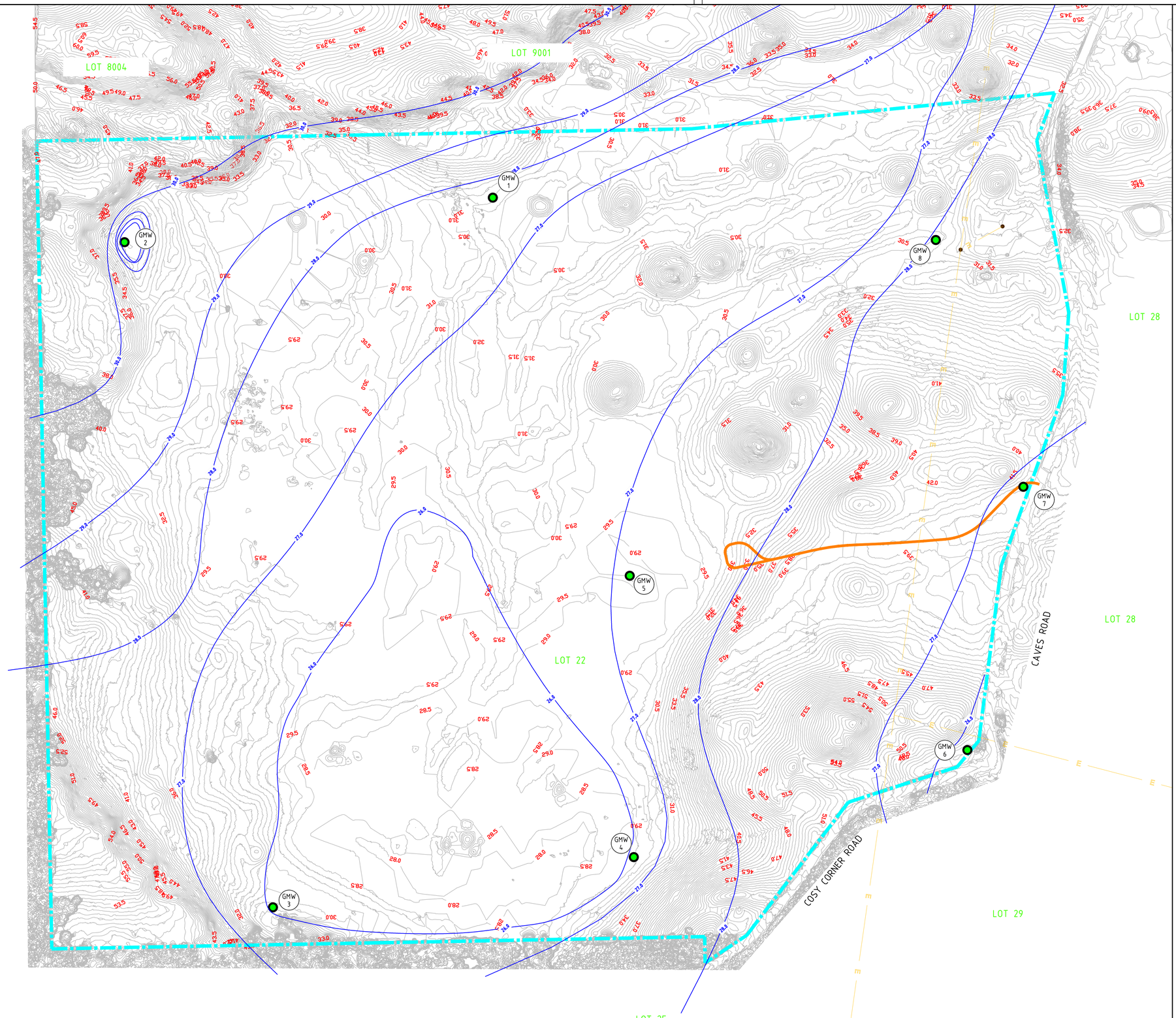
PROJECT: LOT 22 CAVES ROAD HAMELIN BAY

DRAWING TITLE: LOT 21 CAVES ROAD, HAMELIN BAY
GROUNDWATER MONITORING WELLS

THIS DRAWING SHALL BE TREATED AS PRELIMINARY AND IS NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS SIGNED AS APPROVED.

DRAWING NUMBER: 11878-SK-101

REVISION: A



RECEIVED
By Shire of Ravensthorpe at 13 December 2024

LEGEND

- EXISTING NATURAL SURFACE CONTOUR (0.5m INTERVALS)
- LOT 1624 — LOT NUMBERS
- EXISTING POWER LINE
- EXISTING ACCESS ROAD
- LOT 22 BOUNDARY
- 27.0 — INDICATIVE GROUNDWATER CONTOUR (1.0m INTERVALS)
- GROUNDWATER MONITORING WELL (AUGUST 2016)
- GROUNDWATER MONITORING WELL (JULY 2024)
- MW 17 — TYPE / MONITOR WELL NUMBER

SCALE 1:2500 — A1

INFORMATION ONLY

WML Consulting Engineers
Civil | Geotechnical | Structural
BUNBURY +61 8 9722 3544
KALGOORLIE +61 8 9021 1811
PERTH +61 8 9722 3566
wml.com.au

REVISIONS					
N°	DESCRIPTION	APPROVED	DATE	DRAWN	
A	ISSUED FOR REVIEW	L. RUSCONI	07/24	BC	

NOTE: *INDICATES SIGNATURES ON ORIGINAL ISSUE OF DRAWING OR LAST REVISION OF DRAWING

NAMES PRINTED IN FULL		DATE
DESIGNED	B.CHEN	07/24
DRAWN	B.CHEN	07/24
VERIFIED	L. RUSCONI	07/24
APPROVED		

CLIENT: ELEMENT ADVISORY

PROJECT: LOT 22 CAVES ROAD HAMELIN BAY

DRAWING TITLE: LOT 22 CAVES ROAD, HAMELIN BAY GROUNDWATER MONITORING WELLS

THIS DRAWING SHALL BE TREATED AS PRELIMINARY AND IS NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS SIGNED AS APPROVED.

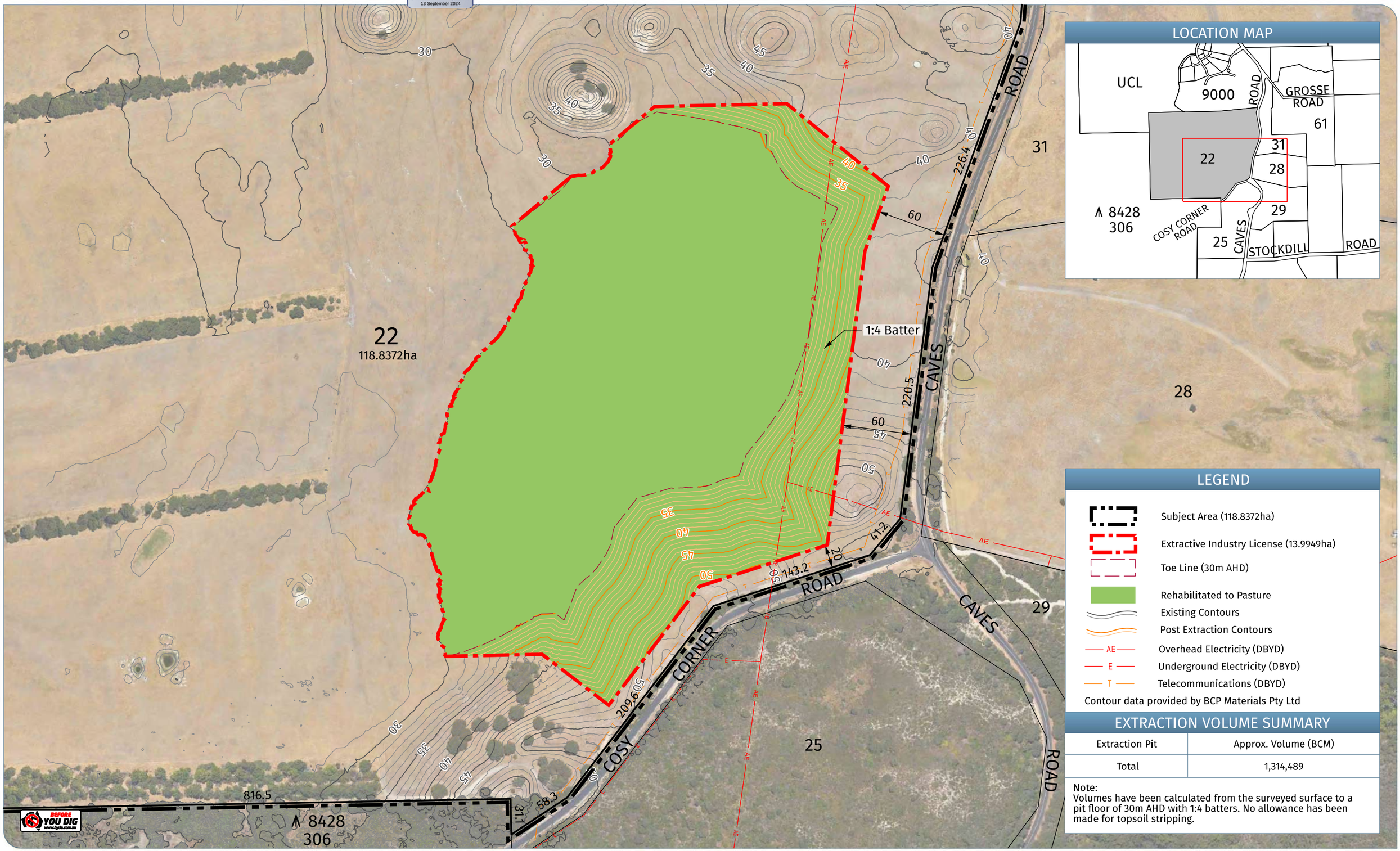
DRAWING NUMBER: 11878-SK-102

REVISION: A

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX C – POST EXTRACTION PLAN

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



LOCATION MAP

LEGEND

- Subject Area (118.8372ha)
- Extractive Industry License (13.9949ha)
- Toe Line (30m AHD)
- Rehabilitated to Pasture
- Existing Contours
- Post Extraction Contours
- AE — Overhead Electricity (DBYD)
- E — Underground Electricity (DBYD)
- T — Telecommunications (DBYD)

Contour data provided by BCP Materials Pty Ltd

EXTRACTION VOLUME SUMMARY

Extraction Pit	Approx. Volume (BCM)
Total	1,314,489

Note:
Volumes have been calculated from the surveyed surface to a pit floor of 30m AHD with 1:4 batters. No allowance has been made for topsoil stripping.

POST EXTRACTION PLAN

Lot 22 (No. 9730) Caves Road, HAMELIN BAY

Plan No.	24210-01	
Date	27/06/24	
Drawn	JW	
Checked	DJ	
Revision	C	
Scale	1:3000@A3	0 40m 80m

BUNBURY OFFICE:
21 Spencer Street,
BUNBURY WA 6230
T: 08 9792 6000
E: bunbury@harleydykstra.com.au
W: www.harleydykstra.com.au
ALBANY | BUNBURY | BUSSELTON | FORRESTDALE | PERTH

COPYRIGHT:
This document is and shall remain the property of HARLEY DYKSTRA.
The document may only be used for the purpose for which it was commissioned and in accordance with the terms of engagement for the commission.
Unauthorised use of this document in any form whatsoever is prohibited

NOTE: This plan has been prepared for planning purposes. Areas, Contours and Dimensions shown are subject to survey

Harley Dykstra
PLANNING & SURVEY SOLUTIONS

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX H – NOISE MANAGEMENT PLAN

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

accendo AUSTRALIA

NOISE MANAGEMENT PLAN

LOT 22 (9730) CAVES ROAD, HAMELIN BAY

August 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Telephone +61 418 950 852

info@accendoaustralia.com.au
PO Box 5178 West Busselton WA 6280
ABN 11 160 028 642

www.accendoaustralia.com.au

Document Control

Version	Date	Author	Reviewer
V1	20/08/2024	PN	KMT/Element
V2	30/08/2024	PN	KMT
Filename	2449_Lot 22 Caves Rd NMP_v2		

Limitations

This report has been prepared by Accendo Australia Pty Ltd in accordance with the scope limitations provided in this report, or as otherwise agreed, between the Client and Accendo.

This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

This report has been prepared based upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report, which Accendo has not independently verified or checked beyond the agreed scope of work. Accendo does not accept liability in connection with such unverified information.

The conclusions and recommendations in this report are based on assumptions made by Accendo described in this report where and as they are required. Accendo disclaims liability arising from any of the assumptions being incorrect.

The report is based on site specific conditions encountered and information received at the time of preparation of this report or the time that site investigations were undertaken. Accendo disclaims responsibility for any changes that may have occurred after this time.

The preparation of this report has been undertaken and performed in a professional manner, in consideration of the scope of services and in accordance with environmental consulting practices. No other warranty is made.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

CONTENTS

1 INTRODUCTION 4
1.1 BACKGROUND 4
1.2 PURPOSE AND SCOPE 4
2 EXISTING ENVIRONMENT 5
2.1 LAND USE 5
2.2 TOPOGRAPHY AND SOILS 5
2.3 CLIMATE 5
3 EXTRACTION ACTIVITIES 6
3.1 OPERATIONAL WORKS 6
3.1.1 Final Contours 7
3.1.2 Rehabilitation 7
3.2 PROPOSED OPERATING TIMES 7
3.3 EQUIPMENT 7
4 NOISE IMPACTS AND MANAGEMENT 9
4.1 SENSITIVE RECEPTORS 9
4.2 NOISE GENERATING ACTIVITIES 9
4.3 NOISE MANAGEMENT MEASURES 11
REFERENCES 14
FIGURES 15
APPENDIX A – EXCAVATION WORKS PLAN 16
APPENDIX B – POST EXTRACTION PLAN 17
APPENDIX C – ACOUSTIC ASSESSMENT 18
APPENDIX D - COMPLAINTS REGISTER 19

TABLES

Table 1. Equipment 7
Table 2. Residential dwellings within 500m of the subject site 9
Table 3. Noise generating activities 10
Table 4. Management actions for noise 11

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

FIGURES

Figure 1. Regional Location of the Subject Site

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

1 INTRODUCTION

1.1 Background

McDougall Quarries Pty Ltd (the applicant) is proposing to extract lime sand and limestone from a 14 hectare (ha) area within Lot 22 (HSE 9730) Caves Road, Hamelin Bay (herein referred to as the subject site) (refer to **Figure 1** and **Appendix A**).

The available volume of sand (*insitu* volume of approximately 1,314,489 m^3) is to be extracted, commencing in the south and moving in a northerly direction before finishing in a stage along the east of the subject site (refer to **Appendix A**).

The post extraction landform will be designed with minimum batters of 1:4.

1.2 Purpose and Scope

This Noise Management Plan (NMP) has been prepared to fulfil the relevant requirements provided within the Shire of Augusta-Margaret River's (the Shire) *Local Planning Scheme No. 1* and the Shire's *Extractive Industries Policy 3.* It is intended to provide the Shire, the public and relevant government agencies with an understanding of the proposal and the environmental strategies and commitments proposed to address noise emissions associated with the proposed land use. This document has been prepared to support and should be read in conjunction with, the *Environmental Management Plan* prepared by Accendo Australia (2024) for sand and limestone extraction within the subject site.

The Plan will describe the proposed management measures necessary to ensure noise impacts on surrounding receptors will be managed in accordance with best practice and the *Environmental Protection (Noise) Regulations 1997*.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

2 EXISTING ENVIRONMENT

2.1 Land Use

The subject site is zoned 'General Agriculture' pursuant to the Shire's *Local Planning Scheme No.* 1 and has previously been used for agriculture.

The surrounding properties are zoned 'Rural Residential' to the north, 'National Park and Nature Reserve' to the west and south and a mixture of 'General Agriculture', 'Priority Agriculture' and 'Landscape Amenity' to the east pursuant to the Shire *Local Planning Scheme No. 1*.

2.2 Topography and Soils

The current topography of the subject site can be described as variable with the elevation ranging from 30 m Australian Height Datum (AHD) through the eastern portion of the subject site to approximately 40m AHD in the west. Elevated areas are located throughout the subject site and range in elevation from approximately 45 m AHD to 60 m AHD (refer to **Appendix A**).

The subject site is located within the Leeuwin Zone landform within the Gracetown Ridge systems consisting of "*lateritic plateau containing sandy gravel, loamy gravel and grey sandy duplex*" and *"a limestone ridge, in the coastal edge of the Leeuwin Zone containing yellow deep sand and red deep sand",* respectively. (Tille 2006).

The subject site is located within the following sub-systems:

- Kilcarnup rocky dunes phase – Low to steep dunes (gradients 5-10%) not exposed to prevailing wines. Dark calcareous sands containing limestone rubble.
- Kilcarnup dunes (organic) phase – Steep dunes (gradients usually in excess of 20%) not exposed to prevailing winds. Deep pale calcareous sands with brown topsoil.

2.3 Climate

The climate of the locality is classified as Mediterranean with warm to hot summers and cool wet winters.

The closest weather recording station is Cape Leeuwin (Station 9518). Temperatures are highest on average in February, at approximately 23.4°C. August has the lowest average temperature of the year of 11.3°C.

Rainfall for the area is approximately 950 mm per annum with approximately 88% of the rain falling during the winter months, April to October inclusive. Evaporation generally exceeds rainfall from October to March.

During the summer months the dominant wind in the mornings is from the south-east at 18-26 kms, swinging to the south-west at 37-46 kms in the afternoon. During winter, the winds are most commonly 18-26 kms with no dominant prevailing direction. During storms winds from the west and north-west can reach 74 kms (BoM 2020).

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

3 EXTRACTION ACTIVITIES

The lime sand and limestone quarry will cover an area of approximately 14 ha, with a current maximum elevation ranging from 30 m AHD to 60 m AHD. It will be excavated to an elevation of 30 m AHD commencing in the south of the subject site and heading north. Extraction activities will be divided into seven stages, of 2.0 ha in size (refer to **Appendix A**).

It is estimated that the total maximum volume of material to be removed will be approximately 1,314,489 m^3. Over a ten year period, a maximum of approximately 131,449 m^3 will be excavated each year, depending on supply and demand.

Earthen bunds for noise mitigation will be constructed with topsoil and overburden that will be stripped from the extraction footprint and other areas within the premise boundary. Construction of the bunds will be undertaken with an excavator and loader.

The planned end use of the quarry is to restore a natural soil profile and return the extraction area to pasture, ensuring that there is no net loss of agricultural land.

3.1 Operational Works

Using a loader, the topsoil (where available) will be stripped and placed in stockpiles. Overburden, if present, will be removed using a dump truck and stockpiled to a convenient location within each extraction stage for operations. Topsoil stockpiles will be less than 2 m high with a batter no greater than 1:3.

In order to comply with noise regulations, surface works with the dozer must commence from the western most point and clear a sufficient area on the western side of Stage 1 to reach the material. Once a sufficient depth (5-6m) is achieved within Stage 1, progression of the pit through to Stage 2 can continue with the use of the dozer (Herring Storer Acoustics, 2024).

The material will be excavated by an excavator, bulldozer or loader to a stockpile or loaded directly to waiting trucks for transport. A summary of the proposed extraction activities is provided below:

- Prior to excavation commencing the site will be ground surveyed, the excavation footprint marked out and a 1 m contour plan developed.
- The topsoil/overburden will be stripped and used to construct earthen bunds using a loader.
- An excavator or front-end loader will be used to dig the sand and transport it to a stockpile.
- The sand will then be picked up by a loader and loaded to trucks for transport.
- All static and other equipment, will be located on the floor of the quarry to provide visual and acoustic screening.
- Excavation will commence in the south of the quarry initially moving north before returning to the east to complete extraction works. The face and walls of the pit will act as noise barriers.
- Crushing and screening of material may be required. Where crushing and screening is required noise bunds will be constructed to ensure compliance with the noise regulations.
- Upon completion of each section of quarry, the section will be reformed and back filled using a combination of equipment such as a tracked bobcat, excavator and front end loader, where subgrade material is available, to achieve the proposed final contours.
- At the end of excavation, the noise bunds will be removed, and the floor of the quarry will be deep ripped, covered by overburden and topsoil, and rehabilitated to a constructed soil.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

3.1.1 Final Contours

The final surface contours of the quarry will be approximately 30 m AHD which is consistent with the adjoining land.

Slopes of the batters at the end of excavation will be retained at 1:4 vertical to horizontal (refer to **Appendix E**).

3.1.2 Rehabilitation

During operations, quarrying and rehabilitation of the extraction area will be undertaken progressively. Following quarrying of each cell, rehabilitation will be undertaken.

Upon completion of each cell, the following broad completion criteria will be achieved:

- A self-sustaining cover of pasture;
- Weed levels that are not likely to impact on the viability of the reconstructed soils; and
- A safe and stable landform suitable for the proposed future land use which will be productive, grazing pasturelands.

Rehabilitation is discussed in further detail in the *Rehabilitation Management Plan* prepared by Accendo Australia (2024).

3.2 Proposed Operating Times

Typical operating hours for quarries will be adopted for the subject site which involves 7am to 5pm each Monday to Friday and Saturdays 7am to 1pm, excluding public holidays. The subject site will be worked by 2 - 3 persons, depending on market demand.

3.3 Equipment

All operational equipment will work on the quarry floor to provide maximum sound and visual screening. All equipment and infrastructure will be fully portable to facilitate movement throughout the site required for staged quarrying operations. The site will be secured by locked gates when it is not being actively worked. The boundary fencing will be maintained to prevent inadvertent and unauthorised entry.

Equipment and facilities that may be used onsite are provided in the Table below.

Table 2. Equipment.

Equipment	Description
Site office and/or containers	May be required for the management and security of small items.
Toilet	A portable toilet may be required on site.
Water tanker	Used for dust suppression on the access roads and working floors when required.
Bulldozer	Topsoil will be stripped using a bulldozer. Bulldozers will also be used for the movement of material and loading trucks.
Front End Loader	Loaders will be used for the movement of material and loading road trucks.
Track Loader	Track loaders will be used for the movement of material, loading road trucks and in rehabilitation.
Excavator	An excavator may be used for the removal of material.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Equipment	Description
Mobile crushing and screening plant	Mobile crushing and screening plant (licensed by DWER) will be utilised for the processing of material. Mobile screening and crushing plants are to be used for the preparation of various grades of lime sand and limestone.
Fuel storage	No fuel will be stored onsite.
Light vehicles	Access to and around the site.
Tip truck	Removal of lime sand and limestone from site.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

4 NOISE IMPACTS AND MANAGEMENT

4.1 Sensitive Receptors

The subject site has been designed to maximise setbacks to the closest sensitive receptors. This has involved extensive analysis of the local landform, environmental characteristics, land uses and location of sensitive receptors. Consultation with all sensitive receptors has also been undertaken by the Proponent.

The Environmental Protection Authority's (EPA) *Guidance for the Assessment of Environmental Factors* (June 2005) provides generic separation distances to assist in the determination of suitable buffers where industry may have the potential to affect the amenity of a sensitive land use. In particular, for extractive industries, a buffer distance of 300 m to 500 m is recommended from sensitive land uses. A conservative buffer of 500 m to sensitive receptors has been adopted for this proposal given that onsite screening and crushing is proposed.

The closest residential dwellings to the subject site are provided below and shown in **Appendix A.**

Table 2. Residential dwellings within 500 m of the subject site

Address	Distance to subject site (m)
Lot 31 (18) Grosse Road	400 m
Lot 9001 (Hamelin Ridge Estate)	>415 m
Lot 28 (9789) Caves Road	526 m

The closest residential dwelling to the subject site is located approximately 400 m to the north east of the subject site. Hamelin Ridge Estate, where most dwellings are yet to be constructed, is located to the north of the subject site, at distances greater than 415 m from the boundary. An additional residential dwelling is located to the east of the subject site at a distance greater than 500 m away.

4.2 Noise Generating Activities

The project works will involve the use of machinery and equipment that will generate noise during operation. Sources of noise from the subject site will include:

- Machinery noise from equipment use.
- Noise from safety equipment (beepers on machinery).
- Noise from trucks departing the site.

Reversing alarms can represent significant nuisance noise to sensitive receptors. There are a number of alternatives to alarms that maintain a safe work environment and also comply with occupational health and safety legislation. Reversing alarms alert pedestrians when a vehicle is moving, however, given that no pedestrians will be onsite (private property), the applicant has committed to using flashing lights or a broadband alarm system as an alternative. The sound of a broadband alarm is much less intrusive by nature than the sound of a tonal alarm and tends to be masked by the background noise at a lesser distance. This will eliminate/reduce noise emissions associated with reversing alarms.

Extraction activities will only be undertaken during standard hours of operation (in accordance with the conditions of the Extractive Industry Licence). A summary of potential noise generating activities is presented in **Table 3**.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Table 3. Noise generating activities.

Activity	Duration	Equipment to be used	Sound pressure Level (dB(A))	Comments
Topsoil stripping	3 weeks per year	CAT D9 Dozer	113	Initial impact to closest resident which will reduce as stockpiles increase.
		CAT 966 FEL or similar	105	Initial impact to closest resident which will reduce as stockpiles increase.
Screening and stockpiling of sand	6 weeks per year	CAT 966 FEL or similar	105	Noise will be muffled by stockpiles and site topography
		Sand Screen	101	Noise will be muffled by stockpiles
		CAT 330 Excavator or similar	105	Noise will be muffled by stockpiles
Crushing and stockpiling of limestone	6 weeks per year	Mobile Crusher	113	Noise will be muffled by noise bunds
		PC 330 Excavator or similar	100	Noise will be muffled by noise bunds
Loading of trucks from stockpiles	A maximum of 10 years with 15 loads per day, dependent on demand.	CAT 966 FEL or similar	105	Noise will be muffled by stockpiles, vehicles are new and well maintained.
Rehabilitation of completed stages	To be undertaken in conjunction with excavation works where applicable.	CAT 966 FEL or similar	105	Limited period of moderate noise levels, indistinguishable from excavation noise when undertaken concurrently.

Noise levels have been obtained from the *Acoustic Assessment* (Herring Storer Acoustics 2024) prepared for Lot 22 (9730) Caves Road, Hamelin Bay for the extraction of limestone and sand.

The *Acoustic Assessment* (Herring Storer Acoustics 2024) (refer to **Appendix C**) demonstrated that noise levels resulting from the extraction, crushing and screening works, and the noise from trucks entering the site, when coupled with the dozer operation (at surface level), are predicted to exceed the assigned level of 45 dB L_{A10} at the closest receptors. To address the noise exceedance, where the pit wall is less than 5 m, it is recommended to construct an earthen bund in proximity to the plant to form a barrier. Additionally, the dozer is required to operate from the western most point of any cells and clear a sufficient area on the western side of the stage to reach the material. Works must remain within the active area for the dozer (refer to Figure 2.1 of **Appendix C**) until a sufficient depth (5-6 m) is achieved. Progression of the pit through to Stage 2 can then continue with the use of the dozer.

Provided the recommended noise mitigation measures are implemented, it is concluded that compliance with the applicable assigned noise level can be achieved at all noise sensitive receptors during the specified working hours.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

4.3 Noise Management Measures

The proponent will ensure that noise emissions comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times. In addition, the management measures prescribed within **Table 4** will be implemented to reduce noise emissions as far as practicable.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Table 4. Management actions for noise.

Item	Action	Trigger/Timing	Responsibility
Inductions			
1	As part of site inductions, employees, contractors and visitors to the site are reminded of their responsibility to undertake work activities in an environmentally sensitive manner, including minimising noise while on site, or entering and leaving the site.	Ongoing	Site Manager
Planning Controls			
2	Daily Planning • The use of significant noise generating equipment or activities simultaneously is avoided. • The noisiest activities are scheduled to the least sensitive times of the day.	Where possible	Site Manager
3	Regular review of meteorological data, specifically wind speed and direction, to guide decisions on quarrying activities.	As required, with consideration to the intensity of activities onsite and the prevailing weather conditions	Site Manager
Operational Controls			
4	Equipment and Machinery • Use machinery and equipment with minimal noise output levels. • Ensure all machinery is regularly serviced as per the equipment's maintenance schedule to minimise noise generation. • Where appropriate, all machinery and equipment will be shut off when not in use. • Use flashing lights/broadband alarms instead of tonal reversing alarms on excavators/loaders. • Apply speed restrictions (20 km/hr within site) and a ban on exhaust braking. • Dozer works at surface level will commence within the western most point of the subject site and remain within the 'Dozer surface only' area as specified within Figure 2.1 of **Appendix C**.	Continuous	All employees & contractors
5	Earth bunds • Overburden and topsoil will be used to form perimeter bunds to assist with noise screening.	Prior to quarrying	Site Manager

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Item	Action	Trigger/Timing	Responsibility
Inductions			
	• Earth bunds around the plant, as specified within Figure 4.1 of **Appendix C** will be constructed to reduce noise impacts to nearby residents.		
Complaints Management			
6	Erect on-site signage directing public to make complaints to the relevant person.	Prior to quarrying	Site Manager
7	Maintain a complaints register (refer to **Appendix D**). A Complaints Register will be established for the site to record the following information: • Date, time, location and nature of the exceedance. • Identify the cause (or likely cause) of the exceedance and responsible parties. • Identify the activities that were occurring at the time of the non-compliance. • Determine the activities that were most likely contributing to the non-compliance. • Describe what action has been taken to date. • Describe the proposed measures to address the exceedance. If the complaint is verified as being due to a site source, remedial action will be undertaken within 2 hours. The Shire of Augusta Margaret River will be advised of all complaints as soon as they are received. If a compliant cannot be resolved within the 2 hour response period, it may be necessary to cease operations.	Upon receiving complaint	Site Manager

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

REFERENCES

Beard J. S. (1990). *Plant life of Western Australia*, Kangaroo Press, Perth.

Barnesby, B.A. and Proulx-Nixon, M.E. (2000). *Land resources from Harvey to Capel on the Swan Coastal Plain, Western Australia - Sheets 1 and 2.* Land Resources Maps No. 23/1 and 23/2. Agriculture Western Australia.

Churchward, H.M. and McArthur, W.M. (1978). Landforms and soils of the Darling System, Western Australia. In *'Atlas of Natural Resources, Darling System, Western Australia'*. Department of Conservation and Environment, Western Australia.

Department of Parks and Wildlife (DBCA) (2004). *Geomorphic Wetlands of the Swan Coastal Plain dataset*.

Department of Water (DoW) (2014). *South West Region Guideline, Water resource considerations for extractive industries.* DoW, Perth WA.

Environmental Protection Authority (EPA) (2006). *Guidance Statement No.10 for the Assessment of Environmental Factors (in accordance with the EP Act 1986: Levels of Assessment for Proposals Affecting Natural Areas Within the System 6 Region and Swan Coastal Plain Portion of the System 1 Region.*

Environmental Protection Authority (EPA) (2009). *South West Regional Ecological Linkages.* Bulletin No 8. Retrieved from: http://epa.wa.gov.au/EPADocLib/3040_SWREL_EPB821009.pdf

Geological Survey of Western Australia (1978). *Geology and mineral resources of Western Australia, memoir 3*. Geological Survey of Western Australia, Perth, WA.

Heddle, E.M., Loneragan, O.W. and Havel, J.J. (1980). *Darling Systems – Vegetation Complexes, In: Atlas of Natural Resources Darling System*, Western Australia, Department of Conservation and Environment, Perth.

Herring Storer Acoustics (2024). *McDougall Quarries Pty Ltd, Extractive Industry, Lot 22 (9730) Caves Road, Hamelin Bay, Acoustic Assessment.* August 2024.

Molly, S., Wood, J. Hall, S., Wallrodt, S. & Whisson, G. (2009). *South West Regional Ecological Linkages Technical Report*. Available from: http://walga.asn.au/AboutWALGA/Policy/SouthWestBiodiversityProject/SouthWestRegionalEcologicalLinkagesTechnicalReport.aspx

Semeniuk, C. A. & Semeniuk, V. (1995). *A geomorphic approach to global classification for inland wetlands*. Vegetation, 118, 103-124.

Thackway, R, and Cresswell, ID, (Eds) (1995). *An Interim Biogeographic Regionalisation for Australia: a framework for establishing the national system of reserves*, Version 4.0. Australian Nature Conservation Agency, Canberra.

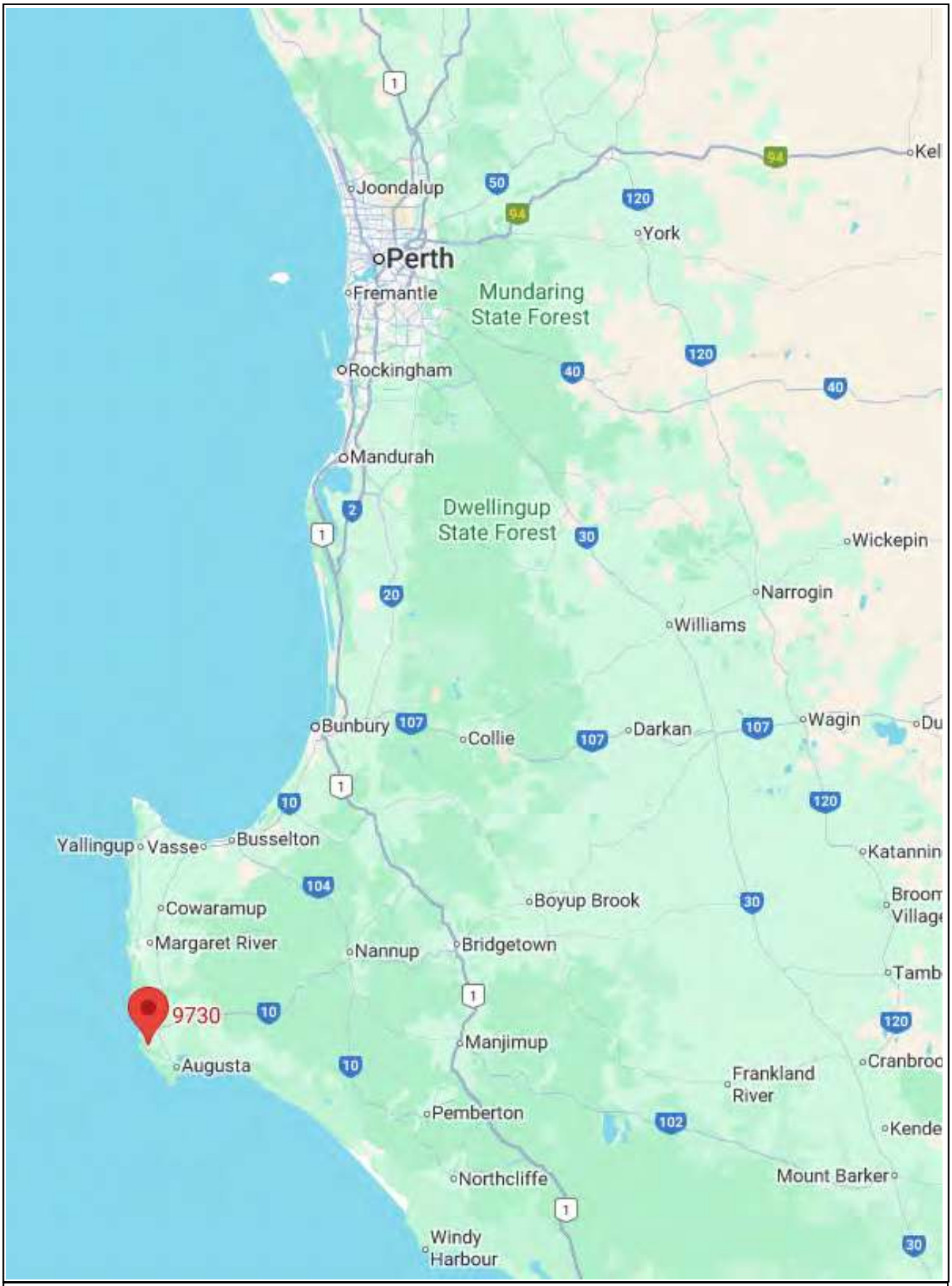
Tille, P (2006). Soil-Landscape Zones of the WA Rangelands and Interior.

Western Australian Planning Commission (WAPC) (2007). *Planning Bulletin No. 64: Acid Sulfate Soils*, Western Australian Planning Commission, Western Australia.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

FIGURES

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



PROJECT	Lot 22 Caves Road, Hamelin Bay	Project Number	Drawing Number	Revision
		2449	Figure 1	A
DRAWING TITLE	Figure 1 - Regional location of the subject site	Designed PN	Checked	
		Drawn PN	Approved	
CLIENT	McDougall Quarries Pty Ltd	Date	20/8/2024	
		Local Authority	City of Busselton	
		Sheet 1 of 1		

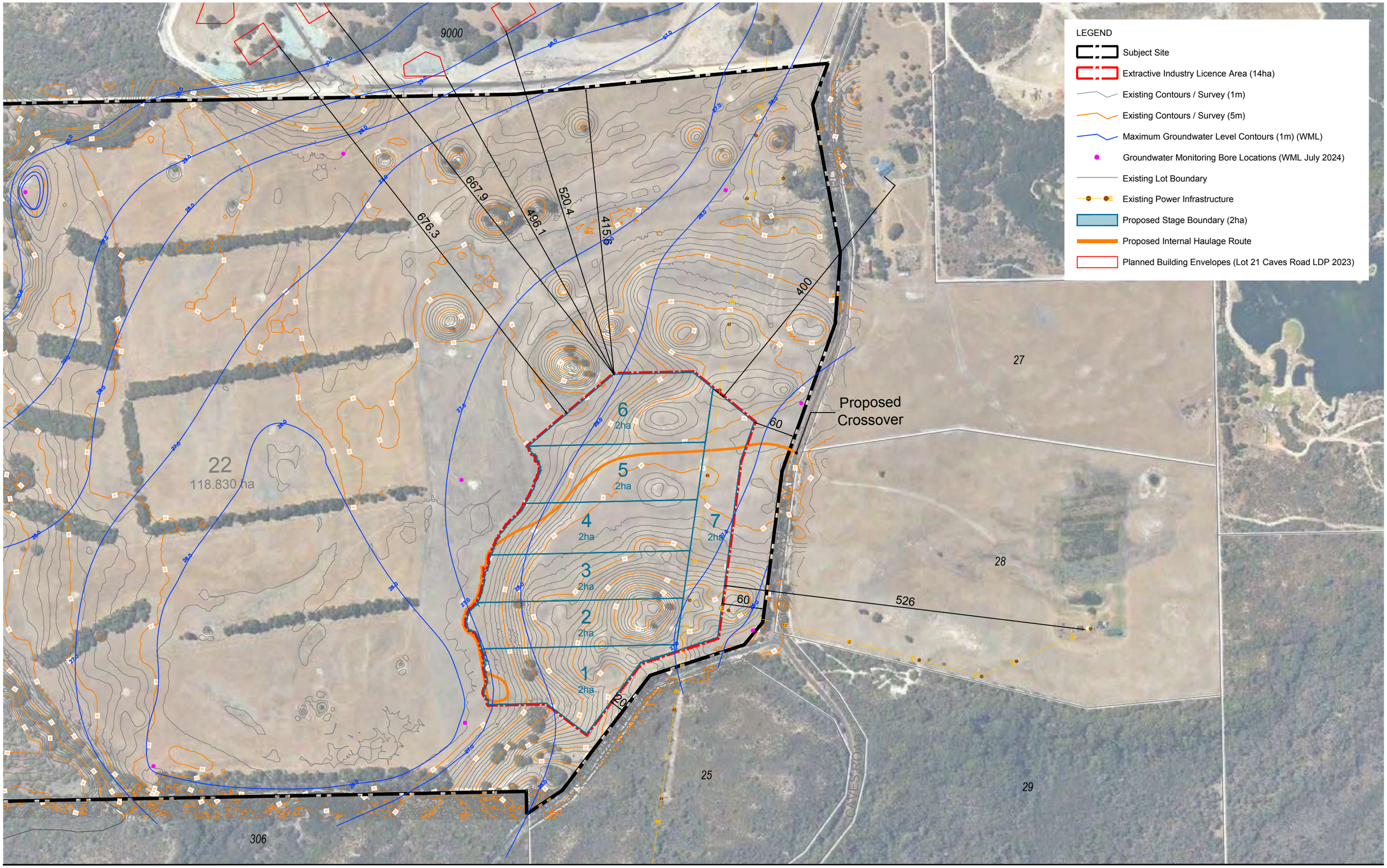
This drawing has been prepared by, and remains the property of Accendo Australia Pty Ltd. This drawing shall not be used without permission. The drawing shall be preliminary only and/or not for construciton until signed approved.

PO Box 5178
West Busselton
Western Australia 6280
Mobile 0418 950 852

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX A – EXCAVATION WORKS PLAN

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Excavation Works Plan

Lot 22 (9730) Caves Road, Hamelin Bay

Date: 26 Aug 2024 Scale: 1:5000 @ A3 1:2500 @ A1 File: **24-132 EX01B** Staff: DL CCG JJ Checked: DL

0 100m

element.

Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
PO Box 7375 Cloisters Square, Perth Western Australia 6850.
T. +61 8 9289 8300 | **E.** hello@elementwa.com.au **elementwa.com.au**

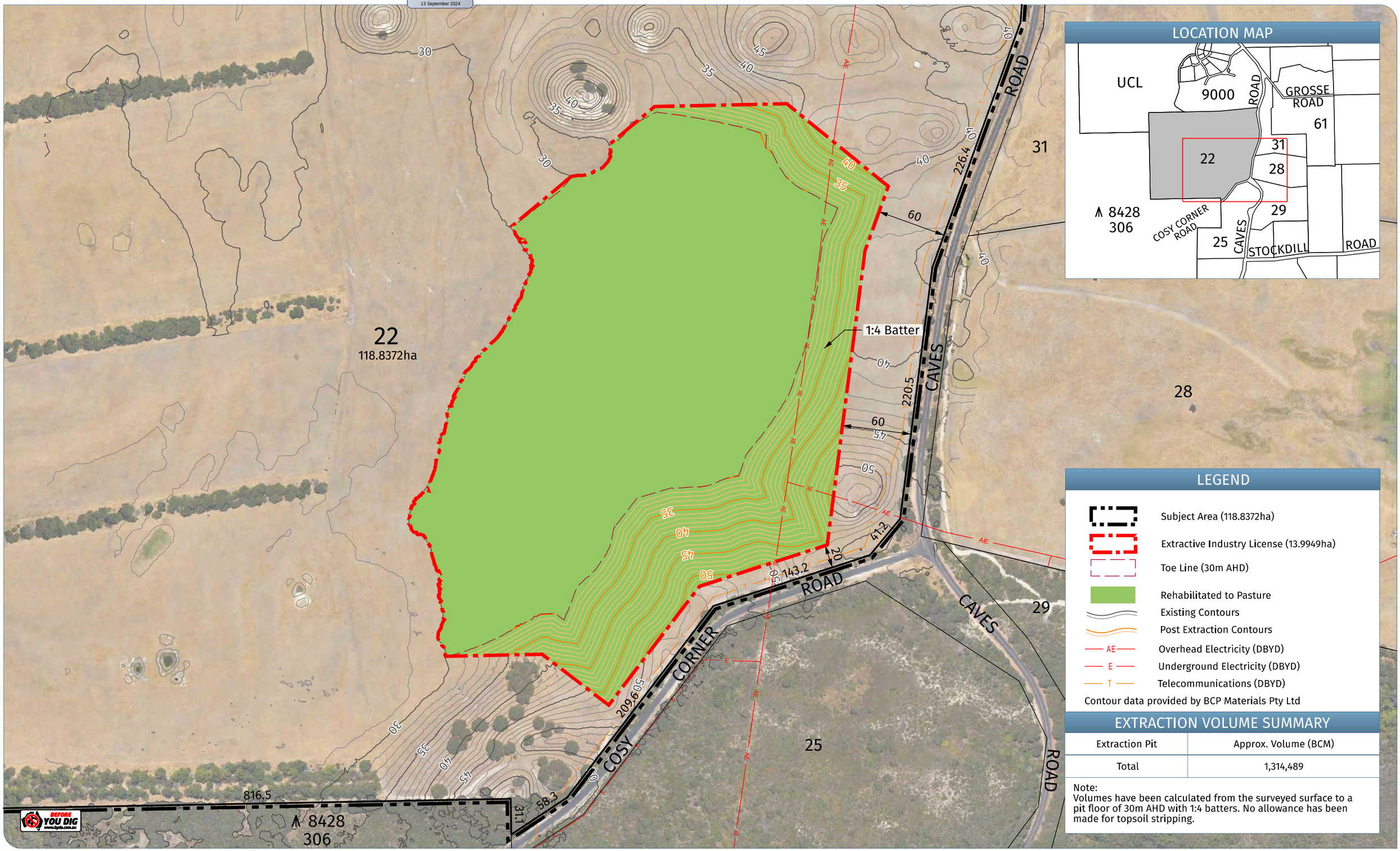
© Element Advisory WA Pty Ltd

This concept has been prepared for the purpose of meeting client specifications. The drawing does not constitute an invitation,agreement or contract (or any part thereof) of any kind whatsoever. Although care has been taken in the compilation of this drawing by Element Advisory WA Pty Ltd, all parties associated with the proposed property development disclaim all responsibility for any errors or omissions. The right is reserved to change the plan at any time. Liability is expressly disclaimed by Element Advisory WA Pty Ltd for any loss or damage which may be sustained by any person acting on any visual impression gained from this drawing.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX B – POST EXTRACTION PLAN

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



LOCATION MAP

LEGEND

- Subject Area (118.8372ha)
- Extractive Industry License (13.9949ha)
- Toe Line (30m AHD)
- Rehabilitated to Pasture
- Existing Contours
- Post Extraction Contours
- AE — Overhead Electricity (DBYD)
- E — Underground Electricity (DBYD)
- T — Telecommunications (DBYD)

Contour data provided by BCP Materials Pty Ltd

EXTRACTION VOLUME SUMMARY

Extraction Pit	Approx. Volume (BCM)
Total	1,314,489

Note:
Volumes have been calculated from the surveyed surface to a pit floor of 30m AHD with 1:4 batters. No allowance has been made for topsoil stripping.

POST EXTRACTION PLAN

Lot 22 (No. 9730) Caves Road, HAMELIN BAY

Plan No.	24210-01	
Date	27/06/24	
Drawn	JW	
Checked	DJ	
Revision	C	
Scale	1:3000@A3	0 40m 80m

BUNBURY OFFICE:
21 Spencer Street,
BUNBURY WA 6230
T: 08 9792 6000
E: bunbury@harleydykstra.com.au
W: www.harleydykstra.com.au
ALBANY | BUNBURY | BUSSELTON | FORRESTDALE | PERTH

COPYRIGHT:
This document is and shall remain the property of HARLEY DYKSTRA.
The document may only be used for the purpose for which it was commissioned and in accordance with the terms of engagement for the commission.
Unauthorised use of this document in any form whatsoever is prohibited

NOTE: This plan has been prepared for planning purposes. Areas, Contours and Dimensions shown are subject to survey

Harley Dykstra
PLANNING & SURVEY SOLUTIONS

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX C – ACOUSTIC ASSESSMENT

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

HERRING STORER ACOUSTICS

MCDOUGALL QUARRIES PTY LTD

EXTRACTIVE INDUSTRY
LOT 22 (9730) CAVES ROAD, HAMELIN BAY

ACOUSTIC ASSESSMENT

AUGUST 2024

OUR REFERENCE: 33157-3-24200

Rochdale Holdings Pty Ltd A.B.N. 85 009 049 067 trading as:
HERRING STORER ACOUSTICS
P.O. Box 219, Como, W.A. 6952
(08) 9367 6200
hsa@hsacoustics.com.au

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

DOCUMENT CONTROL PAGE

ACOUSTIC ASSESSMENT

CAVES ROAD, HAMELIN BAY

Job No: 24200

Document Reference: 33157-3-24200

FOR

MCDOUGALL QUARRIES PTY LTD

DOCUMENT INFORMATION			
Author:	Paul Daly	**Checked By:**	George Watts
Date of Issue:	9th August 2024		

REVISION HISTORY				
Revision	**Description**	**Date**	**Author**	**Checked**
1	Revised Excavation Plan	19/08/2024	PLD	
2	Client Comments	26/08/2024	PLD	

DOCUMENT DISTRIBUTION				
Copy No.	**Version No.**	**Destination**	**Hard Copy**	**Electronic Copy**
1	3	Element Att: Daniel Lewis Email: daniel.lewis@elementwa.com.au		✓

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

CONTENTS

1.	INTRODUCTION	1
2.	SUMMARY	2
3.	CRITERIA	3
4.	CALCULATED NOISE LEVELS	5
5.	MONITORED AMBIENT NOISE	7
6.	RESULTS	10
7.	ASSESSMENT	10
8.	CONCLUSION	11

APPENDICIES

A Site Layout

B Noise Contours

C Ambient Noise Monitoring

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

1. INTRODUCTION

Herring Storer Acoustics have been commissioned by Element on behalf of McDougall Quarries Pty Ltd to undertake an acoustic assessment of noise emissions from the proposed lime sand and limestone extraction operations located at Lot 40 (9730) Caves Road, Hamelin Bay.

The proposed extraction operations will operate from 07:00 – 19:00 Monday to Friday and 07:00 – 13:00 on Saturdays. No operations would occur on Sundays or Public Holidays.

The nearest residential premises are located to the east / northeast of the proposed excavation activities. The most critical in terms of distance from the proposed operations, are approximately 400m from the boundary of the nearest operations. Future residential locations to the north have been noted and also assessed for noise impact.

The main access road is via the east as shown in Figure 1.1, along with the proposed operations.

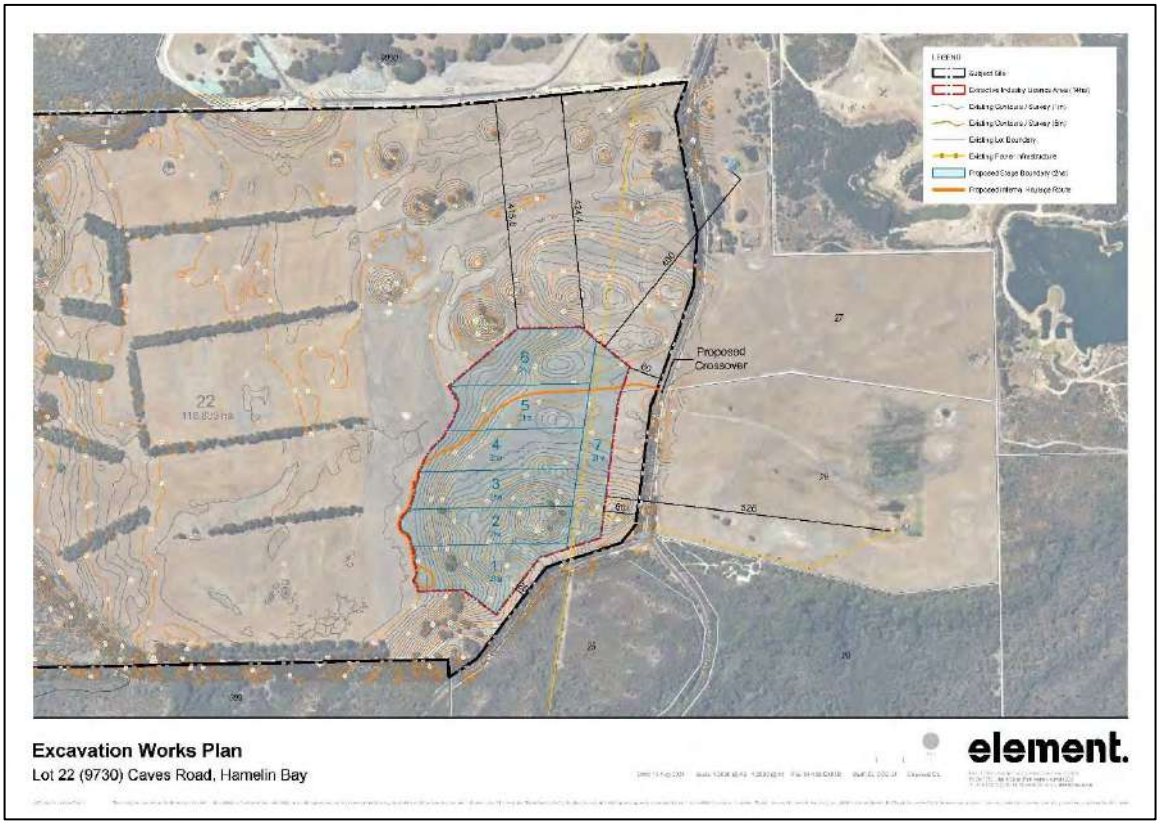


FIGURE 1.1 – EXTRACTION OPERATIONS

This assessment is provided to support the regulatory approvals processes and demonstrate compliance with the requirements of the *Environmental Protection (Noise) Regulations 1997* can be achieved.

As part of the study, the following was carried out:

- Identification of individual operations and the associated noise levels.
- Measurement of the existing background noise levels.
- Assess the predicted noise levels at the nearest surrounding highly noise sensitive premises for compliance with the appropriate criteria.
- If exceedances are predicted, comment on possible noise amelioration options for compliance with the appropriate criteria.

For information, a locality plan is shown in Appendix A.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

2. SUMMARY

Assessment has been conducted on the proposed limestone and sand extraction operations for Lot 40 (9730) Caves Road, Hamelin Bay.

The facility would only operate during the day period (being Monday to Friday 07:00 to 19:00 hours and 07:00 to 16:00 on Saturdays). Therefore, at the neighbouring residences, the applicable acoustic criteria for this assessment is the assigned L_{A10} day period noise level of 45 dB(A).

Noise received at the nearest residential premises has been determined to be 45 dB(A) for the extraction operations for the highest noise level at any stage of the operations. This can be compared to the applicable assigned noise level criteria of 45 dB(A).

Noise monitoring conducted shows that the ambient noise (background) is generally around 45 to 50 dB(A) during the day. Given this, annoying characteristics such as tonality may be present, hence a +5 dB(A) penalty has been included in the assessable noise level stated above.

Information provided is that the material is understood to be located around 10m deep (from ground level). Therefore, as the pits progress, the bottom of the pit will be such that there is a pit wall (operating face) being maintained between equipment and receivers.

As there is a Cat D9 Dozer to be used in the operations, both this and the crushing plant require noise control to ensure compliance. Predictive noise modelling has been conducted where the dozer, located at natural surface level commences operations in Stage 1. The dozer is required to operate from the western most point and clear a sufficient area on the western side of Stage 1 to reach the material. Figure 2.1 below details the active area for the dozer for the commencement of works. Once a sufficient depth (5-6m) is achieved within Stage 1, progression of the pit through to Stage 2 can continue with the use of the dozer.

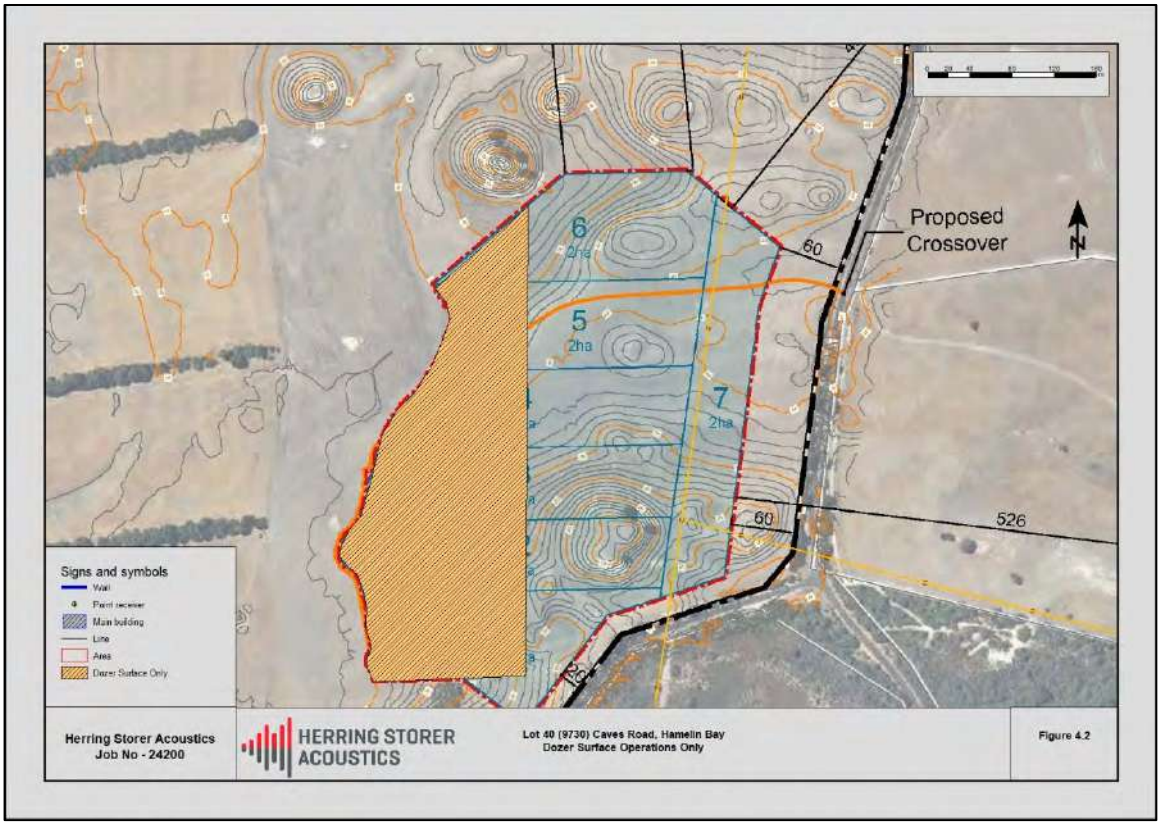


FIGURE 2.1 – DOZER OPERATIONS - SURFACE ONLY

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Additionally, the crushing and screening plant require noise control in the form of a barrier. If the plant is located within the pit at a depth of 5m, then this would provide sufficient attenuation. However, at depth less than this a bund is required in close proximity to the plant to form a barrier.

Modelling has assumed the progression of the pit through the numbered stages. Provided the barrier in the form of a pit wall, or bunding to a minimum height of 3m is maintained, noise levels would be compliant.

Given these operating parameters, noise levels received at the nearest premises has been calculated to comply with the *Environmental Protection (Noise) Regulations 1997* for the operating times as outlined in this assessment.

3. CRITERIA

The allowable noise level for noise sensitive premises in the vicinity of the proposed site is prescribed by the *Environmental Protection (Noise) Regulations 1997*. Regulations 7 and 8 stipulate maximum allowable external noise levels or assigned noise levels that can be received at a premise from another premises. For residential premises, this noise level is determined by the calculation of an influencing factor, which is then added to the base levels shown below. The influencing factor is calculated for the usage of land within two circles, having radii of 100m and 450m from the premises of concern. The base noise levels for residential premises are listed in Table 3.1.

TABLE 3.1 - BASELINE ASSIGNED OUTDOOR NOISE LEVEL

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		$L_{A\ 10}$	$L_{A\ 1}$	$L_{A\ max}$
Noise sensitive premises	0700 - 1900 hours Monday to Saturday (Day)	45 + IF	55 + IF	65 + IF
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day Period)	40 + IF	50 + IF	65 + IF
	1900 - 2200 hours all days (Evening)	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	35 + IF	45 + IF	55 + IF

Note: L_{A10} is the noise level exceeded for 10% of the time.
L_{A1} is the noise level exceeded for 1% of the time.
L_{Amax} is the maximum noise level.
IF is the influencing factor.

It is a requirement that received noise be free of annoying characteristics (tonality, modulation and impulsiveness), defined below as per Regulation 9.

"impulsiveness" means a variation in the emission of a noise where the difference between L_{Apeak} and $L_{Amax\ Slow}$ is more than 15 dB when determined for a single representative event;

"modulation" means a variation in the emission of noise that –

(a) is more than 3dB $L_{A\ Fast}$ or is more than 3 dB $L_{A\ Fast}$ in any one-third octave band;
(b) is present for more at least 10% of the representative assessment period; and
(c) is regular, cyclic and audible;

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

"tonality" means the presence in the noise emission of tonal characteristics where the difference between –

(a) the A-weighted sound pressure level in any one-third octave band; and
(b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3 dB when the sound pressure levels are determined as $L_{Aeq,T}$ levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as $L_{A\ Slow}$ levels.

The nearest potential noise sensitive premises to the proposed development have been identified using the area map in Figure 3.1. It is understood that there is the potential for development to the north of the extractive works, hence, there future residential premises have been assessed, noted at R3.

The usage of the surrounding land use varies from rural (with residential premises) and other extractive industries. Therefore, the assigned noise levels for operational times are as noted in Table 3.2.

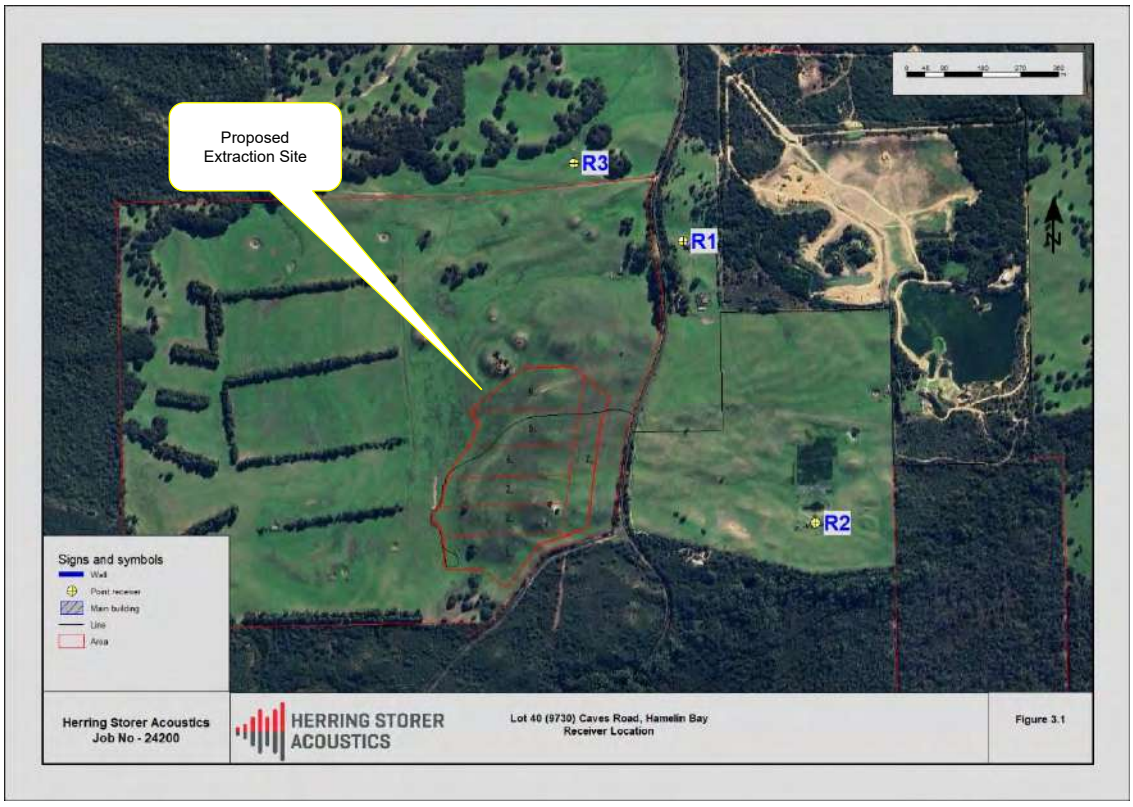


FIGURE 3.1 – RECEIVER LOCATION MAP

TABLE 3.2 – ASSIGNED NOISE LEVELS

Premises Receiving Noise	IF dB	Time of Day	Assigned Level (dB)		
			$L_{A\ 10}$	$L_{A\ 1}$	$L_{A\ max}$
Receivers R1 to R3	0	0700 - 1900 hours Monday to Saturday (Day)	45	55	65

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

4. CALCULATED NOISE LEVELS

Noise immissions[1] at the nearest neighbouring residential premises, due to noise associated with the proposed operations, were modelled with the computer programme SoundPlan using Concawe algorithms. Sound power levels used for the calculations are based on measured sound pressure levels of similar equipment proposed for use on site.

The modelling of noise levels has been based on noise sources and sound power levels shown in Table 4.1.

TABLE 4.1 – SOUND POWER LEVEL - NOISE SOURCES dB(A)

Source Name	Quantity	SWL dB(A)
Loaders (Cat 966 or similar)	1	105
Screening Plant (McCloskey S190 Screener or Similar)	1	101
Crushing Plant (Terex J1175)	1	113
Semi- Tipper Truck	1	98
Excavator (PC330 or similar)	1	100
Dozer (CAT D9)	1	113

Note: The above equipment models have been used to provide an indication of the size. Other models may be used although these have been assumed to have a similar sound power level.

Based on noise emissions from the above equipment, an overall operating scenario has been developed. Figure 4.1 details the source locations assumed in the predictive modelling along with the proposed development of the pit.

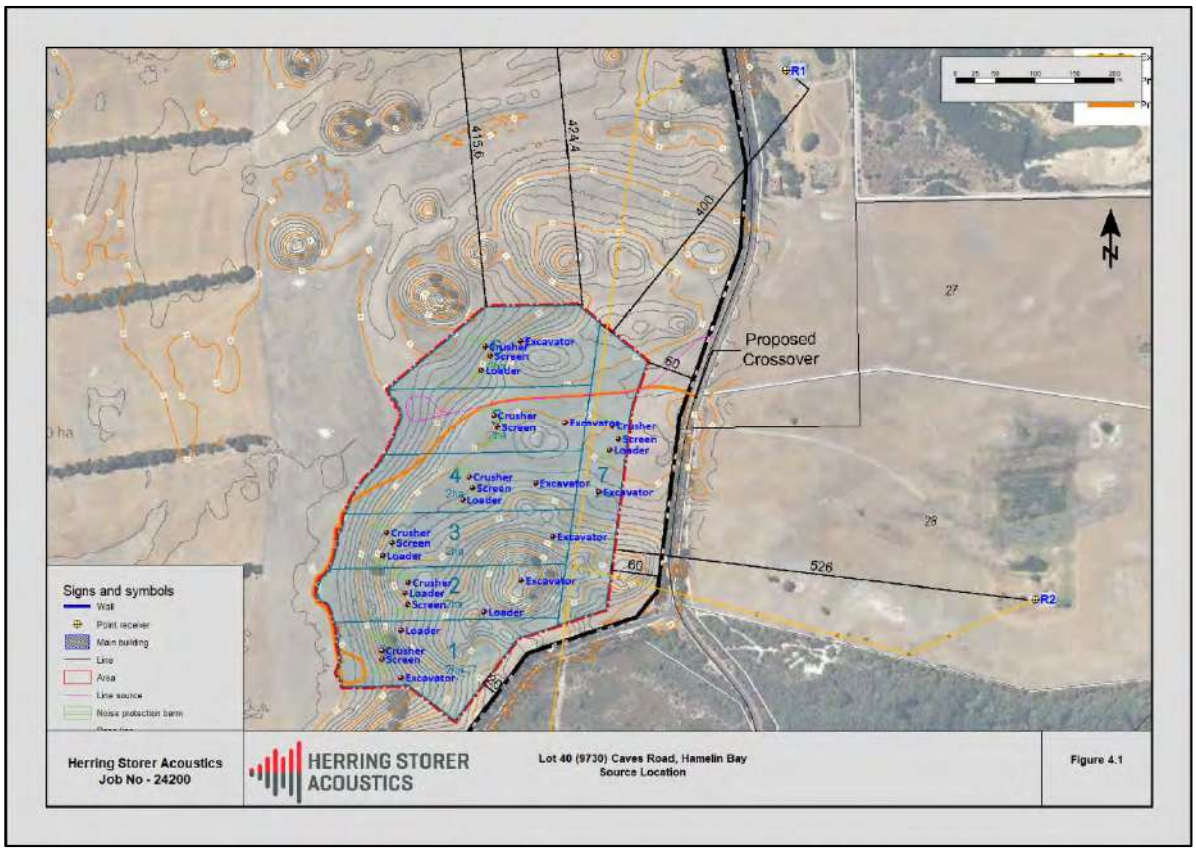


FIGURE 4.1 – SOURCE LOCATION AND PIT PROGRESSION

1 Immissions – noise received at a source
2 Emissions – noise emanating from a source and / or location

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Based on the above, various operating scenarios have been developed for each stage of the proposal. As the fixed plant, being the loader, crusher and screen will generally remain in a static location, this has been modelled for each stage. The truck transporting of material can be within any stage; hence this has been modelled in a separate scenario and included in the overall assessable noise level (added to the fixed plant noise levels). The excavator could operate anywhere within the staged area, whilst the loader would be generally located with the crushing and screen plant, also being available to load out material onto trucks.

It is noted that each stage is assessed individually, with the noise contour plot for the overall noise level being a maximum of each stage (not the cumulative of all stages) for information purposes only.

Information provided is that the material is understood to be located around 10m deep (from ground level). Therefore, as the pits progress, the bottom of the pit will be such that there is a pit wall (operating face) being maintained between equipment and receivers.

As there is a Cat D9 Dozer to be used in the operations, both this and the crushing plant require noise control to ensure compliance. Predictive noise modelling has been conducted where the dozer, located at natural surface level commences operations in Stage 1. The dozer is required to operate from the western most point and clear a sufficient area on the western side of Stage 1 to reach the material. Figure 4.2 details the active area for the dozer for the commencement of works. Once a sufficient depth (5-6m) is achieved within Stage 1, progression of the pit through to stage 2 can continue with the use of the dozer.

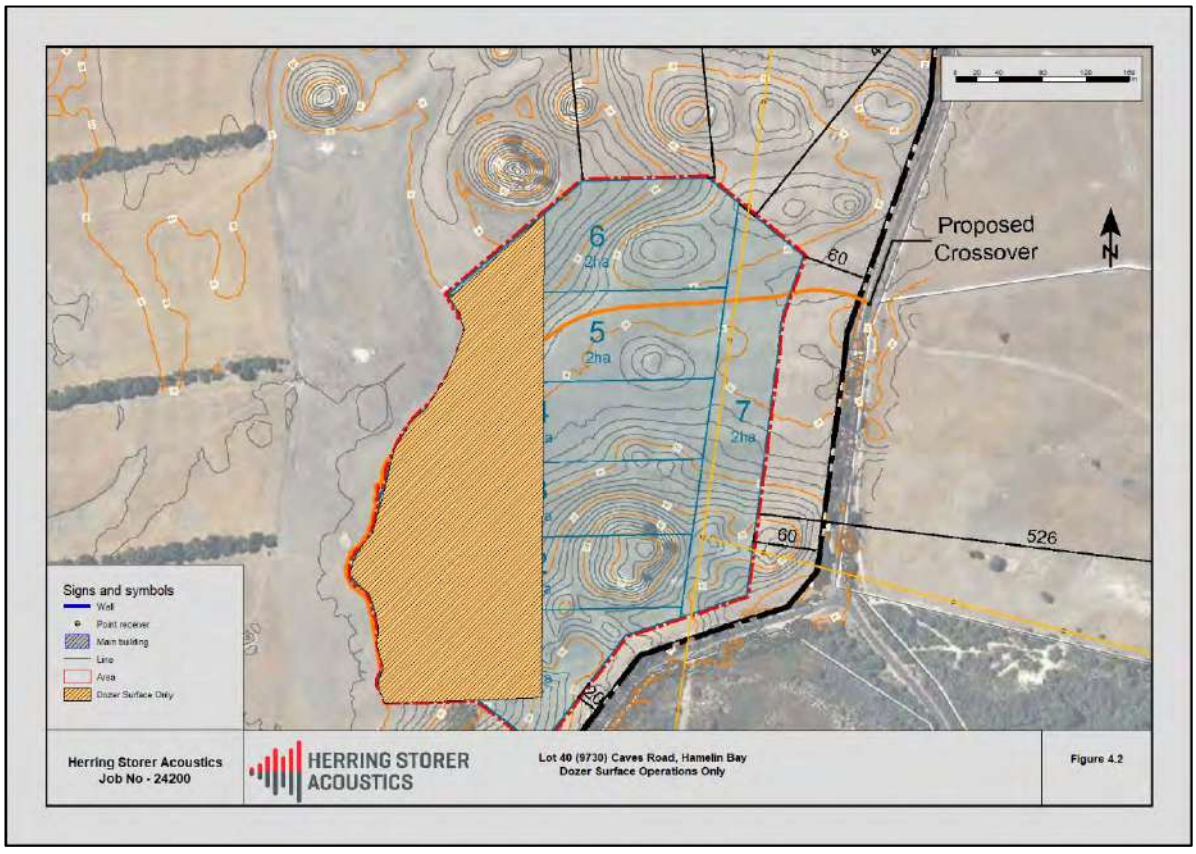


FIGURE 4.2 – DOZER OPERATIONS - SURFACE ONLY

Additionally, the crushing and screening plant require noise control in the form of a barrier. If the plant is located within the pit at a depth of 5m, then this would provide sufficient attenuation. However, at depth less than this a bund is required in close proximity to the plant to form a barrier.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Modelling has assumed the progression of the pit through the numbered stages. Provided the barrier, in the form of a pit wall, or bunding to a minimum height of 3m is maintained, noise levels would be compliant.

Therefore, the operating scenarios considered are:

- Scenario 1 Stage 1 Fixed Plant, Mobile Equipment and truck movements
- Scenario 2 Stage 2 Fixed Plant, Mobile Equipment and truck movements
- Scenario 3 Stage 3 Fixed Plant, Mobile Equipment and truck movements
- Scenario 4 Stage 4 Fixed Plant, Mobile Equipment and truck movements
- Scenario 5 Stage 5 Fixed Plant, Mobile Equipment and truck movements
- Scenario 6 Stage 6 Fixed Plant, Mobile Equipment and truck movements
- Scenario 7 Stage 7 Fixed Plant, Mobile Equipment and truck movements

The following input data was used in the calculations:

a) Provided area plots.
b) Sound Power Levels listed in Table 4.1.
c) Ground contours and receiver point provided by client (Appendix A).

Weather conditions for modelling were as stipulated in the Environmental Protection Authority's "*Draft Guidelines on Environmental Noise for Prescribed Premises"* and for the day period are as listed in Table 4.2.

TABLE 4.2 – WEATHER CONDITIONS

Condition	Day
Temperature	20°C
Relative humidity	50%
Pasquill Stability Class	E
Wind speed	4 m/s*

* From sources, towards receivers.

5. MONITORED AMBIENT NOISE

As per the "Draft Guidelines on Environmental Noise for Prescribed Premises" (released in May 2016), continuous noise monitoring has been conducted to establish the ambient noise levels.

The monitoring location was on the southern boundary of the development, nearest to the neighboring residence. Monitoring commenced on the 19th June 2024 and continued through until the 5th July 2024. Figure 5.1 contains a map of the monitoring location, with Figure 5.2 showing pictures of the monitor in situ.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

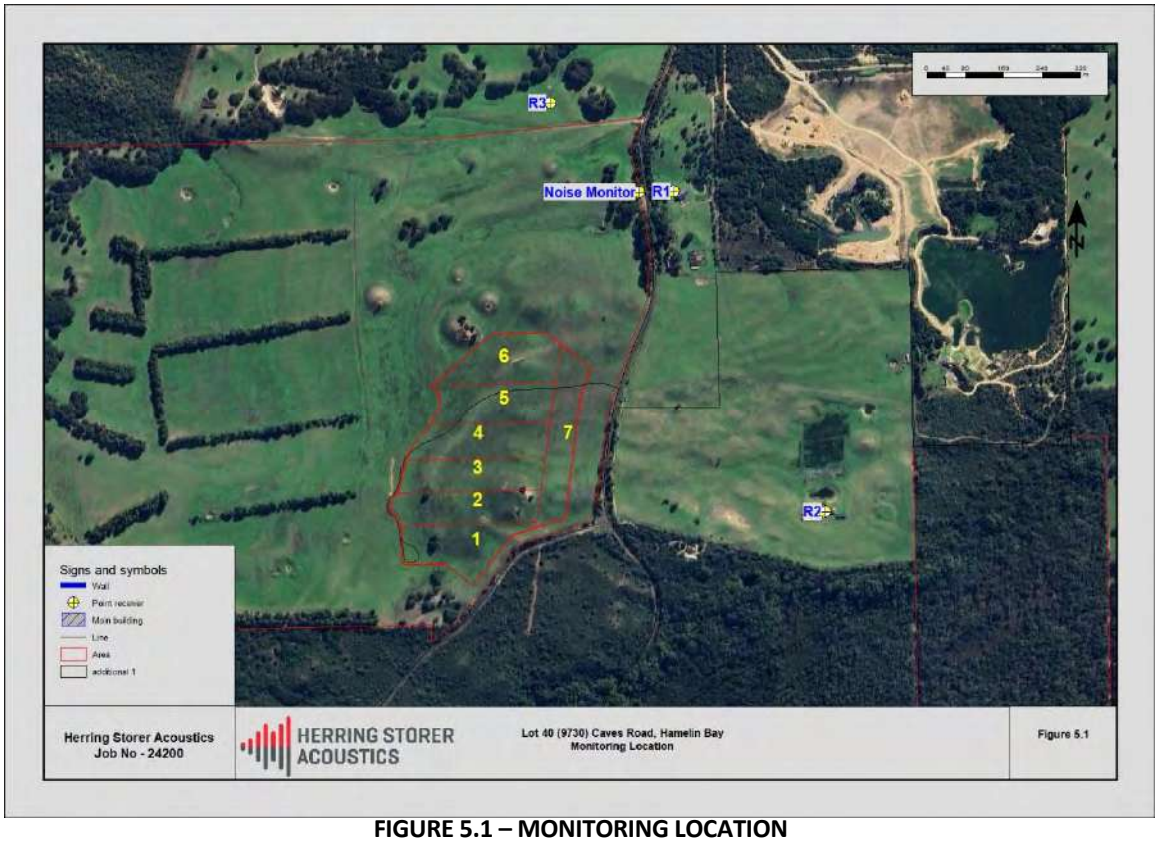


FIGURE 5.1 – MONITORING LOCATION



FIGURE 5.2 – MONITORING PICTURE – IN SITU

Noise monitoring results are summarised graphically below in Figure 5.3, with the full results contained in Appendix C.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

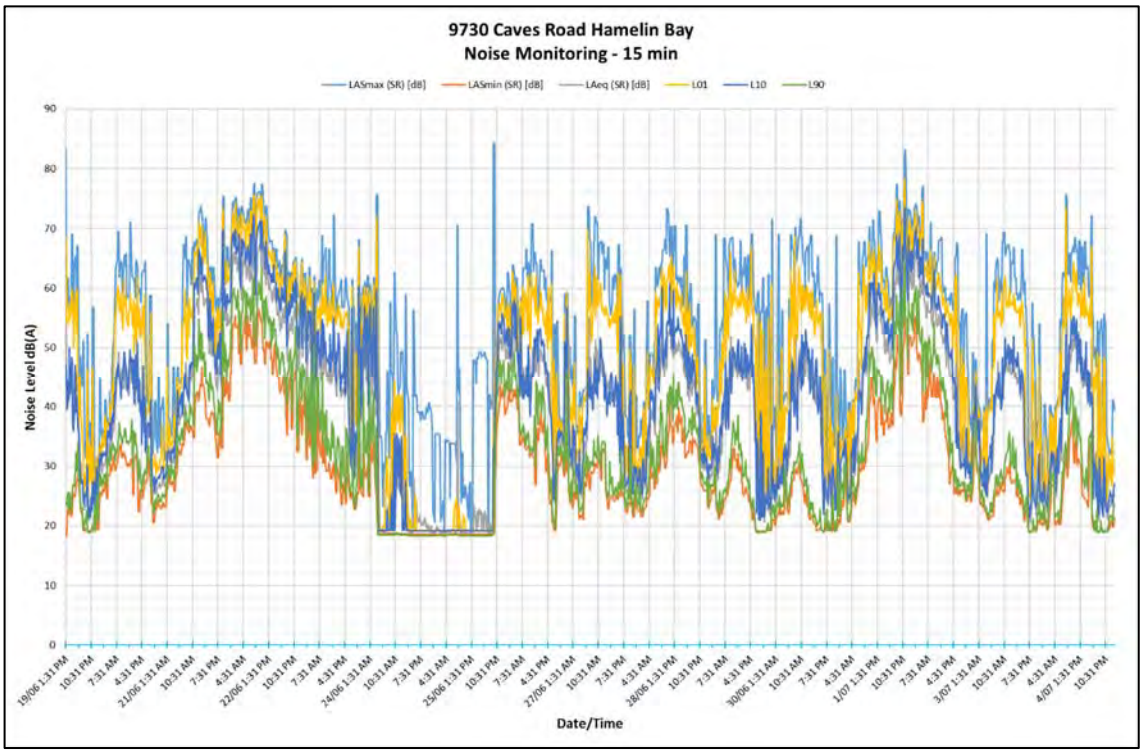


FIGURE 5.3 – MONITORED NOISE LEVELS – TOTAL MONITORING PERIOD

During the monitoring period intermittent rainfall occurred. The days (periods) where rainfall impacted noise levels have been discounted from the assessment of ambient noise.

For informational purposes, a summary of the average noise level for each daily regulatory time period is shown in Table 5.1.

Weather data for the monitoring period was sourced via the Bureau of Meteorology web site for the area.

TABLE 5.1 – SUMMARY NOISE LEVELS

Day / Date	Noise Level	Comments
	Day Period	
Wednesday, 19 June 2024	49.5	
Thursday, 20 June 2024	44.5	
Friday, 21 June 2024	55.2	
Saturday, 22 June 2024	63.0	Rainfall
Sunday, 23 June 2024	46.5	Rainfall
Monday, 24 June 2024	27.5	Rainfall
Tuesday, 25 June 2024	25.8	
Wednesday, 26 June 2024	46.3	Rainfall
Thursday, 27 June 2024	46.1	Rainfall
Friday, 28 June 2024	49.9	Rainfall
Saturday, 29 June 2024	46.1	Rainfall
Sunday, 30 June 2024	45.6	
Monday, 1 July 2024	52.9	
Tuesday, 2 July 2024	53.1	Rainfall
Wednesday, 3 July 2024	45.0	
Thursday, 4 July 2024	48.4	
Average (Good Days)	**49.9**	

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

6. RESULTS

Calculated noise levels associated with the noise emissions from the proposed operations for the assumed scenarios, including bunding to Stages 1 - 3 are summarised below in Table 6.1. Appendix B contains the overall noise contour plots.

TABLE 6.1 – CALCULATED NOISE LEVEL

Operating Scenario	Description	Calculated Noise Level (L_{A10} dB(A))		
		R1	R2	R3
Scenario 1	Stage 1 Fixed Plant, Mobile equipment and Truck Movement	30	24	30
Scenario 2	Stage 2 Fixed Plant, Mobile equipment and Truck Movement	33	31	33
Scenario 3	Stage 3 Fixed Plant, Mobile equipment and Truck Movement	35	33	36
Scenario 4	Stage 4 Fixed Plant, Mobile equipment and Truck Movement	37	35	36
Scenario 5	Stage 5 Fixed Plant, Mobile equipment and Truck Movement	37	36	37
Scenario 6	Stage 6 Fixed Plant, Mobile equipment and Truck Movement	34	29	40
Scenario 7	Stage 7 Fixed Plant, Mobile equipment and Truck Movement	40	39	37

7. ASSESSMENT

For the day time operations, based on calculated noise levels at the nearest premises, noise levels could be considered as potentially containing tonal characteristics.

Based on the assessable noise levels above, comparison against the relevant assigned noise level is contained in Table 7.1. For the purpose of assessment, the highest noise level received for any stage of the operation has been assessed.

TABLE 7.1 – ASSESSMENT OF NOISE LEVELS

Receiver	Premises Receiving Noise Assessable Noise Level dB(A)	Time of Day	Assigned Level (dB)	Compliance
R1	40[45]	0700 - 1900 hours Monday to Saturday (Day)	45	Complies
R2	39[44]			Complies
R3	40[45]			Complies

[ ] Denotes penalty for tonality

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

8. CONCLUSION

Assessment has been conducted on the proposed limestone and sand extraction operations for Lot 40 (9730) Caves Road, Hamelin Bay.

The facility would only operate during the day period (being Monday to Friday 07:00 to 19:00 hours and 07:00 to 13:00 on Saturdays). Therefore, at the neighbouring residences, the applicable acoustic criteria for this assessment is the assigned L_{A10} day period noise level of 45 dB(A).

Noise received at the nearest residential premises has been determined, to be 45 dB(A) for the extraction operations for the highest noise level at any stage of the operations. This can be compared to the applicable assigned noise level criteria of 45 dB(A).

Noise monitoring conducted shows that the ambient noise (background) is generally around 44 dB(A) during the day. Given this, annoying characteristics such as tonality may be present, hence a +5 dB(A) penalty has been included in the assessable noise level stated above.

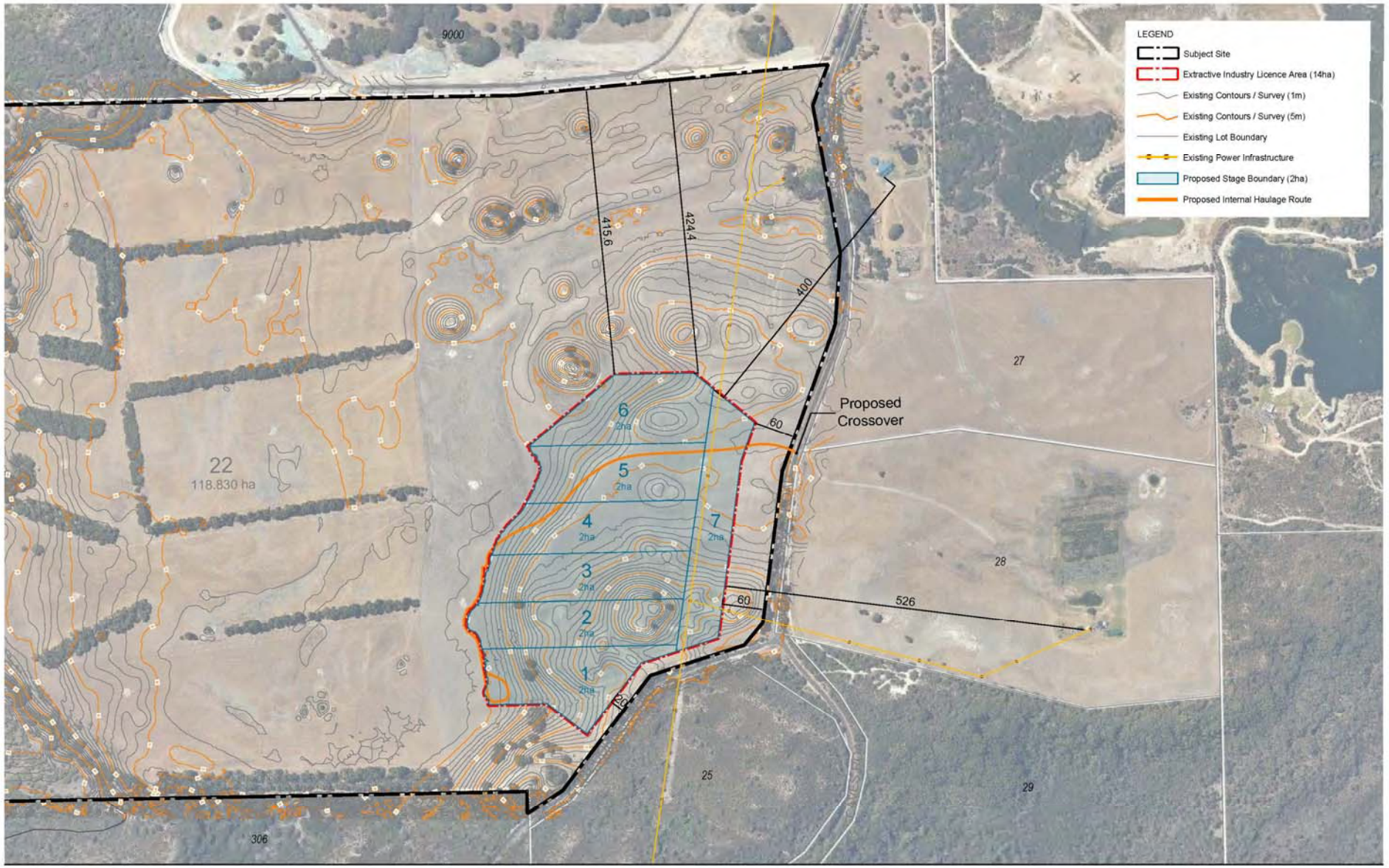
To ensure the above noise levels are maintained, noise control as outline in this report is required.

Given these operating parameters, noise levels received at the nearest premises has been calculated to comply with the *Environmental Protection (Noise) Regulations 1997* for the operating times as outlined in this assessment.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX A

LOCATION MAP



Excavation Works Plan

Lot 22 (9730) Caves Road, Hamelin Bay

Date: 13 Aug 2024 Scale: 1:5000 @ A3 1:2500 @ A1 File: 24-132 EX01B Staff: DL CCG JJ Checked: DL

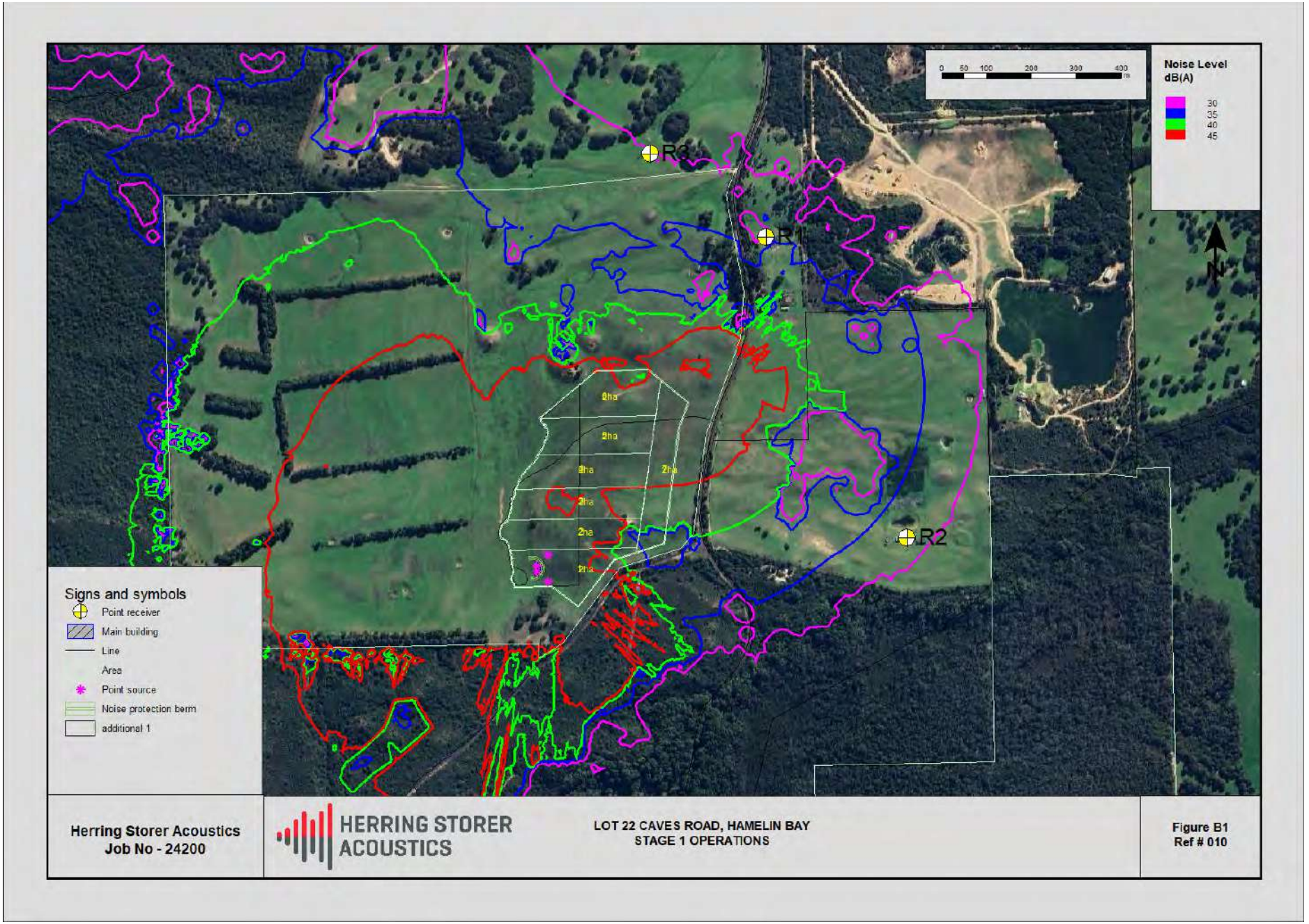
element.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

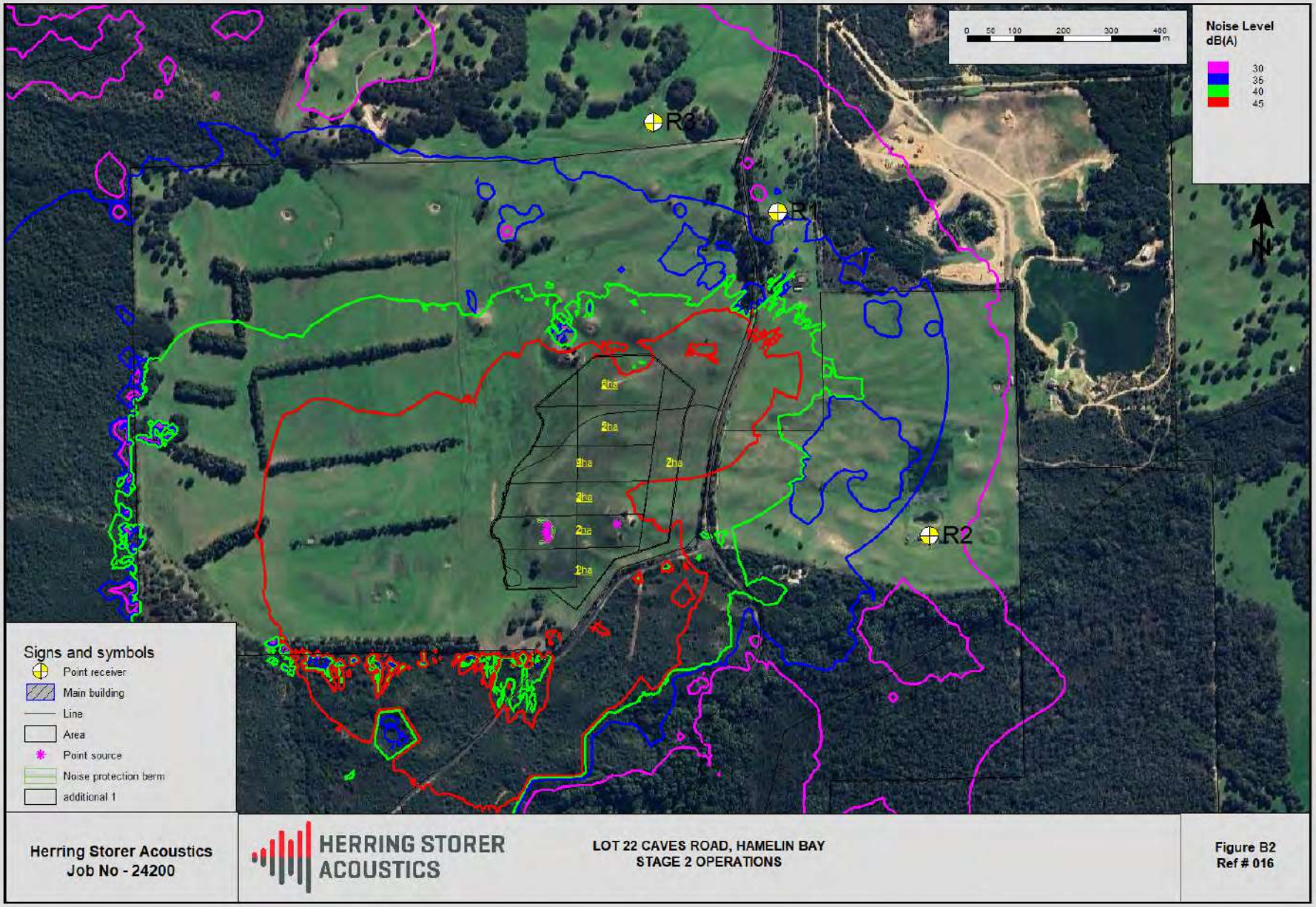
RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX B

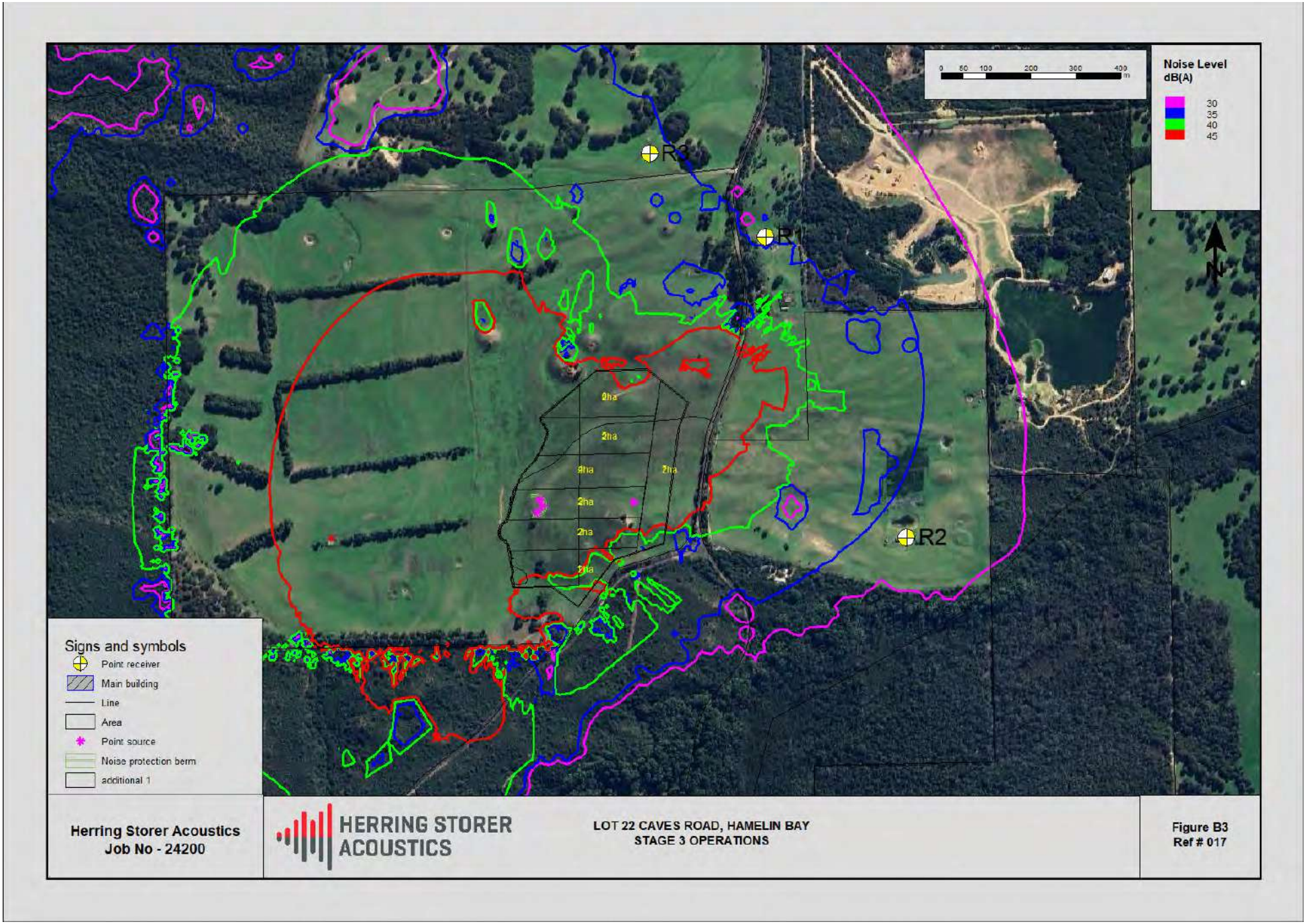
Noise Contours



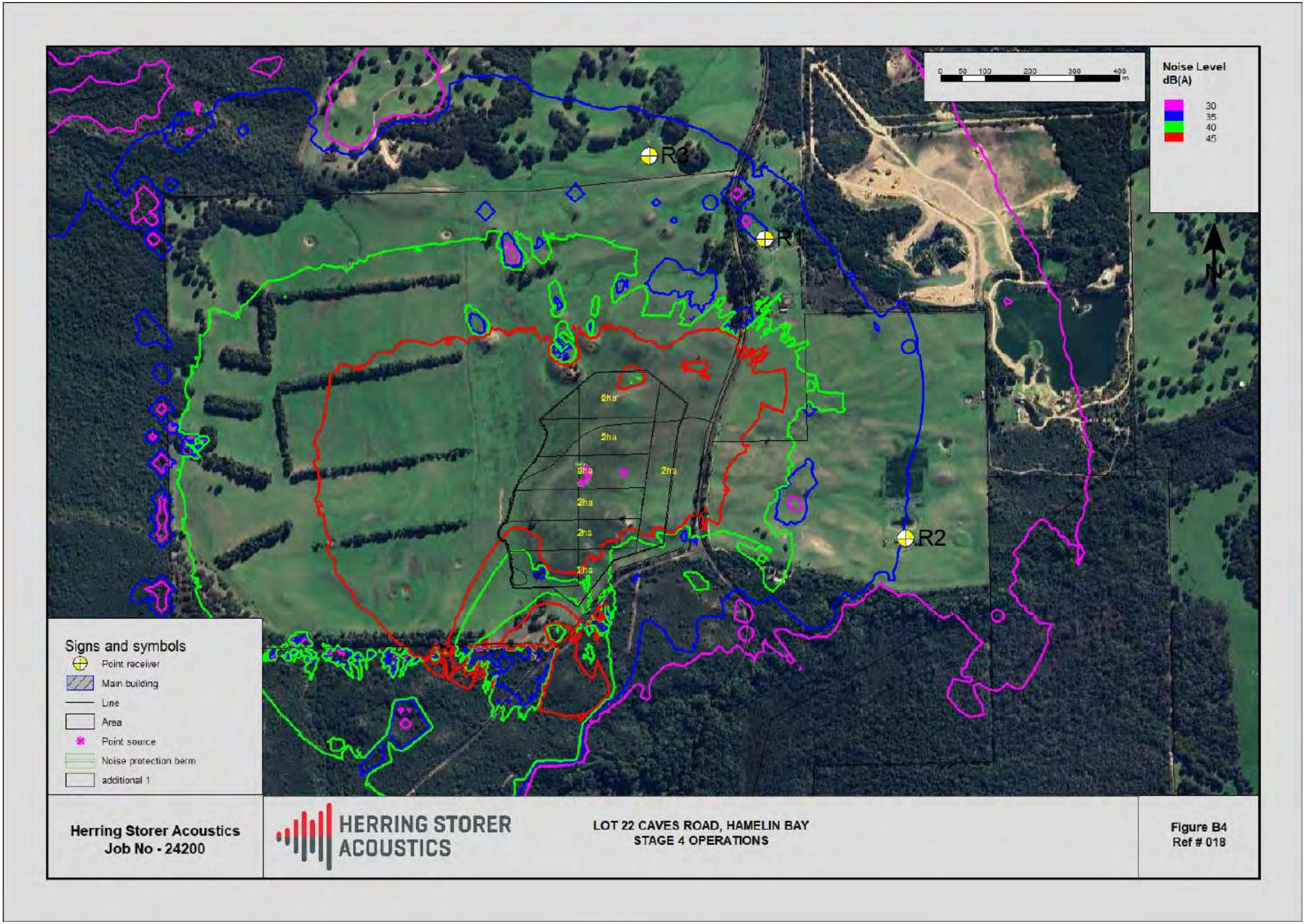
RECEIVED
By Shire of Augusta Margaret River
13 September 2024



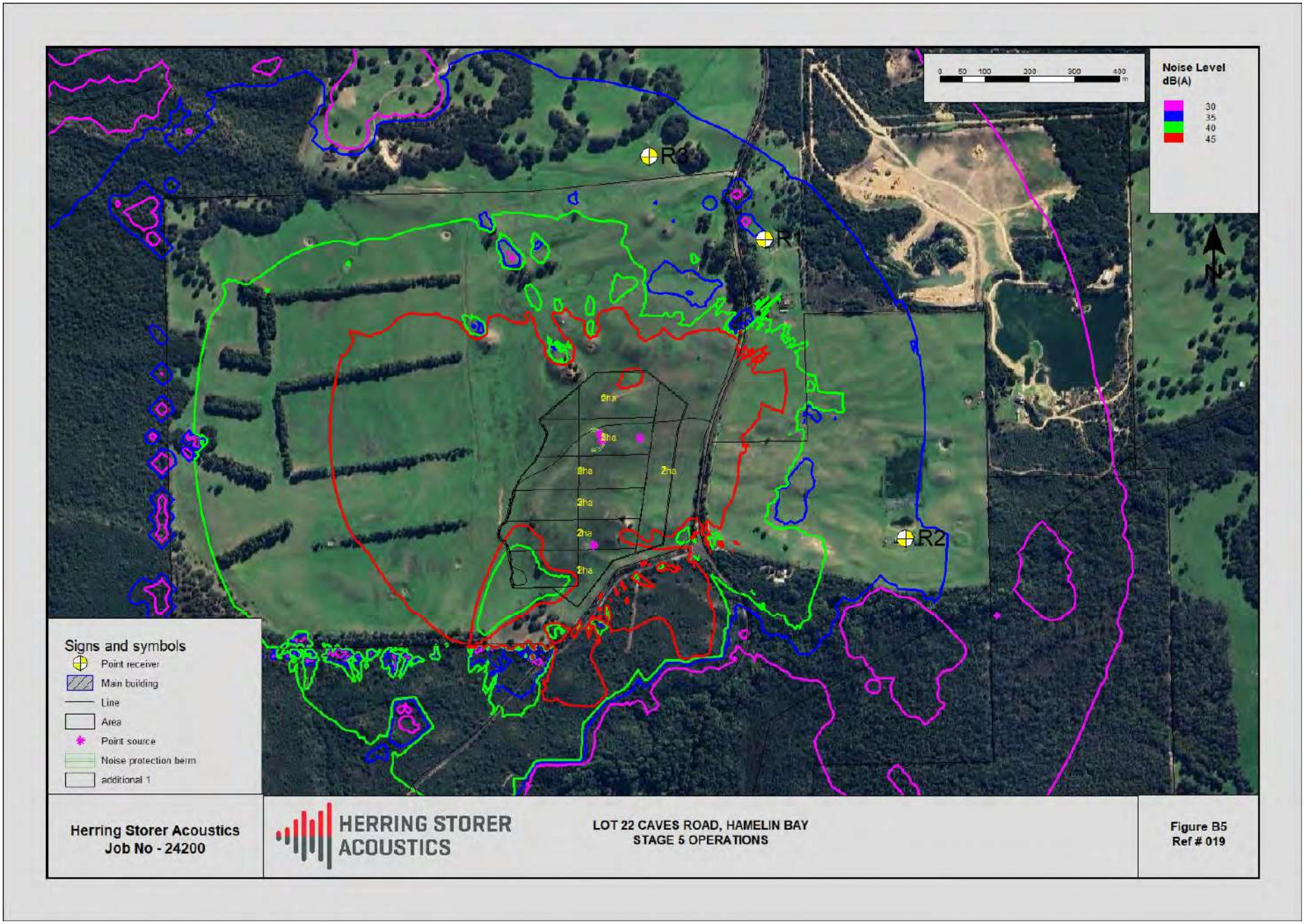
RECEIVED
Shire of Augusta Margaret River
13 September 2024



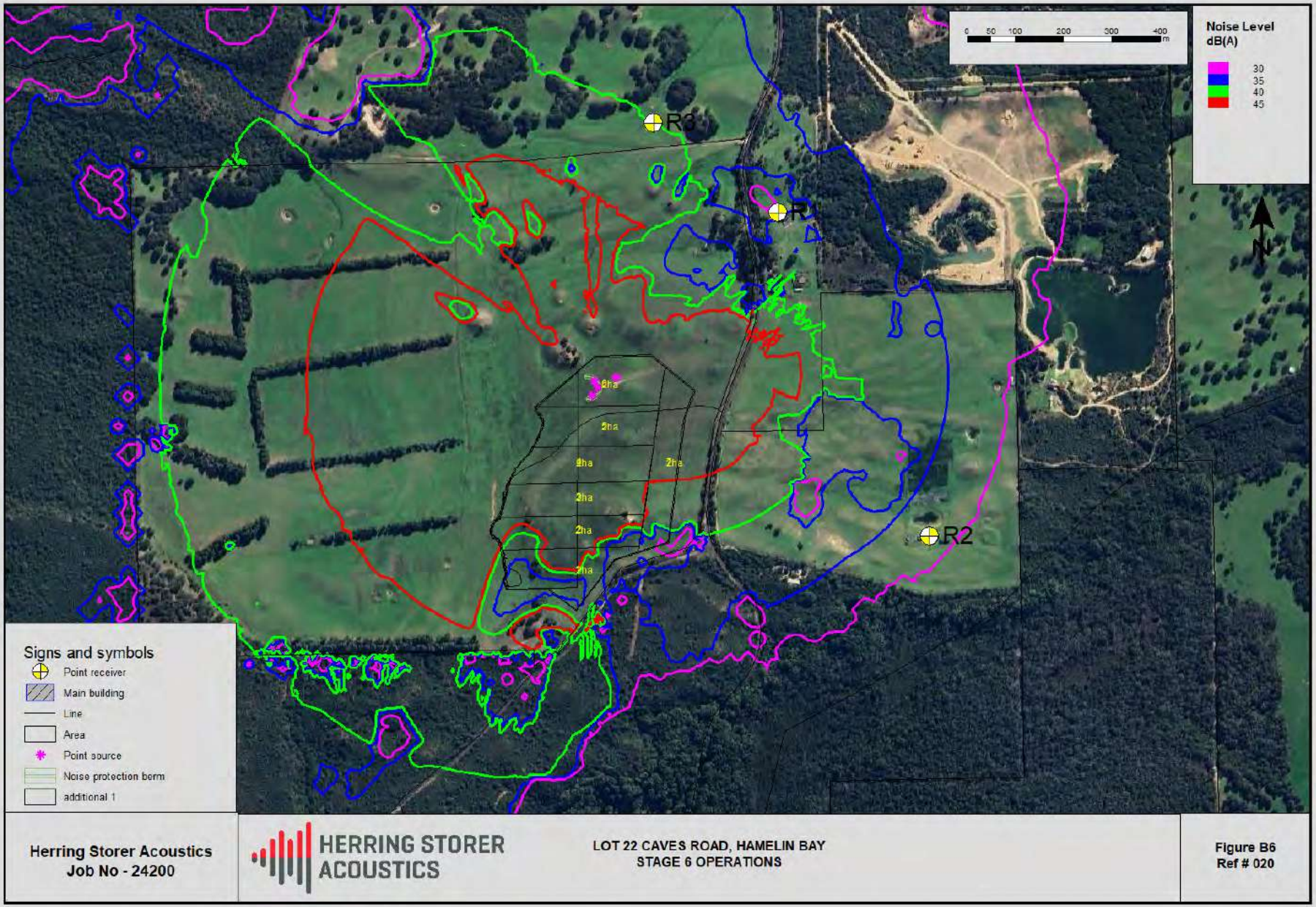
RECEIVED
By Shire of Augusta Margaret River
13 September 2024



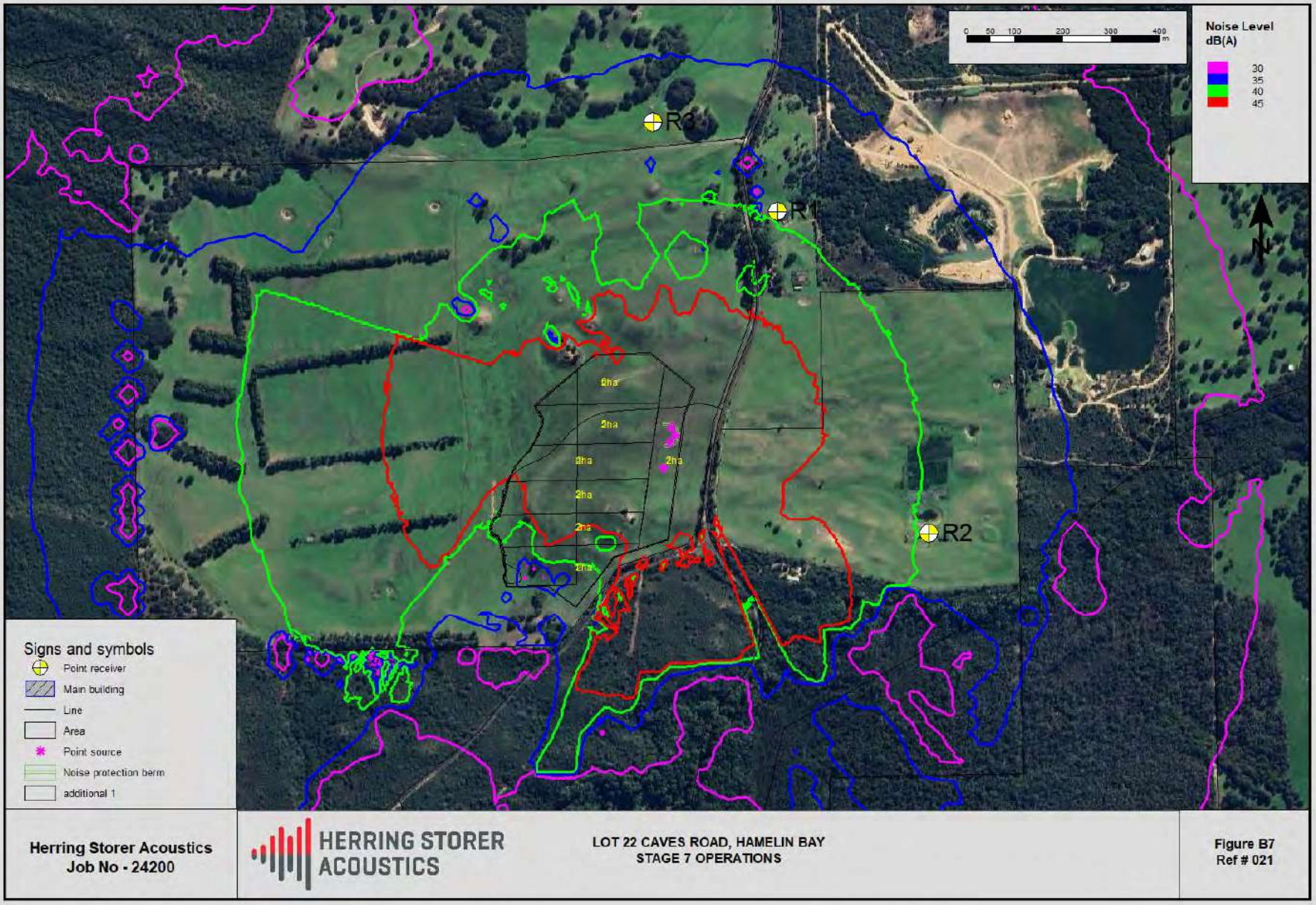
RECEIVED
By Shire of Augusta Margaret River
13 September 2024



RECEIVED
By Shire of Augusta Margaret River
13 September 2024



RECEIVED
By Shire of Augusta Margaret River
13 September 2024

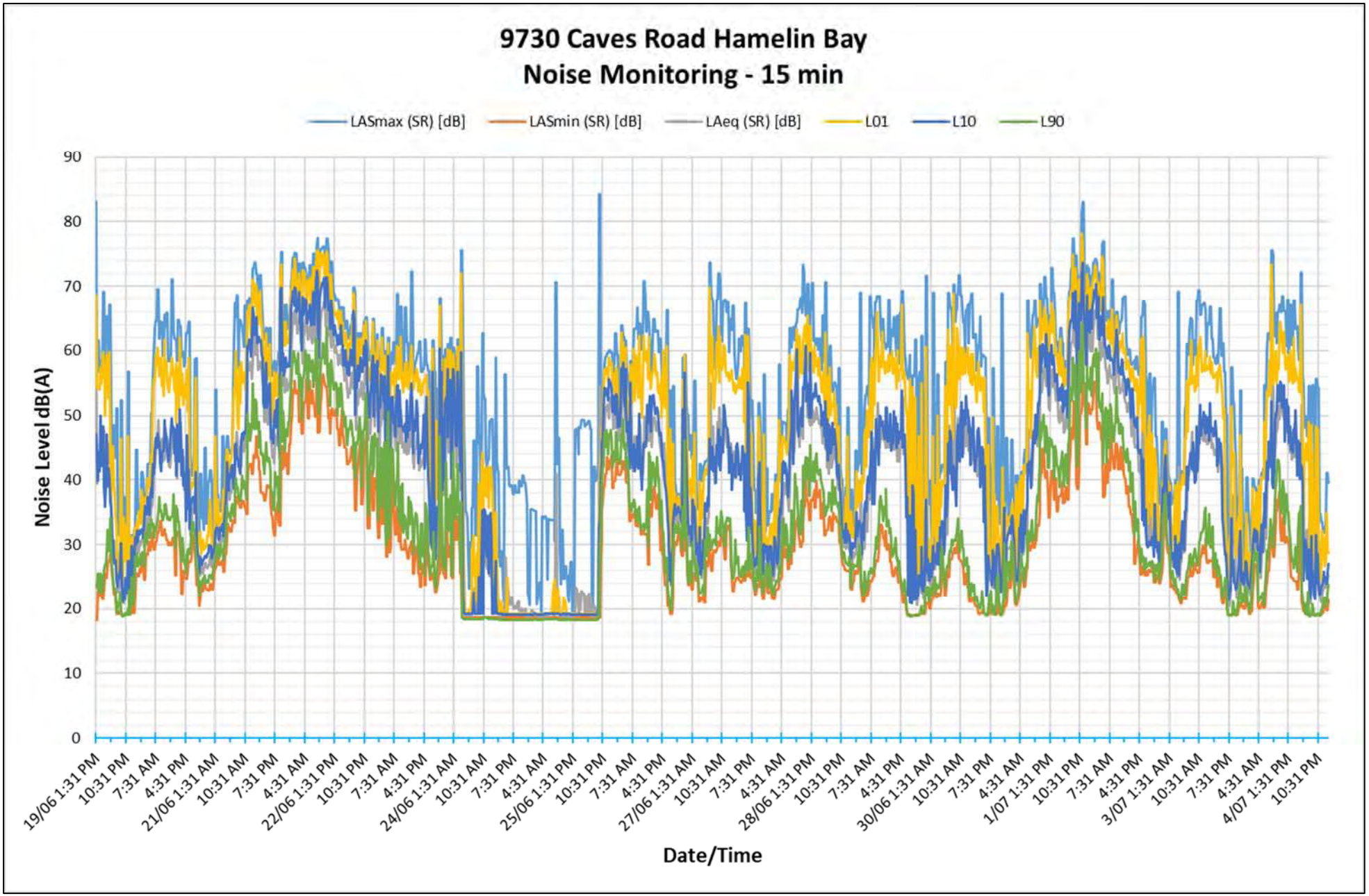


RECEIVED
By Shire of Augusta Margaret River
13 September 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX C

Ambient Noise Monitoring



RECEIVED
By Shire of Augusta Margaret River
13 September 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX D - COMPLAINTS REGISTER

Complaints Register

Ref. No.	Date	Name & Address of Complainant	Time/Date of Complaint	Detail of Complaint	Summary of Actions Taken	Shire Notified	Person Responsible

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX I – DUST MANAGEMENT PLAN

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

accendo AUSTRALIA

DUST MANAGEMENT PLAN

LOT 22 (9730) CAVES ROAD, HAMELIN BAY

August 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Telephone +61 418 950 852

info@accendoaustralia.com.au
PO Box 5178 West Busselton WA 6280
ABN 11 160 028 642

www.accendoaustralia.com.au

Document Control

Version	Date	Author	Reviewer
V1	20/8/2024	PN	KMT/Element
V2	30/8/2024	PN	KMT
Filename	2449_Lot 22 Caves Rd DMP_V2		

Limitations

This report has been prepared by Accendo Australia Pty Ltd in accordance with the scope limitations provided in this report, or as otherwise agreed, between the Client and Accendo.

This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

This report has been prepared based upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report, which Accendo has not independently verified or checked beyond the agreed scope of work. Accendo does not accept liability in connection with such unverified information.

The conclusions and recommendations in this report are based on assumptions made by Accendo described in this report where and as they are required. Accendo disclaims liability arising from any of the assumptions being incorrect.

The report is based on site specific conditions encountered and information received at the time of preparation of this report or the time that site investigations were undertaken. Accendo disclaims responsibility for any changes that may have occurred after this time.

The preparation of this report has been undertaken and performed in a professional manner, in consideration of the scope of services and in accordance with environmental consulting practices. No other warranty is made.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

CONTENTS

1 INTRODUCTION 1
1.1 BACKGROUND 1
1.2 PURPOSE AND SCOPE 1
2 EXISTING ENVIRONMENT 2
2.1 LAND USE 2
2.2 SENSITIVE RECEPTORS 2
2.3 TOPOGRAPHY AND SOILS 2
2.4 CLIMATE 3
3 EXTRACTION ACTIVITIES 4
3.1 OPERATIONAL WORKS 4
3.1.1 Final Contours 5
3.1.2 Water Usage 5
4 POTENTIAL IMPACTS 6
4.1 DUST SOURCES 6
4.2 RISK ASSESSMENT 6
4.3 MANAGEMENT MEASURES 8
REFERENCES 12
FIGURES 13
APPENDIX A – EXCAVATION WORKS PLAN 14
APPENDIX B – WIND ROSES 15
APPENDIX C – POST EXTRACTION PLAN 16
APPENDIX D - COMPLAINTS REGISTER 17

TABLES

Table 1. Residential dwellings within 500 m of subject site 2
Table 2. Dust management measures 9

FIGURES

Figure 1. Regional Location of the Subject Site

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

1 INTRODUCTION

1.1 Background

McDougall Quarries Pty Ltd (the applicant) is proposing to extract lime sand and limestone from a 14 hectare (ha) area within Lot 22 (HSE 9730) Caves Road, Hamelin Bay (herein referred to as the subject site) (refer to **Figure 1** and **Appendix A**).

This application is made for a ten year period however, the exact life of the project is difficult to estimate as it will be dependent on supply and demand trends.

The available volume of sand (*insitu* volume of approximately 1,314,489 m^3) is to be extracted, commencing in the south and moving in a northerly direction before finishing in a stage along the east of the subject site (refer to **Appendix A**).

The slope of the final contours of the quarry will be approximately 30 m AHD which is consistent with the adjoining land.

Slopes of the batters at the end of excavation will be retained at 1:4 vertical to horizontal.

1.2 Purpose and Scope

This Dust Management Plan (DMP) has been prepared to fulfil the relevant requirements provided within the Shire of Augusta-Margaret River's (the Shire) *Local Planning Scheme No. 1* and *Local Planning Policy No. 3 Extractive Industries*. It is intended to provide the Shire, the public and relevant government agencies with an understanding of the proposal and the environmental strategies and commitments proposed to address dust emissions associated with the proposed land use. This document has been prepared to support and should be read in conjunction with, the *Environmental Management Plan* prepared by Accendo Australia (2024) for sand and limestone extraction within the subject site.

Recognised industry standard practices for dust control are well-established within Western Australia. The utilisation of these standard practices is proposed at the subject site to suppress dust and reduce potential impacts associated with dust emissions.

Management of these activities are an effective means to prevent adverse effects of dust. The purpose of this DMP is to review the risks and control measures to appropriately manage dust and mitigate its impact.

The scope of the DMP is to cover the following:

- Legislative and regulatory compliance;
- Existing environment;
- Risk assessment of potential dust sources and air quality impacts;
- Mitigation and measurement measures; and
- Roles and responsibilities in relation to dust management.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

2 EXISTING ENVIRONMENT

2.1 Land Use

The subject site is zoned 'General Agriculture' pursuant to the Shire's *Local Planning Scheme No.* 1 and has previously been used for agriculture. The subject site is currently used for pasture.

The surrounding properties are zoned 'Rural Residential' to the north, 'National Park and Nature Reserve' to the west and south and a mixture of 'General Agriculture', 'Priority Agriculture' and 'Landscape Amenity' to the east pursuant to the Shire *Local Planning Scheme No. 1*.

2.2 Sensitive Receptors

The Environmental Protection Authority (EPA) *Guidance for the Assessment of Environmental Factors* (June 2005) provides generic separation distances to assist in the determination of suitable buffers where industry may have the potential to affect the amenity of a sensitive land use. In particular, for extractive industries, a buffer distance of 300 m to 500 m is recommended from sensitive land uses.

The closest residential dwellings to the subject site are provided below and shown in **Appendix A.**

Table 1. Residential dwellings within 500 m of the subject site.

Address	Distance to subject site (m)
Lot 31 (18) Grosse Road	400 m
Lot 9001 (Hamelin Ridge Estate)	>415 m
Lot 28 (9789) Caves Road	526 m

The closest residential dwelling to the subject site is located approximately 400 m to the north east of the subject site. Hamelin Ridge Estate, where most dwellings are yet to be constructed, is located to the north of the subject site, at distances greater than 415 m from the boundary. An additional residential dwelling is located to the east of the subject site at a distance greater than 500 m away.

2.3 Topography and Soils

The current topography of the subject site can be described as variable with the elevation ranging from 30 m Australian Height Datum (AHD) through the eastern portion of the subject site to approximately 40m AHD in the west. Elevated areas are located throughout the subject site and range in elevation from approximately 45 m AHD to 60 m AHD (refer to **Appendix A**).

The subject site is located within the Leeuwin Zone landform within the Gracetown Ridge systems consisting of "*lateritic plateau containing sandy gravel, loamy gravel and grey sandy duplex*" and *"a limestone ridge, in the coastal edge of the Leeuwin Zone containing yellow deep sand and red deep sand",* respectively. (Tille 2006).

The subject site is located within the following sub-systems:

- Kilcarnup rocky dunes phase – Low to steep dunes (gradients 5-10%) not exposed to prevailing wines. Dark calcareous sands containing limestone rubble.
- Kilcarnup dunes (organic) phase – Steep dunes (gradients usually in excess of 20%) not exposed to prevailing winds. Deep pale calcareous sands with brown topsoil.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

2.4 Climate

The climate of the locality is classified as Mediterranean with warm to hot summers and cool wet winters.

The closest weather recording station is Cape Leeuwin (Station 9518). Temperatures are highest on average in February, at approximately 23.4°C. August has the lowest average temperature of the year of 11.3°C.

Rainfall for the area is approximately 950 mm per annum with approximately 88% of the rain falling during the winter months, April to October inclusive. Evaporation generally exceeds rainfall from October to March.

During the summer months the dominant wind in the mornings is from the south-east at 18 - 26 kms, swinging to the south-west at 37-46 kms in the afternoon. During winter, the winds are most commonly 18 - 26 kms with no dominant prevailing direction. During storms winds from the west and north-west can reach 74 kms (BoM 2020).

Rainfall intensity has been calculated using the Bureau of Meteorology (BoM) Intensity-Frequency-Duration (IFD) data system which yields the two hour 10 year average return interval storm event for the subject site as 38.3 mm/hr (refer to **Appendix B)**.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

3 EXTRACTION ACTIVITIES

The lime sand and limestone quarry will cover an area of approximately 14 ha, with a current maximum elevation ranging from 30 m AHD to 60 m AHD. It will be excavated to an elevation of 30 m AHD commencing in the south of the subject site and heading north. Extraction activities will be divided into seven stages, of 2.0 ha in size (refer to **Appendix A**).

It is estimated that the total maximum volume of material to be removed will be approximately 1,314,489 m^3. Over a ten year period, a maximum of approximately 131,449 m^3 will be excavated each year, depending on supply and demand.

Earthen bunds for noise mitigation will be constructed with topsoil and overburden that will be stripped from the extraction footprint and other areas within the premise boundary. Construction of the bunds will be undertaken with an excavator and loader.

The planned end use of the quarry is to restore a natural soil profile and return the extraction area to pasture, ensuring that there is no net loss of agricultural land.

3.1 Operational Works

Using a loader, the topsoil (where available) will be stripped and placed in stockpiles. Overburden, if present, will be removed using a dump truck and stockpiled to a convenient location within each extraction stage for operations. Topsoil stockpiles will be less than 2 m high with a batter no greater than 1:3.

In order to comply with noise regulations, surface works with the dozer must commence from the western most point and clear a sufficient area on the western side of Stage 1 to reach the material. Once a sufficient depth (5-6m) is achieved within Stage 1, progression of the pit through to Stage 2 can continue with the use of the dozer (Herring Storer Acoustics, 2024).

The material will be excavated by an excavator, bulldozer or loader to a stockpile or loaded directly to waiting trucks for transport. A summary of the proposed extraction activities is provided below:

- Prior to excavation commencing the site will be ground surveyed, the excavation footprint marked out and a 1 m contour plan developed.
- The topsoil/overburden will be stripped and used to construct earthen bunds using a loader.
- An excavator or front-end loader will be used to dig the sand and transport it to a stockpile.
- The sand will then be picked up by a loader and loaded to trucks for transport.
- All static and other equipment, will be located on the floor of the quarry to provide visual and acoustic screening.
- Excavation will commence in the south of the quarry initially moving north before returning to the east to complete extraction works. The face and walls of the pit will act as noise barriers.
- Crushing and screening of material may be required. Where crushing and screening is required noise bunds will be constructed to ensure compliance with the noise regulations.
- Upon completion of each section of quarry, the section will be reformed and back filled using a combination of equipment such as a tracked bobcat, excavator and front end loader, where subgrade material is available, to achieve the proposed final contours.
- At the end of excavation, the noise bunds will be removed, and the floor of the quarry will be deep ripped, covered by overburden and topsoil, and rehabilitated to a constructed soil.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

3.1.1 Final Contours

The final surface contours of the quarry will be approximately 30 m AHD which is consistent with the adjoining land.

Slopes of the batters at the end of excavation will be retained at 1:4 vertical to horizontal (refer to **Appendix C**).

3.1.2 Water Usage

Water is only required for dust suppression within the quarry and the access road. Water will be sourced either onsite or nearby. Should an onsite source be required, a DWER licence will be obtained for the extraction of water.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

4 POTENTIAL IMPACTS

4.1 Dust Sources

The proposed extraction activities will involve the disturbance of large quantities of soil and earthen material. Specifically, this may include the following activities:

- Earthworks during extraction activities;
- Topsoil stripping;
- Loading and transportation of material;
- Screening of material;
- Vehicle movement within the site; and
- Wind erosion of exposed surfaces.

These activities have the potential to generate dust that, if not adequately controlled, can cause nuisance and safety risks. In-pit operations tend to generate less dust than surrounding activities due to the reduced airflow within the pit. The removal and replacement of topsoil material has the highest risk associated with dust generation due to the large volumes of material involved and generally lower levels of soil moisture.

4.2 Risk Assessment

In accordance with the DWER's "*A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities*", a risk assessment for dust emissions has been prepared (DWER 2021).

For a site that is generating uncontaminated dust, such as extractive industry sites, the site classification chart in Appendix 1 of the DWER guideline can be used for assessing the site risk. Appendix 1 also details the provisions and contingency arrangements for dust management which apply to each site classification score.

The site classification assessment is provided below.

Part A. Nature of site

Item	**Score Options**				**Score**
1.Nuisance potential of soil when disturbed	Very low - 1	Low – 2 *Material is of coarse composition*	Medium - 4	High - 6	2
2. Topography and protection provided by undisturbed vegetation	Sheltered and screened - 1	Medium screening – 6 *Screening provided by stabilised bunds and roadside vegetation*	Little screening – 12	Exposed and wind prone - 18	6

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

3. Area of site disturbed by the works	Less than 1ha - 1	Between 1 and 5ha – 3 *Excavation will occur in stages less than 2 ha.*	Between 5 and 10ha – 6	More than 10ha - 9	3
4. Type of work being done	Roads and trenches - 1	Roads, drains and medium deep sewers - 3	Roads, drains, sewers and partial earthworks - 6	Bulk earthworks – 9 *Sand extraction*	9
Total score for Part A					20

Part B. Proximity of site to other land uses

Item	**Score Options**				**Score**
1.Distance of other land uses from site	More than 1km - 1	Between 1km and 500m – 6	Between 100m and 500m - 12	Less than 100m - 18	12
2. Affect of prevailing wind direction (easterly) on other land uses	Not affected - 1	Isolated land uses affected by one wind direction – 6	Dense land uses affected by one wind direction – 9	Dense/sensitive land uses highly affected by prevailing winds - 12	6
Total score for Part A					18

Site Classification Score (A x B) = 360

Classification 2 (score between 200 and 399, considered **Low risk**). The provisions, contingency arrangements and monitoring requirements as specified by the DWER (2011) associated with a Classification 2 proposal are provided below.

Provisions:

The developer shall supply a contingency plan to the local government, which shall detail the activities should dust impacts occur.

Contingency arrangements:

If required, include an allowance for water-cart operation, wind fencing and surface stabilisation during the construction period for the purposes of dust suppression.

All areas of disturbed land should be stabilised to ensure that the disturbed area exposed at any time is kept to a practical minimum.

Monitoring requirements:

Complaints management system in place.

Notice to be erected at the site providing contact details of the person to be contacted.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

4.3 Management Measures

While the potential impacts to amenity from dust emissions are considered low, standard dust suppression measures will be implemented during operation activities, as provided within **Table 2**.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Table 2. Dust management measures.

Legislation and Key Standards		
Environmental Protection Act 1986 (EP Act) *A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities* (DEC 2011)		
Objectives		
• Minimise dust lift during all activities. • No adverse dust impacts to sensitive receptors from the quarry operations.		
Targets		
• No visible dust beyond the property boundary. • No dust complaints.		
Management Actions		
Description	**Responsibility**	**Timing**
Notice to be erected at the site, providing contact details of the person to be contacted regarding the works. This person will also be available outside of operational hours to address any complaints.	Site Manager	Prior to extraction
Induction for all employees will include information on: • Potential sources of dust • Dust Management Plan • Speed limits onsite and staying on designated roads • Reporting procedure for dust issues	Site Manager	Prior to extraction
Topsoil stripping shall not occur during the following conditions: • Winds in excess of 30 km/hr;	Site Manager	Topsoil stripping and bund construction

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Areas of land cleared and the period of time they remain cleared are to be kept to a minimum.	Site Manager	At all times
Water trucks are to water down unsealed roads during operation to reduce dust lift.	Site Manager	As required
Stockpiles, will be limited to 3 m in height.	Machine Operator	At all times
Temporary stockpiles and exposed areas will be watered and stabilised as required. Stabilisation techniques that will be considered depending on environmental conditions will include hydro-mulching.	Site Manager	As required
Transport of dust-prone material will be via covered trucks or dampened prior to transport to prevent dust lift during transport.	Drivers	During soil transport activities
Water trucks are to be available at all times during quarry activities to water the site on observation of dust lift.	Site Manager	As required
Vehicle speeds will be restricted to no more than 30km/hr on the site to minimize dust lift off.	Drivers	At all times
Wind fencing and soil stabilisation equipment will be available for commissioning if required.	Site Manager	As required
Maintain a complaints register (refer to **Appendix D**). A Complaints Register will be established for the site to record the following information: • Date, time, location and nature of the exceedance. • Identify the cause (or likely cause) of the exceedance and responsible parties. • Identify the activities that were occurring at the time of the non-compliance. • Determine the activities that were most likely contributing to the non-compliance. • Describe what action has been taken to date. • Describe the proposed measures to address the exceedance.	Site Manager	As required

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Monitoring			
Description	**Parameter**	**Responsibility**	**Frequency**
Visual monitoring of dust will be ongoing throughout the day during operations. All monitoring is to be maintained on a logging sheet for reference and proof of compliance.	Dust lift and signs of dust deposition near property boundary. Evidence of no visible dust crossing the site boundary will be used as the visual monitoring criteria for compliance.	Site Manager	Continuous

Contingency and Corrective Actions		
Incident or Consequence	**Corrective Action**	**Responsibility**
Observation of excessive dust lift onsite	Report and investigate as incident.	Site Manager
	Halt work within proximity of the area until cause of dust is addressed.	Site Manager
	Increase dust mitigation measures (e.g. additional watering of exposed areas).	Site Manager
Complaint received	Report and investigate as incident. To determine the validity of the complaint, the wind direction, wind speed and activities being undertaken on site at the time of the complaint will be established.	Site Manager
	If required, halt work until cause of dust is addressed.	Site Manager
	If the complaint is verified as being due to a site source, remedial action will be undertaken within 2 hours. The Shire will be advised of all complaints as soon as they are received. If a complaint cannot be resolved within the 2 hour response period, it may be necessary to cease operations.	Site Manger
	Review dust management procedures and adjust if deemed necessary.	Site Manager

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

REFERENCES

Accendo Australia (2024). *Works and Excavation. Plan, Lot 22 (9730) Caves Road, Hamelin Bay*. Busselton, WA.

Barnesby, B.A. and Proulx-Nixon, M.E. (2000). *Land resources from Harvey to Capel on the Swan Coastal Plain, Western Australia - Sheets 1 and 2.* Land Resources Maps No. 23/1 and 23/2. Agriculture Western Australia.

Churchward, H.M. and McArthur, W.M. (1978). Landforms and soils of the Darling System, Western Australia. In *'Atlas of Natural Resources, Darling System, Western Australia'*. Department of Conservation and Environment, Western Australia.

Department of Primary Industries and Regional Development (DPRD) (2019). *Interpolated contours lines at 2 metre intervals database*. Accessed August 2021.

Environmental Protection Authority (EPA) (2005). *Guidance for the Assessment of Environmental Factors.*

Environmental Protection Authority (EPA) (2006). *Guidance Statement No.10 for the Assessment of Environmental Factors (in accordance with the EP Act 1986: Levels of Assessment for Proposals Affecting Natural Areas Within the System 6 Region and Swan Coastal Plain Portion of the System 1 Region.*

Environmental Protection Authority (EPA) (2009). *South West Regional Ecological Linkages.* Bulletin No 8. Retrieved from: http://epa.wa.gov.au/EPADocLib/3040_SWREL_EPB821009.pdf

Geological Survey of Western Australia (1978). *Geology and mineral resources of Western Australia, memoir 3*. Geological Survey of Western Australia, Perth, WA.

Heddle, E.M., Loneragan, O.W. and Havel, J.J. (1980). *Darling Systems – Vegetation Complexes, In: Atlas of Natural Resources Darling System*, Western Australia, Department of Conservation and Environment, Perth.

Molly, S., Wood, J. Hall, S., Wallrodt, S. & Whisson, G. (2009). *South West Regional Ecological Linkages Technical Report*. Available from: http://walga.asn.au/AboutWALGA/Policy/SouthWestBiodiversityProject/SouthWestRegionalEcologicalLinkagesTechnicalReport.aspx

Semeniuk, C. A. & Semeniuk, V. (1995). *A geomorphic approach to global classification for inland wetlands*. Vegetation, 118, 103-124.

Thackway, R, and Cresswell, ID, (Eds) (1995). *An Interim Biogeographic Regionalisation for Australia: a framework for establishing the national system of reserves*, Version 4.0. Australian Nature Conservation Agency, Canberra.

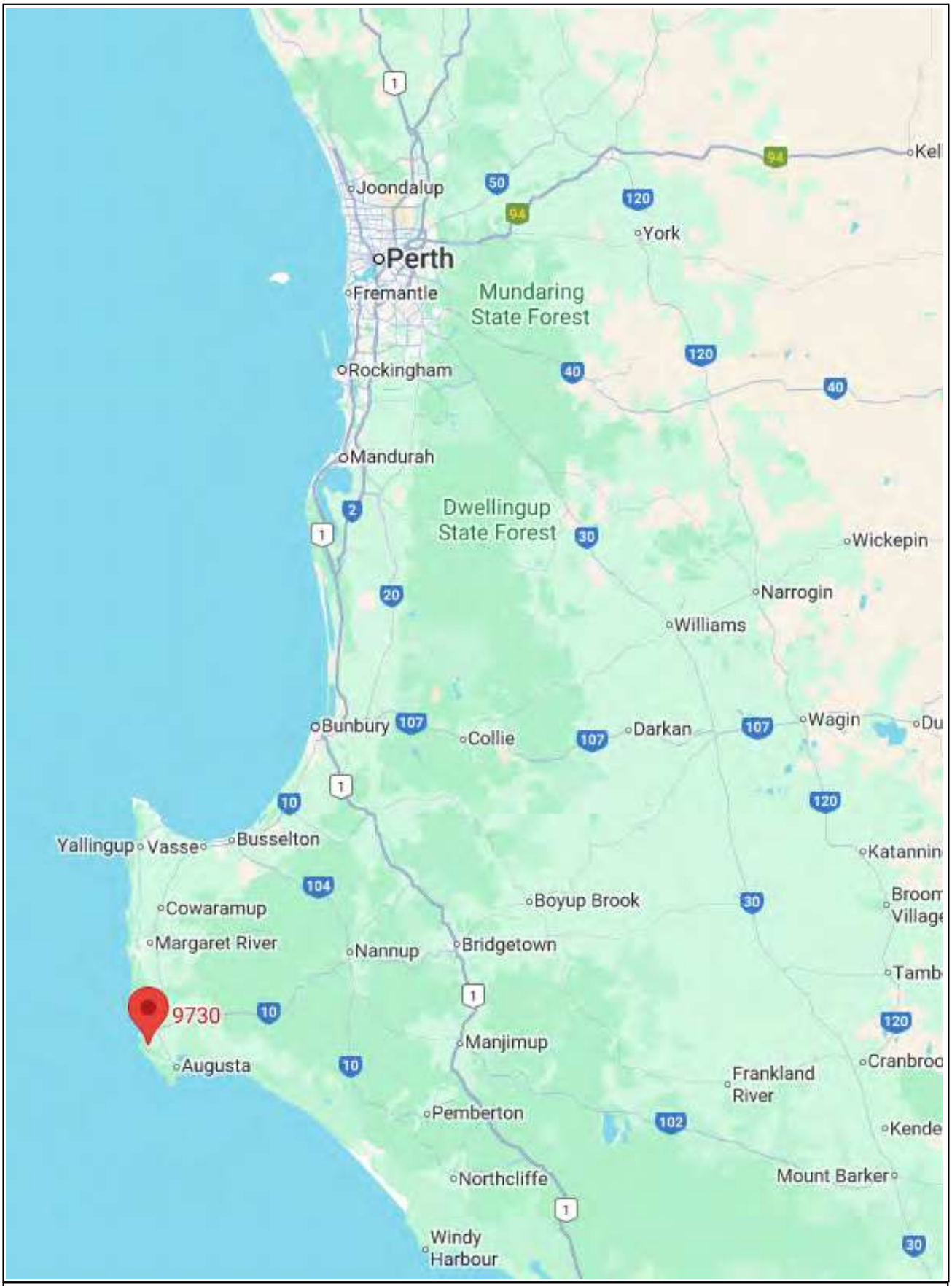
Tille, P (2006). Soil-Landscape Zones of the WA Rangelands and Interior.

Western Australian Planning Commission (WAPC) (2007). *Planning Bulletin No. 64: Acid Sulfate Soils*, Western Australian Planning Commission, Western Australia.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

FIGURES

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



PROJECT	Lot 22 Caves Road, Hamelin Bay	Project Number	Drawing Number	Revision
		2449	Figure 1	A
DRAWING TITLE	Figure 1 - Regional location of the subject site	Designed PN	Checked	
		Drawn PN	Approved	
CLIENT	McDougall Quarries Pty Ltd	Date	20/8/2024	
		Local Authority	City of Busselton	
		Sheet 1 of 1		

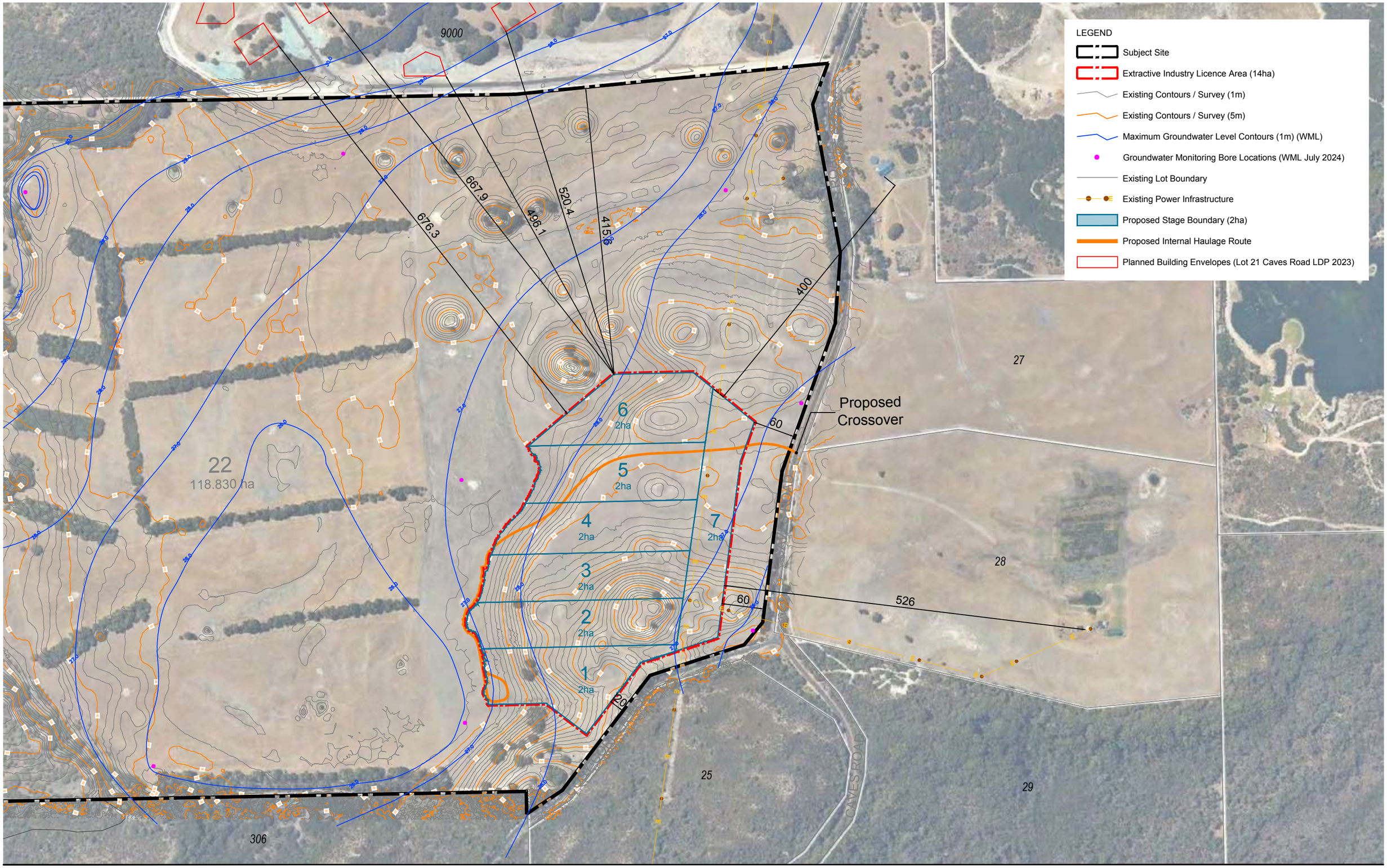
This drawing has been prepared by, and remains the property of Accendo Australia Pty Ltd. This drawing shall not be used without permission. The drawing shall be preliminary only and/or not for construciton until signed approved.

PO Box 5178
West Busselton
Western Australia 6280
Mobile 0418 950 852

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX A – EXCAVATION WORKS PLAN

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Excavation Works Plan

Lot 22 (9730) Caves Road, Hamelin Bay

Date: 26 Aug 2024 Scale: 1:5000 @ A3 1:2500 @ A1 File: **24-132 EX01B** Staff: DL CCG JJ Checked: DL

0 100m

element.

Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
PO Box 7375 Cloisters Square, Perth Western Australia 6850.
T. +61 8 9289 8300 | **E.** hello@elementwa.com.au **elementwa.com.au**

© Element Advisory WA Pty Ltd

This concept has been prepared for the purpose of meeting client specifications. The drawing does not constitute an invitation,agreement or contract (or any part thereof) of any kind whatsoever. Although care has been taken in the compilation of this drawing by Element Advisory WA Pty Ltd, all parties associated with the proposed property development disclaim all responsibility for any errors or omissions. The right is reserved to change the plan at any time. Liability is expressly disclaimed by Element Advisory WA Pty Ltd for any loss or damage which may be sustained by any person acting on any visual impression gained from this drawing.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX B – WIND ROSES

Rose of Wind direction versus Wind speed in km/h (01 Jan 1907 to [illegible]19)

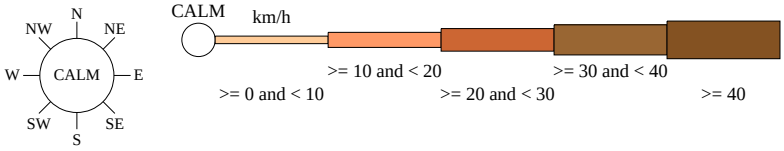
RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Custom times selected, refer to attached note for details

CAPE LEEUWIN

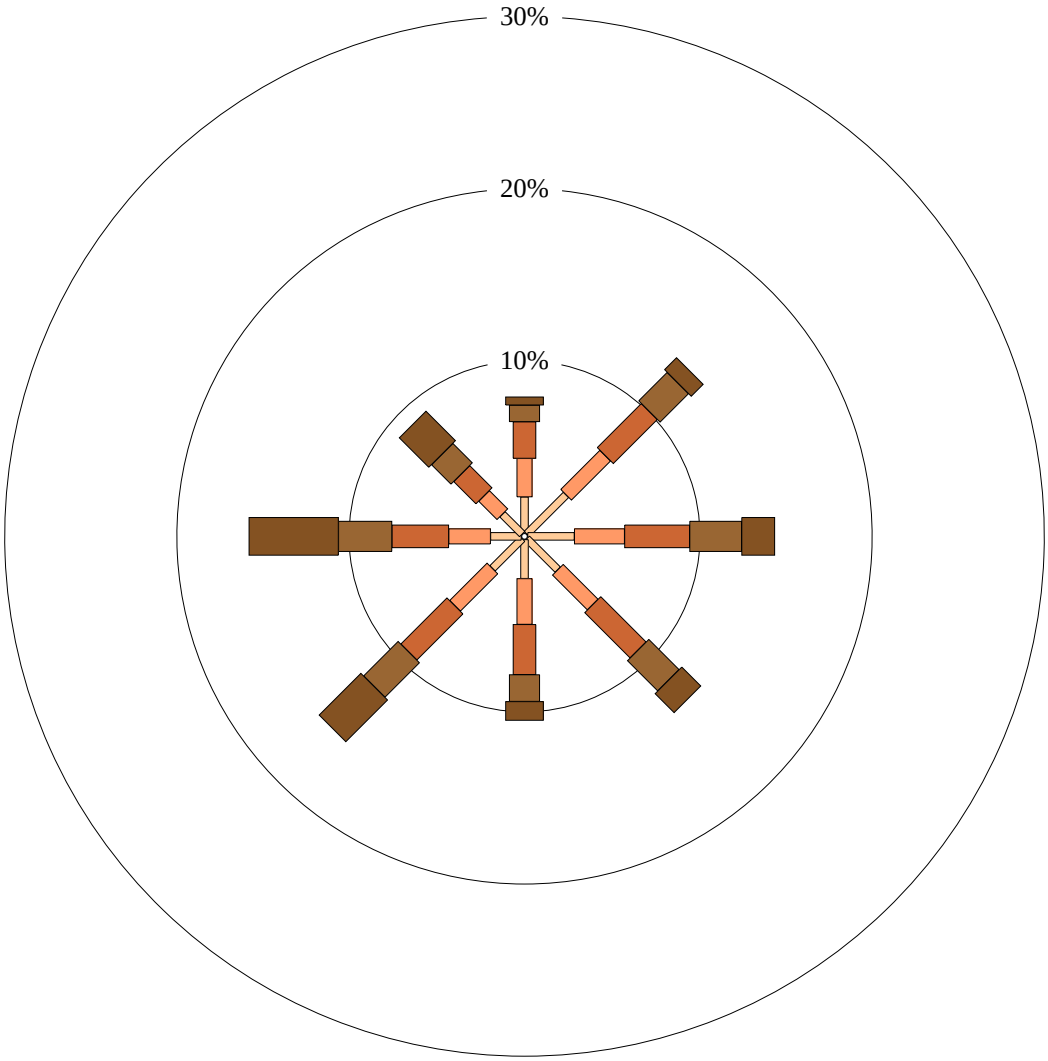
Site No: 009518 • Opened Jan 1897 • Still Open • Latitude: -34.3728° • Longitude: 115.1358° • Elevation 13m

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



9 am
40676 Total Observations

Calm 1%



Australian Government
Bureau of Meteorology

Copyright © *Commonwealth of Australia 2019 . Prepared on 31 Jul 2019*
Prepared by the Bureau of Meteorology.
Contact us by phone on (03) 9669 4082, by fax on (03) 9669 4515, or by email on climatedata@bom.gov.au
We have taken all due care but cannot provide any warranty nor accept any liability for this information.

Rose of Wind direction versus Wind speed in km/h (01 Jan 1907 to [illegible]19)

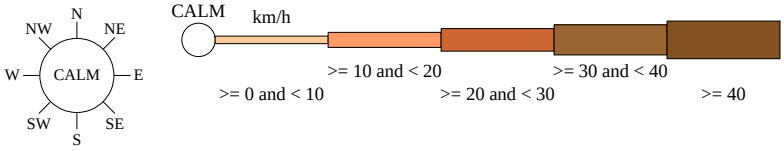
RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Custom times selected, refer to attached note for details

CAPE LEEUWIN

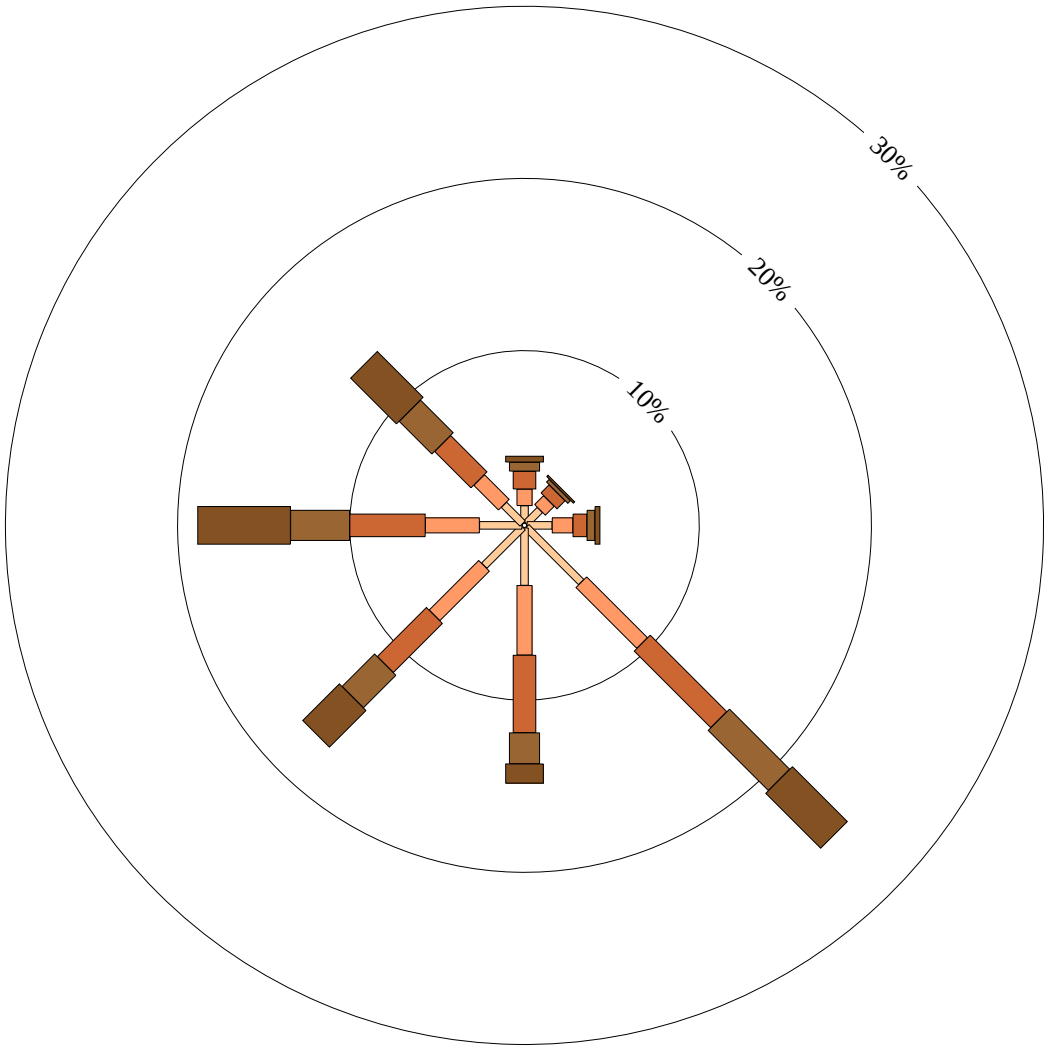
Site No: 009518 • Opened Jan 1897 • Still Open • Latitude: -34.3728° • Longitude: 115.1358° • Elevation 13m

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



3 pm
40648 Total Observations

Calm 1%



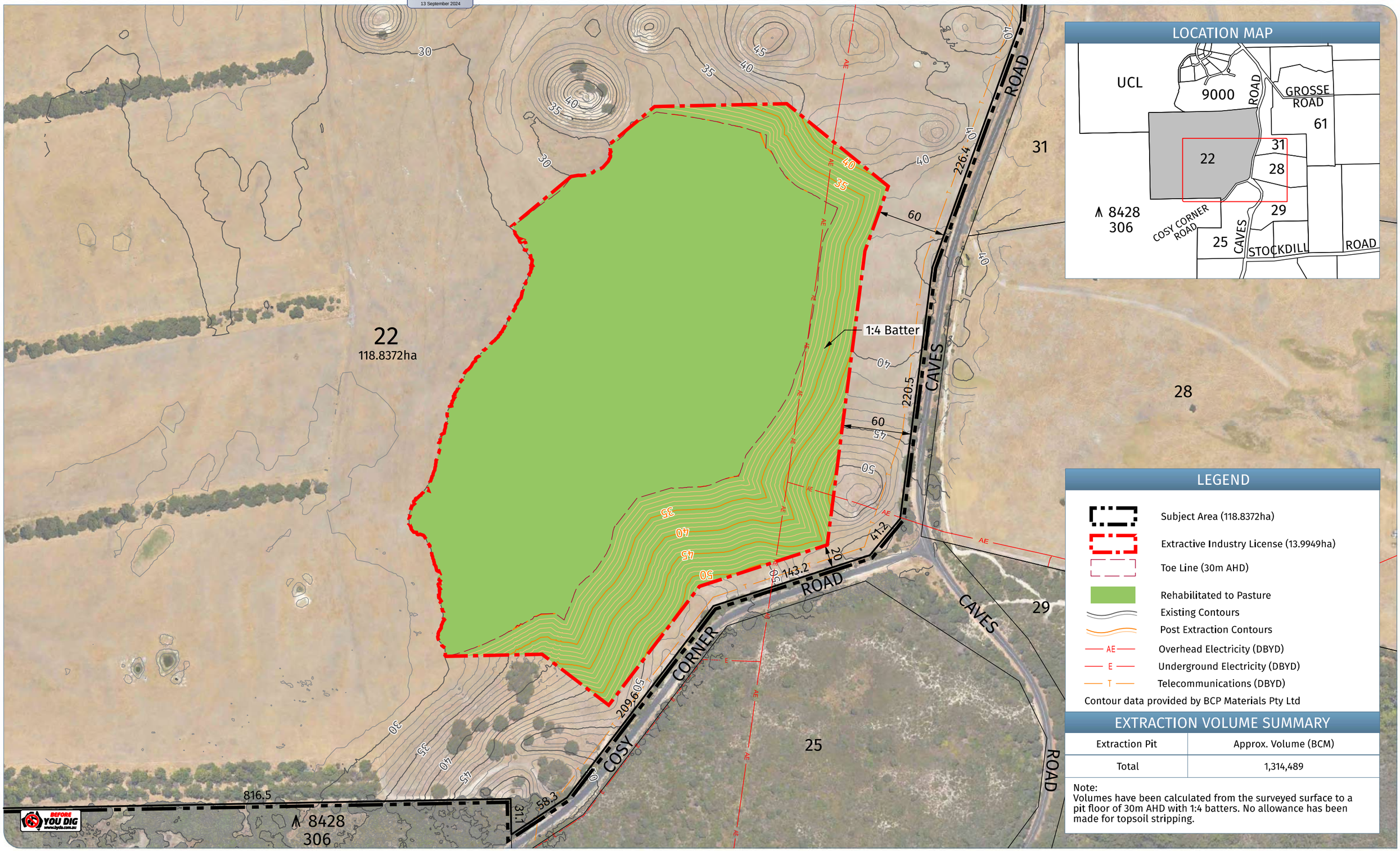
Australian Government
Bureau of Meteorology

Copyright © *Commonwealth of Australia 2019 . Prepared on 31 Jul 2019*
Prepared by the Bureau of Meteorology.
Contact us by phone on (03) 9669 4082, by fax on (03) 9669 4515, or by email on climatedata@bom.gov.au
We have taken all due care but cannot provide any warranty nor accept any liability for this information.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX C – POST EXTRACTION PLAN

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



LOCATION MAP

LEGEND

- Subject Area (118.8372ha)
- Extractive Industry License (13.9949ha)
- Toe Line (30m AHD)
- Rehabilitated to Pasture
- Existing Contours
- Post Extraction Contours
- AE — Overhead Electricity (DBYD)
- E — Underground Electricity (DBYD)
- T — Telecommunications (DBYD)

Contour data provided by BCP Materials Pty Ltd

EXTRACTION VOLUME SUMMARY

Extraction Pit	Approx. Volume (BCM)
Total	1,314,489

Note:
Volumes have been calculated from the surveyed surface to a pit floor of 30m AHD with 1:4 batters. No allowance has been made for topsoil stripping.

POST EXTRACTION PLAN

Lot 22 (No. 9730) Caves Road, HAMELIN BAY

Plan No.	24210-01	
Date	27/06/24	
Drawn	JW	
Checked	DJ	
Revision	C	
Scale	1:3000@A3	0 40m 80m

BUNBURY OFFICE:
21 Spencer Street,
BUNBURY WA 6230
T: 08 9792 6000
E: bunbury@harleydykstra.com.au
W: www.harleydykstra.com.au
ALBANY | BUNBURY | BUSSELTON | FORRESTDALE | PERTH

COPYRIGHT:
This document is and shall remain the property of HARLEY DYKSTRA.
The document may only be used for the purpose for which it was commissioned and in accordance with the terms of engagement for the commission.
Unauthorised use of this document in any form whatsoever is prohibited

NOTE: This plan has been prepared for planning purposes. Areas, Contours and Dimensions shown are subject to survey

Harley Dykstra
PLANNING & SURVEY SOLUTIONS

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX D - COMPLAINTS REGISTER

Complaints Register

Ref. No.	Date	Name & Address of Complainant	Time/Date of Complaint	Detail of Complaint	Summary of Actions Taken	Shire Notified	Person Responsible

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX J – REHABILITATION MANAGEMENT PLAN

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

accendo AUSTRALIA

REHABILITATION MANAGEMENT PLAN

LOT 22 (9730) CAVES ROAD, HAMELIN BAY

August 2023

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Telephone +61 418 950 852

info@accendoaustralia.com.au
PO Box 5178 West Busselton WA 6280
ABN 11 160 028 642

www.accendoaustralia.com.au

Document Control

Version	Date	Author	Reviewer
V1	25/08/2024	PN	KMT/Element
V2	30/08/2024	PN	KMT
Filename	2449_Lot 22 Caves Rd RMP_v2		

Limitations

This report has been prepared by Accendo Australia Pty Ltd in accordance with the scope limitations provided in this report, or as otherwise agreed, between the Client and Accendo.

This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

This report has been prepared based upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report, which Accendo has not independently verified or checked beyond the agreed scope of work. Accendo does not accept liability in connection with such unverified information.

The conclusions and recommendations in this report are based on assumptions made by Accendo described in this report where and as they are required. Accendo disclaims liability arising from any of the assumptions being incorrect.

The report is based on site specific conditions encountered and information received at the time of preparation of this report or the time that site investigations were undertaken. Accendo disclaims responsibility for any changes that may have occurred after this time.

The preparation of this report has been undertaken and performed in a professional manner, in consideration of the scope of services and in accordance with environmental consulting practices. No other warranty is made.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

CONTENTS

1 INTRODUCTION 1
1.1 BACKGROUND 1
1.2 PURPOSE 1
2 EXISTING ENVIRONMENT 2
2.1 LAND USE 2
2.2 TOPOGRAPHY AND SOILS 2
2.3 CLIMATE 2
2.4 VEGETATION AND FAUNA 3
2.5 HYDROLOGY 5
3 EXTRACTION ACTIVITIES 6
4 REHABILITATION MANAGEMENT PLAN 7
4.1 OBJECTIVES 7
4.2 EXTRACTION AREA 7
4.2.1 Topsoil and Overburden Removal 7
4.2.2 Landform Reconstruction and Contouring 8
4.2.3 Site Preparation 8
4.3 LANDSCAPING 8
4.3.1 Site Preparation 8
4.4 WEED MANAGEMENT 9
4.4.1 Weed Control 9
4.4.2 Weed Management Plan 9
4.5 REHABILITATION 10
4.5.1 Pasture 10
4.5.2 Landscaping 10
4.6 MAINTENANCE 11
4.7 MONITORING AND REPORTING 11
4.7.1 Completion Criteria 11
4.8 SCHEDULING 11
4.9 DECOMMISSIONING 12
REFERENCES 13
FIGURES 14

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX A – EXCAVATION WORKS PLAN 15

APPENDIX B – SCREENING VEGETATION PLAN 16

TABLES

Table 1. Rehabilitation Objectives.....6

Table 2. Weed Control Treatment.....7

Table 3. Management actions for weed control.....8

FIGURES

Figure 1. Regional Location of the Subject Site

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

1 INTRODUCTION

1.1 Background

McDougall Quarries Pty Ltd (the applicant) is proposing to extract lime sand and limestone from a 14 hectare (ha) area within Lot 22 (HSE 9730) Caves Road, Hamelin Bay (herein referred to as the subject site) (refer to **Figure 1** and **Appendix A**).

This application is made for a ten year period however, the exact life of the project is difficult to estimate as it will be dependent on supply and demand trends.

The available volume of sand (*insitu* volume of approximately 1,314,489 m^3) is to be extracted, commencing in the south and moving in a northerly direction before finishing in a stage along the east of the subject site (refer to **Appendix A**).

1.2 Purpose

This Rehabilitation Management Plan has been prepared to fulfil the relevant requirements provided within the Shire of Augusta-Margaret River's (the Shire) *Local Planning Scheme No. 1* and the Shire's *Extractive Industries Policy 3*. It is intended to provide the Shire of Augusta-Margaret River, the public and relevant government agencies with an understanding of the proposal and the environmental strategies and commitments proposed to address rehabilitation of the site post extraction activities.

The Plan will describe the proposed management measures necessary to ensure the return of the subject site to a safe and stable landform capable of supporting agriculture (pasture).

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

2 EXISTING ENVIRONMENT

2.1 Land Use

The subject site is zoned 'General Agriculture' pursuant to the Shire's *Local Planning Scheme No.* 1 and has previously been used for agriculture.

The surrounding properties are zoned 'Rural Residential' to the north, 'National Park and Nature Reserve' to the west and south and a mixture of 'General Agriculture', 'Priority Agriculture' and 'Landscape Amenity' to the east pursuant to the Shire *Local Planning Scheme No. 1*.

2.2 Topography and Soils

The current topography of the subject site can be described as variable with the elevation ranging from 30 m Australian Height Datum (AHD) through the eastern portion of the subject site to approximately 40m AHD in the west. Elevated areas are located throughout the subject site and range in elevation from approximately 45 m AHD to 60 m AHD (refer to **Appendix A**).

The subject site is located within the Leeuwin Zone landform within the Gracetown Ridge systems consisting of "*lateritic plateau containing sandy gravel, loamy gravel and grey sandy duplex*" and *"a limestone ridge, in the coastal edge of the Leeuwin Zone containing yellow deep sand and red deep sand",* respectively. (Tille 2006).

The subject site is located within the following sub-systems:

- Kilcarnup rocky dunes phase – Low to steep dunes (gradients 5-10%) not exposed to prevailing wines. Dark calcareous sands containing limestone rubble.
- Kilcarnup dunes (organic) phase – Steep dunes (gradients usually in excess of 20%) not exposed to prevailing winds. Deep pale calcareous sands with brown topsoil.

2.2.1 Acid Sulfate Soils

Acid Sulfate Soils (ASS) is the common name given to naturally occurring soil and sediment containing iron sulfides. They have become a potential issue in land development projects on the Swan Coastal Plain when the naturally anaerobic conditions in which they are situated are disturbed and they are exposed to aerobic conditions and subsequently oxidise. When oxidised, ASS produce sulfuric acid, which can result in a range of impacts to the surrounding environment. ASS that has oxidised and resulted in the creation of acidic conditions are termed "Actual ASS" (AASS), and those that have acid generating potential but remain in their naturally anaerobic conditions are termed "Potential ASS" (PASS).

ASS risk mapping (DWER 2021) indicates that there is a 'nil risk' of ASS occurring within the subject site. This proposal involves the excavation of material above the watertable (at least 2 m separation to maximum groundwater levels will be maintained at all times) and no dewatering will be undertaken during excavation works. Accordingly, the potential impacts associated with ASS are expected to be low and therefore no further investigations regarding ASS are considered necessary.

2.3 Climate

The climate of the locality is classified as Mediterranean with warm to hot summers and cool wet winters.

The closest weather recording station is Cape Leeuwin (Station 9518). Temperatures are highest on average in February, at approximately 23.4°C. August has the lowest average temperature of the year of 11.3°C.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Rainfall for the area is approximately 950 mm per annum with approximately 88% of the rain falling during the winter months, April to October inclusive. Evaporation generally exceeds rainfall from October to March.

During the summer months the dominant wind in the mornings is from the south-east at 18 - 26 kms, swinging to the south-west at 37-46 kms in the afternoon. During winter, the winds are most commonly 18 - 26 kms with no dominant prevailing direction. During storms winds from the west and north-west can reach 74 kms (BoM 2020).

Rainfall intensity has been calculated using the Bureau of Meteorology (BoM) Intensity-Frequency-Duration (IFD) data system which yields the two hour 10 year average return interval storm event for the subject site as 38.3 mm/hr.

2.4 Vegetation and Fauna

Given the condition of vegetation within the subject site and the current land use (livestock grazing and pasture), no flora of conservation significance is likely to occur. Furthermore, mapping prepared by the Department of Biodiversity, Conservation and Attractions (DBCA) does not indicate the presence of any Declared Rare Flora (DRF) species mapped in proximity to the subject site.

Vegetation within the extraction area is in a 'Completely Degraded' condition sowed crops on the flat areas and isolated hills containing *Agonis flexuosa* with no mid or under storey present (refer to **Plates 1** to **3**).



Plate 1: Sowed crops in the foreground with hills with Peppermint trees in background.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Plate 2: View from top of hill looking across extraction area



Plate 3: View across the extraction area towards hill with Peppermint and no understorey.

A search of the DBCA's and EPBC databases found one TEC endorsed under State and Commonwealth legislation and policy recorded within proximity to the subject site. This was the *Empodisma* peatlands of southwestern Australia ecological community.

None of the vegetation within the subject site is representative of this TEC due to the 'completely degraded' condition of the vegetation and the absence of suitable soil types associated with this TEC.

The presence of preferential foraging species within the subject site such as Peppermints represents potential WRP habitat, albeit marginal in quality due to the absence of canopy connectivity and understorey. The extraction footprint has been designed to avoid this vegetation as far as practicable however the removal of some Peppermint trees will be required. The subject site contains less than approximately 0.1 ha of potential habitat which will be removed. However, given the degraded nature of the vegetation and its lack of connectivity to surrounding vegetation this is unlikely to be significant to the WRP population in the local area.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

2.5 Hydrology

2.5.1 Groundwater

The subject site is located within the Cape to Cape South subarea of the *Rights in Irrigation and Water Act 1914* (RiWI Act) proclaimed Blackwood Groundwater Area.

A technical memorandum prepared by WML Consulting Engineers (WML, 2024) reviewed data from the Urban Water Management Plan (UWMP) for the Hamelin Ridge subdivision located directly to the north of the subject site. Additionally, eight bores were installed within the subject site and groundwater levels were measured on the 25th July 2024.

Based on the results from the July groundwater monitoring event and the data from the UWMP for the Hamelin Ridge subdivision, groundwater levels have been estimated to range from approximately 28 m AHD in at the northeastern boundary to approximately 25 m AHD at the southeastern boundary. Given a maximum excavation depth of 30 m AHD, at least 2 m of separation to groundwater is expected to be achieved at all times.

2.5.2 Surface Water

The subject site is located in the Turner subarea of the RiWI Act proclaimed Cape to Cape South surface water area. The subject site is not proclaimed under the *Country Areas Water Supply Act 1947* as a public drinking water source area.

There are no surface water features present within the subject site. The property has three dams, two located to the north west of the subject site and one to the south west. A buffer of greater than 200 m will be maintained from the extraction area to all onsite dams.

The current water cycle within the subject site consists of inputs from rainwater flowing downhill towards the wider drainage system located to the south and east of the subject site. The development is not proposing to alter this process, as there are no drainage lines within the proposed extraction area.

2.5.3 Wetlands

Areas of wetlands in Western Australia have been mapped and this mapping has been converted into a digital dataset that is maintained by the DBCA and is referred to as the '*Geomorphic Wetlands Augusta to Walpole'* dataset. Pursuant to this dataset, there are no mapped wetlands within the subject site. The closest wetlands to the subject site are located to the southeast and are greater than 300m from the extraction area boundary.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

3 EXTRACTION ACTIVITIES

The lime sand and limestone quarry will cover an area of approximately 14 ha, with a current maximum elevation ranging from 30 m AHD to 60 m AHD. It will be excavated to an elevation of 30 m AHD commencing in the south of the subject site and heading north. Extraction activities will be divided into seven stages, of 2.0 ha in size (refer to **Appendix A**).

It is estimated that the total maximum volume of material to be removed will be approximately 1,314,489m^3. Over a ten year period, a maximum of approximately 131,489 m^3 will be excavated each year, depending on supply and demand.

Earthen bunds for noise mitigation will be constructed with topsoil and overburden that will be stripped from the extraction footprint and other areas within the premise boundary. Construction of the bunds will be undertaken with a scraper and dozer.

The planned end use of the quarry is to restore a natural soil profile and return the extraction area to pasture, ensuring that there is no net loss of agricultural land.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

4 REHABILITATION MANAGEMENT PLAN

4.1 Objectives

The objective is to return the land to a condition capable of supporting agricultural activities, with pasture production rates equivalent to or better than pre-mining production rates. This will include dryland pasture with a variety of species.

Table 1. Rehabilitation Objectives

Land Use	Closure Objectives	Completion Criteria	Performance Criteria	Measurement Tool
Agriculture	A self sustaining cover of pasture	Crops cover the extraction area after completion of the rehabilitation works.	Less than 10% bare ground	Annual monitoring as provided in **Section 4.8**
	Weed levels that are not likely to impact on the viability of the reconstructed soils	No declared weed species are present. Weed species are not competing with cover crop across the site.	Declared weed species absent from the rehabilitation area.	Annual monitoring as provided in **Section 4.8**
	A safe and stable landform suitable for the proposed future land use	No areas of erosion or soil collapse are observed.	Rehabilitation surface remains flat and stable, with no evidence of surface erosion.	Annual monitoring as provided in **Section 4.8**
Landscaping	Provide vegetative screening and an ecological linkage along Caves Road and Cosy Corner Road	Provision of one plant (*Agonis flexuosa)* every 5 m along planting area demarcated in **Appendix B**.	85% survival rate for *Agonis flexuosa* planted within the vegetation corridors.	Annual monitoring as provided in **Section 4.8**

4.2 Extraction Area

4.2.1 Topsoil and Overburden Removal

Topsoil is an integral part of rehabilitation as it contains organic matter and a seed bank which assists in establishing vegetation when respread on disturbed areas.

Topsoil at the subject site, where available, will be stripped and stockpiled separately, prior to commencing quarrying.

The soils will be stripped in a dry state to preserve soil structure and stripping will be undertaken in relatively still weather conditions. Management of the topsoil will involve the following:

- Stockpiles will be located sufficiently distant from quarrying operations so that they will not be disturbed prior to being used in rehabilitation.
- Soil stripping should be avoided during wet conditions.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

- The dimensions of the topsoil stockpiles will not exceed 2 m in height. This is to prevent topsoil becoming anaerobic and deteriorating in soil structure, organic matter, nutrients, seed resource and populations of beneficial soil micro-organisms.

Overburden within the subject site will be used in the construction of the noise bunds as specified within the Noise Management Plan.

4.2.2 Landform Reconstruction and Contouring

Landform reconstruction and contouring will involve the following:

- The final landform will be formed to approximately 30 m AHD.
- The post extraction landform will be designed with maximum batters of 1:4.
- Any bunds will be removed and the excavated floor will be deep ripped in two directions. The width between rip lines will be 1 m intervals.

4.2.3 Site Preparation

To ensure the success of the revegetation works, site preparation should occur well before planting is undertaken. This includes landform reconstruction and contouring measures as outlined in **Section 4.3** the implementation of a weed control programme as outlined in **Section 4.5**.

In the event that compacted areas are identified within the revegetation area, contour ripping may be required. Ripping loosens soil aggregates and provides a softer soil surface for the establishment of plant roots. Ripping also promotes aeration of soil, assisting in the breakdown of organic matter and water infiltration.

4.3 Landscaping

4.3.1 Site Preparation

To ensure the success of the revegetation works within the landscaping corridor (refer to **Appendix B**) which will provide screening and an ecological linkage, site preparation will occur well before planting is undertaken. This includes measures such as ploughing or ripping of unvegetated areas and the implementation of a weed control programme as outlined below.

Ploughing may be required to break down the dense mat of dead weed biomass on the ground surface following the weed spraying event and to break up the densely packed fibrous root systems holding the soil together. Following this, contour ripping, at widths which will allow access for equipment required for follow up weed control to occur, may be required to break up the sandy loams/sandy clay loam soils likely to be present on site. Ripping loosens soil aggregates and provides a softer soil surface for the establishment of plant roots. Ripping also promotes aeration of soil, assisting in the breakdown of organic matter and water infiltration. Loam or clay soils are more susceptible to compaction due to their lower porosity.

It is important to note that site preparation works will not occur in proximity to existing native vegetation to avoid physical disturbance or root damage. Furthermore, site works shall not occur within the fire access track.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

4.4 Weed Management

4.4.1 Weed Control

Pre-seeding weed control is only likely to be required where topsoils are used that contain weed species. Given the current land use, it is not anticipated that weed control will be other than normal agriculture practice. If required, weed control will only be conducted after overburden and topsoil have been spread and any seeds have been allowed to germinate.

Herbicides will be selected for the target species, taking into account the surrounding environment and the constraints this may present.

Based on the location and species of weeds present, the recommended weed treatments are detailed in **Table 2**. The timing for weed control is specified within **Table 3**.

Table 2. Weed control treatment.

Treatment	Suggested Constituents	Target Species
Glyphosate spray	2% Glyphosate including Pulse®, wetting agent and Chlorsulfuron	Broadleaf species e.g. *Pelargonium capitatum* Woody weeds e.g. *Zantedeschia aethiopica*
Selective grass spray	Fusilade and approved adjuvant (e.g. Pulse®)	Grass species e.g. *Ehrharta longifolia*

4.4.2 Weed Management Plan

The following weed and disease controls will be implemented within the subject site to assist in the control of invasive species and enhance the outcomes of the proposed rehabilitation works.

Table 3. Management actions for weed control.

Parameter	Action	Timing
Surface Material	Assess weed potential within topsoil material prior to removal and separate weed affected topsoil for treatment or disposal.	Prior to and during topsoil removal
	Store significantly weedy surface material separately to clean surface material.	Surface material removal
	Stockpile all surface materials in the general vicinity of its origin.	Surface material removal
Hygiene Measures	Avoid moving surface material or fill material from weed infected areas to non-infested areas.	At all times
	All earthmoving and ground engaging equipment will be cleaned of vegetation, mud and soil prior to entry and exit of the subject site.	At all times
	No soil and vegetation should be brought to the site apart from that to be used in rehabilitation and plants used in rehabilitation should be free of weeds.	At all times
Access	Control access within the quarry area to reduce the spread of weeds, especially off-road vehicle access, to prevent disturbance to vegetation and weed invasion.	At all times
	Restrict access to areas outside the subject site to reduce the spread of weeds into or out of the site.	At all times
Weed Control	Chemical spraying is to be undertaken as per **Section 4.5.1**.	

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Parameter	Action	Timing
Monitoring and Reporting	Monitoring and reporting work are required to ensure that the revegetation objections are achieved.	Refer to **Section 4.8**

4.5 Rehabilitation

4.5.1 Pasture

Ripping will be undertaken within the completed cells to reduce the potential for surface erosion and promote a seed bed for establishing pasture. During this process, a number of measures will be utilised to ensure maximum efficiency with minimal disturbance. Any ripping that occurs along slopes will have regular contour banks built across the tracks to prevent erosion from water runoff.

As far as possible, topsoil will be placed along the contour to help reduce erosion. Placing the topsoil in such a manner will reduce the down slope flow of water and increase water storage. The final landform will be a more uniform landform with the removal of the isolated raised areas (minus the excavated material). The overburden storage area will take into consideration the surrounding landform and as far as practicable match the surrounding features.

While no specific soil preparation is anticipated, the requirement for the application of lime and/or fertiliser can be determined by soil testing once the landform has been rehabilitated.

For pasture revegetation it is essential that the species are matched to the soil types and rainfall. The location falls into the “High Rainfall Coastal” planting regime with sandy to gravelly soils. Suitable perennial legumes include birdsfoot trefoil, lucerne, strawberry clover and sulla. Perennial pasture includes perennial ryegrass, phalaris, cocksfoot and Rhodes grass. Annual pasture species include ryegrass, serradella and subterranean clover.

The actual species used will be determined by the individual season, nature of the rainfall in the preceding months and stocking/hay production proposed by the landholder which may change from time to time.

Seeding rates are 2 – 5 kg/ha depending on the species used; for example, ryegrass is seeded at 3 kg/ha whereas Rhodes grass is seeded at 4 kg/ha. Seed will be broadcast uniformly within the marked areas in overlapping passes using mechanical equipment to allow for complete and even seed coverage of the pre-prepared area. Seed will be mixed with a bulking agent such as vermiculite, clean sand or sawdust in a ratio of 2 parts bulking agent to 1 part seed. If deemed necessary, seed will be covered by very light harrowing, scarifying, bagging, dragging or light raking of the seeded area as soon as practical and within the same day of seeding.

4.5.2 Landscaping

Upon receipt of the relevant approvals and prior to commencement of extraction activities (excluding the months December to March), a row of vegetation (*Agonis flexuosa*) will be planted at 5 m spacings between the extraction area and fence line along Caves Road, Cosy Corner Road and to the north of the Lot adjacent to the Hamelin Ridge Estate (refer to **Appendix C**). With a completion criteria of 85% survival rate, this will provide approximately 1.4 ha of *Agonis flexuosa* which will offset the clearing of 0.1 ha.

Tubestock provide the most reliable method of establishment for *Agonis flexuosa*. The maximum stock size will be limited to tubestock size as larger stock is likely to require supplementary watering to ensure survival. All revegetation stock will be sourced from (preferably) local nurseries with NIASA accreditation to ensure that tubestock soil is disease free. Only provenance stock will be used.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Planting will preferably be undertaken with a motorised post hole digger by skilled personnel. The planting hole will be excavated vertically into free draining mulched soil to an approximate depth of 0.5 – 0.7 m to accommodate the root ball of the plant.

The planting of seedlings will occur between the months of May to July after substantial rain has saturated the soil profile. Prior to planting the seedling, any tangled roots will be loosened and good soil to plant contact will be made. Seedlings will not be staked for support as free standing plants have increased durability and strength as opposed to staked plants.

4.6 Maintenance

Maintenance will be undertaken following planting/seeding with all activities to be conducted in response to the maintenance inspections and monitoring (as discussed below). The key elements associated with maintenance works will include suppression of smothering weeds, watering of tubestock in summer and infill planting. The requirement to implement revegetation maintenance and infill planting measures will be determined following each monitoring event.

4.7 Monitoring and Reporting

A program of monitoring of the rehabilitation works is required to ensure that the objectives are achieved.

Maintenance inspections will be undertaken annually in spring by the proponent to determine the requirement for maintenance measures.

During these monitoring events, the area will be assessed to determine pasture and tubestock, and weed coverage within areas that have been rehabilitated.

4.7.1 Completion Criteria

To achieve the objectives of the Management Plan and ensure that future management is minimised, the measurable goals for rehabilitated areas are as follows:

- Self-sustaining crop cover with less than 10% bare ground;
- Reduce weed cover to less than 10% (noting that the pasture is not considered a ‘weed’);
- Rehabilitation surface remains flat and stable, with no evidence of surface erosion; and
- 85% survival rate for *Agonis flexuosa* planted within the vegetation corridors (refer to **Appendix B**).

Maintenance will continue to be undertaken as required until this criterion has been achieved or as otherwise agreed with the Shire of Augusta Margaret River. Following the successful completion of the revegetation program, and the submission of the final report, the Shire will, upon application from the owner, refund the bond lodged against the implementation of the Plan.

4.8 Scheduling

Planting of *Agonis flexuosa* planted within the vegetation corridors will occur upon receipt of the relevant approvals and prior to commencement of extraction activities (excluding the months October to April).

The rehabilitation of the excavation area will be undertaken on the completion of excavation. Accordingly, a definitive timeline for rehabilitation is not prescribed, but rather a commitment to establish pasture by the first month of August, following completion of the extraction works.

Rehabilitation works will be undertaken at the following specified times of year:

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

1. Spring/summer:
    - Excavated area to be graded to levels and contours conforming to the adjacent unaffected areas minus the thickness of the excavated material.
    - Deep ripping along the contour at 1 m intervals.
    - Embankment batters will be cut to no less than 1 in 4.
    - Stockpiled topsoil will be spread over the shaped surface.
2. Autumn:
    - Pre-seeding weed control.
3. Autumn/winter:
    - Planting landscape corridor vegetation.
    - Seeding with appropriate agricultural seed mix.
    - If sufficient vegetation does not germinate following initial seeding, the area will be re-seeded.
4. Spring:
    - Maintenance inspections to determine extent of maintenance requirements.
    - Formal monitoring will be undertaken in areas that have been rehabilitated.

4.9 Decommissioning

Following completion of the extraction activities, the applicant will undertake the following actions to decommission the site:

- All buildings and infrastructure will be removed;
- Any hard stand surfaces will be removed and used to backfill the pit;
- Overburden will be used as backfill;
- The area will have the slopes and soils constructed to allow for the future proposed land use.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

REFERENCES

Accendo Australia (2024). *Lot 22 Caves Road, Hamelin Bay Works and Excavation Plan*. Busselton, WA.

Beard J. S. (1990). *Plant life of Western Australia*, Kangaroo Press, Perth.

Churchward, H.M. and McArthur, W.M. (1978). Landforms and soils of the Darling System, Western Australia. In *'Atlas of Natural Resources, Darling System, Western Australia'*. Department of Conservation and Environment, Western Australia.

Department of Biodiversity, Conservation and Attractions (DBCA) (2021). *Geomorphic Wetlands of the Swan Coastal Plain dataset.* Accessed August 2021.

Department of Primary Industries and Regional Development (DPRD) (2019). *Interpolated contours lines at 2 metre intervals database*. Accessed August 2021.

Department of Water (DoW) (2014). *South West Region Guideline, Water resource considerations for extractive industries.* DoW, Perth WA.

Department of Water and Environmental Regulation (DWER) (2021). *Public Drinking Water Source Areas database*. Accessed August 2021.

Environmental Protection Authority (EPA) (2006). *Guidance Statement No.10 for the Assessment of Environmental Factors (in accordance with the EP Act 1986: Levels of Assessment for Proposals Affecting Natural Areas Within the System 6 Region and Swan Coastal Plain Portion of the System 1 Region.*

Environmental Protection Authority (EPA) (2009). *South West Regional Ecological Linkages.* Bulletin No 8. Retrieved from: http://epa.wa.gov.au/EPADocLib/3040_SWREL_EPB821009.pdf

Geological Survey of Western Australia (1978). *Geology and mineral resources of Western Australia, memoir 3*. Geological Survey of Western Australia, Perth, WA.

Thackway, R, and Cresswell, ID, (Eds) (1995). *An Interim Biogeographic Regionalisation for Australia: a framework for establishing the national system of reserves*, Version 4.0. Australian Nature Conservation Agency, Canberra.

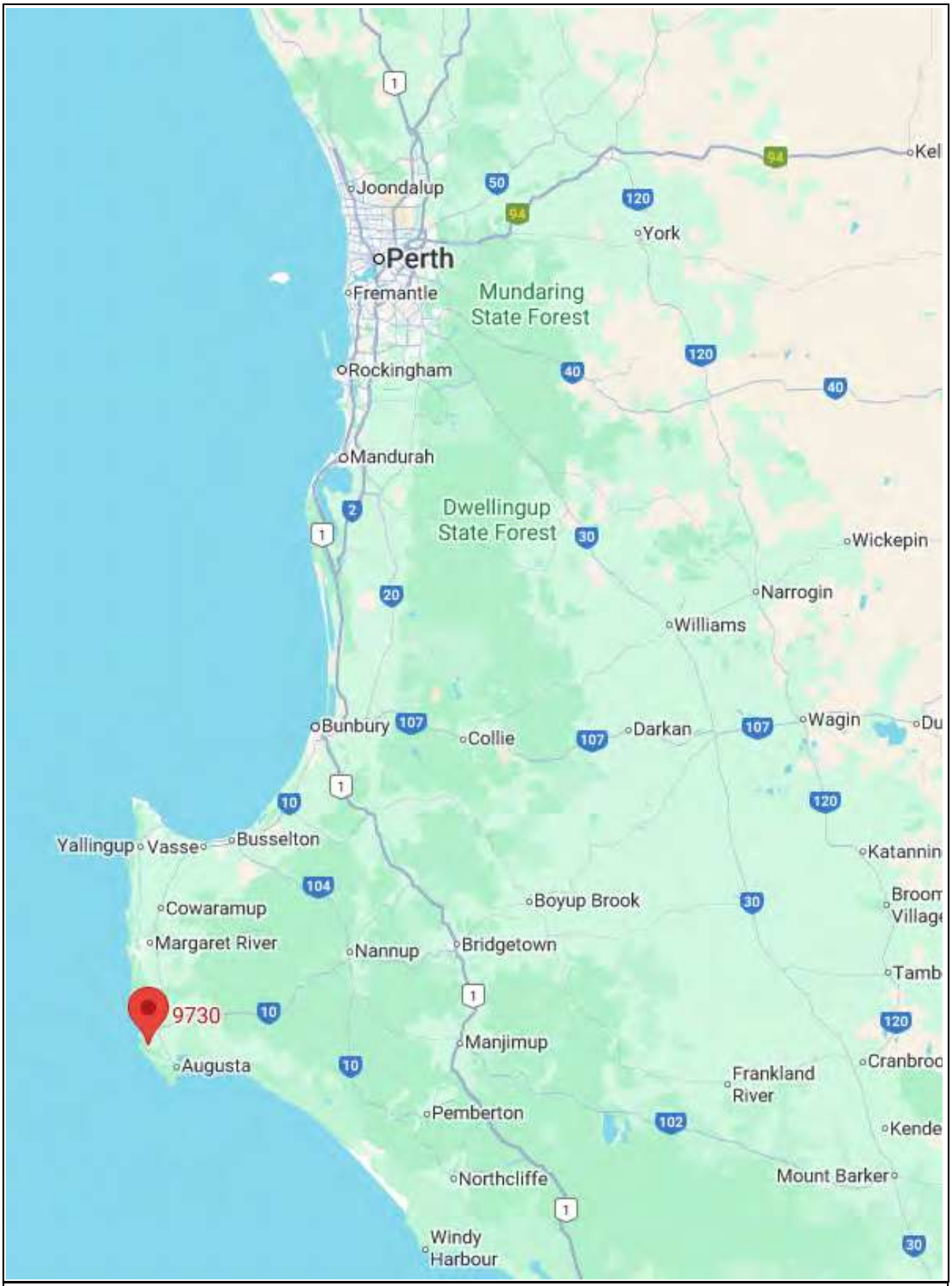
Tille, P (2006). Soil-Landscape Zones of the WA Rangelands and Interior.

Western Australian Planning Commission (WAPC) (2007). *Planning Bulletin No. 64: Acid Sulfate Soils*, Western Australian Planning Commission, Western Australia.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

FIGURES

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



PROJECT	Lot 22 Caves Road, Hamelin Bay	Project Number	Drawing Number	Revision
		2449	Figure 1	A
DRAWING TITLE	Figure 1 - Regional location of the subject site	Designed PN	Checked	
		Drawn PN	Approved	
CLIENT	McDougall Quarries Pty Ltd	Date	20/8/2024	
		Local Authority	City of Busselton	
		Sheet 1 of 1		

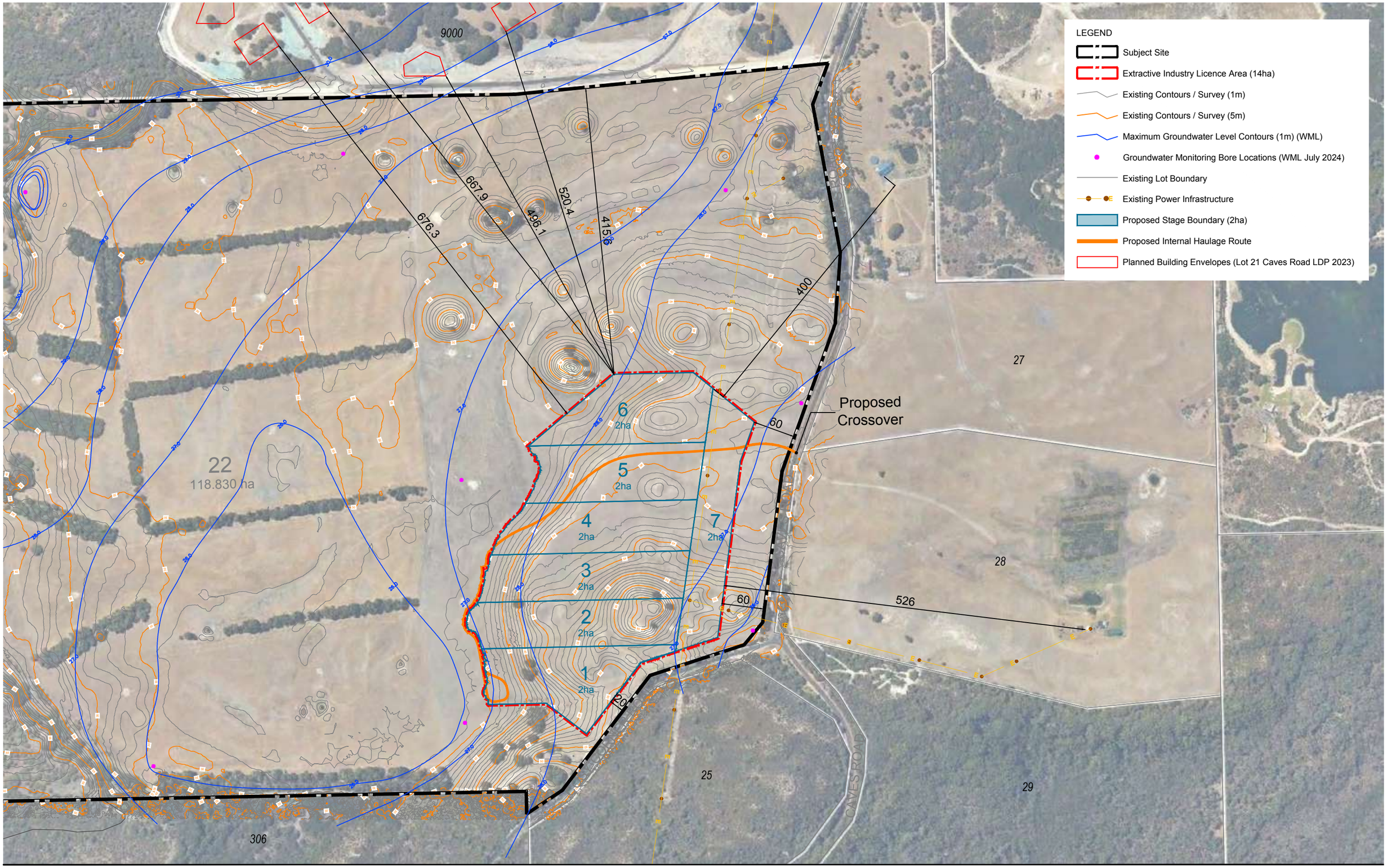
This drawing has been prepared by, and remains the property of Accendo Australia Pty Ltd. This drawing shall not be used without permission. The drawing shall be preliminary only and/or not for construciton until signed approved.

PO Box 5178
West Busselton
Western Australia 6280
Mobile 0418 950 852

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX A – EXCAVATION WORKS PLAN

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Excavation Works Plan

Lot 22 (9730) Caves Road, Hamelin Bay

Date: 26 Aug 2024 Scale: 1:5000 @ A3 1:2500 @ A1 File: **24-132 EX01B** Staff: DL CCG JJ Checked: DL

0 100m

element.

Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
PO Box 7375 Cloisters Square, Perth Western Australia 6850.
T. +61 8 9289 8300 | **E.** hello@elementwa.com.au **elementwa.com.au**

© Element Advisory WA Pty Ltd

This concept has been prepared for the purpose of meeting client specifications. The drawing does not constitute an invitation,agreement or contract (or any part thereof) of any kind whatsoever. Although care has been taken in the compilation of this drawing by Element Advisory WA Pty Ltd, all parties associated with the proposed property development disclaim all responsibility for any errors or omissions. The right is reserved to change the plan at any time. Liability is expressly disclaimed by Element Advisory WA Pty Ltd for any loss or damage which may be sustained by any person acting on any visual impression gained from this drawing.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

APPENDIX B – SCREENING VEGETATION PLAN

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

60m

120m

Legend

- Subject Site Boundary
- Partially Visible
- Visible
- 5m Screening Vegetation Planting
- Extraction Area

Screening Vegetation Plan

Caves Road, Hamelin Bay

Date: 31 July 2024 | Scale: NTS @A3 | Drawing No. **24-132** | Staff: CCG | Checked: DKL

element.

Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
PO Box 7375 Cloisters Square, Perth Western Australia 6850.
T. +61 8 9289 8300 | **E.** hello@elementwa.com.au **elementwa.com.au**

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Appendix G – Groundwater Monitoring Report

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

TECHNICAL MEMORANDUM

Our Ref: 11878-G-TM-001-0

31 July 2024

McDougall Quarries Pty Ltd
44 Forrest Beach Road,
Wonnerup, WA 6280

Attention: Kyle Jackson

LOT 22 CAVES ROAD, HAMELIN BAY – GROUNDWATER LEVELS ASSESSMENT

WML Consultants (WML) was engaged by McDougall Quarries Pty Ltd (the Client) to carry out a groundwater monitoring programme at Lot 22 Caves Road, Hamelin Bay (the site), for the proposed material extractive development. The study will inform on the groundwater levels across the site measured between July and November 2024.

This technical memorandum letter presents the results of the preliminary groundwater levels study for the proposed development, based on currently available information.

At the time of the preparation of this letter, the following groundwater information was reviewed:

- Urban Water Management Plan (UWMP) for Lot 21 Caves Road, Hamelin Bay (Hamelin Ridge subdivision directly north of the site), prepared by Oversby Consulting in December 2021 (Ref. B21031 V1);
- Groundwater monitoring event data for Lot 22 Caves Road, Hamelin Bay (subject site), collected on 25th July 2024 (the first out of five scheduled monitoring events that WML is currently undertaking).

Based on the information included in the UWMP, five groundwater monitoring wells were installed at Lot 22 Caves Road and groundwater levels were measured in August and September 2016. Level Surveys Pty Ltd completed a survey of the old monitoring wells on 22 July 2024. Three out of five monitoring wells (bore No 2, 3 and 4) no longer existed on site; therefore, no accurate measurements could be undertaken. It is believed those wells were removed during the construction of the subdivision (roads and minor earthworks). The approximate ground surface levels were recorded in the likely proximity of the former monitoring wells. The remaining two wells (bore No 1 and 5) were picked up to 8 cm accuracy (horizontal and vertical). Summary of the peak groundwater levels observed in winter 2016 (August 2016) are summarised in Table 1 below.

Table 1: Summary of groundwater monitoring data – Lot 21 Caves Road, Hamelin Bay

Location ID	Coordinates (MGA94 Zone 50)		Elevation (TOC) RL (m)	Upstand (m)	Termination Depth form TOC (m)	Depth to GW (mBGL)	GW levels (m AHD)
	Easting	Northing					
1	321094.91	6209765.243	32.299	0.52	4.00	2.25	29.529
2	320586.241	6209790.014	34.023[1)]	0.50	3.98	DRY	DRY
3	320664.972	6210060.981	48.266[1)]	0.57	3.88	DRY	DRY
4	321012.657	6209966.238	31.568[1)]	0.47	3.67	1.41	30.158
5	321279.968	6210062.191	31.155	0.49	3.60	1.18	29.485

Notes: All depths are relative to the existing ground surface
TOC – Top of Casing
[1)] Monitoring well destroyed; RL level represents ground level in the approximate area.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

WML engaged EDrill Pty Ltd to install groundwater monitoring wells at Lot 22 Caves Road, Hamelin Bay. The works were completed between the 23rd and 24th of July 2024 and comprised the installation of 8 monitoring wells to depths between 3.7 m and 22.0 m below the existing ground level. Summary of the first groundwater monitoring event completed on 25th July 2024 by WML is provided in Table 2 below.

Table 2: Summary of groundwater monitoring data – Lot 22 Caves Road, Hamelin Bay

Location ID	Coordinates (MGA94 Zone 50)		Elevation (TOC) RL (m)	Upstand (m)	Termination Depth (m)	Depth to GW (mBGL)	GW levels (m AHD)
	Easting	Northing					
MW1	320717.901	6209455.786	31.798	0.575	5.1	3.575	27.648
MW2	320257.634	6209400.089	30.557	0.595	3.7	3.485	26.477
MW3	320443.070	6208568.909	29.827	0.570	5.2	3.3	25.957
MW4	320894.124	6208631.739	29.684	0.630	5.1	2.96	26.094
MW5	320889.088	6208983.295	29.964	0.580	4.4	2.17	27.214
MW6	321311.086	6208765.454	45.301	0.545	22.0	19.435	25.321
MW7	321381.067	6209094.519	39.403	0.550	14.3	12.01	26.843
MW8	321271.648	6209402.900	31.281	0.575	5.2	2.575	28.131

Notes: All depths are relative to the existing ground surface
TOC – Top of Casing

Based on the timing of the first groundwater monitoring event (end of July), the above data is considered to represent the levels close to the expected average annual maximum groundwater levels (typically observed towards the end of August), depending on the recorded rainfall.

Based on the results of the historical groundwater monitoring programme at the Hamelin Ridge development site and the first groundwater monitoring event completed on the 25th of July 2024 for the proposed site (Lot 22 Caves Road), it can be observed that the groundwater levels range from about RL 28 m AHD at the northeastern boundary of the site to about RL 25 m AHD at the southeastern boundary of the site. The approximate groundwater contours showing indicative groundwater levels are included in WML drawings No 11878-SK-101 and 11878-SK-102 attached to this report.

We consider the above groundwater levels to be consistent with the topography of the site, with groundwater mounding towards the higher elevated areas and draining towards the existing creek systems south and east of the site.

Yours faithfully,

Aleksandra Gorczynska
Senior Geotechnical Engineer
Author

Raphael Hyde
Senior Geotechnical Engineer
Reviewer

For and on behalf of WML Consultants Pty Ltd

Attachments:

Report Limitations

Drawings

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

REPORT LIMITATIONS

WML Consulting Engineers

This geotechnical report is provided for the sole use by the Client. This report must not be applied for any other purpose or project except the one originally contemplated without written authorisation from WML. WML accepts no responsibility for the use of this report / document, in whole or in part, in other contexts or for any other purpose.

WML have undertaken investigations, performed consulting services, and prepared this report based on the Client's specific requirements, documents and information supplied, and previous experience. If changes occur in the nature or design of the project, however minor, it is recommended WML review this report to assess their impacts and provide additional recommendations, if any. WML does not assume any responsibility or liability for problems that arise due to developments on site of which we were not informed.

This report utilises data and information provided by third parties, including, but not limited to sub-consultants, published data, and the Client. This information has been assumed to be correct unless otherwise stated. WML assumes no responsibility for assessments made partly or entirely based on information provided by third parties or for the adequacy, incompleteness, inaccuracies, or reliability of any data provided by third parties.

It is the responsibility of the Client to transmit the information, recommendations, and limitations of this report to the appropriate organisations or people involved in design of the project, including, but not limited to developers, builders, owners, buyers, architects, engineers, and designers.

WML's opinions are based on upon information that existed at the time of the production of this report and ground conditions encountered at the time the site study was performed. This geotechnical report should not be relied upon if its adequacy has been affected by: the passage of time, by man-made events, such as construction on or adjacent to the site, or by natural events, such as floods, earthquakes, or groundwater fluctuations. In the event of the above changes, WML should be contacted to determine if this report is still reliable or whether additional testing is required.

The subsurface conditions identified within this report are based only upon investigation locations where subsurface tests have been conducted and / or samples obtained, which are explicitly representative of the specific sample or test location. Interpretation of conditions between such points cannot be assumed to represent actual subsurface information and unknowns or variations in ground conditions between test locations that cannot be inferred or predicted. Actual subsurface conditions may differ significantly from those indicated in this report. Specific warning is also given that many factors, either natural or artificial, may render ground conditions different from those which pertained at the time of the investigation. WML does not accept any responsibility for any variance in the ground conditions that may exist across the site. If unexpected subsurface conditions are encountered, WML shall be notified immediately to review those conditions and provide additional and/or modified recommendations, as necessary.

This geotechnical assessment is based upon judgment of the investigation data, visual observations of the site and materials encountered, along with the proposed land use and project specifications. The findings and recommendations presented within this report represent professional opinions and estimates and should not be taken as fact unless explicitally stated. In general, statements of fact are are limited to what was done and / or what was observed on site.

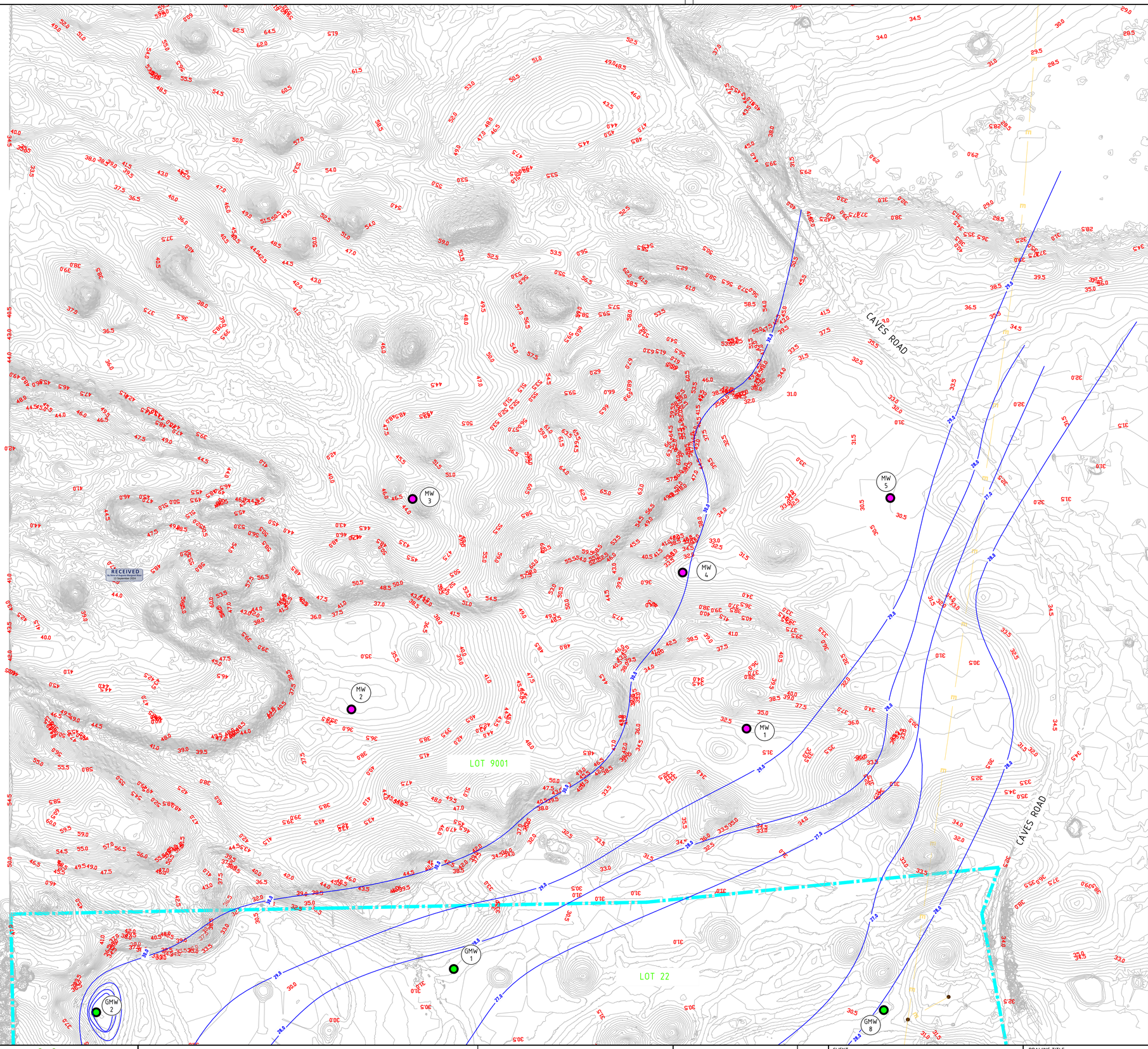
The recommendations provided in this report are preliminary only; final recommendations can only be given after observing the actual subsurface conditions revealed during construction. WML does not assume responsibility or liability for the recommendations in this report if construction observation has not been performed by a WML geotechnical engineer.

Our services did not include any contamination or environmental assessment of the site or adjacent sites. The equipment and techniques used to perform a geoenvironmental study differ from those used to perform a geotechnical investigation. If you require any geoenvironmental information for your project, WML can advise on further steps to be undertaken.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

REPORT LIMITATIONS

WML have performed our professional services in accordance with generally accepted geotechnical engineering principles and practices currently employed in the area; no warranty, expressed or implied, is made as to the professional advice included in this report.



LEGEND

- EXISTING NATURAL SURFACE CONTOUR (0.5m INTERVALS)
- LOT NUMBERS
- EXISTING POWER LINE
- LOT 22 BOUNDARY
- INDICATIVE GROUNDWATER CONTOUR (1.0m INTERVALS)
- GROUNDWATER MONITORING WELL (AUGUST 2016)
- GROUNDWATER MONITORING WELL (JULY 2024)
- MW 17 — TYPE / MONITOR WELL NUMBER

SCALE 1:2500

INFORMATION ONLY

A1

WML Consulting Engineers
Civil | Geotechnical | Structural
BUNBURY +61 8 9722 3544
KALGOORLIE +61 8 9021 1811
PERTH +61 8 9722 3566
wml.com.au

REVISIONS				
N°.	DESCRIPTION	APPROVED	DATE	DRAWN
A	ISSUED FOR REVIEW	L. RUSCONI	07/24	BC

NOTE: *INDICATES SIGNATURES ON ORIGINAL ISSUE OF DRAWING OR LAST REVISION OF DRAWING

NAMES PRINTED IN FULL		DATE
DESIGNED	B.CHEN	07/24
DRAWN	B.CHEN	07/24
VERIFIED	L. RUSCONI	07/24
APPROVED		

CLIENT: ELEMENT ADVISORY

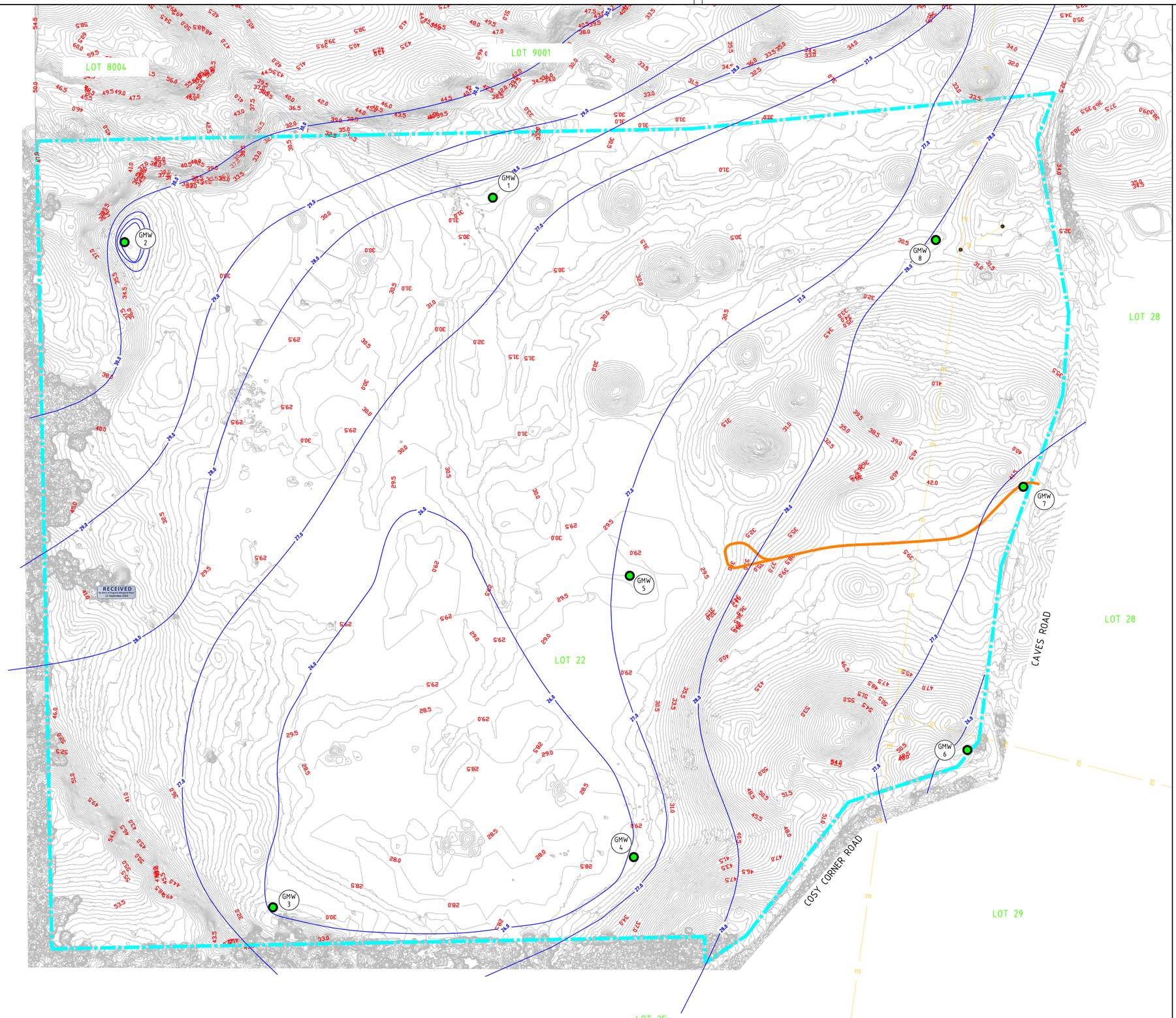
PROJECT: LOT 22 CAVES ROAD HAMELIN BAY

DRAWING TITLE: LOT 21 CAVES ROAD, HAMELIN BAY
GROUNDWATER MONITORING WELLS

THIS DRAWING SHALL BE TREATED AS PRELIMINARY AND IS NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS SIGNED AS APPROVED.

DRAWING NUMBER: 11878-SK-101

REVISION: A



LEGEND

- EXISTING NATURAL SURFACE CONTOUR (0.5m INTERVALS)
- LOT 1624 — LOT NUMBERS
- EXISTING POWER LINE
- EXISTING ACCESS ROAD
- LOT 22 BOUNDARY
- 27.0 — INDICATIVE GROUNDWATER CONTOUR (1.0m INTERVALS)
- GROUNDWATER MONITORING WELL (AUGUST 2016)
- GROUNDWATER MONITORING WELL (JULY 2024)
- MW 17 — TYPE MONITOR WELL NUMBER

SCALE 1:2500 — A1

INFORMATION ONLY

WML Consulting Engineers
Civil | Geotechnical | Structural
BUNBURY +61 8 9722 3544
KALGOORLIE +61 8 9021 1811
PERTH +61 8 9722 3566
wml.com.au

REVISIONS					
N°	DESCRIPTION	APPROVED	DATE	DRAWN	
A	ISSUED FOR REVIEW	L. RUSCONI	07/24	BC	

NOTE: *INDICATES SIGNATURES ON ORIGINAL ISSUE OF DRAWING OR LAST REVISION OF DRAWING

NAMES PRINTED IN FULL		DATE
DESIGNED	B.CHEN	07/24
DRAWN	B.CHEN	07/24
VERIFIED	L. RUSCONI	07/24
APPROVED		

CLIENT: ELEMENT ADVISORY

PROJECT: LOT 22 CAVES ROAD HAMELIN BAY

DRAWING TITLE: LOT 22 CAVES ROAD, HAMELIN BAY GROUNDWATER MONITORING WELLS

THIS DRAWING SHALL BE TREATED AS PRELIMINARY AND IS NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS SIGNED AS APPROVED.

DRAWING NUMBER: 11878-SK-102

REVISION: A

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Appendix H – Visual Impact Assessment

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

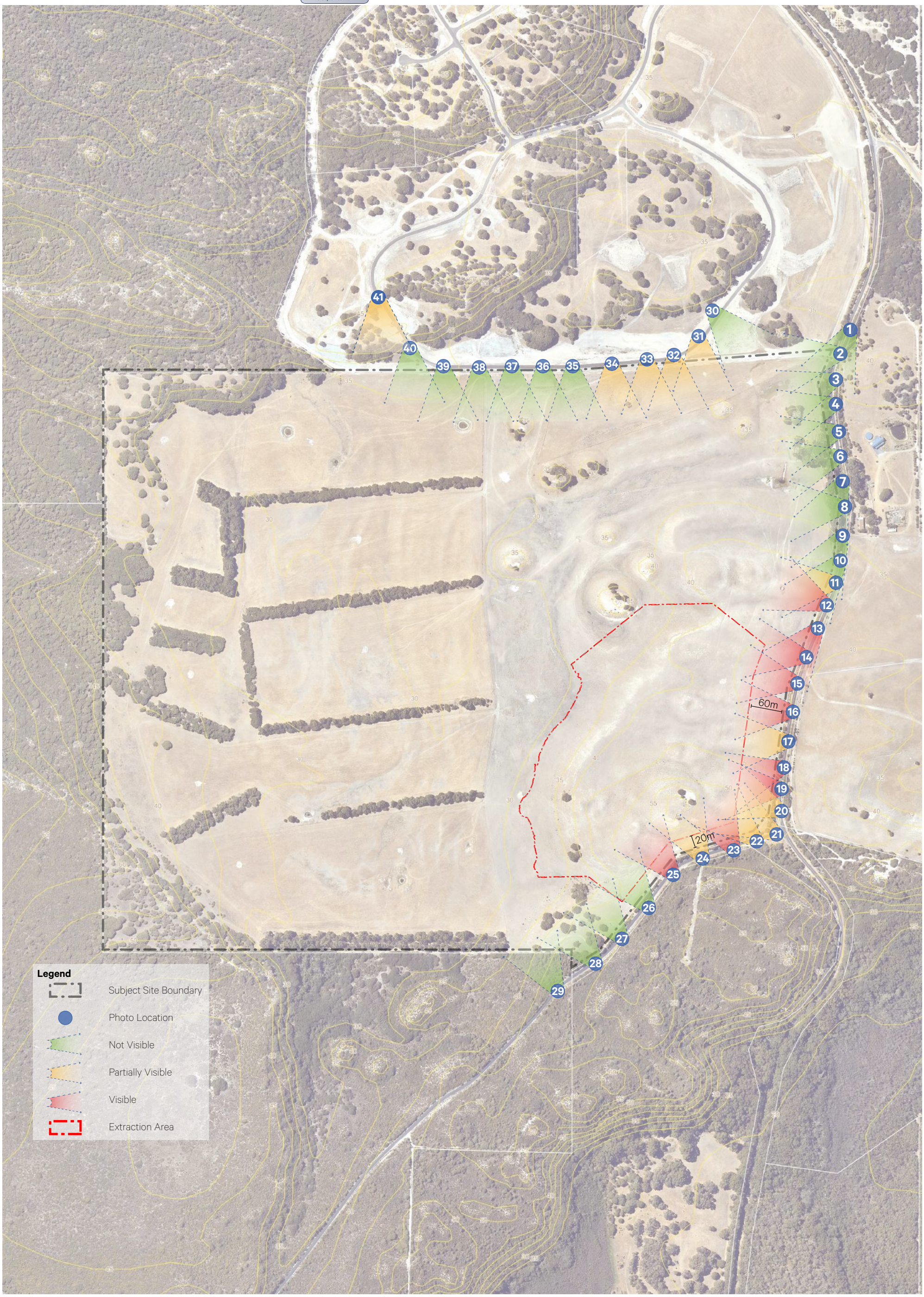
RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Visual Impact Analysis

Lot 22 (No. 9730) Caves Road, Hamelin Bay
Proposed Extractive Industry

element.

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Viewing Diagram

Caves Road, Hamelin Bay

Date: 31 July 2024 Scale: NTS @A3 Drawing No. **24-132** Staff: CCG Checked: DKL

element.

Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
PO Box 7375 Cloisters Square, Perth Western Australia 6850.
T. +61 8 9289 8300 | **E.** hello@elementwa.com.au **elementwa.com.au**

1

RECEIVED
By Shire of Augusta Margaret River
13 September 2024





Photo taken: 27/07/2024 2:45:24 PM

View direction: South-West

Visibility of proposed development: Not Visible,

2





Photo taken: 27/07/2024 2:45:39 PM

View direction: West

Visibility of proposed development: Not Visible

3

RECEIVED
By Shire of Augusta Margaret River
13 September 2024





Photo taken: 27/07/2024 2:46:00 PM

View direction: South-West

Visibility of proposed development: Not Visible

4





Photo taken: 27/07/2024 2:46:22 PM

View direction: West

Visibility of proposed development: Not Visible





Photo taken: 27/07/2024 2:25:44 PM

View direction: West

Visibility of proposed development: Not Visible





Photo taken: 27/07/2024 2:26:29 PM

View direction: West

Visibility of proposed development: Not Visible

7





Photo taken: 27/07/2024 2:26:56 PM

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

View direction: South-South-West

Visibility of proposed development: Not Visible

8





Photo taken: 27/07/2024 2:27:17 PM

View direction: West

Visibility of proposed development: Not Visible





Photo taken: 27/07/2024 2:27:43 PM

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

View direction: South-South-West

Visibility of proposed development: Not Visible





Photo taken: 27/07/2024 2:28:07 PM

View direction: South-West

Visibility of proposed development: Not Visible





Photo taken: 27/07/2024 2:28:28 PM

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

View direction: West

Visibility of proposed development: Partially Visible





Photo taken: 27/07/2024 2:29:08 PM

View direction: West-North-West

Visibility of proposed development: Visible

13





Photo taken: 27/07/2024 2:29:56 PM

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

View direction: South-West

Visibility of proposed development: Visible

14





Photo taken: 27/07/2024 2:30:20 PM

View direction: West

Visibility of proposed development: Visible

15





Photo taken: 27/07/2024 2:30:41 PM

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

View direction: West

Visibility of proposed development: Visible

16





Photo taken: 27/07/2024 2:31:04 PM

View direction: West

Visibility of proposed development: Visible

17





Photo taken: 27/07/2024 2:31:30 PM

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

View direction: West

Visibility of proposed development: Partially Visible

18





Photo taken: 27/07/2024 2:31:55 PM

View direction: West-South-West

Visibility of proposed development: Visible

19





Photo taken: 27/07/2024 2:32:19 PM

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

View direction: West

Visibility of proposed development: Visible

20





Photo taken: 27/07/2024 2:32:48 PM

View direction: West

Visibility of proposed development: Partially Visible





Photo taken: 27/07/2024 2:34:59 PM

View direction: North-West

Visibility of proposed development: Partially Visible





Photo taken: 27/07/2024 2:35:16 PM

View direction: North-West

Visibility of proposed development: Partially Visible





Photo taken: 27/07/2024 2:35:39 PM

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

View direction: North-West

Visibility of proposed development: Visible





Photo taken: 27/07/2024 2:36:04 PM

View direction: North-North-West

Visibility of proposed development: Partially Visible

25





Photo taken: 27/07/2024 2:36:31 PM

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

View direction: North-West

Visibility of proposed development: Visible

26





Photo taken: 27/07/2024 2:36:53 PM

View direction: North-West

Visibility of proposed development: Not Visible

27





Photo taken: 27/07/2024 2:37:21 PM

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

View direction: North-West

Visibility of proposed development: Not Visible

28





Photo taken: 27/07/2024 2:38:02 PM

View direction: North-West

Visibility of proposed development: Not Visible





Photo taken: 27/07/2024 2:38:01 PM

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

View direction: North-West

Visibility of proposed development: Not Visible





Photo taken: 4/08/2024 11:41:08 AM

View direction: South-East

Visibility of proposed development: Not Visible

31





Photo taken: 4/08/2024 11:40:44 AM

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

View direction: South

Visibility of proposed development: Partially Visible

32





Photo taken: 4/08/2024 11:40:15 AM

View direction: South

Visibility of proposed development: Partially Visible

33





Photo taken: 4/08/2024 11:39:51 AM

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

View direction: South

Visibility of proposed development: Partially Visible

34





Photo taken: 4/08/2024 11:39:27 AM

View direction: South

Visibility of proposed development: Partially Visible

35





Photo taken: 4/08/2024 11:39:00 AM

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

View direction: South

Visibility of proposed development: Not Visible

36





Photo taken: 4/08/2024 11:38:34 AM

View direction: South

Visibility of proposed development: Not Visible

37





Photo taken: 4/08/2024 11:38:09 AM

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

View direction: South

Visibility of proposed development: Not visible

38





Photo taken: 4/08/2024 11:37:40 AM

View direction: South

Visibility of proposed development: Not Visible

39





Photo taken: 4/08/2024 11:37:17 AM

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

View direction: South

Visibility of proposed development: Not Visible

40





Photo taken: 4/08/2024 11:36:46 AM

View direction: South

Visibility of proposed development: Not Visible





Photo taken: 4/08/2024 11:36:12 AM

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

View direction: South

Visibility of proposed development: Partially Visible

RECEIVED
By Shire of Augusta Margaret River
13 September 2024



Screening Vegetation Plan

Caves Road, Hamelin Bay

Date: 31 July 2024 Scale: NTS @A3 Drawing No. **24-132** Staff: CCG Checked: DKL

element.

Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
PO Box 7375 Cloisters Square, Perth Western Australia 6850.
T. +61 8 9289 8300 | **E.** hello@elementwa.com.au **elementwa.com.au**

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

Appendix I – Soil Data Analysis

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

ANALYSIS REPORT

Replacement Report

Job No:	**B2408-0405**
Date Issued:	02-Sep-2024
Report Number:	330866
This report replaces Report Number:	330269

Attention:	Kyle Jackson	*Purchase Order:*	Received 16/08/2024
Client:	McDougall Quarries Pty Ltd	*Date Sampled:*	
Address:	PO Box 1876 Busselton WA 6280	*Date Received:*	16-Aug-2024

The following sample was analysed:

Sample ID

B24-0097325

Your Reference: Sample HB1

Product: Limestone

Analysis of this sample conducted between 16-Aug-2024 and 27-Aug-2024

Analysis Results

Determinant	Result Value

Sieve Range (mm)	% weight	Neutralising Value %
0 - 0.125	0.28	83.5
0.125 - 0.250	8.33	91.6
0.250 - 0.50	48.37	93.2
0.50 - 1.00	31.43	91.6
> 1.00	11.59	93.5
Weighted NV	-	92.6

Bulk Sample Analysis^

Moisture %	-
Neutralising Value %	91.85
Calcium %	37.7
Magnesium %	0.1
Sodium %	<2.0

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

ANALYSIS REPORT

Replacement Report

Job No:	**B2408-0405**
Date Issued:	02-Sep-2024
Report Number:	330866
This report replaces Report Number:	330269

Attention:	Kyle Jackson	*Purchase Order:*	Received 16/08/2024
Client:	McDougall Quarries Pty Ltd	*Date Sampled:*	
Address:	PO Box 1876 Busselton WA 6280	*Date Received:*	16-Aug-2024

Bulk Sample Analysis^

Moisture %	-
Neutralising Value %	91.85
Calcium %	37.7
Magnesium %	0.1
Sodium %	<2.0
Copper %	-
Manganese %	-
Phosphorus %	-
Sulphur %	-
Silicon %	-

Note: **All samples are analysed on an 'as received' basis, all results are based on the sample received.**
This report is not to be reproduced except in full.

Please refer to the following link for the measurement of uncertainty values for all NATA accredited analysis

<https://services.awta.com.au/AFTMeasurementUncertainty/index.php>

- Values reported as percent by weight (% w/w), expressed on dried basis.
- Moisture content is representative of the sample as received, determined @ 103C for 6 hours.

The sample(s) referred to in this report were analysed for the following determinant(s):

Analysis	Method	Laboratory
Calcium/Magnesium	BS EN12945:2008 & AOAC 962.01	Bibra Lake Chemistry Lab - WA
Lime Analysis	BS EN12945:2008 & AOAC 962.01	Bibra Lake Chemistry Lab - WA
Neutralising Value	BS EN12945:2008	Bibra Lake Chemistry Lab - WA
Metals - ICP	TP_WA/031	Bibra Lake Chemistry Lab - WA

The results in this report were authorised by:

Name	*Title*	*Name*	*Title*
Prashubha Bhandari	**Laboratory Controller, WA**		



RECEIVED
By Shire of Augusta Margaret River
13 September 2024

ANALYSIS REPORT

Replacement Report

Job No:	**B2408-0405**
Date Issued:	02-Sep-2024
Report Number:	330866
This report replaces Report Number:	330269

Attention:	Kyle Jackson	*Purchase Order:*	Received 16/08/2024
Client:	McDougall Quarries Pty Ltd	*Date Sampled:*	
Address:	PO Box 1876 Busselton WA 6280	*Date Received:*	16-Aug-2024

The following sample was analysed:

Sample ID

B24-0097326 Your Reference Sample HB2

Product Limestone

Analysis of this sample conducted between 16-Aug-2024 and 27-Aug-2024

Analysis Results

Particle Size Distribution^

Sieve Range (mm)	% weight	Neutralising Value %
0 - 0.125	0.52	79.1
0.125 - 0.250	7.10	90.8
0.250 - 0.50	41.94	93.3
0.50 - 1.00	46.49	92.2
> 1.00	3.95	90.2
Weighted NV	-	92.4

Bulk Sample Analysis^

Moisture %	-
Neutralising Value %	92.45
Calcium %	35.2
Magnesium %	1.3
Sodium %	<2.0

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

ANALYSIS REPORT

Replacement Report

Job No:	**B2408-0405**
Date Issued:	02-Sep-2024
Report Number:	330866
This report replaces Report Number:	330269

Attention:	Kyle Jackson	*Purchase Order:*	Received 16/08/2024
Client:	McDougall Quarries Pty Ltd	*Date Sampled:*	
Address:	PO Box 1876 Busselton WA 6280	*Date Received:*	16-Aug-2024

Bulk Sample Analysis^

Moisture %	-
Neutralising Value %	92.45
Calcium %	35.2
Magnesium %	1.3
Sodium %	<2.0
Copper %	-
Manganese %	-
Phosphorus %	-
Sulphur %	-
Silicon %	-

Note: **All samples are analysed on an 'as received' basis, all results are based on the sample received.**
This report is not to be reproduced except in full.

Please refer to the following link for the measurement of uncertainty values for all NATA accredited analysis

<https://services.awta.com.au/AFTMeasurementUncertainty/index.php>

- Values reported as percent by weight (% w/w), expressed on dried basis.
- Moisture content is representative of the sample as received, determined @ 103C for 6 hours.

The sample(s) referred to in this report were analysed for the following determinant(s):

Analysis	Method	Laboratory
Calcium/Magnesium	BS EN12945:2008 & AOAC 962.01	Bibra Lake Chemistry Lab - WA
Lime Analysis	BS EN12945:2008 & AOAC 962.01	Bibra Lake Chemistry Lab - WA
Neutralising Value	BS EN12945:2008	Bibra Lake Chemistry Lab - WA
Metals - ICP	TP_WA/031	Bibra Lake Chemistry Lab - WA

The results in this report were authorised by:

Name	*Title*	*Name*	*Title*
Prashubha Bhandari	**Laboratory Controller, WA**		



RECEIVED
By Shire of Augusta Margaret River
13 September 2024

ANALYSIS REPORT

Replacement Report

Job No:	**B2408-0405**
Date Issued:	02-Sep-2024
Report Number:	330866
This report replaces Report Number:	330269

Attention:	Kyle Jackson	*Purchase Order:*	Received 16/08/2024
Client:	McDougall Quarries Pty Ltd	*Date Sampled:*	
Address:	PO Box 1876 Busselton WA 6280	*Date Received:*	16-Aug-2024

The following sample was analysed:

Sample ID

B24-0097327 Your Reference Sample HB3

Product Limestone

Analysis of this sample conducted between 16-Aug-2024 and 27-Aug-2024

Analysis Results

Particle Size Distribution^

Sieve Range (mm)	% weight	Neutralising Value %
0 - 0.125	1.25	79.8
0.125 - 0.250	12.19	91.5
0.250 - 0.50	61.44	92.6
0.50 - 1.00	22.97	92.4
> 1.00	2.15	92.0
Weighted NV	-	92.2

Bulk Sample Analysis^

Moisture %	-
Neutralising Value %	92.85
Calcium %	34.6
Magnesium %	2.0
Sodium %	<2.0

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

ANALYSIS REPORT

Replacement Report

Job No:	**B2408-0405**
Date Issued:	02-Sep-2024
Report Number:	330866
This report replaces Report Number:	330269

Attention:	Kyle Jackson	*Purchase Order:*	Received 16/08/2024
Client:	McDougall Quarries Pty Ltd	*Date Sampled:*	
Address:	PO Box 1876 Busselton WA 6280	*Date Received:*	16-Aug-2024

Bulk Sample Analysis^

Moisture %	-
Neutralising Value %	92.85
Calcium %	34.6
Magnesium %	2.0
Sodium %	<2.0
Copper %	-
Manganese %	-
Phosphorus %	-
Sulphur %	-
Silicon %	-

Note: **All samples are analysed on an 'as received' basis, all results are based on the sample received.**
This report is not to be reproduced except in full.

Please refer to the following link for the measurement of uncertainty values for all NATA accredited analysis

<https://services.awta.com.au/AFTMeasurementUncertainty/index.php>

- Values reported as percent by weight (% w/w), expressed on dried basis.
- Moisture content is representative of the sample as received, determined @ 103C for 6 hours.

The sample(s) referred to in this report were analysed for the following determinant(s):

Analysis	Method	Laboratory
Calcium/Magnesium	BS EN12945:2008 & AOAC 962.01	Bibra Lake Chemistry Lab - WA
Lime Analysis	BS EN12945:2008 & AOAC 962.01	Bibra Lake Chemistry Lab - WA
Neutralising Value	BS EN12945:2008	Bibra Lake Chemistry Lab - WA
Metals - ICP	TP_WA/031	Bibra Lake Chemistry Lab - WA

The results in this report were authorised by:

Name	*Title*	*Name*	*Title*
Prashubha Bhandari	**Laboratory Controller, WA**		



RECEIVED
By Shire of Augusta Margaret River
13 September 2024

ANALYSIS REPORT

Replacement Report

Job No:	**B2408-0405**
Date Issued:	02-Sep-2024
Report Number:	330866
This report replaces Report Number:	330269

Attention:	Kyle Jackson	*Purchase Order:*	Received 16/08/2024
Client:	McDougall Quarries Pty Ltd	*Date Sampled:*	
Address:	PO Box 1876 Busselton WA 6280	*Date Received:*	16-Aug-2024

The following sample was analysed:

Sample ID

B24-0097328 — Your Reference: Sample HB4 — Product: Limestone

Analysis of this sample conducted between 16-Aug-2024 and 27-Aug-2024

Analysis Results

Particle Size Distribution^

Sieve Range (mm)	% weight	Neutralising Value %
0 - 0.125	0.70	78.9
0.125 - 0.250	6.25	91.6
0.250 - 0.50	34.95	94.0
0.50 - 1.00	54.60	94.2
> 1.00	3.50	90.8
Weighted NV	-	93.7

Bulk Sample Analysis^

Moisture %	-
Neutralising Value %	93.7
Calcium %	35.2
Magnesium %	1.5
Sodium %	<2.0

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

ANALYSIS REPORT

Replacement Report

Job No:	**B2408-0405**
Date Issued:	02-Sep-2024
Report Number:	330866
This report replaces Report Number:	330269

Attention:	Kyle Jackson	*Purchase Order:*	Received 16/08/2024
Client:	McDougall Quarries Pty Ltd	*Date Sampled:*	
Address:	PO Box 1876 Busselton WA 6280	*Date Received:*	16-Aug-2024

Bulk Sample Analysis^

Moisture %	-
Neutralising Value %	93.7
Calcium %	35.2
Magnesium %	1.5
Sodium %	<2.0
Copper %	-
Manganese %	-
Phosphorus %	-
Sulphur %	-
Silicon %	-

Note: **All samples are analysed on an 'as received' basis, all results are based on the sample received.**
This report is not to be reproduced except in full.

Please refer to the following link for the measurement of uncertainty values for all NATA accredited analysis

<https://services.awta.com.au/AFTMeasurementUncertainty/index.php>

- Values reported as percent by weight (% w/w), expressed on dried basis.
- Moisture content is representative of the sample as received, determined @ 103C for 6 hours.

The sample(s) referred to in this report were analysed for the following determinant(s):

Analysis	Method	Laboratory
Calcium/Magnesium	BS EN12945:2008 & AOAC 962.01	Bibra Lake Chemistry Lab - WA
Lime Analysis	BS EN12945:2008 & AOAC 962.01	Bibra Lake Chemistry Lab - WA
Neutralising Value	BS EN12945:2008	Bibra Lake Chemistry Lab - WA
Metals - ICP	TP_WA/031	Bibra Lake Chemistry Lab - WA

The results in this report were authorised by:

Name	*Title*	*Name*	*Title*
Prashubha Bhandari	**Laboratory Controller, WA**		



RECEIVED
By Shire of Augusta Margaret River
13 September 2024

ANALYSIS REPORT

Replacement Report

Job No:	**B2408-0405**
Date Issued:	02-Sep-2024
Report Number:	330866
This report replaces Report Number:	330269

Attention:	Kyle Jackson	*Purchase Order:*	Received 16/08/2024
Client:	McDougall Quarries Pty Ltd	*Date Sampled:*	
Address:	PO Box 1876 Busselton WA 6280	*Date Received:*	16-Aug-2024

The following sample was analysed:

Sample ID

B24-0097329 — Your Reference: Sample HB5 — Product: Limestone

Analysis of this sample conducted between 16-Aug-2024 and 27-Aug-2024

Analysis Results

Particle Size Distribution^

Sieve Range (mm)	% weight	Neutralising Value %
0 - 0.125	0.48	79.8
0.125 - 0.250	8.90	91.9
0.250 - 0.50	56.34	93.2
0.50 - 1.00	31.39	94.3
> 1.00	2.89	93.6
Weighted NV	-	93.4

Bulk Sample Analysis^

Moisture %	-
Neutralising Value %	93.5
Calcium %	35.6
Magnesium %	1.5
Sodium %	<2.0

RECEIVED
By Shire of Augusta Margaret River
13 September 2024

ANALYSIS REPORT

Replacement Report

Job No:	**B2408-0405**
Date Issued:	02-Sep-2024
Report Number:	330866
This report replaces Report Number:	330269

Attention:	Kyle Jackson	*Purchase Order:*	Received 16/08/2024
Client:	McDougall Quarries Pty Ltd	*Date Sampled:*	
Address:	PO Box 1876 Busselton WA 6280	*Date Received:*	16-Aug-2024

Bulk Sample Analysis^

Moisture %	-
Neutralising Value %	93.5
Calcium %	35.6
Magnesium %	1.5
Sodium %	<2.0
Copper %	-
Manganese %	-
Phosphorus %	-
Sulphur %	-
Silicon %	-

Note: **All samples are analysed on an 'as received' basis, all results are based on the sample received.**
This report is not to be reproduced except in full.

Please refer to the following link for the measurement of uncertainty values for all NATA accredited analysis

<https://services.awta.com.au/AFTMeasurementUncertainty/index.php>

- Values reported as percent by weight (% w/w), expressed on dried basis.
- Moisture content is representative of the sample as received, determined @ 103C for 6 hours.

The sample(s) referred to in this report were analysed for the following determinant(s):

Analysis	Method	Laboratory
Calcium/Magnesium	BS EN12945:2008 & AOAC 962.01	Bibra Lake Chemistry Lab - WA
Lime Analysis	BS EN12945:2008 & AOAC 962.01	Bibra Lake Chemistry Lab - WA
Neutralising Value	BS EN12945:2008	Bibra Lake Chemistry Lab - WA
Metals - ICP	TP_WA/031	Bibra Lake Chemistry Lab - WA

The results in this report were authorised by:

Name	*Title*	*Name*	*Title*
Prashubha Bhandari	**Laboratory Controller, WA**		



RECEIVED
By Shire of Augusta Margaret River
13 September 2024

element.

Level 18, 191 St Georges Tce, Perth WA 6000
T. (08) 9289 8300 – **E.** hello@elementadvisory.com.au

elementadvisory.com.au