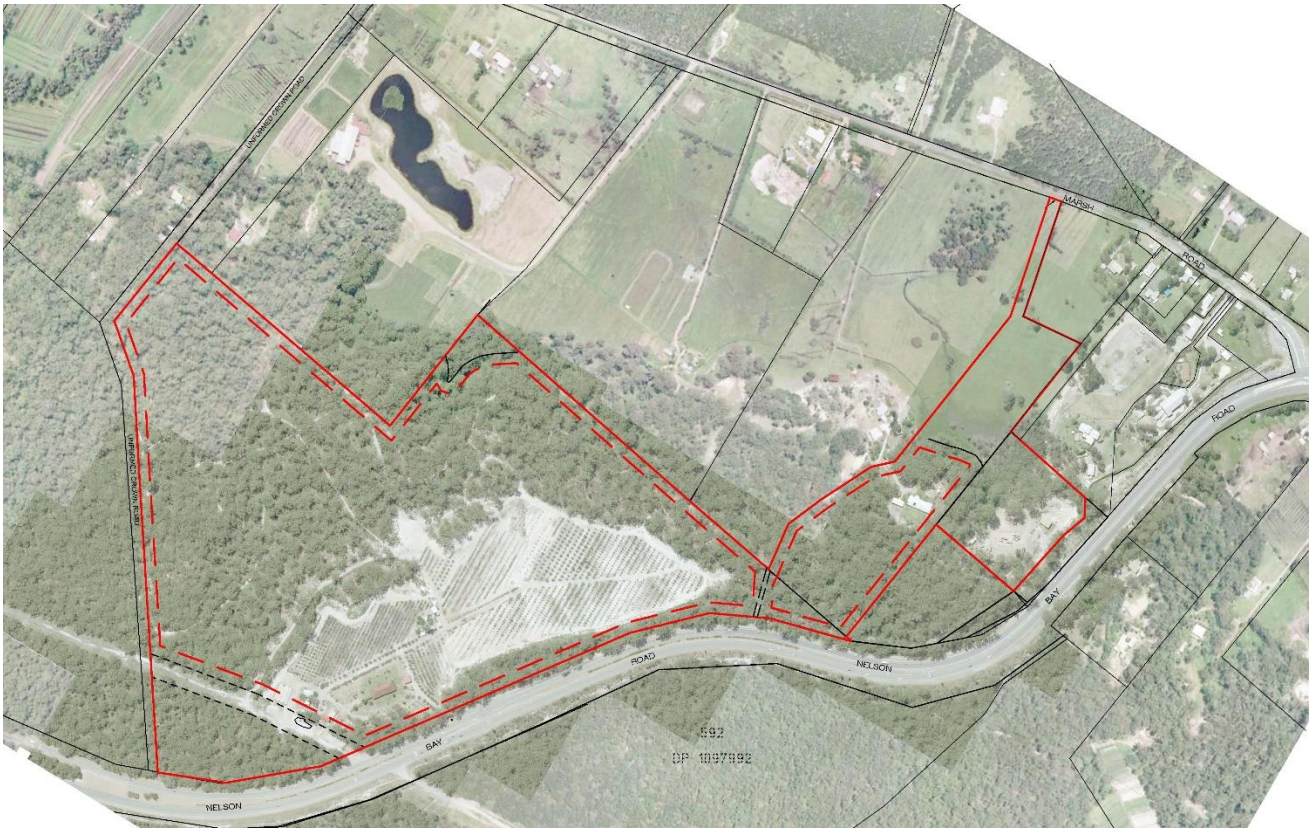

Bobs Farm Sand Mine

SSD 6395

Response to Submissions

AMMOS Resource Management Pty Ltd
February 2021

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Bobs Farm Sand Mine

Response to Submission

SSD 6395

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Job No: 212434

FINAL REPORT

Bobs Farm Sand Mine

Response to Submission

Prepared for
AMMOS Resource Management Pty Ltd

February 2021

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1 Introduction

The concerns raised by the responses to the Bobs Farm EIS from public submissions, Government agencies and other organisations are addressed below. The public responses have been addressed through a reply to themes of concern. Overall, 253 public submissions were made and 11 from organisations. The common themes from all submissions received include:

- Aboriginal cultural heritage;
- Groundwater/surface water;
- Geotechnical and Acid Sulfate Soils;
- Mining plan;
- Noise and vibration;
- Air quality;
- Ecological;
- Traffic; and
- Social impact.

In the general response below (**Section 5.1**), a heading of other has been added. This addresses any other concern that was commonly raised and thematically required another response. Following the General responses, the agency responses have been addressed specifically. Answers endeavour not to overlap between agencies, general submission or the organisation. Each of the 11 organisations that have submitted a response to the EIS have received a specific response further to the general response (see **Section 6**).

2 Analysis of Submissions

According to the Bobs Farm Major project page on the NSW Government Major Projects website, 253 public submissions were made regarding the project. Eleven organisations made submissions, whilst 15 government agencies issued advice letters.

The largest response rate per location is from Bobs Farm. The next largest response groups per locations is from the Tomaree Peninsula, as well as Salt Ash, Tanilba Bay and Lemon Tree Passage. This is approximately three quarters of the responses received. The majority of other responses came from NSW, most in the Hunter Region though one came from the Northern Territory and another from New Zealand.

When referring to the public, organisation and agency submissions, **Table 2.1** notes the concerns raised. In general, the major concerns raised by number of responses were groundwater, air quality, ecology, traffic and social impact (see **Figure 2.1**). All submissions received from the public objected, with four listed as comment. The 11 community organisations that responded all objected.

Table 2.1: Summary of submission

Concern	Submission by			Total Response per concern
	Public	Organisation	Government Agency	
Aboriginal Cultural Heritage	9	1	2	12
Groundwater/Surface water	126	6	6	138
Geotechnical/Acid sulfate Soils	20	2	1	23
Mining Plan	1	-	1	2
Noise/Vibration	67	6	5	78
Air Quality	96	7	5	108
Ecological	132	10	5	147
Traffic	164	7	4	175
Social Impact	117	3	3	123
Other	123	5	7	135

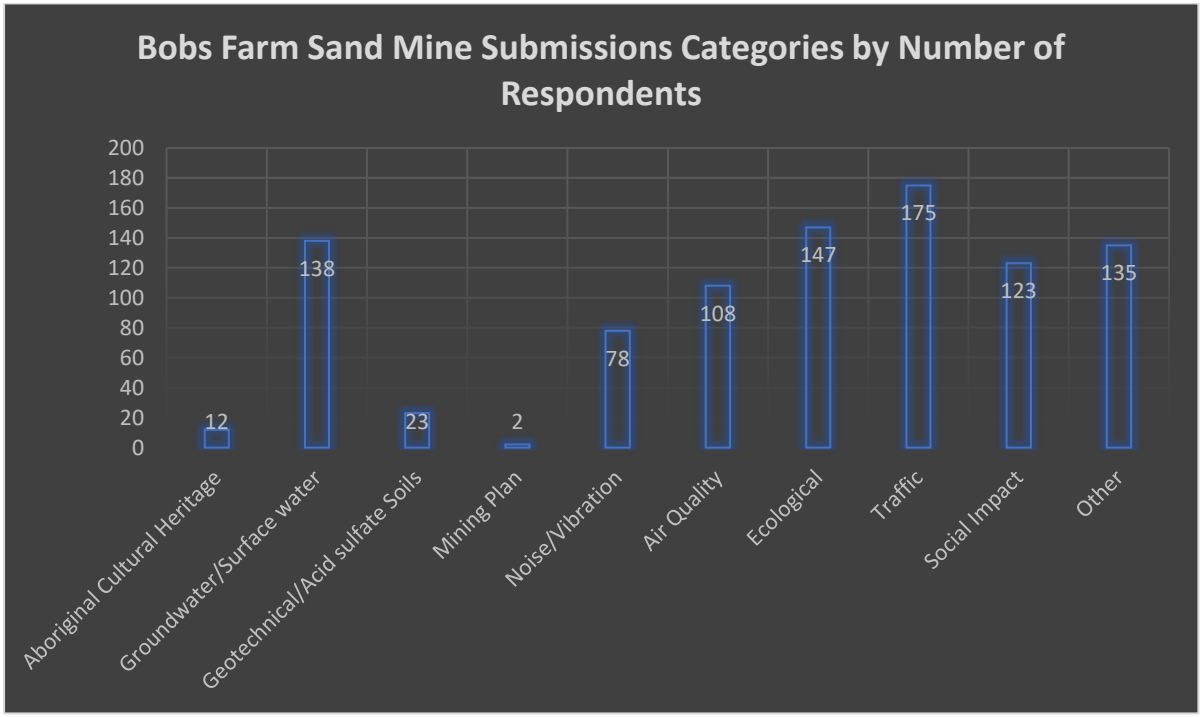

Figure 2.1: Submissions by category and number of respondents

3 Actions taken during and after EIS exhibition

During and after the exhibition of the November 2018 EIS, responses to the EIS were considered and where appropriate action has been taken. Specific action includes:

- Update to EIS report for footprint (**Annex 1**), inclusion of advice from government agencies or addressing their concerns and general update;
- Revised access for sand mine, developed in consultation with Transport for NSW (**Annex 2**);
- Aboriginal Heritage: following the feedback from Heritage NSW the project underwent a new Aboriginal Cultural Heritage Assessment Report due to the gap in consultation since 2015. This was required by the department to address issues such as survey area from the 2015 report. Following this, an Aboriginal Heritage Impact Permit was used to undertake an excavation to investigate the shell located on site. (Details are summarised below. Documents are in **Annex 3**;
- An updated Noise Impact Assessment was undertaken as per the design changes (such as project footprint) and following the advice from government agencies (**Annex 4**). Construction and Operational Noise Management Plans have also been prepared (**Annex 5** and **Annex 6**), along with a memorandum responding to public submissions (**Annex 7**);
- An updated Air Quality Impact Assessment was undertaken as per the design changes (such as project footprint) and following the advice from government agencies (**Annex 8**);
- Further Hydrogeological investigation as well as management plans were undertaken to address advice issued through the exhibition process (**Annex 9**);
- Development of an Acid Sulfate Soil Management Plan (**Annex 10**);
- Historic heritage report was updated to include the new footprint. The assessment outcome has not changed (**Annex 11**);
- Updates to the Biodiversity Assessment Report was undertaken. This was following advice from the Office of Environment and Heritage (**Annex 12**); and
- Following advice from Transport for NSW the access was redesigned to only utilise Nelson Bay Road. This required the traffic assessment to be revised (**Annex 13**).

Below is a detailed summary of updated reports where significate changes or numerous issues were raised by submissions. Relevant updated assessments have been included as annexes to this document.

3.1 Aboriginal Cultural Heritage

3.1.1 Results of 2020 ACHA

The Survey located shell and small bones across disturbed areas. The pedestrian survey was carried out in conjunction with three RAP groups that had previously been involved in the 2014 survey. Overall, thirteen parties registered interest. The findings were consistent with past results and given the disturbed context of the site, the heritage values can't be accurately assessed for cultural significance. Low visibility and low exposure across the less disturbed sections of the site potentially hindered survey efforts.

Effective coverage was considered low in all survey units due to the leaf letter/vegetation blocking visual inspection of the ground. Effective coverage equalled 6.55% due to low visibility (5-20%) and exposure (2-20%). On average transect width averaged 15m with range decreasing/increasing depending upon the density of vegetation. Some transect widths decreased to approximately 2-5m and others increased to approximately 20m. Overall, 17.8 km was walked across the proposed sand mine. The individual transects equated to 15.6 km effectively surveyed.

The registered AHIMS sites are shell that has likely been disturbed from the origin context. Other shell finds across the proposed sand mine site also appear to have a disturbed context. The current disturbances on the property include agricultural (orchard) and pastoral practices (cattle), industrial (powerlines/transmission lines and corridor) and residential. All finds have appeared within an area associated with one of these disturbances. Trees noted as having potential cultural modifications were reassessed during the test excavation and were not scar trees. Few bone fragments were present and do not appear to have the same origin as the shell as it is only found within the orchard area. An intact bird skeleton was noted during the ACHA survey and predatory animals such as snakes were also seen, this leads to some speculation that the bones may be more recent than the shell deposits given the lesser number of finds. Whilst the shell predominantly represents Whelk, Cockle and Oyster shells (as found in AECOM 2015 ACHA report (2014 survey), the disturbed context of shell reduces the archaeological value of the sites. This does not necessarily lower any cultural connections and any further investigation should aim to determine the extent of cultural integrity of the finds.

3.1.2 Results of AHIP and 2020 Test Excavation

This assessment relates to the Test Excavation and further field assessment associated with AHIP C0005692. The test excavation will be the predominant assessment method as per the recommendations of further investigations of the ridge 1 transgressive dune sheet. This includes two previously recorded sites BF-SC4-14 and BF-SC5-14 which were classified as shell scatters; however, additional test pits were opened across the broader Project area to obtain a comprehensive site context and to inform the management measures in an ACHMP as required. These additional test pit locations have been established following an Aboriginal Cultural Heritage Assessment field survey, and in consultation with Registered Aboriginal Parties (RAPs) in the field.

During the excavation, shell was found along tracks, predominantly on the ridge near test pit 2. However, previously and less frequently (one example) of shell was located on the southern side on the lower / waning slope of the dune and vegetated area. This was typical across the site during all recorded site expeditions. Typically, items are isolated on sandy exposed soil/tracks or on exposed soil in lightly revegetated areas, as well as in the orchard area. Only one test pit (Number 2 – 38-5-0352) uncovered subsurface shell. In spit 2 – 15 cm two pieces of shell where located. They were discovered during the sieving process. One piece was a cockle shell fragment and the second was a fragment with a small inner spiral, possibly from a Mud Whelk. In spit 3 – 25 cm one piece of cockle was located within the pit during the excavation in the northern centre half and one cockle fragment was located during the sieving.

The shell located in Pit 2 was relocated on site and reburied under as per requirement 26 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*. The location is recorded the same as Test Pit 1.

3.1.3 Purpose and Scope of the ACHMP

The ACHMP has been prepared in accordance with the Heritage NSW response recommendations for the Project. The ACHMP has been prepared in consultation with the relevant Aboriginal stakeholders and has been referred to Heritage NSW for approval. Any updates or revisions to the ACHMP will also be forwarded to Heritage NSW.

The ACHMP applies to all activities undertaken within the Bobs Farm Sand Mine Project area. Tattersall Lander is currently responsible for implementing all aspects of the ACHMP for the duration of the project and will do so with consultation with the registered Aboriginal parties and a qualified archaeologist, where required. Longer term the mine operator will undertake all the responsibilities under the ACHMP.

The primary objectives of the ACHMP are to provide:

- A means for reporting, reviewing and communicating under the ACHMP with relevant RAPs;
- A methodology for use by RAPs and others for monitoring of vegetation clearance activities;
- Opportunity for RAPs to access the site periodically to inspect stockpiled samples of reject screen material;
- Obtain an AHIP prior to works;
- Provide an unexpected finds procedure;
- Provide a skeletal remains procedure, and
- Development of an Aboriginal cultural heritage awareness training package to be referred to throughout the life of the Project.

3.2 Noise Impact Assessment

A noise impact assessment has been undertaken to determine the potential noise impact of the proposed sand mine at Bobs Farm on noise sensitive receptors in the surrounding area of the proposed development site. An initial assessment was conducted in 2016 previously by Vipac. The 2019 updated report assesses a redesign of the mine including an updated entrance and exit location while addressing the relevant information requests.

Future potential noise levels at the nearest noise sensitive receivers were predicted using the SoundPLAN noise model for each phase, including peak operation. For each scenario, noise levels were predicted for the day and evening periods during both neutral and worst case weather conditions.

Noise levels are predicted to comply with the day and evening criteria with the exception of five of the closest sensitive receivers during the earlier phases of the development. Reasonable and feasible mitigation measures such as noise bunds/earth mounds and acoustic barriers have been recommended, however the closest sensitive receivers remain non-compliant during those initial phases. It is expected the role of the NSW Government Voluntary Land Acquisition and Mitigation Policy (VLAMP) and the use of the Operational Noise Management Plan will provide assistance with managing expectations at these sensitive receivers.

3.3 Air Quality Impact Assessment

The Level 2 assessment predicts air pollutant concentrations in accordance with NSW guidelines and is based on computational modelling and determines controls where needed. The modelling is based on activity information provided by Tattersall Lander. The emission rates for individual mining activities were calculated in accordance with the National Pollutant Inventory (NPI) - *Emissions Estimation Technique (EET) Manual for Mining.*

The main air emissions from the proposed Sand Mine operations are caused by vehicle usage, materials handling and transfers associated with the haul roads, until the dredge operations begin.

In order to assess the impact of the proposed Sand Mine on the receiving environment, the incremental impact is quantified and added to existing background pollutant concentrations.

The results of the modelling have shown that during all Stages, the TSP, PM_{10} (annual), $PM_{2.5}$ (24 hour and annual), respirable crystalline silica and dust deposition predictions comply with the relevant criteria, as requested in the DGRs. In addition, RCS predictions also comply with the relevant criteria.

For most sensitive receptors the maximum 24-hour PM_{10} concentrations are driven by the background concentrations obtained from Newcastle monitoring station. The results have

shown that the highest predicted concentrations will occur during Production Stage 2 (Year 3) for most sensitive receptors. This is a result of the increased throughput with dry mining.

Frequency analysis has identified that the highest number of days the PM_{10} 24-hour criteria will be exceeded is 1 day per annum at two receptors during all Stages except Production Stage 3 (Year 4 onwards).

Overall, the predicted levels comply with the incremental increase and the total dust deposition criteria and therefore dust is not expected to be a nuisance for sensitive receptors.

Recommendations for the installation of a TEOM machine and weather station at the site have been outlined within this report. This would allow proactive dust controls measures to be enforced to reduce the likelihood of exceedances and complaints.

3.4 Hydrological Assessment and Management Plan

The report supersedes a previous groundwater management plan prepared by Martens & Associates (MA) for the site (2015), and has been prepared to address agency comments provided for the Environmental Impact Statement (EIS). This updated assessment includes additional groundwater monitoring data and further groundwater modelling to address agency comments.

This assessment has:

1. Reviewed and analysed existing hydrogeological data for the site and surrounding area, including additional groundwater level and groundwater quality data.
2. Analysed results from site field investigations.
3. Prepared a conceptual groundwater (GW) model.
4. Prepared a numerical GW model for the pre-development and post-development conditions at the site.
5. Analysed the GW model results to determine long-term effects of the development on the local GW system.
6. Assessed any GW impacts in relation to the NSW Department of Primary Industries' Aquifer Interference Policy (2012).
7. Established baseline groundwater quality monitoring data.
8. Established groundwater quality and level monitoring locations, frequencies, analytes, and interim trigger values.
9. Established corrective actions to be taken in case of trigger value breach.
10. Commented on groundwater licensing.

Numerical modelling was able to accurately reproduce the monitored groundwater conditions using the MODFLOW package within the GMS graphical user interface.

This assessment found that:

1. Modelled groundwater level changes do not impact high-priority groundwater dependent ecosystems mapped in the water sharing plan.

2. Modelled groundwater level changes do not impact nearby registered groundwater bores or affect basic landholder rights in respect of groundwater availability.

3. Impacts of changed groundwater levels on acid sulfate soils have been assessed and found to be negligible and able to be managed through the use of the groundwater management plan and ASS management plan.

4. Groundwater quality within the aquifer at the site is currently generally poor and, with the recommended engineering controls, risks to groundwater quality can be suitably managed.

5. The groundwater impacts of the proposed development have been assessed in relation to the NSW Aquifer Interference Policy and have been found to comply with the requirements.

6. A groundwater monitoring plan will be implemented which will manage the impact of the proposed development on groundwater levels and quality.

7. There is sufficient water share allocation available in the Stockton Groundwater Source to allow the purchase of additional share units needed for the operation of the proposed development.

Further, each of the agency comments relating to hydrogeology raised in response to the EIS have been addressed in this assessment.

3.5 Acid Sulfate Soil Management Plan

The plan documents the environmental risks and appropriate management of acid sulfate soils (ASS) required for a proposed sand quarry at 3631 Nelson Bay Road, Bobs Farm (the site). The ASSMP has been developed to provide guidance on the environmental management of ASS for the project, as a result of site soil disturbance during extractive activities. The objective of the ASSMP is to provide recommendations for appropriate management of ASS so that extractive activities are undertaken in a way that minimises or negates ASS risks.

3.6 Biodiversity Assessment Report

This Biodiversity Assessment Report (BAR) has been undertaken to seek approval for a proposed sand mine within Lots 10 DP 1071458, Lot 51 DP 1015671 and Lot 245 DP 753204 Nelson Bay Road, Bobs Farm NSW. This BAR addresses the specific matters raised in the Secretary's Environmental Assessment Requirements (SEARs) that are relevant to biodiversity. In accordance with the SEARs, the BAR uses the Framework for Biodiversity Assessment (FBA) to quantify the project's impacts and the BioBanking Assessment Methodology (BBAM) to determine suitable offsets in accordance with the NSW Biodiversity Offsets Policy for Major Projects. Considerations have also been given to the Fisheries Management Act 1994 (FM Act), Port Stephens Comprehensive Koala Plan of Management 2002 (CKPoM) and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). This report forms part of the Environmental Impact Statement (EIS) undertaken for this proposal.

3.6.1 Definition of the Study Area

The 50.04 ha irregularly shaped study area is composed of three parcels of land:

- Lot 10 DP 1071458 (2.53ha);
- Lot 51 DP 1015671 (6.61ha);
- Lot 254 DP 753204 (40.9ha).

3.6.2 Vegetation

A large portion of Lots 51, 254 and to a lesser extent Lot 10 occurs on Aeolian Holocene transgressive dunes which is undeveloped and consisted of uncleared tall dry open sclerophyll forest dominated by the canopy species Eucalyptus pilularis (Blackbutt) and Angophora costata (Smoothbarked Apple). Coastal Sand Apple Blackbutt Forest composed of E. pilularis and A. costata was the dominant vegetation community on the Holocene sand dunes along Stockton Bight from Fern Bay to Anna Bay. Approximately 10ha within Lot 254 had been cleared and was occupied by an Olive and Fig Orchard. The cleared orchard area also contained a residence and maintained gardens. The lower-lying flat ground in the north of Lots 10 & 51 has had a long history of disturbance and largely consisted of grassland/pasture. Two smaller areas of Swamp Forest dominated by Melaleuca quinquenervia (Broad-leaved Paperbark) were present in the far north and north-west of the study area. An area of Freshwater wetland dominated by sedges was also present in the north of the study area.

3.6.3 Impact Assessment

The proposed Sand Mine will result in the following direct and potential impacts or losses:

- Approximately 27.18ha of Coastal Sand Smooth-barked Apple Blackbutt Forest;
- Approximately 9.5ha of Orchard;
- Approximately 27.18ha of Supplementary Koala Habitat;
- Approximately 27.18ha of known habitat for ten affected threatened fauna species; Glossopsitta pusilla (Little Lorikeet), Ninox strenua (Powerful Owl), Haliaeetus leucogaster (White-bellied Sea Eagle), Petaurus norfolcensis (Squirrel Glider), Scoteanax rueppellii (Greater Broadnosed Bat), Falsistrellus tasmaniensis (Eastern Falsistrelle), Miniopterus australis (Little Bentwing-bat), Miniopterus schreibersii oceanensis (Large Bentwing-bat), Phascolarctos cinereus (Koala) and Pteropus poliocephalus (Grey-headed Flying-fox);
- Suitable habitat for a number of additional threatened and other flora and fauna species likely to utilise the study area;
- Approximately 875 hollow-bearing trees;
- Reduction in the width of the Stockton Bight ecological corridor;
- Habitat Fragmentation;
- Injury/Mortality to native fauna during felling of trees.

The proposed Sand Mine will result in the following potential indirect impacts;

- Increased spread of significant weeds;
- Increased spread of pest fauna species;
- Edge effects;
- Impact on Groundwater Dependent Ecosystems (GDE's) through changes to groundwater levels;
- Increase in noise from machinery; and
- Increase in artificial lighting. Increased lighting may be the result of security lighting.

A number of mitigation measures have been specified to minimise the impact of the loss of habitat. The measures will include:

- Provision of compensatory habitat (Offsetting) using the Biobanking Assessment Methodology (DECC, 2009);
- Protection of remaining habitat/vegetation;
- Protection of fauna during habitat removal;
- Rehabilitation of extraction area;
- Monitoring of groundwater levels and groundwater dependant ecosystems within proximity to the extraction area; and

- Reduction of ongoing mine impacts such as noise and artificial lighting.

To help ensure these measures are carried out a detailed vegetation/habitat management plan has been developed to address any impacts associated with the proposed sand mine to ensure the long-term viability of remaining and rehabilitated habitat.

3.6.4 Offset Requirements using the Biobanking Assessment Methodology (DECC, 2009)

The FBA Credit Calculator generated a Credit Profile for the Development Area. The Development Biobank Credits generated by the Credit Calculator are provided below.

Table 3.1: Offset Requirements

Plant Community Type	Area (ha)	Credits
HU860 – Smooth-barked Apple - Blackbutt - Old Man Banksia woodland on coastal sands of the Central and Lower North Coast	32.29	1,701.00

3.6.5 Provision of compensatory habitat (Offsetting) using the Biobanking Assessment Methodology (DECC, 2009) at Bobs Farm

A Biobanking Assessment and subsequent Biobanking Agreement which has yet to be activated has been undertaken on over 10.50ha Part Lots 254 and 255 DP 753204 which adjoin the proposed Bobs Farm Sand mine proposal. Part Lot 254 (2.33ha) also occurs within the same lot as the majority of the sand mine development (Study Area) and is separated from the proposal by an electricity easement which is approximately 30m wide. Part Lot 255 DP 753204 occurs to the west of Part Lot 254 and is separated by a 20m unformed road. The offset area within Part Lot 255 consists of two sections of land (1.11ha & 7.06ha) separated by the 30m electrical easement. Although the landowner owns the land within the electrical easement, easements are excluded from Biobank sites due to the fact that the landowner has no control over their management (easement is managed by Ausgrid). The 1.11ha section of land has been placed along the northern section of the easement as a buffer and future protection for two threatened orchid species, Diuris arenaria (Tomaree Doubletail) and Diuris praecox (Newcastle Doubletail) which are known to occur within the easement (Wildthing Environmental Consultants, 2018). The Biobank Credits generated by the Credit Calculator are shown below.

Table 3.2: compensatory habitat (Offsetting) at Bobs Farm

Plant Community Type (PCT)	Area (ha)	Credits
Plant Community Type (PCT) Area (ha) Credits HU860 – Smooth-barked Apple - Blackbutt - Old Man Banksia woodland on coastal sands of the Central and Lower North Coast	10.50	108

3.6.6 Provision of compensatory habitat (Offsetting) using the Biodiversity Assessment Methodology (BAM) at Nerong

Two preliminary Biodiversity Stewardship sites were assessed within Lot 32 DP 880637 (No. 8000) Pacific Highway Nerong NSW. These proposed offset sites are in the same IBRA Subregion (Karuah – Manning) as the Bobs Farm Sand Mine Proposal. Both proposed offset areas border Myall Lakes National Park. The Credits generated by the BAM Credit Calculator are shown below.

Table 3.3: compensatory habitat (Offsetting) at Nerong Site 1

Plant Community Type (PCT) Site 1	Area (ha)	Credits
PCT 1618 - Smooth-barked Apple - White Stringybark - Red Mahogany - Melaleuca sieberi shrubby open forest on lowlands of the lower North Coast	13.34	18
PCT 1717- Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast.	3.00	4
PCT 1215 - Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion (Good Condition).	39.10	47
PCT 1215 - Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion (Moderate Condition)	15.40	8
PCT 1619 - Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands (Good Condition)	19.60	20
PCT 1649 - Smooth-barked Apple - Red Mahogany - Swamp Mahogany - Melaleuca sieberi heathy swamp woodland of coastal lowlands	2.30	5
PCT 1728 - Swamp Oak - Prickly Paperbark - Tall Sedge swamp forest on coastal lowlands of the Central Coast and Lower North Coast	4.80	1
PCT 1556 - Tallowwood - Smooth-barked Apple - Blackbutt grass tall open forest of the Central and lower North Coast (Low_Moderate)	14.70	13
PCT 1556 - Tallowwood - Smooth-barked Apple - Blackbutt grass tall open forest of the Central and lower North Coast (Low)	17.32	4

Table 3.4: compensatory habitat (Offsetting) at Nerong Site 2

Plant Community Type (PCT) Site 2	Area (ha)	Credits
PCT 1646 - Smooth-barked Apple - Blackbutt - Old Man Banksia woodland on coastal sands of the Central and Lower North Coast	4.9	9
PCT 1725- Swamp Mahogany - Broad-leaved Paperbark - Swamp Water Fern - Plume Rush swamp forest on coastal lowlands of the Central Coast and Lower North Coast	1.7	1
PCT 1717- Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast (Moderate/Good)	16.5	26
PCT 1717- Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast	2.3	1

PCT 1742 - Jointed Twig-rush sedgeland	3.2	2
PCT 1556 - Tallowwood - Smooth-barked Apple - Blackbutt grass tall open forest of the Central and lower North Coast	0.49	1

3.6.7 Conclusion

The proposed sand mine will result in an incremental loss of habitat for a number of the addressed threatened species occurring within the local area. Taking into account the relatively large amount of similar habitat along Stockton Bight and given the recommendations which include a Biobanking Offset it is believed that the proposal is unlikely to disrupt the life cycle of any addressed threatened species, endangered population or endangered ecological community such that local extinction would occur.

3.7 Traffic Impact Assessment

The following conclusions are drawn from the investigations into the proposed sand quarry at Bobs Farm off Nelson Bay Road:

1. The major access route for outbound material will be to the west of the site along Nelson Bay Road to centres such as Newcastle, Raymond Terrace and the Lower Hunter Valley.
2. The proposal allows for a sand quarry with all vehicle access via an upgraded site access off Nelson Bay Road.
3. The upgraded access will include a left turn deceleration lane to be built on Nelson Bay Road, designed and constructed in accordance with RMS and Council requirements. An acceleration lane will also be included on Nelson Bay Road to accommodate all vehicles exiting the site.
4. To accommodate trucks with destinations to the west, a U-turn is required at the roundabout controlled intersection of Nelson Bay Road and Port Stephens Drive. The trucks will then continue along Nelson Bay Road and then use Richardson Road to head towards Raymond Terrace and the Pacific Highway, or Cabbage Tree Road to head towards the New England Highway and Maitland or continue along Nelson Bay Road towards Newcastle. Both Nelson Bay Road and Cabbage Tree Road are RAV approved routes suitable for heavy haulage. There will be minimal demand for trucks approaching the site from the east, however the roundabout intersection of Nelson Bay Road / Lemon Tree Passage Road can be utilised to complete a U-turn for these vehicles to enable them to approach the site from the west.
5. The access routes for trucks will be controlled by a Traffic Management Plan, informing drivers of their requirements.
6. Light vehicles will be able to utilise the U-turn facilities provided along the Nelson Bay Road corridor. The U-turn facility along the site frontage has been reviewed and can continue to operate in a safe manner taking into account the development flows.
7. The site access points have been reviewed on site and allow for safe vehicle movements, with adequate sight lines and stopping sight distance available based upon vehicle speeds and the posted speed limit.
8. All parking can be accommodated on site. Trucks will not be parked on site over-night and there will be minimal on-site staffing levels requiring minimal on-site parking.

The overall conclusion from the investigations is that traffic and access arrangements for the development proposal are satisfactory and that there is no traffic or access impediments to the development. The trucks access routes have been reviewed based upon impacts for other road users and road safety and the proposed access routes can operate in a safe and efficient manner with minimal delays for other road users. The access point on Nelson Bay Road will be designed and constructed in accordance with RMS and Council requirements to ensure the trucks, including B-Doubles can safely enter and exit the site.

3.8 Consultation

Also, as part of the post EIS phase consultation with government agencies was undertaken. Government agencies included Transport for NSW, the Department of Planning, Industry and Environment and Heritage NSW.

3.8.1 Heritage NSW

From April 2019 consultation concerning Aboriginal heritage and the advice issued by the department has occurred. This has included meetings and phones calls about the specific requirements need to conduct the subsurface testing noted in the advice and the consultation expectation of the department.

3.8.2 Transport for NSW

Further advice was sought regarding the access for the project site. It was decided to use Nelson Bay Road as the sole access point with a new acceleration and declaration lane to be constructed in consultation with Transport for NSW.

3.8.3 Department of Planning, Industry and Environment

General consultation and queries regarding the Bobs Farm sand mine project have been discussed with the Department of Planning, Industry and Environment.

3.8.4 Community engagement

Since the EIS exhibition, community consultation has been undertaken as required. An example of this is the Aboriginal heritage assessment with community consultation occurring, with an increase in Registered Aboriginal Parties occurring (five in 2015 going to thirteen in 2020).

4 Changes to the project and updated project descriptions

4.1 Location

The proposed Bobs Farm Sand Mine is located at Bobs Farm, immediately south of the Marsh Road intersection with Nelson Bay Road and on the western side of Nelson Bay Road.

4.2 Project area and context

The land, the subject of the proposed development is described as Lot 254 DP 753204, Lot 51 DP 1015671 and Lot 10 DP 1071458 Nelson Bay Road, Bobs Farm.

Approximately 39.07ha out of a total of 50.04ha is proposed to be mined with 11.74ha containing future rehabilitated batters and 11.46ha of buffer strips.

To the immediate northeast of Lot 254 there is a small parcel of Crown land. To the immediate west and south there is a series of small to medium rural lots that are rural lifestyle properties or small-scale farming operations. Nelson Bay Road runs along the eastern boundary with the Worimi National Park to the immediate south of Nelson Bay Road.

To the north and northwest there is the Bobs Farm Primary School and the Bobs Farm Community Hall and some additional rural properties.

At the southern corner of the land is an Ausgrid sub transmission line. To the north there is also a Right of Way for Lot 521 DP 1034604.

4.3 Land titles and tenure

Table 4.1 illustrates the ownership of the land which is the subject of the application.

Table 4.1 – Land Tenure

Description	Owner
Lot 254 DP 753204	Patra Holdings Pty Ltd
Lot 51 DP1015671	Patra Holdings Pty Ltd & RA Christie
Lot 10 DP 1071458	Allan Hay

4.4 Existing site characteristics

The proposed extraction area is one of a number of sand deposits within the Stockton Bight and comprises sands deposited approximately 4500 -7000 years ago in the Holocene Epoch.

The site contains dune ridges to the north and west and sand plains to the east. The ridges have attained a height of up to 35m AHD with the lowest sand plain at 5m AHD. The majority of the land within the site is > 8-10m AHD. **Figure 4.1**and **Figure 4.2** illustrate existing contours.

Current operations on Lot 254 comprise an olive and fig farm. The olive and fig farm has been in operation for nearly 15 years. Current access to the farm for the public is from Nelson Bay Road.

Lot 521 DP 1034604 also has an access Right of Way over part of the proposed mine site. There will be no significant interference to the Right of Way during the mining operations other than a public safety accommodation by the landowners as they will need to pass egressing trucks to gain access to Nelson Bay Road.

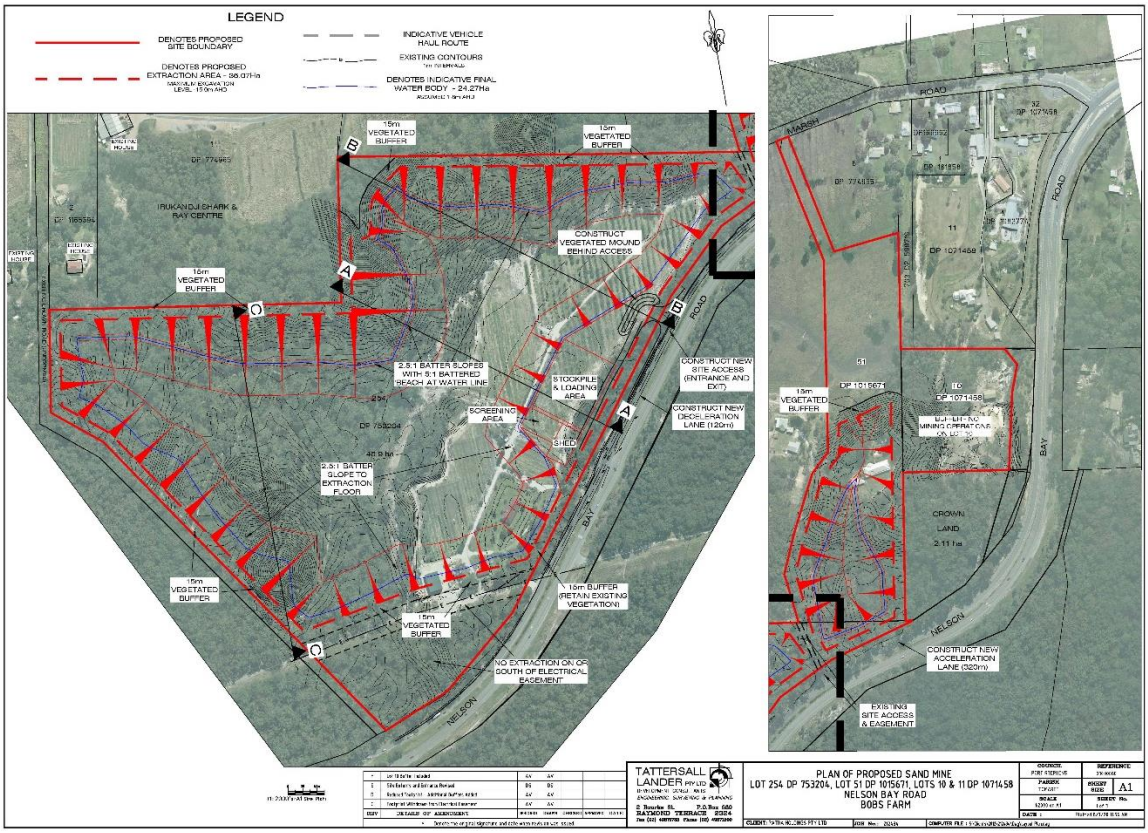

Figure 4.1– Proposed Sand Mine with Aerial (Tattersall Lander, 2020)

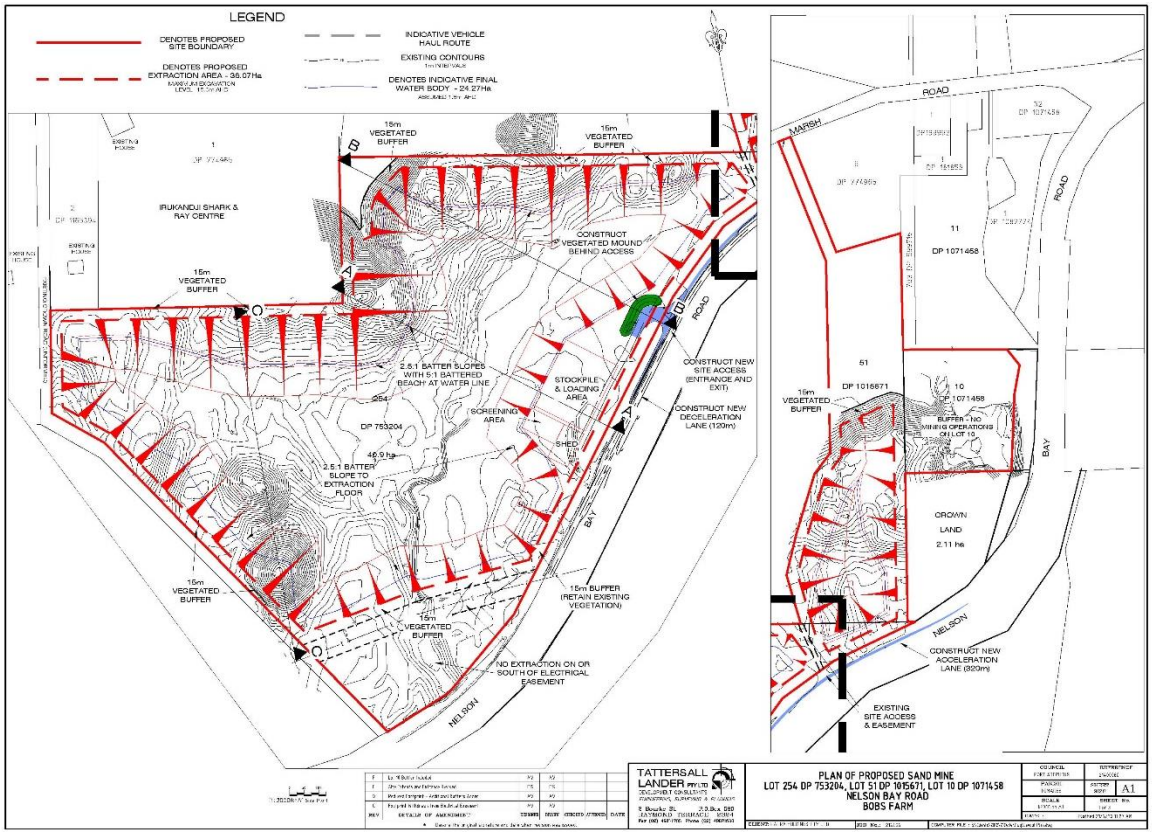

Figure 4.2 – Proposed Sand Mine (Tattersall Lander, 2020)

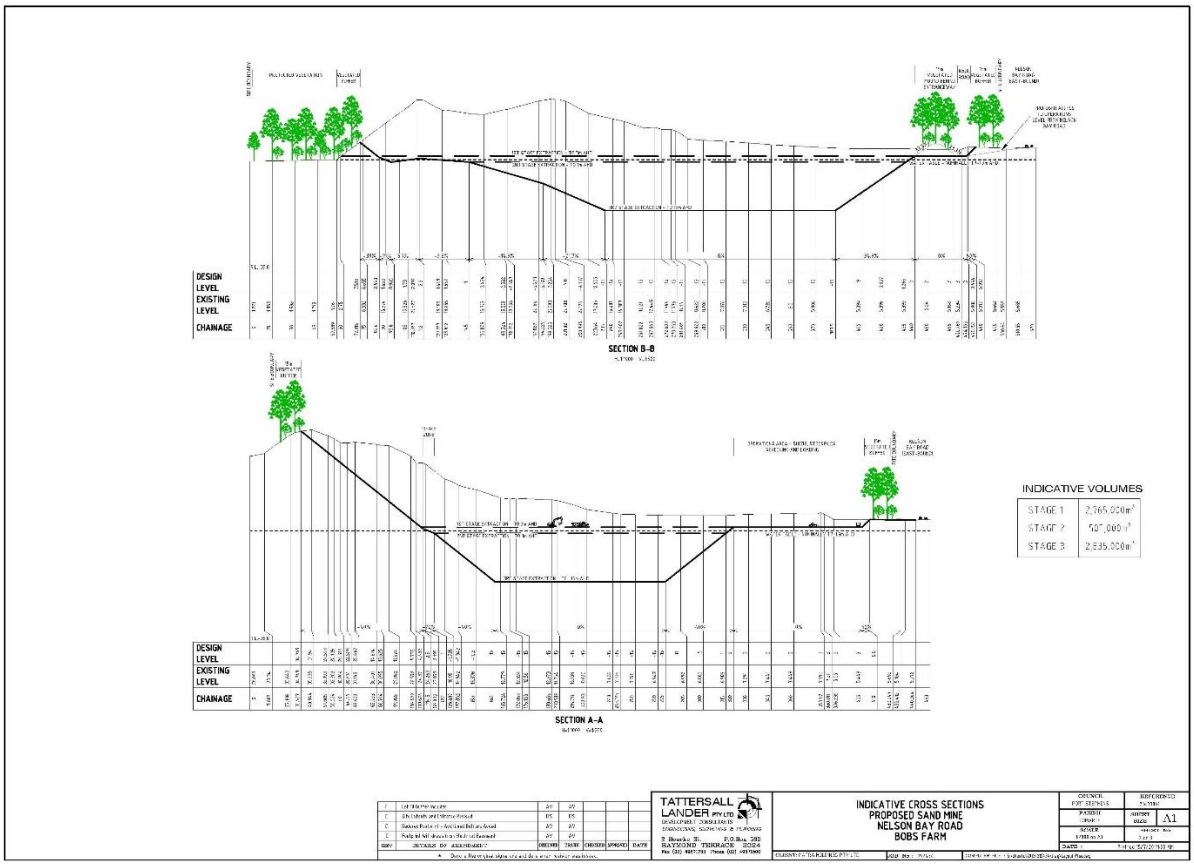

Figure 4.3 – Cross Sections A-A & B-B (Tattersall Lander, 2020)

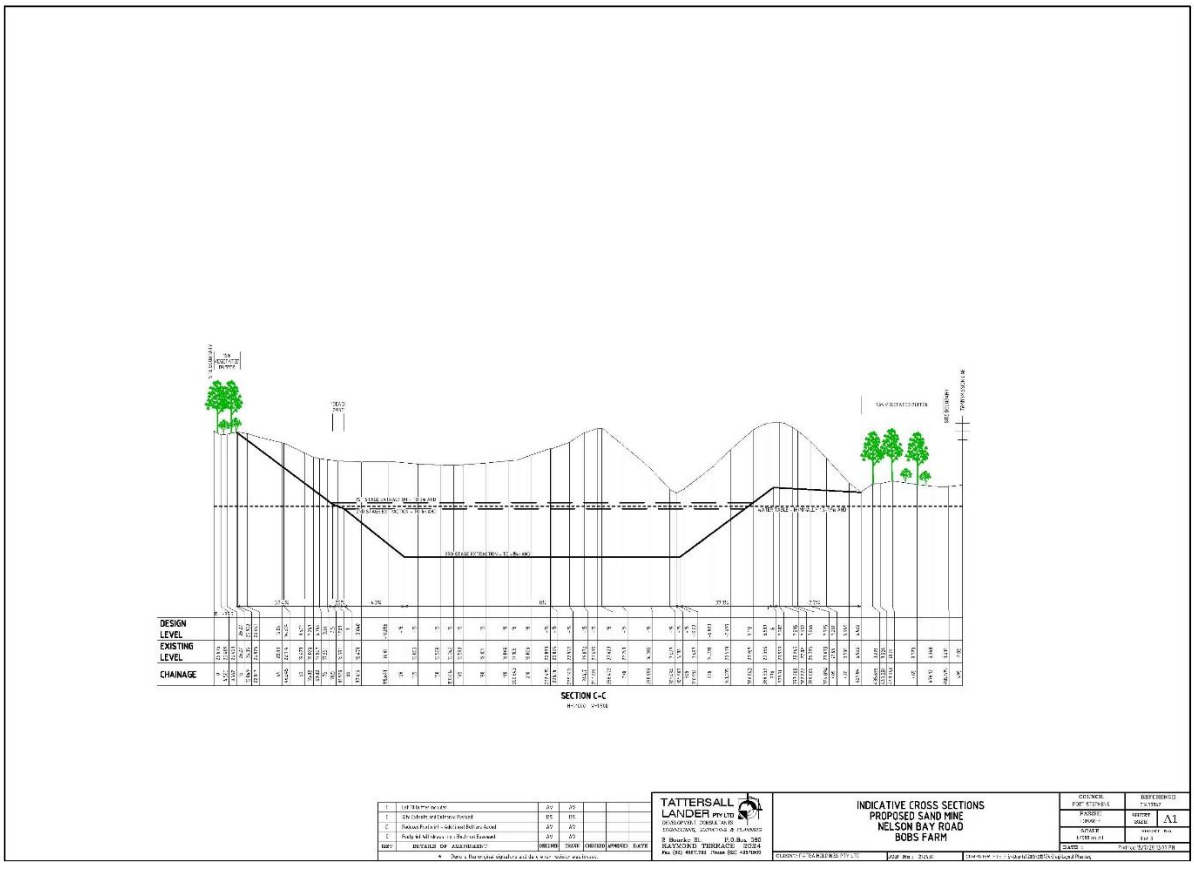

Figure 4.4 – Cross Section C-C (Tattersall Lander, 2020)

4.5 Description of proposed mining operations

The proposal seeks to undertake a sand mining operation over an area of about 36.07ha. The resource estimates provided by Tattersall Lander indicate that around 6.105 million cubic meters of resource is available and the vast majority of sand products are likely to be present. **Figure 4.3 and Figure 4.4** indicate the proposed final profile of the mine with an internal water body that would be used for a tourist facility or a solar energy farm, post mining.

On top of the original 15m offset from the existing boundaries and the maintenance of an appropriate buffer to a central Endangered Ecological Community (EEC), there will be an enhanced buffer around the whole of the mine that will be progressively rehabilitated. Advice from Martens & Associates (Annex G in the EIS) has indicated the required batter slope for long term stability, the batter is shown in **Annex 1**.

It is proposed that the area adjoining Nelson Bay Road will be developed initially with the construction of the access off Nelson Bay Road, operations shed/screens and stockpile areas. These works would also include the required mitigation measures to restrict noise and air quality issues, the installation of permanent water monitoring bores and an on-site weather station.

The winning of particular sand stock will then follow the general mining plan as detailed by QMS in Chapter 16, Annex I of the EIS, and shown as **Figure 4.5** below:

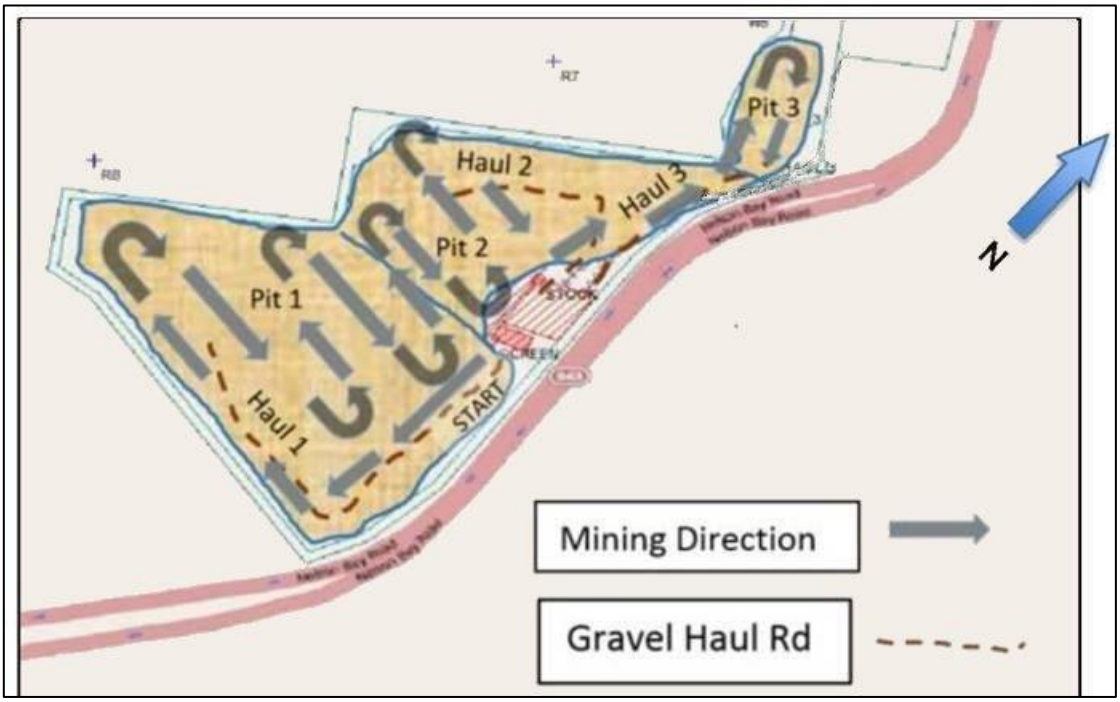

Figure 4.5 – Proposed Mining Plan and Extraction Cell Arrangement (QMS, 2015)

The proposed steps in the mining plan would be generally as follows: -

- Vegetation clearing;
- Topsoil stripping and stockpiling;
- Dry extraction and either processing for market requirements or direct loading onto trucks for market supply; and

- Topsoil respread over exposed areas once the final mine profile is achieved, including the dry mining areas.

It is expected that the extraction arrangements would involve 3-4, one-hectare working cells being actively worked at any one time.

The active cell extraction is planned to commence in the south eastern corner of the site extending west then returning east as per the illustrated extraction flow direction.

Each active cell is to be stripped of existing vegetation in turn and prepared for mining. It will then be dry mined to within 2 metres of the water table, before switching to wet mining.

Haul roads 1 and 2 will consist of gravel, being unsealed.

4.5.1 Dry Mining

Dry mining of the Bobs Farm deposit will commence with stripping of existing vegetation from the surface by excavator with a grab and bulldozer. Salvaged vegetation will be stored onsite to provide the required seed stock of natives for rehabilitation while the remainder will be processed into mulch and stockpiled onsite in a location that will not cause problematic leachate discharge during rain events. This mulch material will be needed throughout the life of the development to vegetate the final bund profiles so should be easily accessible for this future re-use.

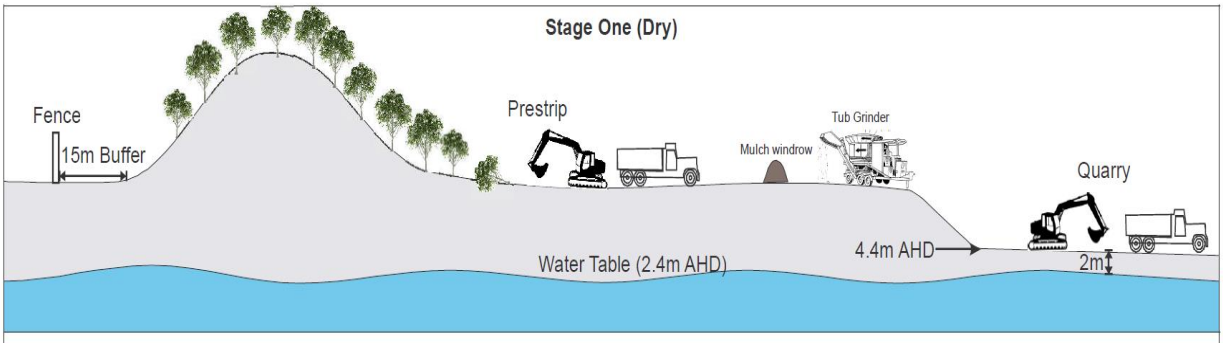

Figure 4.6 – Dry Mining Schematic (Extract from QMS Stage 3 Report)

The final stages of dry mining will involve removal of the Potential Acid Sulfate Soil (PASS) black mud layer, for treatment or disposal, reducing the acid sulfate soil risk for that portion of the site. In accordance with the Martens & Associates acid sulfate management plan (**Annex 10**) for the site, this removal will be undertaken by excavator which will operate at or just below the water table in removing this layer. If testing confirms pH of the sand has dropped below 5 pH points it will be treated with lime in accordance with the PASS treatment plan prepared by Martens& Associates.

4.5.2 Wet Mining

Wet mining is to commence upon establishment of the dedicated suction cutter dredge upon the water table.

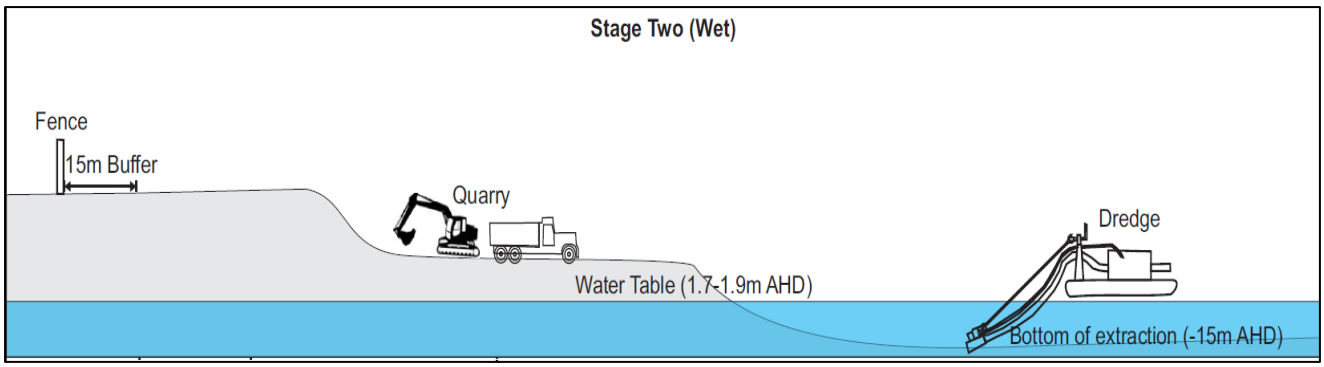

Figure 4.7 – Wet Mining Schematic (Extract from QMS Stage 3 Report)

Wet mining will involve the winning of sand feed by suction cutter dredge.

Sand remaining above the water table will be placed into the dredge pond by excavator with a bulldozer feeding the excavator to assist the process.

The operation of the dredge will be such that it will mine the sand feed below the water table to a final profile as provided by Martens & Associates (EIS 2018)

4.6 Rates of extraction - projected

At peak production a maximum of 750,000 TPA of sand feed is proposed to be extracted for processing. This would equate to approximately 450 tonnes per hour based on 11 months of sand production at 19 days per month and 8 hours per day (=> 750,000 /11/19/8 = 448.56t /hr => ~ 450t/hr of extracted feed). That estimate allows enough time for plant maintenance, shutdowns and production interruptions.

The build-up of sand production volume up to the specified maximum of 750,000 TPA depends on the market take up of sand products.

A conservative approach for build-up of sand product volumes and sales is estimated to achieve maximum percentage at year 4 onwards.

4.7 Development staging

Preliminary staging plan for mining operations is provided in Table 4.2.

Table 4.2 – Preliminary operations staging plan

Stage	Activities	Processes
Preliminary	Preliminary works	Provision of access roads and an intersection with Nelson Bay Road. Initial clearing of existing structures. Setting up of screening operations, loading ramp and storage shed.
1	General site clearing Extraction	Clearing of topsoil and stockpiling, for likely processing into landscape soil base and sports field top-dress material. Extraction of aeolian sands to approximately 3 m above the groundwater table, using conventional excavation/extraction techniques, and stockpiling for later use for various purposes. Rehabilitation of final batter slopes.
2	Extraction	Extraction of aeolian sands to approximately 1 m above the groundwater table, using conventional excavation/extraction techniques, and stockpiling for later use for various purposes. Rehabilitation of final batter slopes.
3	Extraction	Extraction of aeolian and marine sand from approximately 1 m above to 16 m below the groundwater table, by dredging, and stockpiling for later use for various purposes.

4.8 Description of the proposed final landform

Surface elevations vary from 5m AHD to 35m AHD and the detailed survey contained in Annex U of the EIS provides relevant details. **Figure 4.1** to **Figure 4.4** provide elevation details. The highest ridges are contained generally to the west of the land.

Figure 4.1 to **Figure 4.4** provide plans of the existing and indicative final profiles. Given that no part of the extraction mining operation will encroach within the 15m buffer area, the impact on adjoining neighbours is expected to be minimal and the change in landform will not impact neighbouring properties. The proposal is to undertake early rehabilitation of the final landform profiles including on that part of the mine that will contain only dry mining operations. This will provide an enhanced buffer for the adjoining neighbours at the earlier stages of the operations. The rehabilitated areas would return to a typical existing bush configuration.

It is proposed that the final landform will provide a significant tourist or solar farm option potential. The tourist facility would be based on water sports, water activities and recreational accommodation that would potentially include:

- Cable skiing;
- Diver training;
- Tourist cabins;
- Kayaking; and
- Paddle skis.

There is also the potential for the use of the site as a solar energy farm of the type that is currently being trialled in Jamestown in South Australia, and other locations within Australia and globally.

Visual representations of proposed tourist (**Figure 4.8**) and solar energy farm (**Figure 4.9**) operations are shown below.

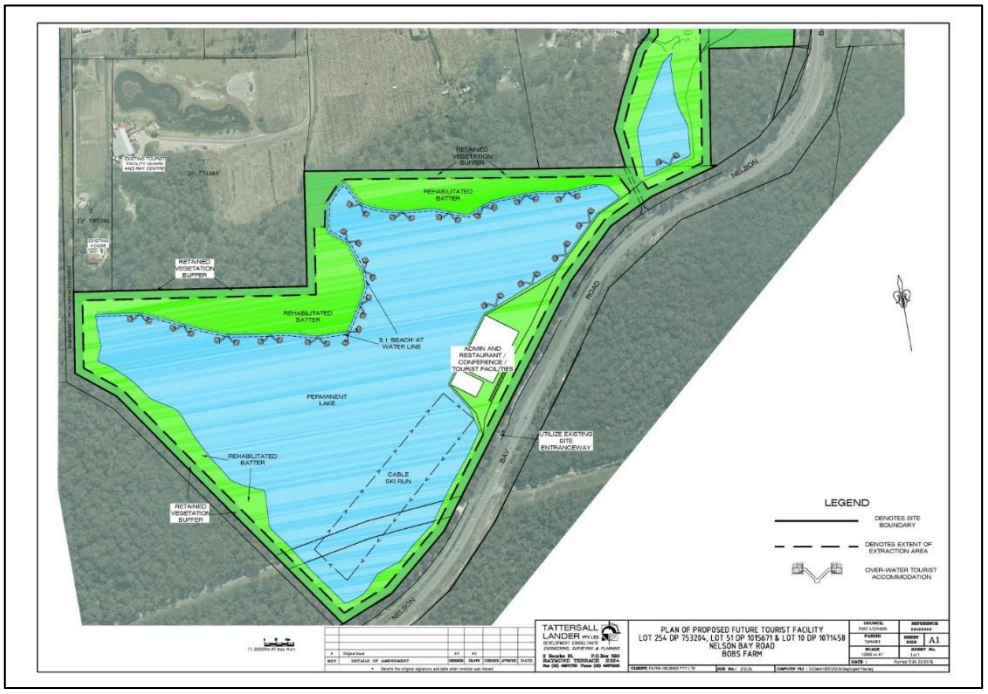

Figure 4.8: Visual Representations of Proposed Eco-Tourist Option

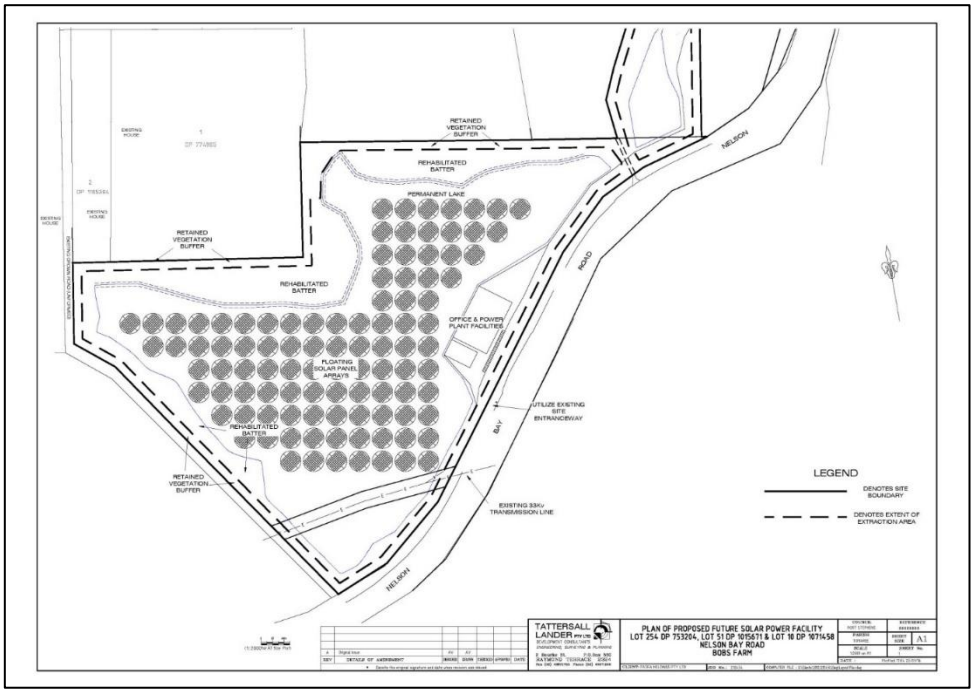

Figure 4.9: Visual Representations of Proposed Floating Solar Farm Option

4.9 Staged landform and vegetation rehabilitation

The proposed landform rehabilitation would be managed per a formal Environmental Management Plan (EMP) process.

The objective of the Plan will be to ensure that the post extraction landform profile does not adversely impact on adjoining neighbours and that the surface profiles are conducive to the re-establishment of the vegetation communities that pre-existed on the site.

The vegetation rehabilitation plan would specify minimum tree/shrub/grass cover plantings to be undertaken with best practice techniques and within a reasonable period of post-extraction monitoring.

The staged clearing of the existing vegetation would see an ecologist supervise removal of the vegetation and the recovery of any fauna. Immediate placement of a number of nest boxes (to partially mitigate the removal of habitat trees) is one of the recommendations within the ecological assessment by Wildthing (**Annex 12**). The topsoil that would be stockpiled will also act as a soil seed stock for the re-establishment of extracted areas involved with the dry mining operations.

Depending on the success of the proposed rehabilitation works, there will be a requirement to also consider direct drilling of native species, tubestock plantings and in some cases, transplanting of locally important Grass trees, *Xanthorrhoea spp.*

Weed control will be included in the site EMP and given the active site presence of machinery and mine staff, the control of weeds into surrounding bush will be an activity that is regular and continuous.

Given that the final profile will intercept the water table, it is suggested that the site also undertake rehabilitation with a view of planting Koala feed trees in areas that create the opportunity for the relevant species to extend their territory (i.e. plant koala feed tree species which thrive in moist/wet soil conditions – such as *e. robusta and e. tereticornis)*. The current areas of Koala activity do not extend into the site and this opportunity to extend their feeding territory should not be wasted.

The monitoring of all rehabilitation works will be undertaken by ecologists and the results will be documented in the reports required by the relevant agencies. The EMP will be an active document and modifications to the rehabilitation works and methodology will be undertaken when and where it is necessary.

4.10 Processing and transporting of sand

It is intended that the processing of the sand would be fully contained with the mine site. The processing steps for the dry mining component are: -

- Winning of feed;
- Feed delivered to processing plant by haul truck;
- Haul truck tips into feed stockpile / hopper;
- Loader feeds grizzly if oversize present then onto a feed conveyor;
- Feed conveyor to double deck screen (maybe a wash screen as required by product);
- Fines to waste stream and possible treatment; and
- Sand screw to radial stacker and final product.

Possible Additional Dry Mining Plant Options

- Spirals for glass sand manufacture; and
- Attrition cells to remove stubborn adhering contaminants.

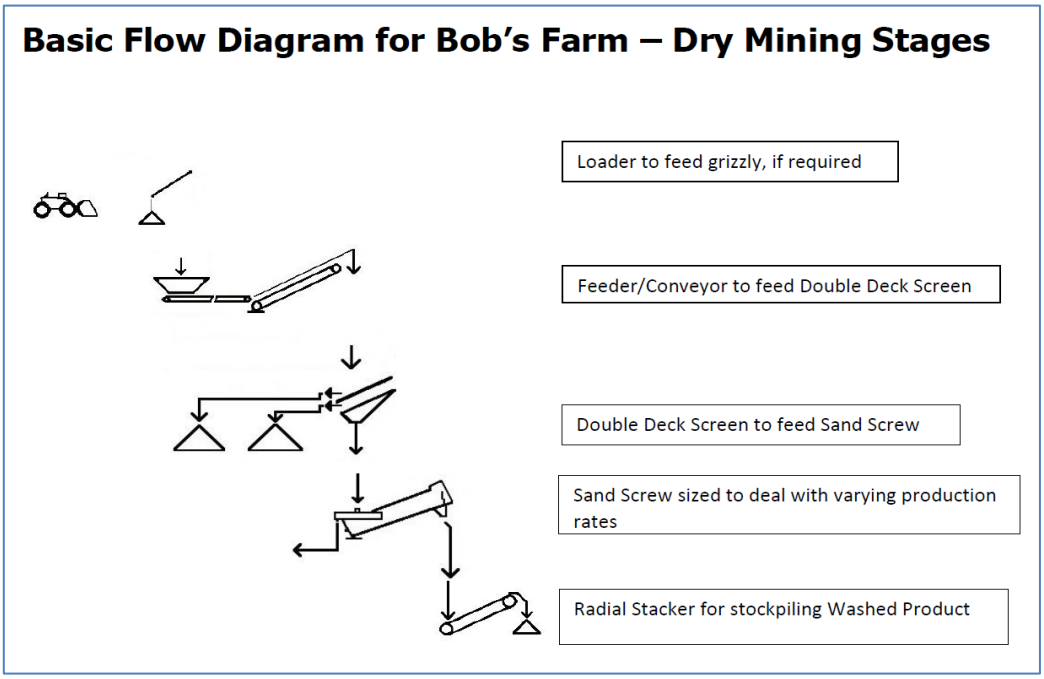

Figure 4.10 Typical Dry Mining Operation (Extract from QMS Stage 3 Report)

The wet mining operations include: -

- Dredge to pump box;
- Pump to double deck vibrating wet screen;
- Dewatering classifying tank; and
- Sand screws to radial stackers and final product.

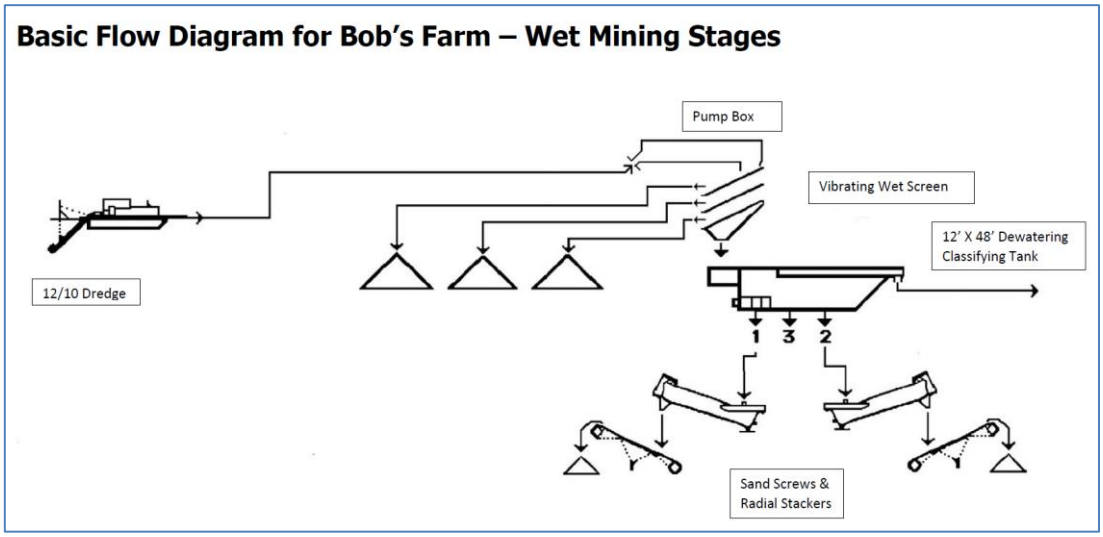

Figure 4.11 – Typical Wet Mining Operation (Extract from QMS Stage 3 Report)

The proposed transportation of the sand out of the site is via Nelson Bay Road. Trucks would travel east about 5km to the roundabout at Port Stephens Drive prior to travelling westward

towards the majority of the expected markets in Newcastle, Newcastle Port and surrounding districts and Sydney. It is expected that the initial truck usage will be around 10 trucks/hr elevating to 20trucks/hr for the wet mining operation.

4.11 Hours of operation and employment

Proposed construction hours are from 7am to 7pm, Monday to Saturday. Operational hours for extraction, loading of vehicles and transportation of material are proposed to be Monday to Saturday 7am to 7pm only. There would be no work undertaken on Sundays or public holidays.

It is expected that around 80 jobs would be generated with 7-10 on site, 50-70 involved in transportation, 15 in downstream manufacturing and laboratory activities and 10 in the use of product for recreational purposes.

4.12 Machinery, equipment, materials and consumables

Depending on the stage of the operations, the machinery and equipment will change to suit the site requirements but generally the following will be utilised:

- Chainsaws (initial clearing);
- Mulching equipment;
- Excavators;
- Dump trucks;
- Loaders;
- Conveyors;
- Hoppers;
- Screens;
- Pumps; and
- Water carts.

Diesel fuel will be the major product consumed on site and the diesel will be bought onto site on an as needs basis. Hydraulic fluid and engine oils would also be consumed with major servicing undertaken off-site.

The site will produce minimal paper and domestic waste which will be collected, sorted and disposed of off-site by waste management contractors.

4.13 Need for the mine and alternative sand sources

High grade white silica sand deposits are scarce, and the deposits of the Tilligerry & Tomaree Peninsulas are unusually pure dune deposits of glass and manufacturing making quality. These deposits represent the only significant source of this grade of sand close to Sydney. The nearest source of equivalent grade sand outside these Peninsulas is located interstate. The processed sand from the Bobs Farm Sand Mine is about 99.9% silica and contains negligible amounts of contaminants. The proposal seeks to maximise the utilisation of the silica sand deposits in the vicinity of the manufacturing and port facilities in the region.

4.14 Alternative to sand extraction options

An option exists to not undertake the mining operation and to attempt to continue the current farming operations involving the fig and olive farm. The sand resource is limited within the area and the need for the resource is growing strategically both locally and regionally. The farming operation is not:

- A significant employer;
- Able to expand operations due to the financial constraints associated with an expansion; and
- Seen by DPI as a viable long-term sustainable operation.

Undertaking the mining operation would see:

- Significant local employment;
- Supply of a limited resource into a market that is continuing to grow locally and regionally but needs to be expanded for the future of infrastructure projects in Sydney, regionally and locally;
- Operations within controlled levels for noise, water quality and visual impact; and
- Mitigation measures to minimise environmental impacts.

4.15 Alternatives of not proceeding

The sand deposits at Bobs Farm are of an exceptional quality that has been identified to be able to supply over 12 known markets that include:

- High Purity Glass Sand- LCD TVs, Silicon Computer Chips etc;
- Optical sand glass / watches etc;
- Glass sand (Clear- general);
- Glass sand (Coloured);
- Horticulture sand - propagation sands etc;
- Landscape sand (High end)- horse sand/golf, bunker, green, fairway sands;
- Decorative sands- resorts, national / international;
- Filter sands / bio retention;
- Soft fall / sand pit sands- kindergartens, wet & wild etc;
- Landscape sand (lower end)- top dress etc;
- Construction sands; and
- Fill sands.

The resource is close to established markets and would add a significant component to the limited sand resources that underpin the economic sustainability of the local region and NSW itself. The impacts associated with the extraction activities are known and measured. The site has been shown to be able to exist with little adverse impacts on adjoining neighbours. Not proceeding would ultimately see the land cease long term as an orchard and little, if any, primary production being carried out. Long term sustainable jobs would utilise the post mining operation with options for a tourist development as well as a solar energy farm being considered.

5 Community Submissions

5.1 General Response

5.1.1 Aboriginal Cultural Heritage

The area is a representative part of the larger Holocene and Pleistocene based sand dune dominated landscape. The landscape and area are connected to the Indigenous heritage with documented heritage. The area on the opposite side of Nelson Bay road is protected through the Worimi National Park. With the Port Stephens peninsula having a large percentage of protected land (national parks), this provides protection to large areas of Indigenous

heritage. The NSW heritage legislation also provides a method of assessment to determine the extent of heritage values, with lengthy community consultation. This provides an input for the Indigenous community. Based on the heritage assessment the project site has some evidence of human transient or occupation behaviour with shell disperse through recent site disturbance. A management plan for protection of heritage has been prepared in consultation with the Aboriginal community, this will manage potential threats to heritage. With the proposed world heritage area, the proposal appears to be ongoing since 2017 and based on the proposal information predominantly concerns biodiversity. As the bid is not finalised the potential impact to any bid is not available, with tourism and being at the entrance to Port Stephens the sand mine design has a vegetation buffer which will provide a visual buffer from Nelson Bay Road and the other adjoining boundaries.

5.1.2 Groundwater/Surface Water

Impacts to water table and catchment, and the Port Stephens bay can be managed with the correct procedures. Modelled groundwater level changes do not impact high-priority groundwater dependent ecosystems mapped in the water sharing plan, additionally the modelling does not impact the registered bores nearby. Currently the groundwater of the aquifer within the project site is generally poor quality and risks can be managed. Also, by implementing a groundwater monitoring plan which will be used to manage water quality and groundwater levels.

For residents and businesses in the area the water quality (potable) and quantity are important. The modelling and assessment have demonstrated that there will be no material offsite impacts with respect to groundwater levels or groundwater quality. Further, the proposed development has been assessed against the requirements of the Aquifer Interference Policy and has been found to comply. With businesses that are reliant on water such as oyster farming with the specialist report considering that there will be no material impact on water quality and oyster farming operations in Tilligerry Creek due to geography, management plan and distance. Acid Sulfate Soils will also be addressed under the ASSMP which includes regular monitoring. In regards to the comment about flooding in regards to the post mine artificial lake, as the area north of the project site (and the north western corner of the site) is already classified as a flood risk in the Port Stephens local environmental plan (LEP), flooding for residential areas and businesses is addressed under the LEP. The water drawdown for the post-development phase was also considered to be within the natural variation.

Following the comments received from the previous EIS submission, all agency comments have been addressed, offsite groundwater level changes caused by the proposal were found to be acceptable and risks to groundwater quality can be effectively managed by appropriate monitoring and management strategies, expected impacts to water quality are minimal. With minimal impact to water quality and groundwater levels within natural tolerances the current water system is not in jeopardy.

5.1.3 Geotechnical/Acid Sulfate Soils

An Acid Sulfate Soil management plan has been devised for Bobs Farm Sand Mine. The objectives of the management plan are to provide guidance on the environmental management of ASS for the project and recommendations for appropriate management of ASS so that extractive activities are undertaken in a way that minimises or negates ASS risks. Risk of the recorded Potential Acid Sulfate Soil causing impacts is deemed minimal and the management plan provides risk reduction for the project. Monthly reporting is recommended. Concern was mentioned in community responses about fracking. The sand mine proposes a wet and dry extraction which differs from fracking as process involves the extraction of sand not rock. The extraction of the sand dunes will reduce the size of the dune on the project site. The greater extent of the dune system will not be impacted by this project through sand

extraction. Environmental monitoring is recorded as a method of evaluation for the project to protect against contamination.

5.1.4 Mining Plan

The sand assessment and mining plan concerns that were raised during community consultation included the limited number of bore holes drilled for sand layer thickness. Additional drilling and geomorphological testing has occurred within the project area, including in the hydrogeological assessment and the archaeological assessments. This provides additional data for the resource assessment and project feasibility. In the stage 2 assessment the methodology of the feasibility process for the sand was detailed.

5.1.5 Noise/Vibration

Noise levels are predicted to comply with the day and evening criteria with the exception of five of the closest sensitive receivers during the earlier phases of the development. Reasonable and feasible mitigation measures such as noise bunds/earth mounds and acoustic barriers have been recommended, however the closest sensitive receivers remain non-compliant during those initial phases. It is expected the role of the NSW Government Voluntary Land Acquisition and Mitigation Policy (VLAMP) and the use of the Operational Noise Management Plan will provide assistance with managing expectations at these sensitive receivers. As seen from the Cumulative Traffic Noise Impact (7am – 10pm) increases in the predicted traffic noise levels at all locations for Phase 1 to Peak operations are within the acceptable limits with the increases of up to 3.7dBA at the approved residential development at 686 Marsh Road. Given the increases are well below the relative increase criteria (Base traffic + 12dB), the increased traffic from the mine along Nelson Bay road is predicted to comply with the relevant road traffic noise criteria. The nearest receivers to the proposed sand mine are located approximately 55m (R1) and 60m (R15) from the nearest mining extraction boundary. Vibration monitoring would need to be undertaken in the unlikely event that any works were to be carried out within 50 metres of residences where vibration may be generated by equipment. Beyond 100 metres there is a low probability of annoyance for all activities. Impacts to receivers in the vicinity based on the noise impact assessment will be limited to those closest to the project. The operating hours of 7am to 7pm are outside of standard construction operating hours, however the assessment recommended to keep the proposed operation hours to 7am-7pm to avoid the potential for sleep disturbance at the nearest sensitive receivers. Operation in the evening period results in fewer receivers exceeding when comparing to the night time results. Businesses and a school are listed within the assessed receivers; none are assessed as exceeding the project specific noise level (e.g., lower intrusiveness criteria).

5.1.6 Air Quality

The results of the modelling have shown that during all Stages, the TSP, PM10 (annual), PM2.5 (24 hour and annual), and dust deposition predictions comply with the relevant criteria. In addition, Respirable Crystalline Silica predictions also comply with the relevant criteria. For most sensitive receptors the maximum 24-hour PM_{10} concentrations are driven by the background concentrations obtained from Newcastle monitoring station. The results have shown that the highest predicted concentrations will occur during Production Stage 2 (Year 3) for most sensitive receptors. This is a result of the increased throughput with dry mining. Frequency analysis has identified that the highest number of days the PM_{10} 24-hour criteria will be exceeded is 1 day per annum at two receptors during all Stages except Production Stage 3 (Year 4 onwards). The predicted levels comply with the incremental increase and the total dust deposition criteria and therefore dust is not expected to be a nuisance for sensitive receptors. An Air Quality Management Plan outlines general practices which will reduce dust

emissions from the operation of Project. The management plan will limit dust from trucks through methods such as a wheel wash for vehicles and paving haul roads or using low silt gravel.

5.1.7 Ecological

The BAR found the proposed Sand Mine will result in the following direct and potential impacts or losses:

- Approximately 27.18ha of Coastal Sand Smooth-barked Apple Blackbutt Forest;
- Approximately 9.5ha of Orchard;
- Approximately 27.18ha of Supplementary Koala Habitat;
- Approximately 27.18ha of known habitat for ten affected threatened fauna species; *Glossopsitta pusilla* (Little Lorikeet), *Ninox strenua* (Powerful Owl), *Haliaeetus leucogaster* (White-bellied Sea Eagle), *Petaurus norfolcensis* (Squirrel Glider), *Scoteanax rueppellii* (Greater Broad-nosed Bat), *Falsistrellus tasmaniensis* (Eastern Falsistrelle), *Miniopterus australis* (Little Bentwing-bat), *Miniopterus schreibersii oceanensis* (Large Bentwing-bat), *Phascolarctos cinereus* (Koala) and *Pteropus poliocephalus* (Grey-headed Flying-fox);
- Suitable habitat for a number of additional threatened and other flora and fauna species likely to utilise the study area;
- Approximately 875 hollow-bearing trees;
- Reduction in the width of the Stockton Bight ecological corridor;
- Habitat Fragmentation; and
- Injury/Mortality to native fauna during felling of trees.

The proposed Sand Mine will result in the following potential indirect impacts;

- Increased spread of significant weeds;
- Increased spread of pest fauna species;
- Edge effects;
- Impact on Groundwater Dependent Ecosystems (GDE's) through changes to groundwater levels;
- Increase in noise from machinery; and
- Increase in artificial lighting. Increased lighting may be the result of security lighting.

A number of mitigation measures have been specified to minimise the impact of the loss of habitat. The measures will include:

- Provision of compensatory habitat (Offsetting) using the Biobanking Assessment Methodology (DECC, 2009);
- Protection of remaining habitat/vegetation;
- Protection of fauna during habitat removal;
- Rehabilitation of extraction area;
- Monitoring of groundwater levels and groundwater dependant ecosystems within proximity to the extraction area; and
- Reduction of ongoing mine impacts such as noise and artificial lighting.

To help ensure these measures are carried out a detailed Biodiversity Management and Rehabilitation Plan has been developed to address any impacts associated with the proposed sand mine to ensure the long-term viability of remaining and rehabilitated habitat.

5.1.8 Traffic

The traffic assessment conclusions are drawn from the investigations into the proposed sand quarry at Bobs Farm off Nelson Bay Road:

1. The site is located within the locality of Bobs Farm with frontage to Nelson Bay Road and previously Marsh Road. The major access route for outbound material will be to the west of the site along Nelson Bay Road to centres such as Newcastle, Raymond Terrace and the Lower Hunter Valley.

2. The proposal allows for a sand quarry with all vehicle access via an upgraded site access off Nelson Bay Road.

3. The upgraded access will include a left turn deceleration lane to be built on Nelson Bay Road, designed and constructed in accordance with RMS and Council requirements. An acceleration lane will also be included on Nelson Bay Road to accommodate all vehicles exiting the site.

4. To accommodate trucks with destinations to the west, a U-turn is required at the roundabout controlled intersection of Nelson Bay Road and Port Stephens Drive. The trucks will then continue along Nelson Bay Road and then use Richardson Road to head towards Raymond Terrace and the Pacific Highway, or Cabbage Tree Road to head towards the New England Highway and Maitland or continue along Nelson Bay Road towards Newcastle. Both Nelson Bay Road and Cabbage Tree Road are RAV approved routes suitable for heavy haulage. There will be minimal demand for trucks approaching the site from the east, however the roundabout intersection of Nelson Bay Road / Lemon Tree Passage Road can be utilised to complete a U-turn for these vehicles to enable them to approach the site from the west

5. The access routes for trucks shall be controlled by a Traffic Management Plan, informing drivers of their requirements.

6. Light vehicles will be able to utilise the U-turn facilities provided along the Nelson Bay Road corridor. The U-turn facility along the site frontage has been reviewed and can continue to operate in a safe manner taking into account the development flows.

7. The site access points have been reviewed on site and allow for safe vehicle movements, with adequate sight lines and stopping sight distance available based upon vehicle speeds and the posted speed limit.

8. All parking can be accommodated on site. The trucks will not be parked on site over-night and there shall be minimal on-site staffing levels requiring minimal on-site parking.

The overall conclusion from the investigations is that traffic and access arrangements for the development proposal are satisfactory and that there is no traffic or access impediments to the development. The trucks access routes have been reviewed based upon impacts for other road users and road safety and the proposed access routes can operate in a safe and efficient manner with minimal delays for other road users. The access point on Nelson Bay Road will be designed and constructed in accordance with RMS and Council requirements to ensure the trucks, including B-Doubles can safely enter the site.

It should be noted that Transport for NSW is currently investigating an upgrade to Nelson Bay road with proposed routes shown in community consultation in 2020. Whilst not an immediate measure to addressing concerns of the public about general increasing traffic on the Tomaree Peninsula, the NSW Government is working towards a solution.

5.1.9 Social Impact

As is the case with many resource extraction projects, the perceived and experienced social impacts/ issues are often greatest for those living in closest proximity to the proposal, or those who perceive they will be most directly impacted by the development. Consequently, should the development application be approved, an appropriate social impact monitoring program should be developed to assess the degree to which impacts are occurring and

appropriate methodologies by which to mitigate any impacts. Each individual report of the EIS addressed issues raised by the community (updated reports provided as annexes to this document). Issues such as contamination, traffic management, ecology and heritage are major concerns raised through the community submissions. Impact to the Primary School was also a heavily debated issue, the footprint and access for the project have changed which modifies the potential impact. The Noise assessment have reasonable and feasible mitigation measures such as noise bunds/earth mounds and acoustic barriers have been recommended, however the closest sensitive receivers remain non-compliant during those earlier phases. It is expected the role of the NSW Government Voluntary Land Acquisition and Mitigation Policy (VLAMP) and the use of the Operational Noise Management Plan will provide assistance with managing expectations at these sensitive receivers. While the air assessment results of the modelling have shown that during all Stages, the TSP, PM10 (annual), PM2.5 (24 hour and annual), and dust deposition predictions comply with the relevant criteria. For ecology and Aboriginal heritage both have management plans developed to protect values for future generations.

5.1.10 Other

Other concerns raised for the Bobs Farm sand mine included commitment to rehabilitation once the project finished, this can be addressed through the Biodiversity Management and Rehabilitation Plan (**Annex 12**, Appendix M). The impact of noise and air quality have been addressed in their relevant chapters, whilst this can also be the case for groundwater with water drawdown for the post-development phase was also considered to be within the natural variation. Comments about no benefit to the community need to considered. Sand is a vital resource for the construction industry. The extraction is able to assist other areas of the economy such as building and transport with the Hunter Region Plan 2036 indicates that Newcastle will have greater growth as Australia's next metropolitan city with greater regional and interregional connectivity, which also includes greater connections to the Asia-Pacific region with port and airport being key components (Department of Planning and Environment 2016, pp.17-20). The forecast of the requirement of 118 million tonnes of natural sand required from December 2018 to December 2036, this indicates a stable demand just within the Greater Sydney Region, which does not consider the demand requirements within the rest of NSW or other markets in which natural sand may be sold (R.W.Corkery & Co. et al. 2019, p. 85, **Annex 15**). This will have a financial flow on affect for NSW and local residents.

6 Agency and Organisation Responses:

6.1 Ausgrid

The extraction area ends to the north of the Ausgrid electricity easement. A 15m vegetation buffer is also planned between the easement and the extraction area. As noted in the 2019 Ausgrid response to the Bobs Farm sand mine EIS, any requirements for electricity, modification of electricity assets or work in the easement will be undertaken in consultation with Ausgrid. The proximity to the existing Ausgrid assets is noted and relevant procedures required to be adhered to will form part of the relevant operational management plan.

6.2 Bobs Farm P&C Submission

6.2.1 Dust

The results of the modelling have shown that during all Stages, the TSP, PM10 (annual), PM2.5 (24 hour and annual), and dust deposition predictions comply with the relevant criteria. In addition, Respirable Crystalline Silica predictions also comply with the relevant criteria. An Air

Quality Management Plan outlines general practices which will reduce dust emissions from the operation of Project.

6.2.2 Traffic

The access routes for trucks shall be controlled by a Traffic Management Plan, informing drivers of their requirements. To accommodate trucks with destinations to the west, a U-turn is required at the roundabout controlled intersection of Nelson Bay Road and Port Stephens Drive. The site access points have been reviewed on site and allow for safe vehicle movements, with adequate sight lines and stopping sight distance available based upon vehicle speeds and the posted speed limit.

6.2.3 Health

The specialist reports for the EIS believes with proper management and based on the project design that the project meets relevant health criteria such as water and air quality. As part of the management plans regular monitoring of environmental criteria will occur, with appropriate action occurring if in the unlikely event criteria are exceed.

6.2.4 Noise

Noise levels are predicted to comply with the day and evening criteria with the exception of five of the closest sensitive receivers during the earlier phases of the development. Reasonable and feasible mitigation measures such as noise bunds/earth mounds and acoustic barriers have been recommended, however the closest sensitive receivers remain non-compliant during those initial phases. The school is not one of those receivers.

6.3 Bobs Farm Principal Submission

6.3.1 Traffic

The access routes for trucks shall be controlled by a Traffic Management Plan, informing drivers of their requirements. To accommodate trucks with destinations to the west, a U-turn is required at the roundabout controlled intersection of Nelson Bay Road and Port Stephens Drive. The site access points, now only off Nelson Bay Road, have been reviewed on site and allow for safe vehicle movements, with adequate sight lines and stopping sight distance available based upon vehicle speeds and the posted speed limit. This is a variation to the original plans that used Marsh Road, which places extra distance between trucks and the school.

6.3.2 Dust

The results of the modelling have shown that during all Stages, the TSP, PM10 (annual), PM2.5 (24 hour and annual), and dust deposition predictions comply with the relevant criteria. In addition, Respirable Crystalline Silica predictions also comply with the relevant criteria. An Air Quality Management Plan outlines general practices which will reduce dust emissions from the operation of Project.

6.3.3 Health

The specialist reports for the EIS believes with proper management and based on the project design that the project meets relevant health criteria such as water and air quality. As part of the management plans regular monitoring of environmental criteria will occur, with appropriate action occurring if in the unlikely event criteria are exceed.

For contamination of groundwater the risk assessed was minimal given management plan techniques, small hydraulic gradient (approximately 2m over 1 km), as well as due to ceasing the agricultural practices on the site water quality may improve. The Respirable Crystalline

Silica concentration is below the criterion (assessed as a background concentration of 0.7 µg/m^3) and is not expected to impact on the nearby sensitive receptors.

6.3.4 Noise

Noise levels are predicted to comply with the day and evening criteria with the exception of five of the closest sensitive receivers during the earlier phases of the development. Reasonable and feasible mitigation measures such as noise bunds/earth mounds and acoustic barriers have been recommended, however the closest sensitive receivers remain non-compliant during those phases. The school is not one of those receivers.

6.4 Department of Education

6.4.1 Traffic

The access routes for trucks shall be controlled by a Traffic Management Plan, informing drivers of their requirements. To accommodate trucks with destinations to the west, a U-turn is required at the roundabout controlled intersection of Nelson Bay Road and Port Stephens Drive. The site access points, now only off Nelson Bay Road, have been reviewed on site and allow for safe vehicle movements, with adequate sight lines and stopping sight distance available based upon vehicle speeds and the posted speed limit. This is a variation to the original plans that used Marsh Road, which places extract distance between trucks and the school. As addressed in the Department of Education's submission, egress from the project site will be onto Nelson Bay Road.

6.4.2 Dust

The results of the modelling have shown that during all Stages, the TSP, PM10 (annual), PM2.5 (24 hour and annual), and dust deposition predictions comply with the relevant criteria. In addition, Respirable Crystalline Silica predictions also comply with the relevant criteria. An Air Quality Management Plan outlines general practices which will reduce dust emissions from the operation of Project.

6.4.3 Health

The specialist reports for the EIS believes with proper management and based on the project design that the project meets relevant health criteria such as water and air quality. As part of the management plans regular monitoring of environmental criteria will occur, with appropriate action occurring if in the unlikely event criteria are exceed.

For contamination of groundwater the risk assessed was minimal given management plan techniques, small hydraulic gradient (approximately 2m over 1 km), as well as due to ceasing the agricultural practices on the site water quality may improve. The Respirable Crystalline Silica concentration is below the criterion (assessed as a background concentration of 0.7 µg/m^3) and is not expected to impact on the nearby sensitive receptors.

6.4.4 Noise

Noise levels are predicted to comply with the day and evening criteria with the exception of five of the closest sensitive receivers during the earlier phases of the development. Reasonable and feasible mitigation measures such as noise bunds/earth mounds and acoustic barriers have been recommended, however the closest sensitive receivers remain non-compliant during those phases. The school is not one of those receivers. As detailed in the Operational Noise Management Plan, noise and vibration monitoring will occur in accordance with the *NSW Noise Policy for Industry*. As part of the management plan, noise amelioration solutions will be investigated and implemented by agreement where appropriate.

6.5 Division of Resources & Geoscience

No issues to address

6.6 Department of Industry

The Department of Industry concerns has been addressed in the hydrogeological assessment and management plan for the project. The 1m buffer above the predicted water table has been assessed as not being required. Modelling and assessment have demonstrated that there will be no material offsite impacts with respect to groundwater levels or groundwater quality. Further, the proposed development has been assessed against the requirements of the AIP and has been found to comply. Four additional wells were installed for this assessment outside of the proposal's extents with 18 additional weeks of continuous monitoring and two groundwater quality sampling rounds were carried out across a total of nine wells in 2020. Risks to water quality in Tilligerry Creek were assessed to be minimal.

6.7 Department of Planning and Environment

6.7.1 Noise

As requested in the Department of Planning and Environment submission graphical information for sites N1 and N2 have been provided in the assessment document with new monitoring undertaken in 2019. It should be noted that site N2 has the same location as the 2014 assessment, whilst N1 was situated between the previous N3 and N4. The original Sites N1, N3 and N4 have not been assessed in 2019. The NIA has a model prepared including all current nearby buildings and known future developments/buildings to accurately predict potential impacts from the mine. The model includes all relevant noise sources as stated in the Quarry Mining System report and detailed in **Annex 4**, and assesses the total overall impact on all surrounding receivers at any one time. The modelling of the peak operation of the mine accounts for the maximum rate of sand extraction. Given the size and shape of the mine, some noise sources have been duplicated to reflect the potential worst case locations where plant/machinery may be closest to sensitive receivers. This method allows for a conservative assumption of total noise levels being emitted from the mine. As requested by the Department of Planning and Environment details about noise attenuation have been added, as well as worst case weather conditions.

6.7.2 Consistent description of the proposal

As part of this new response submission, relevant reports and project descriptions have been updated and any inconsistencies addressed.

6.7.3 Transport

As per the request to consider entry from and exit to Nelson Bay Road, this option has been accepted. The Department of Planning and Environment had a number of queries about the Traffic Impact Assessment, these have been addressed in **Annex 13**. A summary includes:

- *The TIA is dated 1 July 2016 (now 10.12.2019) and includes SIDRA intersection analysis based on 2014 data. Within the TIA at section 2.7 – other proposed developments it is state that "there are no other major developments occurring in the immediate vicinity of the subject site":*
  To allow for other developments and potential background traffic growth, traffic data has been increased by an annual growth rate of 2% per annum to provide current 2020 base traffic. Normal growth rates provided by TfNSW in the Hunter Region is in the order of 1.5-2% per annum. 2% per annum in this location is considered a worstcase scenario, as Nelson Bay Road does not allow for through traffic movements, only access to the

Nelson Bay peninsula. Updated Sidra modelling has been completed and the results updated in the report.

- *As indicated in Item 4, below there is an approved development for eco-cabins on land adjoining the proposed sand mine. According, the TIA needs to consider the traffic impacts likely to be generated by the approved eco-cabin development on predicted traffic movements on Marsh Road*:
  The updated plans for the project allow for access to Nelson Bay Road only and no access to Marsh Road. An eco-cabin development is a very low traffic generator, similar to a motel type development and the RTA Guide to Traffic Generating Developments provides no rates in the AM peak for this land use and 0.4 trips per unit / cabin in the PM peak period only. It is considered that the volume of traffic associated with the eco-cabins will therefore not impact upon the overall road network in this location. The provision of the 2% annual growth for traffic on Nelson Bay Road will cover the traffic movements associated with the eco-cabin development.
- *For assessment of truck movements, the TIA must consider the impact of additional truck movements on public road network until the project-based trucks reach a major highway. For the proposed sand mine, DPE requires that traffic impacts are considered for single carriageway sections of the proposed haulage routes, the roundabout at Paul's Corner (Richardson and Nelson Bay Roads) and the roundabout at Cabbage Tree and Nelson Bay Roads*:
  Standard requirements from TfNSW require the impact of a proposal from the site access to the arterial road network only and they do not require any intersections further along the route to be assessed. TfNSW have previously reviewed this project and have not raised these two roundabouts as requiring any assessment. Observations of traffic operations at both of these roundabouts indicates that both of these roundabouts operate very well with minor delays and congestion during both the morning and afternoon peak periods.
- *In terms of cumulative traffic impacts, DPE considers that sand haulage traffic due to other sand extraction operations must also be considered including:*
  - *Cabbage Tree Road Sand Quarry at Williamtown*
  - *Mackas Sand operations at Salt Ash and William Town*
  - *ATB Morton Salt Ash sand quarry*
  - *Boral Resources Stockton Bight quarry at Fullerton Cove.*

  The traffic flows associated with the above developments are relatively low and with the background growth value of 2% per annum discussed above the traffic flows associated with these developments have been allowed for. It is noted that all of these sites are to the south of the site and as such the traffic movements north past the subject site will be very minor. Traffic from these sites will be predominantly towards greater Newcastle or the Pacific Highway and would have been assessed as part of the relevant approvals including their cumulative impacts AM.
- *It is DPE's experience that the AM peak traffic on Nelson Bay Road occurs earlier than the 7:45 to 8:45 am period provided in the TIA. Please provide details of how this peak period was determined or else amend to a more appropriate period:*
  Traffic data collected from the tube counts by Seca Solution show that the peak eastbound is higher between hours ending 9 AM and 10 AM than the hours before this. For the westbound the highest peak is the hour between 7.00 and 8.00 AM with the hourly flows ending 7.00 AM and 9.00 AM being nearly identical. This would indicate that the traffic flows presented for the hour between 7.45 and 8.45 are therefore acceptable.

6.7.4 Consideration of approved land uses

The proposed development at 686 Marsh Road has been considered in the amended noise and vibration and air quality reports in **Annex 8**.

6.7.5 Biodiversity

Relevant updates and acknowledgment of advice received from NSW Government departments has occurred.

6.7.6 Aboriginal and Cultural Heritage

The advice received Heritage NSW in 2019 has been acted upon in consultation with the department. A new ACHAR, test excavation report and ACHMP have been prepared.

6.7.7 Groundwater

The hydrogeological assessment has addressed all of the concerns raised in the submission from the Department of Planning and Environment. For the question about PASS and ASS, the Acid Sulfate Soil Management Plan determined that lime requirements for treatment of the PASS or ASS would be dependent on the purity of the lime, with the management plan noting that for 90% purity it would require liming at 110%). The data from the hydrological assessment shows that the majority of samples (14 out of 21) were below the practical quantification limit (PQL) for net acidity at the approximate elevation of groundwater drawdown. The hydrological assessment has shown that the risk of generating acid of any material consequence is negligible and that any acidity caused by changes in the groundwater table can be dealt with by way of monitoring as excavation progresses and by the ASS management plan. The hydrogeological assessment determined that extraction below groundwater table is acceptable that a buffer is not required. Whilst updated cross sections have been provided and that the water requirements for the project can be fulfilled through WaterNSW resources (via application) or through trading with other licensees. As part of the updated report four additional groundwater monitoring wells were installed with 18 additional weeks of continuous monitoring and two groundwater quality sampling rounds were carried out across a total of nine wells in 2020, which was used to provide groundwater data and analysis. The EPA's comments to the EIS have been addressed.

6.7.8 Air Quality

As per the submission from the Department of Planning and Environment it is acknowledged and implemented that the Victorian EPA criterion for RCS should be used, refer updated report in **Annex 8**.

6.7.9 Social Impact Assessment

As mentioned in the DPIE letter and the Social Impact Assessment (SIA), a Social Impact Management Plan (SIMP) would be developed. This would be in accordance with the SIA Guideline and would:

- identify opportunities to enhance positive and mitigate negative social and economic impacts of the Project on communities;
- detail adaptive management and mitigation strategies to address potential impacts of the Project;
- identify appropriate stakeholder responsibilities;

- identify appropriate monitoring, reporting and review mechanisms, including the purpose of monitoring and the parameters that would be monitored and how and when monitoring data would be collected;

- outline a process to engage with relevant stakeholders and communities, with a focus on practical mechanisms for the community to collaborate and record their observations and experiences of social impacts and any proposed community participation in monitoring;

- include an incident notification and reporting process, including providing applicable information to the community;

- develop a process for reviewing the above elements to assess whether they are still appropriate, and whether any new issues have emerged that should be included in ongoing monitoring; and

- develop a process for making monitoring results and associated information publicly available, including any revisions to the monitoring and management framework.

The SIMP would outline suitable and proportionate social impact monitoring and adaptive management arrangements for the Project that include the above elements, as well as proposed timing and frequency of monitoring and public reporting of results.

Mitigation measures proposed in each of the specialist reports are likely to satisfy statutory authorities and servicing agencies, along with the Aboriginal community. These will be used as part of the social impact management plan to address community concerns.

Social well-being is a vital component of the Bobs Farm Community. Whilst the mitigation measures described specifically in the EIS and this document will, over time, likely resolve a high proportion of the impacts raised by the community, it is difficult, because of individual beliefs, belief systems, personal characteristics and the like to produce a 'cure-all' series of social impact/other impact mitigation recommendations which will satisfy the community's perception of impacts.

The following recommendations are made to assist the community in resolving outstanding and ongoing concerns.

1. A social impact monitoring program will be developed and will include methodologies to mitigate community impacts (preferably in associated with recommendation 2 below);

2. Asking the community (again) to consider forming a Community Consultative Committee;

3. 3. Ongoing dialogue with local residents will be undertaken on a regular basis via the following:
    - Dedicated phone hot lines for regulation, compliance and emergency matters;
    - Community events (e.g. charity fundraisers);
    - Community information sessions;
    - Annual community reports; and
    - Annual dialogue with neighbours: formal and informal.

6.7.10 Mineral Sands Component

Part of the operations and processing of the sand will see the recovery of a very small quantity of heavy mineral sands. Whilst this material is a by-product of the processing, it is a very valuable resource in its own right and it is classified as a Crown Mineral. As has been discussed with the Department of Planning, Industry and Environment this is a by-product, with limited commercial aspect due to the site containing <1% of heavy minerals. Any extraction of mineral sands would only occur for sand products that require a higher level of purity (e.g. glass). Processing of the minerals would not occur on site.

6.8 EPA

6.8.1 Groundwater, hydrology, PASS

The hydrological assessment has been revised. The report (**Annex 9**) provides a detailed response to each point raised by the EPA in their 2019 response to the Bobs Farm EIS. The assessment determined that extraction below groundwater table is acceptable that a buffer is not required. Whilst updated cross sections have been provided and that the water requirements for the project can be fulfilled through WaterNSW resources (via application) or through trading with other licensees. As part of the updated report four additional groundwater monitoring wells were installed with 18 additional weeks of continuous monitoring and two groundwater quality sampling rounds were carried out across a total of nine wells in 2020, which was used to provide groundwater data and analysis.

6.8.2 Noise

The noise assessment was undertaken from 1st October 2019 to 8th October 2019 at two locations. As part of the assessment the noise mitigation measures, the Acoustic Barriers and Bunds/Earth Mounds details have been included with details of construction materials and locations required for effectiveness. The Voluntary Land Acquisition and Mitigation Policy (VLAMP) is also discussed as per the EPA recommendations in their 2019 advice. Details about the project such as hours of operation have also been updated.

6.8.3 Air Emissions

The EPA had four points of concern. The concerns raised and the response from the air quality specialists are detailed below:

1. *Clarification of the discrepancy of higher production capacities with lower emission estimates*:
   Yes, lower emissions are estimated for a higher production capacity. As correctly assumed by the EPA, both dry mining and wet mining methods are proposed. However, Table 2-1 of the AQIA was not clear such that dry and wet mining methods are proposed for Years 2 and 3 and wet methods for Years 4 onwards. Hence the difference in estimated emissions is an artefact of the proposed mining methods. The table has been updated and further details of the emissions estimation for these sources provided in **Annex 8** - Appendix C;
2. *A more detailed emission inventory that includes but is not limited to the emission factors, emission factor parameters, activity data inputs and control efficiencies applied for each emission source*:
   A more detailed emission inventory has been provided in **Annex 8** - Appendix C that includes but is not limited to the emission factors, emission factor parameters, activity data inputs and control efficiencies applied for each emission source;

3. *Clarification of why there are no haul road emissions for stage 3, however are included for other production stages. Where haul road emissions would occur for Stage 3, they should be assessed*:
   The movement of the product is proposed by dredging in the production stage. No movement is proposed by the haul roads. The AQIA has been updated to clarify this;
4. *Maximum predicted incremental PM2.5 (24 hour) ground level concentrations*:
   Section 8.3 of the AQIA has been updated to include maximum cumulative 24-hour concentrations, with annotations on the contribution from the proposal to the maximum predictions. In conjunction the assessment should provide the maximum predicted incremental predictions from the proposal with annotations on the background concentrations at the time those concentrations are predicted.

6.9 Hunter Water

6.9.1 North Stockton Catchment Area

Several of the agency comments (Section 5) state that extraction activities should not occur below the groundwater table level, and an adequate buffer should be maintained to the excavation base Martens (2020, p.52). This assessment has considered the potential impacts of extraction below the groundwater table level, which consist of:

1. Change to groundwater levels at groundwater dependant ecosystems;
2. Change to groundwater levels at offsite bores;
3. Change to groundwater levels at Acid Sulfate Soils; and
4. Change to groundwater quality.

Each of these potential impacts has been addressed in detail in each of the preceding sections. Modelling and assessment have demonstrated that there will be no material offsite impacts with respect to groundwater levels or groundwater quality. Further, the proposed development has been assessed against the requirements of the AIP and has been found to comply.

Martens (2020, pp.52-53) consider that extraction activities can be safely undertaken below the groundwater table level, and a buffer above the groundwater table is not considered necessary.

6.9.2 Extractive operations, aquifer protection and site rehabilitation

With the above response to the North Stockton Area from the hydrogeological report, the drawdown map shows that six registered wells are predicted to be impacted by drawdown greater than 0.05 m resulting from the proposed development. Of these wells, four are located in the forest to the east of the site which are predicted to drawdown by 0.05-0.15 m and have no known purpose or installation date and are most likely monitoring bores. One of the affected wells is an irrigation well installed in 1982 between the site and Nelson Bay Rd at the north east corner of the site which has a predicted drawdown of between 0.15 and 0.25 m due to the proposed development Martens (2020, p.46). The other well is an irrigation well installed in 2002 in Lot 1 DP 1251784 north west of the site which has a predicted drawdown of -0.05 m (i.e. GW level increased by 0.05 m). None of these bores have drawdown greater than 2.0 m and therefore do not require any remediation work under the AIP. Further, the predicted change in groundwater level is less than the natural groundwater level fluctuation.

An objection to the proposed development citing groundwater impacts was submitted by the proposed Ride Water Park development to the north east of the site at 781 Marsh Road. The drawdown map shows that the proposed development will not cause any drawdown ± 50 mm at the proposed Ride Water Park site. We note that the hydrogeological analysis submitted by Griffiths Investment Properties (the owners of the proposed Ride Water Park) and prepared by Coffey Environments Australia Pty Ltd, relies on limited site data and incorrect assumptions, notably that groundwater within the sand extraction pit would be drawn down to the base of excavation at -15 mAHD (Martens 2020, p.47). This is clearly wrong because it assumes that the dredge pond is to be completely de-watered which is not practical or proposed. Martens (2020) do not consider that the Coffey analysis diminishes or challenges the findings of this assessment. The groundwater impacts on the Ride Water Park site are modelled as being negligible and are therefore considered acceptable. The Department of Planning and Environment has raised concerns regarding the proximity of Hunter Water Corporation's North Stockton Catchment Special Area to the proposed development. Drawdown within this area is limited to 0.35 m in a very small section, but is generally less than 0.25 m. Given the size of the North Stockton Catchment area (> 50 km^2) and the small magnitude of predicted drawdown, especially with respect to the monitored natural groundwater level fluctuation, the predicted drawdown is assessed to have a negligible impact (Martens 2020, p.47).

A response to Hunter Water's concern regarding the issues of:

- *Limits to extraction depth;*
- *Water quality and Groundwater management;*
- *Environmental Management Plan/AEMR; and*
- *Pollution Risk and Spill Management.*

The detailed response in the Hydrogeological report particularly in the section 6.5.2 and section 7 (**Annex 9**). The assessment determined that extraction below groundwater table is acceptable that a buffer is not required. Implementation of the groundwater quality management recommendations will significantly reduce the risk of groundwater contamination. Furthermore, given the agricultural practices on the site will cease, the local groundwater quality may be improved as a result of the proposal (Martens 2020, p51).

6.10 NSW Health

6.10.1 Noise (operation and construction)

Noise levels are predicted to comply with the day and evening criteria with the exception of five of the closest sensitive receivers during the earlier phases of the development. Reasonable and feasible mitigation measures such as noise bunds/earth mounds and acoustic barriers have been recommended, however the closest sensitive receivers remain non-compliant during those initial phases. The school is not one of those receivers. As detailed in the Operational Noise Management Plan, noise and vibration monitoring will occur in accordance with the *NSW Noise Policy for Industry*. As part of the management plan, noise amelioration solutions will be investigated and implemented by agreement where appropriate. As noted in the 2019 NSW Health response, a Construction Noise Management Plan (**Annex 5**) and Operational Noise Management Plan (**Annex 6**) are now prepared for incorporation into the project.

6.10.2 Air quality

The results of the modelling have shown that during all Stages, the TSP, PM10 (annual), PM2.5 (24 hour and annual), and dust deposition predictions comply with the relevant criteria. In addition, Respirable Crystalline Silica predictions also comply with the relevant criteria. An Air Quality Management Plan outlines general practices which will reduce dust emissions from the operation of Project. As noted in the NSW Health 2019 response the NSW EPA response has been considered and addressed above in the specific response to the EPA. The NSW Health air quality comments have been noted considered for incorporation in the AQIA where the EIS air specialist believes applicable.

6.10.3 Potable water supply

As part of the surface water management, a 100KL (not 15KL) rainwater tank will capture roof water to service onsite amenities. For any potable water requirements not satisfied through the rainwater tank, as per the NSW Health 2019 response letter the Public Health Act 2010 will be followed and if further advice is required Hunter New England Local Health District to discuss the provision of potable water options. Re supply of the rainwater tank with potable water is the most likely arrangement that would be followed.

6.10.4 Recycled water

A reuse rate of 309 L/day was applied as per the Wastewater Assessment. Water security modelling indicates the chosen tank has a 99.8% security to satisfy this demand. The advice from NSW Health as per the 2019 response has been noted.

6.10.5 Community engagement

Community engagement is ongoing. The Department of Planning, Industry and Environment provided in their 2019 response the request to construct a Social Impact Management Plan. As per NSW Health 2019 response, the consultation will include avenues for complaints and the SIMP will be able to engage stakeholders potentially through a Community Consultation Committee if the community is willing.

6.11 NSW Rural Fire Service

THE NSW RFS has provided three recommendations. These include:

6.11.1 Fire Management Plan

A fire management plan as per the 2018 response by the NSW RFS will be undertaken. Bushfire management and assessment under NSW legislation has been considered in Chapter 19 of the EIS. Key points of the fire management plan as per the NSW RFS response will include:

- 24 hour emergency contact details including alternative telephone contact;
- Site infrastructure plan;
- Fire fighting water supply plan;
- Site access and internal road plan;
- Construction of an Asset Protection Zones (APZ) and their continued maintenance;
- Location of hazards (physical, Chemical, Electrical) that will affect fire fighting operations and procedures to manage identified hazards during fire fighting operations; and
- Such additional matters as required by the NSW RFS District Office (FMP review and updates).

6.11.2 20,000 Litre Water Tank with a 65mm storz

As per the EIS Chapter 19, a 100,000 litre tank (constructed from concrete or steel) will be adjacent to the shed and this tank shall be made compliant with PBP, including being fitted with a 65mm storz valve with a metal ball or gate valve.

6.11.3 APZ area

The infrastructure APZ is planned to be 20 metres as detailed in Chapter 19 of the EIS. Given the entrance is to be constructed to accommodate trucks, it is considered that there is safe operational access and egress for emergency service personnel and also any other persons on site. Maintenance of the proposed APZ shall be undertaken on a regular basis as part of the day to day mine operations. Unobstructed vehicle access will be provided around the perimeter of the operational compound.

6.12 Office of Environment and Heritage

OEH has made nine recommendations under biodiversity, Aboriginal cultural heritage, as well as flooding and flood risk.

6.12.1 Biodiversity

The biodiversity report has been revised to address the recommendation made by OEH.

6.12.2 Aboriginal Cultural Heritage

The recommendations such as subsurface testing and an Aboriginal Cultural Heritage Management Plan have been prepared. The recommendations have been undertaken in consultation with OEH (now Heritage NSW). This has included an updated ACHAR, new consultation, an AHIP and an ACHMP.

6.12.3 Flooding and flood risk

OEH had no comment on this section.

6.13 OEH Heritage Division

OEH Heritage Division had no advice to provide and no concerns.

6.14 Port Stephens Council

6.14.1 Environment and Ecology

Regarding the points that PSC have made, the Office of Environment and Heritage have been addressed in the Biodiversity Assessment Report.

6.14.2 Traffic, Road works and Parking, safety Concerns and proximity to Bobs Farm School

The access routes for trucks shall be controlled by a Traffic Management Plan, informing drivers of their requirements. To accommodate trucks with destinations to the west, a U-turn is required at the roundabout controlled intersection of Nelson Bay Road and Port Stephens Drive. The site access points have been reviewed on site and are now designed to only utilise Nelson Bay Road and allow for safe vehicle movements, with adequate sight lines and stopping sight distance available based upon vehicle speeds and the posted speed limit. This is a significant variation to the original plans that used Marsh Road, which places extract distance between trucks and the school.

6.14.3 Development contributions

Consideration of a Voluntary Planning Agreements (VPA) with PSC will be considered if it is determined that this the most appropriate course of action. As per the request for fixed development contributions through the Department of Planning, Industry and Environment this should be addressed by the Department. With the alternative haul route now only using Nelson Bay Road, this will limit direct impact from the sand mine on any Council assets.

6.14.4 Acid Sulfate Soils (ASS)

An Acid Sulfate Soil management plan has been devised for Bobs Farm Sand Mine. The objectives of the management plan are to provide guidance on the environmental management of ASS for the project and recommendations for appropriate management of ASS so that extractive activities are undertaken in a way that minimises or negates ASS risks. Risk of the recorded Potential Acid Sulfate Soil causing impacts is deemed minimal and the management plan provides risk reduction for the project. Monthly reporting is recommended. Concern was mentioned in community responses about fracking. The sand mine proposes a wet and dry extraction which differs from fracking as process involves the extraction of sand not rock. The extraction of the sand dunes will reduce the size of the dune on the project site. The greater extent of the dune system will not be impacted by this project through sand extraction. Environmental monitoring is recorded as a method of evaluation for this project to protect against contamination.

6.14.5 Air Quality

The results of the modelling have shown that during all Stages, the TSP, PM10 (annual), PM2.5 (24 hour and annual), and dust deposition predictions comply with the relevant criteria. In addition, Respirable Crystalline Silica predictions also comply with the relevant criteria. An Air Quality Management Plan outlines general practices which will reduce dust emissions from the operation of the Project.

6.14.6 Impacts on Ground water

Risk of the recorded Potential Acid Sulfate Soil causing impacts is deemed minimal and the management plan provides risk reduction for the project. All of Hunter Water's concerns have been addressed in the Hydrogeological assessment and management plan. The raised concerns regarding the proximity of Hunter Water Corporation's North Stockton Catchment Special Area to the proposed development. Drawdown within this area is limited to 0.35 m in a very small section, but is generally less than 0.25 m. Given the size of the North Stockton Catchment area (> 50 km^2) and the small magnitude of predicted drawdown, especially with respect to the monitored natural groundwater level fluctuation, the predicted drawdown is assessed to have a negligible impact Martens (2020, p.47). Assessment impacts of water quality in the nearby area such as oyster farming in Tilligerry Creek has been considered minimal.

6.14.7 Public Interest

Regarding the Bobs Farm Primary School, the project design has been to mitigate impact such as site access being changed to Nelson Bay Road. The specific concerns of water, noise and air have been addressed in specialist reports and relevant response to submissions used from these documents.

6.15 Roads and Maritime Services

The project entry and exit from Nelson Bay Road has been conducted in consultation with Transport for NSW. The project has adjusted the footprint to include an acceleration and deceleration lane to and from the site with the intention to the use the roundabout at the

intersection to Port Stephens Drive for trucks to safely turnaround to head west / southbound away from the project site towards Newcastle/Sydney. As per the TfNSW response in 2018 consideration of design to Austroad standards, stormwater and requirements such as Work Authorisation Deed and Occupation Certificate are noted.

6.16 EcoNetwork – Port Stephens

A number of mitigation measures have been specified to minimise the impact of the loss of habitat. The measures will include:

- Provision of compensatory habitat (Offsetting) using the Biobanking Assessment Methodology (DECC, 2009);
- Protection of remaining habitat/vegetation;
- Protection of fauna during habitat removal;
- Rehabilitation of extraction area;
- Monitoring of groundwater levels and groundwater dependant ecosystems within proximity to the extraction area; and
- Reduction of ongoing mine impacts such as noise and artificial lighting.

To help ensure these measures are carried out, a detailed Biodiversity Management and Rehabilitation Plan has been developed to address any impacts associated with the proposed sand mine to ensure the long-term viability of remaining and rehabilitated habitat.

The project entry and exit from Nelson Bay Road has been conducted in consultation with Transport for NSW. Items such as access to the site have been discussed with TfNSW. The design has been changed to avoid Marsh Road and the Bobs Farm Primary School.

6.17 Koala & Wildlife Preservation Society Ltd

6.17.1 Koala habitat

The biodiversity management and rehabilitation plan (BMRP) has a section devoted to the protection of koalas. This includes:

- Protection of remaining habitat/vegetation;
- Rehabilitation of habitat within Impact Area;
- Planting of Koala Food Trees *Eucalyptus robusta* (Swamp Mahogany);
- Reduction of ongoing mine impacts such as noise and artificial lighting;
- Removal and non-use of barbed-wire within the study area;
- Protection of the Koala during vegetation clearance including preclearance surveys;
- Provision of compensatory habitat (Offsetting);
- Feral Vertebrate Pest Control;
- Installation of compensatory nest boxes; and
- Weed Control.

6.17.2 Mitigation (operation and post)

The BMRP has protection measures during operations and post operation including rehabilitation. These have been development by an experienced ecologist in conjunction with relevant documentation such as:

- Port Stephens Council (2014a). Port Stephens Council Development Control Plan, Draft. November 2014;
- Port Stephens Council (2014b). Port Stephens Council Nest Box Technical Specification. May 2014;
- Port Stephens Council (2014c). Port Stephens Council Tree Technical Specification, Version 1.0. September 2014; and
- Port Stephens Council (2014d). Port Stephens Council Vegetation Technical Specification. May 2014.

6.17.3 Negative fauna species impact

The BMRP provides a framework for the management and monitoring of biodiversity in the proposed sand mine footprint. The objectives of the Biodiversity Management and Rehabilitation Plan include:

- To protect threatened species and minimise impacts on resident fauna during the staged operational life of the sand mine;
- To ensure the ongoing ecological viability of the retained areas of vegetation by identifying any areas within retained vegetation requiring rehabilitation and or/ revegetation and implement a program for this;
- To rehabilitate vegetation retained within the site during the staged operational life and post operational life of the sand mine;
- To install, establish and implement an on-going nest box monitoring program;
- To ensure the long-term viability of groundwater dependent ecosystems by establishing and implementing an on-going groundwater dependent ecosystems monitoring program;
- To salvage resources within the approved disturbance area – including vegetative, soil and hollows – for beneficial reuse in the rehabilitation/offset areas; and
- To implement the control of weeds and feral pests.

6.17.4 Quality of life and health impacts to local community

Quality of life and health impacts to local community are an important consideration for the project. Aspects such as the social impact assessment, air quality assessment, noise assessment and the hydrogeological assessment all consider impacts to the local environment and the community. The environmental assessment predicts minimal impacts to most of the local community. It was also a recommendation of DPIE and the EIS social impact assessment that a Social Impact Management Plan is constructed. This will provide valuable community involvement and provide methods for resolving any issues that arise.

6.18 Maitland Primary Principals' Council

In general, the school has been a main concern of the assessment through submissions and changes to the project footprint to reduce direct impact on the school and Marsh Road. All concerns are addressed using the assessment of this submission, also as part of the assessment process the social impact assessment has determined that a management for ongoing consultation is important and will be developed to address stakeholder concerns and provide an ongoing method of communication.

6.18.1 Traffic, Road works and Parking, safety Concerns and proximity to Bobs Farm School

The access routes for trucks shall be controlled by a Traffic Management Plan, informing drivers of their requirements. To accommodate trucks with destinations to the west, a U-turn is required at the roundabout controlled intersection of Nelson Bay Road and Port Stephens Drive. The site access points have been reviewed on site to now only utilise Nelson Bay Road and allow for safe vehicle movements, with adequate sight lines and stopping sight distance available based upon vehicle speeds and the posted speed limit. This is a significant variation to the original plans that used Marsh Road, which places extract distance between trucks and the school.

6.18.2 Air Quality

The results of the modelling have shown that during all Stages, the TSP, PM10 (annual), PM2.5 (24 hour and annual), and dust deposition predictions comply with the relevant criteria. In addition, Respirable Crystalline Silica predictions also comply with the relevant criteria. An Air Quality Management Plan outlines general practices which will reduce dust emissions from the operation of Project.

6.18.3 Water Quality

The modelling and assessment have demonstrated that there will be no material offsite impacts with respect to groundwater levels or groundwater quality. Further, the proposed development has been assessed against the requirements of the Aquifer Interference Policy and has been found to comply. With businesses that are reliant on water such as oyster farming with the specialist report considering that there will be no material impact on water quality and oyster farming operations in Tilligerry Creek due to geography, management plan and distance. Acid Sulfate Soils will also be addressed under the ASSMP which includes regular monitoring.

6.19 Mamba-Wanda Wetlands Conservation Group, Salamander Bay NSW

6.19.1 Bushfire

Bushfire management and assessment under NSW legislation has been considered in Chapter 19 of the EIS. Additionally, as part of the response stage of the assessment, the RFS have provided comments about bushfire management. These have been factored into the project details (see response in **Section 6.11**).

6.19.2 Biodiversity

A detailed Biodiversity Management and Rehabilitation Plan has been developed to address any impacts associated with the proposed sand mine to ensure the long-term viability of remaining and rehabilitated habitat. The evidence suggests that the study area particularly the area of Swamp Sclerophyll Forest in the far north is utilised infrequently by a small number of Koalas. no areas of Preferred Koala Habitat defined under the CKPoM will be removed. Taking into account the relatively large amount of similar habitat along Stockton Bight and given the recommendations which include a Biobanking Offset it is believed that the proposal is unlikely to disrupt the life cycle of any addressed threatened species, endangered population or endangered ecological community such that local extinction would occur.

6.20 Port Stephens Cycling Group

The access routes for trucks shall be controlled by a Traffic Management Plan, informing drivers of their requirements. It is assessed in the traffic report that access routes for heavy vehicles will be controlled by a Driver's Code of Conduct and it will be enforced through WH&S for the site as well as driver instructions for any contractors visiting the site. To accommodate trucks with destinations to the west, a U-turn is required at the roundabout controlled intersection of Nelson Bay Road and Port Stephens Drive. The site access points have been reviewed on site to now only utilise Nelson Bay Road and allow for safe vehicle movements, with adequate sight lines and stopping sight distance available based upon vehicle speeds and the posted speed limit.

6.21 Port Stephens Greens

For the visual impacts, a 15m vegetation buffer around the site will provide a buffer between Nelson Bay Road and the proposed mine. The school has been considered and impacts mitigated through air quality, noise impact and traffic design and management plans. For traffic, consultation with Transport for NSW has occurred and their advice (response) letter considered removing the use of Marsh Road. It is also noted that Nelson Bay Road is currently

in the early stages of an upgrade design, which will alleviate some of the concerns about single lanes in the future. The hydrogeological report considered impact to Tilligerry creek minimal due to the aquifer conditions and mitigation measures proposed by the project, Hunter Water's concerns have also been addressed. A BMRP has been designed for the project. A SIMP will also be devised in conjunction with the community.

6.22 Say No to Sand Mining in Bobs Farm Community Action Group

It is appreciated the detailed response that the Say No to Sand Mining in Bobs Farm Community Action Group has made concerning the EIS and project assessment. At the start of this document the majority of the groups concerns have been addressed relating to groundwater, noise, air, biodiversity and traffic. In response to submissions, concerns have been addressed such as traffic with a revision of access to and from the site which places more distance between the school and considers the limits of Marsh Road. Based on the assessments most criteria except for the closest noise receivers are all within relevant criteria. The noise impact assessment addresses mitigation measures for minimising impact. It is intended, as mentioned in the social impact assessment, a management plan would allow for communication between parties. As mentioned in the SIA and Say No to Sand Mining in Bobs Farm Community Action Group response, a Community Consultative Committee could be formed if an agreement with the community can be reached. The Say No to Sand Mining in Bobs Farm Community Action Group also had responses that address explicit points including:

6.22.1 Biodiversity

A detailed Biodiversity Management and Rehabilitation Plan has been developed to address any impacts associated with the proposed sand mine to ensure the long-term viability of remaining and rehabilitated habitat. Two biodiversity offset sites have been assessed under the Biobanking Assessment Methodology (DECC, 2009). Taking into account the relatively large amount of similar habitat along Stockton Bight and given the recommendations which include a Biobanking Offset it is believed that the proposal is unlikely to disrupt the life cycle of any addressed threatened species, endangered population or endangered ecological community such that local extinction would occur.

6.22.2 Noise and air

The air quality results of the modelling have shown that during all Stages, the TSP, PM10 (annual), PM2.5 (24 hour and annual), and dust deposition predictions comply with the relevant criteria. In addition, Respirable Crystalline Silica predictions also comply with the relevant criteria. An Air Quality Management Plan outlines general practices which will reduce dust emissions from the operation of Project. Noise levels are predicted to comply with the day and evening criteria with the exception of five of the closest sensitive receivers during the earlier phases of the development. Reasonable and feasible mitigation measures such as noise bunds/earth mounds and acoustic barriers have been recommended, however the closest sensitive receivers remain non-compliant during those phases. The school is not one of those receivers. As detailed in the Operational Noise Management Plan, noise and vibration monitoring will occur in accordance with the *NSW Noise Policy for Industry*. The Voluntary Land Acquisition and Mitigation Policy (VLAMP) is also discussed as per the EPA recommendations in their 2019 advice. Details about the project such as hours of operation have also been updated.

6.22.3 Silica

Respirable Crystalline Silica predictions comply with the relevant criteria in the AQIA. A 2019 report on construction materials for the Greater Sydney Region by R.W.Corkery & Co. et al. (2019, p. 81, **Annex 15**) to the DPIE noted that silicosis is not an environmental issue for natural

sand quarries and that this information should be acknowledged by the NSW Health Department. The R.W.Corkery & Co. et al. (2019) report has had a peer review undertaken by RPS in 2020. As mentioned in the updated AQIA, the management plan will involve monitoring of air quality with appropriate management actions to mitigate risk.

6.23 Soldiers Point Community Group

For the biodiversity issues that were raised in this response, changes to the biodiversity report and a BMRP has been prepared for address points made such as by the Office of Environment and Heritage. This also considered the rehabilitation issues for the project site that are raised in the response. As noted in the response, sand is a vital product for the building industry The Greater Sydney Region analysis report noted that under current approvals for extractive materials there are insufficient reserves of natural sand for the projected 2036 requirements (R.W.Corkery & Co. et al. 2019, p xi). The Hunter and Central Coast region provides the most appropriate sand to the Sydney Region outside of Sydney itself, the demand mentioned also only considered the Greater Sydney Region and consideration should also be given the demand for sand in the rest of NSW. The hydrogeological assessment, management plan and Acid Sulfate Soil Management Plan have been updated and developed to mitigate risk for the project, contamination is considered a minimal risk. Health and ecosystem risks have been addressed with management plans and monitoring devised to mitigate risk to the community and environment.

6.24 Tilligerry Community Association

Consideration of the existing environment has been considered with appropriate offsets and a BMRP development. Bushfire management has also been considered in the proposed sand mine assessment, including a response from the RFS. Traffic management is incorporated with revisions to site access only from Nelson Bay Road to alleviate impact to Marsh Road. Social impact as mentioned in the response is proposed to be managed through a Social Impact Management Plan working with the community.

6.25 Tomaree Ratepayers & Residents Association Inc.

Regarding traffic, no explicit issues to increased traffic volume were mentioned by Transport for NSW in their response to the EIS. The project has redesigned the site access to only include Nelson Bay Road, alleviating concerns about Marsh Road. Air quality will be managed, the AQIA found that the results comply with the relevant criteria. Regarding the concerns about groundwater, all of Hunter Water's concerns have been addressed in the revised groundwater report. The reporting for the EIS also includes management plans for ecology and Acid Sulfate Soils with the intention to devise a social impact management plan as well. Site rehabilitation is addressed in the assessment. Part of the rehabilitation is covered in the biodiversity management and rehabilitation plan. Regarding the comments on heritage, additional work is provided as part of the further Aboriginal heritage assessment that has been undertaken in conjunction with the Aboriginal community and Heritage NSW. A management plan has been devised. For the visual impact a 15m vegetation buffer around the site will provide a buffer between Nelson Bay Road and the proposed mine. Any noise buffers are planned for behind this vegetation buffer. The eventual rehabilitation will rectify visual impacts as noted in Chapter 17 of the EIS. As noted in this response a need for sand is required going forward in NSW. The proposal would provide a resource for the sand resource market. The ecological concerns raised such as biobanking have to work within relevant legislation and any concerns about legislation should be addressed to the relevant parties outside of this forum.

6.26 Wildlife in Need of Care, Fern Bay NSW

All possible mitigation measures have been built into the management plans for the proposed sand mine. The air, noise and traffic hazards near the school have been considered and with

all advice measured, the school will receive minimal impacts with noise and air considered to comply with relevant criteria. The BMRP has been designed to achieve the objectives of:

- To protect threatened species and minimise impacts on resident fauna during the staged operational life of the sand mine;
- To ensure the ongoing ecological viability of the retained areas of vegetation by identifying any areas within retained vegetation requiring rehabilitation and or/ revegetation and implement a program for this;
- To rehabilitate vegetation retained within the site during the staged operational life and post operational life of the sand mine;
- To install, establish and implement an on-going nest box monitoring program;
- To ensure the long-term viability of groundwater dependent ecosystems by establishing and implementing an on-going groundwater dependent ecosystems monitoring program;
- To salvage resources within the approved disturbance area – including vegetative, soil and hollows – for beneficial reuse in the rehabilitation/offset areas; and
- To implement the control of weeds and feral pests.

The aquifer has been considered and through the EIS assessment, impact is considered minimal. Response concerns have been addressed in the Hydrological assessment.

7 Project Evaluation

The Bobs Farm sand mine will/could provide a valuable sand resource for the NSW market. The proposal over 15 years provides a resource during a time period of expected growth and when current supply sources are expected to be declining in reserves. Also, with the reliance of certain economic sectors for sand it becomes an economic fiscal issue.

Sand is a vital resource for the construction industry. At present it is forecast that 725,000 new homes are required by 2036 for the Greater Sydney Region, as well as the requirements for other infrastructure such as roads or non-residential buildings (R.W.Corkery & Co. et al. 2019, p xi, **Annex 15**). The Greater Sydney Region analysis report also noted that under current approvals for extractive materials there are insufficient reserves of natural sand for the projected 2036 requirements (R.W.Corkery & Co. et al. 2019, p xi).

For the financial year of 2018, 5.9 million tonnes (Mt) of natural sand products were supplied for the Greater Sydney Region, which equated to 15% of the total demand for construction materials, of this 5.9Mt only 2.2Mt (37%) came from the Greater Sydney Region (R.W.Corkery & Co. et al. 2019, pp. xiv-xv). It was noted in the report by R.W.Corkery & Co. et al. (2019, p. 38) with Penrith Lakes closing in 2014 and the expected exhaustion of the Maroota supply, alternative sources are being sought. This has included crushing of hard rock to produce sand which is not always preferable for certain grades of construction material such as concrete.

As per **Figure 8.1**, the extractive material feeder areas for the Greater Sydney Region include the Central Coast and Lower Hunter regions, which R.W.Corkery & Co. et al. (2019, p xix) reference as supplying 10 natural sand quarries, which is three times the next most prolific feeder area (South Western with 3 quarries). The Greater Sydney Region is cited as having 12 quarries. Impressively for the 2018 financial year of the 3.7 Mt sourced from outside the Greater Sydney region, the Northern area provide 2.27 Mt, of which the quarries were located in the Stockton, Salt Ash, Williamtown area as well as the central Coast. This demonstrates the Port Stephens district as a vital resource of construction sand for the economic benefit of the State of NSW.

Key supply demands include geographic demands, transport costs, environmental impacts, consumption demand, development consent requirements as well as the availability of land

for infrastructure (R.W.Corkery & Co. et al. 2019, pp. 88-89). These factors can also act as constraints. With the Northern feeder area, the most highly producing of natural sand products to the Sydney Greater Region after Sydney itself (**Figure 8.1**) is Port Stephens and this demonstrates the existing ability for the Northern Region, particularly the Port Stephens area to supply a quantity of natural sand that are easily accessible through Stockton Bight, being the Holocene and Pleistocene dunes (**Figure 8.2**). Also, with the forecast of the requirement of 118 million tonnes of natural sand required from December 2018 to December 2036, this indicates a stable demand just within the Greater Sydney Region, which does not consider the demand requirements within the rest of NSW or other markets in which natural sand may be sold (R.W.Corkery & Co. et al. 2019, p. 85). Constraints that make the northern area more viable include:

- Limited train ability from South Coast and Eastern Harbour City due to availability of train lines, and competing services (passenger);
- Appropriately zoned and sized land near main roads; and
- Community issues.

Due to the nature of historical development within the Lower Hunter and Port Stephens, existing infrastructure such as rail, roads and ports exist for shipping coal, as well as sand to potential clients. The set up for transport in the Newcastle area could also come under the NSW Freight and Ports Plan 2018-2023 as an intermodal freight terminal (R.W.Corkery & Co. et al. 2019, p. 4). NSW Freight and Ports Plan directly links the Hunter as the most significant manufacturing location outside of the Greater Sydney Region as well as a major port for natural resources (Transport for NSW 2018, pp. 37-40). Additionally, the Hunter Region Plan 2036 indicates that Newcastle will have greater growth as Australia's next metropolitan city with greater regional and interregional connectivity, which also includes greater connections to the Asia-Pacific region with port and airport being key components (Department of Planning and Environment 2016, pp.17-20).

Sand mining already exists as an industry in the Port Stephens area, is well known locally and provides significant employment. Through continued extraction and strong management, the area can continue to benefit economically directly from sand extraction, as well as indirectly through the production of resources that require natural sand.

Due to public knowledge of the sand mining industry through it being part of the community already, aspects such as silicosis can be readily addressed as natural sand products are not an environmental issue that generates silicosis as a by-product. It can be a costly and inefficient use of resources in starting up a sand quarry to then have to document existing knowledge about silicosis not being related to the extraction mining of natural sand resources (R.W.Corkery & Co. et al. 2019, p. 81). It is noted in the Greater Sydney Region report that this issue should be addressed at a State Government level and from a community point of view, concerns of this nature would not then feed into community issues.

8 Conclusion

The environmental impacts of the proposal have been carefully considered during the preparation of this EIS and its review with this response to issues. It is considered that the works would pose an acceptable and very low risk to the environment. The production of sand products within the region has been ongoing for many years with minimal negative impacts to the local community and adjoining owners. Commencing a sand mine in this location is logical and would provide a continued cost-effective supply of an important natural resource to local and regional centres.

The project can be implemented with minimal adverse socio-economic and environmental impacts as demonstrated throughout this EIS and the additional advices and reports attached to this RTS. While some environmental impacts are expected, these are manageable and mitigation measures are developed to minimise the impacts and ensure the operations can proceed in an environmentally sustainable manner.

The project is justified on the basis of the efficient utilisation of existing infrastructures, resources and overall economic benefits to local, regional and State economies. It satisfies the objectives of ecologically sustainable development.

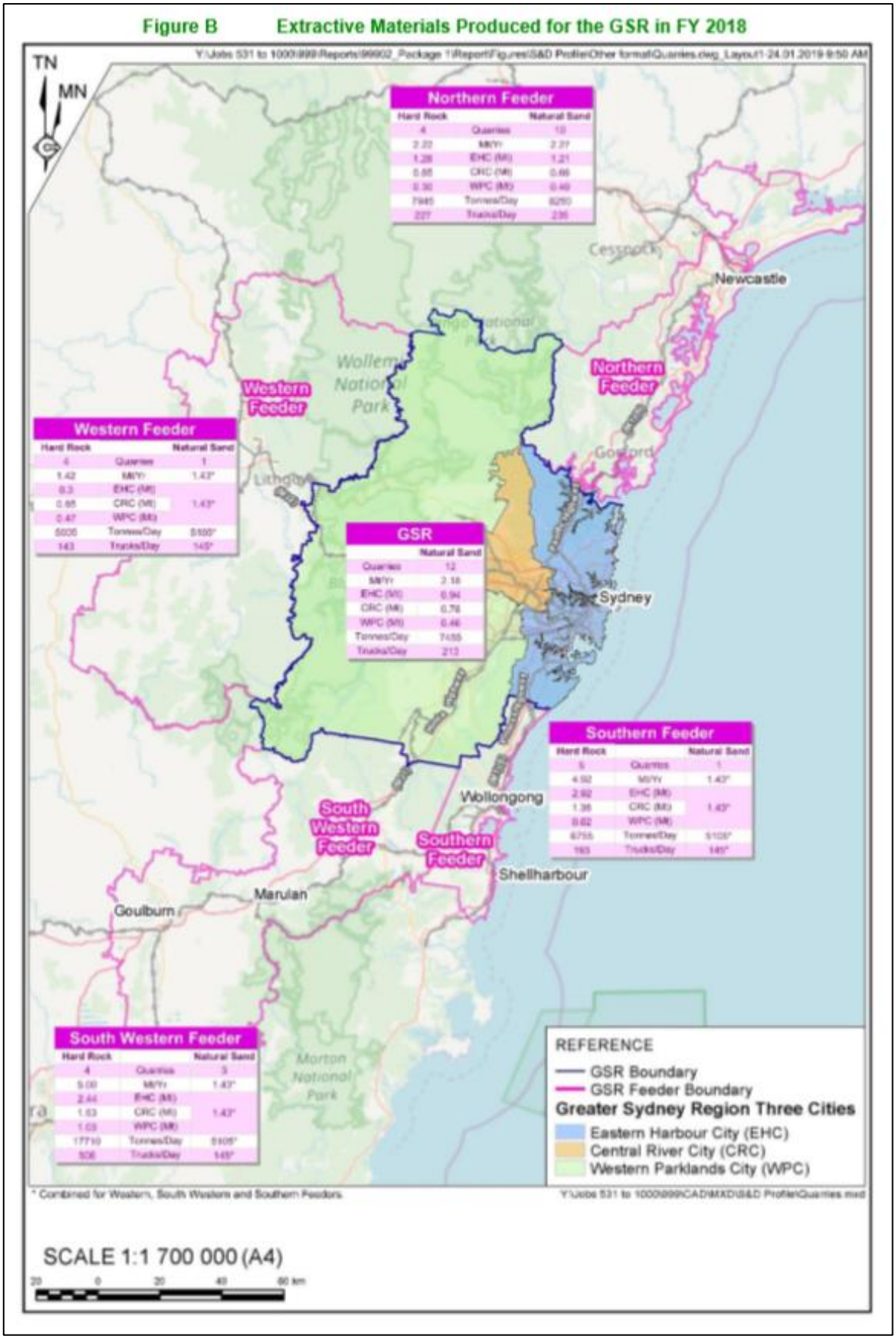

Figure 8.1: Extractive Materials Produced for the GSR in FY 2018 (R.W.Corkery & Co. et al. 2019, pp. xix)

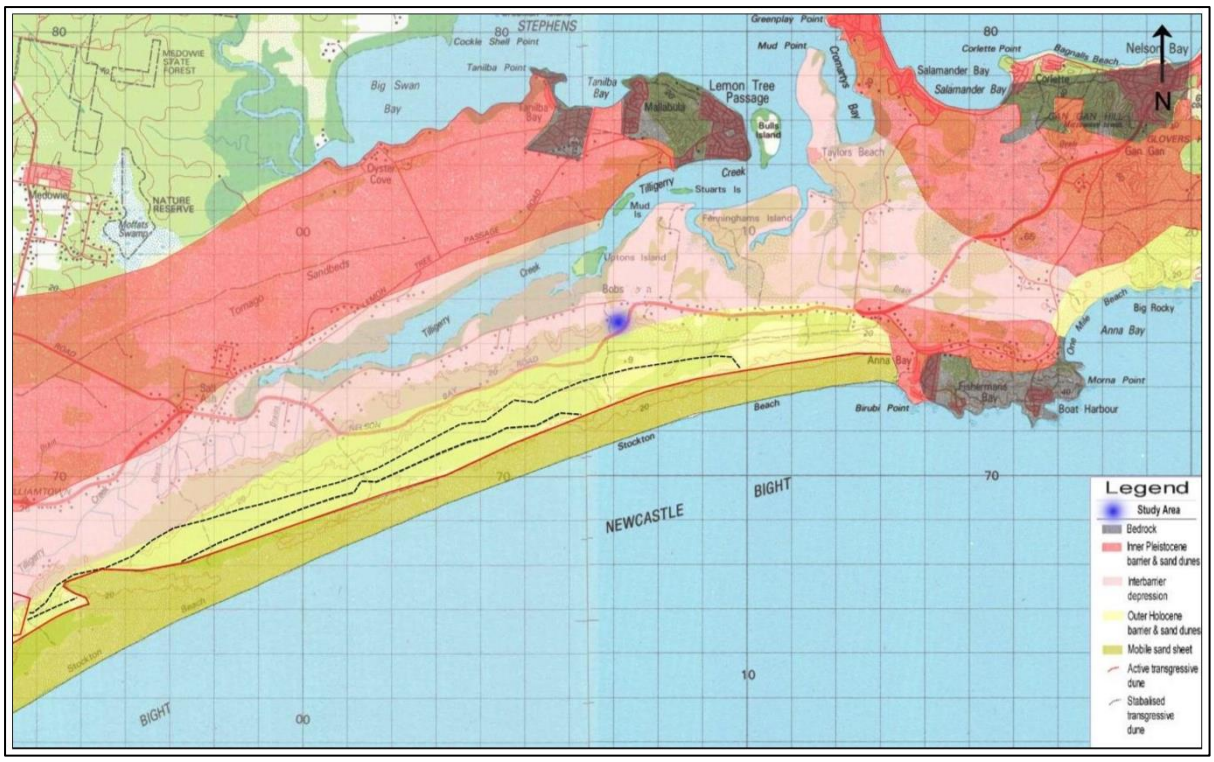

Figure 8.2: Landform Map of Port Stephens with Proposed Bobs Farm Sand Mine Location (study area) (Advitech 2020)

9 References

Department of Planning and Environment 2016, Hunter Regional Plan 2036. NSW Government, Newcastle, NSW.

R.W. Corkery & Co. Pty. Limited Geological & Environmental Consultants, Ecoroc Pty Ltd, Nine-Squared Pty Ltd and Ausrocks Pty Ltd 2019, Supply and Demand Profile of Geological Construction Materials for the Greater Sydney Region. Prepared for the Department of Planning and Environment.

Transport for NSW 2018, NSW Freight and Ports Plan 2018-2023. NSW Government, Chippendale NSW.

Annex 1 - Bobs Farm Sand Mine Plan

Annex 2 - RMS Entranceway Concept Design

Annex 3 - Aboriginal Cultural Heritage Management Plan (including updated ACHAR and Test Excavation Report)

Annex 4 - Noise Impact Assessment

Annex 5 - Construction Noise Management Plan

Annex 6 - Operational Noise Management Plan

Annex 7 - Memorandum in Response to Public Submissions for Noise

Annex 8 - Air Quality Impact Assessment

Annex 9 - Hydrogeological Assessment and Management Plan

Annex 10 - Acid Sulfate Soil Management Plan

Annex 11 - Historic Heritage Assessment

Annex 12 - Biodiversity Assessment Report

Annex 13 - Traffic Impact Assessment

Annex 14 - Register of Submitters and Matrix of Issues

Annex 15 - Supply and Demand Profile of Geological Construction Materials for the Greater Sydney Region